Documentation

HiPath 3000/5000
IP Systems

Service Manual

A31003-H3580-S100-10-7620

Communication for the open minded

Siemens Enterprise Communications
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1 Introduction and Important Notes

Service Manual HiPath 3000/5000 V8: A31003-H3580-S100-10-7620, 01-2011

Disclaimer

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Contents

This chapter covers the following topics:

Topic
Section 1.1, “Product Overview”
Section 1.2, “Target Group and Prerequisites”
Section 1.3, “Using this Manual”
Section 1.4, “Safety Information and Warnings”
Section 1.5, “Emergencies”
Section 1.6, “Reporting Accidents”
Section 1.7, “Correct Disposal and Recycling”
Section 1.8, “Standards and Guidelines for Installation”
Section 1.9, “Privacy and Data Security”
Section 1.10, “Information on the Intranet”
Section 1.11, “Feedback on the Documentation”

1.1 Product Overview

HiPath 3000/5000

HiPath 3000/5000 is a high-performance, reliable communication platform for medium-sized enterprises. It offers the wide range of functionality of a traditional telephony system, coupled with modern UC communication solutions. The system is suited to both packet-switched (LAN/WAN) and line-switched (ISDN) environments, or a combination of the two. HiPath 3000 enables any combination of IP, analog and digital telephones, as well as PC clients and cordless telephones.

Expansion

The HiPath 3000 communication platform is available in the following configurations:

- HiPath 3300 (19-inch rack)
- HiPath 3350 (wall-mounted)
- HiPath 3500 (19-inch rack)
- HiPath 3550 (wall-mounted)
- HiPath 3800 (default system / 19-inch rack)

1.2 Target Group and Prerequisites

Content and target group

This service manual (eSHB) provides information on the various HiPath 3000/5000 V8 systems. The information contained herein should only be considered a guideline and does not replace any training.

CAUTION
Work on the system may only be performed by qualified personnel; see Section 1.4, “Safety Information and Warnings”.

Important: You can find information on complex configurations (e.g. the status for Internet telephony service providers) in the Administrator documentation HiPath 3000/5000, Configuration Examples.

1.3 Using this Manual

This section covers the following topics:

- Section 1.3.1, “Structure”
- Section 1.3.2, “Reference Manuals”
- Section 1.3.3, “Notational Conventions Used”

1.3.1 Structure

This service manual covers the following topics:

Chapter	Description
Chapter 1, “Introduction and Important Notes”	Chapter 1, “Introduction and Important Notes” contains the basic information necessary for working with the product and with this service manual. The safety information and warnings as well as the standards and guidelines regarding installation, including lightning protection, must be observed.
Chapter 2, “System Data”	Chapter 2, “System Data” provides information on the current HiPath 3000/5000 version and associated systems (characteristics, construction, system environment, capacity limits, technical data).
Chapter 3, “Boards for HiPath 3000”	Chapter 3, “Boards for HiPath 3000” describes all of the boards used for HiPath 3000. The hardware information (such as connection cables and NT connections) is presented for each board.
Chapter 4, “Installing HiPath 3000”	The actions necessary for the standard installation (part of a standard system) of the different Chapter 4, “Installing HiPath 3000” systems are described in HiPath 3000.
Chapter 5, “Starting Up HiPath 3000”	The procedures for the startup of the individual HiPath 3000/5000 components are described in Chapter 5, “Starting Up HiPath 3000”, Chapter 6, “HiPath 5000 Startup and Administration” and Chapter 7, “Starting HiPath 3000 as a Gateway”.
Chapter 6, “HiPath 5000 Startup and Administration”	
Chapter 7, “Starting HiPath 3000 as a Gateway”	
Chapter 8, “Licensing”	Chapter 8, “Licensing” contains information about HiPath License Management.

Table 1-1 Chapters in this Service Manual

Chapter	Description
Chapter 9, “Expanding and Upgrading HiPath 3000”	Information on supplementary equipment and expansions and on the procedure for upgrading HiPath 3000 systems are part of Chapter 9, “Expanding and Upgrading HiPath 3000”.
Chapter 10, “Workpoint Clients”	Chapter 10, “Workpoint Clients” contains the description of the workpoint clients supported.
Chapter 11, “HiPath Cordless Office”	Basic information about the operation of the HiPath Cordless Office are part of Chapter 11, “HiPath Cordless Office”.
Chapter 12, “Service”	Chapter 12, “Service” describes service and maintenance tasks and provides information on error detection and troubleshooting.
Chapter 13, “IP Fundamentals”	Introductory information on the subject of IP can be found in Chapter 13, “IP Fundamentals”.
Annex A, “System Programming Codes (Expert Mode Codes)”	The following appendices contain lists with programming codes, IP protocols, port numbers: Annex A, “System Programming Codes (Expert Mode Codes)”, Annex B, “Codes for Activating/Deactivating Features” and Annex C, “IP Protocols and Port Numbers Used with HiPath 3000/5000 V7 and Higher”.
Annex B, “Codes for Activating/ Deactivating Features”	
Annex C, “IP Protocols and Port Numbers Used with HiPath 3000/ 5000 V7 and Higher”	
Annex D, “Identifying System Power Requirements”	Annex D, “Identifying System Power Requirements” provides information about the resource requirements of the boards and components of the HiPath 3000 systems.
Annex E, “Notes for Editing the File snmpd.cnf”	Annex E, “Notes for Editing the File snmpd.cnf” is aimed at users with sufficient SNMP knowledge to modify trap destinations and community names in HiPath Fault Management Desktop.
Annex F, “Components of the Linux Server of OpenScape office HX”	Annex F, “Components of the Linux Server of OpenScape office HX” lists the required components for operation of the Linux server required for the OpenScape Office HX application.
Annex G, “Country Versions”	Annex G, “Country Versions” lists the countries with their own country code and the countries with „IM“ country code that can be set in the Manager E to configure HiPath 3000/5000.

Table 1-1 Chapters in this Service Manual

1.3.2 Reference Manuals

In addition to this service manual, the following manuals are available for HiPath 3000/5000:

Manual	**Part number**
Manager E	A31003-H3580-M100-*-**A9
Manager C	A31003-H3580-M101-*-**A9
Feature Description	A31003-H3580-F100-*-**18
System Description	A31003-H3580-Y100-*-**18
Getting Started	A31003-H3580-G100-*-**31
Configuration Examples	A31003-H3580-M102-*-**A9
HG 1500	A31003-H3580-M103-*-**A9

Table 1-2 Reference Manuals

1.3.3 Notational Conventions Used

This service manual applies the following notational conventions:

Purpose	**Style**	**Example**
Body text that is of particular importance.	Bold	**Name** must not be deleted.
User interface elements to be operated.	Bold	Click **OK**.
Menu sequence	Bold -> Bold	**File** -> **Close**
Text visible in files and text to be entered or selected in input/selection fields.	Courier and bold	**`Word1 Word2 Word3`**
Placeholder	In angle brackets and italic	*`<InstDir>`*
Files and directories containing files.	Courier	*`<InstDir>`*`/config/services/global.cfg`

Table 1-3 Notational Conventions Used

Purpose	Style	Example
Operations and sub-operations in the guideline text	Numbered, nested list	1. Activate the **SIP Registrar** checkbox. The input fields are now activated. 2. Enter the following settings: 1. Activate the optional **Authentication** checkbox. 2. Complete the input fields: • SIP User ID: forexample, **`hipath3000br13`** • Realm: The range for which the authentication should apply, forexample: **`sol`**. 3. Click **Apply**. The changes are saved.
Settings that need not necessarily be performed in order.	List with bullet points	

Table 1-3 Notational Conventions Used



Important: Identifies useful information.

1.4 Safety Information and Warnings

General conditions

- Work on communication systems and devices may only be carried out by qualified persons. For the purposes of safety information and warnings, qualified persons are persons who are authorized to place into operation, ground, and label systems, devices, and lines in accordance with applicable safety procedures and standards.
- It is absolutely essential that you read and understand the following safety information and warnings before starting installation and implementation work on the communication system or device. You should also carefully read and observe all safety information and warnings on the communication systems and devices themselves.
- Familiarize yourself with emergency numbers.
- Always consult a supervisor before starting work in conditions where the necessary safety precautions do not appear to be in place.

Types of safety information and warnings

The following grades of safety information/warnings are used in this service manual:

DANGER
Indicates an immediate danger that could result in death or serious injury.

WARNING
Indicates a general danger that could result in death or serious injury.

CAUTION
Indicates a danger that could result in injury.

NOTE: Indicates a situation that could result in damage to property and/or loss of data.

Symbols for specifying the source of danger more exactly

The following symbols are not generally used in the manual. They explain symbols that may be depicted on the communication systems and equipment.



* electrostatically sensitive devices

1.4.1 Warning Sign: DANGER

DANGER
Risk of electric shock through contact with live wires

- Note: Voltages above 30 Vac (alternating current) or 60 Vdc (direct current) are dangerous.
- Only personnel with proper qualifications or qualified electricians should perform work on the low-voltage network (1000 Vac).

1.4.2 Warning Sign: WARNING

WARNING
Risk of electric shock through contact with live wires

An electric shock can be life-threatening or lead to serious injuries such as burns. There are additional dangers even when working with low voltage and large cable cross-sections. Cables with a large cross-section generally have lower voltages, although the amperages are higher.

- Before starting any work, check that the circuits involved are de-energized. Never take it for granted that turning off a main switch or circuit breaker will reliably interrupt all circuits.
- Only use systems, tools, and equipment which are in perfect condition. Do not use equipment with visible damage.
- Replace any damaged safety equipment (covers, labels and ground wires) immediately.
- Replace the power cable immediately if you notice any damage.
- Only place systems or devices in protection class I into operation using a ground contact socket.
- Connect the communication system and, if necessary, the main distribution frame to the ground wire before starting up the system and connecting telephones and lines. Never operate the communication system without the required ground wire.
- Never touch live wires without ensuring adequate insulation.
- Do not carry out any hardware installation work on telecommunication systems and devices during a storm.
- Expect leakage current from the telecommunications network. Disconnect all telecommunication lines from the system before disconnecting the prescribed ground wire from the system.

WARNING
Disconnection from power circuit(s)
A disconnect device can be a disconnecting switch (main switch), circuit breaker (fuse/cutout), or power plug that completely disconnects the telecommunication system and device from the power circuit.

- Before carrying out any work on the communication system or on the device, find out whether there is a disconnect device and locate it.
- When you need to disconnect the power supply to the communication system or device, you do so using the disconnect device.
- Secure the disconnect device mechanically so that it cannot be used by other persons and attach a sign reading DO NOT OPERATE to the disconnect device.
- Ensure that the communication system or device is not powered from an additional power source (for example, an uninterruptible power supply), or that it is protected by an additional fuse or an additional main switch.
- If you are performing work on circuits with hazardous voltages, always work together with a partner who is familiar with the location of the disconnect devices for the power supplies.
- Always disconnect the power supply when you are working directly next to a power supply unit or direct current converter, unless the work instructions expressly permit you to work without disconnecting the power supply.
- High voltages capable of causing shock are used in this equipment. Be extremely careful when measuring high voltages and when servicing cards, panels, and boards while the system is powered on.
- Metallic surfaces such as mirrors are conductive. If you touch them, there is a risk of electric shocks or short circuits.

1.4.3 Warning Sign: CAUTION

CAUTION
Danger of injury

- When working on an open communication system or device, make sure that it is never left unattended.
- Risk of injury resulting from heavy items or loads.
  Lifting heavy objects/loads can cause injury. Use appropriate aids to carry out such tasks.
- Risk of injury resulting from laser radiation.
  If there are any optical interfaces: In case of laser radiation,
  do not look directly into the beam. You could damage your eyes.

CAUTION
Risk of explosion if accumulators and batteries are not changed properly

- Only use licensed battery packs and batteries.
- The lithium battery must be replaced only by an identical battery or one recommended by the manufacturer.

CAUTION
Risk of fire

- Only telecommunications cables with a cable diameter of at least 0.4 mm (AWG 26) may be used.
- The system cabinets must not be fitted with any third-party devices that have not been approved.
- Do not store any documents or similar flammable items in the system.

CAUTION
General risk of injury/accidents in the workplace

- When maintenance work has been completed, always re-install all safety equipment in the right place. Also close all doors, covers, or the housing after completing test and maintenance work.
- Install cables in such a way that they do not pose a risk of accident (tripping), and cannot be damaged.
- Make sure that the work area is well lit and tidy.
- When working on the systems, never wear loose clothing and always tie back long hair.
- Be sure to remove rings, watches and other jewelry when working with electrical circuits and components. These could cause injury or short circuits.
- Wear eye protection when you are working in any conditions that might be hazardous to your eyes.
- Always wear a hard hat where there is a risk of injury from falling objects.
- Check your tools regularly. Only use intact tools.

1.4.4 Safety Information for Australia (for Australia only)

- Music on Hold and paging devices must be connected to the HiPath 3000 system via an ACA approved Line Isolation Unit.
- HiPath 3550 and HiPath 3350 must be installed near the mains socket outlet, which is powering the system. The mains socket shall be readily accessible. Integrity of the main socket must be assured.
- HiPath 3000 and HiPath 5000 may only be installed and maintained by authorized service personnel.
- HiPath 3550 and HiPath 3350 must be earthed with a separate bonding earth, if the systems are powered by a UPS.
- CE (customer equipment) does not continue to support emergency dialing after loss of mains power, if battery back up and power fail switchover to emergency analog phones is not available.
- HiPath 3000/5000 must always be programmed to allow the dialing of emergency numbers (for example 000).

1.4.5 Safety Information for Brazil (for Brazil only)

The use of the outlet strip with overvoltage protection with part number C39334-Z7052-C33 is absolutely mandatory. The AC power of the HiPath 3000 systems must be conducted through the outlet strip with overvoltage protection.

It is absolutely necessary to use a shielded Ethernet cable for LAN interfaces/ports of the HXGS3 board.

1.4.6 Notes

Note the following information in order to avoid damage to property:

- Before placing the system into operation, check whether the nominal voltage of the power supply network corresponds to the nominal voltage of the communication system or device (type plate). If necessary, adjust the nominal voltage of the communication system or device appropriately.
- To protect electrostatically sensitive devices (ESD):
  - Make sure that you are wearing a wristband before carrying out any work on PC boards and modules.
  - Transport PC boards and modules only in suitable protective packaging.
  - Always place PC boards and modules on a grounded conductive base, and do not work on the PC boards anywhere else.
  - Only use grounded soldering irons.
- Use only original accessories. Failure to observe these instructions may damage the equipment or even violate safety and EMC regulations.
- Before starting wall mounting, check that the wall has sufficient bearing strength. Always use suitable installation and mounting materials to mount the communication systems and devices securely.
- Condensation damage:
  A sudden temperature change may cause condensation to form. If the communication system or device is, for example, moved from a cold environment to a warmer space, condensation may form. Wait until the temperature has regulated and the communication system or device is completely dry before switching it on.

1.5 Emergencies

Actions in emergencies

- Remain calm in the event of an accident.
- Disconnect the power before touching the victim.
- If you cannot disconnect the power immediately, use a nonconducting object, such as a wooden broom handle, to push or pull the victim away from electrical contact.

First aid

- Be familiar with first aid for electrical shock. Familiarity with the various resuscitation methods required for breathing/heartbeat restoration and burn treatment are essential in emergencies of this kind.
- Administer resuscitation immediately if the person is not breathing (mouth-to-mouth or mouth-to-nose).
- If you are trained and certified, administer cardiac compression if the heart is not beating.

Calling for help

1. Immediately call an ambulance or the emergency doctor. Give details of the accident in the following order:
   - Where did it happen?
   - What happened?
   - How many people were injured?
   - What type of injuries were sustained?
2. Be prepared to assist the emergency services with any supplementary information they may require.

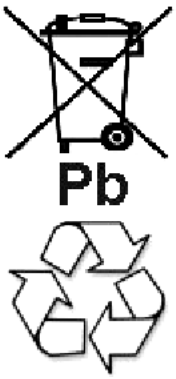
1.6 Reporting Accidents

- Report all accidents, near accidents, and possible hazards to your manager to ensure their causes are resolved as soon as possible.
- Report any electric shock, no matter how minor.

1.7 Correct Disposal and Recycling



All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
The correct disposal and separate collection of your old appliance will help prevent potential negative consequences for the environment and human health. It is a precondition for reuse and recycling of used electrical and electronic equipment.
For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service, the shop where you purchased the product or your sales representative.
The statements quoted above are only fully valid for equipment which is installed and sold in the countries of the European Union and is covered by the directive 2002/96/EC. Countries outside the European Union may have other regulations regarding the disposal of electrical and electronic equipment.



Old batteries with this symbol are utilizable economic units and must be recycled. Old batteries that are not recycled are to be disposed of as special refuse in accordance with all requirements.

1.8 Standards and Guidelines for Installation

1.8.1 Connection to the Power Circuit

HiPath communication systems are approved for connection to TN-S power supply systems. They can also be connected to a TN-C-S power supply system in which the PEN conductor is divided into a ground wire and a neutral wire. TN-S and TN-C-S systems are defined in the IEC 364-3 standard.

If work needs to be done on the low-voltage network, this must be carried out by a qualified electrician. When installing and connecting the HiPath communication systems, the IEC 60364 and IEC 60364-4-41 norms or corresponding legal norms or national requirements must be observed, e.g. in the USA/Canada.

1.8.2 Fire Safety Requirements

Fire safety requirements are defined on a country-specific basis in the building regulations. Please follow the valid regulations for your country.

To ensure the legal fire protection and EMC requirements, operate the HiPath systems only when closed. You may open the system only briefly for assembly and maintenance work.

HiPath system cables comply with the requirements of international norm IEC 60332-1 regarding flammability. The following norms contain similar requirements regarding cable:

IEC 60332-1	**EN 50265-1 with EN 50265-2-1**	**VDE 0482 parts 265-1 with VDE 0842 parts 265-2-1**
Note: IEC 60332-1 is equivalent to test method UL VW-1	Note: EN 50265-1 and -2-1 replace HD 405.1	Note: VDE 0482 parts 265-1 and -2-1 replace VDE 0472, part 804, test method B

The division responsible for project planning and service must check whether the IEC 60332-1 norm complies sufficiently with the relevant building regulation and any other applicable regulations.

1.8.3 Shielded Cables for LAN, WAN and DMZ Connections

Compliance with CE requirements on electromagnetic capability of communication systems and their LAN, WAN and DMZ connections requires the following:

- Communication systems may only be operated using shielded connection cables. This means that a Category 5 shielded cable (CAT.5 cable) at least 3m in length must run between the shielded LAN, WAN and DMZ connection ports on the communication system and the connection to the building installation or to external active components. The cable shield on the end of the cable connected to the building installation or external active components must be grounded (connected to building potential equalization).
- On shorter connections with an external active component (LAN switch or similar), you must also use a Category 5 shielded cable (CAT.5 cable). However, the active component must have a corresponding shielded LAN port, whose shielded port is grounded (connected to building potential equalization).
- Shielding properties on the cable components must fulfil the requirements of the European EN 50173-1 "Generic cabling systems" norm and the links contained therein at the least. The European EN 50173-1 norm is derived from the global ISO/IEC 11801 norm.
- Building installations equipped with consistently shielded, symmetrical copper cables according to the requirements laid out in Class D of the EN 50173-1 norm fulfill the conditions set out above. Class D can be achieved, for example, by installing Category 5 (CAT.5) components (cables, terminal boxes, connection cables, etc.).
- In the North-American market, UTP cabling (US EIA/TIA 568 A norm) is usually installed. Therefore, in this region, the following applies to LAN connections: communication systems can only be operated using shielded connection cables. This means that a Category 5 shielded cable (CAT.5 cable) at least 3m in length must run between the shielded LAN, WAN and DMZ connection ports on the communication system and the connection to the building installation or to external active components. The cable shield on the end of the cable connected to the building installation or external active components must be grounded (connected to building potential equalization).
- For LAN connection to modules in LTUs, please refer to the notes on shielded connections on the LTU frame outlet point.

1.8.4 Lightning Protection

NOTE:

Lightning protection for the boards

Analog and digital subscriber lines are protected on the boards, for up to 2 kV longitudinal voltage and 1 kV transverse voltage, against the high-energy surge voltage with a pulse shape of 10/700 µs and 1.2/50 µs that can be induced by lightning. However, this protection is only effective if the system is properly grounded in accordance with the installation instructions.

Grounding

Once the HiPath 3000 has been grounded, check the low-impedance ground connection of the system using the ground conductor of the power supply circuit, as well as the low-impedance connection (of the additional permanently-connected protective ground conductor) to the building's potential equalization bus.

NOTE:

External lightning protection

In the case of line lengths exceeding 500 m and where the lines exit the building, analog and digital subscriber line modules must be protected by external lightning protection.

Lightning protection of this kind is known as "additional primary protection". This is either installed on the MDF (**M**ain **D**istribution **F**rame) or at the entry point of the line into the building. A **g**as-filled surge arrester with 230 V nominal voltage is switched to ground from each wire that is to be protected.

Without this additional primary protection, lightning that exceeds the voltage values given above could irreparably damage the boards. This can cause the entire system to fail or result in components overheating (risk of fire).

Definition of "additional primary protection"

"Additional primary protection" is a **g**as-filled surge arrester that must be correctly installed on the MDF (**M**ain **D**istribution **F**rame) or at the entry point of the line into the building.

1.8.5 Markings



The device conforms to the EU directive 1999/5/EG, as attested by the CE mark.

1.9 Privacy and Data Security

This telephone system uses and processes personal data (as in call detail recording, telephone displays and customer data records).

In Germany, the processing and use of such data is subject to various regulations, including those of the Federal Data Protection Law (Bundesdatenschutzgesetz, BDSG). Observe all applicable laws in other countries.

The objective of privacy legislation is to prevent infringements of an individual's right to privacy based on the use or misuse of personal data.

By protecting data against misuse during all stages of processing, privacy legislation also protects the material interests of the individual and of third parties.

The customer is responsible for ensuring that the system is installed, operated, and maintained in compliance with the applicable data protection, labor, and labor protection laws.

Employees of Siemens Enterprise Communications GmbH & Co. KG are bound to safeguard trade secrets and personal data under the terms of the company's work rules.

It is imperative to observe the following rules to ensure that the statutory provisions relating to service (on-site or remote) are strictly followed. This safeguards the interests of the customer and offers added personal protection.

A conscientious and responsible approach helps protect data and ensure privacy:

- Ensure that only authorized persons have access to customer data.
- Use the password features of the system with no exceptions. Never give passwords to an unauthorized person orally or in writing.
- Ensure that no unauthorized person can ever process (store, modify, transmit, disable or delete) or use customer data.
- Prevent unauthorized persons from gaining access to data media (such as backup CDs or log printouts). Access should also be prevented during service calls as well as when storing and transporting data.
- Ensure that data media which are no longer required are completely destroyed. Ensure that documents are not generally available.

Work closely with your customer contact; this promotes trust and reduces your workload.

1.10 Information on the Intranet

Up-to-the-minute information on important topics is available on the Siemens Enterprise Communications GmbH & Co. KG intranet. Here is a selection:

Tabelle 1-4 Information on the Intranet

Contents	Languages	URL
Product Overview Product descriptions	German English	http://opus1.mchh.siemens.de:8080/TopNet/index.html
Electronic Documentation on SEN ESY Products Selection and download of the following: • Operating manuals • Administrator documentation • Service documentation • Sales documentation	German English French Italian Dutch Portuguese Spanish	http://apps.g-dms.com:8081/techdoc/search_de.htm
List of "Frequently Asked Questions (FAQ)" in the VD portal Questions and answers regarding HiPath customer scenarios: Keyword "Solutions_Products_Services"	German	https://vd.icn.siemens.de/cfdocs/faq/start.cfm
Knowledge Management for Operational Support and Services KMOSS Platform for the provision of service information (successor to the Service Information System, SIS): • Tips & Tricks • Service information sorted according to products	English	https://www.g-dms.com/livelink/livelink.exe/fetch/2000/12466151/12466438/custom-view%2Ehtml?func=ll&objId=12466438&objAction=Browse&viewType=1
TAC Advisor Technical Assistance Center for enterprise and network partners: • Downloads • Software Maintenance Releases (SMR) • Configuration notes and alerts	English	http://tac.fld.rolm.com/
Back Level Support BLS Product information for the products supported by BLS.	German English	https://bls.icn.siemens.at/en/service_solutions/product_information/product_information_content.cfm

Tabelle 1-4 Information on the Intranet

Contents	Languages	URL
Setting up tracing for the Feature server Configuration notes and procedures	German English	https://www.g-dms.com/livelink/livelink.exe?func=ll&objId=1115241&objAction=View&nexturl=%2Flivelink%2Flivelink%2Eexe%3Ffunc%3Dsrch%2ESearchCache%26cacheId%3D143117641

1.11 Feedback on the Documentation

If you have any questions that have not been answered by this documentation, please contact the following organizations:

- Internal employees should contact their National Support Center.
- Customers should contact their dealer or the Siemens customer service center.

When calling, please ensure you have the title and part number for your documentation to hand.

Example

Title: HiPath 3000/5000 V8, Service Manual

Part number: A31003-H3580-S100-10-7620

2 System Data

Chapter contents

This chapter covers the following topics:

Topic
Section 2.1, “HiPath 3000”
• Section 2.1.1, “Electrical Environment”
• Section 2.1.2, “Lightning Protection”
• Section 2.1.3, “Individual HiPath 3000 System Models”
• Section 2.1.4, “Design and Dimensions of the HiPath 3000 Systems” – Section 2.1.4.1, “Design and Dimensions of HiPath 3800” – Section 2.1.4.2, “Design and Dimensions of HiPath 3550” – Section 2.1.4.3, “Design and Dimensions of HiPath 3350” – Section 2.1.4.4, “Design and Dimensions of HiPath 3500” – Section 2.1.4.5, “Design and Dimensions of HiPath 3300”
• Section 2.1.5, “System Environment of the HiPath 3000 Systems” – Section 2.1.5.1, “System Environment HiPath 3800” – Section 2.1.5.2, “System Environment HiPath 3550” – Section 2.1.5.3, “System Environment HiPath 3350” – Section 2.1.5.4, “System Environment HiPath 3500” – Section 2.1.5.5, “System Environment HiPath 3300”
Section 2.2, “HiPath 5000”
Section 2.3, “System-Specific Capacity Limits for HiPath 3000, HiPath 5000”
Section 2.4, “Static Configuration Rules”
• Section 2.4.1, “Resources and Capacity Limits”
• Section 2.4.2, “Gateway Channels (DSP Channels)”
• Section 2.4.3, “Connections to ITSP”
• Section 2.4.4, “MOH Channels (G.711, G.723, G.729)”
• Section 2.4.5, “IP Networking Channels (PBX Networking Channels)”
• Section 2.4.6, “Bandwidth Control for IP Networking Channels (PBX Networking Channels)”
• Section 2.4.7, “DMC (Direct Media Connection) Channels”
• Section 2.4.8, “ISDN Routing/PPP Channels”
• Section 2.4.9, “Fax/Modem Channels”

Topic
Section 2.5, “Dynamic Configuration Rules”
• Section 2.5.1, “Dynamic Performance Characteristics”
• Section 2.5.2, “Thumb Rule for HiPath 3000/5000 V8”
• Section 2.5.3, “Thumb Rule for HG 1500 V3.0”
• Section 2.5.4, “Example of Application of Thumb Rule”
• Section 2.5.5, “Maximum Number of Devices for Special Cases”
Section 2.6, “Technical Specifications for HiPath 3000”
Section 2.7, “Interface-to-Interface Ranges”
Section 2.8, “Country-Specific Ring Frequencies for Analog Subscriber Line Modules”
Section 2.9, “Numbering Plan”
Section 2.10, “Technical Specifications and Compliance to HiPath 3000”
• Section 2.10.1, “CE Compliance (not for U.S.)”
• Section 2.10.2, “Compliance with US and Canadian Standards (for U.S. and Canada only)”
• Section 2.10.3, “SAFETY International”
Section 2.11, “Environmental Conditions”
• Section 2.11.1, “Electrical Operating Conditions”
• Section 2.11.2, “Mechanical Operating Conditions”

2.1 HiPath 3000

2.1.1 Electrical Environment

HiPath 3000 is intended for use in dwellings, businesses, and industry. When the system is operated in an industrial environment, additional measures may be necessary for ensuring immunity from electromagnetic radiation (refer to Section 2.11).

2.1.2 Lightning Protection

NOTE:

Lightning protection for the boards

Analog and digital subscriber lines are protected on the boards, for up to 2 kV longitudinal voltage and 1 kV transverse voltage, against the high-energy surge voltage with a pulse shape of 10/700 µs and 1.2/50 µs that can be induced by lightning. However, this protection is only effective if the system is properly grounded in accordance with the installation instructions.

Grounding

Once the HiPath 3000 has been grounded, check the low-impedance ground connection of the system using the ground conductor of the power supply circuit, as well as the low-impedance connection (of the additional permanently-connected protective ground conductor) to the building's potential equalization bus.

NOTE:

External lightning protection

In the case of line lengths exceeding 500 m and where the lines exit the building, analog and digital subscriber line modules must be protected by external lightning protection.

Lightning protection of this kind is known as "additional primary protection". This is either installed on the MDF (**M**ain **D**istribution **F**rame) or at the entry point of the line into the building. A **g**as-filled surge arrester with 230 V nominal voltage is switched to ground from each wire that is to be protected.

Without this additional primary protection, lightning that exceeds the voltage values given above could irreparably damage the boards. This can cause the entire system to fail or result in components overheating (risk of fire).

Definition of "additional primary protection"

"Additional primary protection" is a **g**as-filled surge arrester that must be correctly installed on the MDF (**M**ain **D**istribution **F**rame) or at the entry point of the line into the building.

2.1.3 Individual HiPath 3000 System Models

This service manual contains information on all HiPath 3000 systems. Information on marketing individual models in different countries can be obtained at the responsible locations.

- System for standalone installation and for installation in 19-inch cabinets:
  - HiPath 3800
- Systems for wall mounting:
  - HiPath 3550
  - HiPath 3350
- Systems for installation in 19-inch cabinets
  - HiPath 3500
  - HiPath 3300

Information on the capacity limits of the different HiPath 3000 systems is provided in Table 2-6.

2.1.4 Design and Dimensions of the HiPath 3000 Systems

2.1.4.1 Design and Dimensions of HiPath 3800

Two configurations

Depending on the requirements, HiPath 3800 can be used as:

- a single-cabinet system (basic cabinet BC)
- a two-cabinet system (BC + expansion cabinet EC)

Design

The basic cabinet BC has nine slots and the expansion cabinet EC has thirteen slots for peripheral boards. The common control board CBSAP has a fixed slot (slot 6, only in the BC).

Depending on your requirements, up to three LUNA2 power supply units can be used in the basic cabinet BC and up to four in the expansion cabinet EC.

Peripheral devices can be connected to the HiPath 3800 in a number of different ways:

- SIVAPAC connectors are available on the backplane for connecting the external main distribution frame MDFU-E using CABLUs (prefabricated cabling units) or to connect external patch panels.
- Connector panels with RJ45 jacks for connecting the peripheral device directly. The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- For U.S. only: connector panels with CHAMP jack for connecting the peripheral device directly. The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- Connector panels with SIPAC 1 SU connectors for connecting the external main distribution frame MDFU-E or external patch panels using CABLUs. The connector panels are clipped onto the SIVAPAC connectors on the backplane.

The type of connection used will be decided in consultation with the customer on conclusion of the agreement. The cabinets will be delivered accordingly with or without clipped-on connector panels.

Two installation options

HiPath 3800 is suitable for installation both as a standalone system and in a 19-inch cabinet.

Dimensions

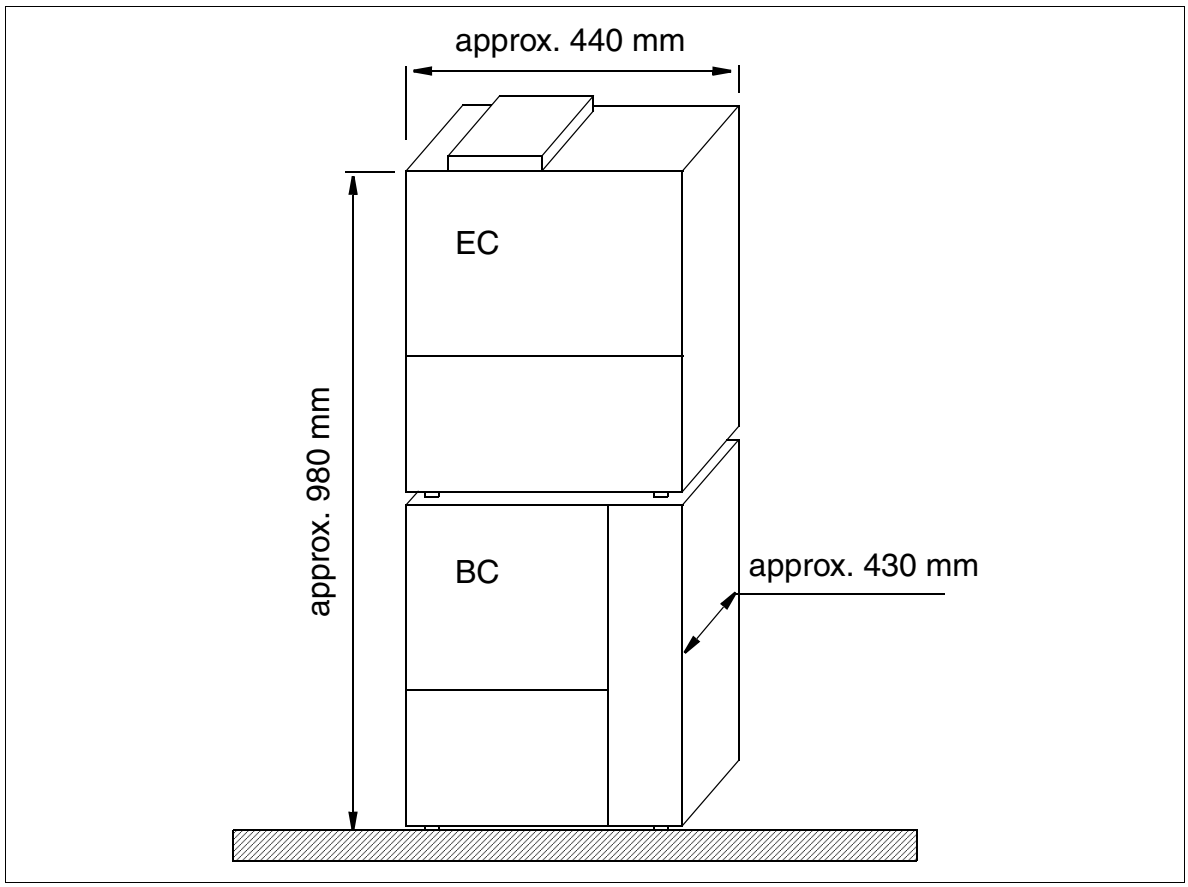


Figure 2-1 HiPath 3800 Dimensions

2.1.4.2 Design and Dimensions of HiPath 3550

Design

The housing intended for wall mounting (Figure 2-2) HiPath 3550 contains one shelf with six slot levels. The slot levels (shown in Figure 4-58), numbered in ascending order from the attachment side, have the following assignments:

- Slot levels 1-3: peripheral boards (two slots per level)
- Slot level 4: CBCC control board only
- Slot level 5: SIPAC slot
- Slot level 6: optional boards (up to 5 modules)

The power supply is on the rear panel of the subrack.

The connection cables to the peripherals (telephones, trunk connections etc.) can be connected directly. Use an external MDFU in certain situations (CMI).

Dimensions

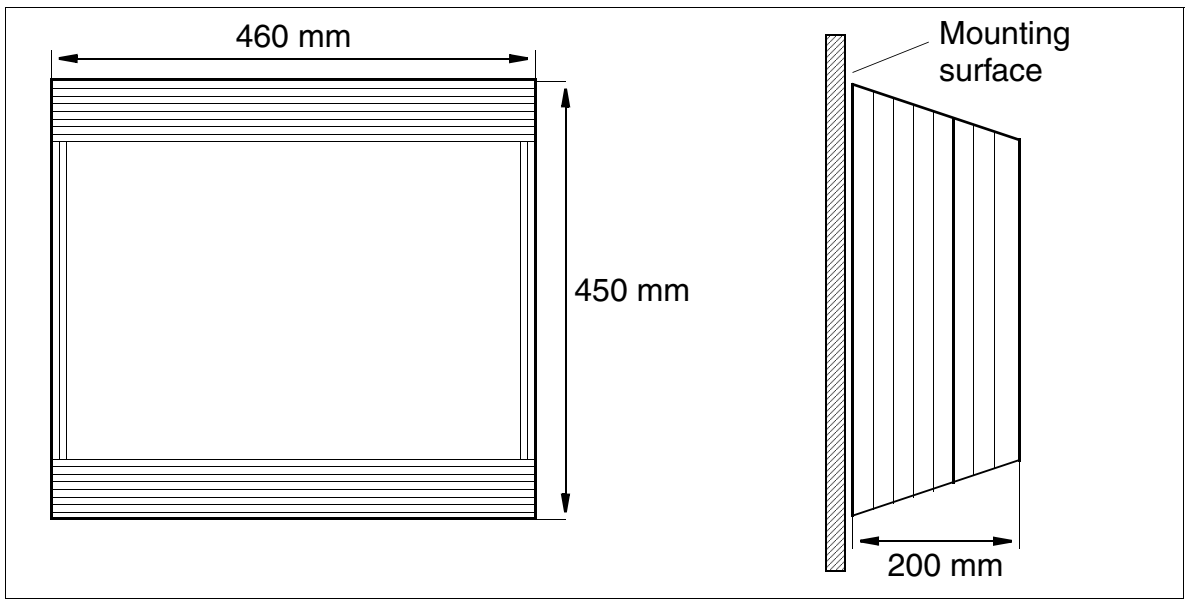


Figure 2-2 HiPath 3550 Dimensions

2.1.4.3 Design and Dimensions of HiPath 3350

Except for the CBCC board, the Octopus F100 communication system is identical in structure to HiPath 3350. The part number for this CBCC is S30810-K2935-T401.

Design

The housing intended for wall mounting (Figure 2-3)HiPath 3350 contains one shelf with three slot levels. The slot levels (shown in Figure 4-61), numbered in ascending order from the attachment side, have the following assignments:

- Slot level 1: peripheral boards (two slots)
- Slot level 2: CBCC control board only
- Slot level 3: optional boards (up to 5 modules)

The power supply is on the rear panel of the subrack.

The HiPath 3350 does not need an external main distribution frame. The connection cables to the peripherals (telephones, trunk connections etc.) are directly connected to the boards.

Dimensions

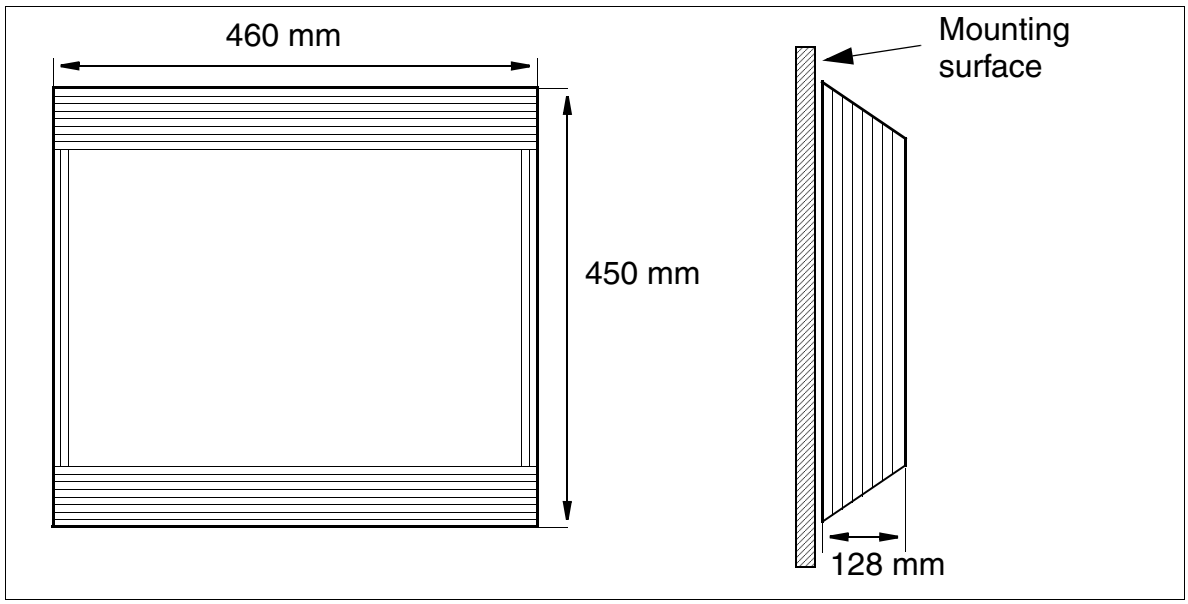


Figure 2-3 HiPath 3350 Dimensions

2.1.4.4 Design and Dimensions of HiPath 3500

Design

The housing intended for use with 19-inch cabinets (Figure 2-4) HiPath 3500 contains four slot levels with the following assignments (represented in Figure 4-66):

- Slot levels 1-3: slide-in shelves for peripheral boards (2 boards can be plugged in on each level)
- Slot level 4: slide-in shelf for CBRC control board
- Slot level 5: optional boards (up to 3 modules)

The power supply is on the rear panel of the subrack.

Connection to the peripherals (telephones, trunk connections, etc.) is set up via RJ45 jacks on the board's front panel.

Dimensions

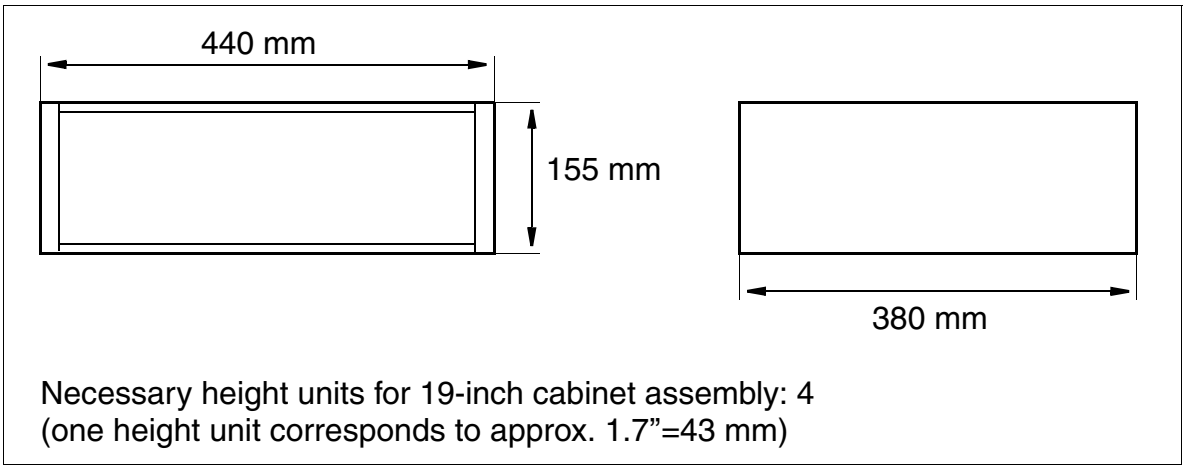


Figure 2-4 HiPath 3500 Dimensions

2.1.4.5 Design and Dimensions of HiPath 3300

Design

The housing intended for use with 19-inch cabinets (Figure 2-5)HiPath 3300 contains three slots with the following assignments (represented in Figure 4-67):

- Slot level 1: slide-in shelves for two peripheral boards
- Slot level 2: slide-in shelf for CBRC control board
- Slot level 3: optional boards (up to 3 modules)

The power supply is on the rear panel of the subrack.

Connection to the peripherals (telephones, trunk connections, etc.) is set up via RJ45 jacks on the board's front panel.

Dimensions

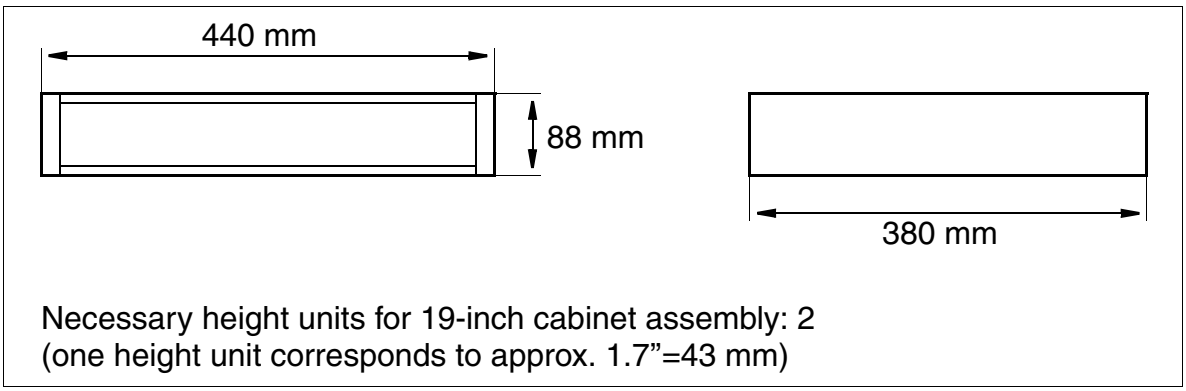


Figure 2-5 HiPath 3300 Dimensions

2.1.5 System Environment of the HiPath 3000 Systems

2.1.5.1 System Environment HiPath 3800

Table 2-1 Boards for HiPath 3800

HiPath 3800					
Subscriber Line Modules		**Central Boards Options**		**Trunk Boards**	
ROW	**U.S.**	**ROW**	**U.S.**	**ROW**	**U.S.**
IVMN8		CBSAP			DIU2U
IVMNL		CMS		DIUN2, DIUT2	
SLCN		DBSAP		PBXXX[1]	
SLMA		IMODN		STMD3	
SLMA2[1]		LIMS		STMI2	
SLMA8		LUNA2		TMANI8	
SLMO2		MMC		TMC16[1]	
SLMO8		MPPI		TMCAS-2[1]	
STMD3					TMDID
STMI2		PFT1/PFT4		TMEW2	
SLMAE		REALS		TMDID2	
SLMAE8		RGMOD[1]		TM2LP	

1 for selected countries only

2.1.5.2 System Environment HiPath 3550

Table 2-2 Boards for HiPath 3550

HiPath 3550					
Subscriber Line Modules		**Central Board Options**		**Trunk Boards**	
ROW	**U.S.**	**ROW**	**U.S.**	**ROW**	**U.S.**
HXGS3		CBCC		HXGS3	
IVMS8		CMA		STLS2	
SLA8N		CMS		STLS4	
SLA16N		CUC		STLSX2	
SLA24N		IMODN		STLSX4	
SLC16N		LIM		TCAS-2[1]	
SLMO24		MMC		TLA2	
SLU8		UPSC-D		TLA4	
STLS2				TLA8	
STLS4		ALUM4		TMQ4	
STLSX2		ANI4[1]		TMCAS[1]	
STLSX4		EVM		TLANI2	
4SLA		EXM		TLANI4	
				TLANI8	
8SLA			EXMNA	TS2	
16SLA		GEE12		TST1	
SLAD4		GEE16			
SLAD8		GEE50			
SLAD16					
		UAM			
		MPPI			
		OPAL			
		PDM1			
		STBG4[2]			
		STRB			
		V24/1			

1 for selected countries only
2 for France only

2.1.5.3 System Environment HiPath 3350

Table 2-3 Boards for HiPath 3350

HiPath 3350					
Subscriber Line Modules		**Central Board Options**		**Trunk Boards**	
ROW	**U.S.**	**ROW**	**U.S.**	**ROW**	**U.S.**
HXGS3		CBCC		HXGS3	
IVMP8		CMA		STLS2	
IVMS8		CMS		STLS4	
SLU8		CUP		STLSX2	
STLS2		IMODN		STLSX4	
STLS4		LIM		TLA2	
STLSX2		MMC		TLA4	
STLSX4		PSUP		TLA8	
4SLA		UPSC-D		TLANI2	
8SLA		ALUM4		TLANI4	
				TLANI8	
16SLA		ANI4[1]			TMQ4
SLAD4		EVM			
SLAD8		EXM			
SLAD16					
			EXMNA		
		GEE12			
		GEE16			
		GEE50			
		UAM			
		MPPI			
		OPAL			
		PDM1			
		STBG4[2]			
		STRB			
		V24/1			

1 for selected countries only
2 for France only

2.1.5.4 System Environment HiPath 3500

Table 2-4 Boards for HiPath 3500

HiPath 3500					
Subscriber Line Modules		**Central Boards Options**		**Trunk Boards**	
ROW	**U.S.**	**ROW**	**U.S.**	**ROW**	**U.S.**
HXGR3		CBRC		HXGR3	
IVMS8R		CMA		STLS4R	
SLU8R		CMS		STLSX4R	
STLS4R		CUCR		TCASR-2[1]	
STLSX4R		IMODN			TMGL4R
8SLAR		LIM			TST1
SLAD8R		MMC		TS2R	
		UPSC-DR		TLA4R	
				TLANI4R	
		ANI4R[1]			
		EVM			
		EXMR			
		MPPI			
		OPALR			
		PDM1			
		STRBR			
		UAMR			

1 for selected countries only

2.1.5.5 System Environment HiPath 3300

Table 2-5 Boards for HiPath 3300

HiPath 3300					
Subscriber Line Modules		**Central Board Options**		**Trunk Boards**	
ROW	**U.S.**	**ROW**	**U.S.**	**ROW**	**U.S.**
HXGR3		CBRC		HXGR3	
IVMP8R		CMA		STLS4R	
IVMS8R		CMS		STLSX4R	
SLU8R		CUPR		TLA4R	TMGL4R
SLU8R		CUPR		TLANI4R	TLANI4R
STLS4R		IMODN			
STLSX4R		LIM			
8SLAR		MMC			
		UPSC-DR			
		ANI4R[1]			
		EVM			
		EXMR			
		MPPI			
		OPALR			
		PDM1			
		STRBR			
		UAMR			

1 for selected countries only

2.2 HiPath 5000

HiPath 5000 Real-Time Services Manager RSM is operated as a central administration unit in an IP network of HiPath 3000 systems. All participating nodes can be administered from a central point through the formation of a "single system image".

HiPath 5000 RSM is the platform for providing applications at a central point and enables them to be used by all stations in the IP network.

Parts of the following setup applications for HiPath 5000 are optional and can be installed both on the HiPath 5000 Real-Time Services Manager (RSM) and on a separate PC.

These applications are:

- Feature Server (central administration service in a HiPath 3000/5000 network)
- Presence Manager (service for LED signaling of call processing station statuses and network-wide DSS keys)
- HiPath 3000/5000 Manager E (MS Windows-based tool for the administration of all service and customer-specific data by Service)
- HiPath 3000/5000 Manager C (MS Windows-based tool for the administration of customer-specific data by the customer)
- HiPath Software Manager (web-based tool for performing upgrades [Upgrade Manager for HG 1500] and backups [Backup Manager for HG 1500 and Databases])
- Inventory Manager (service for detecting software components installed and system information in a HiPath 3000/5000 network)
- Customer License Agent CLA (service for analyzing and decrypting a HiPath License Management license file)
- Central License Manager CLM (CLA front-end for reading in licenses in online and offline mode)
- HiPath FM Desktop V3.0 (Java-based application for error signaling)
- GetAccount (application that prepares generated call data records for further processing)

The IP network is also available if four ITSPs are connected simultaneously.

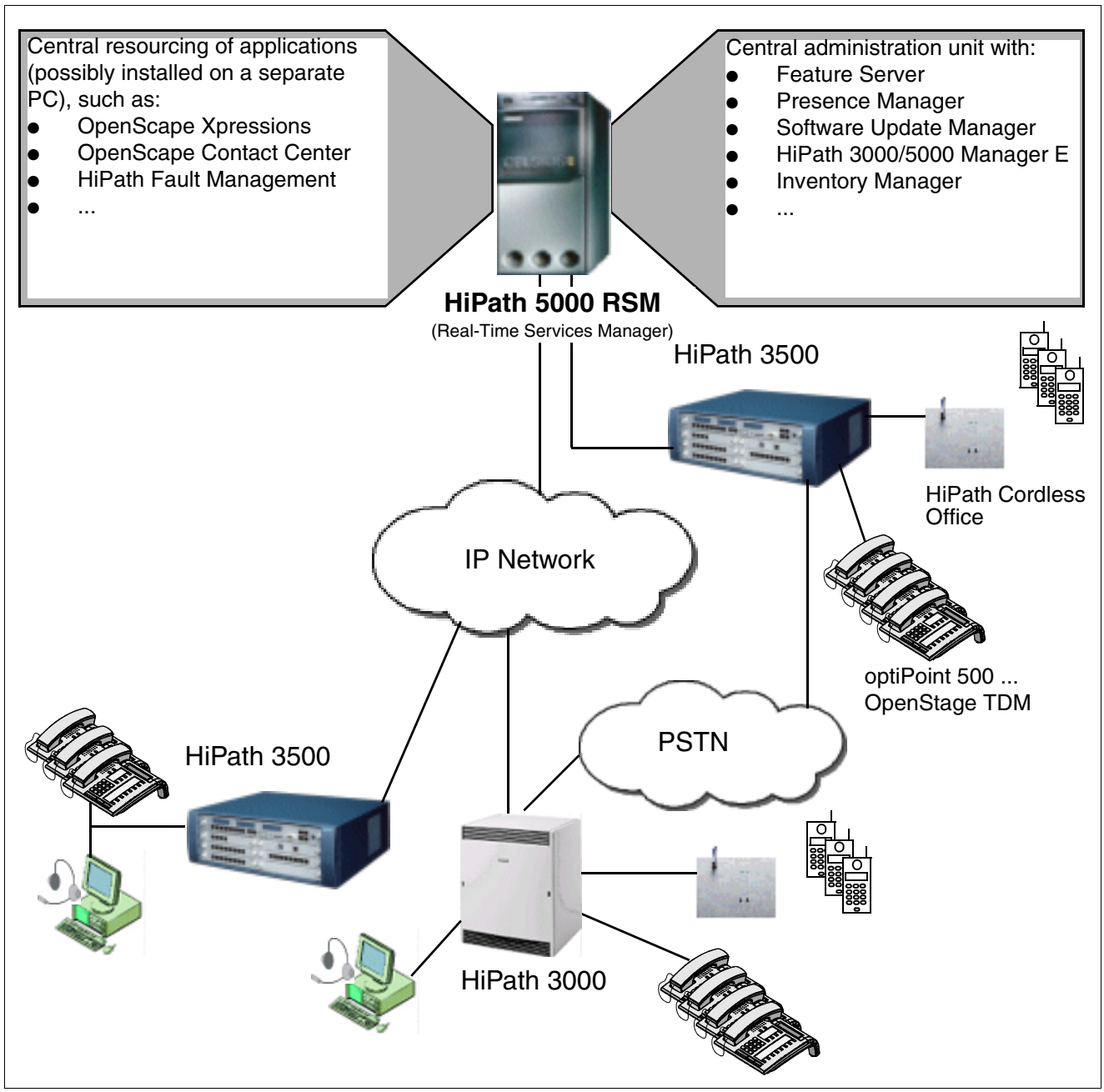


Figure 2-6 HiPath 5000 RSM Multi-Node IP System

2.3 System-Specific Capacity Limits for HiPath 3000, HiPath 5000

The maximum capacity limits are calculated based on the following assumptions:

- HiPath 3800: two board slots are reserved for trunks.
- HiPath 3550, HiPath 3500: Two S_0 interfaces on the central board + 1 board slot are reserved for trunks.
- HiPath 3350, HiPath 3300: Two S_0 interfaces on the central board are reserved for trunks.
- Traffic capacity: 0.15 Erlang

Alternative capacity limits may be determined for sales purposes.

Table 10-9 contains the maximum system-specific configurations for $U_{P0/E}$ workpoint clients and the corresponding add-on modules and adapters. Refer to the section "Capacities" in the system description for a more detailed data table.

Table 2-6 HiPath 3000/5000 - System-Specific Capacity Limits (Maximum Configuration)

System			HiPath 3800[1]	HiPath 3550	HiPath 3500	HiPath 3350	HiPath 3300	HiPath Com-Scendo Service
Stations/Workpoint Clients	**Total Number of TDM and IP Stations[2]**		500	96[3]	96[4]	96[5]	96[6]	–
	IP stations (system clients, H.323 clients)		500	96[7]	96[7]	96[7 8]	96[7 9]	1000
	Total number of TDM stations[2]		384	96[10]	77[10 11]	57[12]	41[13]	–
	TDM Stations	Analog stations	384	96[2]	44[14]	36[15]	20[16]	–
		$U_{P0/E}$ stations	384	72[17]	48[18]	24[19]	24[20]	–
		Additional stations via adapter (phone adapter/analog adapter/ISDN adapter)	116	48[10]	29[10]	24[21]	24[21]	–
		Cordless stations	250	64/32[22 23]	32	16	16	–
Base Stations forHiPath Cordless Office			64	16/7	7	3	3	–
Lines	**Total Number of Lines**		250	60	60	16	16	–
	Total number of analog trunks and network trunks		120	60	60	16	8	–
	Total number of B channels on digital trunks and digital network trunks (S_0, S_{2M})		180	60	60	16	16	–
	CorNet IP network trunks		128	60	60	16	16	250
HG 1500 boards			8	3	3	1 (2^{24})	1 (2^{24})	–
Gateway channels to the system			128	48	48	16	16	–

1 The system load depends heavily on factors like system configuration and traffic. Static rules are therefore not suitable for the verification of a system configuration. As a guide, configurations containing ACD/UCD, more than one SLC16N, groups with 10 or more subscribers or OpenScape Office configurations should always be verified with the Planning/Performance tool (https://enterprise-businessarea.siemens-enterprise.com/productinfo/document/c9yH1MXx3k8_/HiPath%203000%20V8%20Planning%20Guide%20Performance%20Calculation%20Tool.xls).

2 Only configurations that do not exceed this limit will be supported.
3 Up to 96 stations can be TDM stations.
4 Up to 61 of the 96 stations can be TDM stations (4xa/b + 1x$U_{P0/E}$ + 7xBS/32xHiPath Cordless Office stations at the central board + 3xSLU8R or 3x8SLAR or 3xSLAD8R).
5 Up to 41 of the 96 stations can be TDM stations (4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 1x16SLA).
6 Up to 33 of the 96 stations can be TDM stations (4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 1xSLU8R or 1x8SLAR or 1xSLAD8R).
7 These are administrative capacity limits.
8 Due to the power consumption of HG 1500, a UPSC-D must be used.
9 Due to the power consumption of HG 1500, a UPSC-DR must be used.
10 If the total number of $U_{P0/E}$ stations, analog stations and additional stations connected using an adapter is greater than 72, an external power supply unit (Powerbox PB3000 with LUNA2) must be used.
11 4xa/b + 1x$U_{P0/E}$ + 7xBS/32xHiPath Cordless Office stations at the central board + 5xSLU8R or 5x8SLAR or 5xSLAD8R.
12 4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 2x16SLA.
13 4xa/b + 5x$U_{P0/E}$ + 3xBS/16xHiPath Cordless Office stations at the central board + 2xSLU8R or 2x8SLAR or 2xSLAD8R.
14 4xa/b at the central board + 5x8SLAR or 5xSLAD8.
15 4xa/b at the central board + 2x16SLA.
16 4xa/b at the central board + 2x8SLAR or 2xSLAD8.
17 8x$U_{P0/E}$ at the central board + 5xSLU8 + 1xSLMO24.
18 8x$U_{P0/E}$ at the central board + 5xSLU8R.
19 8x$U_{P0/E}$ at the central board + 2xSLU8.
20 8x$U_{P0/E}$ at the central board + 2xSLU8R.
21 If the total number of $U_{P0/E}$ stations and additional stations connected using an adapter is greater than 24, UPSC-D/UPSC-DR must be used.
22 Due to the 5-V power supply unit, one SLC16N and a maximum of two HG 1500 V3.0 boards can be used.
23 64 HiPath Cordless Office stations at the SLC16N or 32 HiPath Cordless Office stations at the central board.
24 Two HG 1500 boards can be installed if PDM1 is not being used.

2.4 Static Configuration Rules

2.4.1 Resources and Capacity Limits

For information on the configuration of HG 1500 boards, refer to the HG 1500 Administration Manual.

With HiPath 3000/5000, HG 1500 provides the resources listed in Table 2-7 via the HG 1500 boards defined as media gateways (= gateway HG 1500).

Table 2-8 shows the board-specific capacity limits (maximum configuration) for the corresponding functions.

Table 2-7 Technical Specifications (Resources) of the HG 1500 Boards Defined as Media Gateways

Resource	HXGM3			HXGS3 HXGR3		STMI2
	without PDM1	with 1 x PDM1	with 2 x PDM1	without PDM1	with 1 x PDM1	
Routing channels A routing channel is required, for example, for making connections between two IP networks via ISDN (ISDN routing).	16			16		16
Gateway channels (DSP channels) A gateway channel is required, for example, to connect an IP workpoint client and a TDM workpoint client (for example, optiPoint 500).	16	24	32	8	16	32
Fax/modem channels (G.711)	16	24	32	8	16	32
Fax channels (T.38) These are special hardware resources which facilitate fax via vCAPI and fax via IP functionality with the T.38 protocol.	3			2		3
Teleworker with AES encryption and codec G.711/G.729 (Sample rate ≥ 20 ms)	10			8		10

Table 2-7 Technical Specifications (Resources) of the HG 1500 Boards Defined as Media Gateways

Resource	HXGM3			HXGS3 HXGR3		STMI2
	without PDM1	with 1 x PDM1	with 2 x PDM1	without PDM1	with 1 x PDM1	
Teleworker with AES encryption and codec G.723 (sample rate ≥ 30 msec)	16			12		16
DMC channels These are the gateway channels for Direct Media Connection (DMC) with HiPath 4000 (DMC interworking feature is active).[1]).	12	18	24	6	12	24
MOH Channels (G.711, G.723, G.729) The number of MOH channels used depends on the configuration (HiPath 3000/5000 Manager E).	5			5		5
LAN connections Number of LAN connections that can be used as DSL connections.	2 1			2 1		2 1

1 The number of gateway channels available (DSP channels) is reduced as soon as the DMC interworking feature is activated with HiPath 3000/5000 Manager E.

Table 2-8 HG 1500 - Board-Specific Capacity Limits (Maximum Configuration)

Function	HXGM3			HXGS3 HXGR3		STMI2
	without PDM1	with 1 x PDM1	with 2 x PDM1	without PDM1	with 1 x PDM1	
PPP Routing Partner	70			70		70
vCAPI clients IP workpoint clients that support vCAPI.	100			100		100
MOH data streams	10			10		10

2.4.2 Gateway Channels (DSP Channels)

Connections from IP workpoint clients/lines to TDM workpoint clients/lines

Gateway connections are required for connections from IP to TDM workpoint clients and lines. A gateway channel is required on the HG 1500 board for each gateway connection.

TDM workpoint clients/lines are:

- $U_{P0/E}$ stations (optiPoint 500)
- CMI stations
- analog stations
- ISDN stations
- trunk and tie lines (MSI, S_0, S_{2M})

Examples for assigning a gateway channel on the HG 1500:

- A consultation call to a TDM workpoint client is set up during an existing connection between two IP workpoint clients.
- An IP workpoint client seizes a trunk.

Connections between TDM workpoint clients/lines

Connections between TDM workpoint clients/lines do not require DSP channels. The communication system automatically detects that no DSP channels are required.

Conferences

In the case of conferences, the number of gateway channels seized corresponds to the number of stations and IP workpoint clients involved.

Channels required for gateway connections

The following table shows the number of gateway channels (HG 1500 boards) necessary based on the existing IP workpoint clients.

The calculation of the values is based on the following assumptions:

- A station spends 10 % of its working time in call status.
- The average time per call is three minutes.
- The availability loss is limited to 1.2 %.

Provisions should be made for more gateway channels (HG 1500 boards) in high traffic volume environments (for example, call centers).

Table 2-9 Number of Required Gateway Channels (HG 1500 Boards)

IP workpoint clients in the system	Required number of gateway channels
0 – 3	2
4 – 12	4
13 – 16	6
17 – 38	8
39 – 54	10
55 – 70	12
71 – 86	14
87 – 96	15
97 – 101	16
102 – 136	20
137 – 172	24
173 – 210	28
211 – 247	32
248 – 324	40
325 – 402	48
403 – 481	56
482 – 562	64
563 – 726	80
727 – 890	96
891 – 1000	112

In a straightforward IP network, the number of gateway channels must be greater than or equal to the number of TDM lines.

The required number of HG 1500 boards for VoIP is determined by the sum of the gateway channels, MOH channels, and conference channels.

IP/IP e2e payload via enterprise proxy

HiPath 3000/5000 as of V7 R2 supports "IP/IP e2e payload switching via enterprise proxy" for Internet (DSL) telephony (enterprise proxy: also RTP proxy). This means that, for Internet (DSL) telephony, data packets do not need to be processed by the digital signal processors of the system. Instead, the calls (i.e. payload data) are directed from the telephone over the LAN and via routers to the Internet Telephony Service Provider (ITSP), and back again. As a result, no gateway channels (DSP channels) are needed for ITSP connections. The maximum number of simultaneous calls depends on the selected codec and the available bandwidth of the Internet (DSL) service.

In order to enable "IP/IP e2e payload switching via enterprise proxy", the "Use RTP Proxy" flag must be activated in the WBM of the HG 1500.

2.4.3 Connections to ITSP

Overview

HG 1500 supports the connection to Internet Telephony Service Providers (ITSP) and thus the use of DSL telephony in versions HiPath 3000/5000 V6.0 SMR-09 and later, especially DSL connections that support DID with a phone number range. A maximum of four active ITSPs are supported simultaneously.

When using Internet telephony, the HG 1500 board is not permitted to be deployed as a DSL router. In this case, the connections to the ITSP must be established via an external router.

Maximum number of simultaneous connections

The maximum number of simultaneous connections to the ITSP depends on the deployed number of HG 1500 boards and PDM boards and on the system used.

Tabelle 2-10 Maximum number of simultaneous connections to the ITSP

Feature/system	Maximum number
When using "IP/IP e2e payload via enterprise proxy":	32
When using the B-channels (DSP channels) of the HG 1500:	
• HiPath 33x0 with 1 HG 1500 (HXGS3, HXGR3) and 1 PDM1 module	16
• HiPath 35x0 with 1 HG 1500 (HXGS3, HXGR3) and 1 PDM1 module	16
• HiPath 3800 with 1 HG 1500 (STMI2)	32

Required number of required gateway channels

B-channels (DSP-channels) of the HG 1500 are required for connections from HiPath 3000/5000 to an ITSP. The following table shows their number as a function of the call type being used.

Tabelle 2-11 Number of required gateway channels to ITSP

Call type	Number
IP terminal/client to ITSP with "IP/IP e2e payload via enterprise proxy"	0
Digital terminal to ITSP	1
Analog terminal to ITSP	1

2.4.4 MOH Channels (G.711, G.723, G.729)

A DSP channel is reserved on an HG 1500 board for each codec used for MOH. Up to five codecs can be configured for MOH for every HG 1500 board.

Examples:

- Only the codec G.711 is used for MOH: –> 1 DSP channel is needed.
- Codecs G.711, G.723.1, and G.729AB are used for MOH: –> 3 DSP channels are needed.

The DSP channels needed for MOH are no longer available for voice connections.

MOH can be simultaneously supplied to a maximum of ten IP workpoint clients per HG 1500 board, irrespective of the number of codecs configured. This means that up to ten MOH data streams are possible for each HG 1500 board. If more than ten MOH data streams are needed simultaneously, MOH should be activated on other HG 1500 boards.

2.4.5 IP Networking Channels (PBX Networking Channels)

IP networking channels are used for connections between communication systems. In this case, a distinction must be made between connections that use a gateway channel and direct payload connections. Depending on the connection, the following resources are required for successful connection setup.

Connection type	Line	Gateway channel
Direct payload connection	Required	Not required
Gateway connection	Required	Required

A connection request is rejected if a required resource is unavailable.

HiPath 3000/5000 Manager E is used to define how many of the maximum number of lines are to be configured as IP networking channels (IP network trunks). The maximum number of IP network trunks can be found in Table 2-6.

2.4.6 Bandwidth Control for IP Networking Channels (PBX Networking Channels)

If IP networking channels are routed over the PPP channels (ISDN routing) on an HG 1500 board (see Section 2.5.4.2.3, “IP Trunking via LAN and WAN (ISDN/PPP)”) on HiPath 3750 and HiPath 3700, bandwidth control is only performed if this board is an HG 1500 gatekeeper (signaling gateway).

Bandwidth control is not performed if the router is located on an HG 1500 gateway (media gateway).

2.4.7 DMC (Direct Media Connection) Channels

When the DMC interworking feature is active in an IP network between HiPath 3000 and HiPath 4000, gateway connections are set up over DMC channels. From the user's perspective, a DMC channel is a gateway channel that provides a gateway connection between HiPath 3000 and HiPath 4000. The fact that a DMC channel must serve both a master and slave connection results in a DSP channel reduction.

Note: The number of gateway channels available (DSP channels) is reduced as soon as the DMC interworking feature is activated with HiPath 3000/5000 Manager E. In this case, a Digital Signal Processor (DSP) can only provide up to 80% of all possible channels (for example: 6 instead of 8 DSP channels, 12 instead of 16 DSP channels, etc.).

2.4.8 ISDN Routing/PPP Channels

HG 1500 boards can also be used as ISDN routers. The ISDN router can connect two physically separate IP networks together via an ISDN line. Channel bundling can be used to adjust the required bandwidth.

The system reserves the B channels required for ISDN routing and thus restricts the available gateway channels.

Table 2-12 HG 1500 - Board-Specific Sum of PPP Channels and Gateway Channels (Maximum Numbers)

	HXGS3 HXGR3		**STMI2**
	without PDM1	**with 1 x PDM1**	
Sum of PPP channels (for ISDN routing) and gateway channels	8	16	32

If a large number of IP workpoint clients is required, the HG 1500 board may not also be used as an ISDN router. In this case, ISDN routing functionality must be assigned to an individual HG 1500 board.

2.4.9 Fax/Modem Channels

It is possible to transmit faxes with Internet telephony both via G.711 gateway channels and, in HiPath 3000/5000 V7 R4 or later, via T.38 channels.

Although T.38 offers the more reliable method of fax transmission, it can only be used to a maximum of 14 Kbps. The number of T.38 channels available is limited by the higher processor speed required for T.38. Alternatively, E.711 gateway channels can be used for fax transmissions (not for Internet telephony).

Technical restrictions in Internet telephony mean that modem transmissions are not possible.

Note: The number of G.711 gateway channels available is reduced as soon as the DMC interworking feature is activated with HiPath 3000/5000 Manager E.

Internet-based fax transmissions that use G.711 frequently fail or incur errors. For this reason, fax transmission via Internet telephony and G.711 is not supported. If the provider supports the T.38 protocol, T.38 must be activated on the gateway. Otherwise, transmission must be via ISDN. The number of possible fax connections that can be routed simultaneously depends on the hardware used.

The switchover from G.711 to T.38 takes place in WBM.

2.5 Dynamic Configuration Rules

This section describes the underlying theoretical principles for the thumb rule by which the control load, and thus the dynamic performance characteristics, of HiPath 3000/5000 V8 systems can be determined. The principles from which this document is derived are the same as those for the thumb rule for HiPath 4000, i.e., every interface is considered in light of its outgoing and incoming seizure intensity.

2.5.1 Dynamic Performance Characteristics

The dynamic performance characteristics of HiPath 3000/5000 V8 are as follows:

Standard BHCA	Analog	IP Phone	ACD	CorNet-N	CorNet NQ
HiPath 33x0 HiPath 35x0	2,880	1,250	690	1,650	1,420
HiPath 3800	22,600	9,820	5,400	13,000	11,200

Table 2-13 Dynamic Performance Characteristics of HiPath 3000/5000 V8

This thumb rule can also be used to calculate the maximum number of terminals for certain configurations. The method and some sample tables are described in the Section 2.5.5, “Maximum Number of Devices for Special Cases”.

2.5.2 Thumb Rule for HiPath 3000/5000 V8

2.5.2.1 Procedural Principles

The thumb rule presented below for calculating the dynamic load for HiPath switches is based on the principle of considering every interface (telephones and trunks) in light of its (incoming and outgoing) seizure intensity. In the case of an external seizure, for example, the CPU load is split between the telephone and the trunk.

The thumb rule for determining the manageable load takes multiple factors into account. This includes not only several parameters, whose values can be determined from the current configuration of the switch being examined, but also a variety of interfaces and performance characteristics. These interfaces are each assigned a specific weight in accordance with their share of the load to be managed. The basis for this is the average overhead for an Anate seizure (60% internal-, 20% outgoing external-, and 20% incoming external seizure). This enables all values to be normalized to Anate seizures. The planned switch configurations are then permissible if the sum of all seizures – normalized to Anate seizures – does not exceed a maximum value depending on the current switch variant and the computing hardware being used.

The goal is to detect critical switch configurations early in the planning stage and to then perform a more precise analysis. The appropriate project planning tools for this purpose are still maintained by SEN ESY HS PDT 4 or SEN ESY SME MP 42 and provided to the usual project planning locations:

- *NERT* (Network Engineering & Routing Tool for Private Networks) for network planning
  http://intranet.mch4.siemens.de/syseng/perfeng/tools/nert/index_en.htm

and

- Project Planning Tools for HiPath Systems
  http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index_en.htm

An electronic version of the thumb rule in which all the following calculations are implemented will also be made available there.

2.5.2.2 Planning Load for HiPath Systems

This section describes a dimensioning method for the various systems. In order to provide for sufficient reserves to handle load fluctuations during operations, a so-called planning load is defined the systems. This planning load consists of 70 % of the capacity available for call processing (switching) transactions (see Figure below).

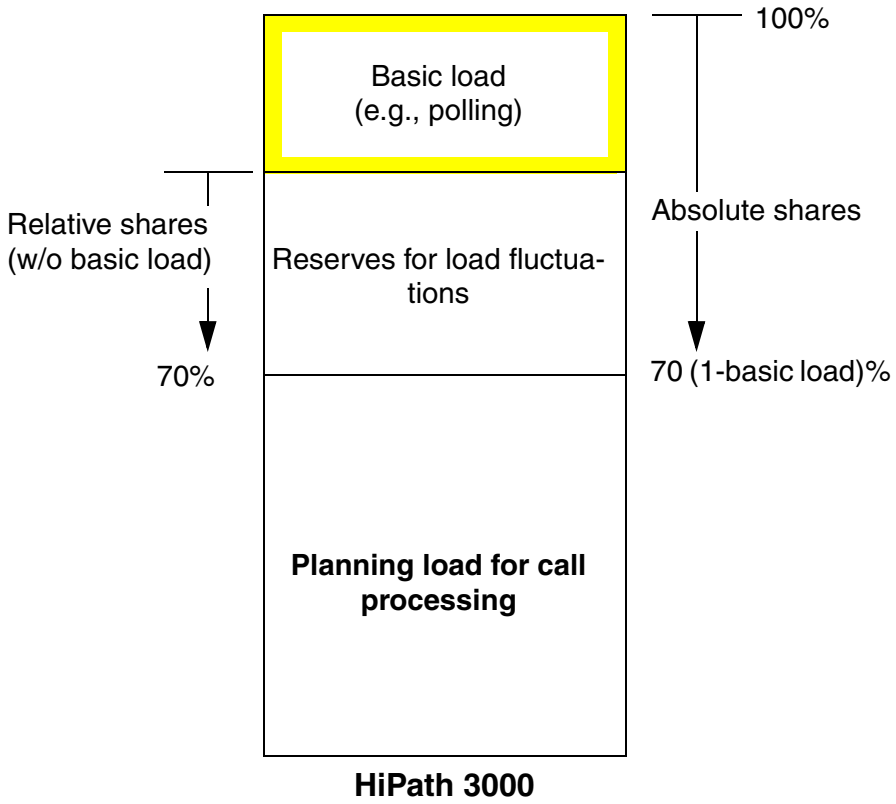


Figure 2-7 Planning Load for HiPath 3000/5000 Systems

The planning load values described here are taken into account in the following table as the "maximum permissible points".

2.5.2.3 Maximum Permissible Values for HiPath 3000/5000 V8

For version V8, the following maximum permissible point totals are used as a basis for the thumb rule (Norm BHCA):

HiPath 3000	Maximum Points
HiPath 3300/3350/3500/3550	2,880
HiPath 3800	22,600

Table 2-14 **HiPath 3000/5000 V8** Expansion Levels and their Maximum Points

2.5.2.4 Additional Parameters

In order to calculate the number of points for a specific system, several additional parameters are usually required. These parameters are described below.

- Factor F_{Tln} (subscriber traffic factor):
  As in Guideline 12TR3 for 700 ports or more, this rule of thumb assumes a station traffic value P_{Tln} = 0.15 Erl and four outgoing seizures per device during busy traffic hours. The factor F_{Tln} is used to achieve some flexibility in the underlying station traffic values and seizures. In the case of international systems, in particular, a factor greater than 1 may be appropriate in some circumstances (e.g. P_{Tln} = 0.20 erl results in F_{Tln} = 1.33). In general, the following applies:

  $$F_{Tln} = \frac{P_{Tln}}{0.15} \qquad F_{Tln} = \frac{BHCA_{Tln}}{4}$$

  If the seizure value per terminal is not directly specified, F_{Tln} can be determined via the relationship to the 4 outgoing seizures indicated above (e.g., 3 seizures produce a value of F_{Tln} = 0.75).

- Factor F_{Ltg} (trunk traffic factor) for traffic volume on trunks:
  As in Guideline 12TR3, this rule of thumb assumes a line traffic value P_{Ltg} = 0.8 Erl and 12.5 incoming seizures per B channel during busy traffic hours. The factor F_{Line} is used to achieve some flexibility in the underlying traffic values and seizures. A factor of less than 1 (for example, P_{Ltg} = 0.5 Erl gives F_{Ltg} = 0.63) may be appropriate in some cases, especially for systems that were over-dimensioned to create a virtually blockage-free system. In general, the following applies:

  $$F_{Ltg} = \frac{P_{Ltg}}{0.8} \qquad F_{Ltg} = \frac{BHCA_{Ltg}}{12.5}$$

- Factor F_{VPL} (AC traffic factor) for traffic volume of an attendant console:
  This rule of thumb assumes a traffic value at an active attendant P_{VPL} = 0.8 Erl and 144 seizures during busy traffic hours. The factor F_{VPL} is used to achieve some flexibility in the underlying station traffic values and seizures. A factor of less than 1 may be appropriate, especially for systems in which the attendant consoles were over-dimensioned. In general, the following applies:

  $$F_{VPL} = \frac{P_{VPL}}{0.8} \qquad F_{VPL} = \frac{BHCA_{VPL}}{144}$$

- Factor *C* for ACD utilization:
  For ACD agents, the intensity of the utilization of this feature must also be taken into account. By default, it is assumed that an ACD agent handles 16 ACD calls per hour. If applications need to be configured with values that significantly exceed or fall below this default, the factor *C* can be used to specify the corresponding multiple of the value 16. For example, TV advertising campaigns may incur values of up to ten times the norm.

- Factor *g* for mobility within a CMI node:
  This thumb rule formula is based on the assumption of the mobility level of mobile subscribers. The factor *g* determines the probability that a station is not located at its home board when visiting the radio area of it home system. In the case of homogeneous allocation, the factor *g* can be calculated from the number of SLC boards in the system:

$$g = 1 - \frac{1}{\text{Number of SLC boards}}$$

- Factor *G* for mobility within the CMI network:
  This thumb rule formula is based on the assumption of the mobility level of mobile subscribers. The factor *G* determines the probability, that a subscriber resides outside the cordless area of his home system. In branch networks where subscribers rarely reside in other nodes, G is relatively small (e.g. $G = 0.1$). A homogeneous allocation can be assumed, if a location is overlapped from several cordless areas of different nodes. In this case, the factor *G* can be calculated from the number of CMI nodes:

$$G = 1 - \frac{1}{\text{Number of CMI nodes}}$$

2.5.2.5 Current Thumb Rule Values

The following tables list the interfaces considered in the thumb rule formula with their respective meanings and corresponding weights in points (normalized to Anate seizures).

- Table 2-15 on page 2-34: Points for Devices
- Table 2-16 on page 2-34: Points for Mobile Handsets
- Table 2-17 on page 2-35: Points for Special Devices
- Table 2-18 on page 2-35: Points for Trunks
- Table 2-19 on page 2-36: Additional Overhead for Controlling Process Flows at Devices via CTI Applications
- Table 2-20 on page 2-36: Points for Groups

Terminal Devices

System Interface	Meaning	Weight
Analog	Number of devices connected via T/R wires.	$3.3 \cdot F_{TIn}$
$U_{P0/E}$ devices	Number of devices connected via $U_{P0/E}$ (for example, optiPoint 500, OpenStage TDM), including adapters for data traffic characterized by long call durations.	$7.7 \cdot F_{TIn}$
IP phones	Number of terminal devices (e.g. OpenStage (CorNet-IP [HFA]), connected via IP with HFA functionality. Note: HG 1500 performance must be considered separately.	$7.6 \cdot F_{TIn}$
SIP phones	Number of terminal devices (e.g. optiPoint 410 S, optiPoint 420 S) connected via SIP. Note: HG 1500 performance must be considered separately.	$3.6 \cdot F_{TIn}$
Data	Number of devices for data services (for example, data terminals).	$4.7 \cdot F_{TIn}$
ISDN port	Number of ISDN connections; the B channels are used for voice and data traffic characterized by relatively short call durations (e.g. S_0 bus with several terminal devices but no Xpression ports).	$12.8 \cdot F_{TIn}$

Table 2-15 Points for Devices

Mobile Stations

System Interface	Meaning	Weight
Cordless Devices	Number of CMI handsets if **only one system in the network** is operated in CMI mode and **only one SLC16** is used.	$6.8 \cdot F_{TIn}$
	Number of CMI handsets if **only one system in the network** is operated in CMI mode.	$(6.8 + 23.0 \cdot g) \cdot F_{TIn}$
	Number of CMI handsets, if network wide CMI mode is operated.	$(6.8 + 23.0 \cdot g \cdot (1-G) + 44.4 \cdot G) \cdot F_{TIn}$

Table 2-16 Points for Mobile Handsets

Special Devices

System Interface	Meaning	Weight
UCD Agent (HPCC, OSCC)	Number of active UCD agents[1] controlled by the OSCC application.	59 · C
ACD Agent (e.g., HPCO)	Number of active ACD agents[1], where the display of each agent is refreshed every T seconds.	179 / T + 65 · C
ACD group	Number of ACD groups.	4.8
AC	Number of active attendant consoles	252 · F_{VPL}
Automatic AC (IVM)	Number of analog trunks or digital B channels which are routed from CO to the automatic attendant at IVM.	21.9 · F_{Ltg}

Table 2-17 Points for Special Devices

1 The associated devices must no longer be considered separately; the same applies to the incoming trunks provided for the ACD group (at least one B channel per agent)

Trunk Interfaces

System Interface	Meaning	Weight
Trunk	Number of analog trunks or digital B channels to CO	24.6 · F_{Ltg}
ITSP trunks	Possible number of simultaneous voice channels to the ITSPs	23.9 · F_{Ltg}
Networking trunk (TDM CorNet-N)	Number of digital B channels to other nodes or to Xpressions via TDM with CorNet-N	23.4 · F_{Ltg}
Networking trunk (TDM CorNet-NQ)	Number of digital B channels to other nodes or to Xpressions via TDM with CorNet-NQ	27.1 · F_{Ltg}
Networking trunk (IP)	Number of digital B channels to other nodes or to Xpressions via IP Note: HG 1500 performance must be considered separately.	23.9 · F_{Ltg}

Table 2-18 Points for Trunks

Additional Overhead for Features

The additional overhead values listed below are based on the assumption that the corresponding basic overhead for each terminal device involved has already been recorded in Table 2-15.

System Interface	Meaning	Weight
CTI-control via CSTA	Number of devices operated by means of CTI-controlled connection procedures via CSTA commands	$1.7 \cdot F_{TIn}$

Table 2-19 Additional Overhead for Controlling Process Flows at Devices via CTI Applications

System Interface	Meaning	Weight
Call pickup group	Overhead per call pickup group with N members, where Opt refers to digital devices.	$(0.06 \cdot (N-1) \cdot N + 0.48 \cdot (N-1) \cdot Opt) \cdot F_{TIn}$
Group call	Overhead per call pickup group with N members, where Opt refers to digital devices.	$(0.91 \cdot (N-1) \cdot N + 0.66 \cdot (N-1) \cdot Opt) \cdot F_{TIn}$

Table 2-20 Points for Groups

2.5.3 Thumb Rule for HG 1500 V3.0

2.5.3.1 Procedural Principles

The thumb rule presented below for calculating the dynamic load for the HG 1500 board is based on the principle of considering every functionality (HFA phone, IP trunking, gateway channels, VPN tunnel, etc.) in terms of its CPU load.

2.5.3.2 Maximum Permissible Values for HG 1500 V3.0

For version V3.0, the following maximum permissible point totals are used as a basis for the thumb rule:

HG 1500 Board	Corresponding Systems	Maximum Points
HXGS3, HXGR3	HiPath 3300/3350/3500/3550	780
STMI2	HiPath 3800	980

Table 2-21 HG 1500 V3.0 Boards and Corresponding Maximum Points

2.5.3.3 Current Thumb Rule Values

The following table lists the interfaces taken into account in the thumb rule.

PDM Modules

System Interface	Meaning	Weight
PDM1	Number of PDM1 modules on the board	10

Table 2-22 Points for the PDM Modules to Increase the DSP Number

Signaling

System Interface	Meaning	Weight
IP phones without H.235	Number of terminal devices connected via IP using HFA functionality or SIP (GK security is deactivated).	$0.68 \cdot F_{TIn}$
IP phones with H.235	Number of terminal devices connected via IP using HFA functionality (full or reduced GK security is activated).	$0.78 \cdot F_{TIn}$

Table 2-23 Points for Signaling

System Interface	Meaning	Weight
PBX networking channel without H.235	Number of digital B channels (networking trunk) to other nodes or to Xpressions via IP (GK security is deactivated).	$3.2 \cdot F_{Tln}$
PBX networking channel with H.235	Number of digital B channels (networking trunk) to other nodes or to Xpressions via IP (reduced or full GK security is activated).	$4.0 \cdot F_{Ltg}$
ITSP lines without H.235	Possible number of simultaneous voice channels to the ITSPs	$3.2 \cdot F_{Ltg}$
ITSP lines with H.235	Possible number of simultaneous voice channels to the ITSPs	$4.0 \cdot F_{Ltg}$

Table 2-23 Points for Signaling

Gateway Channels (DSP - LAN)

The following table indicates the HG 1500 gateway channel load (DSP ↔ LAN) required for connections between TDM and IP, e.g. for calls between CO and IP phones. The size of the HG 1500 load depends on various features (for example, "Enhanced B Channels", VPN functionality) and on the voice codec used (G.711, G.729, G.723).

System Interface	Meaning	Weight
Gateway channels with enhanced B channel	Number of gateway channels (DSP ↔ LAN) if the feature "Enhanced B Channels" is activated in the WBM, that is, firewall and VPN functionality may not be used.	11
Gateway channels without VPN	Number of gateway channels (DSP ↔ LAN) if VPN functionality is not used.	39
Gateway channels with VPN and AES	Number of gateway channels (DSP ↔ LAN) if VPN and AES encryption are used.	89
Gateway channels with VPN and 3DES	Number of gateway channels (DSP ↔ LAN) if VPN and 3DES are used.	104
Gateway channels with enhanced B channel (G.723 only)	Number of gateway channels (DSP ↔ LAN) if only the voice codec G.723 is used and the feature "Enhanced B Channels" is activated in the WBM.	7.5
Gateway channels without VPN (G.723 only)	Number of gateway channels (DSP ↔ LAN) if only the voice codec G.723 and no VPN functionality is used.	26

Table 2-24 Points for Gateway Channels (When Using G.711 or G.729)

System Interface	Meaning	Weight
Gateway channels with VPN and AES (G.723 only)	Number of gateway channels (DSP ↔ LAN) if only the voice codec G.723 and VPN with AES encryption are used.	60
Gateway channels with VPN and 3DES (G.723 only)	Number of gateway channels (DSP ↔ LAN) if only the voice codec G.723, VPN and 3DES are used.	70

Table 2-24 Points for Gateway Channels (When Using G.711 or G.729)

Voice Channels (LAN1 - LAN2)

The following table indicates the HG 1500 voice channel load (LAN1 ↔ LAN2) when voice packets are routed via the HG 1500, e.g. for calls between IP phones in two different systems networked via a VPN tunnel. The size of the HG 1500 load depends on the encryption algorithm (AES or 3DES) and on the voice codec used (G.711, G.729, G.723).

System Interface	Meaning	Weight
Voice channels without VPN	Number of voice channels (LAN1 ↔ LAN2) if encryption is not used.	73
Voice channels with VPN and AES	Number of voice channels (LAN1 ↔ LAN2) if VPN and AES encryption are used.	89
Voice channels with VPN and 3DES	Number of voice channels (LAN1 ↔ LAN2) if VPN and 3DES encryption are used.	104
Voice channels without VPN (G.723 only)	Number of voice channels (LAN1 ↔ LAN2) if only the voice codec G.723 and no encryption is used.	49
Voice channels with VPN and AES (G.723 only)	Number of voice channels (LAN1 ↔ LAN2) if only the voice codec G.723 and VPN with AES encryption is used.	60
Voice channels with VPN and 3DES (G.723 only)	Number of voice channels (LAN1 ↔ LAN2) if only the voice codec G.723 and VPN with 3DES encryption is used.	70

Table 2-25 Points for Voice Channels (When Using G.711 or G.729)

Data (LAN)

The following table indicates the HG 1500 data routing load (LAN1 ↔ LAN2), e.g. for a DSL connection to the Internet or a data connection for two locations via VPN. The size of the HG 1500 load depends on the encryption algorithm used (AES or 3DES), and on the packet rate and average packet size.

System Interface	Meaning	Weight
Data without VPN 100 bytes	Number of packets per second if the average packet size is 100 bytes and encryption is not used.	0.72
Data with AES 100 bytes	Number of packets per second if the average packet size is 100 bytes and VPN with AES encryption is used.	0.84
Data with 3DES 100 bytes	Number of packets per second if the average packet size is 100 bytes and VPN with 3DES encryption is used.	0.93
Data without VPN 500 bytes	Number of packets per second if the average packet size is 500 bytes and encryption is not used.	0.79
Data with AES 500 bytes	Number of packets per second if the average packet size is 500 bytes and VPN with AES encryption is used.	1.19
Data with 3DES 500 bytes	Number of packets per second if the average packet size is 500 bytes and VPN with 3DES encryption is used.	1.66
Data without VPN 1400 bytes	Number of packets per second if the average packet size is 1400 bytes and encryption is not used.	0.96
Data with AES 1400 bytes	Number of packets per second if the average packet size is 1400 bytes and VPN with AES encryption is used.	1.98
Data with 3DES 1400 bytes	Number of packets per second if the average packet size is 1400 bytes and VPN with 3DES encryption is used.	3.29

Table 2-26 Points for Data Routing

PPP Channels

System Interface	Meaning	Weight
Voice channels (G.729 – 1)	Number of voice channels with G.729 and a packet assembly of 1 (20ms) that are routed with PPP via ISDN.	150
Voice channels (G.729 – 3)	Number of voice channels with G.729 and a packet assembly of 3 (60ms) that are routed with PPP via ISDN.	54
Voice channels (G.723 – 1)	Number of voice channels with G.723 and a packet assembly of 1 (20ms) that are routed with PPP via ISDN.	100
Voice channels (G.723 – 2)	Number of voice channels with G.723 and a packet assembly of 2 (60ms) that are routed with PPP via ISDN.	57
PPP data channels	Number of channels via which data is routed with PPP	55

Table 2-27 Points for PPP Channels

VCAPI Channels

System Interface	Meaning	Weight
VCAPI fax	Number of VCAPI channels (not the number of clients) used for fax purposes	11
VCAPI data	Number of VCAPI channels (not the number of clients) used for data transfer	34

Table 2-28 Points for VCAPI Channels

2.5.4 Example of Application of Thumb Rule

In this example, a calculation is made on the basis of a standard configuration to illustrate use of the thumb rule.

2.5.4.1 HiPath 3000/5000 V8 Configuration

Number	Type
100	Anate (**ana**log **te**lephones, terminal devices)
100	Digital terminal devices
20	Digital terminal devices with CTI-controlled functions
20	IP phones
1	Call pickup group consisting of two analog telephones and eight digital telephones
5	ACD agents of digital telephones with 32 calls per hour and display update every 5 seconds
2	Attendant consoles
60	Digital trunks to CO, of which 5 are for ACD application
30	Digital trunks to other systems via TDM (CorNet-N)

The calculations are made using default traffic values. The thumb rule produces the following results:

100 · *3.4* +	Anate
(100 + 20) · *6.3* +	Digital devices, but without ACD agents
20 · *7.3* +	IP phones
5 · (*179* / 5 + *65* · 32 / 16) +	ACD agents (32 calls per hour and agent, i.e. C = 32/16)
1 · *4.8* +	One ACD group
2 · *252* +	Attendant consoles
55 · *22.9*	Digital trunks minus the 5 ACD trunks
30 · *18.9* +	Networking trunk via TDM
20 · *1.7* +	Additional overhead for the 20 CTI-controlled terminal devices
1 · (*0.06* · 9 · 10 + *0.48* · 9 · 8)	Call pickup group
= 4,480	**Total number of points**

According to Table 2-14, 22,600 points are available for HiPath 3800. Implementation with Hi-Path 3800 is, consequently, possible.

2.5.4.2 HG 1500 Configurations

2.5.4.2.1 IP Trunking with TDM Terminal Points Only

A HiPath 3800 system is networked with another system via an IP trunking link with 32 B channels. The codec G.711 with a sample rate of 20 ms (without encryption) is used for the IP trunking link. This requires an STMI2 module (2 DSPs on board = 32 voice channels are supported).

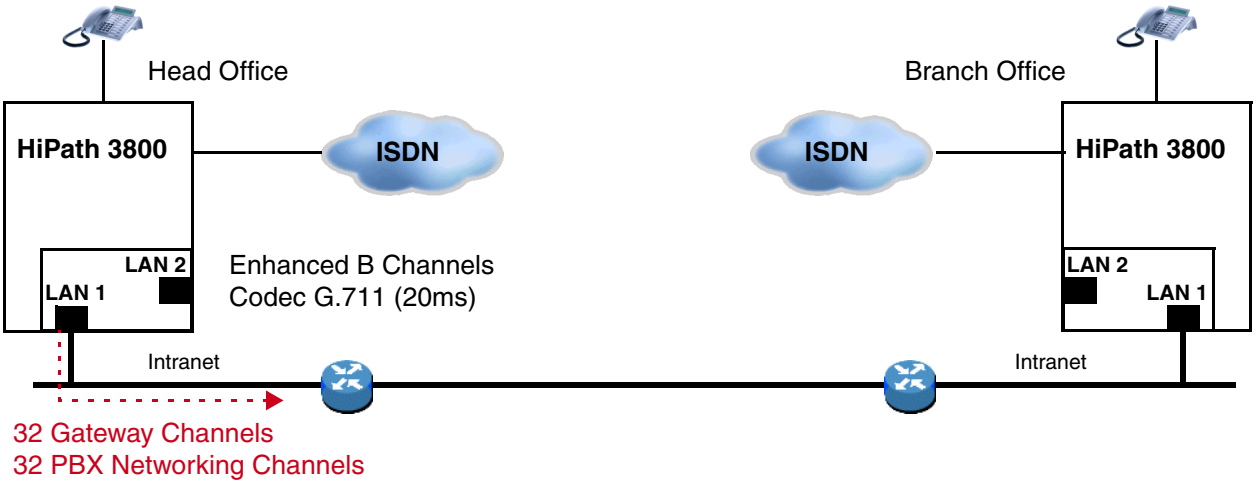


Figure 2-8 IP Trunking with TDM Terminal Points Only

Calculation:

32 gateway channels via LAN 1 should be included in the calculation. If more than 16 channels are required, the feature “Enhanced B Channels” must be activated. The signaling load must also be taken into account.

Function	Formula	Points
Signaling: IP-Phones (without H.235)	96 · 0.68	65
Signaling: PBX networking channels (without H.235)	16 · 3.2	51
Gateway channels: payload (G.711/20ms)	31 · 11	341
Total		**477**

Table 2-29 IP Trunking Calculated with TDM Terminal Points Only

With a permissible maximum points total of 980, this scenario is feasible. However, this sample calculation does not apply for HXGS/R3. This is because the static configuration rules only allow a maximum of 16 channels per board card.

2.5.4.2.2 IP Trunking and HFA Clients

A HiPath 3800 system with 96 HFA clients and additional TDM subscribers is networked with other nodes via an IP trunking link with 16 B channels. For 96 HFA terminal points, 15 gateway channels with 0.1 erl per terminal point are required.

The codec G.711 with a sample rate of 20 ms (without encryption) is required both for the IP trunking link and for the HFA terminal points. This requires an STMI2 module (2 DSPs on board = 32 voice channels are supported).

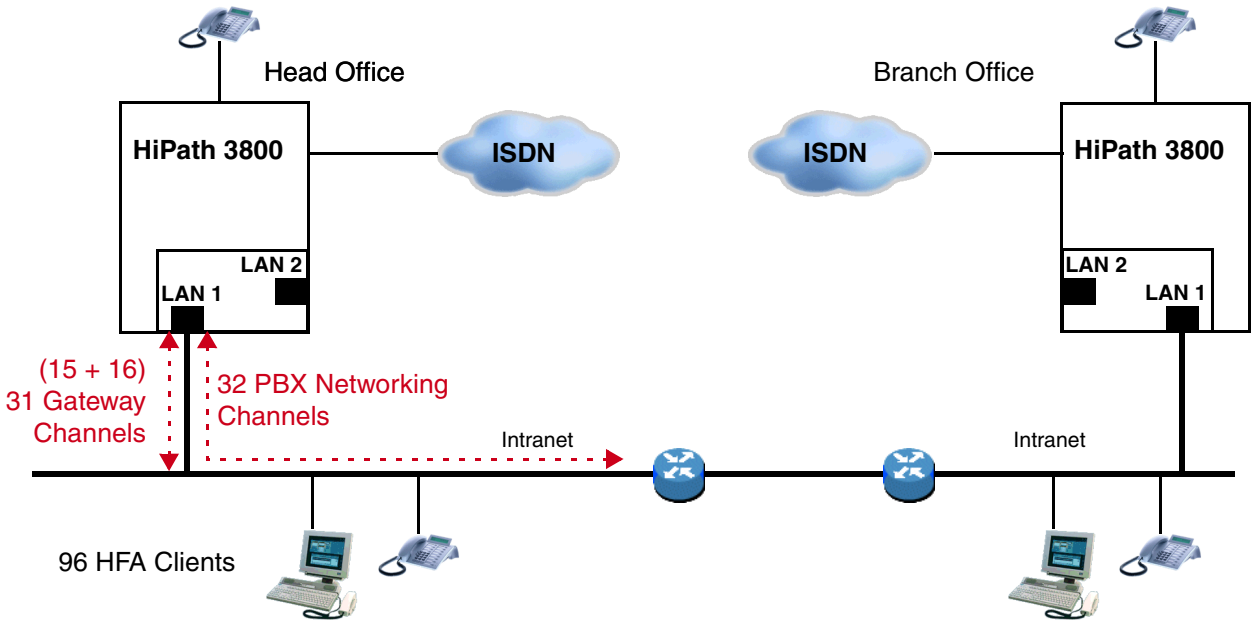


Figure 2-9 IP Trunking and HFA Clients

Calculation:

Thirty-one gateway channels via LAN 1 should be taken into account. If more than 16 channels are required, the feature "Enhanced B Channels" must be activated. Firewall and encryption are not possible in this example. The signaling load (16 PBX networking channels and 96 HFA clients) must also be taken into account.

Function	Formula	Points
Signaling: IP phones (without H.235)	96 · 0.68	65
Signaling: PBX networking channels (without H.235)	16 · 3.2	51
Gateway channels: payload (G.711/20ms)	31 · 11	341
Total		**477**

Table 2-30 Calculation for IP Trunking and HFA Clients

With a permissible maximum points total of 980, this scenario is feasible. However, this sample calculation does not apply for HXGS/R3. This is because the static configuration rules only allow a maximum of 16 channels per board card.

2.5.4.2.3 IP Trunking via LAN and WAN (ISDN/PPP)

A HiPath 3800 system (head office) is connected to a second system (branch office 1) via an ISDN connection with 2 PPP channels (S_0), and to a third system (branch office 2) via a direct LAN connection.

Voice over PPP with codec G.729 and a sample rate of 60 ms without encryption is implemented for PBX network connection to the second system. Six voice channels are consequently supported via the two PPP channels (S0).

8 voice channels are sufficient for the PBX networking connection to the third system (branch office 2). Codec G.729 with a sample rate of 20 ms without encryption is used for this connection.

At head office, 6+8=14 PBX networking channels must be configured, while 6 PBX networking channels must be configured at branch office 1, and 8 PBX networking channels configured at branch office 2.

One STMI2 (2 DSPs on board supporting up to 32 voice channels) is sufficient for this purpose.

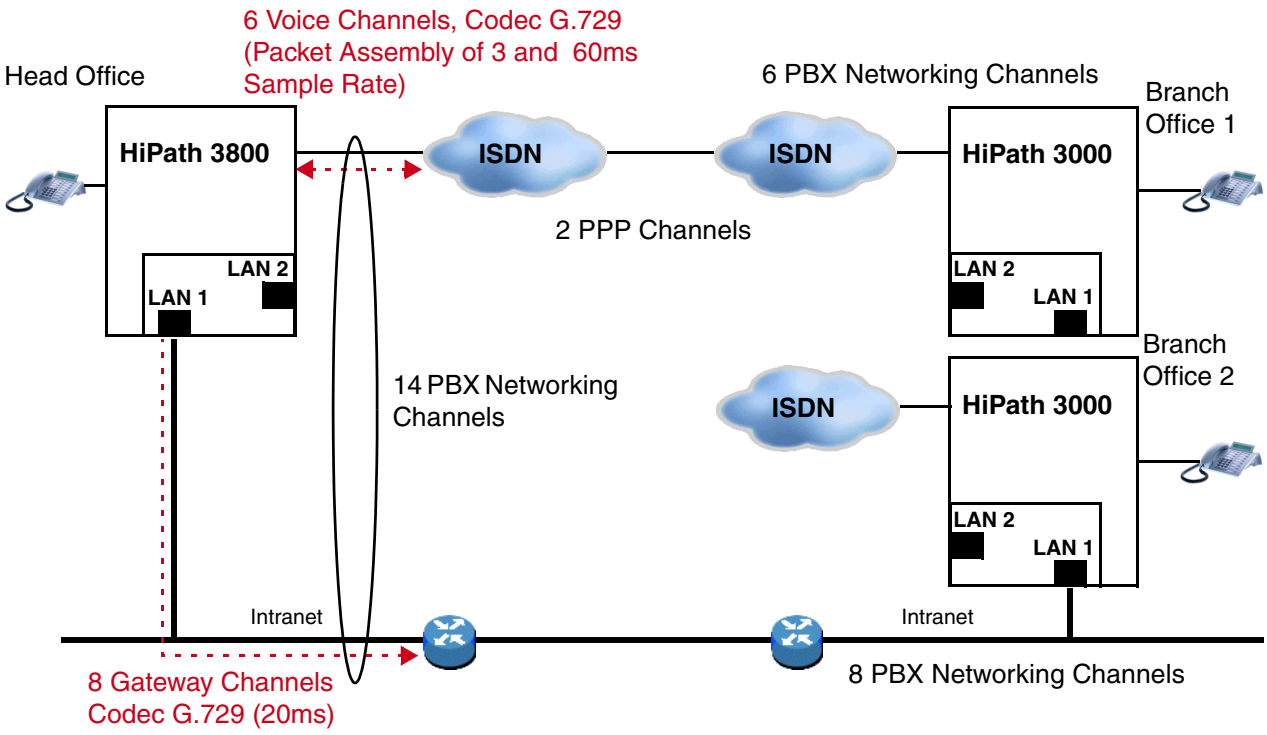


Figure 2-10 IP Trunking and Node Connection via ISDN (PPP)

Calculation for head office:

6 voice channels over PPP must be calculated for branch office 1. The points for G.729 with a packet assembly of 3 (60ms) must be used. 8 gateway channels via LAN 1 must be calculated for branch office 2. The signaling load (14 PBX networking channels) must also be taken into account.

Function	Formula	Points
Signaling: PBX networking channels (without H.235)	14 · 3.2	45
Gateway channels: payload (G.711/20ms)	8 · 39	312
PPP channels: voice with G.729 and a packet assembly of 3	6 · 54	324
Total		**681**

Table 2-31 Calculation for Head Office

With a permissible maximum points total of 980, this scenario is feasible.

2.5.4.2.4 IP Trunking with VPN (Voice Only)

2 HiPath 3500/3550 systems should be connected via VPN with a HiPath 3800 system. At head office (HiPath 3800), only TDM telephones are connected. 8 voice channels via LAN2 are available for the connection to the branch offices.

Each branch office (HiPath 3500/3550 system) is equipped with 30 HFA telephones and 8 gateway channels for the connection with the ISDN CO. 4 voice channels are also available for the connection to head office. The codec G.711 with a sample rate of 20ms is used for the VPN networking. The connection between the head office and the branch offices should be configured via the Internet using an AES-encrypted VPN tunnel.

For this configuration, the HiPath 3800 requires one STMI2 (2 DSPs on board for 32 channels), while the HiPath 3500/3550 systems each require one HXGS3 (1 DSP on board for 8 channels).

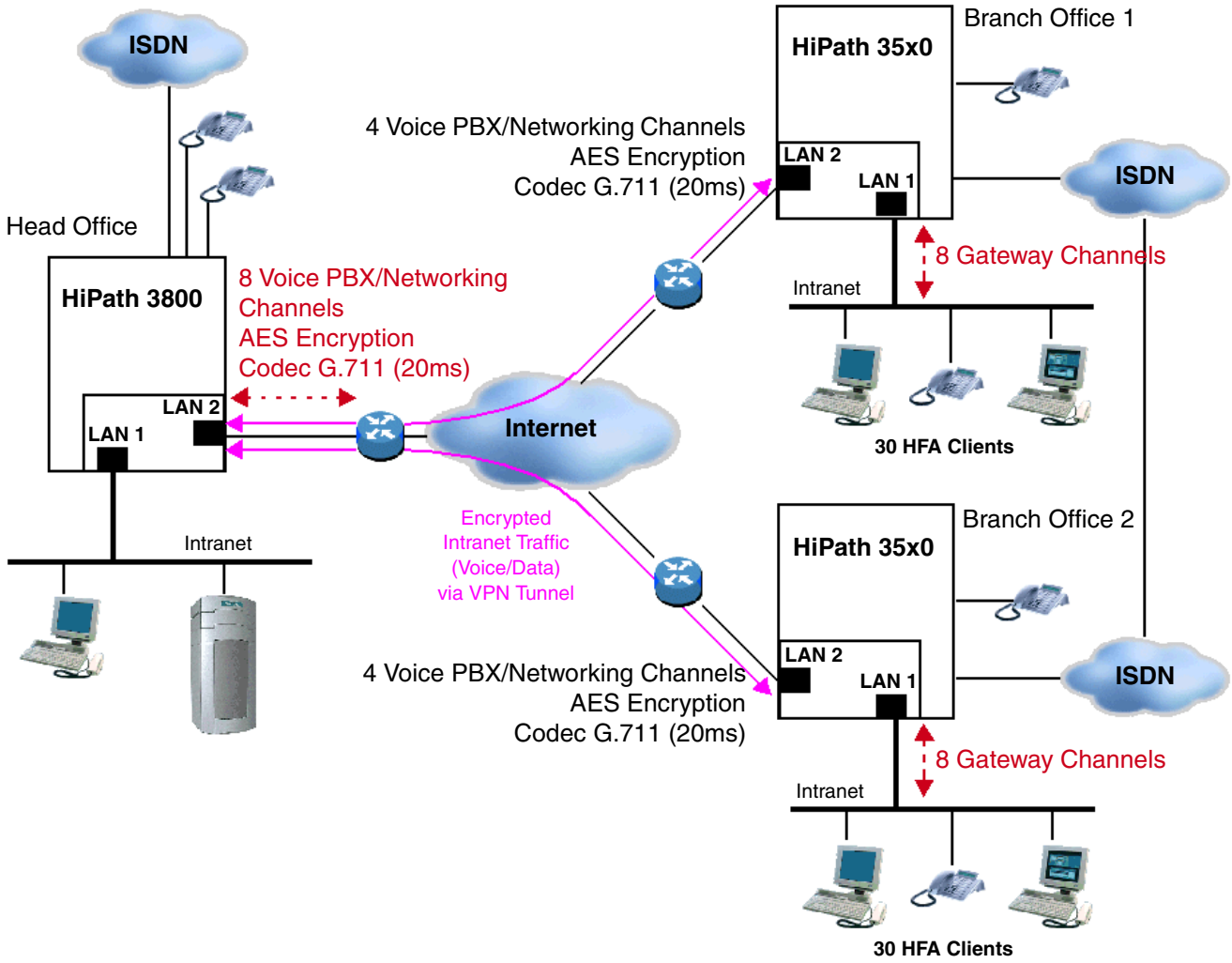


Figure 2-11 VPN Networking (Voice Only)

Calculation for head office (HiPath 3800)

8 gateway channels via LAN2 with AES encryption must be calculated. In order to use the encryption feature, the option "Enhanced B Channels" must be deactivated. The signaling load must also be taken into account.

Function	Formula	Points
Signaling: PBX networking channels (without H.235)	8 · 3.2	26
Gateway channels: G.711 with VPN and AES	8 · 89	712
Total		**738**

Table 2-32 Calculation for Head Office (HiPath 3800)

With a permissible maximum points total of 980, this scenario is feasible for head office.

Calculation for each individual branch office (HiPath 3500/3550):

4 gateway channels via LAN2 with AES encryption, and 8 gateway channels from HFA telephones to the local ISDN CO (via LAN1) must be calculated. The signaling load must also be taken into account.

Function	Formula	Points
Signaling: IP phones (without H.235)	30 · 0.68	20
Signaling: PBX networking channels (without H.235)	4 · 3.2	13
Gateway channels: payload (G.711/20ms)	8 · 39	312
Voice channels: G.711 with VPN and AES	4 · 89	356
Total		**701**

Table 2-33 Calculation for Each Individual Branch Office (HiPath 3500/3550):

With a permissible maximum points total of 780, this scenario is feasible for the branch offices.

2.5.4.2.5 Standalone System with Home Offices connected via VPN

8 home offices are to be connected to a HiPath 3800 system. Teleworkers use G.723 with a sample rate of 30 ms. Data can also be transferred at 512 Kbps in both directions via a 1-Mbps SDSL connection. The average packet length is 500 bytes. VPN should be used with AES encryption. This configuration requires 1 STMI2 (2 DSPs on board for 32 channels).

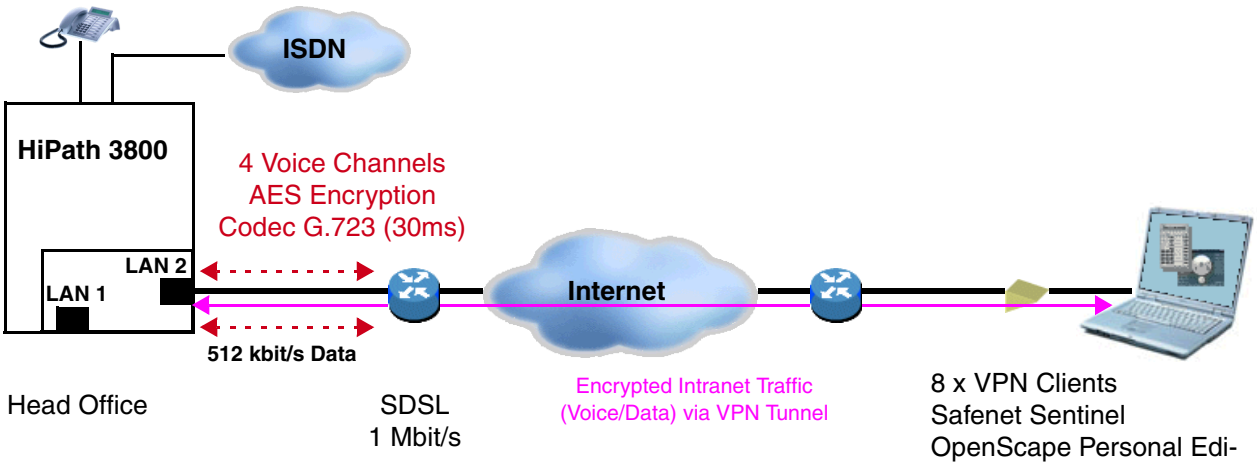


Figure 2-12 VPN Voice and Data, Home Office Connection

Performance calculation:

G.723 is generally configured for home offices. As VPN is required for the DSL connection, the option "Enhanced B Channels" must be deactivated. The HFA terminal point signaling load must also be taken into account.

When calculating the data traffic load, the upstream and downstream packet rates must be calculated from the average packet length.

$$\frac{512 \cdot 1000 / 8 \textit{ byte/s}}{500 \textit{ bytes/packet}} = 128 \textit{ packets/s} \qquad \frac{512 \cdot 1000 / 8 \textit{ byte/s}}{500 \textit{ bytes/packet}} = 128 \textit{ packets/s}$$

Function	Formula	Points
Signaling: IP phones (without H.235)	8 · 0.68	5
Voice channels: G.723 with VPN and AES	8 · 60	480
Data (LAN): VPN and AES with 500 bytes upstream	128 · 1.19	152
Data (LAN): VPN and AES with 500 bytes downstream	128 · 1.19	152
Total		**789**

Table 2-34 Performance Calculation

With a permissible maximum points total of 980, this scenario is feasible.

Bandwidth calculation:

Function	Formula	Points
Voice channels: G.723 with VPN and AES	8 · 44.3	354
Data (LAN): VPN and AES with 500 bytes	512	512
Total		**866**

Table 2-35 Bandwidth Calculation

A 1Mbit/s connection is sufficient for the customer.

2.5.4.2.6 VPN Networking with Data and Voice Connections

A 1000 Kbps duplex data connection between 2 HiPath 3800 systems should be configured via a 2 Mbps SDSL interface. The average packet size should be 500 bytes. The SDSL connection should also be used for trunk connections with G.729 and a sample rate of 20ms. The SDSL line is connected to LAN2. The maximum possible number of additional IP trunking channels with G.729 should be calculated.

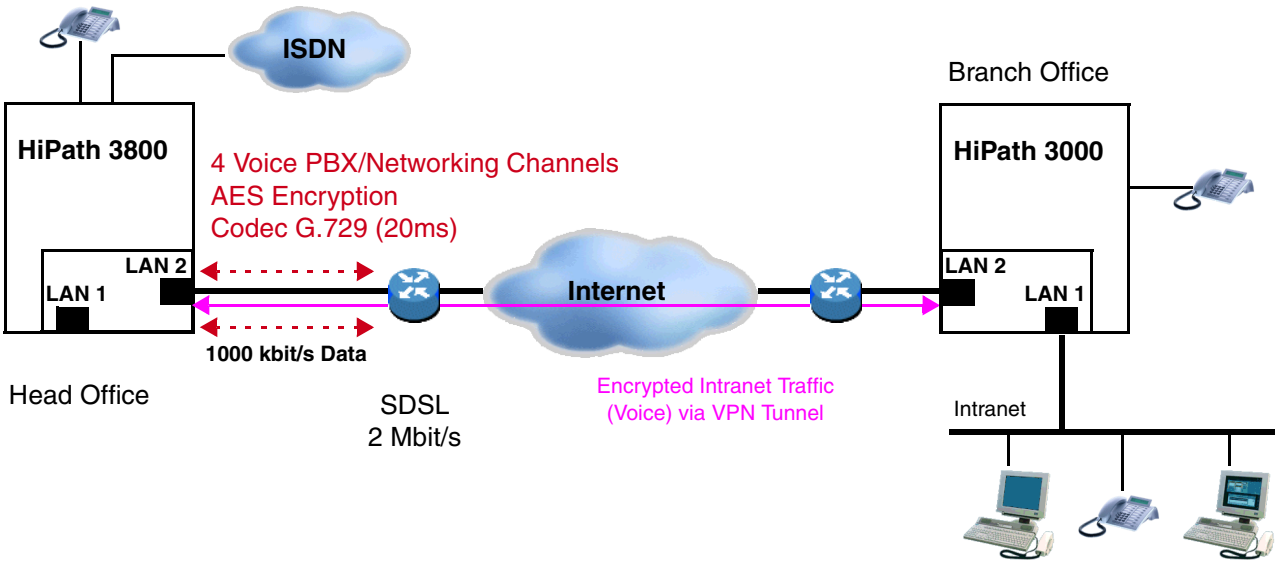


Figure 2-13 VPN Networking

Performance calculation:

The required data traffic performance must first be determined. The upstream and downstream packet rates must therefore first be calculated from the average packet length.

$$\frac{1000 \cdot 1000 / 8\ byte/s}{500\ bytes/packet} = 250\ packets/s \qquad \frac{1000 \cdot 1000 / 8\ byte/s}{500\ bytes/packet} = 250\ packets/s$$

Function	Formula	Points
Data (LAN): VPN and AES with 500 bytes upstream	250 · 1.19	298
Data (LAN): VPN and AES with 500 bytes downstream	250 · 1.19	298
Total		**596**

Table 2-36 Performance Calculation (1)

With a permissible maximum points total of 980, this leaves 980-596=384 points for IP trunking channels. For each IP trunking channel, one PBX networking channel and one gateway channel with VPN and AES is required. In other words, 3.2+89=92.2 points are required per trunking channel. If the remaining points are divided by the number of points per channel and rounded off, this results in 384/92.2=4 channels.

Function	Formula	Points
Signaling: IP phones (without H.235)	4 · 3.2	13
Gateway channels: G.729 with VPN and AES	4 · 89	356
Data (LAN): VPN and AES with 500 bytes upstream	250 · 1.19	298
Data (LAN): VPN and AES with 500 bytes downstream	250 · 1.19	298
Total		**965**

Table 2-37 Performance Calculation (2)

With a permissible maximum points total of 980, this scenario is feasible.

Bandwidth calculation:

Function	Formula	Points
Voice channels: G.729 with VPN and AES	4 · 60	240
Data (LAN): VPN and AES with 500 bytes	1000	1000
Total		**1240**

Table 2-38 Bandwidth Calculation

A 2Mbit/s connection is sufficient for the customer.

2.5.4.2.7 IP terminals/clients for ISDN and ITSP connection in HiPath 3800

Conditions

For this scenario, the following conditions apply:

- One hundred IP terminals/clients (without H.235) are connected to HiPath 3800.
- It should be possible to connect eight simultaneous calls to the ISDN CO and 8 simultaneous calls to the ITSP.
- Voice and data traffic into the Internet take place via an external router, which also handles the firewall functionality.Therefore, the "Enhanced B-Channels" feature in the WBM of the HG 1500 must be activated.
- One STMI2 board is to be deployed.

Configuration instructions

For signaling, the IP terminals/clients and the signaling for the calls to the ITSP must be taken into account. Eight gateway channels to the ISDN CO are needed for the 8 simultaneous calls. No gateway channels are needed for the 8 simultaneous calls to the ITSP due to the "IP/IP e2e payload via enterprise proxy" feature.

Graphical overview

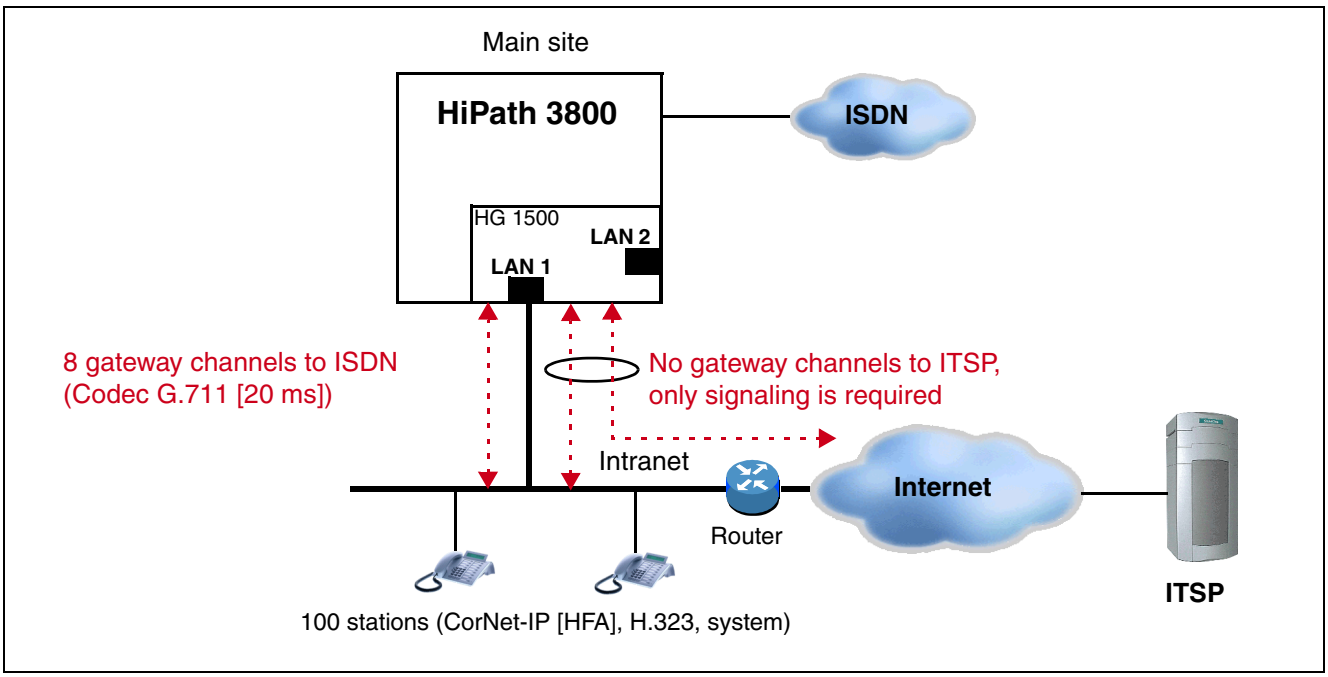


Bild 2-14 IP terminals/clients for ISDN and ITSP connection in HiPath 3800

Calculation

Tabelle 2-39 Power requirements for ISDN and ITSP connection in HiPath 3800

Functionality		Formula	Points
Signaling without H.235 security (independent of "Enhanced B-Channels" setting)	100 x IP terminals/clients, 8 calls per hour	100 x 0.68	68
Payload data ("Enhanced B-Channels" setting is activated) Gateway channel via LAN 1 without encryption	24 x G.711 (reception: 20 ms/transmission: 20 ms)	24 x 11	264
Sum			**332**

Conclusion

The calculated power requirement of **332** points is below the total performance of 980 points that the STMI2 board can make available. The configuration can be implemented.

2.5.5 Maximum Number of Devices for Special Cases

This thumb rule can be used to calculate the maximum number of terminal devices for specific configurations. The formula for the calculation is as follows:

$$\#Terminal = \frac{Max\ No.\ of\ Points — \#Trunks \cdot 22.9 \cdot F_{Ltg}}{Points_{Terminal} \cdot F_{Tln}}$$

First, all resources required for other interfaces (e.g. trunks) are deducted from the maximum number of points. This value is then divided by the points for a specific terminal device. The result obtained thus indicates the maximum number of devices of that type.

If all terminal devices have a specific feature (e.g., CTI control), then the points for CTI-controlled devices must be added to the points for the terminal device. The formula for CTI-controlled terminal devices would thus be:

$$\#Terminal = \frac{Max\ No.\ of\ Points — \#Trunks \cdot 22.9 \cdot F_{Ltg}}{(Points_{Terminal} + 1.7) \cdot F_{Tln}}$$

It is also possible to conceive of further tables, e.g., for a system with attendant consoles and ACD agents. In this case, the points required for the trunks, attendant consoles and ACD agents must be deducted from the maximum number of points. The formula for the calculation would thus be:

$$\#Terminal = \frac{Max\ No.\ of\ Points — \#Lines \cdot 22.9 \cdot F_{Ltg} — \#VPL \cdot 252 \cdot F_{VPL} — \#ACD \cdot 59 \cdot C}{Points_{Terminal} \cdot F_{Tln}}$$

2.6 Technical Specifications for HiPath 3000

Table 2-40 Technical specifications

Maximum System Values	HiPath 3800	HiPath 3550	HiPath 3350	HiPath 3500	HiPath 3300
Ringer Equivalence Number (type plate)	BC[1] = 6 A / 110 VAC, 3 A / 230 VAC EC[1] = 8 A / 110 VAC, 4 A / 230 VAC	2.6 A / 115 – 230 VAC	1.3 A / 115 – 230 VAC	2.6 A / 115 – 230 VAC	1.3 A / 115 – 230 VAC
Line frequency	50 – 60 Hz				
Power consumption[2]	BC = 490 W EC = 720 W				
Development of heat (without workpoints)[2]	BC = 1500 kJ/h EC 2200 kJ/h				
Dimensions (height x width x depth in mm)	490 x 440 x 430	450 x 460 x 200	450 x 460 x 128	155 x 440 x 380	88 x 440 x 380
Height units for 19-inch cabinet assembly	11	–	–	4	2
Weight	BC = 16.5 kg EC = 15.0 kg (transport weight, including back-plane and cabinet feet)	8 kg (17.62 lb.)	6 kg (13.22 lb.)	8 kg (17.62 lb.)	6 kg (13.22 lb.)
	Powerbox PB3000, incl. 4 batteries and LUNA2: 21 kg (Battery compartment including 4 batteries: 12 kg, LUNA2: 2 kg)				

1 BC: Basic cabinet, EC: expansion cabinet

2 The levels specified are worst case values that should not be used to estimate operating costs (energy costs). The real consumption values are expansion- and traffic-dependant and generally lie far below the worst case values.

2.7 Interface-to-Interface Ranges

Telephone interface-to-interface ranges

Table 2-41 Telephone Interface-to-Interface Ranges (with J-Y (ST) 2x2x0.6, 0.6 mm diameter)

Telephone interfaces	Range in m	Loop resistance in ohms
ISDN-S_0 point-to-point	< 600	156
ISDN S_0 extended bus connection	< 400	104
ISDN S_0 bus connection[1]	< 60 for the HiPath 3800 board STMD3 (Q2217) < 120 for all other S_0 boards	21
ISDN-S_0 wall outlet to terminal	< 10	–
Analog users	< 2000	520
$U_{P0/E}$ exchange to host (master)	< 1000	230
$U_{P0/E}$ host to client (master/slave)	< 100	23

1 Board-specific

Trunk connection and CorNet-N/CorNet-NQ ranges

The table below provides the maximum cable lengths for direct trunk connection and direct CorNet-N/CorNet-NQ Direct Wiring. The values apply to ideal conditions, which means there can be no joints, etc. The real conditions must be measured on-site.

Table 2-42 Cable Lengths for Trunk Connection and Direct CorNet-N/CorNet-NQ Direct Wiring

Inter-face	Cable	Diameter	Attenuation per km	Max. Cable Length
S_0	ICCS cable J-2Y(ST)Y4x2x0.51 LG ICCS Data5	0.51 mm	7.5 dB at 96 kHz	800 m
	Installation cable J-2Y(ST)Y ≥ 10x2x0.6 ST III BD	0.6 mm	6.0 dB at 96 kHz	1000 m
S_{2M}	A-2Y0F(L)2Y ≥ 10x2x0.6 (full PE insulation, filled)	0.6 mm	17 dB at 1 MHz	350 m

2.8 Country-Specific Ring Frequencies for Analog Subscriber Line Modules

The following table contains the ring frequency settings necessary for the implementing analog subscriber line modules in the various countries listed.

Table 2-43 Country-specific ring frequencies for analog subscriber line modules

Country	Abbreviation	Ring frequency (Hz)
Algeria	ALG	25
Argentina	ARG	25
Ethiopia	ETH	25
Australia	AUS	25
Belgium	BEL	25
Brazil	BRA	25
Federal Republic of Germany	FRG	25
Burundi	BUD	25
China	CHN	25
Denmark	DAN	25
Europe	EU	25
Finland	FIN	25
France	FRA	50
Greece	GRE	25
United Kingdom	UK	25
Commonwealth of Independent States	CIS	25
Hong Kong	HGK	25
India	IND	25
Indonesia	IDS	25
Ireland	IRL	25
Italy	ITL	25
Cameroon	CAM	25
Canada	CAN	20
Kenya	KEN	25
Congo	CGO	25
Croatia	CRO	25

Table 2-43 Country-specific ring frequencies for analog subscriber line modules

Country	Abbreviation	Ring frequency (Hz)
Luxembourg	LUX	25
Malaysia	MAL	20
Morocco	MOR	25
Mexico	MEX	25
Netherlands	NDL	25
Nigeria	NIA	25
Oman	OMA	25
Austria	OES	25
Pakistan	PAK	25
Philippines	PHI	20
Poland	POL	25
Portugal	POR	25
Republic of South Africa	RSA	25
Sweden	SWD	25
Switzerland	SWZ	25
Singapore	SIN	25
Slovenia	SLO	25
Spain	SPA	25
South Korea	KOR	20
Thailand	THA	25
Czech Republic	CRE	25
Turkey	TRK	25
Hungary	HUN	25
U.S. / Canada	U.S.	20
Vietnam	VIT	25
Zimbabwe	ZIM	25

2.9 Numbering Plan

2.9.1 Default Numbering for HiPath 3000/5000

HiPath 3000/5000 provides one default numbering plan for users.

Table 2-44 Default numbers for HiPath 3000/5000

Type of numbering	Default station numbers		
	HiPath 3800	**HiPath 3550 HiPath 3500**	**HiPath 3350 HiPath 3300**
User station numbers	100-749	100-287 500-687	11-30 51-70
User direct inward dialing numbers	100-749	100-287 500-687	11-30 51-70
Trunk station number	7801-7920	7801-7920	801-816
Seizure codes (external codes)	0 = ROW 9 = U.S.	0 = ROW 9 = U.S.	0 = ROW 9 = U.S.
	80-84 850-859	80-84 850-859	82-88
USBS station number internal & direct inward dialing	891	891	891
IMOD station number internal & direct inward dialing	890	890	890
Digital modem internal & direct inward dialing	879	879	879
Group station numbers internal & direct inward dialing	350-499 8600-8749	350-499	31-50
Internal attendant code number (intercept position)	9 = ROW 0 = U.S.	9 = ROW 0 = U.S.	9 = ROW 0 = U.S.
Attendant code extension (intercept position)	0 = ROW – = USA	0 = ROW – = USA	0 = ROW – = USA
Substitution for “*”	75	75	75
Substitution for “#”	76	76	76
Service codes	*xxx #xxx	*xxx #xxx	*xxx #xxx

2.9.2 Internet Telephony Phone Numbers

HiPath 3000 supports connection to the Internet telephony service provider (ITSP) and, therefore, the use of Internet telephony.

For Internet telephony subscriber lines, each call number must be individually registered at the ITSP. Up to thirty ITSP client user account IDs can be configured. The ITSP client user IDs and the Internet telephony phone numbers are supplied by the provider once an Internet telephony subscriber line is requested.

An Internet telephony system connection with DID is a connection that supports DID and for which an ITSP, an Internet telephony system phone number, an ITSP system ID (SIP system account) and a call number range with Internet telephony phone numbers are provided. Up to 30 Internet telephony phone numbers may be configured in the system.

The system is configured for connection to an ITSP via Web-Based Management (WBM) and Manager E.

2.9.3 Numbering in Networked Systems

In private networks, station phone numbers, seizure codes, and service codes are assigned according to a numbering plan provided by the customer.

HiPath 3000 supports the following numbering schemes:

- Closed numbering
  Requires that all station numbers are unique within the network. Each station in the network can reach another station by dialing their phone number.
- Open numbering
  This means that stations are identified using a node number (PABX number) and their station number. Stations in different nodes (systems) may therefore share the same number.
- M.164 numbering
  The numbering can be open or closed. A node number is not required. The stations can be reached via their public number, i.e. their E.164 number. Each station is represented by its E.164 number which can be displayed optimally. The advantage of the E.164 numbering is that the station can be reached via a number and no node number is required.

The same numbering plan must be selected for all networked systems (nodes).

2.10 Technical Specifications and Compliance to HiPath 3000

2.10.1 CE Compliance (not for U.S.)

The systems conform to the following guidelines and standards:

Guideline	Standard
R&TTE Directive 99/5/EEC	• EN 60950-1: 2001 (Safety) • EN61000-6-2 (EMC Immunity Industrial) • EN55024 (EMC Immunity Residential) • ETS 300 329 (DECT Emission/Immunity) • TBR 06, ETS 301489-1/6 (DECT Air Interface)

2.10.2 Compliance with US and Canadian Standards (for U.S. and Canada only)

Table 2-45 Compliance with US and Canadian Standards (for U.S. and Canada only)

Category	HiPath 3800	HiPath 3550	HiPath 3350
Product security	UL 60950-1 First Edition CAN/CSA C22.2 No. 60950-1-03	UL 60950-1 First Edition CAN/CSA C22.2 No. 60950-1-03	
FCC Part 15 subpart J	Class A	Class A	Class B
FCC Part 68 registration	AY3PF05BHIPATH3K8	AY3USA–25214–MF–E AY3USA–25215–KF–E	
Industry Canada CS-03 certification	267V-HP3800	267 8782A	
Ringer Equivalence Number (REN)	0.5B	0.4	

2.10.2.1 FCC Compliance

2.10.2.1.1 FCC Rules, Part 15

Each Siemens Enterprise Communications GmbH & Co. KG system discussed in this section, except HiPath 3350, has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If installation and operation are not in line with the instructions in the manual, this can lead to disruptions in radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

The HiPath 3350 has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If installation and handling are incorrect, this can lead to disruptions in radio communication However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

2.10.2.1.2 FCC Rules, Part 68

Each Siemens Enterprise Communications GmbH & Co. KG system discussed in this section complies with FCC Rules, Part 68. A label on the outside back of the cabinet identifies the FCC registration number, the ringer equivalence number (REN), and other information. If requested, this information must be given to the telephone company.

Disruption of the Network and T1

For networked systems using 1.544 Megabits per second (Mbps) T1 service, notify the telecommunication company when the equipment is disconnected from the network. If any Siemens Enterprise Communications GmbH & Co. KG system discussed in this section disrupts the telephone network, the telecommunication company can discontinue your service temporarily. If possible, the telecommunication company will notify you in advance. If this is not possible, you will receive notification at the earliest possible opportunity. In this context you will also be informed that you can lodge a complaint with the FCC.

Telephone Company Facility Changes

The telecommunication company is entitled to adapt its own equipment, devices, operating procedures, and processes as necessary; such modifications may impair the operation of your equipment. If they do, you should be notified in advance so you can maintain uninterrupted telephone service.

Nonlive Voice Equipment

Nonlive voice equipment, such as, music-on-hold devices and recorded announcements for systems must be approved by Siemens Enterprise Communications GmbH & Co. KG and registered in accordance with the rules and regulations of Subpart C of the FCC Rules, Part 68; or it must be connected through protective circuitry that is approved by Siemens Enterprise Communications GmbH & Co. KG and registered in accordance with the rules and regulations in Subpart C of the FCC Rules, Part 68.

REN

The Ringer Equivalence Number (REN) is used to determine the number of devices that can be connected to a telephone line so that all the devices ring when that telephone number is called. In most areas, but not all, the sum of the RENs of all devices connected to a line should not exceed five. Contact the local telecommunication company to determine the maximum REN for your calling area.

Newly Established Network Area and Exchange Codes

The off-net routing feature, also known as the least-cost routing (LCR) software feature, which allows user access to the telephone network, must be configured to recognize newly established network area codes and exchange codes as soon as they are placed in service.

Failure to reconfigure the customer premises equipment to recognize the new codes as they are established restricts the customer and the customer's employees from gaining access to the network and to these codes.

Hearing Aid Compatibility

Telephones for emergency use and telephones installed in common areas such as lobbies, hospital rooms, elevators, and hotel rooms must have handsets that are compatible with magnetically coupled hearing aids. Persons who are not in common areas also must be provided with hearing-aid compatible handsets, if needed.

For the hearing impaired, all Siemens Enterprise Communications GmbH & Co. KG digital devices manufactured after August 16, 1989, are hearing-aid-compatible and comply with FCC Rules, Part 68, Section 68.316.

Programmed dial functions

When you program emergency numbers or make test calls to emergency numbers using Siemens Enterprise Communications GmbH & Co. KG products with programmed dialer features, stay on the line and briefly explain to the dispatcher the reason for the call before hanging up. Perform these activities in off-peak hours, such as early morning or late evening.

Connecting Off-Premises Station Facilities

Customers who intend to connect off-premises station (OPS) facilities must inform the telecommunication company of the OPS class for which the equipment is registered and the connection desired.

Direct Inward Dialing Answer Supervision

Customers operating any Siemens Enterprise Communications GmbH & Co. KG system discussed in this section without providing proper answer supervision are in violation of Part 68 of the FCC rules.

- Each Siemens Enterprise Communications GmbH & Co. KG system discussed in this section returns proper answer supervision to the public switched telephone network (PSTN) when DID calls are:
  - Answered by the called station.
  - Answered by the attendant.
  - Routed to a recorded announcement that can be administered by the customer.
- Each Siemens Enterprise Communications GmbH & Co. KG system discussed in this section returns proper answer supervision on all DID calls forwarded to the PSTN. Permissible exceptions are when:
  - A call is unanswered
  - A busy tone is received
  - A reorder tone is received

Equal Access Requirements

Call aggregators, such as hotels, hospitals, airports, colleges and universities, and so on, must provide the end user with equal access to the carriers of the user's choice. The current equal access codes (also known as carrier access codes [CACs]) are 10xxx and 101xxxx, and 800/888 and 950, where xxx or xxxx represents the carrier identification code.

To select the carrier of choice for a call, the user dials the equal access code before dialing the called party number. Equal access is also obtained by dialing the 800/888 or 950 number of the carrier of choice.

Each Siemens Enterprise Communications GmbH & Co. KG system discussed in this section is capable of providing user access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities are a violation of the Telephone Operator Consumer Services Improvement Act of 1990 and Part 68 of the FCC Rules.

Electrical Safety Advisory

Each Siemens Enterprise Communications GmbH & Co. KG system discussed in this section is fully compliant with FCC Rules and Regulations. It is nevertheless recommended that an alternating current (AC) surge arrestor of the form and capability suitable for the model purchased be installed in the AC outlet to which the system is connected. Consult your sales partner to determine the surge protector requirements for your system.

2.10.2.2 Industry Canada Compliance

The following paragraphs describe requirements for and present information based on the Industry Canada standards.

2.10.2.2.1 REN

The Ringer Equivalence Number (REN) defines how many devices can be connected to a telephone line at the same time. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed five.

2.10.2.2.2 Equipment Attachment Limitations

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements as described in the appropriate Terminal Equipment Technical Requirement documents. However, the Department offers no assurances that the devices will operate to the customer's complete satisfaction at all times.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with these conditions may not prevent degradation of performance in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



DANGER
Users should not attempt to make such connections themselves, but should contact the electric inspection authority, or electrician, as appropriate.

2.10.3 SAFETY International

IEC 60950-1, first edition 2001, modified

2.11 Environmental Conditions

2.11.1 Electrical Operating Conditions

- Operating limits
  Room temperature: + 5 ...+ 40 °C (41 ... 104 °F)
  absolute humidity: 2 - 25 g H_2O/m^3
  Relative humidity: 5 - 80%
- System ventilation is by convection only. Automatic ventilation is required when using the HG 1500 in HiPath 3550 and HiPath 3350.



Caution
Avoid exposing the system to direct sunlight and heaters (excessive heat may damage the system).
Systems covered with condensation must be dried before being used. Do not start up the system until it has thoroughly dried.

2.11.2 Mechanical Operating Conditions

The systems are intended for stationary use.

3 Boards for HiPath 3000

NOTE: All boards of HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 and the central boards of HiPath 3800 can only be pulled or inserted when the system has been powered down and de-energized.

Boards with additional primary protection

NOTE: Danger of damage to property due to overvoltage. Lines exiting buildings of the boards listed below must be protected with an additional primary protection against overvoltage caused by lightening strikes (see also Section 2.1.2, “Lightning Protection”).

- CBCC, CBRC, CBSAP
- SLA8N, SLA16N, SLA24N
- SLAD4, SLAD8, SLAD8R
- SLAD16
- SLC16N, SLCN
- SLMAE8, SLMAE
- SLMA, SLMA8, SLMA2
- SLMO2, SLMO8, SLMO24
- SLU8, SLU8R
- STLS2, STLS4, STLS4R
- STLSX2, STLSX4, STLSX4R
- STMD3, STMI2
- TCAS-2, TCASR-2
- TLA2, TLA4, TLA8, TLA4R
- TM2LP, TMAMF
- TLANI2, TLANI4, TLANI8
- TLANI4R
- TMANI, TMANI-IM, TMANI-BRA
- TMC16, TMCAS, TMCAS-2
- TST1
- TMDID, TMDID2
- TMEW2
- TMGL4, TMGL4R
- TMQ4, TST1
- TS2, TS2R
- 4SLA, 8SLA, 16SLA
- 8SLAR
- ALUM4, ANI4, ANI4R
- GEE12, GEE16, GEE50
- REALS, STBG4

NOTE (only for Brasil): Danger of damage to property. To protect against overvoltage caused by lightening, the use of the lightening protection strip with the part number C39334-Z7052-C33 is absolutely mandatory. The power supply cable of the HiPath 3000 must be inserted into the lightening protection strip. The lightening protection strip must be connected to the power supply.

Chapter contents

This chapter covers the following topics:

Topic
Section 3.1, “Functional and Model Overview of the Boards”
Section 3.2, “Central boards”
Section 3.3, “Peripheral Boards”
Section 3.4, “Options”

3.1 Functional and Model Overview of the Boards

Functional overview of all boards used

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
Central boards		
CBCC	S30810-Q2935-A401	HiPath 3550/HiPath 3350
CBRC	S30810-Q2935-Z301	HiPath 3500/HiPath 3300
CBSAP	S30810-Q2314-X	HiPath 3800
CMA	S30807-Q6931-X	HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300
CMS	S30807-Q6928-X	HiPath 3000
CUC	S30777-Q750-X	HiPath 3550
CUCR	S30777-Q750-Z	HiPath 3500
CUP	S30777-Q751-X	HiPath 3350
CUPR	S30777-Q751-Z	HiPath 3300
DBSAP	S30807-Q6722-X	HiPath 3800
IMODN	S30807-Q6932-X100	HiPath 3000
LIM	S30807-Q6930-X	HiPath 3000
LIMS	S30807-Q6721-X	HiPath 3800
LUNA2	S30122-K7686-A1 S30122-K7686-M1	HiPath 3800
MMC	S30122-X8002-X10	HiPath 3000
PSUP	S30122-K5658-M	HiPath 3350
RGMOD	S30124-X5109-X	HiPath 3800 (for selected countries only)
UPSC-D	S30122-K5660-A300 S30122-K5660-M300	HiPath 3550/HiPath 3350
UPSC-DR	S30122-K7373-A900 S30122-K7373-M900	HiPath 3500/HiPath 3300

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
Peripheral boards **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
16SLA	S30810-Q2923-X	HiPath 3550/HiPath 3350 (not for U.S.)
4SLA	S30810-Q2923-X200	HiPath 3550/HiPath 3350 (not for U.S.)
8SLA	S30810-Q2923-X100	HiPath 3550/HiPath 3350
8SLAR	S30810-K2925-Z	HiPath 3500/HiPath 3300
DIU2U	S30810-Q2216-X	HiPath 3800 (for U.S. only)
DIUN2	S30810-Q2196-X	HiPath 3800
DIUT2	S30810-Q2226-X100	HiPath 3800
HXGR3	S30810-K2943-Z	HiPath 3500/HiPath 3300
HXGS3	S30810-Q2943-X	HiPath 3550/HiPath 3350
HXGS3	S30810-Q2943-X1	HiPath 3550/HiPath 3350
HXGS3	S30810-K2943-Z1	HiPath 3500/HiPath 3300
IVMN8	S30122-H7688-X100	HiPath 3800
IVMNL	S30122-H7688-X	HiPath 3800
IVMP8	S30122-Q7379-X100	HiPath 3350 (not for U.S.)
IVMP8R	S30122-K7379-Z100	HiPath 3300 (not for U.S.)
IVMS8	S30122-Q7379-X	HiPath 3550/HiPath 3350
IVMS8R	S30122-K7379-Z	HiPath 3500/HiPath 3300
PBXXX	S30810-Q6401-X	HiPath 3800 (for selected countries only)
SLA16N	S30810-Q2929-X100	HiPath 3550
SLA24N	S30810-Q2929-X	HiPath 3550
SLAD4	S30810-H2956-X100	HiPath 3550/HiPath 3350
SLAD8	S30810-H2956-X200	HiPath 3550/HiPath 3350
SLAD8R	S30810-K2956-X300	HiPath 3500/HiPath 3300
SLAD16	S30810-Q2957-X	HiPath 3550/HiPath 3350
SLC16N	S30810-Q2193-X100	HiPath 3550 (not for U.S.)
SLCN	S30810-Q2193-X300	HiPath 3800 (not for U.S.)
SLMA	S30810-Q2191-C300	HiPath 3800
SLMA2	S30810-Q2246-X	HiPath 3800 (for selected countries only)

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
SLMA8	S30810-Q2191-C100	HiPath 3800
SLMAE	S30810-Q2225-X200	HiPath 3800
SLMAE8	S30810-Q2225-X100	HiPath 3800
SLMAV		HiPath 3800
SLMO2	S30810-Q2168-X10	HiPath 3800
SLMO24	S30810-Q2901-X	HiPath 3550
SLMO8	S30810-Q2168-X100	HiPath 3800
SLU8	S30817-Q922-A301	HiPath 3550/HiPath 3350
SLU8R	S30817-K922-Z301	HiPath 3550/HiPath 3300
STLS2	S30817-Q924-B313	HiPath 3550/HiPath 3350 (not for U.S.)
STLS4	S30817-Q924-A313	HiPath 3550/HiPath 3350
STLS4R	S30817-K924-Z313	HiPath 3500/HiPath 3300
STLSX2	S30810-Q2944-X100	HiPath 3550/HiPath 3350
STLSX4	S30810-Q2944-X	HiPath 3550/HiPath 3350
STLSX4R	S30810-K2944-Z	HiPath 3500/HiPath 3300
STMD3	S30810-Q2217-X10	HiPath 3800
STMI2	S30810-Q2316-X100	HiPath 3800
TCAS-2	S30810-Q2945-X	HiPath 3550 (for selected countries only)
TCASR-2	S30810-K2945-X	HiPath 3500 (for selected countries only)
TLA2	S30817-Q923-Bxxx	HiPath 3550/HiPath 3350 (not for U.S.)
TLA4	S30817-Q923-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
TLA4R	S30817-Q923-Zxxx	HiPath 3550/HiPath 3300 (not for U.S.)
TLA8	S30817-Q926-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
TLANI2	S30810-H2953-X1xx	HiPath 3550/HiPath 3350
TLANI4	S30810-H2953-Xxx	HiPath 3550/HiPath 3350
TLANI8	S30810-H2954-X1xx	HiPath 3550/HiPath 3350
TLANI4R	S30810-K2953-X2xx	HiPath 3500/HiPath 3300
TM2LP	S30810-Q2159-Xxxx	HiPath 3800
TMANI	S30810-Q2327-X	HiPath 3800
TMANI-IM	S30810-Q2327-X1	HiPath 3800

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
TMANI-BRA	S30810-Q2327-X82	HiPath 3800
TMC16	S30810-Q2485-X	HiPath 3800 (for selected countries only)
TMCAS	S30810-Q2938-X	HiPath 3550 (for selected countries only)
TMCAS-2	S30810-Q2946-X	HiPath 3800 (for selected countries only)
TMDID	S30810-Q2452-X	HiPath 3800 (for U.S. only)
TMDID2	S30810-Q2197-T	HiPath 3800 (for selected countries only)
TMEW2	S30810-Q2292-X100	HiPath 3800
TMGL4	S30810-Q2918-X	HiPath 3550/HiPath 3350 (for U.S. only)
TMGL4R	S30810-K2918-Z	HiPath 3500/HiPath 3300 (for U.S. only)
TMQ4	S30810-Q2917-X	HiPath 3550/HiPath 3350 (for U.S. only)
TS2	S30810-Q2913-X300	HiPath 3550 (not for U.S.)
TS2R	S30810-K2913-Z300	HiPath 3500 (not for U.S.)
TST1	S30810-Q2919-X S30810-K2919-Z	HiPath 3550 (for U.S. only) HiPath 3500 (for U.S. only)

Table 3-1 HiPath 3000 - Functional Overview of All Boards Used

Board	Part number	Model
Options		
ALUM4	S30817-Q935-A	HiPath 3550/HiPath 3350
ANI4	S30807-Q6917-Axxx	HiPath 3550/HiPath 3350 (for selected countries only)
ANI4R	S30807-Q6917-Z103	HiPath 3500/HiPath 3300 (for selected countries only)
EVM	S30807-Q6945-X	HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300
EXM	S30817-Q902-B401	HiPath 3550/HiPath 3350
EXMNA	S30817-Q6923-X	HiPath 3550/HiPath 3350 (for U.S. only)
EXMR	S30122-K7403-Z	HiPath 3500/HiPath 3300
GEE12	S30817-Q951-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
GEE16	S30817-Q951-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
GEE50	S30817-Q951-Axxx	HiPath 3550/HiPath 3350 (not for U.S.)
HOPE	S30122-Q7078-X S30122-Q7079-X	HiPath 3550/HiPath 3350 (for U.S. only)
MPPI	S30122-K5380-X200	HiPath 3550/HiPath 3350 (not for U.S.)
MPPI	S30122-K7275-B	HiPath 3000
OPAL	C39195-A7001-B130	HiPath 3550/HiPath 3350
OPALR	C39195-A7001-B142	HiPath 3500/HiPath 3300
PFT1/PFT4	S30777-Q539-X S30777-Q540-X	HiPath 3800 (not for U.S.)
PDM1	S30807-Q5692-X100	HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300
REALS	S30807-Q6629-X	HiPath 3800
STBG4	S30817-Q934-A	HiPath 3550/HiPath 3350 (France only)
STRB	S30817-Q932-A	HiPath 3550/HiPath 3350
STRBR	S30817-Q932-Z	HiPath 3500/HiPath 3300
UAM	S30122-X7217-X	HiPath 3550/HiPath 3350 (not for U.S.)
UAMR	S30122-X7402-Z	HiPath 3500/HiPath 3300 (not for U.S.)
V24/1	S30807-Q6916-X100	HiPath 3550/HiPath 3350 (not for U.S.)

Overview of all board models used

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3800		
AMOM	S30807-K5480-Xxxx	Opto-electronic converter
CBSAP	S30810-Q2314-X	Central board
CMS	S30807-Q6928-X	Central board
DBSAP	S30807-Q6722-X	Central board
DIU2U	S30810-Q2216-X	Peripheral board (for U.S. only)
DIUN2	S30810-Q2196-X	Peripheral board
DIUT2	S30810-Q2226-X100	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMN8	S30122-H7688-X100	Peripheral board
IVMNL	S30122-H7688-X	Peripheral board
LIMS	S30807-Q6721-X	Central board
LUNA2	S30122-K7686-A1 S30122-K7686-M1	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
PBXXX	S30810-Q6401-X	Peripheral board (for selected countries only)
PFT1/PFT4	S30777-Q539-X S30777-Q540-X	Option (not for U.S.)
REALS	S30807-Q6629-X	Option
RGMOD	S30124-X5109-X	Central board (for selected countries only)
SLCN	S30810-Q2193-X300	Peripheral board (not for U.S.)
SLMA	S30810-Q2191-C300	Peripheral board
SLMA2	S30810-Q2246-X	Peripheral board (for selected countries only)
SLMA8	S30810-Q2191-C100	Peripheral board
SLMAE	S30810-Q2225-X200	Peripheral board
SLMAE8	S30810-Q2225-X100	Peripheral board
SLMAV		Peripheral board
SLMO2	S30810-Q2168-X10	Peripheral board
SLMO8	S30810-Q2168-X100	Peripheral board
STMD3	S30810-Q2217-X10	Peripheral board
STMI2	S30810-Q2316-X100	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
TM2LP	S30810-Q2159-Xxxx	Peripheral board
TMC16	S30810-Q2485-X	Peripheral board (for selected countries only)
TMCAS-2	S30810-Q2946-X	Peripheral board (for selected countries only)
TMDID	S30810-Q2452-X	Peripheral board (for U.S. only)
TMDID2	S30810-Q2197-T	Peripheral board (for selected countries only)
TMEW2	S30810-Q2292-X100	Peripheral board
TMANI	S30810-Q2327-X	Peripheral board
TMANI-IM	S30810-Q2327-X1	Peripheral board
TMANI-BRA	S30810-Q2327-X82	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3550 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ALUM4	S30817-Q935-A	Option
ANI4	S30807-Q6917-Axxx	Option (for selected countries only)
CBCC	S30810-Q2935-A401	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUC	S30777-Q750-X	Central board
EVM	S30807-Q6945-X	Option
EXM	S30817-Q902-B401	Option
EXMNA	S30817-Q6923-X	Option (for U.S. only)
GEE12	S30817-Q951-Axxx	Option (not for U.S.)
GEE16	S30817-Q951-Axxx	Option (not for U.S.)
GEE50	S30817-Q951-Axxx	Option (not for U.S.)
HOPE	S30122-Q7078-X S30122-Q7079-X	Option (for U.S. only)
HXGS3	S30810-Q2943-X	Peripheral board
HXGS3	S30810-Q2943-X1	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMS8	S30122-Q7379-X	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K5380-X200 (not for U.S.) S30122-K7275-B	Option
OPAL	C39195-A7001-B130	Cable
PDM1	S30807-Q5692-X100	Option
SLA8N	S30810-Q2929-X200	Peripheral board (not for U.S.)
SLA16N	S30810-Q2929-X100	Peripheral board
SLAD4	S30810-H2956-X100	Peripheral board
SLAD8	S30810-H2956-X200	Peripheral board
SLAD16	S30810-Q2957-X	Peripheral board
SLA24N	S30810-Q2929-X	Peripheral board
SLC16N	S30810-Q2193-X100	Peripheral board (not for U.S.)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
SLMO24	S30810-Q2901-X	Peripheral board
SLU8	S30817-Q922-A301	Peripheral board
STBG4	S30817-Q934-A	Option (France only)
STLS2	S30817-Q924-B313	Peripheral board (not for U.S.)
STLS4	S30817-Q924-A313	Peripheral board
STLSX2	S30810-Q2944-X100	Peripheral board
STLSX4	S30810-Q2944-X	Peripheral board
STRB	S30817-Q932-A	Option
TCAS-2	S30810-Q2945-X	Peripheral board (for selected countries only)
TLA2	S30817-Q923-Bxxx	Peripheral board (not for U.S.)
TLA4	S30817-Q923-Axxx	Peripheral board (not for U.S.)
TLA8	S30817-Q926-Axxx	Peripheral board (not for U.S.)
TLANI2	S30810-H2953-X1xx	Peripheral board
TLANI4	S30810-H2953-Xxx	Peripheral board
TLANI8	S30810-H2954-X1xx	Peripheral board
TMAMF	S30810-Q2587-A400	Peripheral board (for selected countries only)
TMCAS	S30810-Q2938-X	Peripheral board (for selected countries only)
TMGL4	S30810-Q2918-X	Peripheral board (for U.S. only)
TMQ4	S30810-Q2917-X	Peripheral board (for U.S. only)
TST1	S30810-Q2919-X	Peripheral board (for U.S. only)
TS2	S30810-Q2913-X300	Peripheral board (not for U.S.)
UAM	S30122-X7217-X	Option (not for U.S.)
UPSC-D	S30122-K5660-A300 S30122-K5660-M300	Central board
V24/1	S30807-Q6916-X100	Option (not for U.S.)
4SLA	S30810-Q2923-X200	Peripheral board (not for U.S.)
8SLA	S30810-Q2923-X100	Peripheral board
16SLA	S30810-Q2923-X	Peripheral board (not for U.S.)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3350 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ALUM4	S30817-Q935-A	Option
ANI4	S30807-Q6917-Axxx	Option (for selected countries only)
CBCC	S30810-Q2935-A401	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUP	S30777-Q751-X	Central board
EVM	S30807-Q6945-X	Option
EXM	S30817-Q902-B401	Option
EXMNA	S30817-Q6923-X	Option (for U.S. only)
GEE12	S30817-Q951-Axxx	Option (not for U.S.)
GEE16	S30817-Q951-Axxx	Option (not for U.S.)
GEE50	S30817-Q951-Axxx	Option (not for U.S.)
HOPE	S30122-Q7078-X S30122-Q7079-X	Option (for U.S. only)
HXGS3	S30810-Q2943-X	Peripheral board
HXGS3	S30810-Q2943-X1	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMP8	S30122-Q7379-X100	Peripheral board (not for U.S.)
IVMS8	S30122-Q7379-X	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K5380-X200 (not for U.S.) S30122-K7275-B	Option
OPAL	C39195-A7001-B130	Cable
PDM1	S30807-Q5692-X100	Option
PSUP	S30122-K5658-M	Central board
SLAD4	S30810-H2956-X100	Peripheral board
SLAD8	S30810-H2956-X200	Peripheral board
SLAD16	S30810-Q2957-X	Peripheral board
SLU8	S30817-Q922-A301	Peripheral board
STBG4	S30817-Q934-A	Option (France only)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
STLS2	S30817-Q924-B313	Peripheral board (not for U.S.)
STLS4	S30817-Q924-A313	Peripheral board
STLSX2	S30810-Q2944-X100	Peripheral board
STLSX4	S30810-Q2944-X	Peripheral board
STRB	S30817-Q932-A	Option
TLA2	S30817-Q923-Bxxx	Peripheral board (not for U.S.)
TLA4	S30817-Q923-Axxx	Peripheral board (not for U.S.)
TLA8	S30817-Q926-Axxx	Peripheral board (not for U.S.)
TLANI2	S30810-H2953-X1xx	Peripheral board
TLANI4	S30810-H2953-Xxx	Peripheral board
TLANI8	S30810-H2954-X1xx	Peripheral board
TMGL4	S30810-Q2918-X	Peripheral board (for U.S. only)
TMQ4	S30810-Q2917-X	Peripheral board (for U.S. only)
UAM	S30122-X7217-X	Option (not for U.S.)
UPSC-D	S30122-K5660-A300 S30122-K5660-M300	Central board
V24/1	S30807-Q6916-X100	Option (not for U.S.)
4SLA	S30810-Q2923-X200	Peripheral board (not for U.S.)
8SLA	S30810-Q2923-X100	Peripheral board
16SLA	S30810-Q2923-X	Peripheral board (not for U.S.)

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3500 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
ANI4R	S30807-Q6917-Z103	Option (for selected countries only)
CBRC	S30810-Q2935-Z401	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUCR	S30777-Q750-Z	Central board
EVM	S30807-Q6945-X	Option
EXMR	S30122-K7403-Z	Option
HXGR3	S30810-K2943-Z	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMS8R	S30122-K7379-Z	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
OPALR	C39195-A7001-B142	Cable
PDM1	S30807-Q5692-X100	Option
SLAD8R	S30810-K2956-X300	Peripheral board
SLU8R	S30817-K922-Z301	Peripheral board
STLS4R	S30817-K924-Z313	Peripheral board
STLSX4R	S30810-K2944-Z	Peripheral board
STRBR	S30817-Q932-Z	Option
TCASR-2	S30810-K2945-X	Peripheral board (for selected countries only)
TLA4R	S30817-Q923-Zxxx	Peripheral board (not for U.S.)
TLANI4R	S30810-K2953-X2xx	Peripheral board
TMGL4R	S30810-K2918-Z	Peripheral board (for U.S. only)
TST1	S30810-K2919-Z	Peripheral board (for U.S. only)
TS2R	S30810-K2913-Z300	Peripheral board (not for U.S.)
UAMR	S30122-X7402-Z	Option (not for U.S.)
UPSC-DR	S30122-K7373-A900 S30122-K7373-M900	Central board
8SLAR	S30810-K2925-Z	Peripheral board

Table 3-2 HiPath 3000 - Overview of All Boards Models Used

Board	Part number	Function
HiPath 3300 **Note:** The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.		
8SLAR	S30810-K2925-Z	Peripheral board
ANI4R	S30807-Q6917-Z103	Option (for selected countries only)
CBRC	S30810-Q2935-Z401	Central board
CMA	S30807-Q6931-X	Central board
CMS	S30807-Q6928-X	Central board
CUPR	S30777-Q751-Z	Central board
EVM	S30807-Q6945-X	Option
EXMR	S30122-K7403-Z	Option
HXGR3	S30810-K2943-Z	Peripheral board
IMODN	S30807-Q6932-X100	Central board
IVMP8R	S30122-K7379-Z100	Peripheral board (not for U.S.)
IVMS8R	S30122-K7379-Z	Peripheral board
LIM	S30807-Q6930-X	Central board
MMC	S30122-X8002-X10	Central board
MPPI	S30122-K7275-B	Option
OPALR	C39195-A7001-B142	Cable
PDM1	S30807-Q5692-X100	Option
SLAD8R	S30810-K2956-X300	Peripheral board
SLU8R	S30817-K922-Z301	Peripheral board
STLS4R	S30817-K924-Z313	Peripheral board
STLSX4R	S30810-K2944-Z	Peripheral board
STRBR	S30817-Q932-Z	Option
TLA4R	S30817-Q923-Zxxx	Peripheral board (not for U.S.)
TLANI4R	S30810-K2953-X2xx	Peripheral board
TMGL4R	S30810-K2918-Z	Peripheral board (for U.S. only)
UAMR	S30122-X7402-Z	Option (not for U.S.)
UPSC-DR	S30122-K7373-A900 S30122-K7373-M900	Central board

3.2 Central boards

NOTE: The system must be disconnected from the power source before removing or inserting any boards in HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300, and before removing or inserting the central boards in HiPath 3800.

3.2.1 CBCC

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Octopus F100

Except for the CBCC board, the Octopus F100 communication system is identical in structure to HiPath 3350. The part number for this CBCC is S30810-K2935-T401.

Introduction

The CBCC board (**C**entral **B**oard with **C**oldfire **C**om) performs all central control and attendant functions for HiPath 3550 and HiPath 3350.

This description refers to the following versions of central CBCC board:

- CBCC S30810-Q2935-A401: Implemented from V6.0 Rel. 10 or later and V5.0 Rel. 15 or later.
  Essential new functions:
  - Integration of the functionality of the LIM subboard
  - Increase of the ring voltage of analog station interfaces (T/R) to approx. 65 V_{eff}
  - Discontinuation of the second V.24 interface (Option V24/1)
- CBCC S30810-Q2935-A301: implemented in V5.0 or later
  Essential new function: CLIP

Differences between both CBCC versions are indicated at the appropriate point in the following description.

Subboards

The following subboards can be used depending on the application:

- Clock module CMA or CMS (optional)
- MMC multimedia card

- IMODN integrated modem card new (optional)
- MPPI music on hold (optional)
- Entry Voice Mail EVM (optional): Pluggable up to HiPath 3000/5000 V7, securely soldered as of HiPath 3000/5000 V8.
- LAN Interface Module LIM (optional, for CBCC S30810-Q2935-A301 only)

Outputs, interfaces

- Ethernet (10 BaseT)/10 MBit) LAN interface, only in CBCC S30810-Q2935-A401
  The interface can be used for administration via HiPath 3000 Manager E and CTI functions (TAPI 120 V2.0). Bear in mind, however, that the number of BHCAs (Busy Hour Call Attempts = number of connection attempts during busy traffic hours) is restricted to 400 at a maximum of six TAPI ports. The use of "power dialers" is not approved.

  The ETHERNET-LAN interface is deactivated by the system software deactivated as soon as an HG 1500 board is inserted.
- Eight digital $U_{P0/E}$ subscriber lines
  For example, $U_{P0/E}$ workpoint clients or BS3/1 base stations for HiPath Cordless Office can be connected here.
- Four analog T/R subscriber lines
  For U.S. only: These interfaces do not support the connection of external extensions via OPS (Off-Premises Station) signaling.
  CBCC S30810-Q2935-A401: The interfaces supply a ring voltage of approx. 65 V_{eff}. CBCC S30810-Q2935-A301: The T/R interfaces supply a ring voltage of approx. 35 V_{eff}. Depending on the terminals connected, we cannot exclude the possibility of errors occurring during ringing state.
- Two digital S_0 interfaces (CO (default) or station)
- Backplane (CUC or CUP) connection via slots 1 (X11), 2 (X5) and 3 (X6)
- Music on hold: MPPI, EXM

  Please note that only one MPPI module may be connected. In other words, you can connect either MPPI S30122-K5380-X200 via X4 or MPPI S30122-K7275-B via X19/X20.
- Options bus (O bus)
- V.24 interface
  CBCC S30810-Q2935-A301: A second V.24 interface can be realized via the V24/1 option.

Switches and indicators

- Reset/reload switch
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (RUN LED off indicates that a reload is in progress)
- RUN LED
  LED status meaning is explained in the following table.

Table 3-3 CBCC - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data.
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

1 The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

Figure CBCC S30810-Q2935-A401

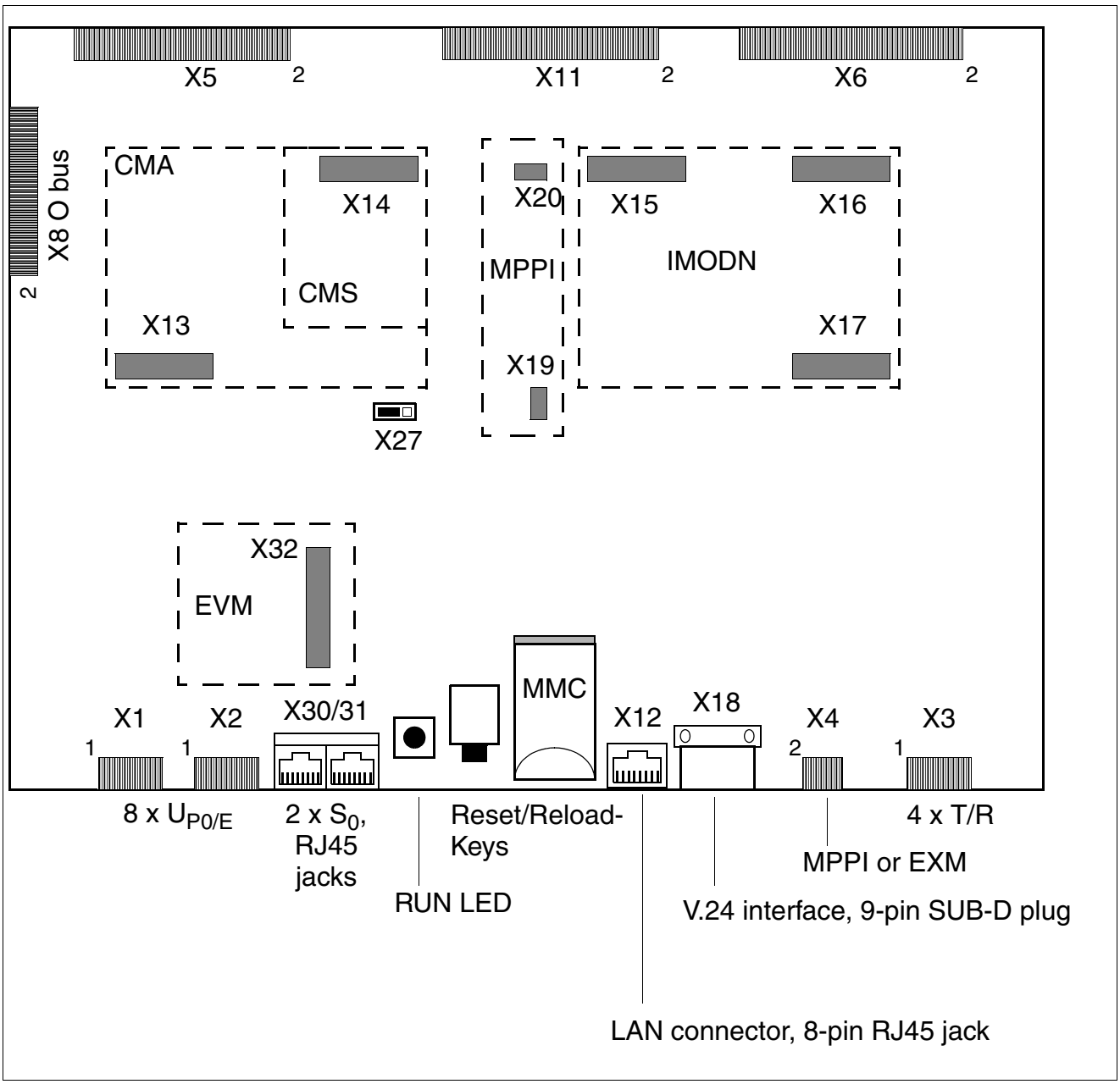


Figure 3-1 CBCC Board (S30810-Q2935-A401)

Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

Figure CBCC S30810-Q2935-A301

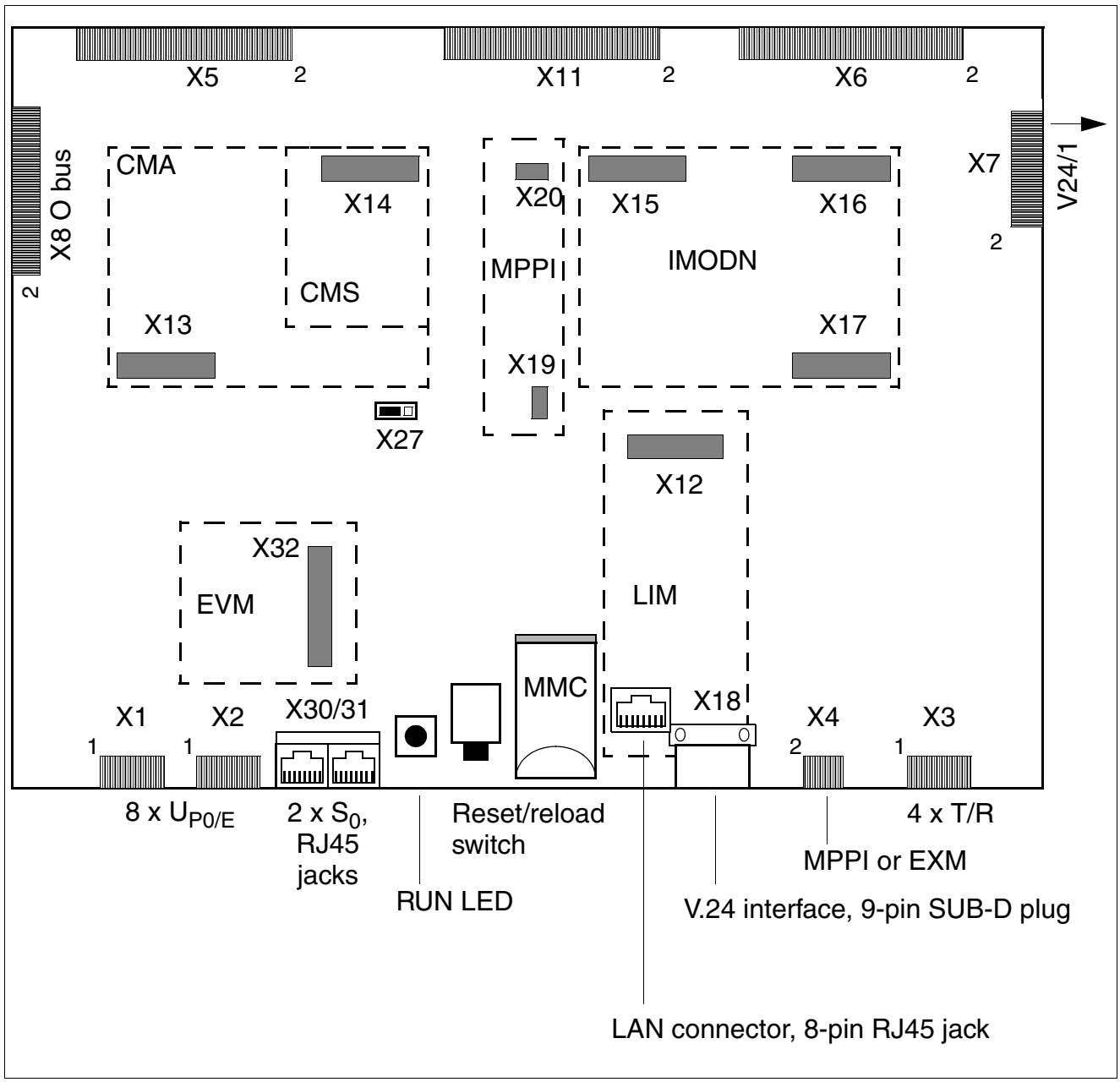


Figure 3-2 CBCC Board (S30810-Q2935-A301)

Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

X1 to X4 contact assignments

Table 3-4 CBCC - X1 to X4 Contact Assignments

Contact	Connector X1	Connector X2	Connector X3	Connector X4
	$U_{P0/E}$		T/R	MPPI or EXM
1	$U_{P0/E}$ port 1b	$U_{P0/E}$ port 5b	T/R port 1a	GND
2	$U_{P0/E}$ port 1a	$U_{P0/E}$ port 5a	T/R port 1b	Not used
3	$U_{P0/E}$ port 2b	$U_{P0/E}$ port 6b	T/R port 2a	Not used
4	$U_{P0/E}$ port 2a	$U_{P0/E}$ port 6a	T/R port 2b	EXMCLK (512 kHz data cycle)
5	$U_{P0/E}$ port 3b	$U_{P0/E}$ port 7b	T/R port 3a	EXMDIR (8 kHz frame cycle)
6	$U_{P0/E}$ port 3a	$U_{P0/E}$ port 7a	T/R port 3b	EXMRES (high-active reset)
7	$U_{P0/E}$ port 4b	$U_{P0/E}$ port 8b	T/R port 4a	EXMD (data line)
8	$U_{P0/E}$ port 4a	$U_{P0/E}$ port 8a	T/R port 4b	EXMDET (detect signal)
9	–	–	–	+5 V
10	–	–	–	Not used

S_0 interface assignment

Table 3-5 CBCC - S_0 Interface Assignment (RJ45 Jacks)

Contact	S_0	
	X30	X31
1	–	–
2	–	–
3	S_0 port 1, transmit +	S_0 port 2, transmit +
4	S_0 port 1, receive +	S_0 port 2, receive +
5	S_0 port 1, receive –	S_0 port 2, receive –
6	S_0 port 1, transmit –	S_0 port 2, transmit –
7	–	–
8	–	–

V.24 interface assignment

Table 3-6 CBCC - V.24 Interface Assignment (SUB-D Plug)

X18, Pin	Signal	Description
1	–	Not used
2	RxD A	Receive data, channel A
3	TxD A	Transmit data, channel A
4	–	Not used
5	0 V	Ground
6	–	Not used
7	RTS A	Request to send, channel A
8	CTS A	Clear to send, channel A
9	–	Not used

LAN connector assignment

CBCC S30810-Q2935-A301: The Ethernet LAN interface is provided by the optional LIM sub-board.

Table 3-7 CBCC - LAN Connector Assignment (RJ45 Jack)

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

Default Numbering Plan When Using CBCC in HiPath 3550

Table 3-8 Default Numbering Plan When Using CBCC in HiPath 3550

Station	Int. call no.	DID no.	Port
$U_{P0/E}$ host (master)	100	100	$U_{P0/E}$ 1
	101	101	$U_{P0/E}$ 2
	102	102	$U_{P0/E}$ 3
	103	103	$U_{P0/E}$ 4
	104	104	$U_{P0/E}$ 5
	105	105	$U_{P0/E}$ 6
	106	106	$U_{P0/E}$ 7
	107	107	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	500	500	$U_{P0/E}$ 1
	501	501	$U_{P0/E}$ 2
	502	502	$U_{P0/E}$ 3
	503	503	$U_{P0/E}$ 4
	504	504	$U_{P0/E}$ 5
	505	505	$U_{P0/E}$ 6
	506	506	$U_{P0/E}$ 7
	507	507	$U_{P0/E}$ 8
T/R	108	108	T/R 1
	109	109	T/R 2
	110	110	T/R 3
	111	111	T/R 3
EVM	112	112	EVM-1
	113	113	EVM-2
Line	**Code**		**Port**
S_0 CO PP	7801		S_0 1-1
	7802		S_0 1-2
	7803		S_0 2-1
	7804		S_0 2-2

Default Numbering Plan When Using CBCC in HiPath 3350

Table 3-9 Default Numbering Plan When Using CBCC in HiPath 3350

Station	Int. call no.	DID no.	Port
$U_{P0/E}$ host (master)	11	11	$U_{P0/E}$ 1
	12	12	$U_{P0/E}$ 2
	13	13	$U_{P0/E}$ 3
	14	14	$U_{P0/E}$ 4
	15	15	$U_{P0/E}$ 5
	16	16	$U_{P0/E}$ 6
	17	17	$U_{P0/E}$ 7
	18	18	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	51	51	$U_{P0/E}$ 1
	52	52	$U_{P0/E}$ 2
	53	53	$U_{P0/E}$ 3
	54	54	$U_{P0/E}$ 4
	55	55	$U_{P0/E}$ 5
	56	56	$U_{P0/E}$ 6
	57	57	$U_{P0/E}$ 7
	58	58	$U_{P0/E}$ 8
T/R	19	19	T/R 1
	20	20	T/R 2
	21	21	T/R 3
	22	22	T/R 3
EVM	23	23	EVM-1
	24	24	EVM-2
Line	**Code**		**Port**
S_0 CO PP	801		S_0 1-1
	802		S_0 1-2
	803		S_0 2-1
	804		S_0 2-2

3.2.2 CBRC

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The CBRC board (**C**entral **B**oard **R**ack **C**om) performs all central control and attendant functions for HiPath 3500 and HiPath 3300.

This description refers to the following versions of central CBRC board:

- CBRC S30810-Q2935-Z401: Implemented from V6.0 Rel. 10 or later and V5.0 Rel. 15 or later.
  Essential new functions:
  - Integration of the functionality of the LIM subboard
  - Increase of the ring voltage of analog station interfaces (T/R) to approx. 65 V_{eff}
- CBRC S30810-Q2935-Z301: implemented in V5.0 or later
  Essential new function: CLIP

Differences between both CBRC versions are indicated at the appropriate point in the following description.

Subboards

The following subboards can be used depending on the application:

- Clock module CMA or CMS (optional)
- MMC multimedia card
- IMODN integrated modem card new (optional)
- MPPI music on hold (optional)
- Entry Voice Mail EVM (optional): Pluggable up to HiPath 3000/5000 V7, securely soldered as of HiPath 3000/5000 V8.
- LAN Interface Module LIM (optional, for CBRC S30810-Q2935-Z301 only)

Outputs, interfaces

- Ethernet (10 BaseT)/10 MBit) LAN interface, only in CBRC S30810-Q2935-Z40
  The interface can be used for administration via HiPath 3000 Manager E and CTI functions (TAPI 120 V2.0). However, bear in mind that the number of BHCAs (Busy Hour Call Attempts = number of connection attempts during busy traffic hours) is restricted to 400 at a maximum of six TAPI ports. The use of "power dialers" is not approved.

  The ETHERNET-LAN interface is deactivated by the system software deactivated as soon as an HG 1500 board is inserted.
- Eight digital $U_{P0/E}$ subscriber lines
  For example, $U_{P0/E}$ workpoint clients or BS3/1 base stations for HiPath Cordless Office can be connected here.
- Four analog T/R subscriber lines
  For U.S. only: These interfaces do not support the connection of external extensions via OPS (Off-Premises Station) signaling.
  CBRC S30810-Q2935-Z401: The interfaces supply a ring voltage of approx. 65 V_{eff}.
  CBRC S30810-Q2935-Z301: The T/R interfaces supply a ring voltage of approx. 35 V_{eff}.
  Depending on the terminals connected, we cannot exclude the possibility of errors occurring during ringing state.
- Two digital S_0 interfaces (CO (default) or station)
- Backplane (CUCR or CUPR) connection via slots 1 (X11), 2 (X5) and 3 (X6)
- Music on hold: MPPI, EXMR
- Options bus (O bus)
- V.24 interface

Switches and indicators

- Reset/reload switch
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (RUN LED off indicates that a reload is in progress)
- RUN LED
  LED status meaning is explained in the following table.

Table 3-10 CBRC - LED Status Meaning

RUN LED	Meaning
off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data.
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

1 The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

Figure CBRC S30810-Q2935-Z401

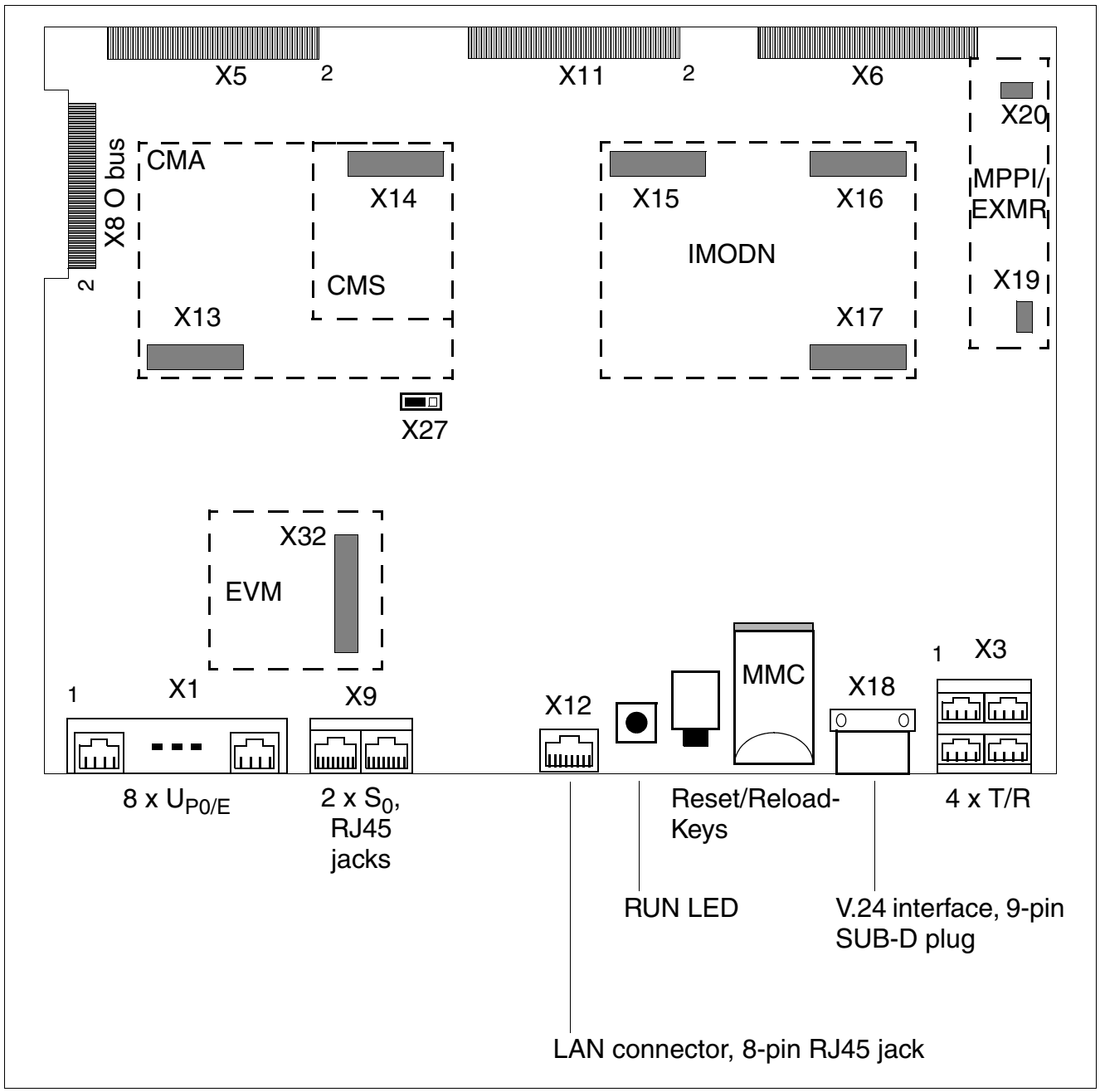


Figure 3-3 CBRC Board (S30810-Q2935-Z401)

Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

Figure CBRC S30810-Q2935-Z301

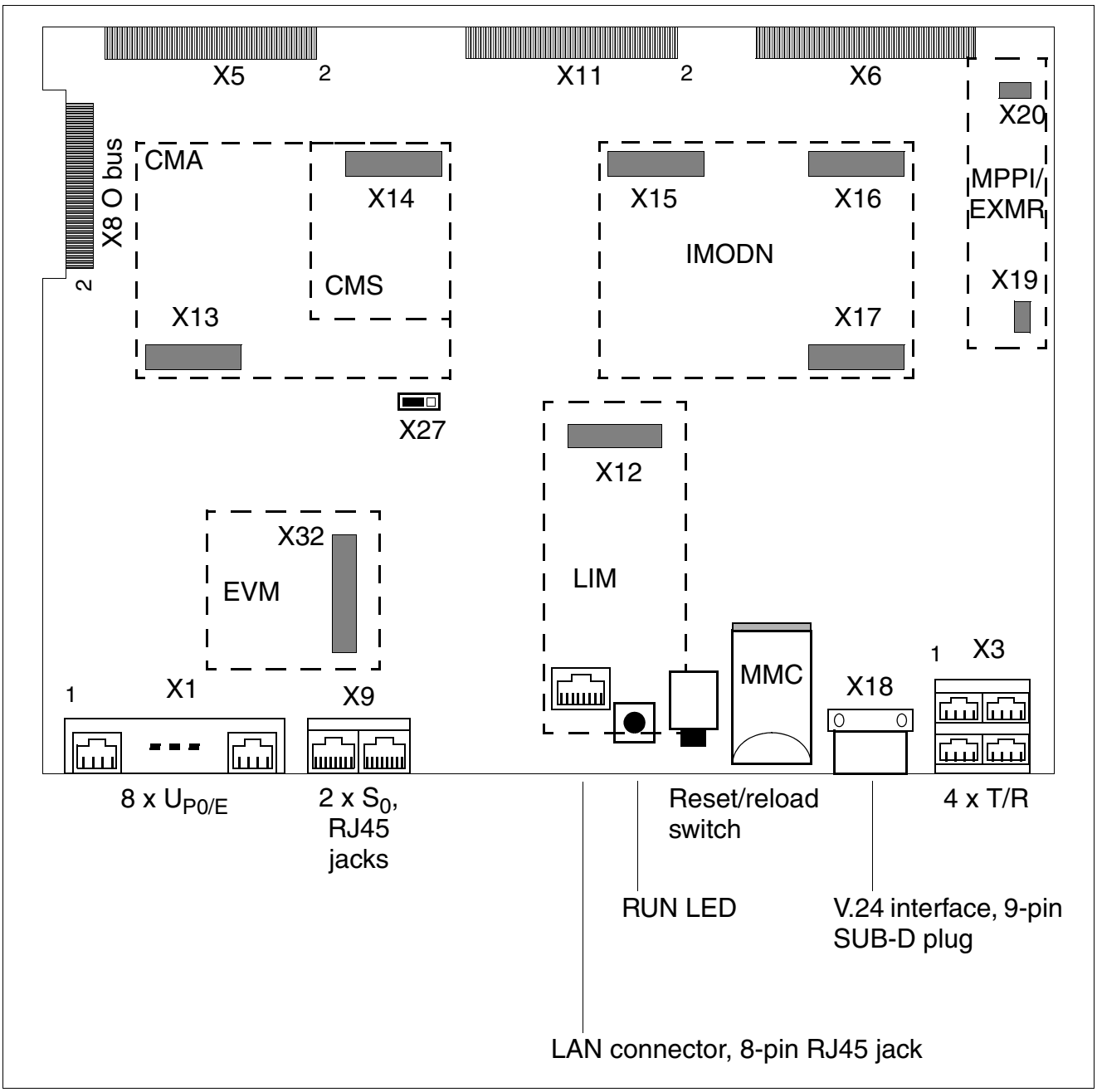


Figure 3-4 CBRC Board (S30810-Q2935-Z301)

Disconnecting the battery buffer by unplugging the X27 jumper is necessary only for testing (module test at the factory). Disconnection does not necessarily delete the customer database (CDB). To delete the CDB, use the reset switch.

X1 and X3 contact assignments

Table 3-11 CBRC - X1 and X3 Contact Assignments

Contact	Connector X1	Connector X3
	$U_{P0/E}$	T/R
14	$U_{P0/E}$ port 1a	T/R port 1a
15	$U_{P0/E}$ port 1b	T/R port 1b
24	$U_{P0/E}$ port 2a	T/R port 2a
25	$U_{P0/E}$ port 2b	T/R port 2b
34	$U_{P0/E}$ port 3a	T/R port 3a
35	$U_{P0/E}$ port 3b	T/R port 3b
44	$U_{P0/E}$ port 4a	T/R port 4a
45	$U_{P0/E}$ port 4b	T/R port 4b
54	$U_{P0/E}$ port 5a	–
55	$U_{P0/E}$ port 5b	–
64	$U_{P0/E}$ port 6a	–
65	$U_{P0/E}$ port 6b	–
74	$U_{P0/E}$ port 7a	–
75	$U_{P0/E}$ port 7b	–
84	$U_{P0/E}$ port 8a	–
85	$U_{P0/E}$ port 8b	–

S_0 interface assignment

Table 3-12 CBRC - S_0 Interface Assignment (RJ45 Jacks)

X9 Pin	S_0 Port 1	X9 Pin	S_0 Port 2
11	–	21	–
12	–	22	–
13	S_0 port 1, transmit +	23	S_0 port 2, transmit +
14	S_0 port 1, receive +	24	S_0 port 2, receive +
15	S_0 port 1, receive –	25	S_0 port 2, receive –
16	S_0 port 1, transmit –	26	S_0 port 2, transmit –
17	–	27	–
18	–	28	–

V.24 interface assignment

Table 3-13 CBRC - V.24 Interface Assignment (SUB-D Plug)

X18, Pin	Signal	Description
1	–	Not used
2	RxD A	Receive data, channel A
3	TxD A	Transmit data, channel A
4	–	Not used
5	0 V	Ground
6	–	Not used
7	RTS A	Request to send, channel A
8	CTS A	Clear to send, channel A
9	–	Not used

LAN connector assignment

CBRC S30810-Q2935-Z301: The Ethernet LAN interface is provided by the optional LIM sub-board.

Table 3-14 CBRC - LAN Connector Assignment (RJ45 Jack) via LIM

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

Default Numbering Plan When Using CBRC in HiPath 3500

Table 3-15 Default Numbering Plan When Using CBRC in HiPath 3500

Station	Int. call no.	DID no.	Port
$U_{P0/E}$ host (master)	100	100	$U_{P0/E}$ 1
	101	101	$U_{P0/E}$ 2
	102	102	$U_{P0/E}$ 3
	103	103	$U_{P0/E}$ 4
	104	104	$U_{P0/E}$ 5
	105	105	$U_{P0/E}$ 6
	106	106	$U_{P0/E}$ 7
	107	107	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	500	500	$U_{P0/E}$ 1
	501	501	$U_{P0/E}$ 2
	502	502	$U_{P0/E}$ 3
	503	503	$U_{P0/E}$ 4
	504	504	$U_{P0/E}$ 5
	505	505	$U_{P0/E}$ 6
	506	506	$U_{P0/E}$ 7
	507	507	$U_{P0/E}$ 8
T/R	108	108	T/R 1
	109	109	T/R 2
	110	110	T/R 3
	111	111	T/R 3
EVM	112	112	EVM-1
	113	113	EVM-2
Line	**Code**		**Port**
S_0 CO PP	7801		S_0 1-1
	7802		S_0 1-2
	7803		S_0 2-1
	7804		S_0 2-2

Default Numbering Plan When Using CBRC in HiPath 3300

Table 3-16 Default Numbering Plan When Using CBRC in HiPath 3300

Station	Int. call no.	DID no.	Port
$U_{P0/E}$ host (master)	11	11	$U_{P0/E}$ 1
	12	12	$U_{P0/E}$ 2
	13	13	$U_{P0/E}$ 3
	14	14	$U_{P0/E}$ 4
	15	15	$U_{P0/E}$ 5
	16	16	$U_{P0/E}$ 6
	17	17	$U_{P0/E}$ 7
	18	18	$U_{P0/E}$ 8
$U_{P0/E}$ client (slave)	51	51	$U_{P0/E}$ 1
	52	52	$U_{P0/E}$ 2
	53	53	$U_{P0/E}$ 3
	54	54	$U_{P0/E}$ 4
	55	55	$U_{P0/E}$ 5
	56	56	$U_{P0/E}$ 6
	57	57	$U_{P0/E}$ 7
	58	58	$U_{P0/E}$ 8
T/R	19	19	T/R 1
	20	20	T/R 2
	21	21	T/R 3
	22	22	T/R 3
EVM	23	23	EVM-1
	24	24	EVM-2
Line	**Code**		**Port**
S_0 CO PP	801		S_0 1-1
	802		S_0 1-2
	803		S_0 2-1
	804		S_0 2-2

3.2.3 CBSAP

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The CBSAP board (**C**entral **B**oard **S**ynergy **A**ccess **P**latform) performs all central control and switching functions for HiPath 3800 (see Figure 3-5).

Capacity

- DTMF transmitters: 12
- DTMF receivers: 12
- Tone generators: 16
- Dial tone receivers: 4

Subboards

The following subboards can be used depending on the application:

- CMS clock module (optional)
- Multimedia card (MMC)
- IMODN integrated modem card new (optional)
- LIMS LAN interface module (optional)
  Contains two Ethernet (10BaseT) LAN connectors (8-pin RJ45 jacks):
  - LAN1 (administration via HiPath 3000/5000 Manager E and CTI functions)
  - LAN2 (not assigned)
- MPPI music on hold (optional)

V.24 interfaces (9-pin SUB-D plug)

- Service (X50) = for connecting the service PC
- Application (X51) = for connecting a printer or application

Switches and indicators

- Reset/reload switch:
  - Switch pressed < 5 s = Reset activated
  - Switch pressed > 5 s = Reload activated (FAIL LED (red) off indicates that a reload is in progress)
- Two LEDs indicating the board status:
  - Run (green) = signals the current status of the CBSAP board (see Table 12-2)
  - Fail (red) = error encountered
- Two LEDs for displaying the LAN interface status:
  - LED1:
    – Green = 100 Mbps online (link)
    – Yellow = 10 Mbps online (link)
    – Flashing = active
  - LED2 (green):
    – On = full-duplex (FDX)
    – Off = half-duplex

Diagram of CBSAP board

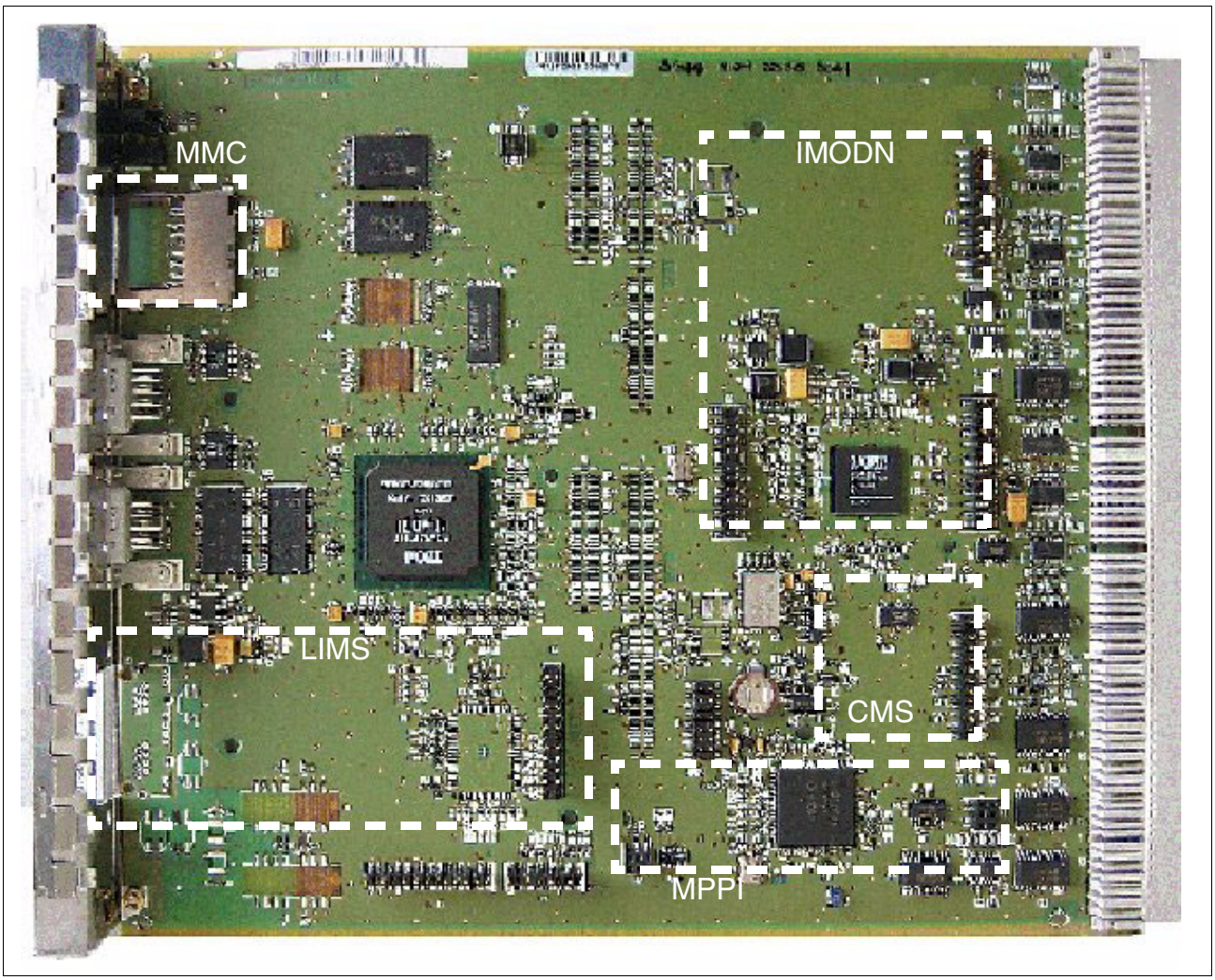
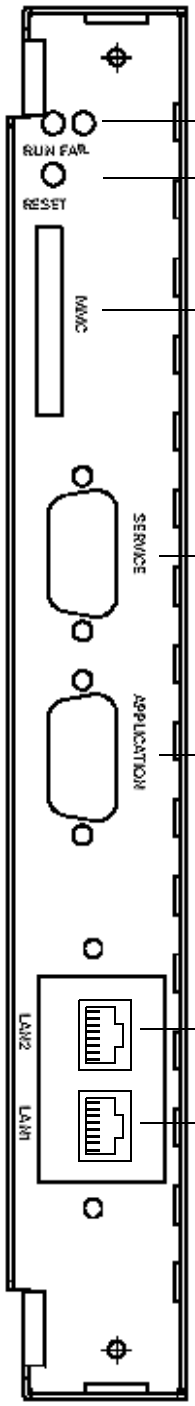


Figure 3-5 CBSAP Board (S30810-Q2314-X)

Front panel



Two LEDs indicating the board status:
- Run (green, flashing: 0.5 s on/0.5 s off) = correct, error-free operation
- Fail (red) = error encountered

Reset/reload switch

Slide-in shelf for MMC

V.24 interfaces (9-pin SUB-D plug):
- Service (X50) = for connecting the service PC
- Application (X51) = for connecting a printer or application

Two Ethernet (10BaseT) LAN connectors (8-pin RJ45 jacks) via LIMS:
- LAN2 (not assigned)
- LAN1 (administration via HiPath 3000/5000 Manager E and CTI functions)

The LAN interface status is indicated by two LEDs:
- LED1:
  - Green = 100 Mbps online (link)
  - Yellow = 10 Mbps online (link)
  - Flashing = active
- LED2 (green):
  - On = full-duplex (FDX)
  - Off = half-duplex

Figure 3-6 CBSAP - Front Panel

V.24 interface assignment

Table 3-17 CBSAP - V.24 Interface Assignment (SUB-D Plug)

X50/X51, Pin	Signal	Description
1	DCD	Data carrier detect (not used)
2	RxD	Receive data
3	TxD	Transmit data
4	DTR	Data terminal ready (not used)
5	0 V	Ground
6	DSR	Data send ready (not used)
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator (not used)

LAN connector assignment via LIMS

Table 3-18 CBSAP - LAN Connector Assignment (RJ45 Jack)

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.2.4 CMA

> **Caution**
> Place the central control board on a flat surface before inserting the CMA subboard. The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-7).
> Otherwise you may damage the board.

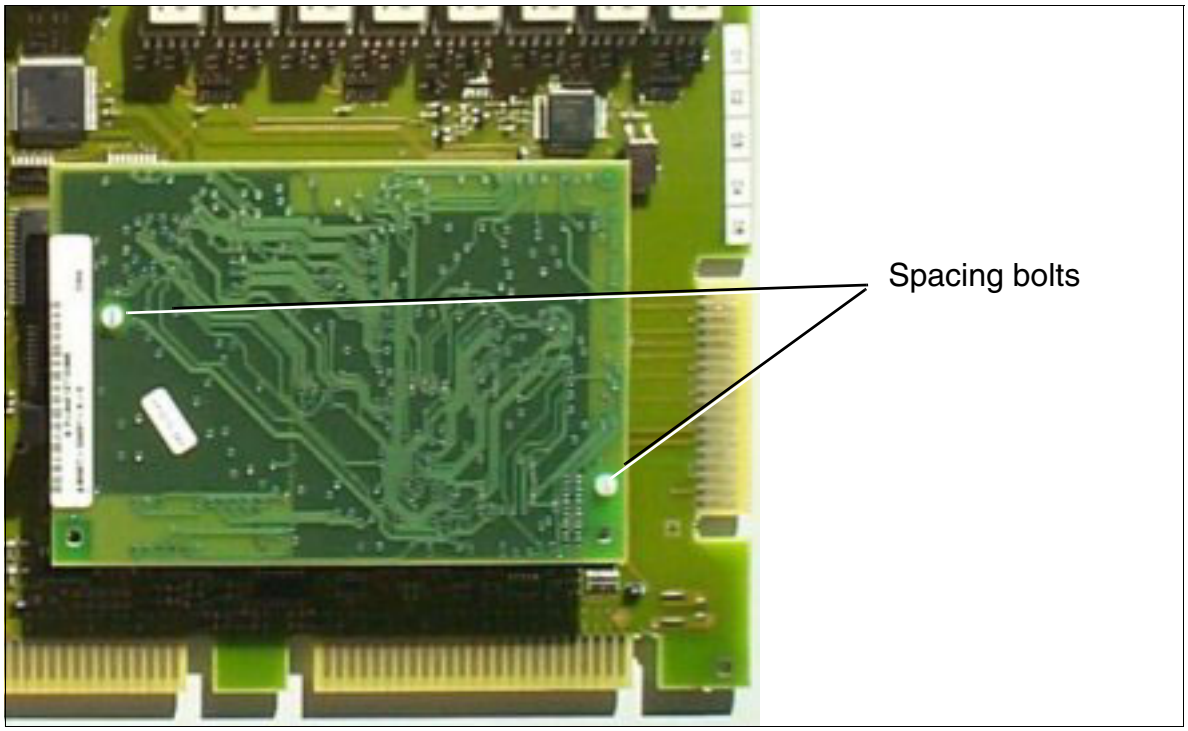


Figure 3-7 CMA with Spacing Bolts

Introduction

The **C**lock **M**odule **A**DPCM CMA (S30807-Q6931-X) is an optional subboard for the CBCC and CBRC central control boards. The CMA module is needed for special HiPath Cordless Office configurations.

All clock module small (CMS) functions are available when you insert a CMA module.

Please refer to Page 3-40 for recommendations on CMA module implementation.

3.2.5 CMS

Caution
Place the central control board on a flat surface before inserting the CMS subboard. The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-7).
Otherwise you may damage the board.

Introduction

The **C**lock **M**odule **S**mall CMS (S30807-Q6928-X) is an optional subboard for the HiPath 3000 central control boards and guarantees greater clock accuracy.

Recommendations for CMA and CMS implementation

Table 3-19 provides recommendations for the implementation of CMA and CMS subboards based on

- the type of network (ISDN S_0, ISDN S_{2M} or Ethernet/IP (10/100 BaseT))
- the trunk connection available (no trunk/analog trunk, ISDN S_0 or ISDN S_{2M}) and consequently, the possible provision of a digital reference clock
- HiPath Cordless Office.

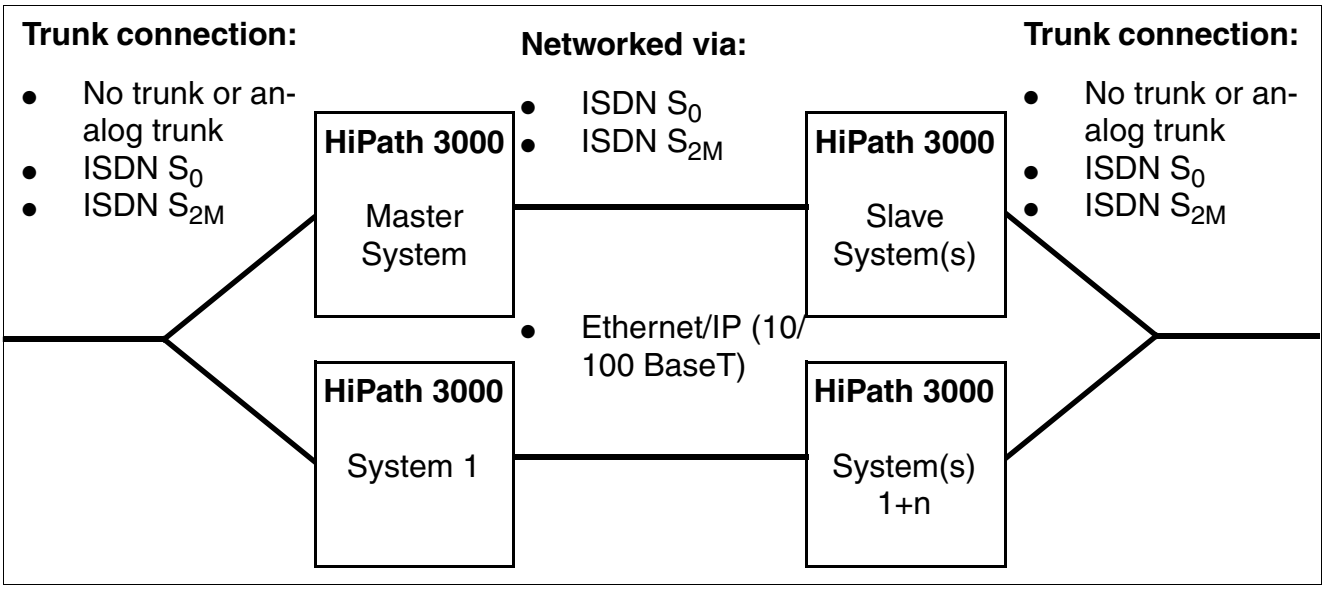


Figure 3-8 Networking Options for HiPath 3000 Systems

Table 3-19 Recommendations for CMA and CMS Implementation

Trunk connection	Reference clock	HiPath Cordless Office		Trunk connection	Reference clock	HiPath Cordless Office	
		no	yes			no	yes
Networking via ISDN S_0 lines:							
MASTER system				**SLAVE system(s)**			
No trunk or analog trunk	–	–	CMS or CMA (see Table 11-1)	No trunk or analog trunk	Via ISDN S_0 networking line	–	CMA[2]
ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[1]	CMS or CMA (see Table 11-1)	ISDN S_0 (not always active)	Via ISDN S_0 networking line	–	CMA[2]
ISDN S_0 (always active)	Via ISDN S_0 trunk connection	CMS[1]	CMA[2]	ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]
ISDN S_{2M}	Via ISDN S_{2M} trunk connection	CMS[1]	CMA[2]	ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]

Table 3-19 Recommendations for CMA and CMS Implementation

Trunk connection	Reference clock	HiPath Cordless Office		Trunk connection	Reference clock	HiPath Cordless Office	
		no	yes			no	yes
Networking via ISDN S_{2M} lines:							
MASTER system				**SLAVE system(s)**			
No trunk or analog trunk	–	–	CMS or CMA (see Table 11-1)	No trunk or analog trunk	Via ISDN S_{2M} networking line	–	CMA[2]
ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[1]	CMS or CMA (see Table 11-2)	ISDN S_0 (not always active)	Via ISDN S_{2M} networking line	–	CMA[2]
ISDN S_0 (always active)	Via ISDN S_0 trunk connection	CMS[1]	CMA[2]	ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]
ISDN S_{2M}	Via ISDN S_{2M} trunk connection	CMS[1]	CMA[2]	ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]

Table 3-19 Recommendations for CMA and CMS Implementation

Trunk connection	Reference clock	HiPath Cordless Office		Trunk connection	Reference clock	HiPath Cordless Office	
		no	yes			no	yes
Networking via Ethernet/IP (10/100 BaseT) lines:							
System 1				**System(s) n+1**			
No trunk or analog trunk	–	CMS[3]	CMS or CMA (see Table 11-1)	No trunk or analog trunk	–	CMS[3]	CMS or CMA (see Table 11-1)
ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[3]	CMS or CMA (see Table 11-1)	ISDN S_0 (not always active)	Via ISDN S_0 trunk connection (if active)	CMS[3]	CMS or CMA (see Table 11-1)
ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]	ISDN S_0 (always active)	Via ISDN S_0 trunk connection	–	CMA[2]
ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]	ISDN S_{2M}	Via ISDN S_{2M} trunk connection	–	CMA[2]

1 CMS is not necessary if the reference clock supplied by the CO is **always** available via the networking lines (not a transparent clock).

2 CMA is not necessary if ADPCM conversion is not needed for HiPath Cordless Office (see Table 11-1).

3 CMS is not necessary but is recommended for the following reasons: Although an Ethernet link is an asynchronous connection, buffer overflow/underflow can cause transmission errors. To avoid this, the clock difference between the master and the slave systems should be as small as possible so that the receive and send buffer can be read and addressed at the same speed on both sides. The more accurate the clock source in the relevant systems, the fewer the faults.

3.2.6 CUC and CUCR

The backplane comes in two versions:

- CUC (**C**onnection **U**nit **C**om) S30777-Q750-X (Figure 3-9) - for use in HiPath 3550 (wall housing)
- CUCR (**C**onnection **U**nit **C**om **R**ack) S30777-Q750-Z (Figure 3-10) - for use in HiPath 3500 (19-inch housing)

CUC connector designations and slot assignments (S30777-Q750-X)

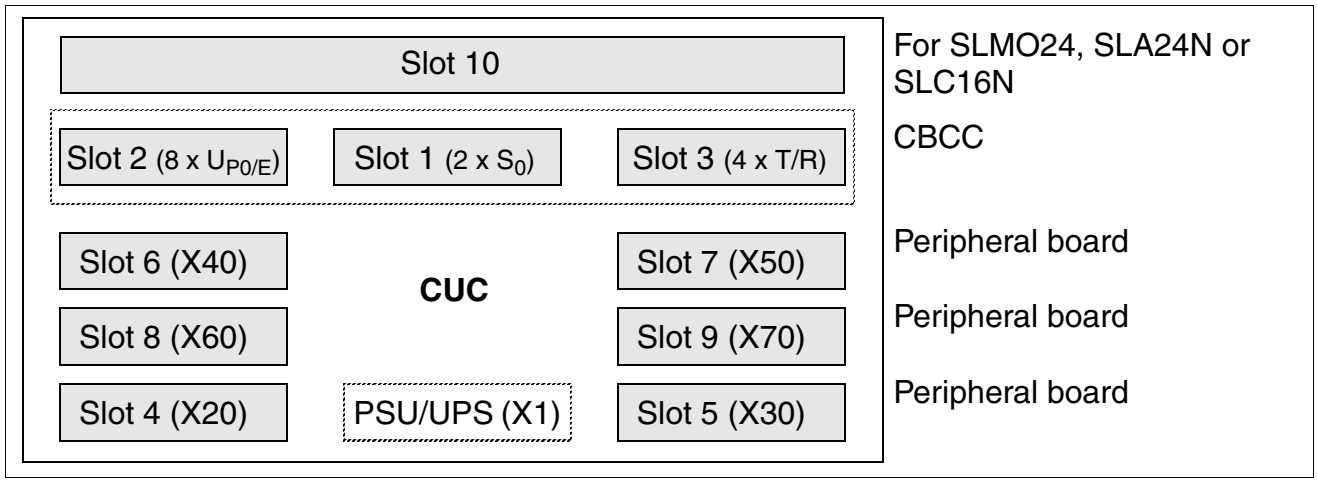


Figure 3-9 CUC Backplane (S30777-Q750-X)

CUCR connector designations and slot assignments (S30777-Q750-Z)

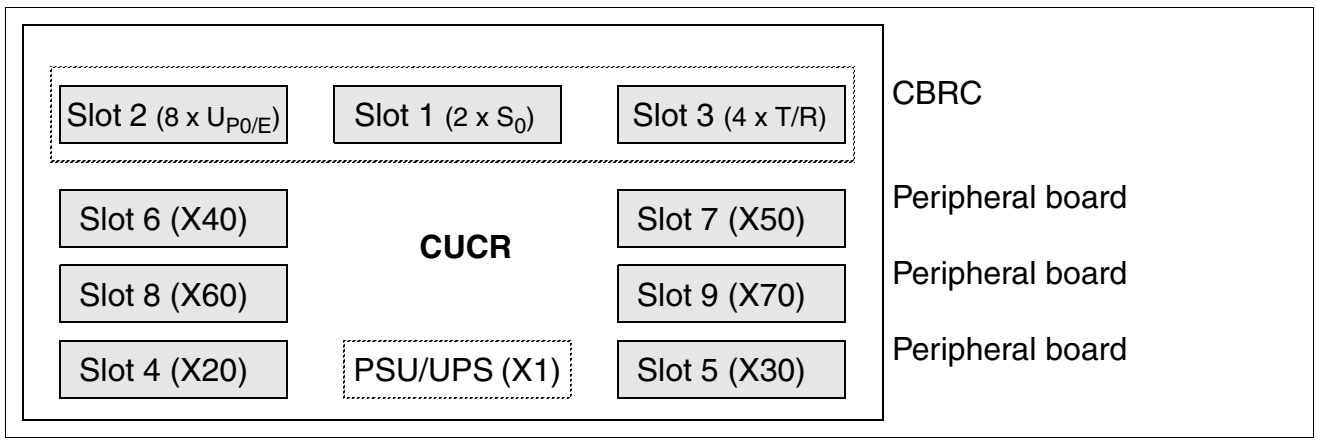


Figure 3-10 CUCR Backplane (S30777-Q750-Z)

3.2.7 CUP and CUPR

The backplane comes in two versions:

- CUP (**C**onnection **U**nit **P**oint) S30777-Q751-X (Figure 3-11) - for use in HiPath 3350 (wall housing)
- CUPR (**C**onnection **U**nit **P**oint **R**ack) S30777-Q751-Z (Figure 3-12) - for use in HiPath 3300 (19-inch housing)

CUP connector designations and slot assignments (S30777-Q751-X)

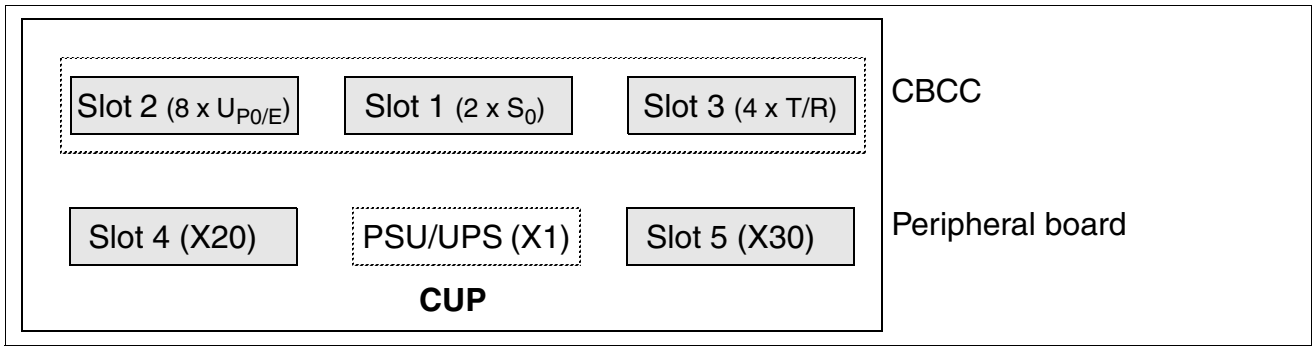


Figure 3-11 CUP Backplane (S30777-Q751-X)

CUPR connector designations and slot assignments (S30777-Q751-Z)

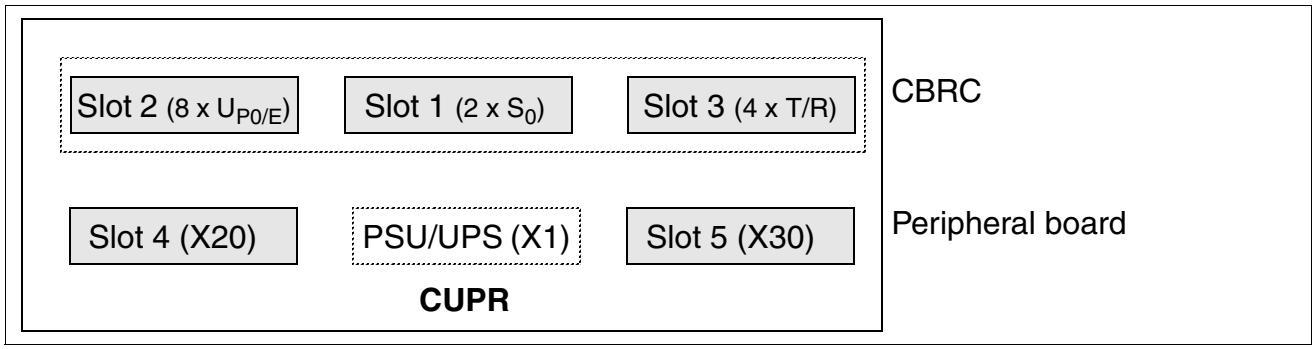
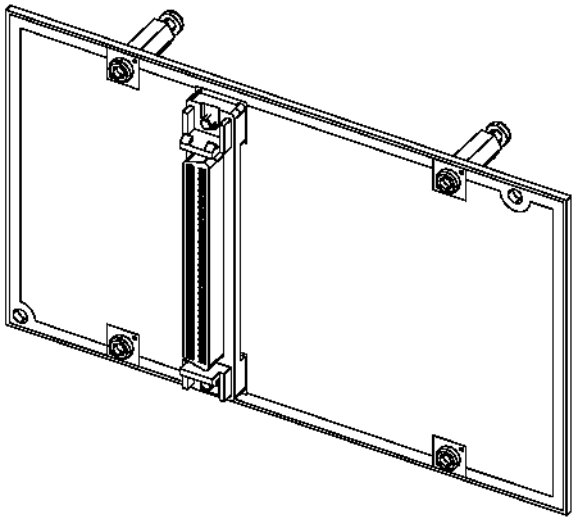


Figure 3-12 CUPR Backplane (S30777-Q751-Z)

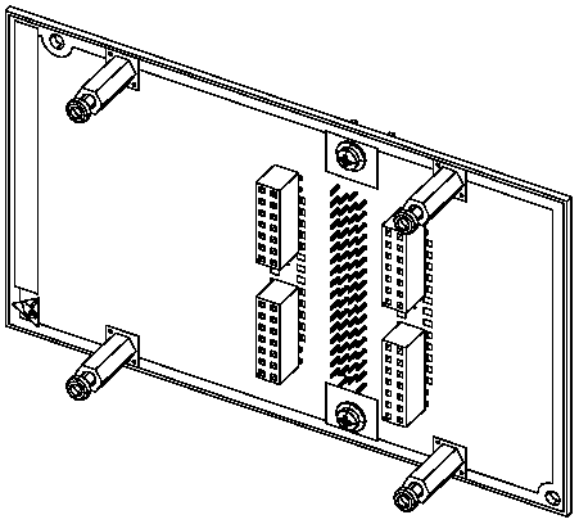
3.2.8 DBSAP

A prerequisite for expanding HiPath 3800 to a two-cabinet system is that the DBSAP (**D**river **B**oard for **S**ynergy **A**ccess **P**latform) board is mounted on the backplane of the expansion cabinet.

DBSAP ensures that the expansion cabinet receives HDLC, PCM and clock signals from the basic cabinet. In addition, an ID signal is created which indicates the availability of an expansion cabinet to the CBSAP.



Front
With 68-pin DB68 mini-jack for connecting the connection cable to the basic cabinet



Back
With four jacks for plugging into the backplane of the expansion cabinet

Figure 3-13 DBSAP (S30807-Q6722-X)

The cable (C39195-Z7611-A10) is used as the connection cable between basic cabinet (X201 jack) and expansion cabinet (DBSAP board). To ensure smooth operation, use only shielded cables with a maximum length of 1 m.

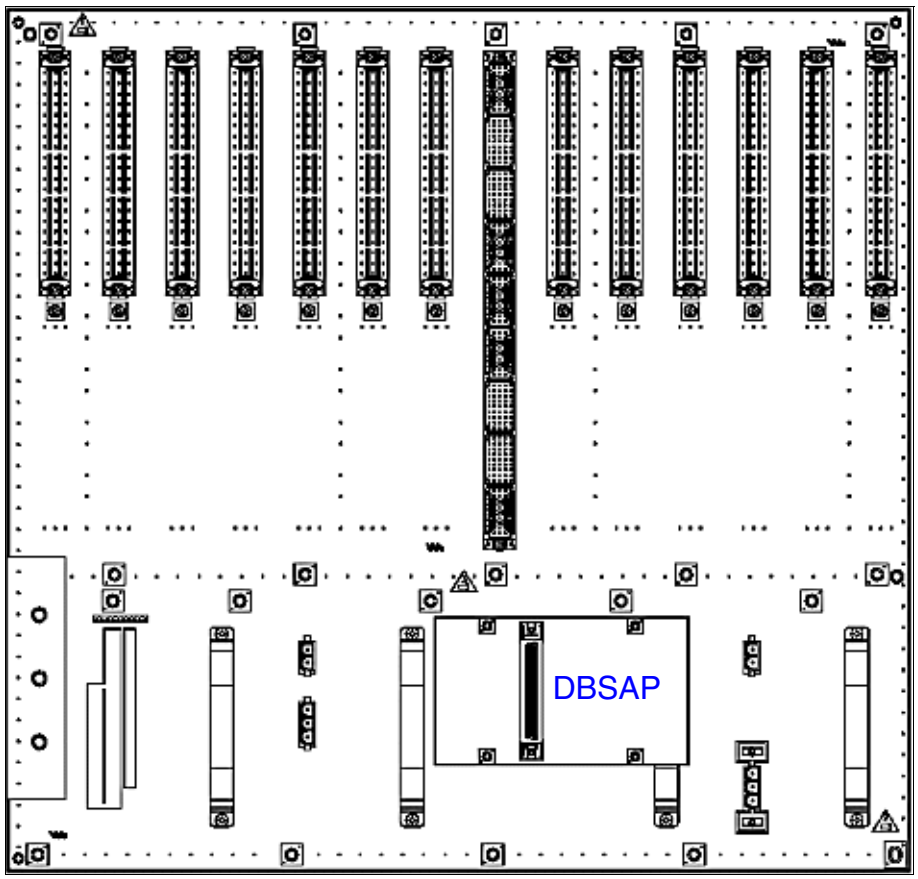


Figure 3-14 DBSAP on the Backplane of the Expansion Cabinet

3.2.9 IMODN

Caution
Place the central control board on a flat surface before inserting the IMODN subboard.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-7).
Otherwise you may damage the board.

Introduction

The **I**ntegrated **Mod**em Card **N**ew (IMODN - S30807-Q6932-X100) is an optional subboard for HiPath 3000 central control boards.

It permits the use of remote service (analog mode up to 33.6 Kbps) over analog trunks without an external modem.

IMODN is the compatible successor of IMODC. Functional differences between both modules only exist in the higher transmission speed of the IMODN.

Loadable loadware

To avoid exchanging the IMODN subboard during a software upgrade, IMODN loadware is automatically updated in V4.0 SMR-08 and later.

Updating the IMODN loadware takes approx. 10 minutes beginning with the idle system status. The red LED on the IMODN lights up repeatedly during the loading procedure. IMODN is ready as soon as the green LED starts to flash.

If the IMODN loadware is not updated when the system is reset, the green LED starts to flash approx. 10 seconds after the reset. The green LED continues to flash after the system boot.

3.2.10 LIM

Caution
The LAN interface module must not be plugged in or out when the system is energized.
Place the central control board on a flat surface before inserting the LIM subboard. The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-7).
Otherwise you may damage the board.

Introduction

The LAN Interface Module LIM (S30807-Q6930-X) is an optional plug-in card for all central control boards of HiPath 3000 with the exception of the CBSAP (HiPath 3800), the CBCC (HiPath 3550, HiPath 3350) from S30810-Q2935-A401 or later, and the CBRC (HiPath 3500, HiPath 3300) from S30810-Q2935-Z401 or later.

The board provides an Ethernet (10BaseT/10 megabit) LAN connector via an 8-pin RJ45 jack.

The LIM module can be used for administration via HiPath 3000/5000 Manager E and for CTI functions (TAPI 120 V2.0). Bear in mind, however, that the number of BHCAs (Busy Hour Call Attempts = number of connection attempts during busy traffic hours) is restricted to 400 at a maximum of six TAPI ports. The use of "power dialers" is not approved.

In V6.0 or later, the system software deactivates an existing LIM module when an HG 1500 board is inserted. You cannot operate the LIM module and a HG 1500 board simultaneously in a HiPath 3000.

RJ45 jack assignment

Table 3-20 LIM - RJ45 Jack Assignment

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.2.11 LIMS

Caution
The LIMS module must not be plugged in or out when the system is energized.

Introduction

The **L**AN **I**nterface **M**odule for **S**APP LIMS (S30807-Q6721-X) is an optional plug-in card for the CBSAP central control board in HiPath 3800.

The board provides two Ethernet (10BaseT) LAN connectors via two 8-pin RJ45 jacks:

- LAN1 (administration via HiPath 3000/5000 Manager E and CTI functions)
- LAN2 (not assigned)

The LIMS module can be used for administration via HiPath 3000/5000 Manager E and for CTI functions (TAPI 120 V2.0). However, bear in mind that the number of BHCAs (Busy Hour Call Attempts = number of connection attempts during busy traffic hours) is restricted to 400 at a maximum of six TAPI ports. The use of "power dialers" is not approved.

In V6.0 or later, the system software deactivates an existing LIMS module when an STMI2 board is inserted. You cannot operate the LIMS module and an STMI2 board simultaneously in a HiPath 3800.

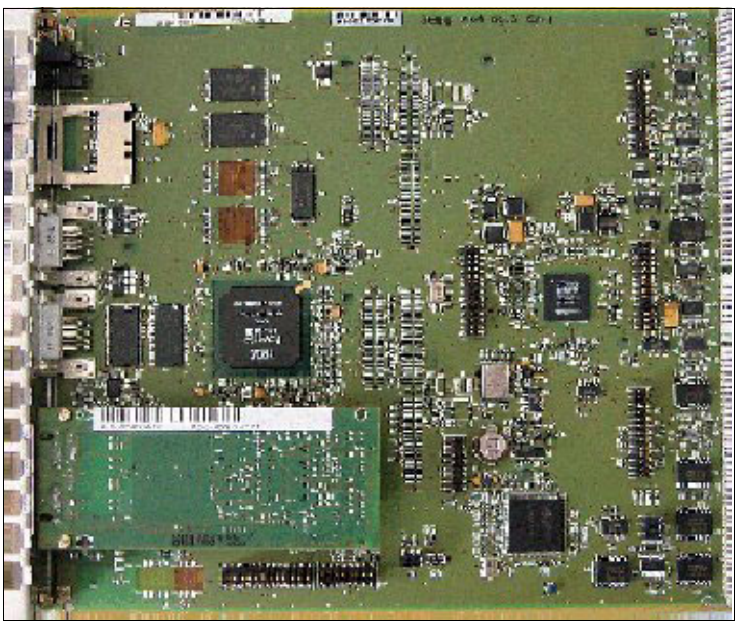


Figure 3-15 CBSAP with LIMS Module Plugged In

RJ45 jack assignment

Table 3-21 LIMS - RJ45 Jack Assignment

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.2.12 LUNA2

Introduction

LUNA2 (**L**ine-powered **U**nit for **N**etwork-based **A**rchitecture No. **2**) is used as the central power supply in HiPath 3800. Depending on the system configuration up to three LUNA2 modules can be used in the basic cabinet and up to four LUNA2 modules can be used in the expansion cabinet.

When expanding the HiPath 3800 to a two-cabinet system, two LUNA2 modules in the basic cabinet and three LUNA2 modules in the expansion cabinet are enough to supply the maximum configuration in Table 2-6. For information on how to calculate the number of LUNA2 modules required, see Page 3-59.

You can use a third LUNA2 in the basic cabinet and a fourth in the expansion cabinet to ensure error-free operation if one LUNA2 module fails (redundant LUNA2) or to charge a connected battery pack or a Power Box PB3000 (with 4 batteries 12 V/7 Ah).



It is not possible to combine both LUNA2 operating modes redundant LUNA2 and battery charger LUNA2.

LUNA2 integrates the functions of power supply and battery management. No further components are required for permanent AC power supply operation. The following options are available for emergency battery operation in the event of a power cut, i.e. the function UPS:

- Connection of battery packs 4 x 12 V/7 Ah (S30122-K5950-Y200) per system cabinet. The batteries are charged via the redundant LUNA2 in the respective system cabinet.
  Note: Only the S30122-K5950-Y200 battery back is approved for use with LUNA2.
- Connection of the Power Box PB3000 with 4 batteries 12 V/7 Ah (4 x V39113-W5123-E891) per system cabinet. The batteries are charged via the redundant LUNA2 in the respective system cabinet.
  Note: Only the V39113-W5123-E891 batteries are approved for use with the Power Box PB3000.
- Connection of the battery cabinet BSG 48/38 using the 38 Ah/48 V battery set and battery charger per HiPath 3800.
- Connection of the Power Box PB3000 with 4 batteries 12 V/7 Ah (4 x V39113-W5123-E891) and LUNA2 as battery charger per HiPath 3800 system.
  Note: Only the V39113-W5123-E891 batteries are approved for use with the Power Box PB3000.

LUNA2 is used in all countries.

Part numbers

- LUNA2: S30122-K7686-A1, S30122-K7686-M1
  For production-related reasons, two different LUNA2 modules with the same functions are used. Technically identical, the two models have minor mechanical differences and are fully compatible with each other.
- Battery pack 4 x 12V/7 Ah: S30122-K5950-Y200
  Weight (including batteries): 14.1 kg
  Dimensions (length x width x height): 280 mm x 160 mm x 140 mm
  (the connection cable for LUNA2 is part of the battery pack)
- Battery cabinet BSG 48/38: S30122-K5950-F300 (Page 3-60)
  - Battery cable for BSG 48/38: C39195-Z7985-B10
    (A battery cable is required for each system cabinet to be connected.)
  - Battery 12V/38Ah: S30122-X5950-F320
    (Four batteries necessary for each BSG 48/38.)
- Power Cabinet PB3000 (see Page 9-5)

Technical specifications

- Nominal voltage range: 110 Vac - 240 Vac
- Nominal frequency: 50 Hz - 60 Hz
- Output voltage (battery charging voltage, if a LUNA2 is used as a battery charger):
  –54.7 VDC; –53.5 VDC (for gell cell batteries, currently not released)
- Output current (battery charge current, if a LUNA2 is used as a battery charger): up to 2 A
- Bridging times
  Table 3-22 lists the maximum possible bridging times (emergency battery operation in case of power failure) with 48-V/7-Ah battery pack (S30122-K5950-Y200), battery housing BSG 48/38 (S30122-K5950-F300), and Powerbox PB3000 (S30177-U773-X).

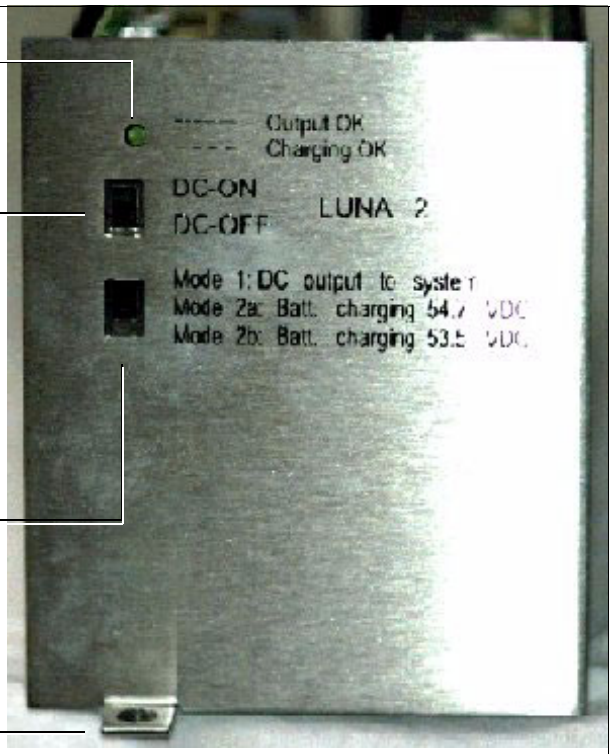
  Tabelle 3-22 LUNA2 - Bridging Times with 48-V/7-Ah Battery Pack, Upright Battery Housing BSG 48/38, and Powerbox PB3000

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3800	2 x LUNA2 per system cabinet as PSU 1 x LUNA2 per system cabinet as battery charger 1 x battery pack 48 V/7 Ah per system cabinet	60 % nominal load	25 min

Tabelle 3-22 LUNA2 - Bridging Times with 48-V/7-Ah Battery Pack, Upright Battery Housing BSG 48/38, and Powerbox PB3000

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3800	5 x LUNA2 per system 1 x BSG 48/38 upright battery housing per system (LUNA2 is not required as a battery charger as the BSG 48/38 battery cabinet features a built-in charger.)	60 % nominal load	1 h 30 min
HiPath 3800	2 x LUNA2 per system cabinet as PSU Powerbox PB3000 for each system with 1 x LUNA2 as battery charger and 4 x 12-V/7-Ah batteries	60 % nominal load	25 min
Measurement conditions: • All measurements were performed at a room temperature of approximately 22 °C (71.6 °F). • The batteries were new and fully charged when measurement started.			

Front view of LUNA2 with indicators and switches



LUNA2 can only be plugged in or out when the system is switched off (switch = DC-OFF)

Figure 3-16 LUNA2 Front Panel

- LED for displaying the operating status:
  - Illuminated = LUNA2 is operating as power supply unit
  - Flashing = LUNA2 is operating as a battery charger
  - Off = at least one secondary operating voltage is outside the tolerance zone. In this case
    a) the voltage feed for LUNA2 may not be sufficient (an additional LUNA2 module is required. For information on how to determine the number of LUNA2 modules required, see Page 3-59).
    b) LUNA2 may be defective (the board must be replaced).

- ON/OFF switch for secondary operating voltages (system supply voltages)

> **Caution**
> The switches for deactivating the secondary operating voltage (system supply voltage) must be set to "DC-OFF" on all LUNA2s during maintenance work that requires the system to be de-energized (for example, central board replacement). **The system is only in de-energized state if the switches on ALL LUNA2s are set to "DC-OFF" position.**
> The system is only restarted if all LUNA2 switches are returned to the "DC-ON" position.

- Switches for setting the operating mode (the operating mode must be set before the outer panel is mounted):
  - Mode 1: For use as power supply (LED illuminated)
  - Mode 2a: For use as battery charger (LED flashing) with a charging voltage of 54.7 Vdc
  - Mode 2b: For use as battery charger (LED flashing) with a charging voltage of 53.5 Vdc

> From a technical viewpoint, there are no differences between the LUNA2 slots. A LUNA2 can be used in all slots, regardless of the selected operating mode. To achieve a uniform LUNA2 system configuration worldwide, the following rules should be observed:
> - The power supplies that are used to supply the system directly should be plugged in at LUNA2 slots 1, 2, and 3 (expansion cabinet only).
> - At the LUNA2 slot marked "4", the only power supplies that should be plugged in are those
>   - used for LUNA2 redundancy (set to mode 1).
>   - used to charge batteries (set to mode 2a or mode 2b).

Slots

Push the LUNA2 power supply unit into the slots provided in the lower part of the system cabinet shelf until you hear a click (see Figure 4-18).

The power supply unit slots must be covered with the outer panel shown in Figure 3-17 (basic cabinet) and in Figure 3-18 (expansion cabinet) before the system is started up.

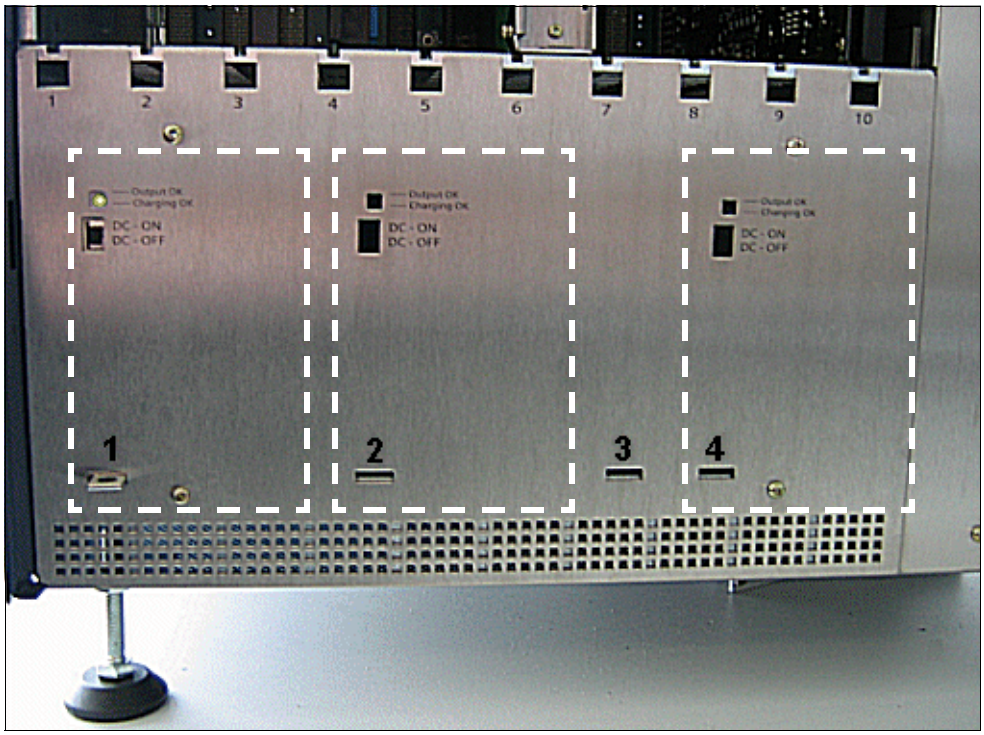


Figure 3-17 LUNA2 slots in the basic cabinet (outer panel mounted)

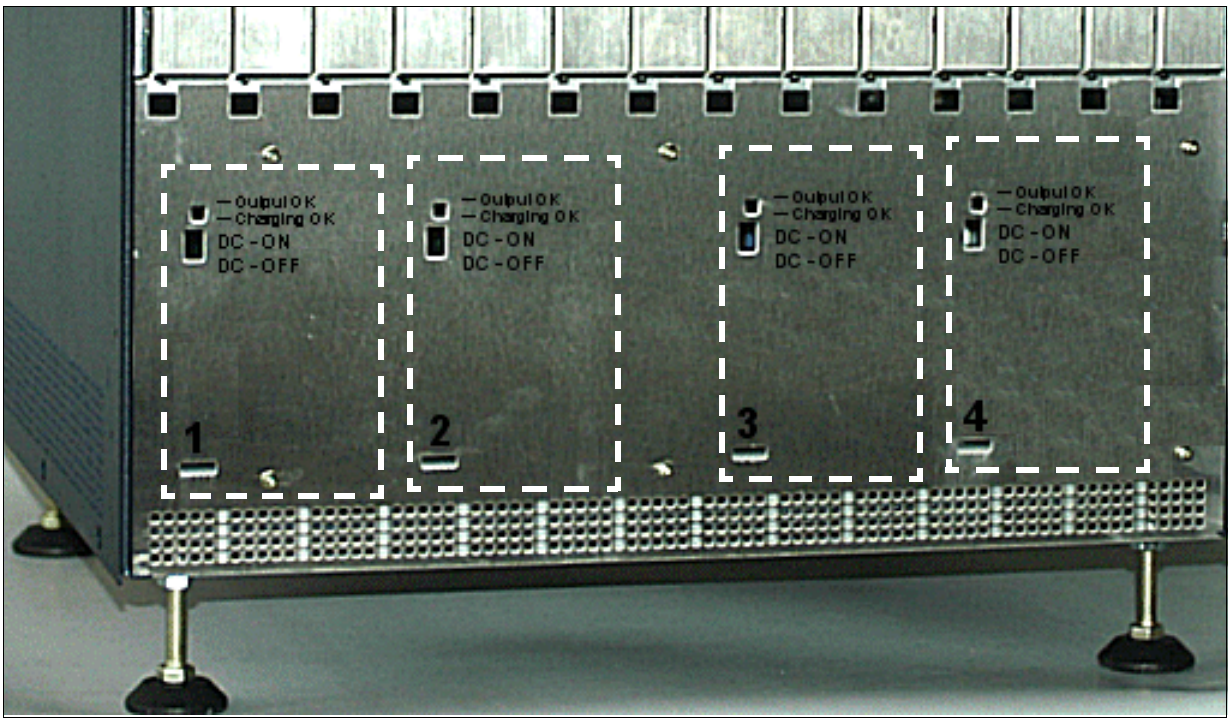


Figure 3-18 LUNA2 Slots in the Expansion Cabinet (With Outer Panel Mounted)

Calculating the number of LUNA2 modules required

The number of LUNA2 modules required in relation to the number and type of peripheral boards installed can be calculated using the following table.

Table 3-23 Determining the Number of LUNA2 Modules Required Per Cabinet

	Number of peripheral boards per cabinet	PBXXX, STMI2, SLMA and/or SLCN available	Number of LUNA2s required per cabinet
Basic cabinet	< 5	no	**1**
	< 5	yes	**2**
	≥ 5	no	**2**
	≥ 5	yes	**2**
Expansion cabinet	< 5	no	**1**
	< 5	yes	**2**
	≥ 5	no	**2**
	≥ 5	yes	**3**
	≥ 10	no	**3**
	≥ 10	yes	**3**

Examples for a one-cabinet system:

a) Basic cabinet with CBSAP and peripheral boards (without PBXXX, STMI2, SLMA or SLCN)

- A single LUNA2 can supply a CBSAP and up to four peripheral boards.
- A second LUNA2 is required for five or more peripheral boards.
- A third LUNA2 can be used as a battery charger or as a redundant LUNA2.

b) Basic cabinet with CBSAP and peripheral boards (with PBXXX, STMI2, SLMA and/or SLCN)

- Two LUNA2s are always required to supply a CBSAP, peripheral boards, and PBXXX, STMI2, SLMA and/or SLCN.
- A third LUNA2 can be used as a battery charger or as a redundant LUNA2.

BSG 48/38

You can use a BSG 48/38 battery cabinet instead of the battery pack to extend the bridging time in the event of a power failure. The BSG 48/38 battery cabinet (S30122-K5950-F300) consists of

- an upright housing
- a charging rectifier
- a battery set (38 Ah/48 V)

Technical specifications for the BSG 48/38 battery cabinet:

- Weight, including batteries: 75.9 kg
- Weight, excluding batteries: 18.3 kg
- Dimensions (length x width x height): 380 mm x 420 mm x 492 mm

The battery cabinet is designed for direct connection to the HiPath 3800 communication system. The DC connection cable (C39195-Z7985-B10) included in delivery lets you connect any system cabinet to the battery cabinet (do not connect to extension cables). Figure 3-20 is a schematic display of the connections between the battery cabinet BSG 48/38 and HiPath 3800.

For detailed information about safety precautions as well as using and connecting the battery cabinet, refer to the installation and startup instructions that came with the cabinet.

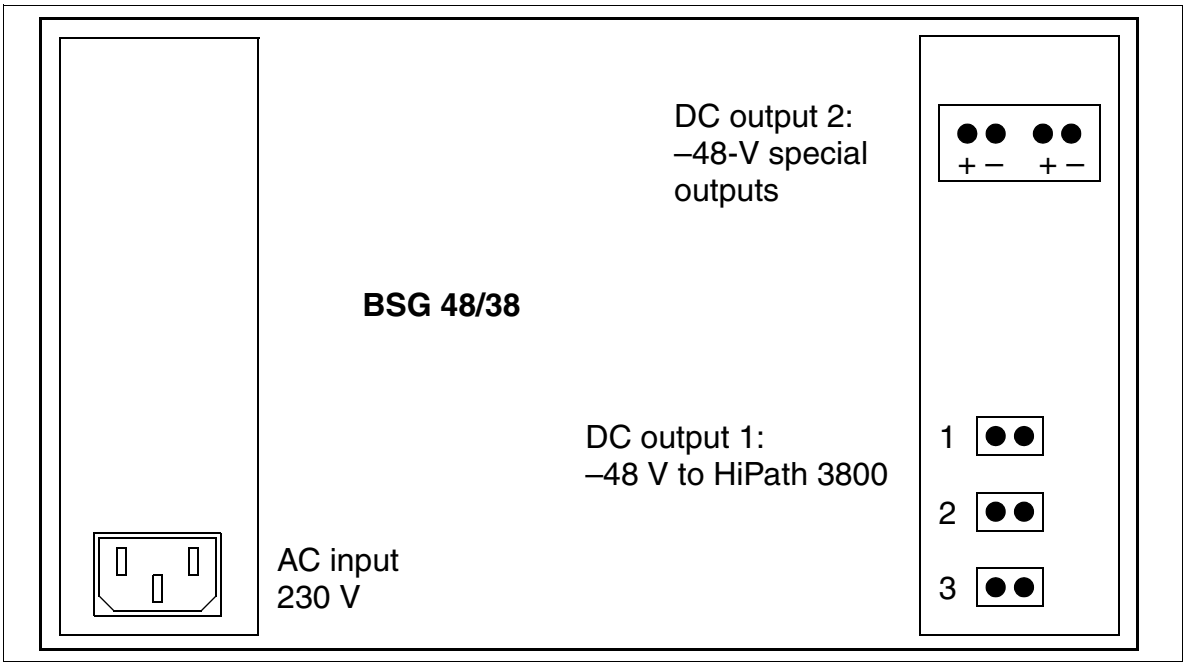


Figure 3-19 Rear View of the BSG 48/38 Battery Cabinet (S30122-K5950-F300)

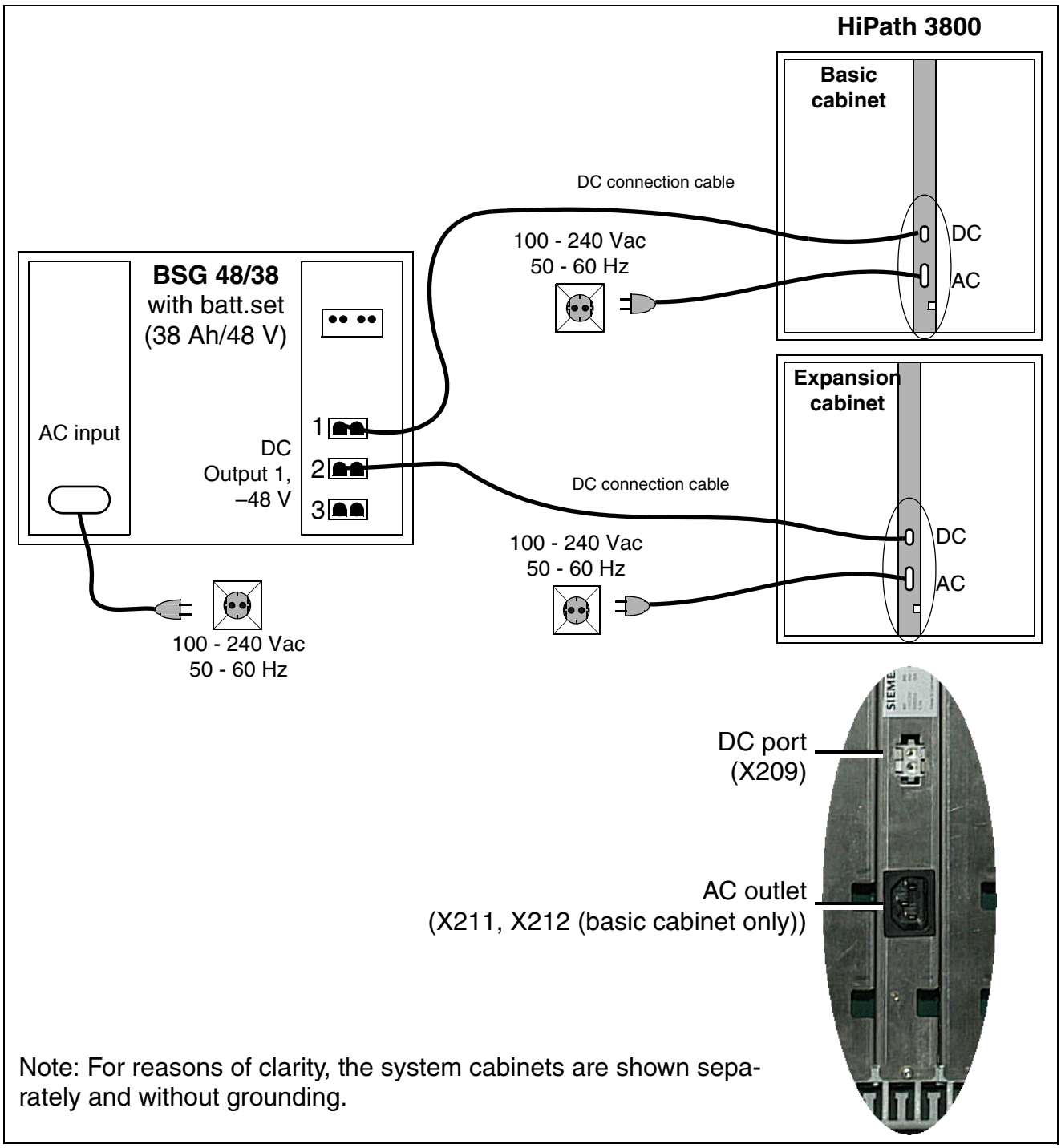


Figure 3-20 Connections Between the BSG 48/38 Battery Cabinet and HiPath 3800

3.2.13 MMC

Introduction

The MMC (**M**ulti-**M**edia **C**ard) is a plug-in memory card for the central control boards and contains the CDB backup and the relevant version-specific application processor software (APS).

Please note that the MMC may only be replaced by an MMC approved by Siemens Enterprise Communications GmbH & Co. KG. Cards that have not been approved may have a different internal structure which can affect temporal access and certain features (for example, CDB backup and APS transfer).

MMC storage capacity

- In HiPath 3000 V5.0 and later systems, MMC storage capacity must be at least 64 MB (MMC64, in V7 also: MMC128, MMC512). An MMC16 (with 16 MB capacity) cannot be used in these systems.
- In HiPath 3000 V8 and later systems, MMC storage capacity must be at least 128 MB (MMC128, MMC512). An MMC64 cannot be used in these systems. HiPath 3000 communication systems with MMC64 cannot be upgraded to HiPath 3000 V8 due the greater storage requirement for the V8 software.

When the system starts, the MMC is checked automatically. If an MMC with insufficient storage capacity is detected in place of the correct MMC, the startup process is cancelled.

Variants

Table 3-24 Multimedia Card Models and Applications

MMC	Part Number	Application in countries	Application in HiPath 3000						
			HiPath 3800	HiPath 3550	HiPath 3350	HiPath 3350 with CBCC	HiPath 3500	HiPath 3300	HiPath 3300 with CBRC
HiPath 3000 Version 4.0									
MMC16 (16 MB)	S30122-X7424-X (blank)	ROW		X	X	X	X	X	X
	P50038-P1009-A816 (system software)				X			X	
	P50038-P1010-A816 (system software)			X		X	X		X
	P50038-P1011-A816 (system software)								

Table 3-24 Multimedia Card Models and Applications

MMC	Part Number	Application in countries	Application in HiPath 3000						
			HiPath 3800	HiPath 3550	HiPath 3350	HiPath 3350 with CBCC	HiPath 3500	HiPath 3300	HiPath 3300 with CBRC
MMC64 (64 MB)	S30122-X8002-X10 (blank)	ROW		X	X	X	X	X	X
	P50038-P1010-A864 (system software)			X	X	X	X	X	X
	P50038-P1011-A864 (system software)								
HiPath 3000 Version 5.0									
MMC64 (64 MB)	S30122-X8002-X10 (blank)	ROW	X	X	X	X	X	X	X
	P50038-P1053-A816 (system software)		X						
	P50038-P1054-A816 (system software)			X	X	X	X	X	X
HiPath 3000 Version 6.0									
MMC64 (64 MB)	S30122-X8002-X10 (blank)	ROW	X	X	X	X	X	X	X
	P30152-P1205-P2 (system software)		X						
	P30152-P1205-P1 (system software)			X	X	X	X	X	X
HiPath 3000 V7									
MMC64 (64 MB)	S30122-X8002-X10 (blank)	ROW	X	X	X	X	X	X	X
	P30152-P1205-P2 (system software)		X						
	P30152-P1205-P1 (system software)			X	X	X	X	X	X
MMC128 (128 MB)	S30122-X8002-X25 (blank)	ROW	X	X	X	X	X	X	X
	P30152-P1266-P1 (system software)		X						
	P30152-P1266-P2 (system software)			X	X	X	X	X	X
MMC512 (512 MB)	S30122-X8002-X29 (blank)	ROW	X	X	X	X	X	X	X
	P30152-P1266-P1 (system software)		X						
	P30152-P1266-P2 (system software)			X	X	X	X	X	X

Table 3-24 Multimedia Card Models and Applications

MMC	Part Number	Application in countries	Application in HiPath 3000						
			HiPath 3800	HiPath 3550	HiPath 3350	HiPath 3350 with CBCC	HiPath 3500	HiPath 3300	HiPath 3300 with CBRC
HiPath 3000 V8									
MMC128 (128 MB)	S30122-X8002-X25 (blank)	ROW	X	X	X	X	X	X	X
	P30152-P1441-P2 (system software)		X						
	P30152-P1441-P1 (system software)			X	X	X	X	X	X
MMC512 (512 MB)	S30122-X8002-X29 (blank)	ROW	X	X	X	X	X	X	X
	P30152-P1441-P2 (system software)		X						
	P30152-P1441-P1 (system software)			X	X	X	X	X	X

3.2.14 PSUP

Introduction

The power supply PSUP S30122-K5658-M (Figure 3-21) is used in HiPath 3350 (wall housing). The device plugs into a special slot and is secured by screws. It connects to the power outlet using a modular power cord.

A monitoring LED indicates the presence of the 5-V output voltage.

Technical specifications

- Nominal voltage range: 100 Vac - 240 Vac
- Nominal frequency: 50 Hz - 60 Hz
- Ring voltage generator 75 Vac, 20/25/50 Hz
- Partial voltages: +5 Vdc, –48 V
- Power consumption: 70 W

> **Caution**
> System voltage can only be switched on or off by plugging in or out the power plug.

PSUP interfaces (S30122-K5658-M)

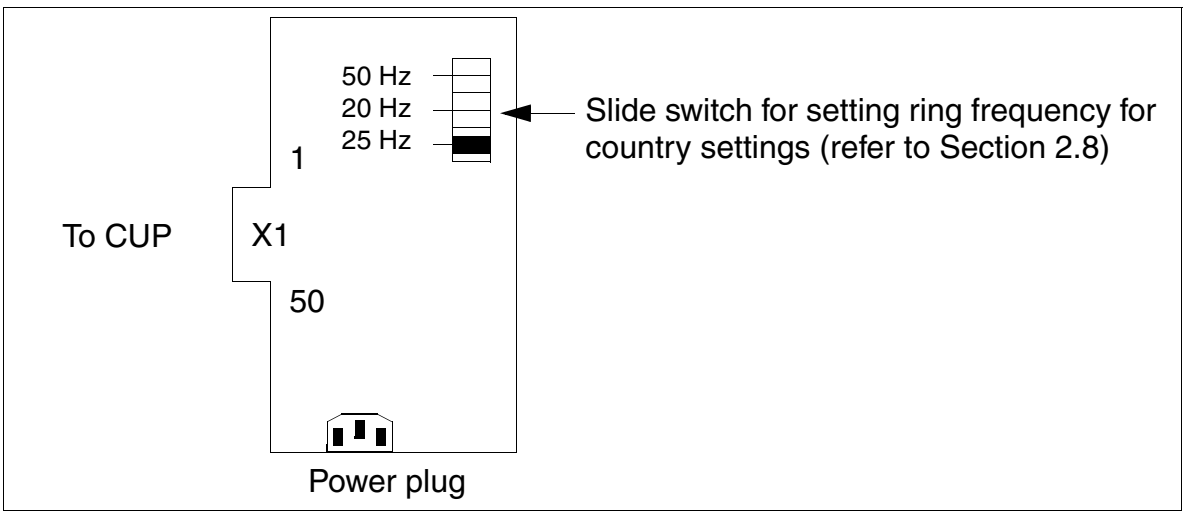


Figure 3-21 PSUP Interface (S30122-K5658-M)

3.2.15 RGMOD (for selected countries only)

Introduction

The external ring voltage generator RGMOD (S30124-X5109-X) is required for generating ring voltages for the HiPath 3800 SLMA2 board. RGMOD is plugged in on the reverse of the backplane of the basic and/or expansion cabinet.

Danger
RGMOD must not be plugged in or out when the system is energized!
In normal mode, the ring voltage generator operates with voltages ranging from +75 V to –170 V. The prescribed measures for protection against high voltage must be taken when working on or close to the board.
When the ring voltage generator is removed, no ring tone is generated for the analog telephones connected to the SLMA2.

A system cabinet can be fitted with a mix of SLMA, SLMA8 and SLMA2 boards. RGMOD has no effect on SLMA and SLMA8, as these boards generate their own ring voltage (35 V_{eff}).

Setting the ring voltage and ring frequency

The ring voltage and ring frequency are set using jumpers.

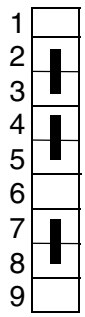
Ring voltage	Ring frequency	Setting	Standard
75 V_{eff}	25 Hz		European standard

Table 3-25 RGMOD (for selected countries only) - Setting the Ring Voltages and Ring Frequencies

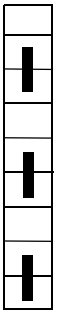
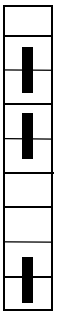
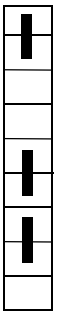
Ring voltage	Ring frequency	Setting	Standard
65 V_{eff}	25 Hz		Switzerland
75 V_{eff}	50 Hz		France
85 V_{eff}	20 Hz		U.S.

Table 3-25 RGMOD (for selected countries only) - Setting the Ring Voltages and Ring Frequencies

Installing RGMOD

The RGMOD ring voltage generator is plugged in at the rear of the backplane.

- Basic cabinet
  When using one or more SLMA2 boards in the basic cabinet, RGMOD must be plugged into the 10-pin port X214 of the basic cabinet (see Figure 3-22).

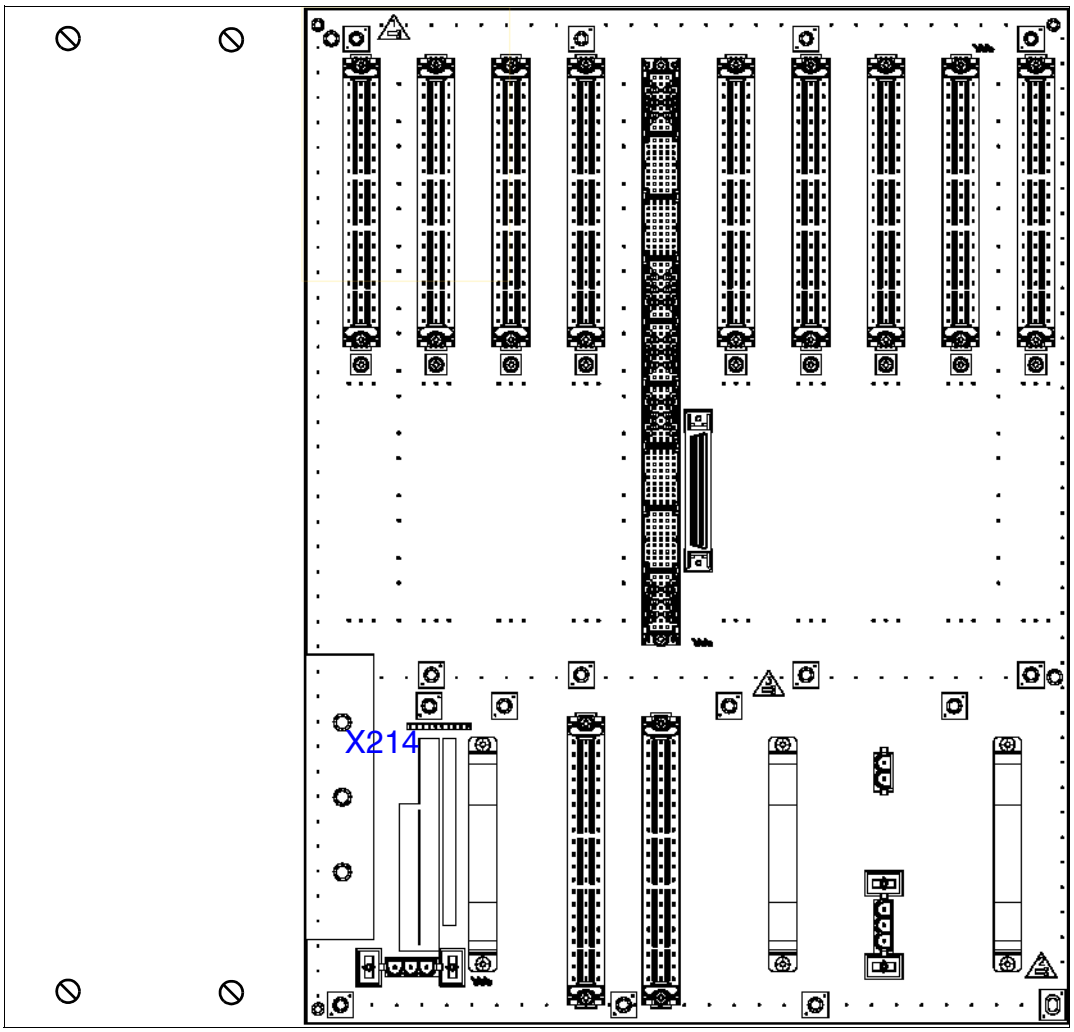


Figure 3-22 HiPath 3800 - Connectors and Jacks on Backplane of Basic Cabinet

- Expansion cabinet
  When using one or more SLMA2 boards in the expansion cabinet, RGMOD must be plugged into the 10-pin port X214 of the expansion cabinet (see Figure 3-23).

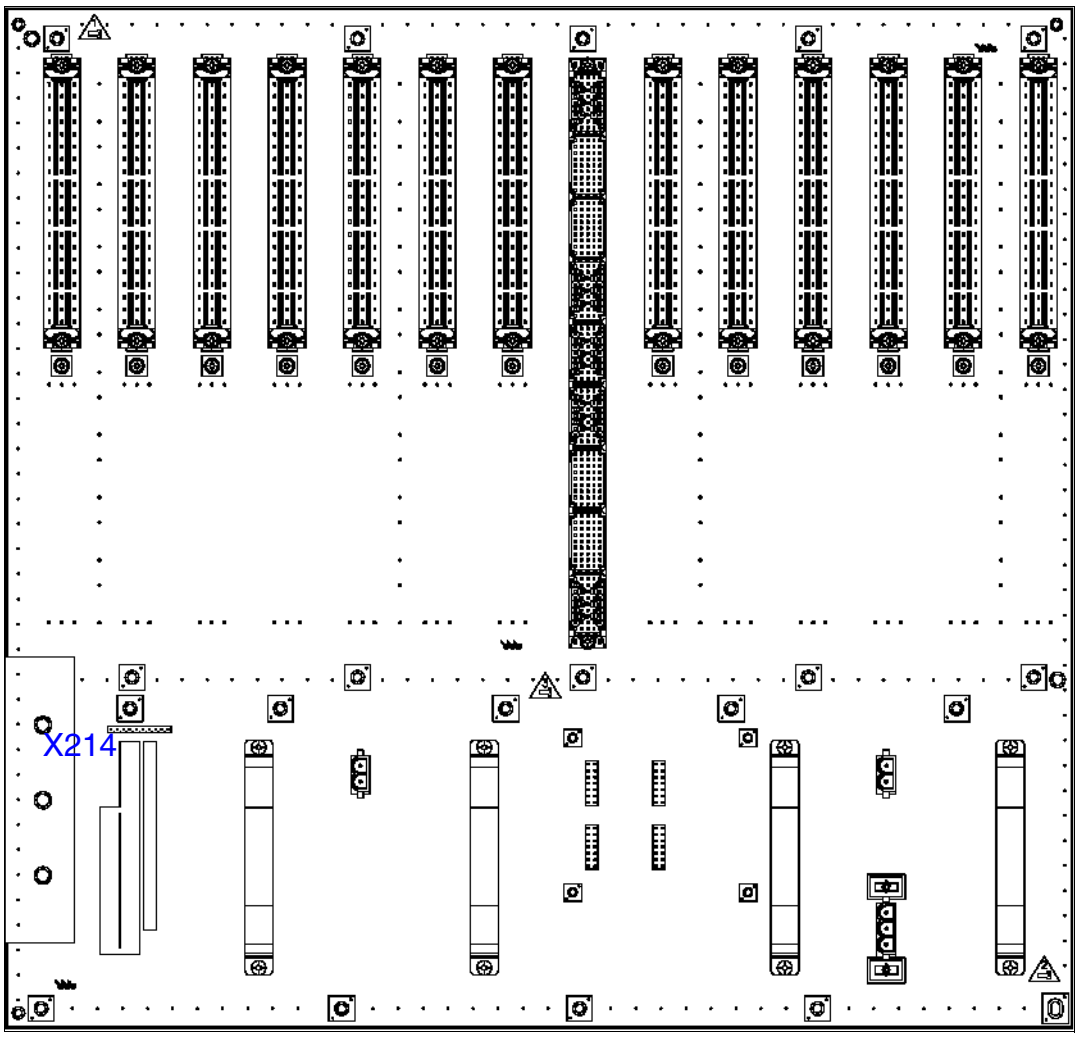


Figure 3-23 HiPath 3800 - Connectors and Jacks on Backplane of Expansion Cabinet

3.2.16 UPSC-D

Introduction

The UPSC-D (S30122-K5660-A300, S30122-K5660-M300 (Figure 3-24)) module is installed in HiPath 3550 and HiPath 3350 (wall housing). UPSC-D integrates the functions of a power supply and a battery manager. If operated on an AC network, no further components are needed.To be able to change to the emergency battery mode if the AC network fails, an additional battery pack must be connected.

Power supply

The UPSC-D board is only released for continuous operation on an AC network. Continuous operation is not permitted on a DC network.

The temporary connection to a DC supply (48 V battery pack or 48 V DC network) is only used to bridge a failure of the AC network. The battery pack is the preferred solution.

***NOTE:* property damage from overvoltage**
If a 48 V DC network is used for the DC power supply instead of the 48 V battery pack, the same connection conditions must be adhered to as apply for a battery pack. The 48 V DC network must not exceed a maximum voltage of 60 V during operation, when charging or in the event of a malfunction. If this is not ensured, the DC network is not permitted to be connected to the UPSC-D.

Additional power supply

If the power supplied by the UPSC-D is insufficient, additional power can be supplied with an external power supply, i.e. a Power Box PB3000 with LUNA2. For this, the output of the PB3000 must be connected with the special –48 V DC input of the UPSC-D. Connecting the external voltage deactivates the internal –48 V output of the UPSC-D.

Emergency battery operation

To be able to change to emergency battery operation if the mains power supply or the additional power supply fails, one of the following measures can be taken:

- An additional 48 V/1.2 Ah battery pack is connected to the UPSC-D.
- A 48 V/7 Ah battery pack is installed in the Power Box PB3000. If the PB3000 is to be used only for emergency battery operation but not as an additional power supply, no LUNA2 is necessary.

Approved battery packs for UPSC-D

The following battery packs are approved and released for operation on the UPSC-D board:

- 48 V battery pack S30122-K5928-X (4 x 12 V/1.2 Ah)
- 48 V battery pack 4 x V39113-W5123-E891 (4 x 12 V/7 Ah)
- **Not approved:** The 24 V battery pack S30122-K5403-X is not approved for use.

> **CAUTION**
> **Danger of explosion when the 24 V battery pack (S30122-K5403-X) is used with the UPSC-D**
> It is prohibited to connect the 24 V battery pack (S30122-K5403-X) to the UPSC-D. The battery pack is overcharged during operation and an explosive gas escapes (hydrogen + oxygen).

> ***Important:*** The UPSC-D does not charge a battery pack with a voltage of less than 35 V (tolerance: 33 V to 37 V). This ensures that a low voltage battery pack, e.g. a 24 V battery pack, or a faulty battery pack, cannot be operated with the UPSC-D.

Technical data

- Rated voltage range: 100 VAC - 240 VAC
- Rated frequency: 50 Hz - 60 Hz
- Ring tone voltage generator: 75 VAC, 20/25/50 Hz
- Partial voltages: +5 VDC, –48 V
- Battery charger: 4 x 12 V (40.8 V-55.2 V)
- Power consumption: 180 W
- Bridging times: see next section.

Bridging times

The maximum possible bridging times of the HiPath 3350 and HiPath 3550 systems in emergency battery mode, i.e. if the network failed, are shown here. Values are provided for a 48 V/ 1.2 Ah battery pack and the Power Box with 48 V/7 Ah (without LUNA2). The bridging times were determined under the following conditions:

- All measurements were taken at a room temperature of approx. 23 °C (73.4 °F).
- The batteries were fully charged when measurements began.

The bridging times shown in the tables are rough guide values. Depending on the system configuration of your system, your values may differ from those specified here.

Power supply	Load values	Maximum bridging time
UPSC-D Battery pack **48 V/1.2 Ah**	Long-term output test 100 % = 5 V and 3 A / –48 V and 0.5 A; call approx. 2 VA	19 min
UPSC-D Power Box PB3000 with **48 V/7 Ah** battery pack (4 x 12 V/7 Ah)	Long-term output test 100 % = 5 V and 3 A / –48 V and 0.5 A; call approx. 2 VA	3 h

Table 3-26 **HiPath 3350** – maximum bridging times

Power supply	Load values	Maximum bridging time
UPSC-D Battery pack **48 V/1.2 Ah**	Long-term output test 100 % = 5 V and 8 A / –48 V and 1.1 A; call approx. 4 VA	6 min
UPSC-D Battery pack **48 V/1.2 Ah**	Long-term output test 60 % = 5 V and 4.8 A / –48 V and 0.66 A; call approx. 2 VA	15 min
UPSC-D Power Box PB3000 with battery pack **48 V/7 Ah** (4 x 12 V/7 Ah)	Long-term output test 60 % = 5 V and 4.8 A / –48 V and 0.66 A; call approx. 2 VA	2 h 30 min

Table 3-27 **HiPath 3550** – maximum bridging times

Diagram of UPSC-D



Figure 3-24 UPSC-D (S30122-K5660-M300)

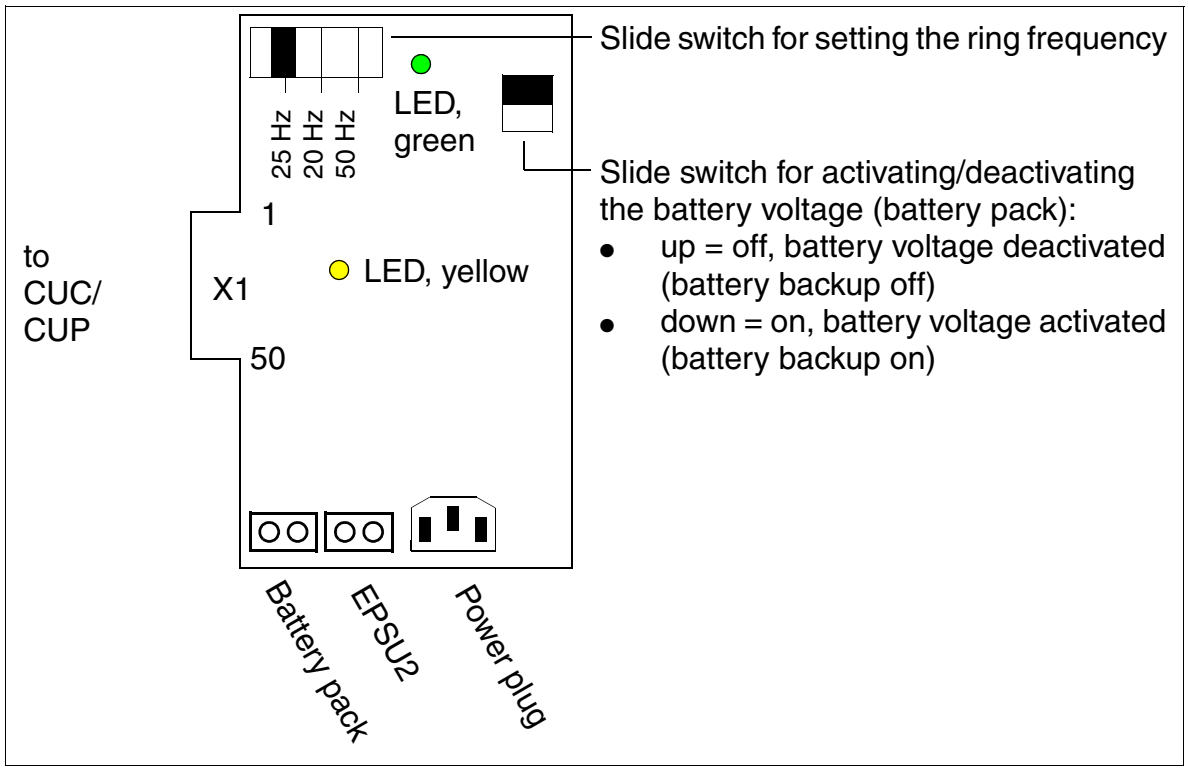


Figure 3-25 UPSC-D (S30122-K5660-A300/-M300)

Switches and indicators

> **Caution**
> System voltage can only be switched on or off by plugging in or out the power plug. If using an uninterruptible power supply, switch off the battery voltage first.

- LED, green: +5-V output voltage is available.
- LED, yellow: –48-V output voltage is supplied by the external power supply (Powerbox PB3000 with LUNA2).
- Slide switch for setting the ring frequency:
  – 25 Hz (Germany + international market)
  – 20 Hz (U.S.)
  – 50 Hz (France)
- Slide switch for activating and deactivating the battery voltage (battery pack):
  – up = off, battery voltage deactivated (battery backup off)
  – down = on, battery voltage activated (battery backup on)

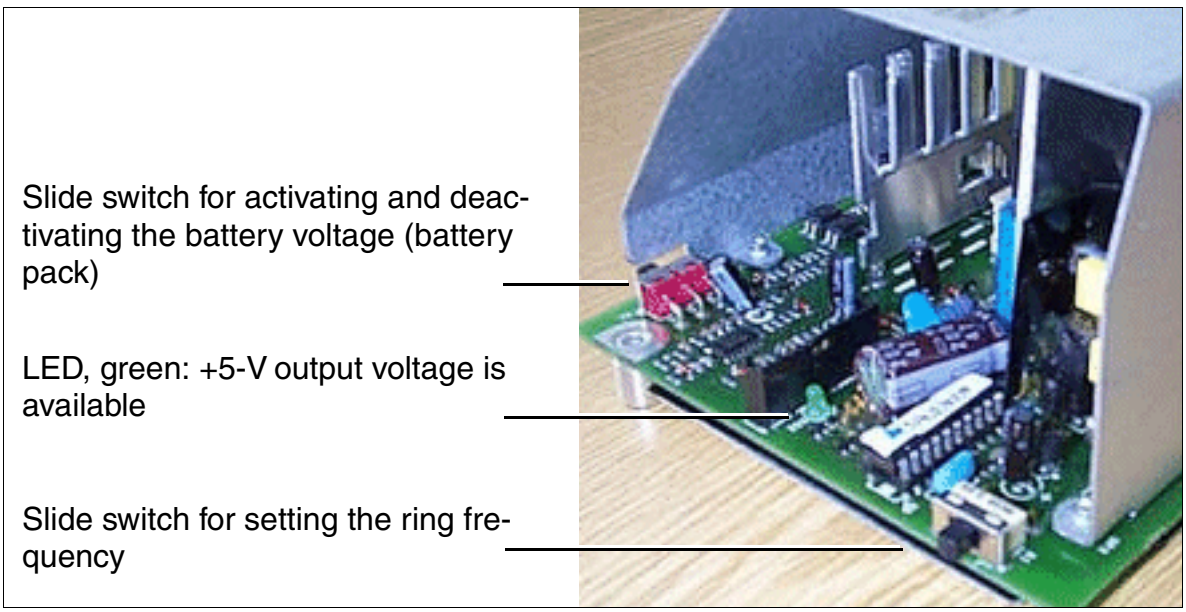


Figure 3-26 UPSC-D - Switches and LEDs

Connectors

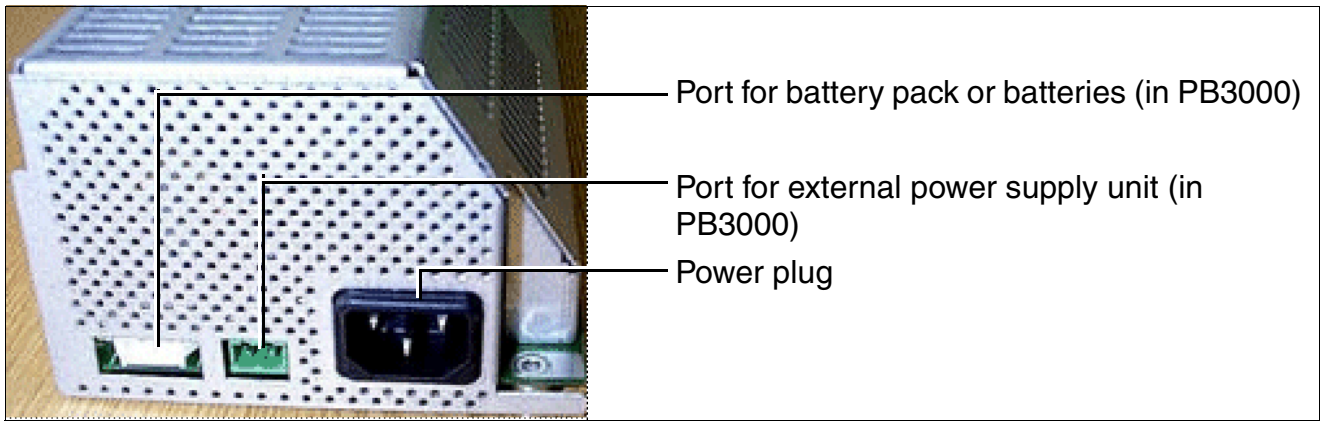


Figure 3-27 UPSC-D - Connectors

3.2.17 UPSC-DR

Introduction

The UPSC-DR board (S30122-K7373-A900, S30122-K7373-M900 (Figure 3-28)) is used in HiPath 3500 and HiPath 3300 (19-inch housing).

The board combines the functions of a power supply unit and battery manager. No further components are required for operation in AC power supply mode. To maintain short-term battery emergency operation after a power failure, that is, to use uninterruptible power supply functions, you must also connect a battery pack (see Section 9.1.3).

Warning
The UPSC-DR power supply unit is only released for permanent AC power supply. Permanent operation at a direct-current system is not allowed.
A DC power supply unit is only connected to bridge an AC power failure (emergency battery operation).
If a 48-V direct-current system is being used instead of a battery pack for DC power supply, connection must be performed as for a battery pack. The 48-V direct-current system must not exceed the limit of 60 V in operating mode, during loading, and when an error occurs. The direct-current system must not be connected to the UPSC-DR if this cannot be guaranteed!

Danger
The **UPSC-DR board is not insulated**.
Consequently, a system using a UPSC-DR may only be operated with a closed housing.
Before opening the housing, make sure that the system is de-energized as follows:

- by disconnecting the battery voltage and line voltage at any connected PB3000.
- by disconnecting the line cord attached to any connected batteries (PB3000).
- by disconnecting the line cord attached to any connected Powerbox PB3000.
- by disconnecting the power plug.

If the power supplied by the UPSC-DR is insufficient, an external power supply (Powerbox PB3000 with LUNA2) can be installed to provide additional power. To do this, connect the DC port on the PB3000 to the special –48-Vdc input on the UPSC-DR. The UPSC-DR's internal -48 V output is deactivated when the external power supply is connected. For emergency battery operation in the event of power failure, 4 x 12-V/7-Ah batteries (4 x V39113-W5123-E891) must be installed in the Powerbox PB3000.

Licensed batteries for UPSC-DR

4 x V39113-W5123-E891 (4 x 12-V/7-Ah batteries)
These are the only batteries released for connection to UPSC-DR and installation in Powerbox PB3000.

Danger
Do not use 24-V batteries (S30122-K5403-X) in conjunction with UPSC-DR as an explosive gas (hydrogen + oxygen) escapes when the battery is overloaded.

Technical specifications

- Nominal voltage range: 100 Vac - 240 Vac
- Nominal frequency: 50 Hz - 60 Hz
- Ring voltage generator 75 Vac, 20/25/50 Hz
- Partial voltages: +5 Vdc, –48 V
- Battery charger: 4 x 12 V **(40.8 V-55.2 V)**
- Power consumption: 180 W
- Bridging times
  Table 3-28 lists the maximum possible bridging times (emergency battery operation in case of power failure) with four batteries (4 x 12-V/7-Ah batteries) and Powerbox PB3000 (S30177-U773-X), depending on the system.

  Tabelle 3-28 UPSC-DR - Bridging Times with four Batteries V39113-W5123-E891 (4 x 12-V/7-Ah Batteries) and Powerbox PB3000

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3300	UPSC-DR 4 x 12-V/7-Ah batteries	Normal output load = 5 V: 3 A; –48 V: 0.5 A; ringing approx. 2 VA	3 h
HiPath 3300	UPSC-DR Powerbox PB3000 with 1 x LUNA2 and 4 x 12-V/7-Ah batteries	Normal output load = 5 V: 3 A; –48 V: 0.5 A; ringing approx. 2 VA	3 h
HiPath 3500	UPSC-DR 4 x 12-V/7-Ah batteries	Normal output load 100 % = 5 V: 8 A; –48 V: 1.1 A; ringing approx. 4 VA	1 h 30 min

Tabelle 3-28 UPSC-DR - Bridging Times with four Batteries V39113-W5123-E891 (4 x 12-V/7-Ah Batteries) and Powerbox PB3000

System	Power supply unit	Load levels	Maximum bridging time
HiPath 3500	UPSC-DR 4x 12-V/7-Ah batteries	Normal output load 60 % = 5 V: 4.8 A; –48 V: 0.66 A; ringing approx. 2 VA	2 h 20 min
HiPath 3500	UPSC-DR Powerbox PB3000 with 1 x LUNA2 and 4 x 12-V/7-Ah batteries	Normal output load 100 % = 5 V: 8 A; –48 V: 1.1 A; ringing approx. 4 VA	1 h 30 min
Measurement conditions: • All measurements were performed at a room temperature of approximately 23 °C (73.4 °F). • The batteries were fully charged when the measurement was started.			

Diagram of UPSC-DR

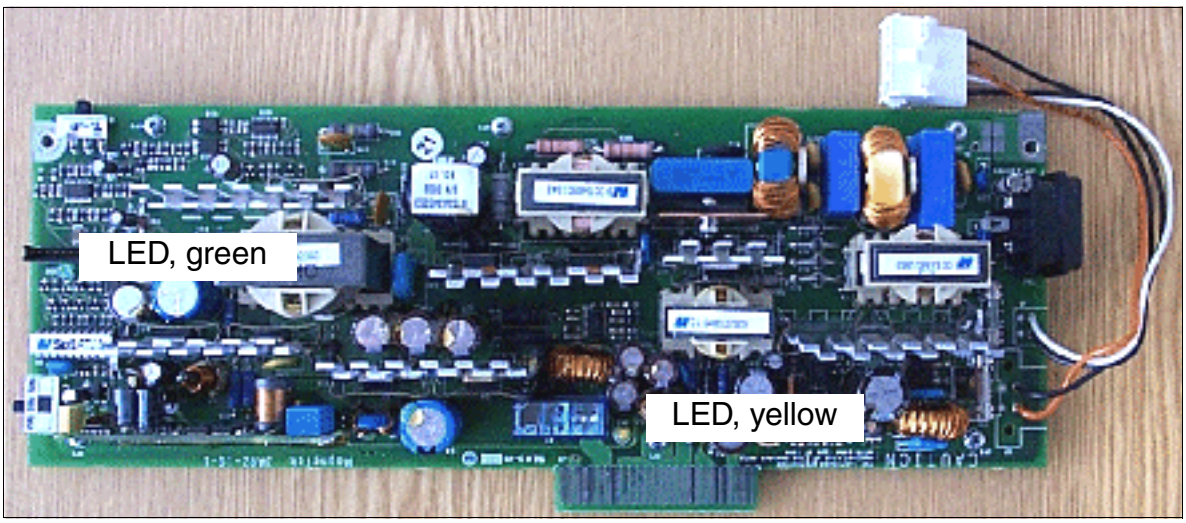


Figure 3-28 UPSC-DR (S30122-K7373-M900)

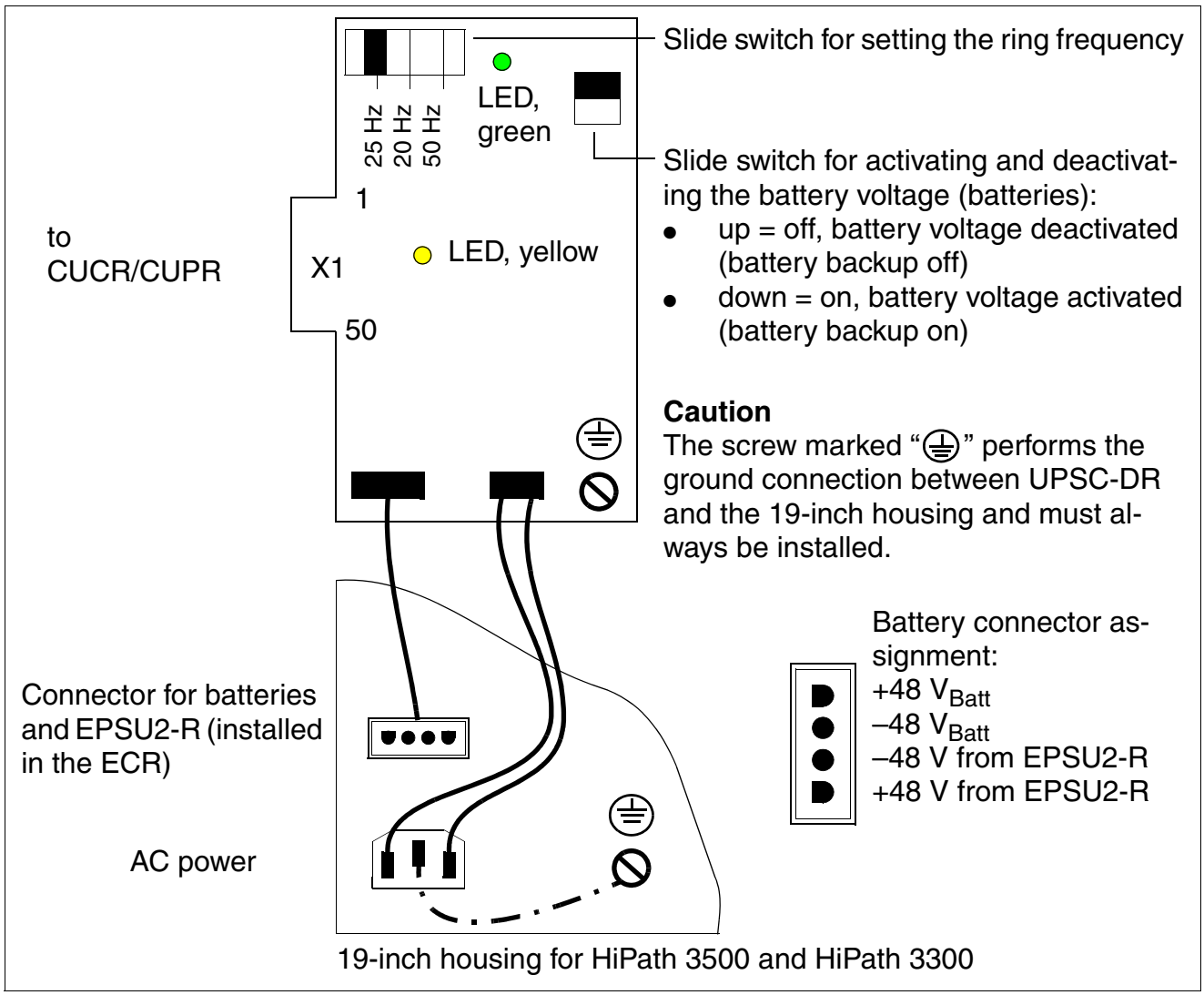


Figure 3-29 UPSC-DR (S30122-K7373-A900/-M900)

Switches and indicators

> **Caution**
> System voltage can only be switched on or off by plugging in or out the power plug. If using an uninterruptible power supply, switch off the battery voltage first.

- LED, green: +5-V output voltage is available.
- LED, yellow: –48-V output voltage is supplied by the external power supply (Powerbox PB3000 with LUNA2).
- Slide switch for setting the ring frequency:
  – 25 Hz (Germany + international market)
  – 20 Hz (U.S.)
  – 50 Hz (France)
- Slide switch for activating and deactivating the battery voltage (batteries):
  – up = off, battery voltage deactivated (battery backup off)
  – down = on, battery voltage activated (battery backup on)

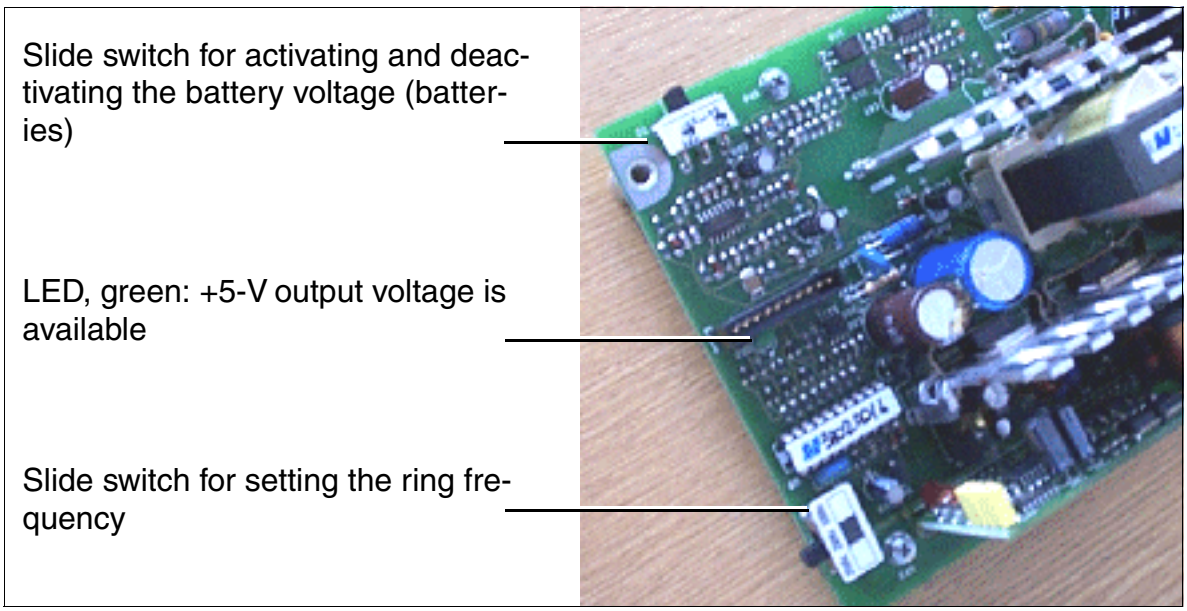


Figure 3-30 UPSC-DR - Switches and LEDs

Connectors

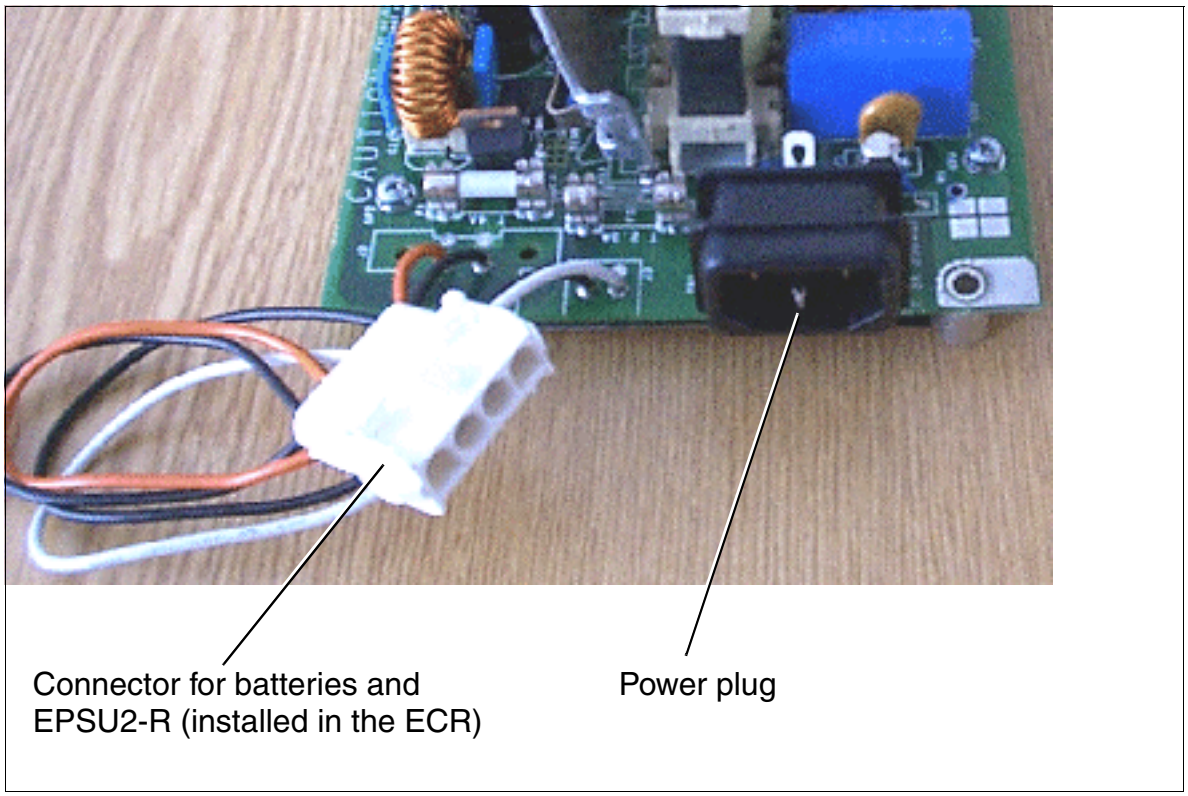


Figure 3-31 UPSC-DR - Connectors

3.3 Peripheral Boards

Important information

Caution
The system must be powered down and **de-energized** before removing or inserting any boards in HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300, and before removing or inserting the central boards in HiPath 3800.

The HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 peripheral boards must be firmly inserted into their slots; otherwise contact problems can cause board failure.

Abbreviations for colors

The tables in this section use abbreviations to denote the colors of connector assignments. The abbreviations used are as follows:

- wht: white
- gry: gray
- yel: yellow
- ora: orange
- red: red
- grn: green
- blu: blue
- vio: violet
- brn: brown
- blk: black

3.3.1 DIU2U (for U.S. only)

Introduction

The DIU2U (**D**igital **I**nterface **U**nit **2** **U**niversal) trunk module connects two digital trunks to HiPath 3800 and in this way provides two primary rate interfaces (PRI) ISDN via T1 interfaces.

Connection types

- Fiber optic cable
  The fiber optic cable is only connected via the front panel. The opto-electronic converter AMOM must be used to connect a fiber optic cable to the 15-pin Sub-D jacks on the front panel.
- Copper cable
  The copper cable is connected to T1-CSU (Customer Service Unit) or DSU (Data Service Unit) via the adapter cable (C39195-A7269-B625) shown in Figure 3-32.

Adapter cable C39195-A7269-B625

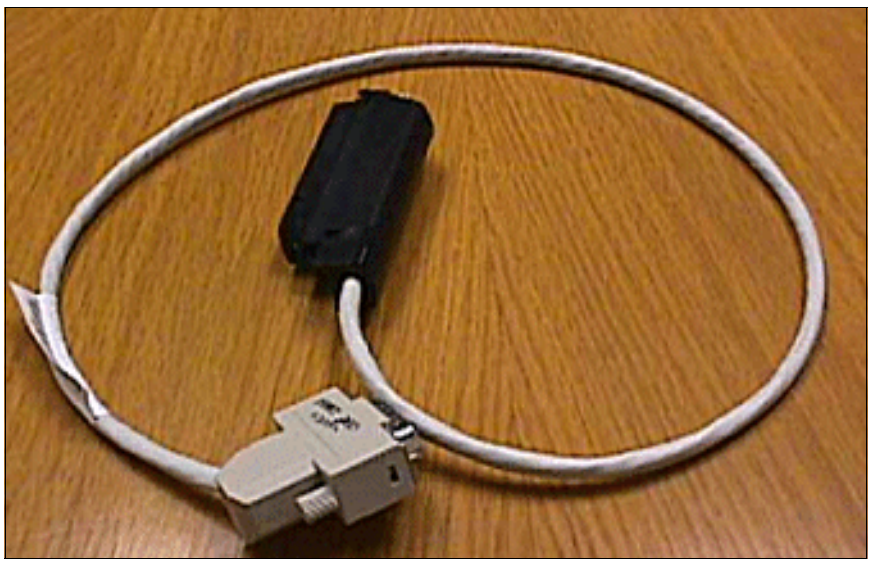


Figure 3-32 DIU2U (for U.S. only) Adapter Cable C39195-A7269-B625

Table 3-29 DIU2U (for U.S. only) - adapter cable assignment (C39195-A7269-B625)

15-pin Sub-D connector Pin	50-pin Amphenol connector Pin	Function	Color code
9	38	a-wire (T), transmit	wht/blu
1	13	b-wire (R), transmit	blu/wht

Table 3-29 DIU2U (for U.S. only) - adapter cable assignment (C39195-A7269-B625)

15-pin Sub-D connector Pin	50-pin Amphenol connector Pin	Function	Color code
15	41	a-wire (T), receive	wht/ora
8	16	b-wire (R), receive	ora/wht

Front panel



Two LEDs indicating the board status:
- LED (green)
- LED (red)

Interface 1

Interface 2

Figure 3-33 DIU2U (for U.S. only) - Front Panel (S30810-Q2216-X)

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

LED statuses and their meanings

Table 3-30 DIU2U (for U.S. only) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

3.3.2 DIUN2

Introduction

The DIUN2 (**D**igital **I**nterface **U**nit ISD**N**) provides 2 x 30 B channels (voice channels) for HiPath 3800. These are used

- for the S_{2M} trunk connection (via NT).
- for S_{2M} networking via S_{2M} lines.

In HiPath 3000/5000 V5.0 and later, the B channels in the DIUN2 board are subject to license. Information on licensing can be found in Chapter 8.

Front panel



Two LEDs indicating the board status:
- LED (green)
- LED (red)

Interface 1

Interface 2

Figure 3-34 DIUN2 - Front Panel (S30810-Q2196-X)

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

LED statuses and their meanings

Table 3-31 DIUN2 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

Connection types

- Fiber optic cable
  The fiber optic cable is only connected via the front panel. The opto-electronic converter AMOM must be used to connect a fiber optic cable to the 15-pin Sub-D jacks on the front panel.
- Copper cable
  The copper cable is only connected via the 15-pin Sub-D jacks on the front panel.

Notes:

- The connection type setting (fiber optic cable = DIUN2 mod., copper cable = DIUN2) is made in HiPath 3000/5000 Manager E: System Status – System-wide – Card Config. – Card Data. The connection type setting always applies to both interfaces (line 1 and line 2). Connection types “DIUN2 mod.” and “DIUN2” cannot be used at the same time.
  - Switch over to the connection type “DIUN2 mod.” with an AMOM adapter plugged in and an existing fiber-optic connection: The fiber-optic path goes into operation immediately if configured correctly.
  - Switch over to the connection type “DIUN2 mod.” with an AMOM adapter plugged in and without an existing fiber-optic connection: The fiber-optic path goes into operation once the fiber-optic cable is plugged in if configured correctly. This can take up to three minutes.
  - Switch over to the connection type “DIUN2 mod.” without an AMOM adapter plugged in: If the connection type is switched before the adapter is plugged in, you must perform a Reload Card with HiPath 3000/5000 Manager E after plugging in the adapter to ensure that the adapter is detected by the DIUN2 board.

  The DIUN2 board automatically performs a reload after switching from “DIUN2 mod.” to “DIUN2” or vice versa to load the loadware for the operating mode.
- Both interfaces can be operated with different versions of the AMOM adapter (see AMOM versions).
- Both interfaces can be operated with different protocols.

Jack assignment

Tabelle 3-32 DIUN2 - 15-Pin Sub-D Jack Assignment

Pin	Signal	Signal description	Direction
1	TTIP0	a-wire 120 ohms/75 ohms	Output
4	LWLO0_FRONT	Fiber optic (data output)	Output
5	GND	Ground return path for the +5-V power supply	Input/output
6	SCAN_IN0	Adapter test	Input
7	SCAN_IN0	Adapter test	Input
8	RTIP0	a-wire 120 ohms/75 ohms	Input
9	TRING0	b-wire 120 ohms/75 ohms	Output
10	+5 V	+5-V power supply	Output
11	LWLI0_FRONT	Fibre optic (data input)	Input
12	GND	Ground return path for the +5-V power supply	Input/output
14	+5 V	+5-V power supply	Output
15	RRING0	b-wire 120 ohms/75 ohms	Input
No other pins used.			

Assigning the system cable S30267-Z167-Axxx

Tabelle 3-33 DIUN2 - Assignment of System Cable S30267-Z167-Axxx

Pin	Function	Color code
8	a-wire (T), transmit	ora/wht
15	b-wire (R), transmit	wht/ora
1	a-wire (T), receive	blu/wht
9	b-wire (R), receive	wht/blu

3.3.3 DIUT2

Introduction

HiPath 3000/5000 V7 Minor Release 5 and higher supports the use of the DIUT2 board (**D**igital **I**nterface **U**nit **T**runk 2) in HiPath 3800.

The DIUT2 board is a compatible successor to the following boards:

- DIU2U (S30810-Q2216-X) (for U.S. only)
- DIUN2 (S30810-Q2196-X)

The board features two ports for the following:

- S_{2M} trunk connection (over NT)
- S_{2M} networking via S_{2M} lines
- T1-PRI (**P**rimary **R**ate **I**nterface) trunk connection (for U.S. only)
- T1 analog trunk connection (for U.S. only)

A total of up to three DIUT2 and/or DIUN2 boards can be installed in a system. When used as a T1 trunk connection (PRI or analog), a system can accommodate up to four DIUT2 and/or DIU2U boards.



Not for U.S.: The B channels associated with the DIUT2 board require a license. Information on licensing can be found in Chapter 8, “Licensing”.

Front panel



2 LEDs that indicate the board status:
- LED (green)
- LED (red)

15-pin "Sub-D" interface 1 (X10)

15-pin "Sub-D" interface 2 (X11)

Bild 3-35 DIUT2 - Front panel (S30810-Q2226-X100)

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

Backplane

System interfaces X1 to X9 are located on the backplane. They are designed as SIPAC connectors.

LED statuses and their meanings

Tabelle 3-34 DIUT2 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

Definition of application and connection type

The board is configured via the loadware once the application and connection type have been selected.

- The application type is selected with HiPath 3000/5000 Manager E: System status – System-wide – SW expansion – Card selection

  The following options are available:

  – DIUT2 T1 S2: for use as an S2M interface (S2M trunk connection, S2M network)

  – DIUT2 T1: for use as a T1 interface (T1-PRI trunk connection)

  – DIUT2 T1 analog: for use as a T1 interface for T1 analog (T1 analog trunk connection)

- The connection type is selected with HiPath 3000/5000 Manager E: System status – System-wide – SW expansion – Card data.

  The following options are available:

  – DIUT2 T1 S2 mod., DIUT2 T1 mod., DIUT2 T1 analog mod.: for connection via fiber optic cable
  The fiber optic cable is only connected via the front panel. The opto-electronic converter AMOM must be used to connect a fiber optic cable to the 15-pin Sub-D jacks on the front panel.

  – DIUT2 T1 S2, DIUT2 T1, DIUT2 T1 analog: for connection via copper cable (system cable S30267-Z167-Axxx)
  The copper cable is only connected via the 15-pin Sub-D jacks on the front panel.

The connection type setting always applies to both interfaces in a board. Different connection types cannot be used at the same time.

Both interfaces can be operated with different versions of the AMOM adapter (see AMOM versions).

The DIUN2 board automatically performs a reload after switching the connection type to load the loadware for the connection type.

Assigning the "Sub-D" interfaces X10 and X11

Table 3-35 DIUT2 - Assigning the "Sub-D" Interfaces X10 and X11

Pin	Signal	Signal description	Direction
1	TTIP0	a-wire 120 ohms/75 ohms	Output
4	LWLO0_FRONT	Fiber optic (data output)	Output
5	GND	Ground return path for the +5-V power supply	Input/output
6	SCAN_IN0	Adapter test	Input
7	SCAN_IN0	Adapter test	Input
8	RTIP0	a-wire 120 ohms/75 ohms	Input
9	TRING0	b-wire 120 ohms/75 ohms	Output
10	+5 V	+5-V power supply	Output
11	LWLI0_FRONT	Fibre optic (data input)	Input
12	GND	Ground return path for the +5-V power supply	Input/output
14	+5 V	+5-V power supply	Output
15	RRING0	b-wire 120 ohms/75 ohms	Input
No other pins used.			

Assigning the SIPAC connectors X1 to X9

Signal Name	Connector contact	Signal description	Direction
+ 5V	X1-22, X4-30, X5-30, X9-28	Power supply unit + 5 V GS	Input
U_VOR	X5-16, X5-26, X5-36, X5-18, X5-28, X5-38	Power supply unit + 5 V GS for hot plug	Input
GND	X1-24, X2-26, X3-26, X4-28, X6-22, X7-24, X8-24, X9-26 X5-12, X5-22, X5-32, X5-14, X5-24, X5-34	Earth return for + 5 V GS	Input/output
GND	X5-23	Earth return for hot plug	Not connected
- 48 V	X6-04	-48 V power supply unit	Not connected

Table 3-36 SIPAC Connector Contact Assignment

Signal Name	Connector contact	Signal description	Direction
BGx_0A, BGx_0B	X1-02, X1-26 X1-06, X1-08 X1-10, X2-02 X2-04, X2-06 X2-08, X2-10 X3-02, X3-04 X3-06, X3-08 X3-10, X4-02	Sets 0 to 7 AB pair	Not connected
HO0 … HO3	X8-22, X7-30, X8-44, X8-42	Old PCM lines (2.048 Mbps)	Input
HI0 … HI3	X9-24, X9-02, X9-44, X9-42	Old PCM lines (2.048 Mbps)	Output
WHO0 … WHO3	X6-32, X6-33, X6-34, X6-35	New PCM lines (2.048 Mbps)	Input
WHI0 … WHI3	X7-31, X7-32, X7-33, X7-34	New PCM lines (2.048 Mbps)	Output
HDI	X9-06	HDLC lines	Input
HDO	X8-04	HDLC lines	Output
PRS	X7-26	System reset	Input
BA0 … BA6	X7-06, X7-28, X8-26 X8-28, X9-04, X8-06, X8-2	Frame address recognition	Input
FMB	X9-22	Clock synchronization signal	Input
CKA	X8-08	System clock (2.048 MHz)	Input
(CLS)	X8-10	Clock selection (CLS=GND --> CKA=2.048 MHz) The (CLS) pin should be earthed on the backplane.	Input
RCLK	X7-02	Reference clock	Output
RAC	X7-04	Reference clock activation Low-active for activating RCLK Tristate for deactivating CLK	Output tristate
LWLOOP	X4-04	Output for result of self-check	Not connected
TOUT	X6-48	Output for result of self-check	Not connected
TCK	X7-44	Boundary scan: check clock	Not connected

Table 3-36 SIPAC Connector Contact Assignment

Signal Name	Connector contact	Signal description	Direction
TMS	X7-46	Boundary scan: check mode selection	Not connected
TDI	X7-48	Boundary scan: Check data input	Not connected
TDO	X7-50	Boundary scan: Check data output	Not connected

Table 3-36 SIPAC Connector Contact Assignment

Assigning the system cable S30267-Z167-Axxx

Table 3-37 DIUT2 - Assignment of System Cable S30267-Z167-Axxx

Pin	Function	Color code
8	a-wire (T), transmit	ora/wht
15	b-wire (R), transmit	wht/ora
1	a-wire (T), receive	blu/wht
9	b-wire (R), receive	wht/blu

Power supply unit

The DIUT2 board receives +5 V (±5%) supply voltage via the backplane. Voltage of +1.5 V and +3.3 V is created by onboard controllers.

3.3.4 HXGS3, HXGR3

Introduction

HXGS3 and HXGR3 are VoIP gateway boards (VoIP - Voice over IP) that provide the functionality of HG 1500 in HiPath 3550, HiPath 3350 (HXGS3), HiPath 3500, and HiPath 3300 (HXGR3):

- Connection of a local LAN to the HiPath 3000 and connection with external LANs via the ISDN and DSL interfaces of HiPath 3000.
- Support for the conventional functions of an ISDN and DSL router with the additional functionality of a media gateway for the transfer of voice, fax and data.
- Forwarding of calls between IP-supported networks (LAN, intranet, Internet) and circuit-switched networks (ISDN, PSTN).
- Bidirectional video signal transmission on the SIP interface (OpenScape Personal Edition).

Configuration is performed via Web-Based Management (WBM) which enables the administration of HG 1500 without any special software requirements.

For information on how to calculate the number of boards required for HG 1500, see Section 2.5.

HXGS3/HXGR3 Installation

Up to three boards can be used in HiPath 3550 and HiPath 3500.
A maximum of one board is permitted in HiPath 3350 and HiPath 3300. Two boards can be installed only if PDM1 is not being used.
When using an HXGS3 in HiPath 3350, pthe ower supply unit PSUP must be replaced with UPSC-D.
It is not possible to operate an HXGS3 or HXGR3 and an LIM module simultaneously in one system.

For information on configuration, refer to the HG1500 Administration Manual.

Upgrade, fan kit

If the following housing covers are avaiable on the HiPath 3350 and HiPath 3550 systems, a fan kit is not required when upgrading with a HXGS3:

- HiPath 3350: from housing cover C39165-A7021-B53
- HiPath 3550: from housing cover C39165-A7021-B52



If the HiPath 3350 and HiPath 3550 systems have the old housing covers and should be upgraded with a HXGS3, then the old housing covers must be replaced by C39165-A7021-B53 or C39165-A7021-B52 housing covers.

Board versions

Table 3-38 HXGS3/HXGR3 Board Versions

Board	Part Number	Services	DSPs	B channels DSP channels
HXGS3	S30810-Q2943-X	Voice and Data	1	8
HXGS3; with new software for HiPath 3000 V8	S30810-Q2943-X1	Voice and Data	1	8
HXGS3; for HiPath 3500, 3300 (S30810-Q2943-X1 + panel)	S30810-K2943-Z1	Voice and Data	1	8
HXGR3	S30810-K2943-Z	Voice and Data	1	8

Eight simultaneous Voice over IP connections are possible per DSP (Digital Signal Processor).



When using the extension module PDM1, the number of DSP channels for HXGS3 and HXGR3 boards can be expanded by eight per board.

Extension modules

The HXGS3 and HXGR3 boards each have two HGA (HiPath Gateway Accelerator) slots, which can be used to connect extension modules.

Table 3-39 HXGS3/HXGR3 - Extension Modules

Extension module	Part number	Function	Notes
PDM1 (PMC DSP modules)	S30807-Q5692-X100	Used for expansion for an additional eight DSP channels.	Maximum of one PDM1 module possible.

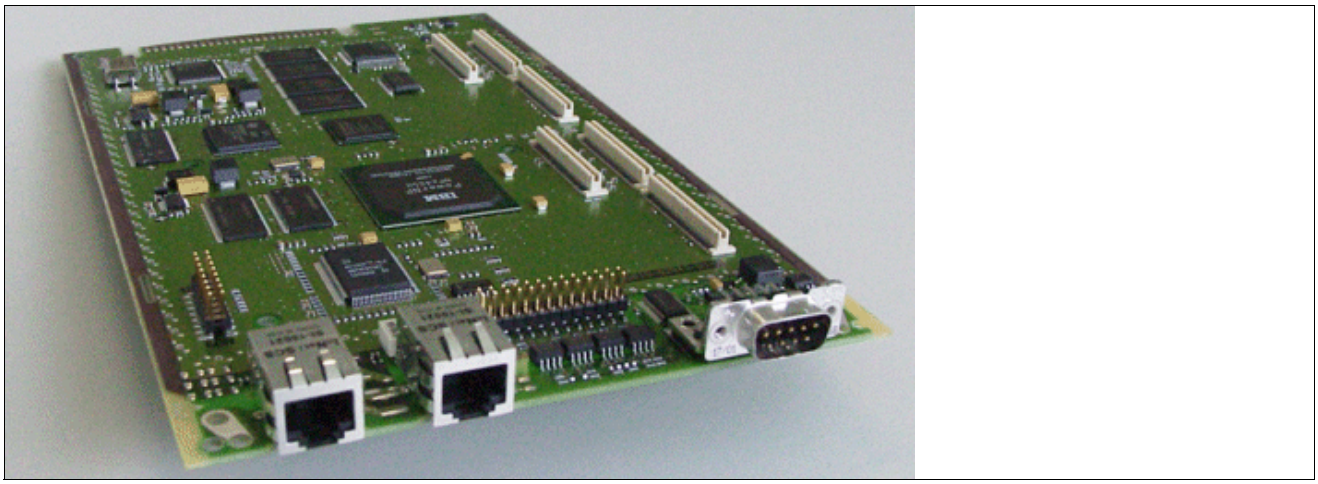


Figure 3-36 HXGS3 (S30810-Q2943-X, S30810-Q2943-X1)

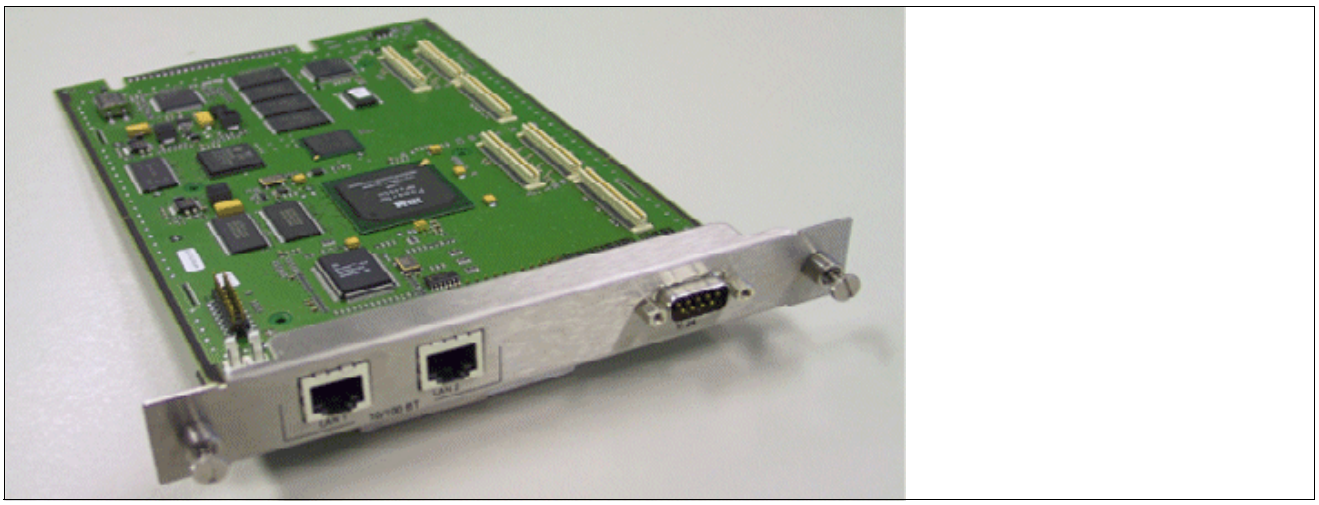


Figure 3-37 HXGR3 (S30810-K2943-Z)

Interfaces/connectors

The HXGS3 and HXGR3 boards provide the following connectors:

- X1: 50-pin connector (edge connector) to the system
- X2: 8-pin RJ45 jack for LAN interface 1
- X3: 8-pin RJ45 jack for LAN interface 2

> **Caution**
> It is absolutely necessary to use a shielded Ethernet cable for LAN interfaces/ ports of the HXGS3 board.

Both LAN interfaces allow access to the Ethernet standard (IEEE 802.3) with 10 Mbps or 100 Mbps with automatic configuration. Manual configuration is also possible.

- X4: 9-pin Sub-D plug for V.24 interface

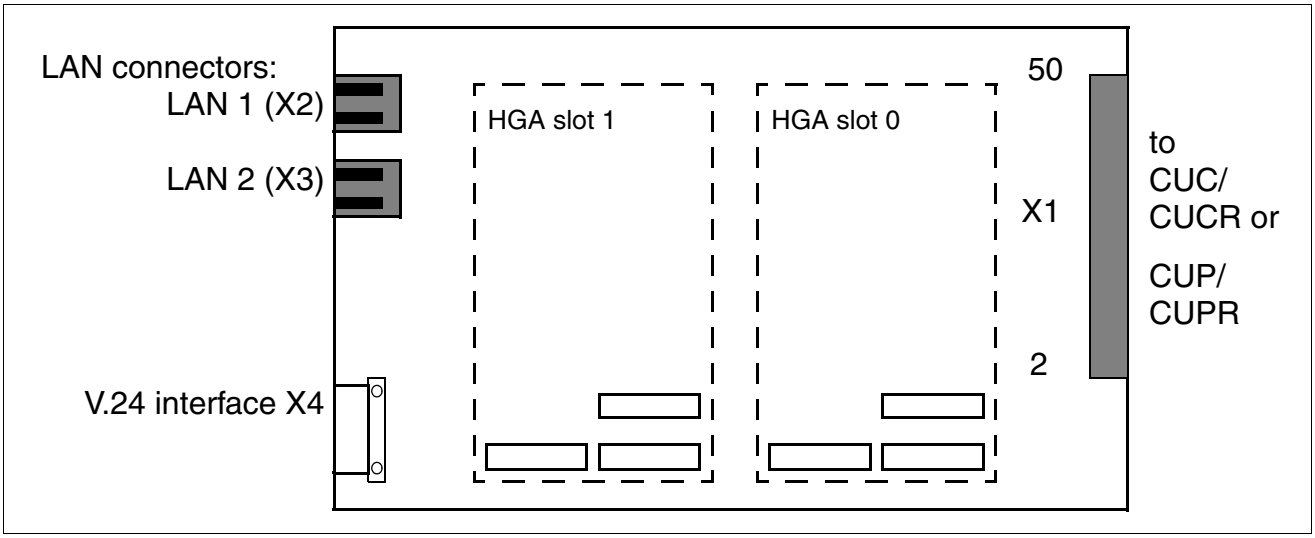


Figure 3-38 HXGS3/HXGR3 - Interfaces

LAN interfaces

Table 3-40 HXGS3/HXGR3 - LAN Interface Assignment

Pin on HXGS3/HXGR3 (X2 and X3)	Pin of RJ45 connector	Signal
1	1	TDP (Transmit Data +)
3	2	TDN (Transmit Data –)
4	3	RDP (Receive Data +)
–	4	TT1 (Transmit Termination 1)
–	5	TT2 (Transmit Termination 2)
6	6	RDN (Receive Data –)
–	7	RT1 (Receive Termination 1)
–	8	RT2 (Receive Termination 2)
Signals TT1/2 and RT1/2 are not needed for transmitting data. They represent a signal termination of 100 ohms (known as a Bob Smith termination) for the two unused wire pairs in a 4-pair twisted pair cable.		

V.24 interface

The V.24 cable (C30267-Z355-A25) is used for connecting the service PC.

The following settings must be chosen for a terminal or PC connected to the V.24 interface:

Transmission rate	19.200
Data bits	8
Parity bit	None
Stop bits	1
Data flow control	none

It is recommended that the local echo be deactivated on the connected terminal or PC.

Table 3-41 HXGS3/HXGR3 - Assignment of V.24 Interface X10

Pin	Signal	I/O	Remark
1			
2	RxD	I	Internal pull-up resistor in level switch (MAX211E)
3	TxD	O	
4	DTR	O	
5	0 V		Ground
6	DSR	I	Internal pull-up resistor in level switch (MAX211E)
7	RTS	O	
8	CTS	I	Internal pull-up resistor in level switch (MAX211E)
9			

3.3.5 VMNL, IVMN8

Introduction

The IVMNL and IVMNL8 (**I**ntegrated **V**oice **M**ail **N**ew **L**arge) boards allow you to use the HiPath Xpressions Compact integrated voice mail functionality in HiPath 3800:

- IVMNL (S30122-H7688-X) = 24 ports
- IVMN8 (S30122-H7688-X100) = 8 ports

Up to 500 mailboxes are available with a total storage capacity of 100 hours. The boards can also be used for Music on Hold and announcements.

HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
HiPath Xpressions Compact may be used as a central announcement device in a network system with V6.0 SMR-06 or later.

Optional administration of HiPath Xpressions Compact via the Ethernet (10/100BaseT) interface in the front panel of the board is also possible.

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product.

Caution
For thermal reasons the IVMNL board may only be installed in the basic cabinet in a HiPath 3800 19-inch cabinet installation.

Only one IVMNL or IVMN8 may be installed per HiPath 3800 system.
In order to avoid inactive IVM channels (due to the slow IVM board boot-up), the following recommendations must be observed:

- IVMNL:
  - Installing HiPath 3800 (Standalone): The IVMNL board is to be installed in the last slot in the last system cabinet. If possible, the two slots in front should be kept free.
  - Installing HiPath 3800 (19-Inch Cabinet): The IVMNL board should be installed in the last slot in the basic cabinet. If possible, the two slots in front should be kept free.
- IVMN8:
  Standalone installation of the HiPath 3800 or 19" cabinet installation of the HiPath 3800: The IVMN8 board should be installed in the last slot in the last system cabinet. If possible, the two slots in front should be kept free.

Front panel



Two LEDs indicating the board status:
- LED (green)
- LED (yellow)

Lockout switch

Ethernet (10/100BaseT) interface (8-pin RJ45 jack)

Figure 3-39 IVMNL, IVMN8 - Front Panel (S30122-H7688-X -X100)

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, press the lockout switch four times (off-on-off-on) during the LED test at startup. This action cancels the LED test and both LEDs flash for approximately five seconds in confirmation.

LED statuses and their meanings

Table 3-42 IVMNL, IVMN8 - LED Statuses

LED Yellow	LED Green	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 60 s)	
On	On	2	LED test (lasts approx. 10 s)	
On	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): • blocked = On • free = Off	Possibly check if board was deactivated using HiPath 3000/ 5000 Manager E or lockout switch.
Off				
Flashing (500/ 500 ms)	Off	4	Hard disk test, application startup (depending on hard disk status, lasts approx. 2 - 9 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch. Change board if faulty.
During Operation				
Off	On	Idle (no call)		

Table 3-42 IVMNL, IVMN8 - LED Statuses

LED Yellow	LED Green	Meaning	Action
Flashing (500/ 500 ms)	Off	At least one active port (call)	
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call	
On	Off	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch. Change board if faulty.
Flashing (100/ 100 ms)	Off	Upgrade process active	

RJ45 jack assignment

Table 3-43 IVMNL, IVMN8 - RJ45 Jack Assignment

Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

3.3.6 IVMP4, IVMP4R

Introduction

The following boards are used for the integrated voice mail functionality in HiPath Xpressions Compact in V2.5 and later:

- IVMP4 (**I**ntegrated **V**oice **M**ail **P**oint) S30122-Q7004-X13 - for HiPath 3550 and HiPath 3350 (wall housing)
- IVMP4R (**I**ntegrated **V**oice **M**ail **P**oint **R**ack) S30122-K7004-Z13 - for HiPath 3500 and HiPath 3300 (19-inch housing)

Up to 30 mailboxes are available with a total storage capacity of four hours. The boards can also be used for Music on Hold and announcements.



HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
HiPath Xpressions Compact may be used as a central announcement device in a network system with V6.0 SMR-06 or later.

Optional administration of HiPath Xpressions Compact is also possible via the board's Ethernet (10/100BaseT) interface.



Only one IVMP4 or IVMP4R may be installed per system.
For thermal reasons, the IVMP4 board may only be used in slots 5, 7, and 9 (lower slots) in HiPath 3550 (wall housing).
Only slot 5 can be used for the IVMP4 board in HiPath 3350 (wall housing).

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product.

Switches and LEDs

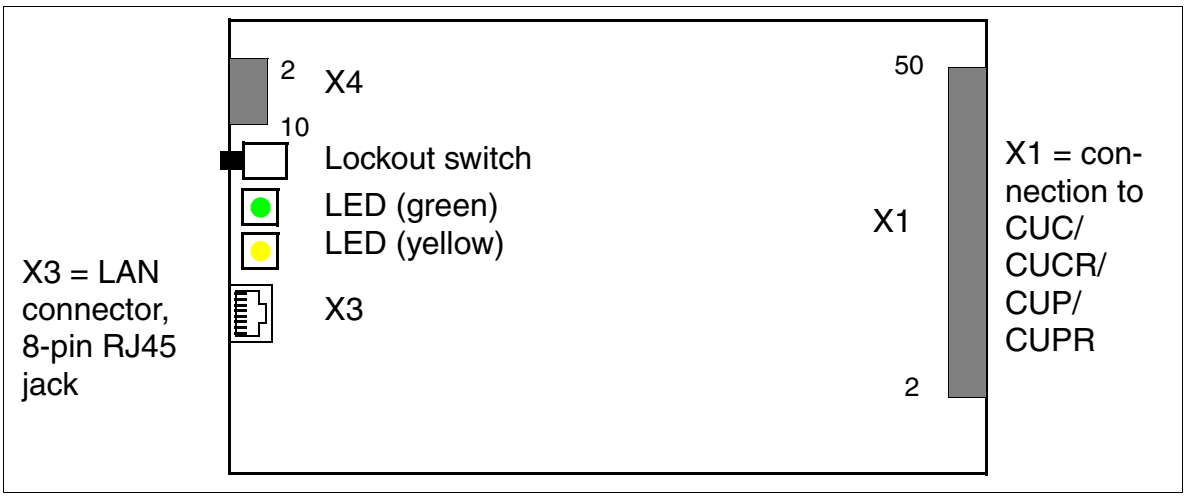


Figure 3-40 IVMP4, IVMP4R

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

Assignment of the RJ45 jack X3

The Ethernet (10/100BaseT) interface is accessed via the 8-pin RJ45 jack X3.

RJ45 Jack X3 Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

Table 3-44 IVMP4, IVMP4R - Assignment of the RJ45 Jack X3 (LAN Connector)

LED statuses and their meanings

LED Yellow	LED Green	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 60 s)	
On	On	2	LED test (lasts approx. 10 s)	
On Off	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): • blocked = On • free = Off	Possibly check if board was deactivated using HiPath 3000/ 5000 Manager E or lockout switch.
Flashing (500/ 500 ms)	Off	4	Hard disk test, application startup (depending on hard disk status, lasts approx. 2 - 9 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch. Change board if faulty.
During Operation				
Off	On	Idle (no call)		
Flashing (500/ 500 ms)	Off	At least one active port (call)		
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call		
On	Off	Board locked or board error occurred		Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch. Change board if faulty.
Flashing (100/ 100 ms)	Off	Upgrade process active		

Table 3-45 IVMP4, IVMP4R - LED Statuses

3.3.7 IVMP8 (not for U.S.) and IVMP8R (not for U.S.)

Introduction

The following boards are used for the integrated voice mail functionality in HiPath Xpressions Compact in V1.2 and later:

- IVMP8 (**I**ntegrated **V**oice **M**ail **P**oint) S30122-Q7379-X100 - for HiPath 3350 (wall housing)
- IVMP8R (**I**ntegrated **V**oice **M**ail **P**oint **R**ack) S30122-K7379-Z100 - for HiPath 3300 (19-inch housing)

Upgrading to HiPath Xpressions Compact V2.5 is not possible.

Music on Hold can be used in V4.0 SMR-7 or later and announcements in V5.0 or later.

In addition, the boards have an Ethernet (10/100BaseT) interface which can be used for HiPath Xpressions Compact administration (fast APS transfer, backup and restore activities).



Only one IVMP8 or IVMP8R may be installed per system.
Only slot 5 can be used for the IVMP8 board in HiPath 3350 (wall housing).

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product.



HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
HiPath Xpressions Compact may be used as a central announcement device in a network system with V6.0 SMR-06 or later.

Packing protection covering

You must remove the red packing protection covering (cardboard block), shown in the following picture, before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.



Figure 3-41 IVMP8 and IVMP8R (not for U.S.) - Packing Protection Covering

Switches and LEDs

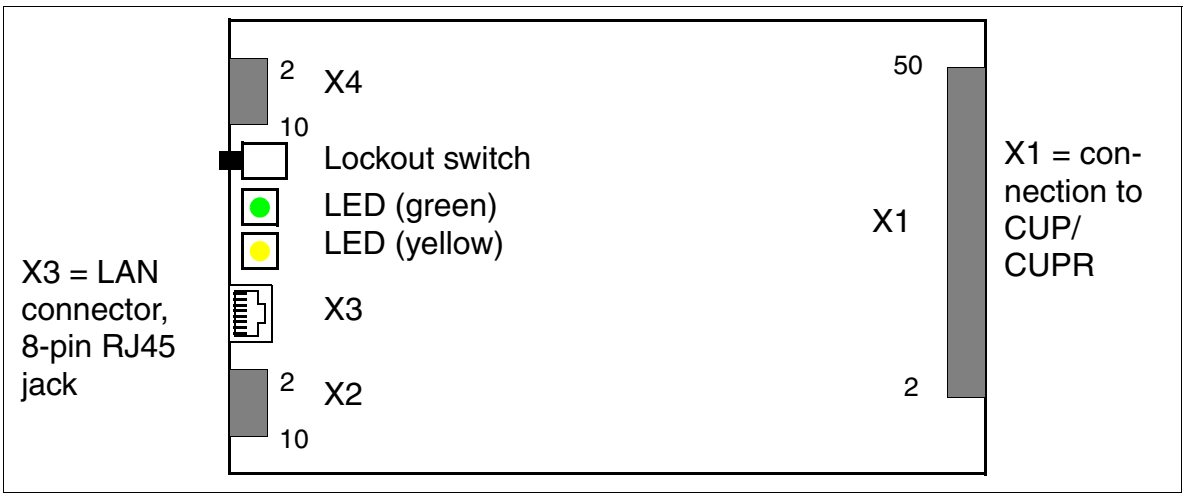


Figure 3-42 IVMP8, IVMP8R (S30122-Q7379-X100, -K7379-Z100) (not for U.S.)

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

Assignment of the RJ45 jack X3

The Ethernet (10/100BaseT) interface is accessed via the 8-pin RJ45 jack X3. The signals are output simultaneously at the printed circuit connector X2.

Table 3-46 IVMP8 and IVMP8R (not for U.S.) - Assignment of the RJ45 Jack X3 (LAN Connector)

RJ45 Jack X3 Pin	Signal	Description	Printed Circuit Connector X2 Pin
1	Tx +	Transmit +	1
2	Tx –	Transmit –	3
3	Rx +	Receive +	7
4	–	Not used	
5	–	Not used	
6	Rx –	Receive –	9
7	–	Not used	
8	–	Not used	

LED statuses and their meanings

Table 3-47 IVMP8 and IVMP8R (not for U.S.) - LED Statuses

LED Yellow	LED Green		Meaning	Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 8 - 12 s)	
On	On	2	LED test (lasts approx. 10 s)	
On	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): • blocked = On • free = Off	Possibly check if board was deactivated using HiPath 3000/5000 Manager E or lockout switch.
Off				
Flashing (500/ 500 ms)	Off	4	Hard disk test, application startup (depending on hard disk status, lasts approx. 3 - 8 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch.
During Operation				
Off	On		Idle (no call)	
Off	Flashing (500/ 500 ms)		At least one active port (call)	
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)		Lockout switch activated during a call	
On	Off		Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch.

3.3.8 IVMS8, IVMS8R

Introduction

The following boards are used for the integrated voice mail functionality in HiPath Xpressions Compact in V1.2 and later:

- IVMS8 (**I**ntegrated **V**oice **M**ail **S**mall) S30122-Q7379-X - for HiPath 3550 and HiPath 3350 (wall housing)
- IVMS8R (**I**ntegrated **V**oice **M**ail **S**mall **R**ack) S30122-K7379-Z - for HiPath 3500 and HiPath 3300 (19-inch housing)

Music on Hold can be used in V4.0 SMR-7 or later and announcements in V5.0 or later.

In addition, the boards have an Ethernet (10/100BaseT) interface which can be used for HiPath Xpressions Compact administration (fast APS transfer, backup and restore activities).



Only one IVMS8 or IVMS8R may be installed per system.
For thermal reasons, the IVMS8 board may only be used in slots 5, 7, and 9 (lower slots) in HiPath 3550 (wall housing).
Slot 5 can only be used for the IVMS8 board in HiPath 3350 (wall housing).

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product.



HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server.
HiPath Xpressions Compact may be used as a central announcement device in a network system with V6.0 SMR-06 or later.

Packing protection covering

You must remove the red packing protection covering (cardboard block), shown in the following picture, before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.



Figure 3-43 IVMS8, IVMS8R - Packing Protection Covering

Switches and LEDs

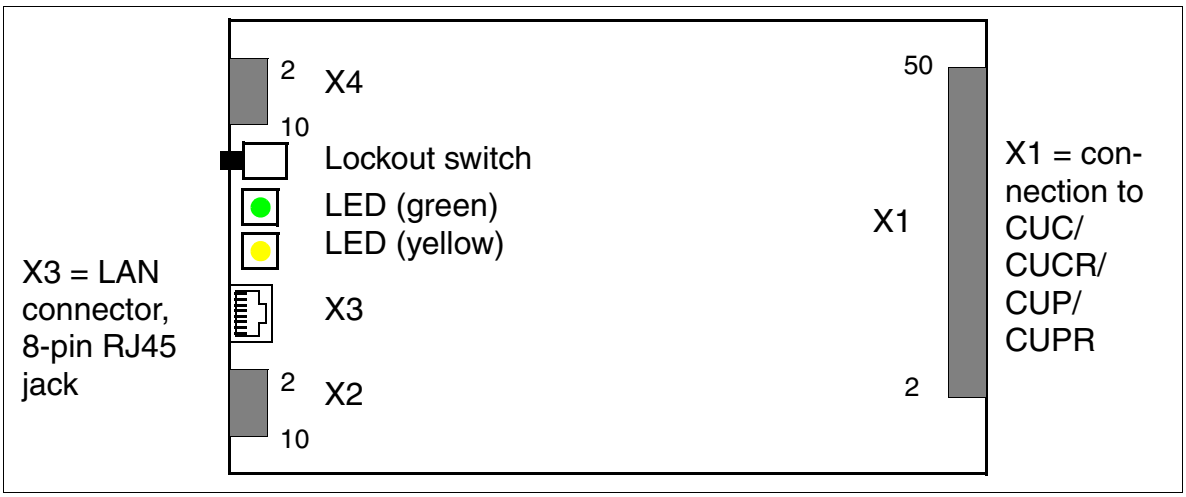


Figure 3-44 IVMS8, IVMS8R (S30122-Q7379-X, -K7379-Z)

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

Front view of IVMS8R

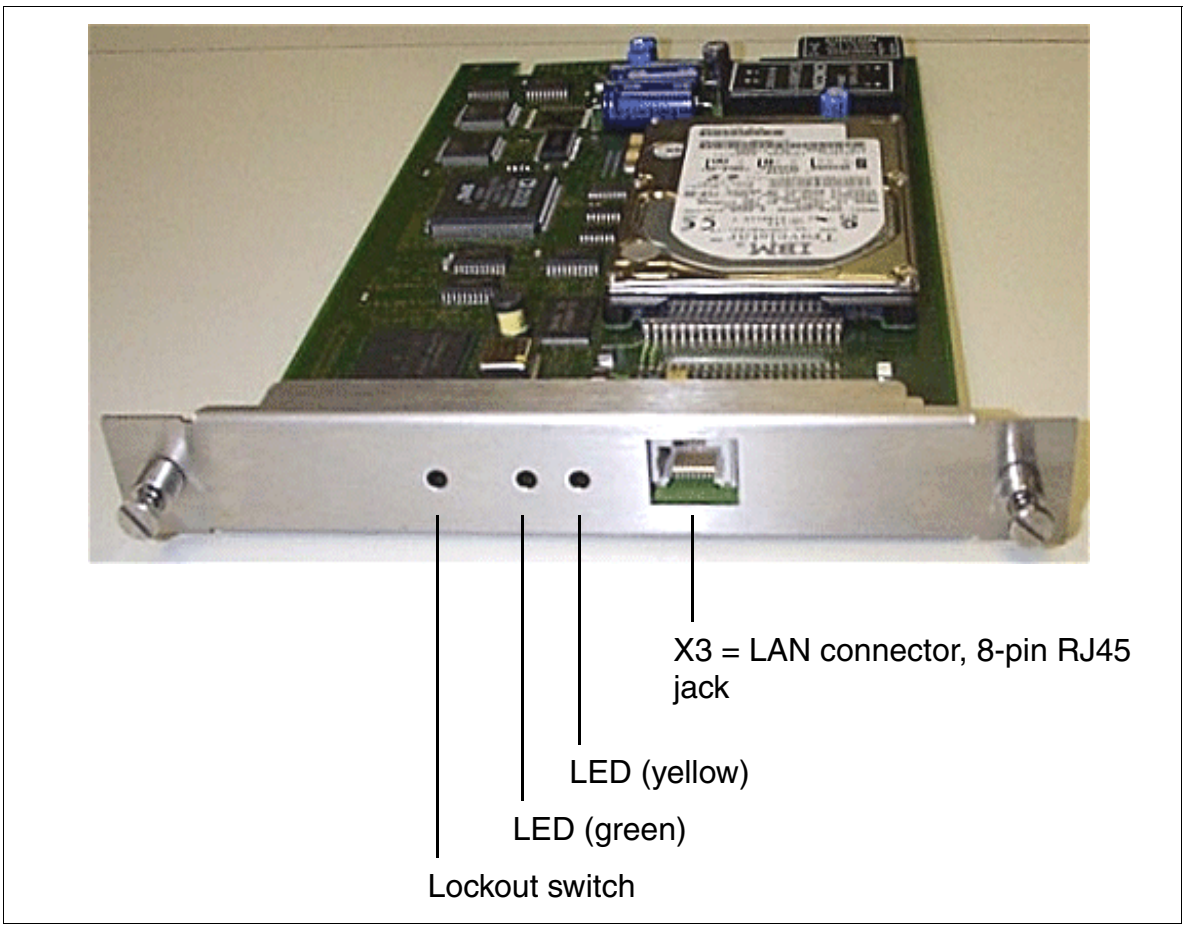


Figure 3-45 IVMS8R - Front View (S30122-K7379-Z)

Assignment of the RJ45 jack X3

The Ethernet (10/100BaseT) interface is accessed via the 8-pin RJ45 jack X3. The signals are output simultaneously at the printed circuit connector X2.

Table 3-48 IVMS8, IVMS8R - Assignment of the RJ45 Jack X3 (LAN Connector)

RJ45 Jack X3 Pin	Signal	Description	Printed Circuit Connector X2 Pin
1	Tx +	Transmit +	1
2	Tx –	Transmit –	3
3	Rx +	Receive +	7
4	–	Not used	
5	–	Not used	
6	Rx –	Receive –	9
7	–	Not used	
8	–	Not used	

LED statuses and their meanings

Table 3-49 IVMS8, IVMS8R - LED Statuses

LED Yellow	LED Green	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 8 - 12 s)	
On	On	2	LED test (lasts approx. 10 s)	
On	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): • blocked = On • free = Off	Possibly check if board was deactivated using HiPath 3000/5000 Manager E or lockout switch.
Off				
Flashing (500/ 500 ms)	Off	4	Hard disk test, application startup (depending on hard disk status, lasts approx. 3 - 8 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch.
During Operation				
Off	On	Idle (no call)		
Off	Flashing (500/ 500 ms)	At least one active port (call)		
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call		
On	Off	Board locked or board error occurred		Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch.

3.3.9 IVMS8N, IVMS8NR

Introduction

The following boards are used for the integrated voice mail functionality in HiPath Xpressions Compact in V2.5 and later:

- IVMS8N (**I**ntegrated **V**oice **M**ail **S**mall **N**ew) S30122-Q7379-X200 - for HiPath 3550 and HiPath 3350 (wall housing)
- IVMS8NR (**I**ntegrated **V**oice **M**ail **S**mall **N**ew **R**ack) S30122-K7379-Z200 - for HiPath 3500 and HiPath 3300 (19-inch housing)

Up to 500 mailboxes are available with a total storage capacity of 100 hours. The boards can also be used for Music on Hold and announcements.



HiPath Xpressions Compact supports a central voice mail functionality in a HiPath 3000/5000 network. All stations can use the central voice mail server. HiPath Xpressions Compact may be used as a central announcement device in a network system with V6.0 SMR-06 or later.

Optional administration of HiPath Xpressions Compact is also possible via the board's Ethernet (10/100BaseT) interface.



Only one IVMS8N or IVMS8NR may be installed per system.
For thermal reasons, the IVMS8N board may only be used in slots 5, 7, and 9 (lower slots) in HiPath 3550 (wall housing).
Slot 5 can only be used for the IVMS8N board in HiPath 3350 (wall housing).

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product.

Packing protection covering

You must remove the red packing protection covering (cardboard block) before starting up the board.

If it is necessary to transport the board again at a later time, for example, for servicing, you must reattach the packing protection covering.

Switches and LEDs

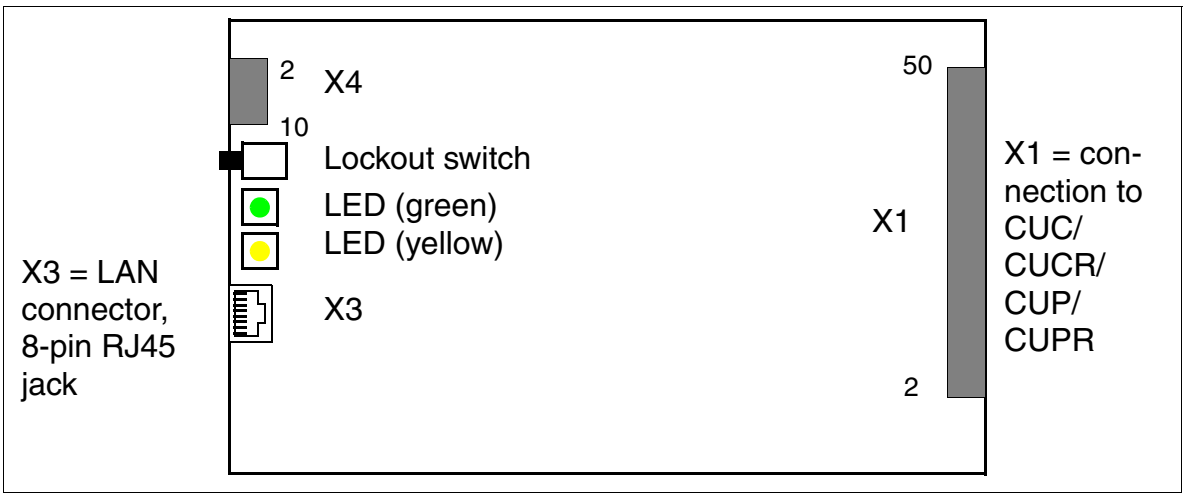


Figure 3-46 IVMS8N, IVMS8NR

Lockout switch settings

- Pressed = free (default)
- Not pressed = locked: existing connections remain active, new connections are locked.
  - The yellow LED lights up when all connections are ended and the board is effectively locked.
  - The yellow LED flashes when a lockout request is entered (via lockout switch or software) but at least one call is still active.

To reset the board to the default state, activate the lockout switch twice within the first 10 s of board startup.

Assignment of the RJ45 jack X3

The Ethernet (10/100BaseT) interface is accessed via the 8-pin RJ45 jack X3.

RJ45 Jack X3 Pin	Signal	Description
1	Tx +	Transmit +
2	Tx –	Transmit –
3	Rx +	Receive +
4	–	Not used
5	–	Not used
6	Rx –	Receive –
7	–	Not used
8	–	Not used

Table 3-50 IVMS8N, IVMS8NR - Assignment of the RJ45 Jack X3 (LAN Connector)

LED statuses and their meanings

LED Yellow	LED Green	Meaning		Action
During Startup and Initialization				
Off	Off	1	Boot procedure (lasts approx. 60 s)	
On	On	2	LED test (lasts approx. 10 s)	
On Off	Off	3	Lockout switch state signaling by yellow LED (lasts approx. 5 s): • blocked = On • free = Off	Possibly check if board was deactivated using HiPath 3000/5000 Manager E or lockout switch.
Flashing (500/ 500 ms)	Off	4	Hard disk test, application startup (depending on hard disk status, lasts approx. 2 - 9 minutes)	
Off	On	5a	Standby mode after successful boot	
On	Off	5b	Board locked or board error occurred	Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch. Change board if faulty.
During Operation				
Off	On	Idle (no call)		
Flashing (500/ 500 ms)	Off	At least one active port (call)		
Flashing (500/ 500 ms)	Flashing (500/ 500 ms)	Lockout switch activated during a call		
On	Off	Board locked or board error occurred		Check whether board was deactivated using HiPath 3000/5000 Manager E or lockout switch. Change board if faulty.
Flashing (100/ 100 ms)	Off	Upgrade process active		

Table 3-51 IVMS8N, IVMS8NR - LED Statuses

3.3.10 PBXXX (for selected countries only)

Introduction

The PBXXX (**P**eripheral **B**oard **XXX**) module can be used in HiPath 3800 to support country-specific CAS protocols.

> The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. Since the PBXXX board has SIVAPAC connector strips, you will have to install a SIVAPAC-SIPAC board adapter to be able to use it in HiPath 3800.
> For information on this procedure, please see Section 4.1.5.5.

The PBXXX board converts the Euro-ISDN protocol on an S_{2M} link into the Channel Associated Signaling (CAS) protocol. The board functions only in conjunction with a DIUN2. There is no direct connection between the PBXXX board and the system's central control unit. The DIUN2 handles all signaling and data traffic.

The following combination options are possible:

- 1 x DIUN2 + 1 x PBXXX (see Page 3-129)
  The PBXXX board must be plugged in on the left next to the DIUN2.
- 1 x DIUN2 + 2 x PBXXX (see Page 3-132)
  The PBXXX boards must be plugged in on the left and right next to the DIUN2.

Up to four PBXXX boards can be installed in a HiPath 3800. For power supply reasons, a maximum of two PBXXX can be installed in a cabinet.

Administration of the CAS protocol converter

Use the ECGM tool for administration. For information on installing the software on the service PC and on the required settings, see Page 3-303.

The C39195-Z7267-C2 cable can be used with a C39334-Z7080-C2 adapter (9-pin Sub-D jack – 25-pin Sub-D jack) to connect the PBXXX (port M) and the service PC.

Notes on setup using HiPath 3000/5000 Manager E

Because the PBXXX card is not recognized by the hardware, offline configuration is required with HiPath 3000/5000 Manager E. Either "DIUN2 + PBXXX" or "DIUN2 + 2PBXXX" should be specified as the board to be configured. After configuration, the module data can be seen in HiPath 3000/5000 Manager E. However, this is only visible in the software configuration, as the PBXXX card was only configured on the software side.

Note: The offline configuration of the PBXXX serves solely to visualize the card with HiPath 3000/5000 Manager E.

Front panel



Figure 3-47 PBXXX (S30810-Q6401-X) (for selected countries) – Front Panel

Seven-segment display

The board statuses listed in the following table are displayed.

Table 3-52 PBXXX (for selected countries only) – Seven-Segment Display

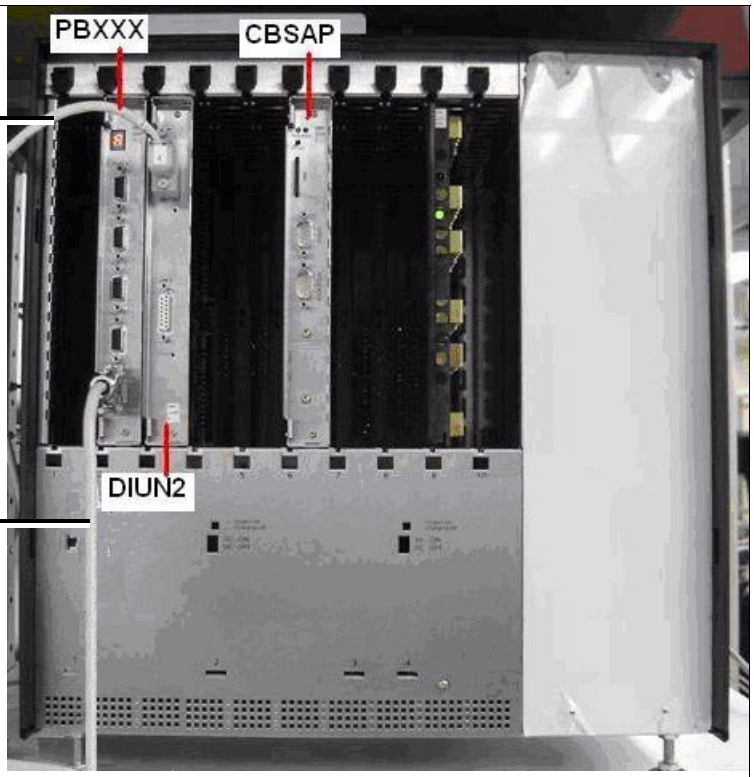
Display	Meaning
0	Waiting for the PBXXX software download
1	Starting the PBXXX software download
3	PBXXX software download
7	Writing the PBXXX software/extender software to the flash memory
8	Loading the PBXXX software/extender software from the flash memory
E	Waiting for ECGM command (10 s)
F	Error while writing the software to flash memory
H	No software in the flash memory, waiting for reload
F E	Flash memory erased (changing display)
o	PBXXX card active, Link 1 and Link 2 not active
P	Link 1 active, Link 2 not active
q	Link 1 not active, Link 2 active
R	Link 1 active, Link 2 active
J	Boot procedure

Connection 1x DIUN2 + 1 x PBXXX

The figure below shows an example of a DIUN2 with one PBXXX in the basic cabinet.

Connection cable DIUN2–PBXXX: C39195-A7700-B7
Note: The cable must run under the cabinet.

Cable to service PC



The CAS cable is connected to the backplane using an APPCU adapter (Figure 3-49).

Figure 3-48 HiPath 3800 Basic Cabinet – 1x DIUN2 + 1 x PBXXX

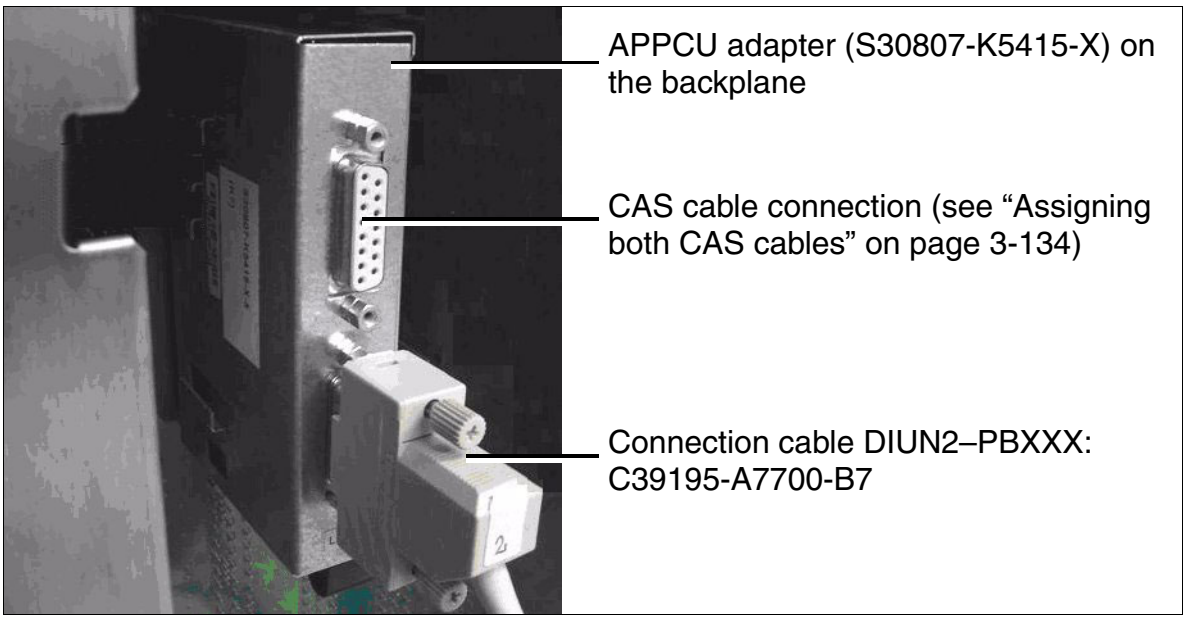


Figure 3-49 PBXXX (for selected countries only) – Connecting the CAS Cable using the APPCU Adapter

The backplane of the PBXXX board must be closed with the adapter panels provided (C39165-A7050-C35, Figure 3-50).



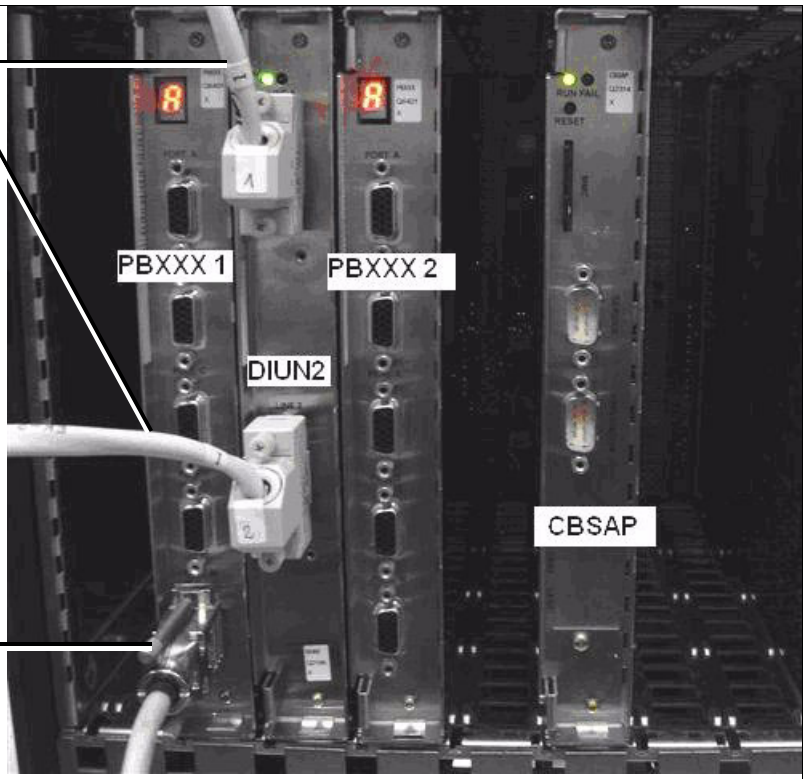
Figure 3-50 PBXXX (for selected countries only) – Adapter Panel (C39165-A7050-C35)

Connection 1x DIUN2 + 2 x PBXXX

The figure below shows an example of a DIUN2 with two PBXXXs in the basic cabinet.

Connection cable DIUN2–PBXXX: C39195-A7700-B7
Note: The cables must run under the cabinet.

Cable to service PC



The CAS cable is connected to the backplane using two APPCU adapters (Figure 3-52).

Figure 3-51 HiPath 3800 Basic Cabinet – 1x DIUN2 + 2 x PBXXX

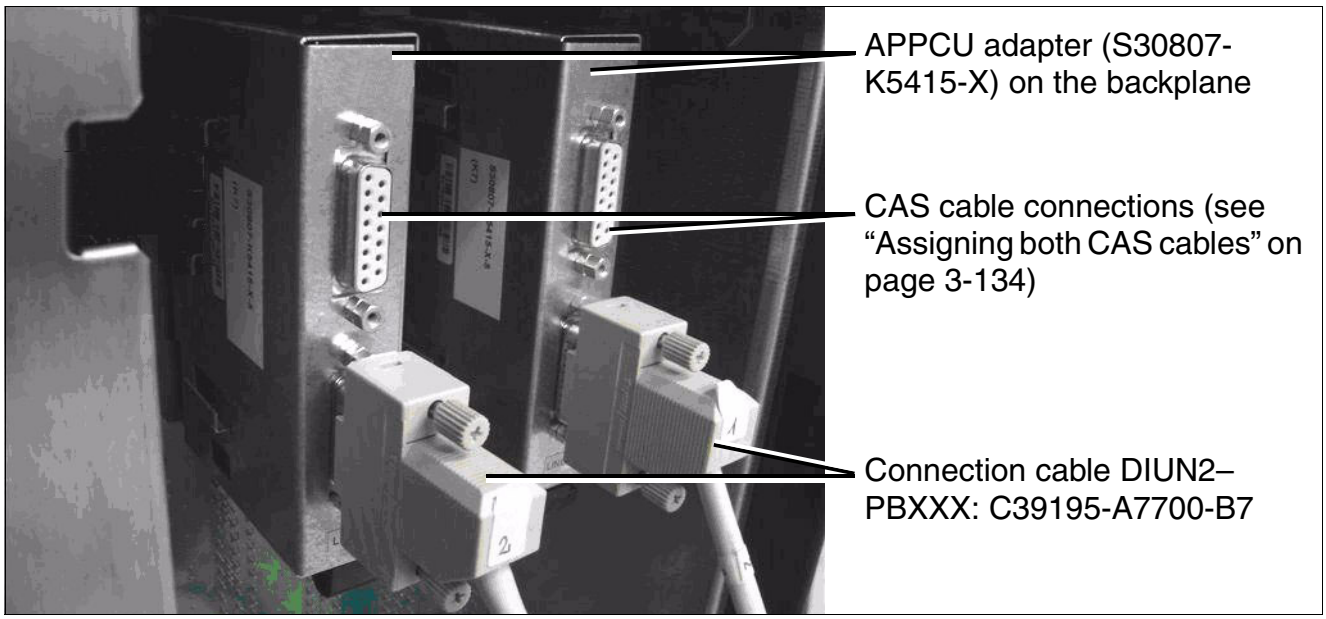


Figure 3-52 PBXXX (for selected countries only) – Connecting the CAS Cable using Two APPCU Adapters

The backplane of both PBXXX boards must be closed with the adapter panels provided (C39165-A7050-C35, Figure 3-50).

Assigning both CAS cables

The following CAS cables are connected to the backplane via two APPCU adapters:

- symmetrical line (120 ohms), open end

  Table 3-53 Assigning the CAS cable S30267-Z167-A100

15-pin Sub-D connector Pin	Function	Color code
9	a-wire (T), transmit	wht/blu
1	b-wire (R), transmit	blu/wht
15	a-wire (T), receive	wht/ora
8	b-wire (R), receive	ora/wht

- coaxial line (75 ohms)

  Table 3-54 Assigning the CAS cable S30267-Z80-A100

15-pin Sub-D connector Pin	Function	Wire
15	a-wire (T), receive	BNC line, cable 1
8	b-wire (R), receive	BNC shield, cable 1
9	a-wire (T), transmit	BNC line, cable 2
1	b-wire (R), transmit	BNC shield, cable 2

3.3.11 SLA8N (not for U.S.), SLA16N, SLA24N

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The following peripheral boards can be used in HiPath 3550:

- SLA8N (**S**ubscriber **L**ine **A**nalog) with eight analog T/R interfaces (not for U.S.)
- SLA16N (16 analog interfaces)
- SLA24N (24 analog interfaces)

Switches and LEDs

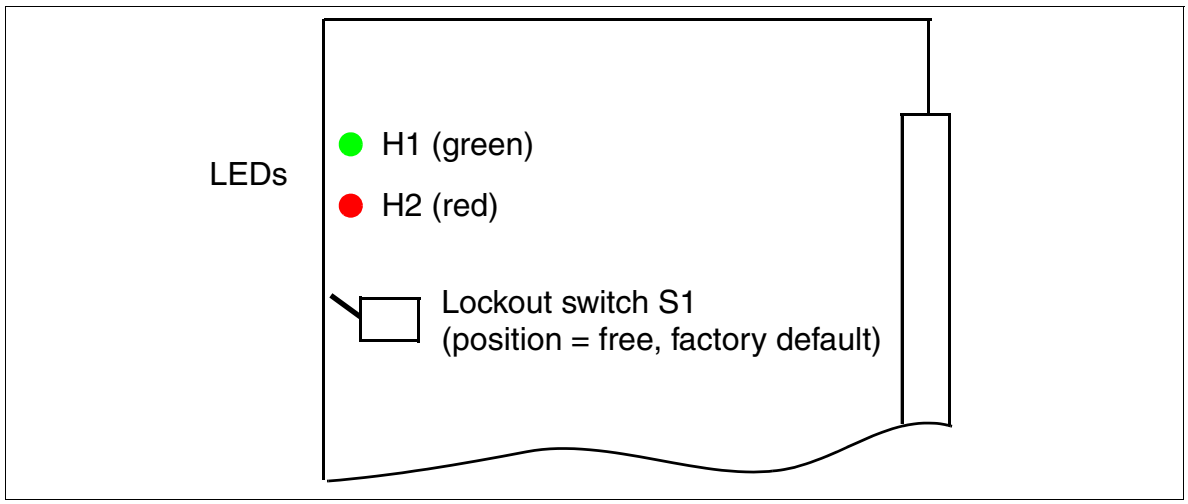


Figure 3-53 SLA8N (not for U.S.), SLA16N, SLA24N (S30810-Q2929-X200, -X100, -X)

The operating mode (short or long line with the appropriate flash times) can be set up for each subscriber line interface with HiPath 3000/5000 Manager E (the menu settings: Set up station –> Station –> Param –> Flags).

LED statuses and their meanings

Table 3-55 SLA8N (not for U.S.), SLA16N, SLA24N - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one station is activated.	

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-56 SLA8N, SLA16N, SLA24N Assignment Cable 1 (SU Xx8) (not for U.S.)

Color group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector BP: Xx8	SLA8N, SLA16N, SLA24N		MDFU/ MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	not used in SLA8N
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-57 SLA8N, SLA16N, SLA24N - Assignment Cable 2 (SU Xx9) (not for U.S.)

Color group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector BP: Xx9	SLA8N, SLA16N, SLA24N		MDFU/ MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	not used in SLA8N, 16N
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-58 SLA16N, SLA24N - Assignment (SU Xx8, Xx9) (for U.S. only)

#	a-wire[1] (tip)	b-wire[1] (ring)	SU connector		SLA16N, SLA24N		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
1	wht/blu		19		1a	Port 1	1	1a	
		blu/wht	39		1b		26	1b	
2	wht/ora		38		2a	Port 2	2	2a	
		ora/wht	48		2b		27	2b	
3	wht/grn		27		3a	Port 3	3	3a	
		grn/wht	47		3b		28	3b	
4	wht/brn		16		4a	Port 4	4	4a	
		brn/wht	46		4b		29	4b	
5	wht/gry		05		5a	Port 5	5	5a	
		gry/wht	45		5b		30	5b	
6	red/blu		14		6a	Port 6	6	6a	
		blu/red	44		6b		31	6b	
7	red/ora		23		7a	Port 7	7	7a	
		ora/red	43		7b		32	7b	
8	red/grn		32		8a	Port 8	8	8a	
		grn/red	42		8b		33	8b	
9	red/brn		11		9a	Port 9	9	9a	
		brn/red	31		9b		34	9b	
10	red/gry		02		10a	Port 10	10	10a	
		gry/red	22		10b		35	10b	
11	blk/blu		13		11a	Port 11	11	11a	
		blu/blk	33		11b		36	11b	
12	blk/ora		04		12a	Port 12	12	12a	
		ora/blk	24		12b		37	12b	
13	blk/grn		15		13a	Port 13	13	13a	
		grn/blk	35		13b		38	13b	
14	blk/brn		06		14a	Port 14	14	14a	
		brn/blk	26		14b		39	14b	
15	blk/gry		17		15a	Port 15	15	15a	
		gry/blk	37		15b		40	15b	
16	yel/blu		08		16a	Port 16	16	16a	
		blu/yel	28		16b		41	16b	

Table 3-58 SLA16N, SLA24N - Assignment (SU Xx8, Xx9) (for U.S. only)

#	a-wire[1] (tip)	b-wire[1] (ring)	SU connector		SLA16N, SLA24N		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
17	red/brn			11	17a	Port 17	9	9a	not used in SLA16N
		brn/red		31	17b		34	9b	
18	red/gry			02	18a	Port 18	10	10a	
		gry/red		22	18b		35	10b	
19	blk/blu			13	19a	Port 19	11	11a	
		blu/blk		33	19b		36	11b	
20	blk/ora			04	20a	Port 20	12	12a	
		ora/blk		24	20b		37	12b	
21	blk/grn			15	21a	Port 21	13	13a	
		grn/blk		35	21b		38	13b	
22	blk/brn			06	22a	Port 22	14	14a	
		brn/blk		26	22b		39	14b	
23	blk/gry			17	23a	Port 23	15	15a	
		gry/blk		37	23b		40	15b	
24	yel/blu			08	24a	Port 24	16	16a	
		blu/yel		28	24b		41	16b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Technical connection conditions

- Maximum supply current: approximately 34 mA; maximum supply voltage: approximately 40 Vdc
- Ring voltage against negative supply voltage (a-wire (tip)/RING): two telephones maximum
- Range, see Section 2.7
- Loop current detection > 10 mA
- Ground button detection > 20 mA
- The transmission technology is set according to the specific country through the respectively entered country code (for country initialization, see Chapter 5, “Starting Up HiPath 3000”).

3.3.12 SLAD4, SLAD8, SLAD8R

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

In HiPath 3000/5000 V6 R4 and V7 R4 and later, the following boards can be used to connect analog subscribers (analog phones, group 3 fax, etc.):

- SLAD4 (**S**ubscriber **L**ine **A**nalog with **D**uSLIC) S30810-H2956-X100 – for HiPath 3550 and HiPath 3350
- SLAD8 (**S**ubscriber **L**ine **A**nalog with **D**uSLIC) S30810-H2956-X200 – for HiPath 3550 and HiPath 3350
- SLAD8R (**S**ubscriber **L**ine **A**nalog with **D**uSLIC **R**ack) S30810-K2956-X300 – for HiPath 3500 and HiPath 3300

The SLAD boards are compatible successor modules for the following boards:

- 4SLA (S30810-Q2923-X200)
- 8SLA (S30810-Q2923-X100)
- 8SLAR (S30810-K2925-Z).

These are being phased out and can no longer be ordered.

Main features

A DTMF code receiver is available for each analog interface (permits DTMF dialing at analog telephones. This guarantees that all analog terminals connected are fully accessible.

These boards support calling name identification presentation (CLIP).

The connection of external extensions via OPS (Off-Premises Station) signaling is supported.

Ring voltage is generated by the power supply unit of the relevant system (UPSC-D for SLAD4 and SLAD8, UPSC-DR for SLAD8R). Information about country-specific ring frequency settings is provided in Section 2.8.

SLAD4, SLAD8 interfaces



Figure 3-54 SLAD4, SLAD8 – interfaces

Table 3-59 SLAD4, SLAD8 – assigning the ports

X2, Pin	T/R ports 1-4	X3, Pin	T/R ports 5-8
1	a 1	1	a 5
2	b 1	2	b 5
3	a 2	3	a 6
4	b 2	4	b 6
5	a 3	5	a 7
6	b 3	6	b 7
7	a 4	7	a 8
8	b 4	8	b 8

Nur für USA:
Bei SLAD4 und SLAD8 sind außenliegende Nebenstellen an den a/b-Ports über OPS-Signalisierung (im Folgenden: OPS-Ports) anschließbar. Die Anzahl der OPS-Ports ist begrenzt. Folgende Maximalzahlen dürfen nicht überschritten werden:

- in HiPath 33x0: max. 4 OPS-Ports
- in HiPath 35x0: max. 8 OPS-Ports und max. 4 OPS-Ports pro Baugruppe

An SLAD16 sind OPS-Ports generell verboten.

SLAD8R interfaces

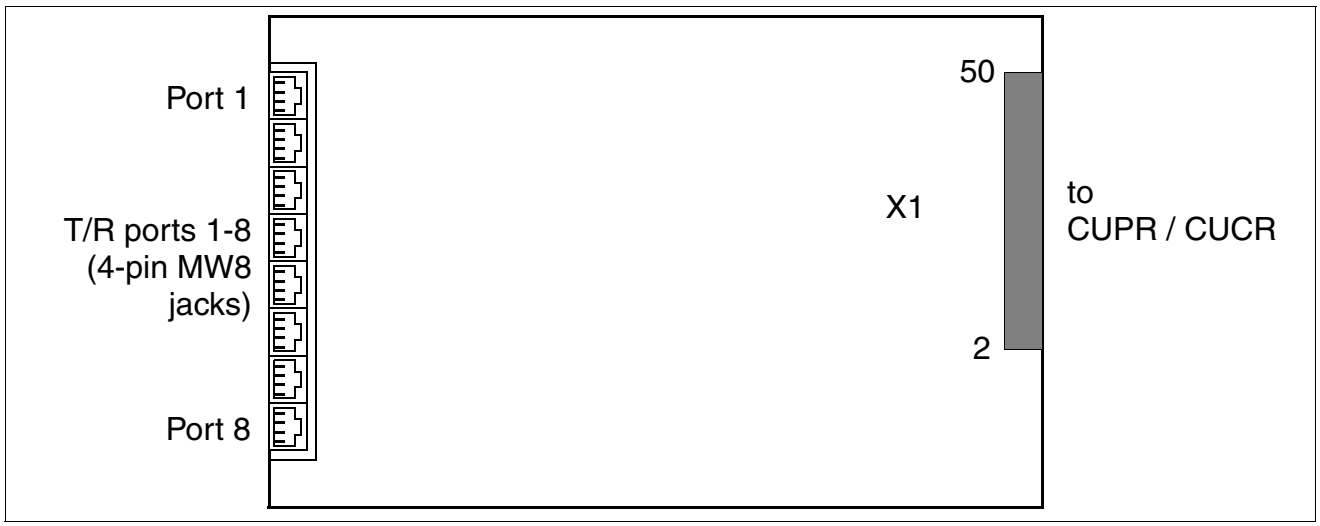


Figure 3-55 SLAD8R – interfaces

Table 3-60 SLAD8R – assigning the ports

RJ45 jack	X2, Pin	T/R ports 1-4	RJ45 jack	X2, Pin	T/R ports 5-8
1	14	a 1	5	54	a 5
	15	b 1		55	b 5
2	24	a 2	6	64	a 6
	25	b 2		65	b 6
3	34	a 3	7	74	a 7
	35	b 3		75	b 7
4	44	a 4	8	84	a 8
	45	b 4		85	b 8

3.3.13 SLAD16

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

HiPath 3000/5000 V7 R6 or later supports the use of the SLAD16 board (**S**ubscriber **L**ine **A**nalog with **D**uSLIC) in HiPath 3550 and HiPath 3350 to connect analog stations (analog telephones, Group 3 fax devices, etc.).

The SLAD16 board (S30810-Q2957-X) is a compatible successor to the 16SLA board (S30810-Q2923-X), which is being discontinued and can no longer be ordered.

Main features

A DTMF code receiver is available for each analog interface (permits DTMF dialing at analog telephones). This guarantees that all analog terminals connected are fully accessible.

These boards support calling name identification presentation (CLIP).

It is prohibited to connect external extensions to SLAD16 using OPS signaling (off-premises station).

Ring voltage is generated by the UPSC-D power supply unit and may require connection to an external power supply unit depending on configuration. Please refer to Section 2.8, “Country-Specific Ring Frequencies for Analog Subscriber Line Modules” for information on how to set the country-specific ring frequency.

Configuration rules for HiPath 3350

The following rules must be observed when using an SLAD16 board to guarantee that the communication system is sufficiently cooled:

- The second HiPath 3350 slot may not be occupied with the following boards: SLAD16, SLAD8, SLAD4, 16SLA, 8SLA, 4SLA.
- Up to 20 analog stations may be connected to HiPath 3350 (including CBCC).

Configuration rules for HiPath 3550

The following table shows the number at which analog station ports must occupy which slots in which sequence and whether the fan kit (C39165-A7021-B46-1) must be installed. Generally, the fan kit is always required if more that 32 analog stations ports are present in HiPath 3550 (not including the four CBCC ports). This also applies if, for example, two SLAD16 and one SLAD8 are installed:

Table 3-61 Using the fan kit on HiPath 3550

Number of analog station ports	Slot				Fan kit Yes/No
	6	8	4	7	
16 (**1** SLAD16)	X				No
32 (**2** SLAD16)	X	X			No
48 (**3** SLAD16)	X	X	X		Yes
64 (**4** SLAD16)	X	X	X	X	Yes

Important: The fan kit (C39165-A7021-B46-1) is not permitted in the U.S. and Canada; therefore, a maximum of two SLAD16 (up to 32 analog station ports) may be installed in these countries.

Examples:

- If 32 analog station ports are required and thus two SLAD16 boards are installed, slots 6 and 8 should be used. No fan kit is required.
- If 40 analog station ports are required and thus two SLAD16 boards and one SLAD8 board are installed, slots 6, 8 and 4 should be used. The fan kit must be installed.
- If 64 analog station ports are required and thus four SLAD16 boards are installed, slots 6, 8, 4 and 7 should be used. The fan kit must be installed. Thus slot 7 is occupied and only slot 9 is available for the TS2 board.

Interfaces

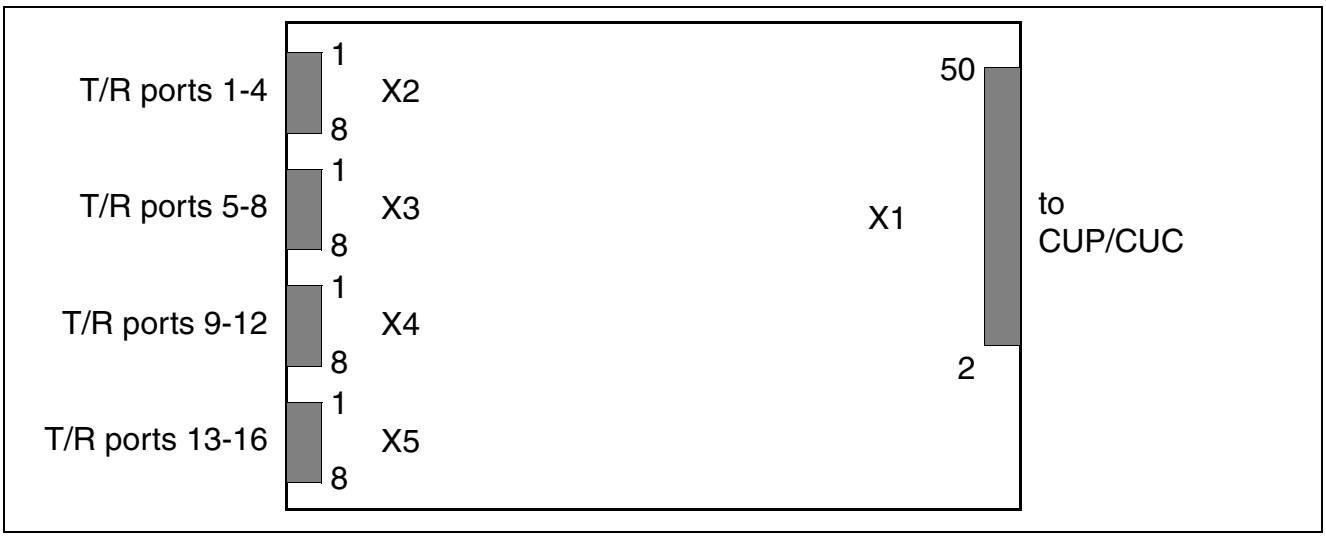


Figure 3-56 SLAD16 – Interfaces

Table 3-62 SLAD16 – Port Assignment

X2, Pin	T/R ports 1-4	X3, Pin	T/R ports 5-8	X4, Pin	T/R ports 9-12	X5, pin	T/R ports 13-16
1	a 1	1	a 5	1	a 9	1	a 13
2	b 1	2	b 5	2	b 9	2	b 13
3	a 2	3	a 6	3	a 10	3	a 14
4	b 2	4	b 6	4	b 10	4	b 14
5	a 3	5	a 7	5	a 11	5	a 15
6	b 3	6	b 7	6	b 11	6	b 15
7	a 4	7	a 8	7	a 12	7	a 16
8	b 4	8	b 8	8	b 12	8	b 16

Installing fan kit C39165-A7021-B46-1 for SLAD16 in HiPath 3550

Important: Installing the fan kit marks the end of silent system operation. This must be taken into consideration when operating the system in an office environment.

To install and connect the fan kit, proceed as follows:

Step	Activity
1.	Disconnect system from power supply. **CAUTION** **Risk of electric shock through contact with live wires** Always switch off the system voltage by plugging the power plug out. If using an uninterruptible power supply (USP) on the system, switch off the battery voltage first.
2.	Open the system. **CAUTION** **Cuts caused by sharp edges on the shielding plate** When opening the system, ensure that you only touch the housing cover from the outside (see Section 4.2.3.4, “Removing the System Housing Cover”).
3.	Place the fan kit *[A]* on the system’s shelf *[B]* (see Figure 3-57).
4. ***NOTE:***	Arrange all fan kits on the board frame so that cool air reaches all expansion slots, i.e. the distance *[C]* to the wall must be approx. 45 mm, (see Figure 3-57). **Danger of overheating from incorrect positioning of the fan kit** *The fan kit should not be mounted directly above the baseplate because in this position the cool air does not reach all the expansion slots!*
5.	Push the two supplied securing clips over positions *[D]* illustrated in Figure 3-57 to attach the fan kit to the shelf.
6.	Remove the power supply cable between PB3000 and UPSC-D and replace it with the new power supply cable C39195-A7985-B41-1. This cable has a branch-off point for the fan kit.
7.	Place the connection cable *[E]* for the fan kit on the shelf as displayed in figure Figure 3-58 and attach them with cable ties *[F]* at the points shown.
8.	Close the plug connection *[G]* to connect the fan kit connection cable and the branched part of the power supply cable (see Figure 3-59).

Step	Activity
9. 	Close the system. **CAUTION** **Cuts caused by sharp edges on the shielding plate** When opening the system, ensure that you only touch the housing cover from the outside.
10.	Start the system by plugging in the power plug. If using a UPS, the battery voltage must also be switched on.

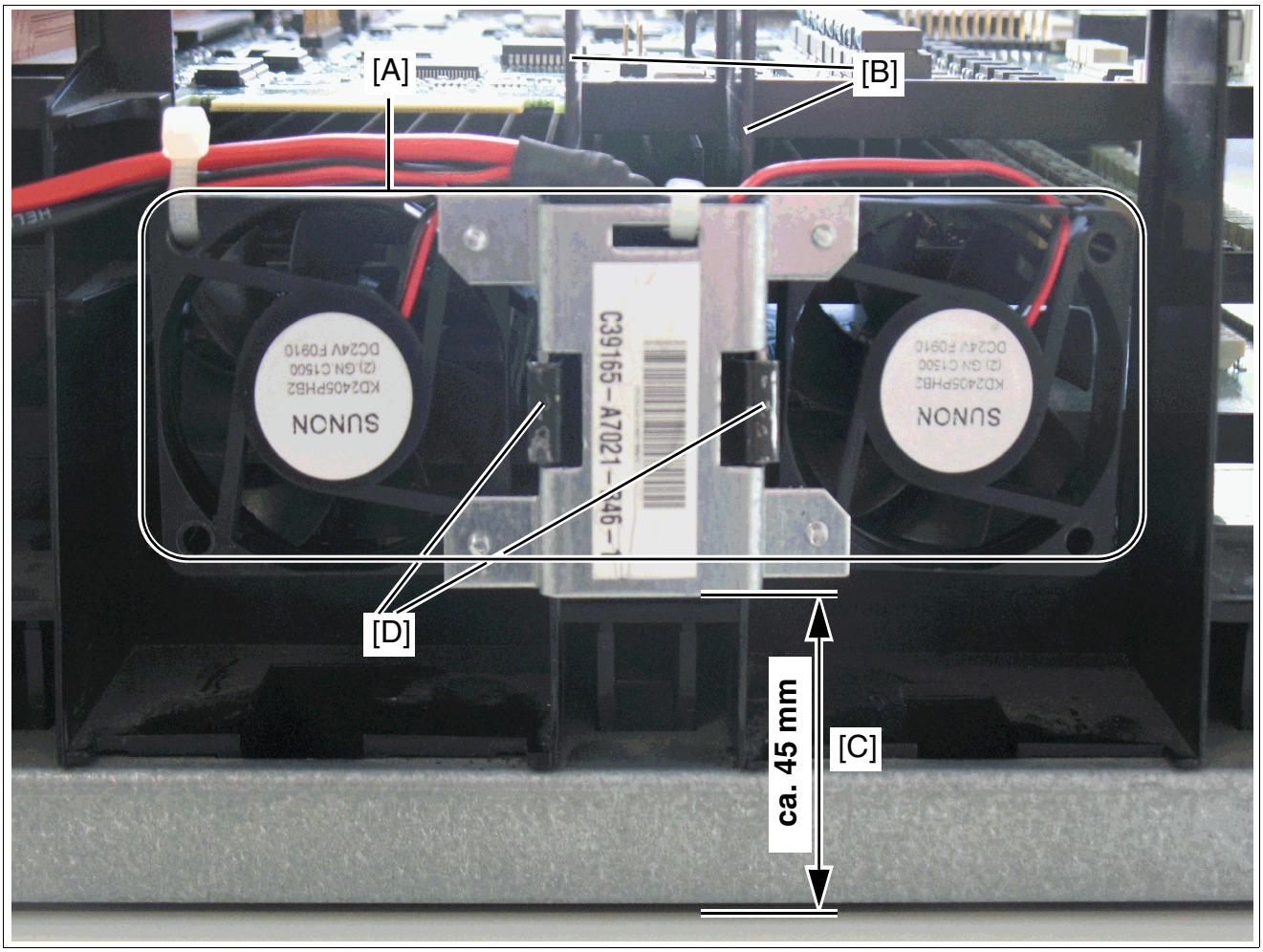


Bild 3-57 SLAD16 - Einbau des Lüfterkits in HiPath 3550

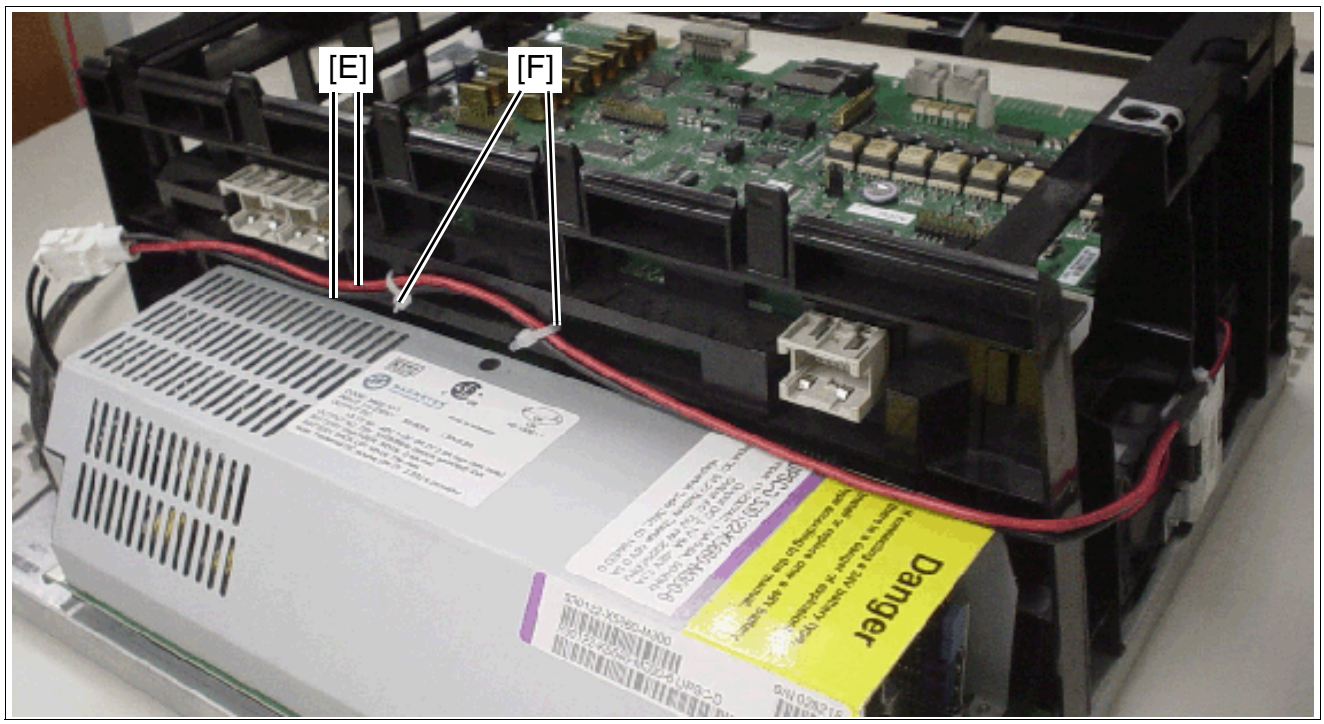


Bild 3-58 SLAD16 - Anschlusskabel des Lüfterkits

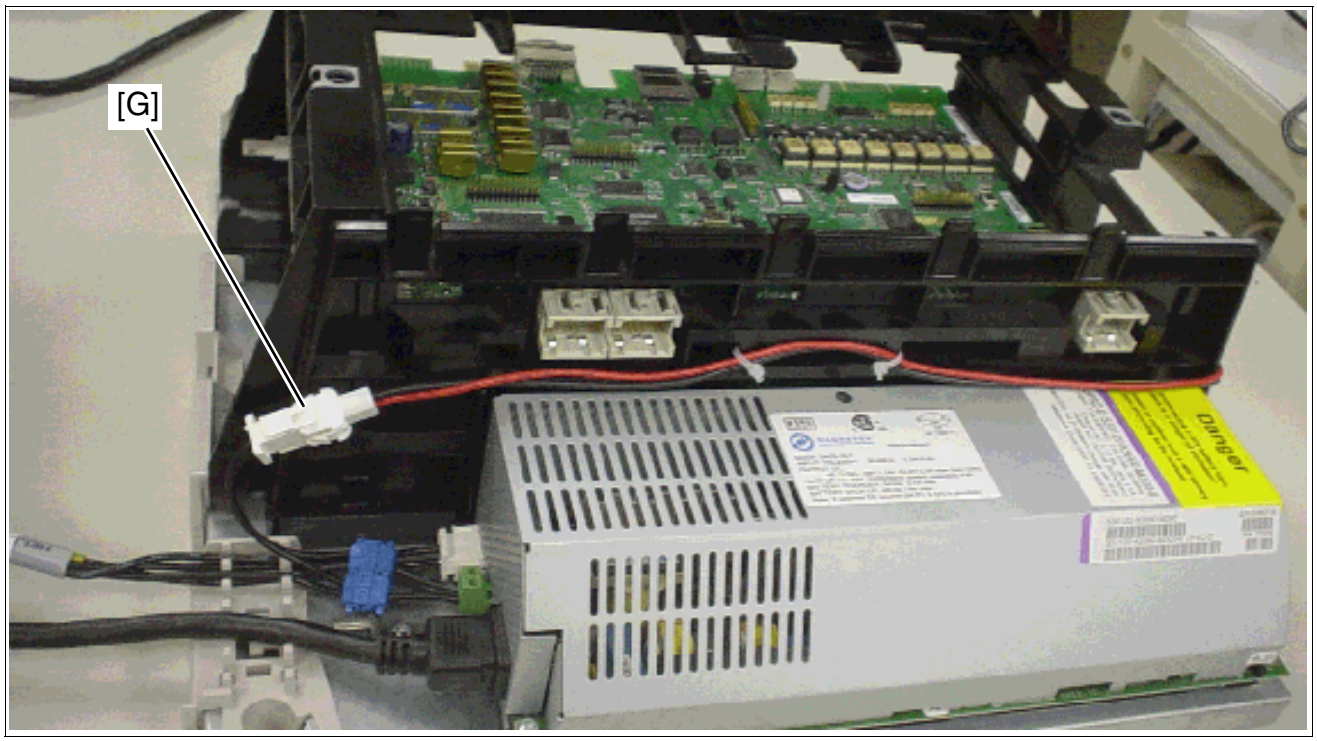


Bild 3-59 SLAD16 - Anschluss des Lüfterkits

3.3.14 SLC16N (not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLC16N board is used in HiPath Cordless Office and connects base stations to

- HiPath 3550 (max. one SLC16N per system).

Chapter 11 contains basic information on the options available for the use of HiPath Cordless Office.

For initial installation of HiPath Cordless Office, the HiPath cordless system number (DECT ID) must be ordered together with the SLC16N board.
Replacement boards are always delivered without a HiPath cordless system number.
Installing the first SLC16N and entering the HiPath cordless system number releases 16 mobile telephones for use (PIN numbers are assigned). These mobile units can then be logged on to the system. Other mobile telephones must be released before they can be used (see Section 10.13.4).

The base stations BS3/1 (S30807-H5482-X), BS3/3 (S30807-H5485-X), and BS3/S (X30807-X5482-X100) are being phased out and may no longer be ordered. You must use the successor product BS4 (S30807-U5491-X) instead of the types named.
You can still operate the base stations listed in HiPath 3000. Base stations BS3/1, BS3/3, and BS4 can also be used in mixed mode.

Base stations must be clocked with a high degree of accuracy for HiPath Cordless Office. For this, the subboard CMA or CMS must be plugged into the CBCC board (HiPath 3550) (see Table 11-1).

Switches and LEDs

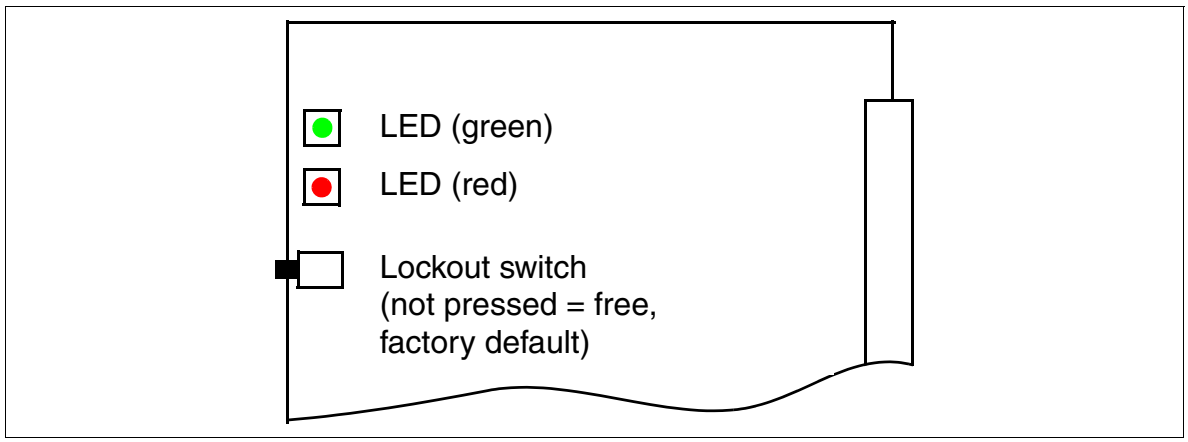


Figure 3-60 SLC16N (S30810-Q2193-X100) (not for U.S.)

When you activate the lockout switch (press the switch), all idle mobile telephones are locked. Active mobile telephones are not locked until their release keys are pressed.
Before unplugging the SLC16N board, always activate the lockout switch and wait until the green LED stops flashing. This precaution ensures that none of the mobile telephones are active.

LED statuses and their meanings

Table 3-63 SLC16N (not for U.S.) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	
On	On	Board disabled.	Check whether board was deactivated using the lockout switch.

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-64 SLC16N (not for U.S.) - Cable Assignment

Color group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector BP: Xx8	SLC16N		MDFU/ MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Access 1	1a	4	BS 1: $U_{P0/E}$ port 1
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Access 2	2a	4	BS x: $U_{P0/E}$ port x
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Access 3	3a	4	BS x: $U_{P0/E}$ port x
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Access 4	4a	4	BS x: $U_{P0/E}$ port x
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Access 5	5a	4	BS x: $U_{P0/E}$ port x
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Access 6	6a	4	BS x: $U_{P0/E}$ port x
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Access 7	7a	4	BS x: $U_{P0/E}$ port x
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Access 8	8a	4	BS x: $U_{P0/E}$ port x
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Access 9	9a	4	BS x: $U_{P0/E}$ port x
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Access 10	10a	4	BS x: $U_{P0/E}$ port x
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Access 11	11a	4	BS x: $U_{P0/E}$ port x
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Access 12	12a	4	BS x: $U_{P0/E}$ port x
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Access 13	13a	4	BS x: $U_{P0/E}$ port x
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Access 14	14a	4	BS x: $U_{P0/E}$ port x
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Access 15	15a	4	BS x: $U_{P0/E}$ port x
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Access 16	16a	4	BS x: $U_{P0/E}$ port x
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

System configuration using SLC16N

For information on the maximum possible system configuration of HiPath Cordless Office with SLC16N boards, see Table 11-1.

Supplying power to base stations

Power is supplied to the base stations primarily via the internal PSU in the system in question.

- HiPath 3550
  Subject to certain prerequisites, the system-internal PSU UPSC-D provides sufficient power for the operation of sixteen BS3/1s (one $U_{P0/E}$ each) or eight BS3/3s (two $U_{P0/E}$ each). These prerequisites depend on the

  – Line length and line type between SLC16N and base station.
  The following specifications are based on line lengths of up to 1000 m and a line type 2x0.6 mm per $U_{P0/E}$.

  – Number and type of corded telephones connected to the system.
  Table 3-65 through Table 3-66 show which telephone configurations work without additional power supply.

Table 3-65 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16N and BS4s connected to SLC16N (not for U.S.)

Number of BS3/1s and BS4s connected via 1x$U_{P0/E}$ to SLC16N	**Maximum number of corded telephones**					
	Analog telephones					
	A0	1-10	11-20	21-30	31-40	41-50
	optiPoint 500 (digital telephones)					
1	66	61	57	53	48	44
2	63	59	54	50	46	41
3	60	56	52	47	43	39
4	58	53	49	45	40	36
5	55	51	47	42	38	33
6	53	48	44	40	35	31
7	50	46	41	37	33	28
8	47	43	39	34	30	26
9	45	40	36	32	27	23
10	42	38	33	29	25	20
11	40	35	31	27	22	18
12	37	33	28	24	20	15
13	34	30	26	21	17	13
14	32	27	23	19	14	10
15	29	25	20	16	12	7

Table 3-65 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16N and BS4s connected to SLC16N (not for U.S.)

Number of BS3/1s and BS4s connected via 1x$U_{P0/E}$ to SLC16N	**Maximum number of corded telephones**					
	Analog telephones					
	A0	1-10	11-20	21-30	31-40	41-50
	optiPoint 500 (digital telephones)					
16	27	22	18	13	9	5

Table 3-66 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/3 Base Stations Connected to SLC16N and BS4s Connected to SLC16N (not for U.S.)

Number of BS3/3s and BS4s connected via 2x$U_{P0/E}$ to SLC16N	**Maximum number of corded telephones**					
	Analog telephones					
	0	1-10	11-20	21-30	31-40	41-50
	optiPoint 500 (digital telephones)					
1	64	60	56	51	47	42
2	60	56	52	47	43	39
3	57	52	48	43	39	35
4	53	48	44	40	35	31
5	49	44	40	36	31	27
6	45	40	36	32	27	23
7	41	37	32	28	23	19
8	37	33	28	24	20	15

Options for supplying power to the base stations

For information on connecting the base stations, refer to the HiPath Cordless Office service manual.

Each base station must be connected to the SLC16N via the main distribution frame (MDFU or MDFU-E).

Always route the $U_{P0/E}$ interfaces on the SLC16N via a splitting strip to arrest surges caused to lightning. To do so, insert the polarized surge protectors (supplied) in the plugging locations on the splitting strip from above.

The following options are available for supplying power to the base stations:

- Power supply via one $U_{P0/E}$ interface (Page 3-157)
- Power supply via two $U_{P0/E}$ interfaces (Page 3-158)
- Power supply via three $U_{P0/E}$ interfaces (Page 3-159), for BS3/3 only

If the power supplied by the UPSC-D (HiPath 3550) is insufficient, additional power can be supplied by installing the external power supply (Powerbox PB3000 with LUNA2 (Page 3-159)).

Signal propagation times differ due to the varying distances between the base stations, the system, and the connection cables used (refer to the HiPath Cordless Office service manual). The SLC16N board automatically balances these propagation times.

Base Station Power Supply via One $U_{P0/E}$ Interface

Connect the base station to a free interface on SLC16N as shown in Figure 3-61. Be careful not to exceed the maximum connection cable lengths (1000 m for 2x0.6 mm).

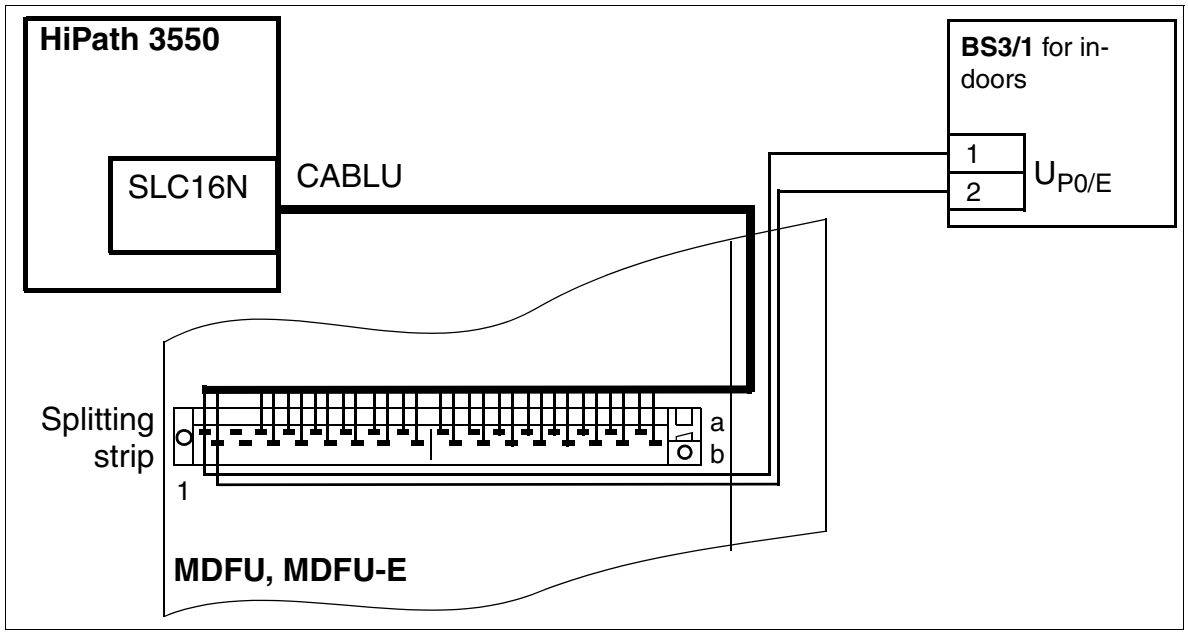


Figure 3-61 Base Station Power Supply via One $U_{P0/E}$ Interface (not for U.S.)

Base Station Power Supply via Two $U_{P0/E}$ Interfaces

Connect the base station to two free interfaces on SLC16N as shown in Figure 3-62. Be careful not to exceed the maximum connection cable lengths (1000 m for 2x0.6 mm).
Using two $U_{P0/E}$ interfaces increases the traffic capacity in BS3/3 base stations.

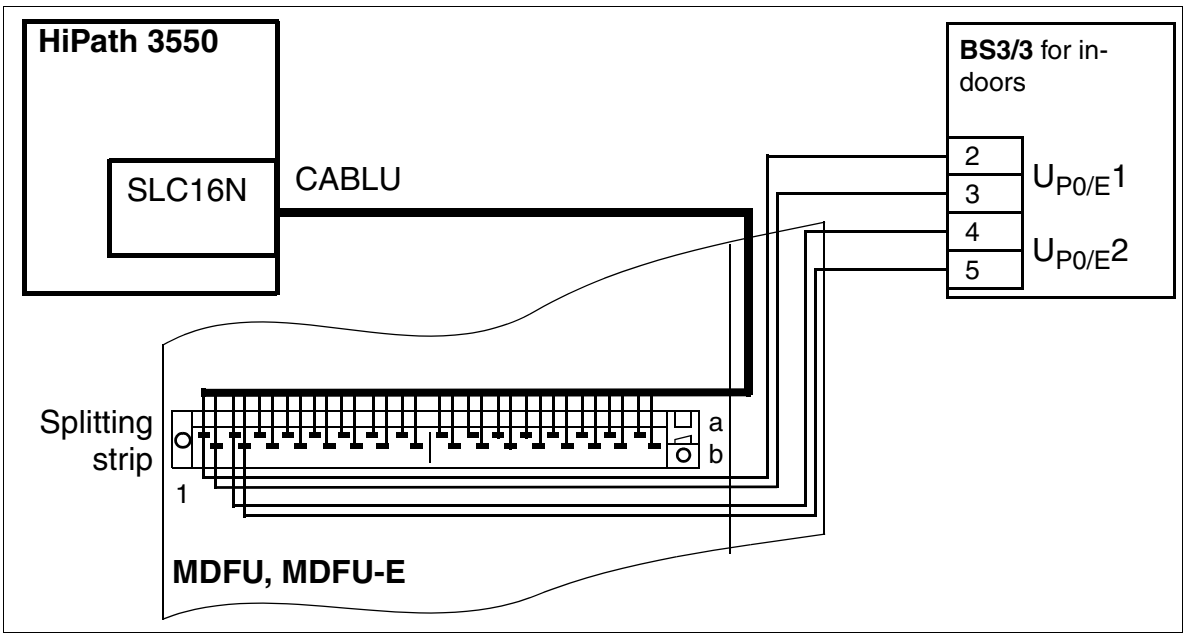


Figure 3-62 Base Station Power Supply via Two $U_{P0/E}$ Interfaces (not for U.S.)

Base Station Power Supply via Three $U_{P0/E}$ Interfaces

Connect the base station to three free interfaces on SLC16N as shown in Figure 3-63. Be careful not to exceed the maximum connection cable lengths (1000 m for 2x0.6 mm).
The use of three $U_{P0/E}$ interfaces increases the traffic capacity in the base station.

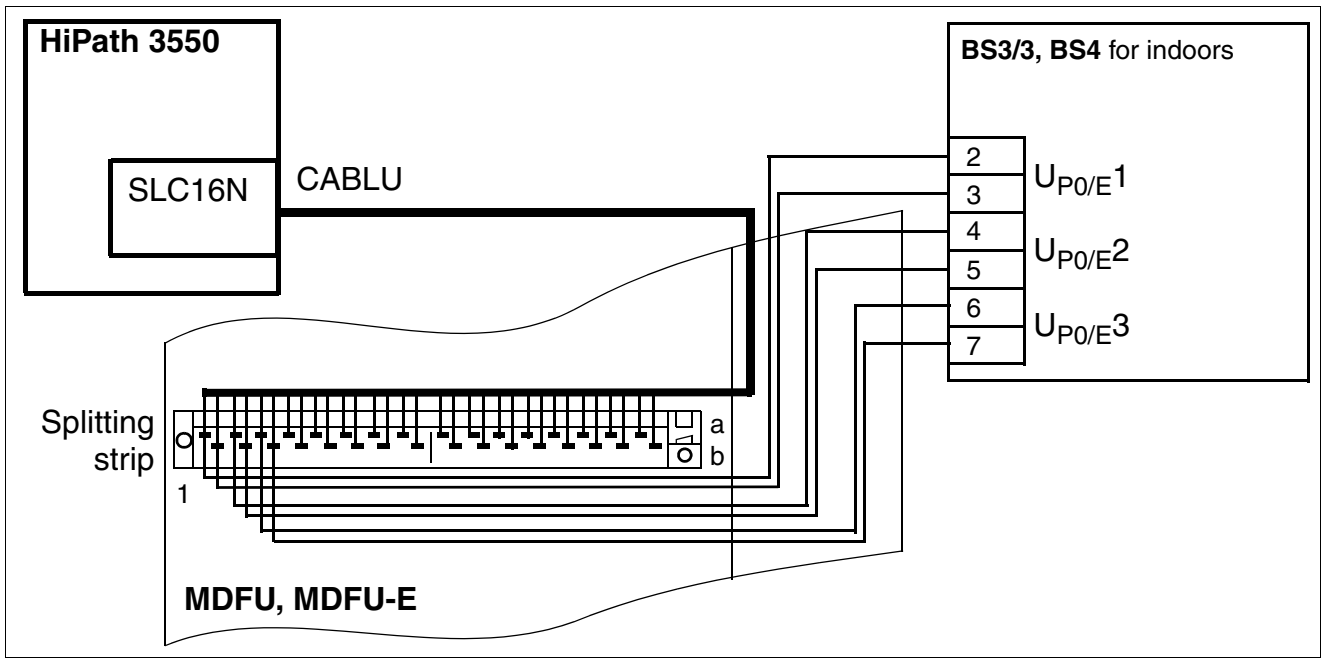


Figure 3-63 Base Station Power Supply via Three $_{P0/E}$ Interfaces (not for U.S.)

Additional UPSC-D power supply via an external power supply unit

If the power supplied by the UPSC-D (HiPath 3550) is insufficient, additional power can be supplied by installing the external power supply (Powerbox PB3000). To do this, connect the DC port on the PB3000 to the special DC input on the UPSC-D.

As described on the preceding pages, the base stations must be connected to free $U_{P0/E}$ interfaces. BS3/1 needs one, BS3/2 needs two, and BS3/3 needs three free $U_{P0/E}$ interfaces.

Powerbox PB3000 is also used if an external power supply unit is required for HiPath 3500 or HiPath 3300 (19-inch housing).

Section 11.4, “Power-Related Capacity Limits” shows which telephone configurations manage without an additional power supply and which configurations require an additional one.

3.3.15 SLCN (not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLCN (**S**ubscriber **L**ine Module **C**ordless **N**ew) board is used in HiPath 3800 and connects base stations to HiPath Cordless Office. There are 16 $U_{P0/E}$ ports available for this.

You can install up to four SLCN boards in one system.

Chapter 11 contains basic information on the options available for operating HiPath Cordless Office.

Base stations must be clocked with a high degree of accuracy for HiPath Cordless Office. For this, the subboard CMS must be plugged into the CBSAP board (see Table 11-1).

Front panel

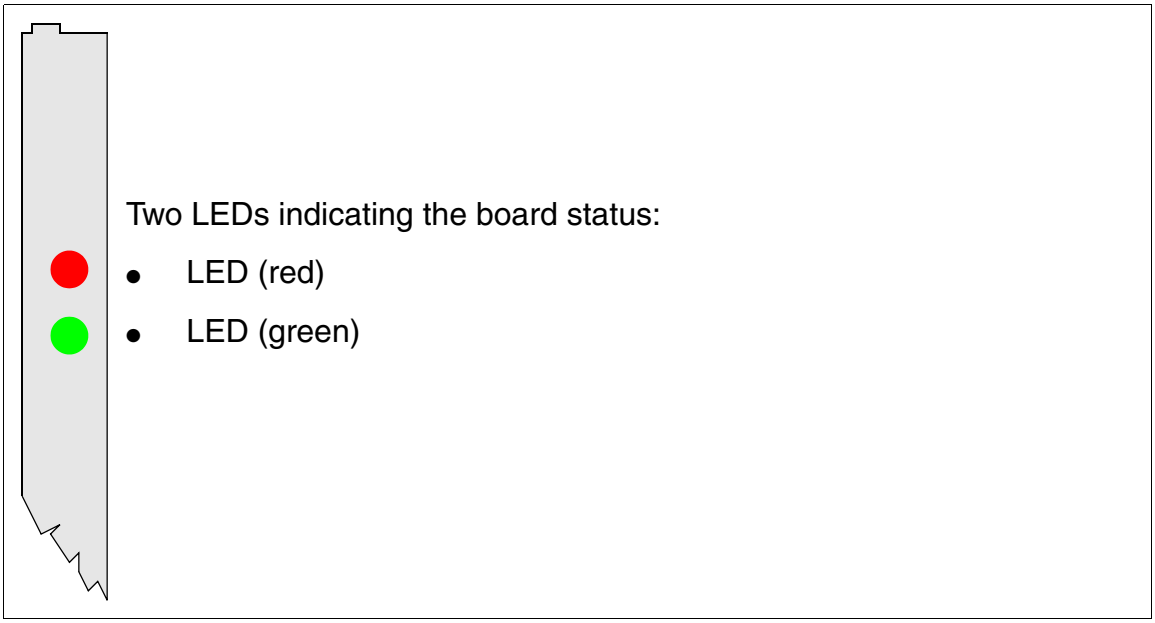


Figure 3-64 SLCN (not for U.S.) (S30810-Q2193-X300) - LEDs in the Front Panel

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

LED statuses and their meanings

Table 3-67 SLCN (not for U.S.) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-68
- For connecting to the connector panels using RJ45 jacks: Table 3-69
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-70

Table 3-68 SLCN (not for U.S.) - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLCN		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-69 SLCN (not for U.S.) - Assignment of Connector Panels with RJ45 Jacks

RJ45 jack		SLCN	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-69 SLCN (not for U.S.) - Assignment of Connector Panels with RJ45 Jacks

RJ45 jack		SLCN	Notes
No.	**Pin**		
17	4		Free
	5		
18	4		Free
	5		
19	4		Free
	5		
20	4		Free
	5		
21	4		Free
	5		
22	4		Free
	5		
23	4		Free
	5		
24	4		Free
	5		

Table 3-70 SLCN (not for U.S.) - Assignment of Connector Panels with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	SLCN		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

System configuration using SLCN

For information on the maximum possible system configuration of HiPath Cordless Office with the SLCN boards see Table 11-1.

SLCN board distribution in HiPath 3800 cabinets

You can install up to four SLCN boards in HiPath 3800. A system cabinet can be fitted with all four SLCN boards.



To guarantee uninterrupted operation of the HiPath 3800, not more than two SLCN boards should be plugged in to a PCM segment. This condition must always be observed. For information on PCM segment distribution, see Section 4.1.5.7.
One board slot should be kept free between two SCLN boards to prevent overheating.

Supplying power to base stations

Power is supplied to the base stations primarily via the internal PSU in the system in question.

If the correct number of LUNA2 modules was calculated, the system's internal power supply unit provides sufficient power to supply the HiPath Cordless Office system configuration specified in Table 11-1.

3.3.16 SLMAE8, SLMAE (SLMAE200)

The SLMAE8 and SLMAE boards will be replaced from August 2011 by the SLMAV board (8 ports or 24 ports).

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLMAE8 and SLMAE [SLMAE200] boards (**S**ubscriber **L**ine **M**odule **A**nalog **E**nhanced) provide analog T/R interfaces for use in HiPath 3800 as of V6.0 SMR-10:

- SLMAE8 (S30810-Q2225-X100) = 8 analog T/R interfaces
- SLMAE (S30810-Q2225-X200) = 24 analog T/R interfaces

These boards support calling name identification presentation (CLIP).

NOTE: External analog extensions may only be connected via the SLMAE board.

For U.S. only: Connecting external extensions via OPS signaling (OPS: Off-Premises Station) is not supported.

Ring voltage

SLMAE8 and SLMAE boards generate their own ring voltage at 65 V_{eff}, meaning that an external ring voltage generator is not required.

Touch guard

CAUTION
Risk of electric shock through contact with live components
The boards are fitted with a touch guard because the onboard heat sinks are energized. Do not remove this touch guard.

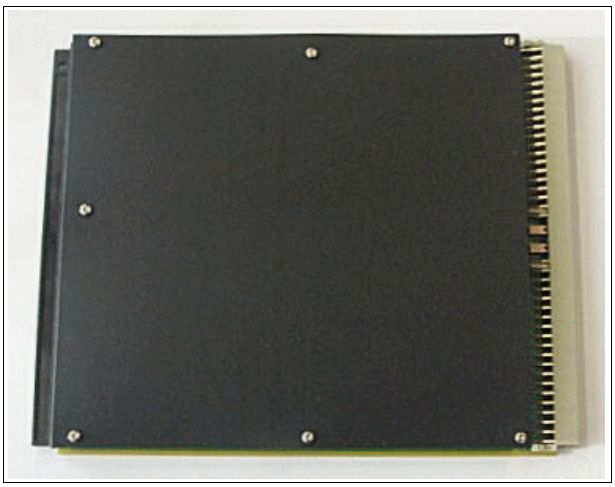


Figure 3-65 SLMAE8, SLMAE - Touch Guard

Front panel

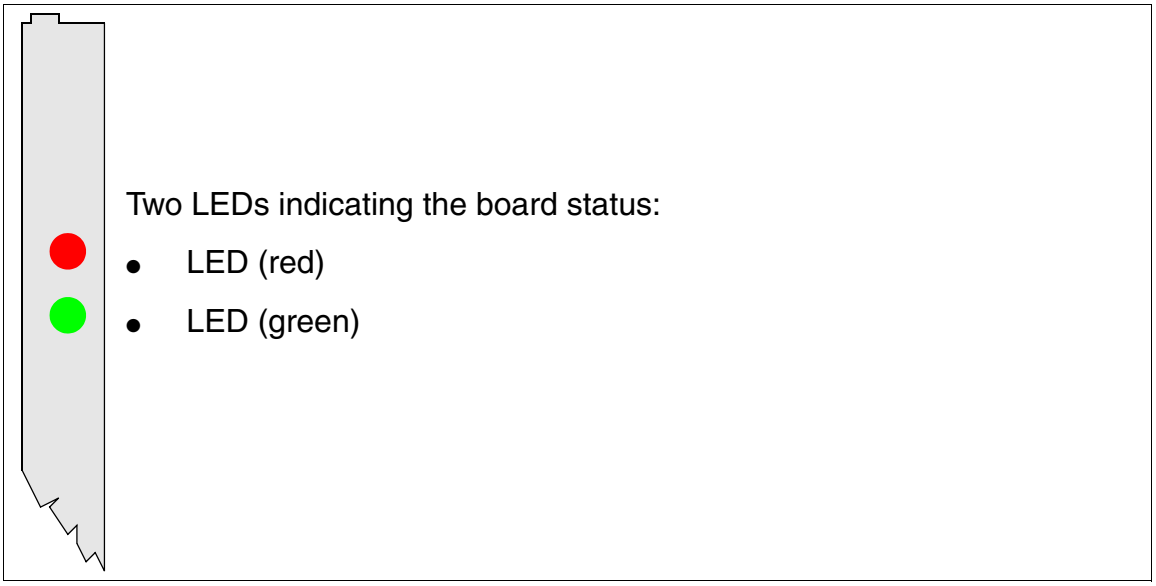


Figure 3-66 SLMAE8, SLMAE - LEDs on the Front Panel

Cover

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-71 SLMAE8, SLMAE - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-78
- For connecting to the connector panels using RJ45 jacks: Table 3-79
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-80
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-81 and Table 3-82

Table 3-72 SLMAE8, SLMAE - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMAE8, SLMAE		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	Not used for SLMAE8
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-72 SLMAE8, SLMAE - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMAE8, SLMAE		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	Not used for SLMAE8
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-73 SLMAE8, SLMAE - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA8, SLMAE	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	not used in SLMAE8
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-73 SLMAE8, SLMAE - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA8, SLMAE	Notes
No.	**Pin**		
17	4	17a	not used in SLMAE8
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Table 3-74 SLMAE8, SLMAE - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMAE8, SLMAE			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9	9a	9 Ring	Port 9	Not used for SLMAE8
34	9b	9 Tip		
10	10a	10 Ring	Port 10	
35	10b	10 Tip		
11	11a	11 Ring	Port 11	
36	11b	11 Tip		
12	12a	12 Ring	Port 12	
37	12b	12 Tip		
13	13a	13 Ring	Port 13	
38	13b	13 Tip		
14	14a	14 Ring	Port 14	
39	14b	14 Tip		
15	15a	15 Ring	Port 15	
40	15b	15 Tip		
16	16a	16 Ring	Port 16	
41	16b	16 Tip		

Table 3-74 SLMAE8, SLMAE - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMAE8, SLMAE			Notes
17	17a	17 Ring	Port 17	not used in SLMAE8
42	17b	17 Tip		
18	18a	18 Ring	Port 18	
43	18b	18 Tip		
19	19a	19 Ring	Port 19	
44	19b	19 Tip		
20	20a	20 Ring	Port 20	
45	20b	20 Tip		
21	21a	21 Ring	Port 21	
46	21b	21 Tip		
22	22a	22 Ring	Port 22	
47	22b	22 Tip		
23	23a	23 Ring	Port 23	
48	23b	23 Tip		
24	24a	24 Ring	Port 24	
49	24b	24 Tip		

Table 3-75 SLMAE8, SLMAE - Connector Panel Assignment with SIPAC 1 SU Connectors (cable for ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	SLMA8, SLMAE		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	Not used for SLMAE8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-76 SLMAE8, SLMAE - Connector Panel Assignment with SIPAC 1 SU Connectors (cable for ports 17 - 24)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	SLMA8, SLMAE		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	Not used for SLMAE8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.17 SLMA (SLMA24), SLMA8

The SLMA and SLMA8 boards will be replaced from August 2011 by the SLMAV board (8 ports or 24 ports).

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLMA [SLMA24] and SLMA8 boards (**S**ubscriber **L**ine **M**odule **A**nalog) provide analog T/R interfaces for use in HiPath 3800:

- SLMA (S30810-Q2191-C300) = 24 analog T/R interfaces
- SLMA8 (S30810-Q2191-C100) = eight analog T/R interfaces

NOTE: External analog extensions may only be connected via the SLMAE board.

Ring voltage

SLMA and SLMA8 boards generate their own ring voltage at 35 V_{eff}, meaning that an external ring voltage generator is not required. If the generated ring voltage is too low for the connected telephones, malfunctions may occur (for example, the MWI signal is not detected). To generate higher ring voltage, the SLMA2 board can be used in connection with the ring voltage generator RGMOD.

Front panel

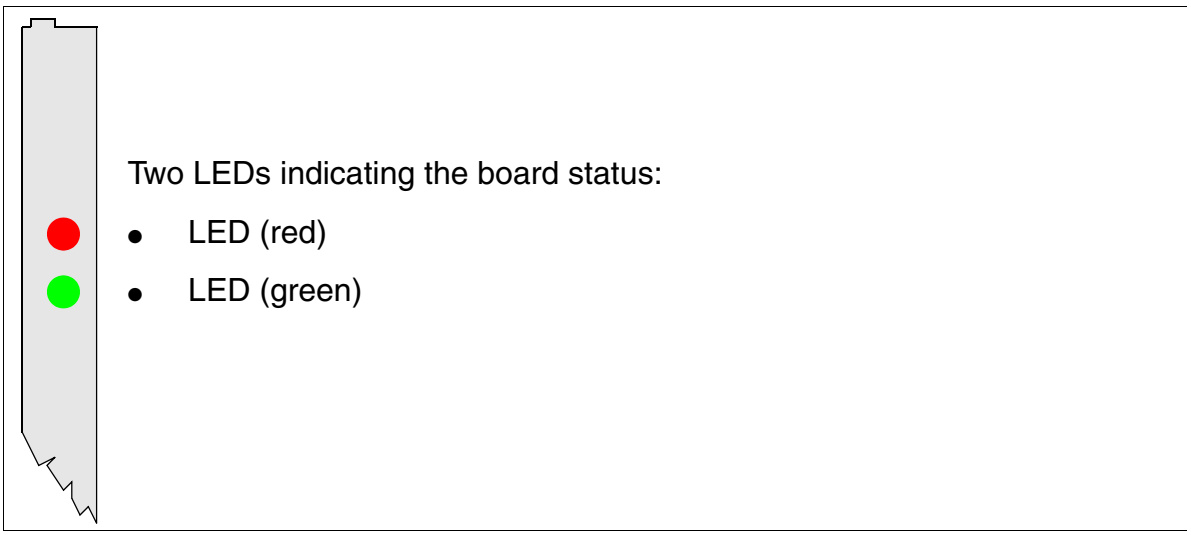


Figure 3-67 SLMA/SLMA8 - LEDs on the Front Panel

Cover

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-77 SLMA/SLMA8 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-78
- For connecting to the connector panels using RJ45 jacks: Table 3-79
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-80
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-81 and Table 3-82

Table 3-78 SLMA/SLMA8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMA, SLMA8		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	Not used for SLMA8
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-78 SLMA/SLMA8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMA, SLMA8		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	Not used for SLMA8
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-79 SLMA/SLMA8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA, SLMA8	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	not used in SLMA8
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-79 SLMA/SLMA8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA, SLMA8	Notes
No.	**Pin**		
17	4	17a	not used in SLMA8
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Table 3-80 SLMA/SLMA8 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMA, SLMA8			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9	9a	9 Ring	Port 9	Not used for SLMA8
34	9b	9 Tip		
10	10a	10 Ring	Port 10	
35	10b	10 Tip		
11	11a	11 Ring	Port 11	
36	11b	11 Tip		
12	12a	12 Ring	Port 12	
37	12b	12 Tip		
13	13a	13 Ring	Port 13	
38	13b	13 Tip		
14	14a	14 Ring	Port 14	
39	14b	14 Tip		
15	15a	15 Ring	Port 15	
40	15b	15 Tip		
16	16a	16 Ring	Port 16	
41	16b	16 Tip		

Table 3-80 SLMA/SLMA8 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMA, SLMA8			Notes
17	17a	17 Ring	Port 17	not used in SLMA8
42	17b	17 Tip		
18	18a	18 Ring	Port 18	
43	18b	18 Tip		
19	19a	19 Ring	Port 19	
44	19b	19 Tip		
20	20a	20 Ring	Port 20	
45	20b	20 Tip		
21	21a	21 Ring	Port 21	
46	21b	21 Tip		
22	22a	22 Ring	Port 22	
47	22b	22 Tip		
23	23a	23 Ring	Port 23	
48	23b	23 Tip		
24	24a	24 Ring	Port 24	
49	24b	24 Tip		

Table 3-81 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	SLMA, SLMA8		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	Not used for SLMA8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-82 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17 - 24)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	SLMA, SLMA8		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	Not used for SLMA8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.18 SLMA2 (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLMA2 (**S**ubscriber **L**ine **M**odule **A**nalog) board provides 24 analog T/R interfaces for use in HiPath 3800.

The external ring voltage generator RGMOD (S30124-X5109-X) is required for generating ring voltages. RGMOD is plugged in on the reverse of the backplane of the basic and/or expansion cabinet. The ring voltage and ring frequency are set using jumpers.

A system cabinet can be fitted with a mix of SLMA, SLMA8 and SLMA2 boards. RGMOD has no effect on SLMA and SLMA8, as these boards generate their own ring voltage (35 V_{eff}).

Front panel

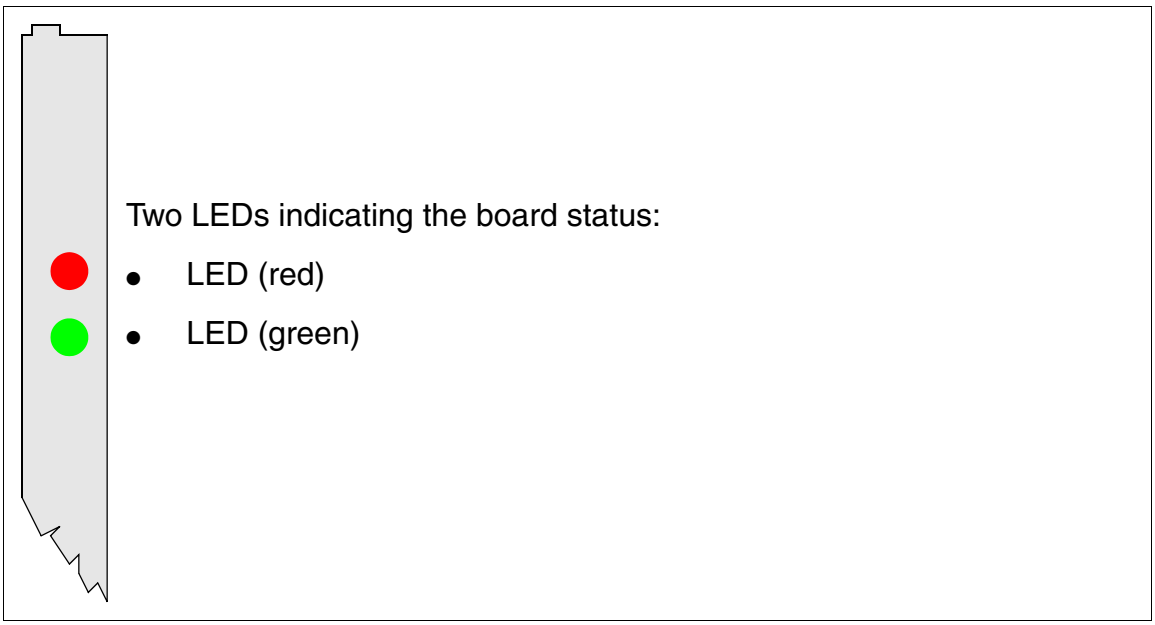


Figure 3-68 SLMA2 (S30810-Q2246-X) (for selected countries only) - LEDs on the Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-83 SLMA2 (for selected countries only) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-78
- For connecting to the connector panels using RJ45 jacks: Table 3-79
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-80
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-81 and Table 3-82

Table 3-84 SLMA2 (for selected countries only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMA2		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-84 SLMA2 (for selected countries only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMA2		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-85 SLMA2 (for selected countries only) - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA2	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-85 SLMA2 (for selected countries only) - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMA2	Notes
No.	**Pin**		
17	4	17a	
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Table 3-86 SLMA2 (for selected countries only) - Connector Panel Assignment with CHAMP Jacks (U.S. only)

CHAMP jack	SLMA2			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9	9a	9 Ring	Port 9	
34	9b	9 Tip		
10	10a	10 Ring	Port 10	
35	10b	10 Tip		
11	11a	11 Ring	Port 11	
36	11b	11 Tip		
12	12a	12 Ring	Port 12	
37	12b	12 Tip		
13	13a	13 Ring	Port 13	
38	13b	13 Tip		
14	14a	14 Ring	Port 14	
39	14b	14 Tip		
15	15a	15 Ring	Port 15	
40	15b	15 Tip		
16	16a	16 Ring	Port 16	
41	16b	16 Tip		

Table 3-86 SLMA2 (for selected countries only) - Connector Panel Assignment with CHAMP Jacks (U.S. only)

CHAMP jack	SLMA2			Notes
17	17a	17 Ring	Port 17	
42	17b	17 Tip		
18	18a	18 Ring	Port 18	
43	18b	18 Tip		
19	19a	19 Ring	Port 19	
44	19b	19 Tip		
20	20a	20 Ring	Port 20	
45	20b	20 Tip		
21	21a	21 Ring	Port 21	
46	21b	21 Tip		
22	22a	22 Ring	Port 22	
47	22b	22 Tip		
23	23a	23 Ring	Port 23	
48	23b	23 Tip		
24	24a	24 Ring	Port 24	
49	24b	24 Tip		

Table 3-87 SLMA2 (for selected countries only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1-16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU con-nector	SLMA2		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-88 SLMA2 (for selected countries only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17-24)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU con-nector	SLMA2		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.19 SLMAV

The SLMAV board (**S**ubscriber **L**ine **M**odule **A**nalog **V**inetic) replaces the SLMAE, SLMAE8, SLMAE200, SLMA, SLMA8 and SLMA2 boards in HiPath 3000. It will be available as of August 2011.

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

SLMAV has the same features as the SLMAE board. It provides analog T/R interfaces for use in HiPath 3800. The SLMAV board is available for HiPath 3800 in the following variants:

- SLMAV8 (S30810-Q2227-X100) = 8 analog T/R interfaces
- SLMAV24 (S30810-Q2227-X200) = 24 analog T/R interfaces

Application: SLMAV can be used as of HiPath 3800 V7 and V8, but not in older versions of HiPath 3800. It is supported in IP and TDM environments. Automatic migration to SLMAV is not possible. The slot in HiPath 3800 must be enabled via Manager E/C.

Code Receiver: A code receiver is available for each T/R interface (permits DTMF dialing at analog telephones). This guarantees that all analog terminals connected are fully accessible.

CLIP: These boards support calling name identification presentation (CLIP).

External analog extensions:

- External analog extensions may only be connected via the SLMAV board.
- For U.S. only: The connection of external analog extensions via OPS signaling (OPS: Off-Premises-Station) is not supported.

Ring voltage: The SLMAV board generates it own ring voltage of 71 V_{eff}. An external ring voltage generator is therefore not required.

Product image

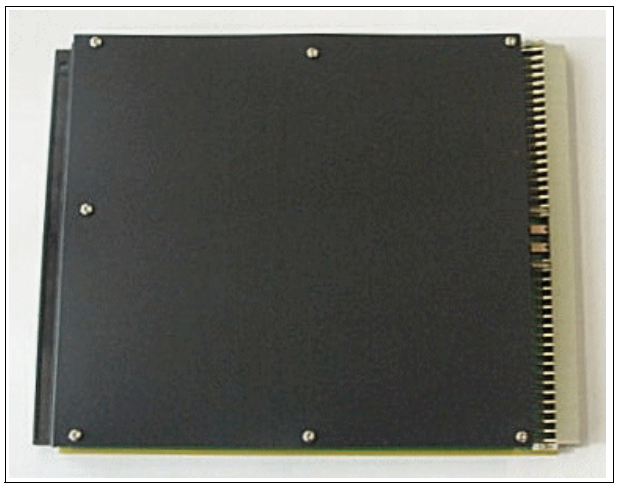


Bild 3-69 SLMAV8, SLMAV24

Front panel

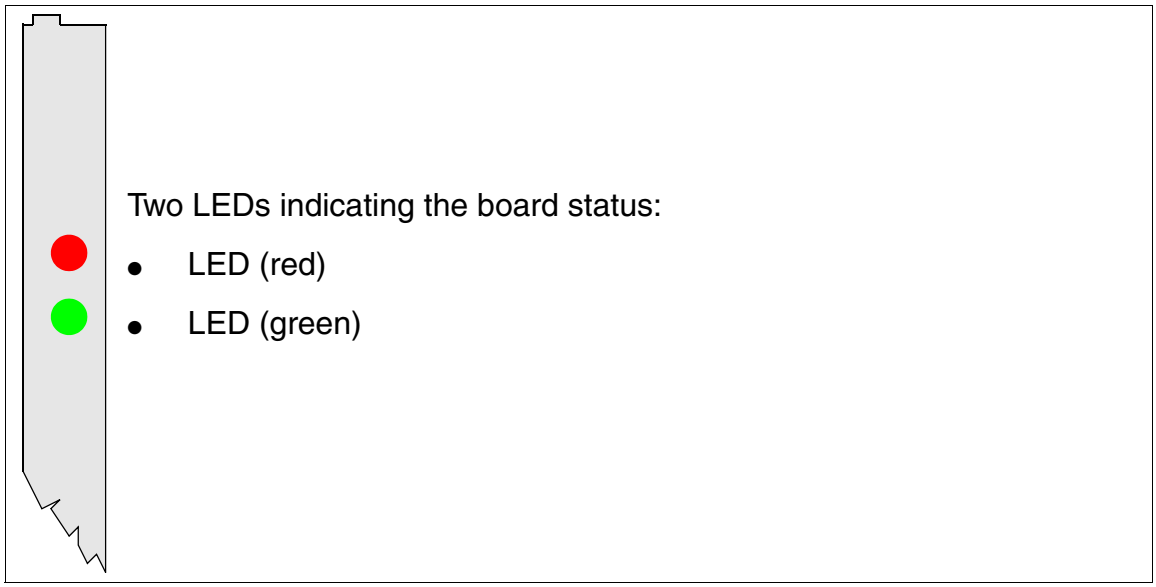


Bild 3-70 SLMAV8, SLMAV24 – LEDs in the front panel

Shielding panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.4.

LED statuses and their meanings

Tabelle 3-89 SLMAV8, SLMAV24 – LED statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Flashing	Board performs a self-test.	
Flashing slow	Off	Board is faulty.	Replace board.
Flashing quick	Off	Loadware is being loaded.	
Off	On	Loading was successfully completed and board is OK (idle state). No subscriber line circuit is active.	
Off	Flashing	At least one subscriber line circuit is activated.	
On	On	Major hardware or loadware error	Replace board.

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-90
- For connecting to the connector panels using RJ45 jacks: Table 3-91
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-92
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-93 and Table 3-94

Tabelle 3-90 SLMAV8, SLMAV24 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire (tip)[1]	b-wire (ring)[1]	SIVAPAC connector	SLMAV8, SLMAV24		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	not used in SLMAV8
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Tabelle 3-90 SLMAV8, SLMAV24 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire (tip)[1]	b-wire (ring)[1]	SIVAPAC connector	SLMAV8, SLMAV24		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	not used in SLMAV8
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Tabelle 3-91 SLMAV8, SLMAV24 - Connector Panel Assignment with RJ24 Jacks

RJ45 jack		SLMAV8, SLMAV24	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	not used in SLMAV8
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Tabelle 3-91 SLMAV8, SLMAV24 - Connector Panel Assignment with RJ24 Jacks

RJ45 jack		SLMAV8, SLMAV24	Notes
No.	**Pin**		
17	4	17a	not used in SLMAV8
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Tabelle 3-92 SLMAV8, SLMAV24 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMAV8, SLMAV24			Notes
1	1a	1 Ring	Port 1	
26	1b	1 TIP		
2	2a	2 Ring	Port 2	
27	2b	2 TIP		
3	3a	3 Ring	Port 3	
28	3b	3 TIP		
4	4a	4 Ring	Port 4	
29	4b	4 TIP		
5	5a	5 Ring	Port 5	
30	5b	5 TIP		
6	6a	6 Ring	Port 6	
31	6b	6 TIP		
7	7a	7 Ring	Port 7	
32	7b	7 TIP		
8	8a	8 Ring	Port 8	
33	8b	8 TIP		
9	9a	9 Ring	Port 9	not used in SLMAV8
34	9b	9 TIP		
10	10a	10 Ring	Port 10	
35	10b	10 TIP		
11	11a	11 Ring	Port 11	
36	11b	11 TIP		
12	12a	12 Ring	Port 12	
37	12b	12 TIP		
13	13a	13 Ring	Port 13	
38	13b	13 TIP		
14	14a	14 Ring	Port 14	
39	14b	14 TIP		
15	15a	15 Ring	Port 15	
40	15b	15 TIP		
16	16a	16 Ring	Port 16	
41	16b	16 TIP		

Tabelle 3-92 SLMAV8, SLMAV24 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMAV8, SLMAV24			Notes
17	17a	17 Ring	Port 17	not used in SLMAV8
42	17b	17 TIP		
18	18a	18 Ring	Port 18	
43	18b	18 TIP		
19	19a	19 Ring	Port 19	
44	19b	19 TIP		
20	20a	20 Ring	Port 20	
45	20b	20 TIP		
21	21a	21 Ring	Port 21	
46	21b	21 TIP		
22	22a	22 Ring	Port 22	
47	22b	22 TIP		
23	23a	23 Ring	Port 23	
48	23b	23 TIP		
24	24a	24 Ring	Port 24	
49	24b	24 TIP		

Tabelle 3-93 SLMAV8, SLMAV24 - Connector Panel Assignment with SIPAC 1 SU Connectors (cable for ports 1 - 16)

Color Group	Pair	a-wire (tip)[1]	b-wire (ring)[1]	SU connector	SLMAV8, SLMAV24		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	not used in SLMAV8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Tabelle 3-94 SLMAV8, SLMAV24 - Connector Panel Assignment with SIPAC 1 SU Connectors (cable for ports 17 - 24)

Color Group	Pair	a-wire (tip)[1]	b-wire (ring)[1]	SU connector	SLMAV8, SLMAV24		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	not used in SLMAV8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.20 SLMO2, SLMO8

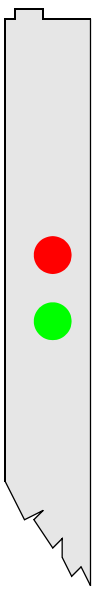
NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLMO2 and SLMO8 boards (**S**ubscriber **L**ine **M**odule **O**ptiset) provide $U_{P0/E}$ interfaces for optiPoint and OpenStage telephones in HiPath 3800:

- SLMO2 (S30810-Q2168-X10) = 24 $U_{P0/E}$ interfaces
- SLMO8 (S30810-Q2168-X100) = eight $U_{P0/E}$ interfaces

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-71 SLMO2/SLMO8 - LEDs on the Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-95 SLMO2 and SLMO8 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-96
- For connecting to the connector panels using RJ45 jacks: Table 3-97
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-98
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-99 and Table 3-100

Table 3-96 SLMO2/SLMO8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMO2, SLMO8		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	Not used for SLMO8
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

Table 3-96 SLMO2/SLMO8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	SLMO2, SLMO8		MDFU-E	Notes
17	yel/ora		43	17a	Port 17	17a	Not used for SLMO8
		ora/yel	44	17b		17b	
18	yel/grn		45	18a	Port 18	18a	
		grn/yel	46	18b		18b	
19	yel/brn		47	19a	Port 19	19a	
		brn/yel	48	19b		19b	
20	yel/gry		49	20a	Port 20	20a	
		gry/yel	50	20b		20b	
21	vio/blu		51	21a	Port 21	21a	
		blu/vio	52	21b		21b	
22	vio/ora		53	22a	Port 22	22a	
		ora/vio	54	22b		22b	
23	vio/grn		55	23a	Port 23	23a	
		grn/vio	56	23b		23b	
24	vio/brn		57	24a	Port 24	24a	
		brn/vio	58	24b		24b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-97 SLMO2/SLMO8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMO2, SLMO8	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4	9a	not used in SLMO8
	5	9b	
10	4	10a	
	5	10b	
11	4	11a	
	5	11b	
12	4	12a	
	5	12b	
13	4	13a	
	5	13b	
14	4	14a	
	5	14b	
15	4	15a	
	5	15b	
16	4	16a	
	5	16b	

Table 3-97 SLMO2/SLMO8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		SLMO2, SLMO8	Notes
No.	**Pin**		
17	4	17a	not used in SLMO8
	5	17b	
18	4	18a	
	5	18b	
19	4	19a	
	5	19b	
20	4	20a	
	5	20b	
21	4	21a	
	5	21b	
22	4	22a	
	5	22b	
23	4	23a	
	5	23b	
24	4	24a	
	5	24b	

Table 3-98 SLMO2/SLMO8 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMO2, SLMO8			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9	9a	9 Ring	Port 9	not used in SLMO8
34	9b	9 Tip		
10	10a	10 Ring	Port 10	
35	10b	10 Tip		
11	11a	11 Ring	Port 11	
36	11b	11 Tip		
12	12a	12 Ring	Port 12	
37	12b	12 Tip		
13	13a	13 Ring	Port 13	
38	13b	13 Tip		
14	14a	14 Ring	Port 14	
39	14b	14 Tip		
15	15a	15 Ring	Port 15	
40	15b	15 Tip		
16	16a	16 Ring	Port 16	
41	16b	16 Tip		

Table 3-98 SLMO2/SLMO8 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	SLMO2, SLMO8			Notes
17	17a	17 Ring	Port 17	not used in SLMO8
42	17b	17 Tip		
18	18a	18 Ring	Port 18	
43	18b	18 Tip		
19	19a	19 Ring	Port 19	
44	19b	19 Tip		
20	20a	20 Ring	Port 20	
45	20b	20 Tip		
21	21a	21 Ring	Port 21	
46	21b	21 Tip		
22	22a	22 Ring	Port 22	
47	22b	22 Tip		
23	23a	23 Ring	Port 23	
48	23b	23 Tip		
24	24a	24 Ring	Port 24	
49	24b	24 Tip		

Table 3-99 SLMO2/SLMO8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU con-nector	SLMO2, SLMO8		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	Not used for SLMO8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a				
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-100 SLMA, SLMA8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 17 - 24)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	SLMA, SLMA8		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Port 17	17a	4	Not used for SLMO8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Port 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Port 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Port 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Port 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Port 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Port 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Port 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.21 SLMO8 (not for U.S.), SLMO24

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLMO8 and SLMO24 boards (**S**ubscriber **L**ine **M**odule Cost **O**ptimized $U_{P0/E}$) provide 8 and 24 $U_{P0/E}$ interfaces for optiPoint and OpenStage telephones on HiPath 3550.

Switches and LEDs

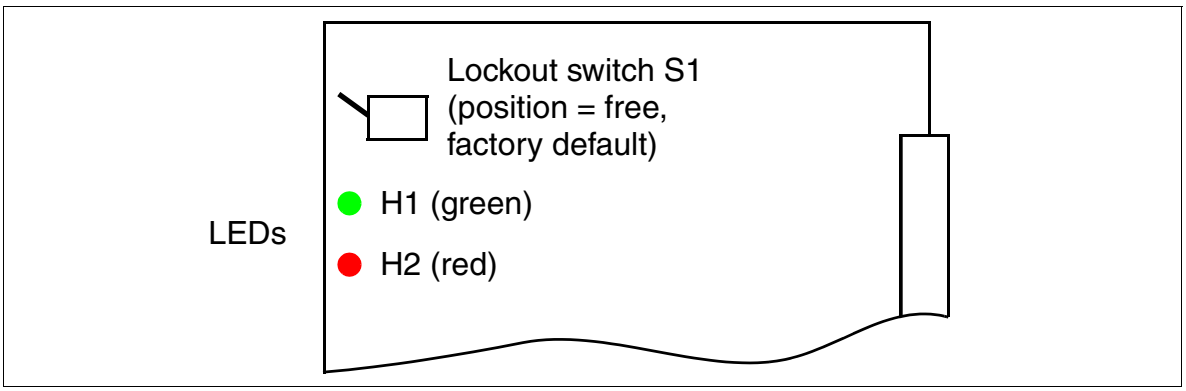


Figure 3-72 SLMO8 (not for U.S.), SLMO24 (S30810-Q2901-X100, S30810-Q2901-X)

LED statuses and their meanings

Table 3-101 SLMO8 (not for U.S.) and SLMO24 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-102 SLMO8 (not for U.S.), SLMO24 - Cable 1 Assignment (SU Xx8)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector BP: Xx8	SLMO8, SLMO24		MDFU/ MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Access 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Access 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Access 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Access 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Access 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Access 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Access 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Access 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Access 9	9a	4	Not used for SLMO8
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Access 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Access 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Access 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Access 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Access 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Access 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Access 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-103 SLMO8 (not for U.S.), SLMO24 - Cable 2 Assignment (SU Xx9)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector BP: Xx9	SLMO8, SLMO24		MDFU/ MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu				Free			
			blu/wht						
	2	wht/ora				Free			
			ora/wht						
	3	wht/grn				Free			
			grn/wht						
	4	wht/brn				Free			
			brn/wht						
	5	wht/gry				Free			
			gry/wht						
2	6	red/blu				Free			
			blu/red						
	7	red/ora				Free			
			ora/red						
	8	red/grn				Free			
			grn/red						
	9	red/brn		11	17a	Access 17	17a	4	Not used for SLMO8
			brn/red	31	17b		17b	5	
	10	red/gry		02	18a	Access 18	18a	4	
			gry/red	22	18b		18b	5	
3	11	blk/blu		13	19a	Access 19	19a	4	
			blu/blk	33	19b		19b	5	
	12	blk/ora		04	20a	Access 20	20a	4	
			ora/blk	24	20b		20b	5	
	13	blk/grn		15	21a	Access 21	21a	4	
			grn/blk	35	21b		21b	5	
	14	blk/brn		06	22a	Access 22	22a	4	
			brn/blk	26	22b		22b	5	
	15	blk/gry		17	23a	Access 23	23a	4	
			gry/blk	37	23b		23b	5	
4	16	yel/blu		08	24a	Access 24	24a	4	
			blu/yel	28	24b		24b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-104 SLMO24 - Assignment (SU Xx8, Xx9) (for U.S. only)

#	a-wire[1] (tip)	b-wire[1] (ring)	SU connector		SLMO24		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
1	wht/blu		19		1a	Port 1	1	1a	
		blu/wht	39		1b		26	1b	
2	wht/ora		38		2a	Port 2	2	2a	
		ora/wht	48		2b		27	2b	
3	wht/grn		27		3a	Port 3	3	3a	
		grn/wht	47		3b		28	3b	
4	wht/brn		16		4a	Port 4	4	4a	
		brn/wht	46		4b		29	4b	
5	wht/gry		05		5a	Port 5	5	5a	
		gry/wht	45		5b		30	5b	
6	red/blu		14		6a	Port 6	6	6a	
		blu/red	44		6b		31	6b	
7	red/ora		23		7a	Port 7	7	7a	
		ora/red	43		7b		32	7b	
8	red/grn		32		8a	Port 8	8	8a	
		grn/red	42		8b		33	8b	
9	red/brn		11		9a	Port 9	9	9a	
		brn/red	31		9b		34	9b	
10	red/gry		02		10a	Port 10	10	10a	
		gry/red	22		10b		35	10b	
11	blk/blu		13		11a	Port 11	11	11a	
		blu/blk	33		11b		36	11b	
12	blk/ora		04		12a	Port 12	12	12a	
		ora/blk	24		12b		37	12b	
13	blk/grn		15		13a	Port 13	13	13a	
		grn/blk	35		13b		38	13b	
14	blk/brn		06		14a	Port 14	14	14a	
		brn/blk	26		14b		39	14b	
15	blk/gry		17		15a	Port 15	15	15a	
		gry/blk	37		15b		40	15b	
16	yel/blu		08		16a	Port 16	16	16a	
		blu/yel	28		16b		41	16b	

Table 3-104 SLMO24 - Assignment (SU Xx8, Xx9) (for U.S. only)

#	a-wire[1] (tip)	b-wire[1] (ring)	SU connector		SLMO24		CHAMP jack, MDF		Notes
			BP: Xx8	BP: Xx9					
17	red/brn			11	17a	Port 17	9	9a	
		brn/red		31	17b		34	9b	
18	red/gry			02	18a	Port 18	10	10a	
		gry/red		22	18b		35	10b	
19	blk/blu			13	19a	Port 19	11	11a	
		blu/blk		33	19b		36	11b	
20	blk/ora			04	20a	Port 20	12	12a	
		ora/blk		24	20b		37	12b	
21	blk/grn			15	21a	Port 21	13	13a	
		grn/blk		35	21b		38	13b	
22	blk/brn			06	22a	Port 22	14	14a	
		brn/blk		26	22b		39	14b	
23	blk/gry			17	23a	Port 23	15	15a	
		gry/blk		37	23b		40	15b	
24	yel/blu			08	24a	Port 24	16	16a	
		blu/yel		28	24b		41	16b	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.22 SLU8

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLU8 board for HiPath 3550 and HiPath 3350 (wall housing) with 8 digital subscriber line interfaces allows up to 16 digital telephones to be connected in host-client operation (master-slave operation).

Interfaces

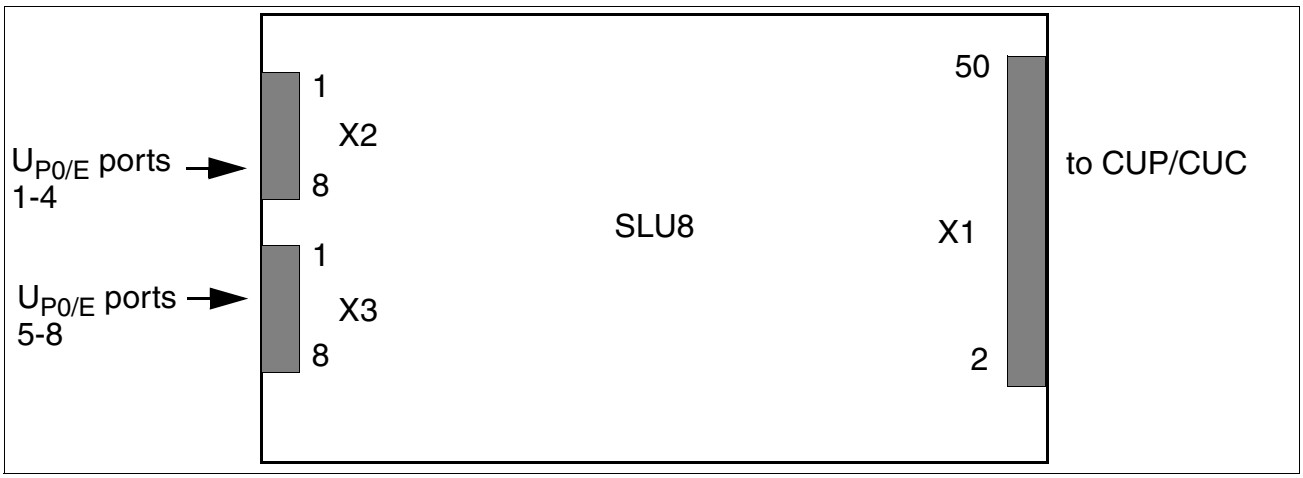


Figure 3-73 SLU8 Interfaces (S30817-Q922-A301)

Caution
After deactivating the power supply, you must wait a short while before plugging the SLU8 in or out. If you do not wait before doing so, the CBCC/CBCP may be damaged.

Table 3-105 SLU8 Contact Assignments

Contact	X2 ($U_{Po/E}$ ports 1-4)	X3 ($U_{P0/E}$ ports 5-8)
1	a 1	a 5
2	b 1	b 5
3	a 2	a 6
4	b 2	b 6
5	a 3	a 7
6	b 3	b 7
7	a 4	a 8
8	b 4	b 8

3.3.23 SLU8R

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The SLU8R (**S**ubscriber **L**ine $\mathbf{U_{P0/E}}$ **R**ack) boards provide eight ports for connecting optiPoint 500 telephones to HiPath 3500 and HiPath 3300 (19-inch housing).

Interfaces

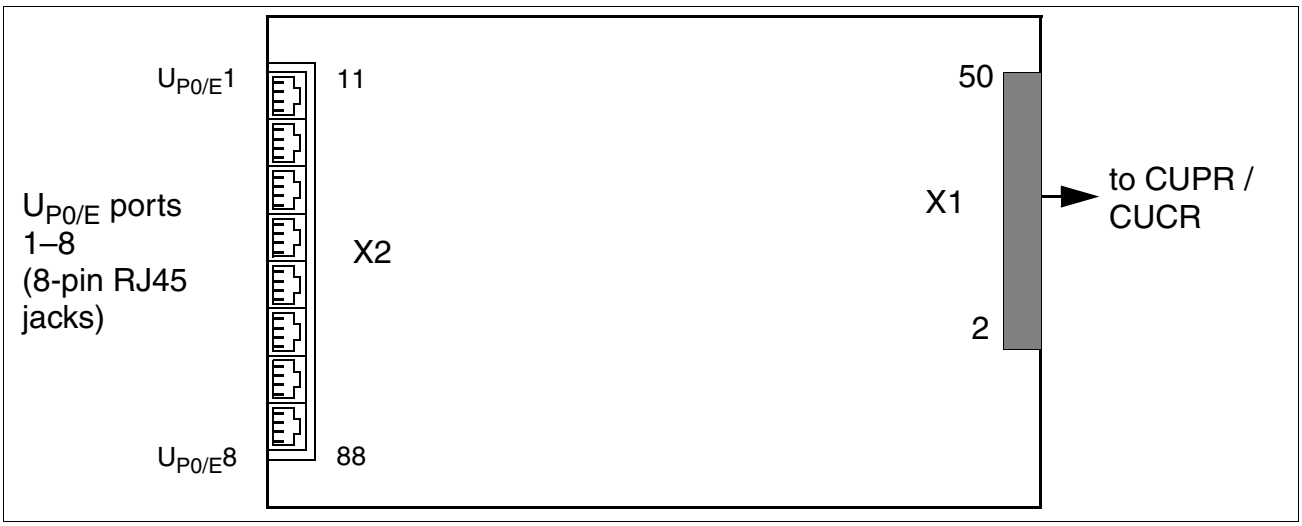


Figure 3-74 SLU8R Interfaces (S30817-K922-Z301)

Table 3-106 SLU8R Contact Assignments

RJ45 jack	X2, Pin	$U_{P0/E}$ ports 1-4	RJ45 jack	X2, Pin	$U_{P0/E}$ ports 5-8
1	14	a 1	5	54	a 5
	15	b 1		55	b 5
2	24	a 2	6	64	a 6
	25	b 2		65	b 6
3	34	a 3	7	74	a 7
	35	b 3		75	b 7
4	44	a 4	8	84	a 8
	45	b 4		85	b 8

3.3.24 STLS2 (not for U.S.), STLS4

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The STLS4 board for HiPath 3550 and HiPath 3350 (wall housing) has four S_0 ports that can operate as trunk interfaces or as subscriber line interfaces (see Page 3-229).

The STLS2 is an underequipped variant with two S_0 ports.

Interfaces

The board does **not** supply terminals with power. Power must be supplied locally using a local plug-in power supply or a bus power supply unit, for example.

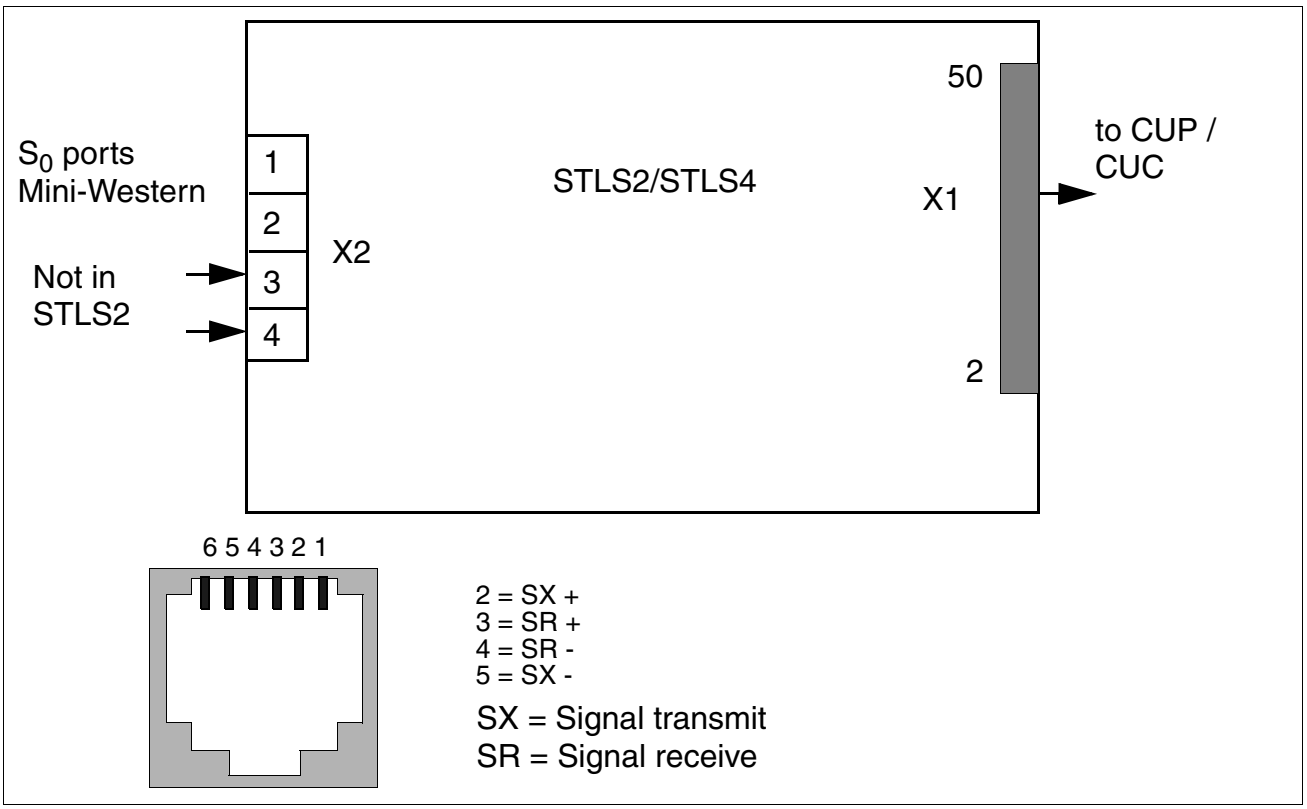


Figure 3-75 STLS2 (not for U.S.), STLS4 Interfaces (S30817-Q924-B313, -A313)

Interface Assignments (for U.S. only)

Table 3-107 STLS4 Module Interface Assignments (for U.S. only)

Pin	Port	Assignment		Pin	Port	Assignment
2	1	Transmit		2	3	Transmit
3		Receive		3		Receive
4		Receive		4		Receive
5		Transmit		5		Transmit
2	2	Transmit		2	4	Transmit
3		Receive		3		Receive
4		Receive		4		Receive
5		Transmit		5		Transmit

Note: The STLS4 module supports the trunk side in Europe, so the transmit and receive signals must be reversed before the first device on the S_0 bus.The ISDN terminals must have their own local power supply.

The system only assigns the MSN after the S_0 port has been configured on the “Euro bus” (not for U.S.) and can be read out via administration (Manager T: Code 20 4 3 S_0 Bus MSN).

Connecting ISDN (S_0) interfaces (not for U.S.)

You can use the MW jacks on the STLS boards to connect between one and four ISDN S_0 buses. The interfaces on the STLS boards are freely configurable.

- EURO CO point-to-point
- EURO CO point-to-multipoint
- EURO bus
- CorNet-N/CorNet-NQ slave
- Using HiPath 3000/5000 Manager E, you can also set up configurations for networking and dedicated lines

Use the S_0 interface $S_0$1 for connection to the public telecommunications network (ISDN trunk).

You can also connect S_0 interfaces $S_0$2 to $S_0$4 to the ISDN trunk or to ISDN terminals (ISDN telephone, group 4 fax device, PC, dialing aid) via an S_0 bus.

The connection (networking) to HiPath 3000 and HiPath 4000 (CorNet-NQ) can also be set up via S_0 interfaces $S_0$1 to $S_0$4.

S_0 connection options:

- Point-to-point (PP) (default)
- Point-to-multipoint (PMP)

Connecting an ISDN trunk (not for U.S.)

Insert the connection cable supplied in jacks $S_0$1 to $S_0$4. Insert the other end in the NT of the carrier.

Networking connection (HiPath 4000/CorNet-NQ (not for U.S.)

Insert the connection cable supplied in jacks $S_0$1 to $S_0$4. Connect the other end with the HiPath 4000 port.

Connecting ISDN terminals (not for U.S.)

Depending on the system, you can set up a maximum of four internal S_0 buses ($S_0$1 to $S_0$4). A maximum of eight ISDN terminals can be addressed on each S_0 bus.

The system does not assign the MSN until the S_0 port is configured on the “Euro bus”; the MSN can be read out via administration.

When you set up an S_0 bus, it is assigned an MSN. This MSN is the first free station number in the system. The S_0 station is immediately available under this MSN, without an outgoing seizure.

If no MSN is entered in the terminal, a default MSN is automatically assigned after you change the S_0 port to “Euro bus” in system administration.

Configuring an S_0 bus with a Mini-Western jack (not for U.S.)

S_0 telephones cannot be directly connected to an STLS board’s Mini-Western jack via the cable supplied. You must first install a jack with cross-connected cables (see Figure 3-77).

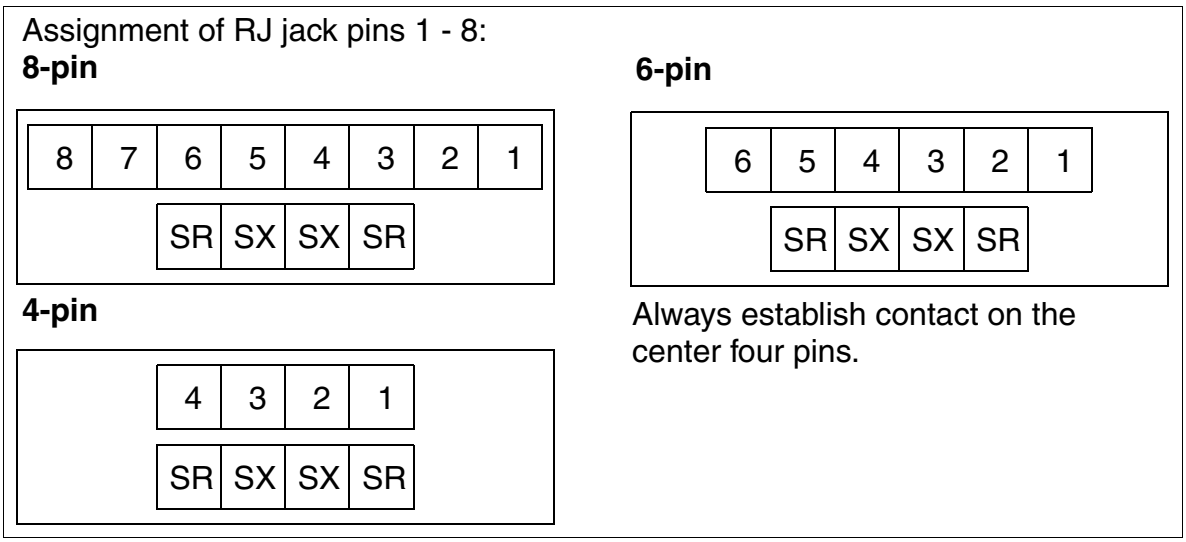


Figure 3-76 Sample Pin Assignments in MW Jacks (not for U.S.)

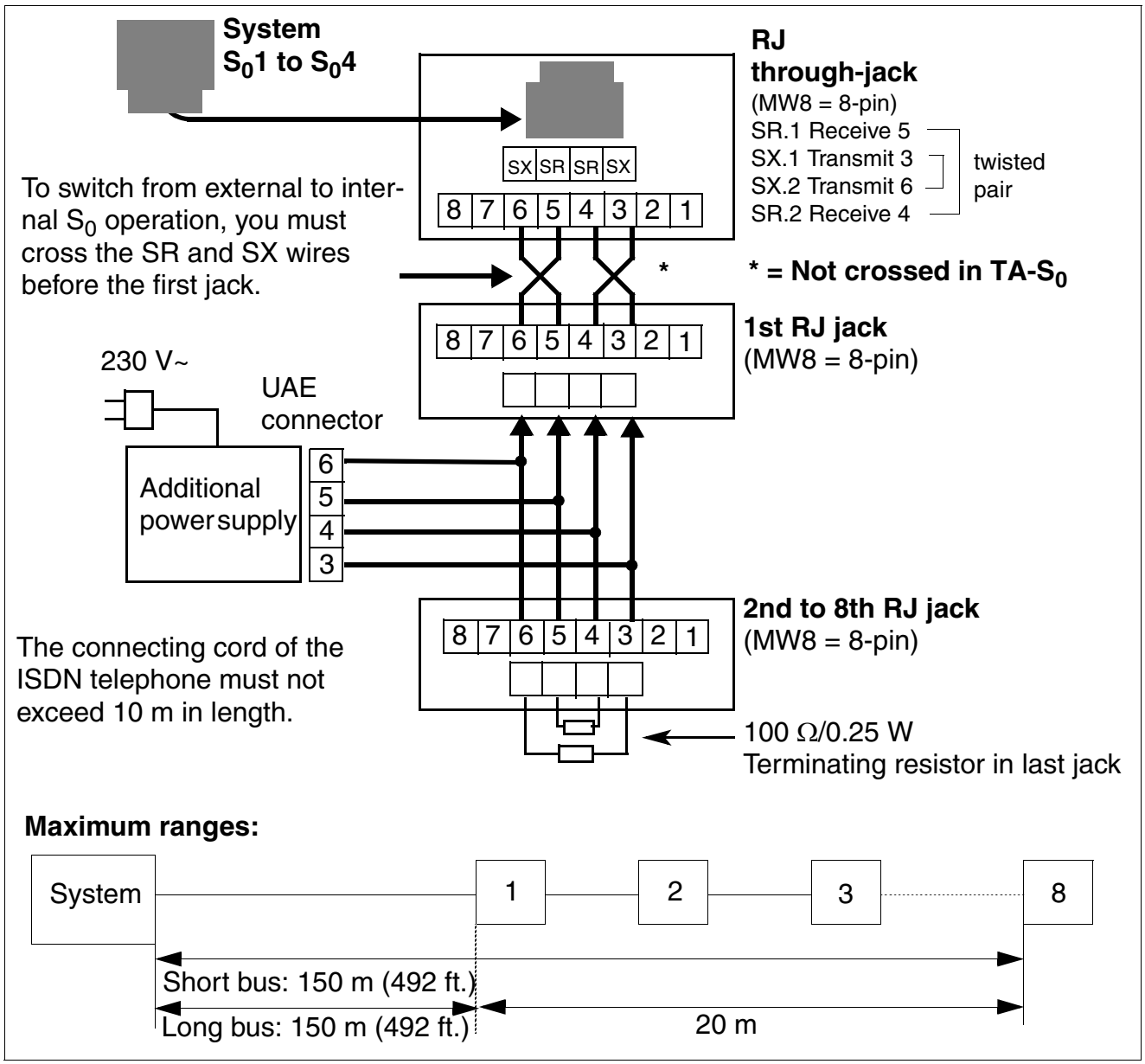


Figure 3-77 Wiring and Ranges for S_0 Bus Jacks (not for U.S.)

Connecting ISDN Terminals to HiPath 3550 and HiPath 3350 (for U.S. only)

- S_0 Bus With RJ45 jack, connecting $S_0$1 to $S_0$4:
  - Connect the provided, silver-satin connector cord to each port on the STLS4 Module. Connect the other end to a mounted MW jack, reversing the transmit and receive wires.
  - Contact is always established using the center pins of MW jacks. Figure 3-78 shows the pin assignments for jacks of different sizes.
  - The ISDN terminals must have their own local power supply.
  - Plug the ISDN terminal (connecting cord) into the MW jack. Connecting an ISDN S_0 telephone requires a local power supply (e.g. manufactured by Sedlbauer).
- Pin Assignment of MW Jacks

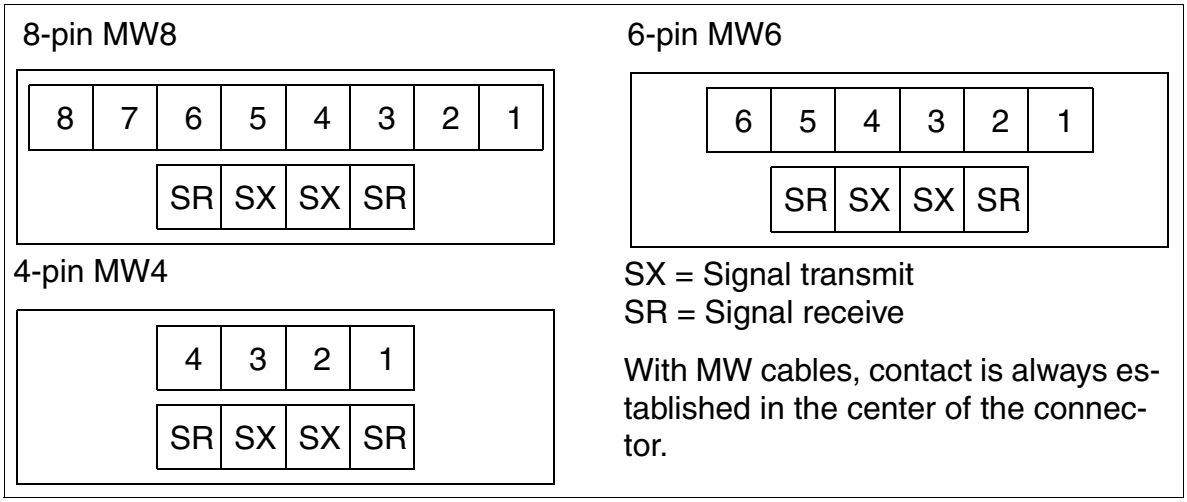


Figure 3-78 MWxx Jack Pin Assignment (for U.S. only)

3.3.25 STLS4R

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The STLS4R (**S**ubscriber And **T**runk **L**ine **S_0 R**ACK) board provides four S_0 basic rate accesses for HiPath 3500 and HiPath 3300 (19-inch housing). These are operated either as external trunk interfaces in TE (terminal equipment) mode or as internal S_0 buses (PMP bus) in NT (network terminator) mode with cross-connected RX-TX lines.

The board does **not** supply terminals with power. In this case, power must be supplied locally using a local plug-in power supply or a bus power supply unit, for example.

Interfaces

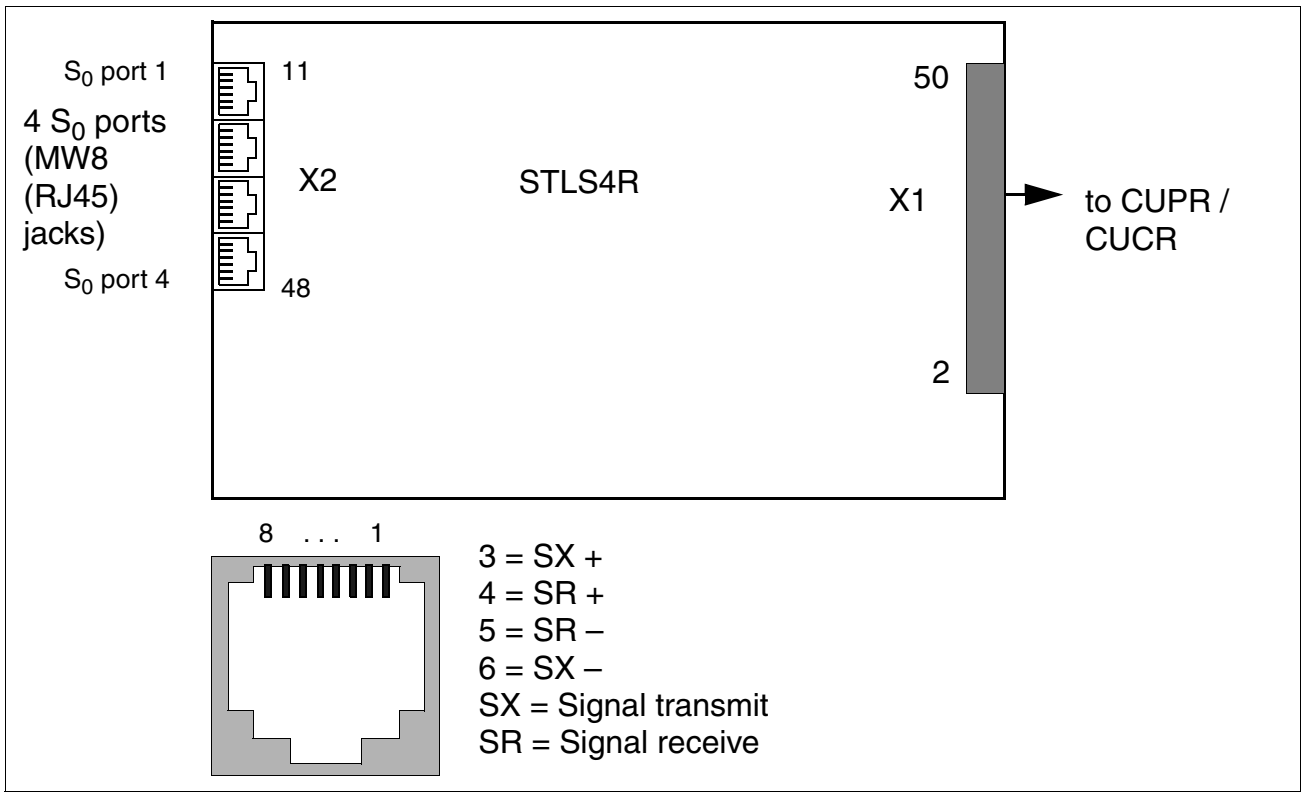


Figure 3-79 STLS4R Interfaces (S30817-K924-Z313)

Table 3-108 STLS4R Contact Assignments

MW8 (RJ45) Jack	X2, Pin	S_0 Ports 1-4
1	13	S_0 port 1 transmit+
	14	S_0 port 1 receive+
	15	S_0 port 1 receive–
	16	S_0 port 1 transmit–
2	23	S_0 port 2 transmit+
	24	S_0 port 2 receive+
	25	S_0 port 2 receive–
	26	S_0 port 2 transmit–
3	33	S_0 port 3 transmit+
	34	S_0 port 3 receive+
	35	S_0 port 3 receive–
	36	S_0 port 3 transmit–
4	43	S_0 port 4 transmit+
	44	S_0 port 4 receive+
	45	S_0 port 4 receive–
	46	S_0 port 4 transmit–

Refer to Page 3-229 for information on connecting ISDN lines and telephones.

3.3.26 STLSX2, STLSX4, STLSX4R

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The following boards provide S_0 basic connections:

- STLSX4 (**S**ubscriber **T**runk **L**ine **S_0** with ISAC-S**X**) S30810-Q2944-X = four S_0 basic rate accesses for use in HiPath 3550 and HiPath 3350.
- STLSX2 S30810-Q2944-X100 = two S_0 basic rate accesses for use in HiPath 3550 and HiPath 3350.
- STLSX4R (**S**ubscriber **T**runk **L**ine **S_0** with ISAC-S**X** **R**ack) S30810-K2944-Z = four S_0 basic rate accesses for use in HiPath 3500 and HiPath 3300.

These are operated either as external trunk interfaces in TE (terminal equipment) mode or as internal S_0 buses (PMP bus) in NT (network terminator) mode with cross-connected RX-TX lines.

Interfaces



The board does **not** supply terminals with power. Power must be supplied locally for telephones, for example via a plug-in power supply unit.

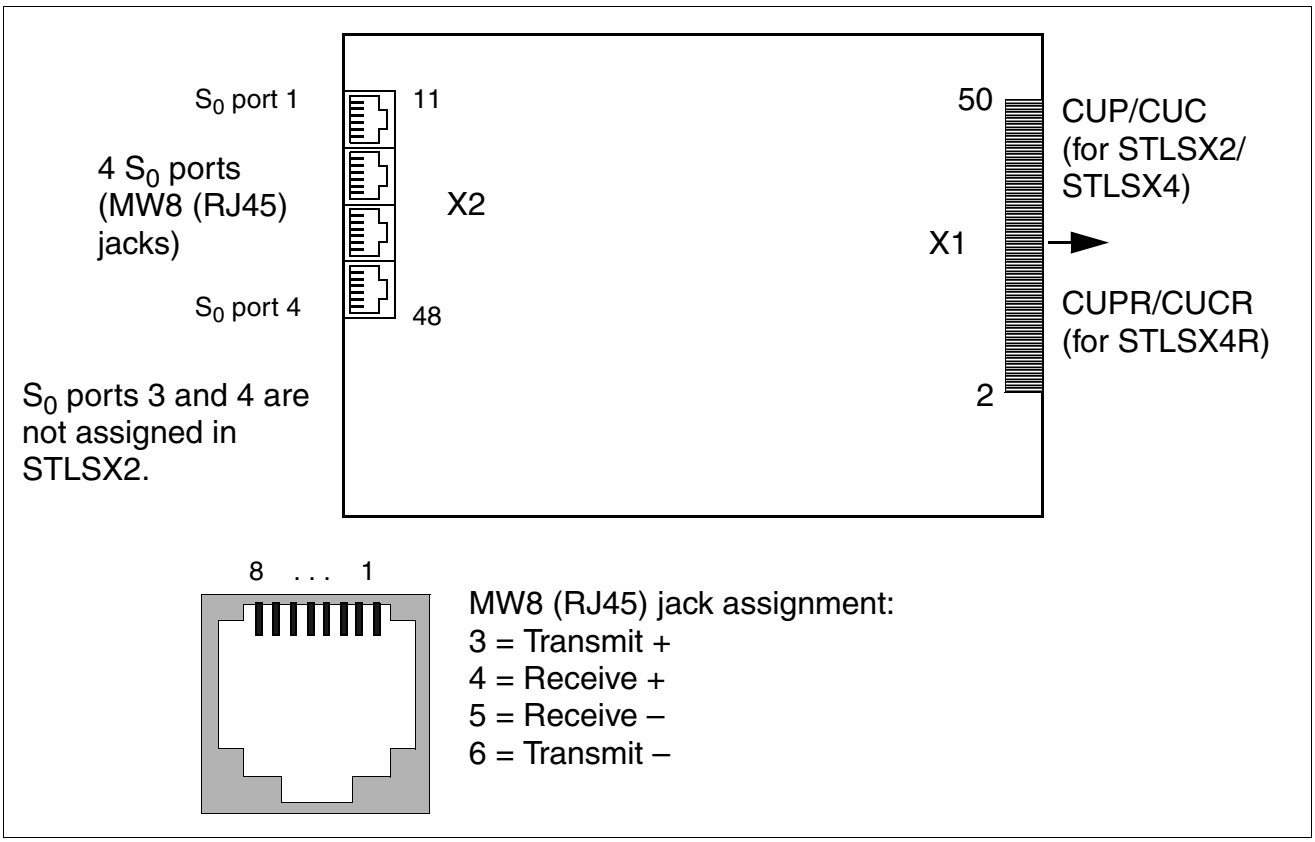


Figure 3-80 STLSX2, STLSX4, STLSX4R - Interfaces

S_0 interface assignment

Table 3-109 STLSX2, STLSX4, STLSX4R - S_0 Interface Assignment

X2 Pin	S_0 Port 1	X2 Pin	S_0 Port 2	X2 Pin	S_0 Port 3[1]	X2 Pin	S_0 Port 4[1]
11	–	21	–	31	–	41	–
12	–	22	–	32	–	42	–
13	Transmit +	23	Transmit +	33	Transmit +	43	Transmit +
14	Receive +	24	Receive +	34	Receive +	44	Receive +
15	Receive –	25	Receive –	35	Receive –	45	Receive –
16	Transmit –	26	Transmit –	36	Transmit –	46	Transmit –
17	–	27	–	37	–	47	–
18	–	28	–	38	–	48	–

1 Not for STLSX2

Configuring S_0 interfaces

Depending on how the interfaces are applied, use HiPath 3000/5000 Manager E to define the relevant protocols for the trunks to be connected. Please note the additional information contained in the protocol templates when selecting a suitable S_0 protocol:

- CO = Interfaces to the public CO
- Bus = Interfaces to an internal station
- Master = Interfaces for a master system network
- Slave = Interfaces for a slave system network
- H150/H118 or H300 = Defines the CorNet protocol:
  - H150/H118 = Optimized for interconnection with HiPath 3000
    This setting should also be selected in connection with HiPath ProCenter Office HPCO.
  - H300 = Optimized for interconnection with HiPath 4000
- Direct or fixed connection: defines the type of connection for a network and controls the supply of clock pulses:
  - Direct = Communication systems are connected to one another by means of a direct cable connection. The master system supplies the reference clock pulse for the networked system.
  - Fixed connection = Communication systems are connected over lines leased from a network provider (with clock pulse supply). The master system receives the reference clock pulse from the network.

  A slave system always receives the clock pulse from the master system regardless of whether the connection is direct or fixed.

Use the S_0 interface S_0 1 for connection to the public telecommunications network. You can also connect S_0 interfaces S_0 2 to S_0 4 to the ISDN trunk or to ISDN terminals (ISDN telephone, group 4 fax device, PC, dialing aid) via an S_0 bus.

Connecting ISDN telephones

Depending on the system, you can set up a maximum of four internal S_0 buses (S_0 1 to S_0 4). A maximum of eight ISDN terminals can be addressed on each S_0 bus.

The system does not assign the MSN until the S_0 port is configured on the “Euro bus”; the MSN can be read out via administration.

When you set up an S_0 bus, it is assigned an MSN. This MSN is the first free station number in the system. The S_0 station is immediately available under this MSN, without an outgoing seizure.

If no MSN is entered in the terminal, a default MSN is automatically assigned after you change the S_0 port to “Euro bus” in system administration.

Configuring an S_0 bus with a Mini-Western jack

S_0 telephones cannot be directly connected to an STLSX board’s Mini-Western jack via the cable supplied. You must first install a jack with cross-connected cables (see Figure 3-82).

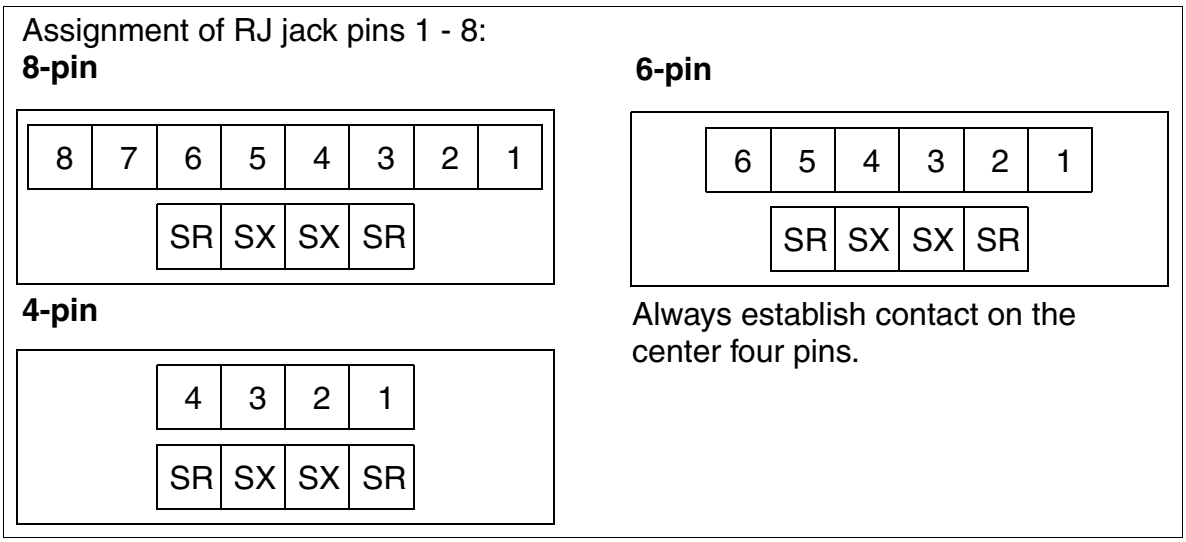


Figure 3-81 Pin Assignments in MW Jacks

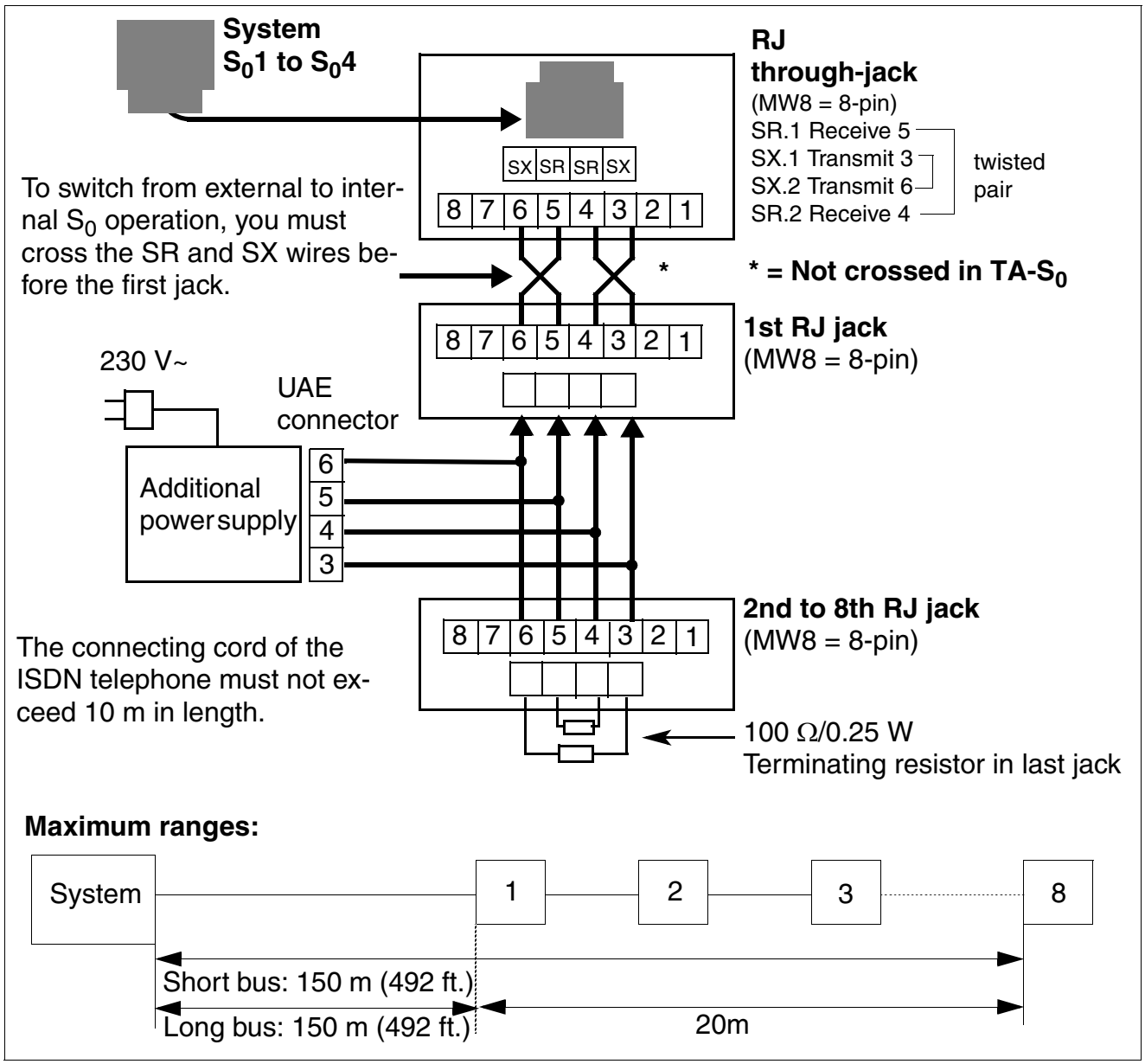


Figure 3-82 Wiring and Ranges for S_0 Bus Jacks

3.3.27 STMD3

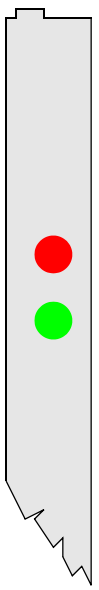
NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The STMD3 (**S**ubscriber and **T**runk **M**odule **D**igital S_0) board contains eight S_0 basic rate accesses for HiPath 3800.

The range of the short S_0 bus (up to eight Terminal Equipment Identifiers (TEI)) is limited to approximately 60 m.
If longer cables are required, the S_0 bus type must be set to "Long" in HiPath 3000/5000 Manager E developer mode. This provides a range of approximately 160 m. This setting can be made in V5.0 SMR-05 (CV 5) or later.

Front panel



Two LEDs indicating the board status:

- LED (red)
- LED (green)

Figure 3-83 STMD3 (S30810-Q2217-X10) - LEDs in the Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-110 STMD3 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one channel is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-111
- For connecting to the connector panels using RJ45 jacks: Table 3-112
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-113
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-114

Table 3-111 STMD3 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	STMD3		MDFU-E	Notes
1	wht/blu		1	1Ea	Basic rate access 1	1a	
		blu/wht	23	1Eb		1b	
2	wht/ora		3	1Sa		2a	
		ora/wht	4	1Sb		2b	
3	wht/grn		5	2Ea	Basic rate access 2	3a	
		grn/wht	6	2Eb		3b	
4	wht/brn		7	2Sa		4a	
		brn/wht	8	2Sb		4b	
5	wht/gry		9	3Ea	Basic rate access 3	5a	
		gry/wht	10	3Eb		5b	
6	red/blu		11	3Sa		6a	
		blu/red	12	3Sb		6b	
7	red/ora		13	4Ea	Basic rate access 4	7a	
		ora/red	14	4Eb		7b	
8	red/grn		15	4Sa		8a	
		grn/red	16	4Sb		8b	
9	red/brn		17	5Ea	Basic rate access 5	9a	
		brn/red	18	5Eb		9b	
10	red/gry		19	5Sa		10a	
		gry/red	20	5Sb		10b	
11	blk/blu		24	6Ea	Basic rate access 6	11a	
		blu/blk	25	6Eb		11b	
12	blk/ora		26	6Sa		12a	
		ora/blk	27	6Sb		12b	
13	blk/grn		29	7Ea	Basic rate access 7	13a	
		grn/blk	30	7Eb		13b	
14	blk/brn		31	7Sa		14a	
		brn/blk	32	7Sb		14b	
15	blk/gry		34	8Ea	Basic rate access 8	15a	
		gry/blk	35	8Eb		15b	
16	yel/blu		37	8Sa		16a	
		blu/yel	38	8Sb		16b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-112 STMD3 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack			STMD3		Notes
No.	**Subscriber line Pin**	**Trunk connection Pin**			
1	3	4	1Ea	Basic rate access 1	
	6	5	1Eb		
	4	3	1Sa		
	5	6	1Sb		
2	3	4	2Ea	Basic rate access 2	
	6	5	2Eb		
	4	3	2Sa		
	5	6	2Sb		
3	3	4	3Ea	Basic rate access 3	
	6	5	3Eb		
	4	3	3Sa		
	5	6	3Sb		
4	3	4	4Ea	Basic rate access 4	
	6	5	4Eb		
	4	3	4Sa		
	5	6	4Sb		
5	3	4	5Ea	Basic rate access 5	
	6	5	5Eb		
	4	3	5Sa		
	5	6	5Sb		
6	3	4	6Ea	Basic rate access 6	
	6	5	6Eb		
	4	3	6Sa		
	5	6	6Sb		
7	3	4	7Ea	Basic rate access 7	
	6	5	7Eb		
	4	3	7Sa		
	5	6	7Sb		
8	3	4	8Ea	Basic rate access 8	
	6	5	8Eb		
	4	3	8Sa		
	5	6	8Sb		

Table 3-113 STMD3 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	STMD3		Notes
1	S_0, Receive	Basic rate access 1	
26	S_0, Receive		
2	S_0, Transmit		
27	S_0, Transmit		
3	S_0, Receive	Basic rate access 2	
28	S_0, Receive		
4	S_0, Transmit		
29	S_0, Transmit		
5	S_0, Receive	Basic rate access 3	
30	S_0, Receive		
6	S_0, Transmit		
31	S_0, Transmit		
7	S_0, Receive	Basic rate access 4	
32	S_0, Receive		
8	S_0, Transmit		
33	S_0, Transmit		
9	S_0, Receive	Basic rate access 5	
34	S_0, Receive		
10	S_0, Transmit		
35	S_0, Transmit		
11	S_0, Receive	Basic rate access 6	
36	S_0, Receive		
12	S_0, Transmit		
37	S_0, Transmit		
13	S_0, Receive	Basic rate access 7	
38	S_0, Receive		
14	S_0, Transmit		
39	S_0, Transmit		
15	S_0, Receive	Basic rate access 8	
40	S_0, Receive		
16	S_0, Transmit		
41	S_0, Transmit		

Table 3-114 STMD3 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	STMD3		MDFU-E	S_0 patch panel, MW8 pin	
								Subscriber line	Trunk connection
1	1	wht/blu		19	1Ea	Basic rate access 1	1a	3	4
			blu/wht	39	1Eb		1b	6	5
	2	wht/ora		38	1Sa		2a	4	3
			ora/wht	48	1Sb		2b	5	6
	3	wht/grn		27	2Ea	Basic rate access 2	3a	3	4
			grn/wht	47	2Eb		3b	6	5
	4	wht/brn		16	2Sa		4a	4	3
			brn/wht	46	2Sb		4b	5	6
	5	wht/gry		05	3Ea	Basic rate access 3	5a	3	4
			gry/wht	45	3Eb		5b	6	5
2	6	red/blu		14	3Sa		6a	4	3
			blu/red	44	3Sb		6b	5	6
	7	red/ora		23	4Ea	Basic rate access 4	7a	3	4
			ora/red	43	4Eb		7b	6	5
	8	red/grn		32	4Sa		8a	4	3
			grn/red	42	4Sb		8b	5	6
	9	red/brn		11	5Ea	Basic rate access 5	9a	3	4
			brn/red	31	5Eb		9b	6	5
	10	red/gry		02	5Sa		10a	4	3
			gry/red	22	5Sb		10b	5	6
3	11	blk/blu		13	6Ea	Basic rate access 6	11a	3	4
			blu/blk	33	6Eb		11b	6	5
	12	blk/ora		04	6Sa		12a	4	3
			ora/blk	24	6Sb		12b	5	6
	13	blk/grn		15	7Ea	Basic rate access 7	13a	3	4
			grn/blk	35	7Eb		13b	6	5
	14	blk/brn		06	7Sa		14a	4	3
			brn/blk	26	7Sb		14b	5	6
	15	blk/gry		17	8Ea	Basic rate access 8	15a	3	4
			gry/blk	37	8Eb		15b	6	5
4	16	yel/blu		08	8Sa		16a	4	3
			blu/yel	28	8Sb		16b	5	6

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.28 STMI2

Introduction

STMI2 (**S**ubscriber **T**runk **M**odule **I**P) is a VoIP gateway board (VoIP - Voice over IP) which provides the functionality of HG 1500 in HiPath 3800. This includes:

- Connection of a local LAN to the HiPath 3800 and connection with external LANs via the ISDN and DSL interfaces of HiPath 3800.
- Support for the conventional functions of an ISDN and DSL router with the additional functionality of a media gateway for the transfer of voice, fax and data.
- Forwarding of calls between IP-supported networks (LAN, intranet, Internet) and circuit-switched networks (ISDN, PSTN).
- Bidirectional video signal transmission on the SIP interface (OpenScape Personal Edition).

Configuration is performed via Web-Based Management (WBM) which enables the administration of HG 1500 without any special software requirements.

A combination of up to eight STMI2 boards can be used per system, but the following restrictions must be observed:
- A maximum of four STMI2 boards may be inserted per HiPath 3800 cabinet.
- To allow for future channel expansion with extension modules, the slot between two STMI2 boards should remain free.

Information on configuration is provided in the HG 1500 administrator documentation.

For information on how to calculate the number of boards required for HG 1500, see Section 2.5.

Board versions

Table 3-115 STMI2 - Board Variants

Board	Part number	Services	DSPs	B channels DSP channels
STMI2	S30810-Q2316-X100	Voice and Data	2	32

Sixteen simultaneous Voice over IP connections are possible per DSP (Digital Signal Processor).

Extension modules

The STMI2 board has two HGA (HiPath Gateway Accelerator) slots, which can be used to connect the extension modules.

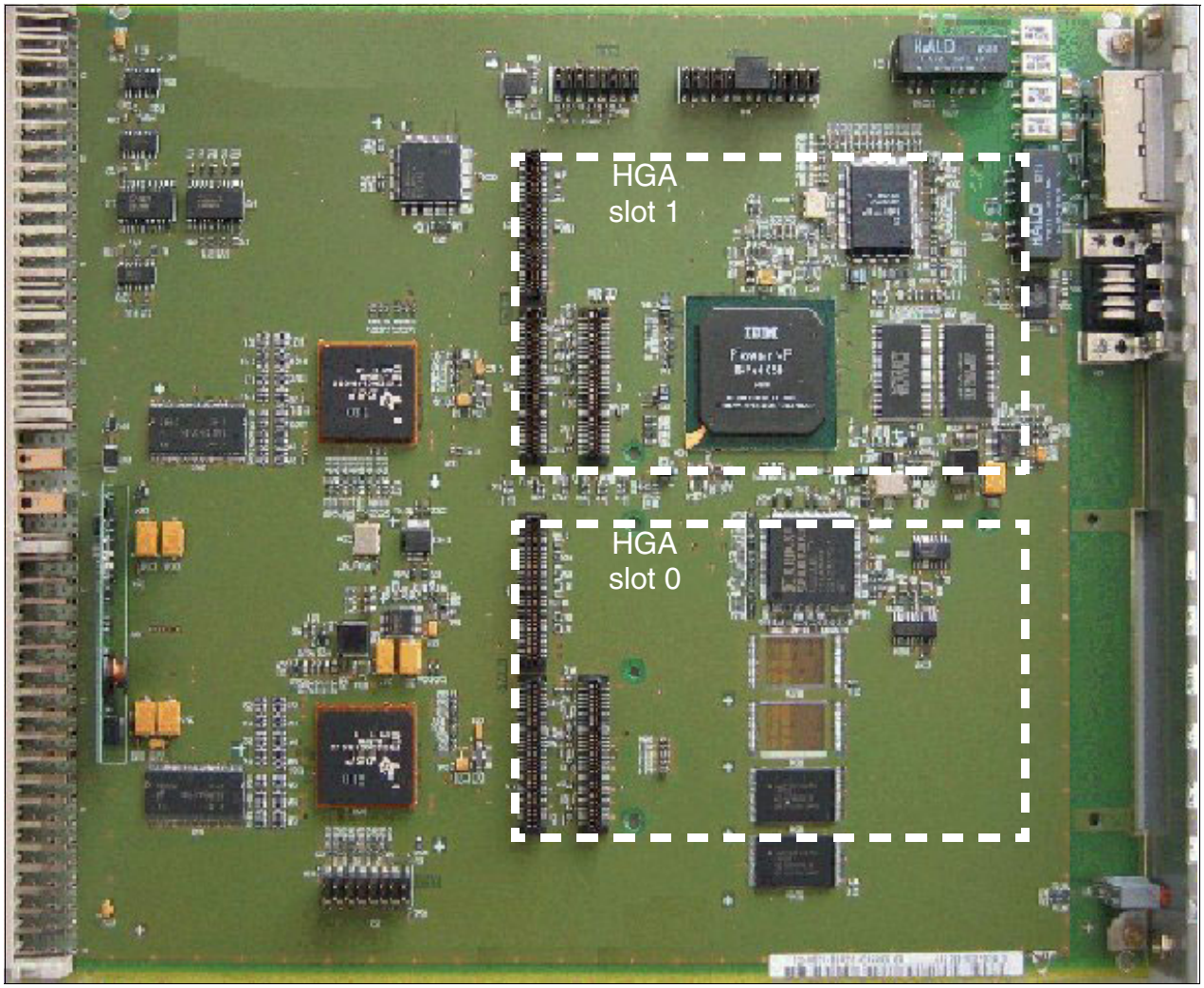


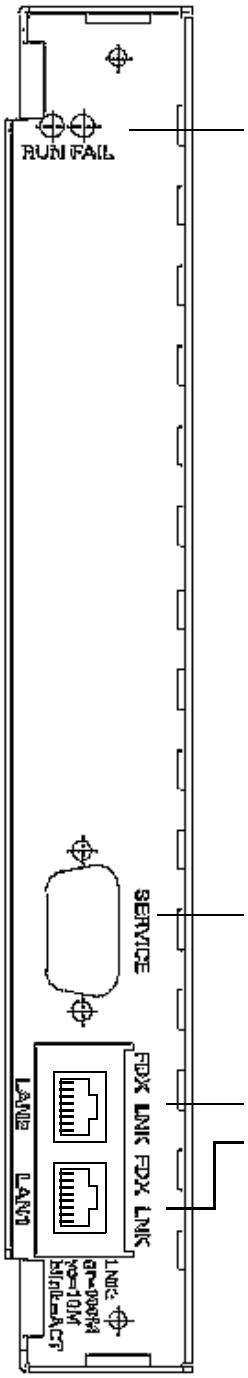
Figure 3-84 STMI2 (S30810-Q2316-X100) - HGA Slots

Connections

The STMI2 board features the following connections on the front panel:

- Two RJ45 jacks for LAN interfaces. These provide access to the Ethernet standard (IEEE 802.3) with 10 Mbps or 100 Mbps with automatic configuration. Manual configuration is also possible.
- 9-pin Sub-D plug for V.24 interface

Front panel



Two LEDs indicating the board status:

- Run (green)
  - on = at least 1 B channel busy
  - off = normal operation
- Fail (red) = error encountered

V.24 interface (9-pin Sub-D plug)

Two Ethernet (10/100BaseT) LAN connectors (8-pin RJ45 jacks):

- LAN2 (only released for service applications)
- LAN1

The LAN interface status is indicated by two LEDs:

- LED1:
  - Green = 100 Mbps online (link)
  - Yellow = 10 Mbps online (link)
  - Flashing = active
- LED2 (green):
  - On = full-duplex (FDX)
  - Off = half-duplex

Figure 3-85 STMI2 - Front Panel

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

V.24 interface

The V.24 cable (C30267-Z355-A25) is used for connecting the service PC.

The following settings must be chosen for a terminal or PC connected to the V.24 interface:

Transmission rate	38,400 (default)
Data bits	8
Parity bit	None
Stop bits	1
Data flow control	none

It is recommended that the local echo be deactivated on the connected terminal or PC.

Table 3-116 STMI2 - V.24 Interface Assignment

Pin	Signal	I/O	Remark
1	DCD		Not used
2	RxD	I	Internal pull-up resistor in level switch (MAX211E)
3	TxD	O	
4	DTR	O	
5	0 V		Ground
6	DSR	I	Internal pull-up resistor in level switch (MAX211E)
7	RTS	O	
8	CTS	I	Internal pull-up resistor in level switch (MAX211E)
9	RI		Not used

LAN interfaces

Table 3-117 STMI2 - LAN Interface Assignment (RJ45 Jacks)

Pin	Signal
1	TDP (Transmit Data +)
2	TDN (Transmit Data –)
3	RDP (Receive Data +)
4	TT1 (Transmit Termination 1)
5	TT2 (Transmit Termination 2)
6	RDN (Receive Data –)
7	RT1 (Receive Termination 1)
8	RT2 (Receive Termination 2)
Signals TT1/2 and RT1/2 are not needed for transmitting data. They represent a signal termination of 100 ohms (so-called Bob Smith termination) for the two unused wire pairs in a 4-pair twisted pair cable.	

3.3.29 TCAS-2 and TCASR-2 (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The following cards - one per system - can be used for V5.0 SMR -10 and later to support country-specific CAS (**C**hannel **A**ssociated **S**ignaling) protocols:

- TCAS-2 (S30810-Q2945-X) in HiPath 3550
- TCASR-2 (S30810-K2945-X) in HiPath 3500

Please note that the cards listed can only be used in slots 7 and 9.

Each of the cards features two E1-CAS interfaces, which together support up to 60 B channels. Since HiPath 3550 and HiPath 3500 each support a maximum of 30 B channels, a total of up to 30 B channels can be used per card.

Direct connection to the MINI BNC connectors on each card is only possible for coaxial trunks (75 ohms). An external impedance converter (F31505-E1-A146) must be used for symmetrical trunks (120 ohms).

TCAS-2 and TCASR-2 function as converters, which convert the Euro-ISDN protocol on an S_{2M} link to the Channel Associated Signaling protocol CAS. In contrast to the predecessor TMCAS board, TCAS-2 and TCASR-2 communicate directly with the central control in the system. All signaling and data traffic goes through TCAS-2 and TCASR-2. Unlike TMCAS, connection to an S_{2M} board is therefore not required.



Figure 3-86 TCAS-2 (S30810-Q2945-X) (for selected countries only) – Figure

Interfaces and jumpers

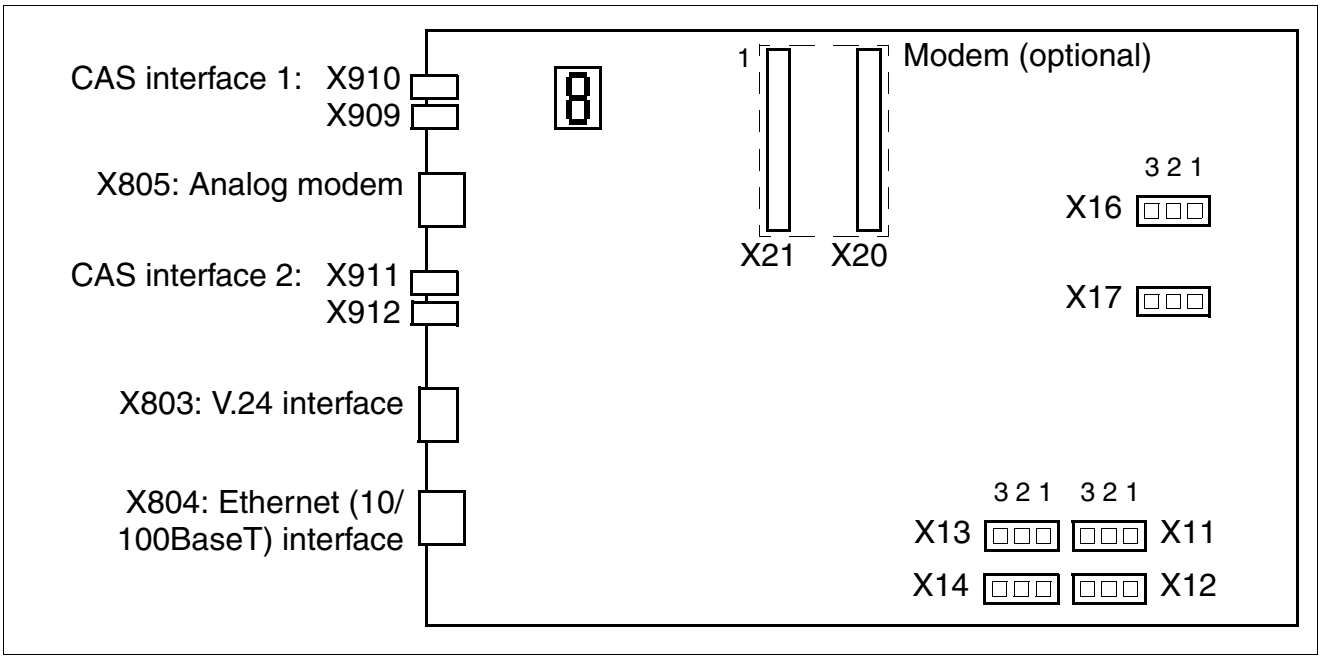


Figure 3-87 TCAS-2, TCASR-2 (for selected countries only) – Interfaces and Jumpers

Settings

Table 3-118 TCAS-2, TCASR-2 (for selected countries only) – Jumper Functions

Jumper	Function	Setting	
		Pins 1–2 closed	**Pins 2–3 closed**
X11	Sets the V.24 baud rate	See Table 3-119	
X12			
X14			
X13	Deletes the flash memory	Flash memory is deleted (all sectors apart from U-boot (firmware)).	Flash memory is not deleted. (default setting)
X16	Resets card	Reset performed.	Reset not performed. (default setting)
X17	Hardware watchdog	Watchdog active. (default setting)	Watchdog is not active.

Table 3-119 TCAS-2, TCASR-2 (for selected countries only) – Jumper for Setting the V.24 Baud Rate

V.24 baud rate (Kbps)	Jumper		
	X11	**X12**	**X14**
9.6 (default setting)	Open	Open	Open
19.2	Open	Open	Closed
38.4	Closed	Open	Closed
57.6	Open	Closed	Closed
115.2	Closed	Closed	Closed
9.6	All other configurations		

Connections

X910 (MINI BNC connector, 75 ohms): Receive (RX)

CAS interface 1:

X909 (MINI BNC connector, 75 ohms): Transmit (TX)

X805 (RJ45 jack): Analog modem (optional)

X911 (MINI BNC connector, 75 ohms): Receive (RX)

CAS interface 2:

X912 (MINI BNC connector, 75 ohms): Transmit (TX)

X803 (9-pin MINI DIN jack): V.24 interface

X804 (RJ45 jack): Ethernet (10/100BaseT) interface
Two LEDs indicate the current interface status:

- Yellow LED = transmitting data
- Green LED = receiving data



Figure 3-88 TCAS-2, TCASR-2 (for selected countries only) – Connections

TCASR-2 front panel

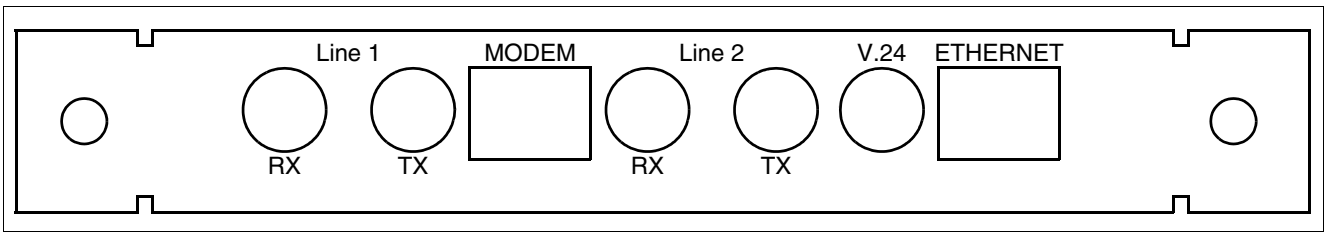
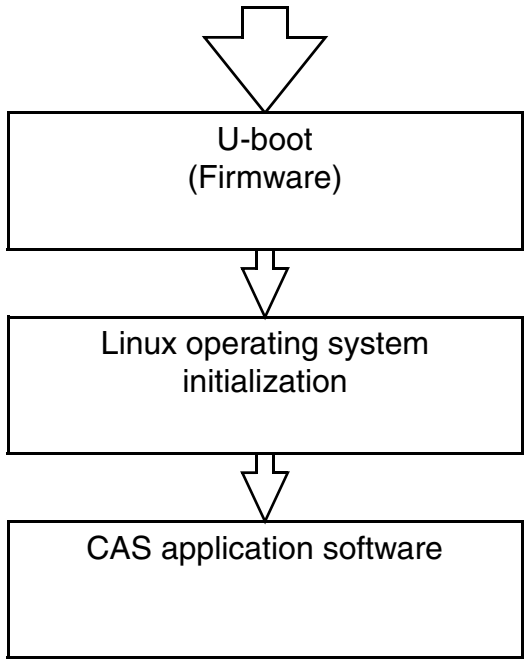


Figure 3-89 TCASR-2 (for selected countries only) – Front Panel

Seven-segment display

The card's software status can be ascertained on the basis of the seven-segment display. For this a distinction is made between the following boot phases:

Power supply unit switched on



The decimal point is flashing to indicate that the U-boot firmware is operational.

The decimal point is activated (not flashing) to indicate initialization of the Linux operating system.

The decimal point is activated when the card supplies the clock reference for the system.

- U-boot (firmware) states

  Table 3-120 TCAS-2, TCASR-2 (for selected countries only) – U-boot (firmware) States

Display	Meaning
H	Initializing hardware Downloading DSP (Digital Signal Processor) firmware Downloading FPGA (Field Programmable Gate Array) firmware
F	Accessing flash EPROM (Save and Delete)
b	Activating built-in self test BIST (BIST1 or BIST2)
A	Administration (Service PC connected)
C	Copying software (from SDRAM to FEPROM)
i	Downloading image file (Linux and CAS application)
L	Initializing the Linux operating system
E	Error
0	Resetting card
.	U-boot (firmware) operational (decimal point flashing)

- Linux operating system states

  Table 3-121 TCAS-2, TCASR-2 (for selected countries only) – Linux Operating System States

Display	Meaning
	Linux kernel boot
.	User space boot
1.	Check and mount flash
2.	Error found, mounted file system rebuild, reboot

Table 3-121 TCAS-2, TCASR-2 (for selected countries only) – Linux Operating System States

Display	Meaning
3.	Mounting flash file system
4.	Error mounting flash (flashing display)
5.	Configuring network interface
7.	Loading real-time kernel modules
9.	Loading board-specific modules
.	Core files available

- CAS application software states

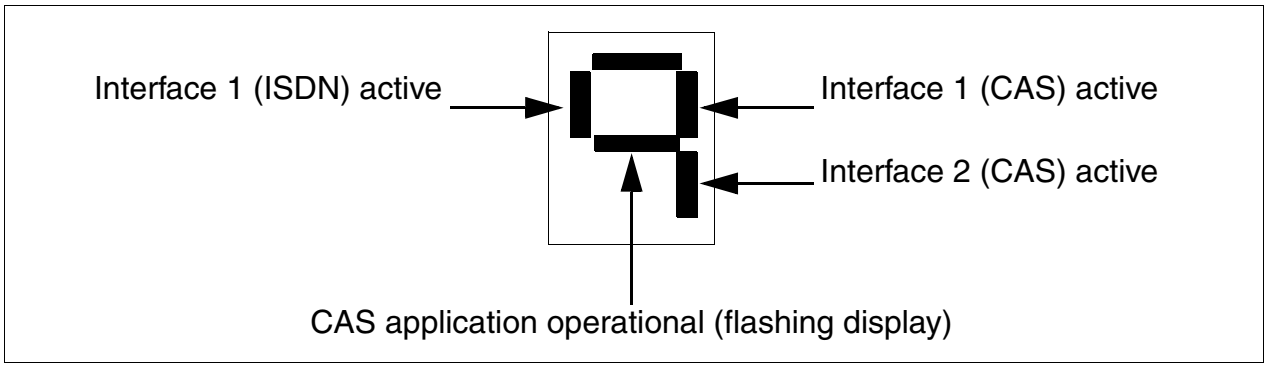


Figure 3-90 TCAS-2, TCASR-2 (for selected countries only) – CAS Application Software States

Modem (optional)

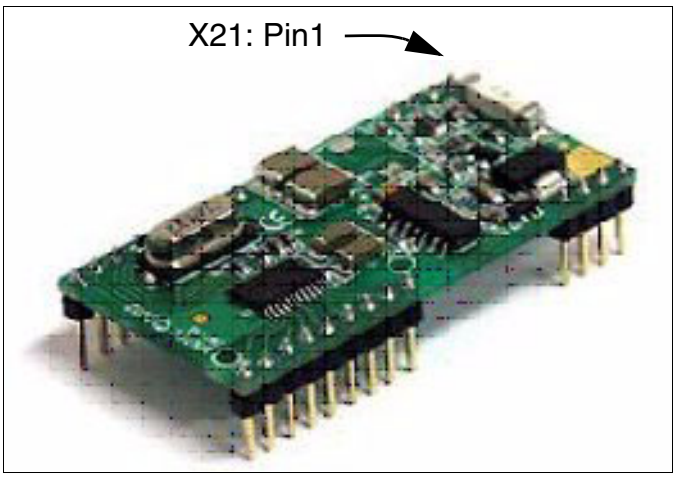


Figure 3-91 TCAS-2, TCASR-2 (for selected countries only) – Optional Modem

The analog modem (modem kit F31505-E1-A147) is an optional subboard for the TCAS-2 and TCASR-2 cards, which is plugged into the X20 and X21 ports. This facilitates remote administration of the CAS protocol converter on the TCAS-2 and TCASR-2 cards (see Page 3-259).

Administration of the CAS protocol converter

A separate tool, the CAS Manager, is used to download the software and administer the TCAS-2 and TCASR-2. The CAS Manager software is stored on a CD supplied with the card. For information on how to install the CAS Manager software on the Service PC, refer to the readme file.

The following options are available for accessing the cards:

- Via the V.24 interface (9-pin MINI DIN jack X803) and the connection cable C39195-A9700-B532.
- Via the Ethernet (10/100BaseT) interface (RJ45 jack X804).
- Via the optional analog modem (modem kit F31505-E1-A147). In this case, you will need to establish a connection from the analog modem (RJ45 jack X805) to a free port in an analog subscriber line module via the RJ45 cable C39195-Z7208-A10 supplied with the modem kit (see Figure 3-93).

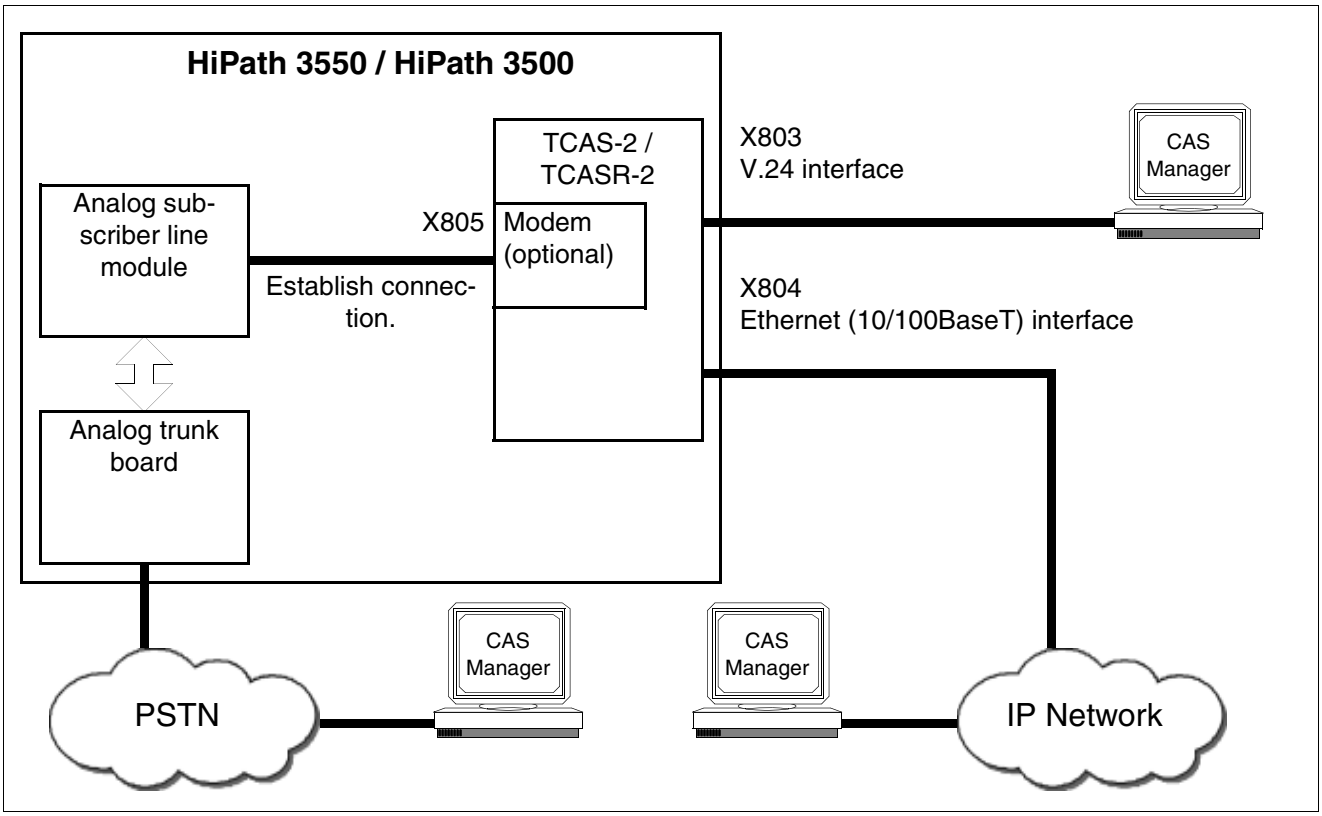
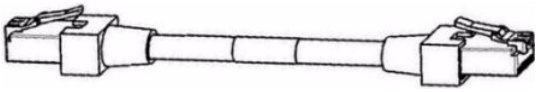


Figure 3-92 TCAS-2, TCASR-2 (for selected countries only) – Connection Options for Card Administration using CAS Manager

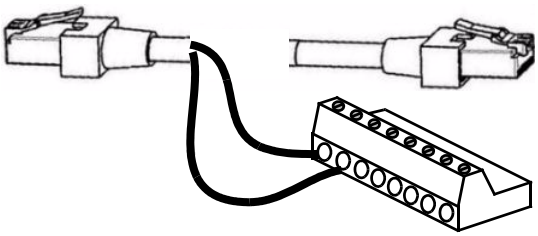
RJ45 Cable C39195-Z7208-A10 (included in modem kit F31505-E1-A147)

- **HiPath 3500**
  TCASR-2: X805



Plug the RJ45 connector into the free jack on an analog subscriber line module.

- **HiPath 3550**
  TCAS-2: X805



Disconnect the RJ45 cable and connect the T/R wires to the free terminals on an analog subscriber line module.

Figure 3-93 TCAS-2, TCASR-2 (for selected countries only) – RJ45 Cable C39195-Z7208-A10

Assigning the CAS cable

The following options are available for connecting network terminators (NT), multiplexers (MUX) or modems to the TCAS-2 and TCASR-2 cards (MINI BNC connections):

- Coaxial trunk (75 ohms), length = 10 m

  Table 3-122 TCAS-2, TCASR-2 (for selected countries only) – Assignment of the CAS Cable C39195-A7700-B13

Wire	Function	MINI BNC connector	BNC connector
1	Receive, Tip	Conductor	Conductor
	Receive, Ring	Shield	Shield
2	Transmit, Tip	Conductor	Conductor
	Transmit, Ring	Shield	Shield

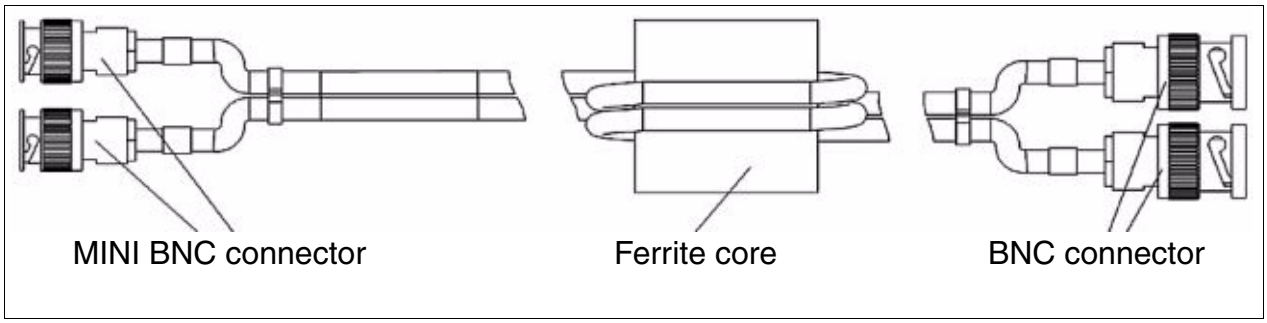


Figure 3-94 TCAS-2, TCASR-2 (for selected countries only) – CAS Cable C39195-A7700-B13

- Symmetrical trunk (120 ohms)

  The impedance converter F31505-E1-A146 must be used for connecting to a symmetrical trunk.

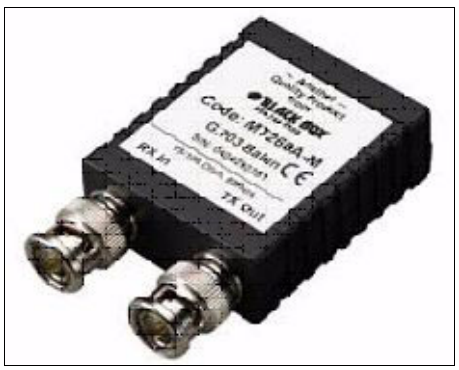


Figure 3-95 TCAS-2, TCASR-2 (for selected countries only) – Impedance Converter F31505-E1-A146

- CAS cable shield contacts

  To ensure sufficient electromagnetic shielding (according to EN 55022), both shielded CAS cables must be contacted at the appropriate points on the HiPath 3550/HiPath 3350.

  Procedure:

  Fix the cable shielding (B) for both CAS cables (A) via cable binder (C) to the T tongue (D) of the housing, so a continuously conductive contact is created between the conductive tape on the cable shielding and the housing (see figure).

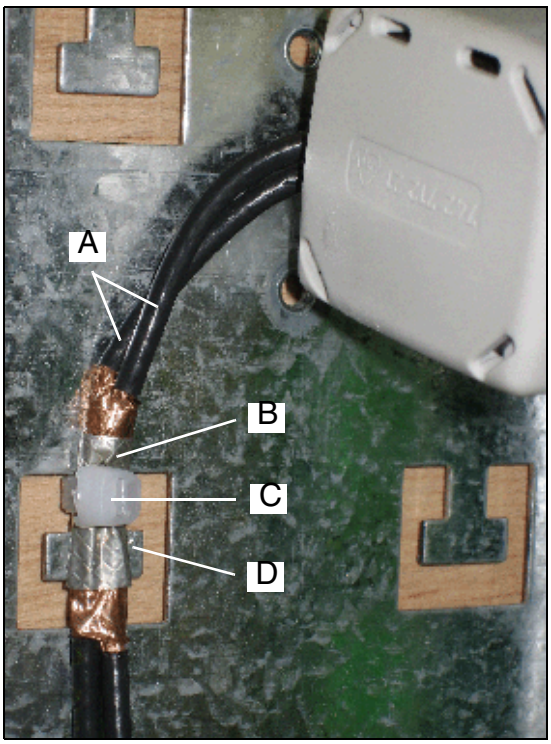


Figure 3-96 CAS cable – shield contacting

3.3.30 TLA2 (Not for U.S.), TLA4 (Not for U.S.), TLA8 (not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The MSI boards TLA2, TLA4 and TLA8 provide 2, 4 and 8 analog trunks (DP and DTMF dialing method) for HiPath 3550 and HiPath 3350 (wall housing).

Interfaces

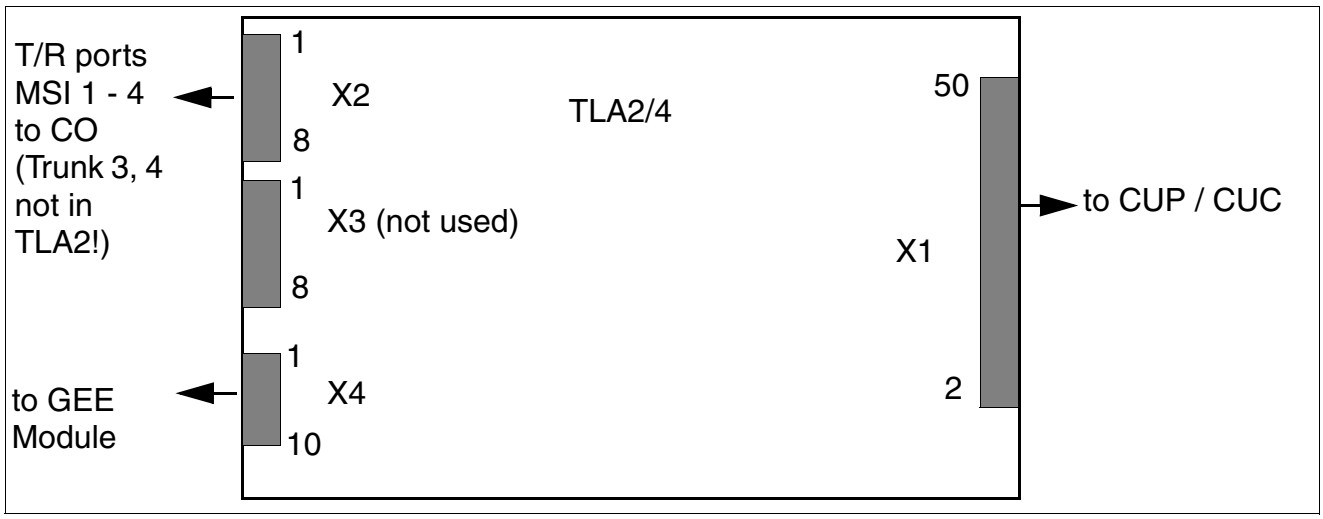


Figure 3-97 TLA2, TLA4 (not for U.S.) - Interfaces (S30817-Q923-Bxxx, -Axxx)

Table 3-123 TLA2, TLA4 (not for U.S.) - Contact Assignments

Contact	Connector X2	Connector X4
1	a trunk 1	GND for GEE50 FKR, otherwise free
2	b trunk 1	b trunk 1
3	a trunk 2	a trunk 1
4	b trunk 2	b trunk 2
5	a trunk 3[1]	a trunk 2
6	b trunk 3[1]	b trunk 3[1]
7	a trunk 4[1]	a trunk 3[1]
8	b trunk 4[1]	b trunk 4[1]
9		a trunk 4[1]
10		Call charging module assignment (GMZ)

1 Not for TLA2

The MSI board TLA8 with eight analog trunks for DP and DTMF signalling in HiPath 3550 and HiPath 3350

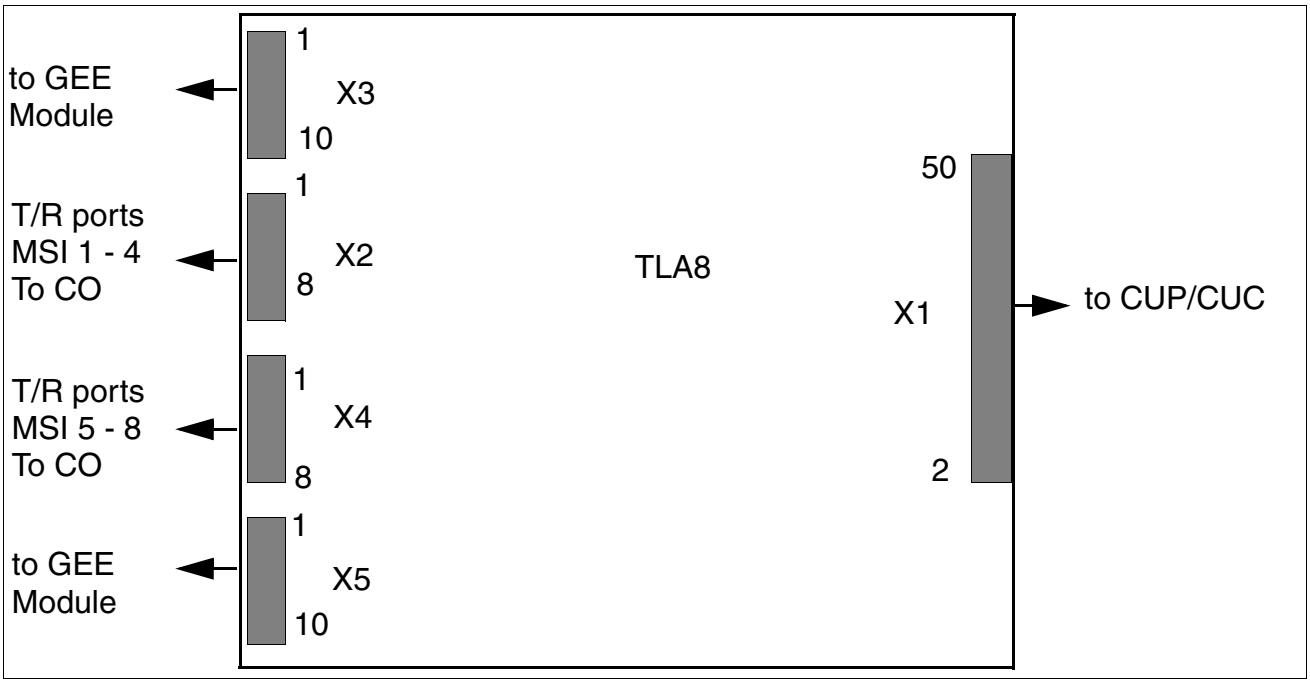


Figure 3-98 TLA8 (not for U.S.) - Interfaces (S30817-Q926-Axxx)

Table 3-124 TLA8 (not for U.S.) - Contact Assignments

Contact	Connector X3	Connector X2	Connector X4	Connector X5
1	GND	a trunk 1	a trunk 5	GND
2	b trunk 1	b trunk 1	b trunk 5	b trunk 5
3	a trunk 1	a trunk 2	a trunk 6	a trunk 5
4	b trunk 2	b trunk 2	b trunk 6	b trunk 6
5	a trunk 2	a trunk 3	a trunk 7	a trunk 6
6	b trunk 3	b trunk 3	b trunk 7	b trunk 7
7	a trunk 3	a trunk 4	a trunk 8	a trunk 7
8	b trunk 4	b trunk 4	b trunk 8	b trunk 8
9	a trunk 4	–	–	a trunk 8
10	GMZ 1	–	–	GMZ 2
GMZ= Call charging module assignment GND= GND for GEE50 FKR, otherwise free				

3.3.31 TLA4R (not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TLA4R (**T**runk **L**ine **A**nalog **R**ack) board provides four ports for the analog trunk connection (DP and DTMF signaling methods) on HiPath 3500 and HiPath 3300 (19-inch housing). There are also two ALUM power failure transfers.

The transmission and function-oriented characteristics of the TLA4R are completely identical to those of the TLA boards that are used in HiPath 3550 and HiPath 3350. The only differences are

- the two ALUMs which are only available on the TLA4R.
- the call metering receiving equipment interface, which is only on the TLA boards.

Interfaces

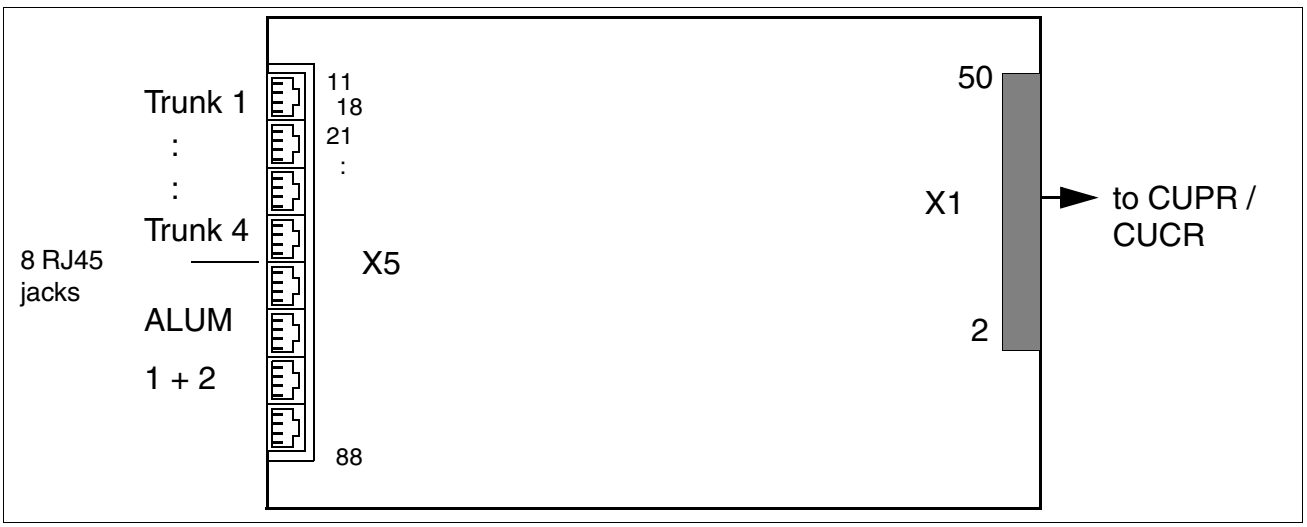


Figure 3-99 TLA4R (not for U.S.) - Interfaces (S30817-Q923-Zxxx)

Table 3-125 TLA4R (not for U.S.) - Contact Assignments

RJ45 jack	X5, Pin	Trunk connections 1-4	
1	14	a trunk 1	
	15	b trunk 1	
2	24	a trunk 2	
	25	b trunk 2	
3	34	a trunk 3	
	35	b trunk 3	
4	44	a trunk 4	
	45	b trunk 4	
RJ45 jack	**X5, Pin**	**ALUM 1 + 2**	
5	54	TB1	ALUM1: Stn card connection
	55	TA1	
6	64	TB2	ALUM2: Stn card connection
	65	TA2	
7	74	BE1	ALUM1: Analog telephone connection
	75	AE1	
8	84	BE2	ALUM2: Analog telephone connection
	85	AE2	

3.3.32 TM2LP

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TM2LP (**T**runk **M**odule **L**oop **P**rocedure) board connects up to eight analog trunks to HiPath 3800 using the loop-start protocol.

Front panel

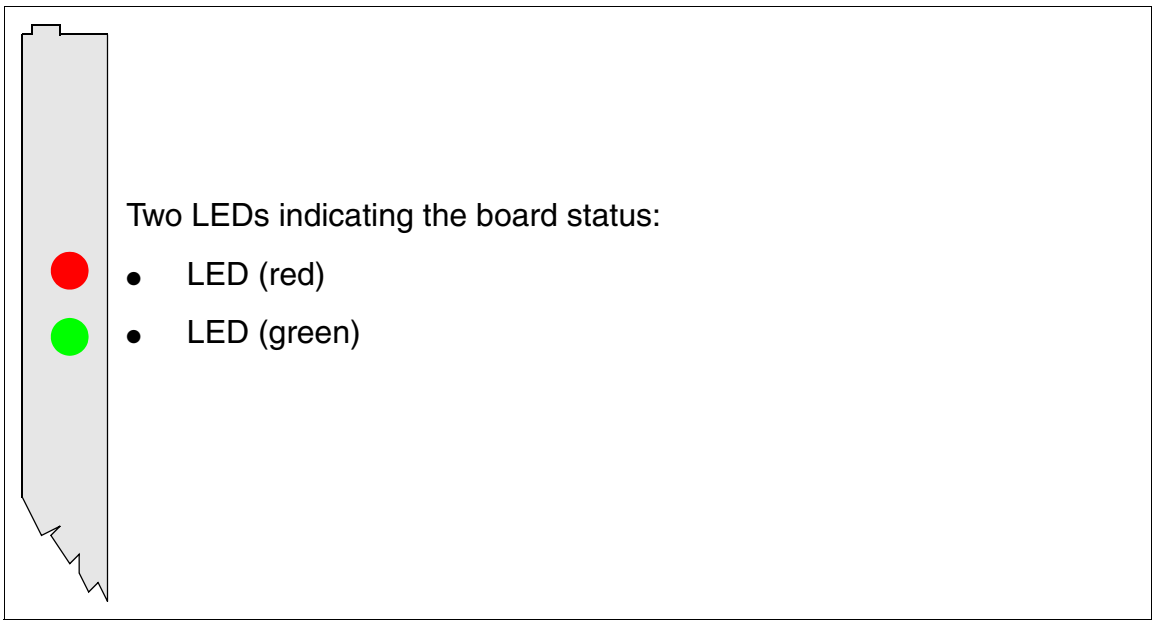


Figure 3-100 TM2LP - Front Panel (S30810-Q2159-Xxxx)

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-126 TM2LP - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-127
- For connecting to the connector panels using RJ45 jacks: Table 3-128
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-129
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-130

Table 3-127 TM2LP - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	TM2LP		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17		Free		
		brn/red	18				
10	red/gry		19		Free		
		gry/red	20				
11	blk/blu		24		Free		
		blu/blk	25				
12	blk/ora		26		Free		
		ora/blk	27				
13	blk/grn		29		Free		
		grn/blk	30				
14	blk/brn		31		Free		
		brn/blk	32				
15	blk/gry		34		Free		
		gry/blk	35				
16	yel/blu		37		Free		
		blu/yel	38				

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-128 TM2LP - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TM2LP	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4		Free
	5		
10	4		Free
	5		
11	4		Free
	5		
12	4		Free
	5		
13	4		Free
	5		
14	4		Free
	5		
15	4		Free
	5		
16	4		Free
	5		
17	4		Free
	5		

Table 3-128 TM2LP - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TM2LP	Notes
No.	**Pin**		
18	4		Free
	5		
19	4		Free
	5		
20	4		Free
	5		
21	4		Free
	5		
22	4		Free
	5		
23	4		Free
	5		
24	4		Free
	5		

Table 3-129 TM2LP - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	TM2LP			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9			Free	
34				
10			Free	
35				
11			Free	
36				
12			Free	
37				
13			Free	
38				
14			Free	
39				
15			Free	
40				
16			Free	
41				

Table 3-130 TM2LP - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU con-nector	TM2LP		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.33 TMAMF (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TMAMF (**T**runk **M**odule **A**nalog for **M**ulti**F**requency Code Signaling) board contains eight trunks for analog direct inward dialing. The system supports MFC-R2 signaling (default setting), MFC-R2 with caller ID, tone dialing, and dial pulsing. It is not possible to use DTMF and MFC-R2 (with or without caller ID) simultaneously.

The board is implemented in HiPath 3550 and has the part number S30810-Q2587-A400.

Switches and LEDs

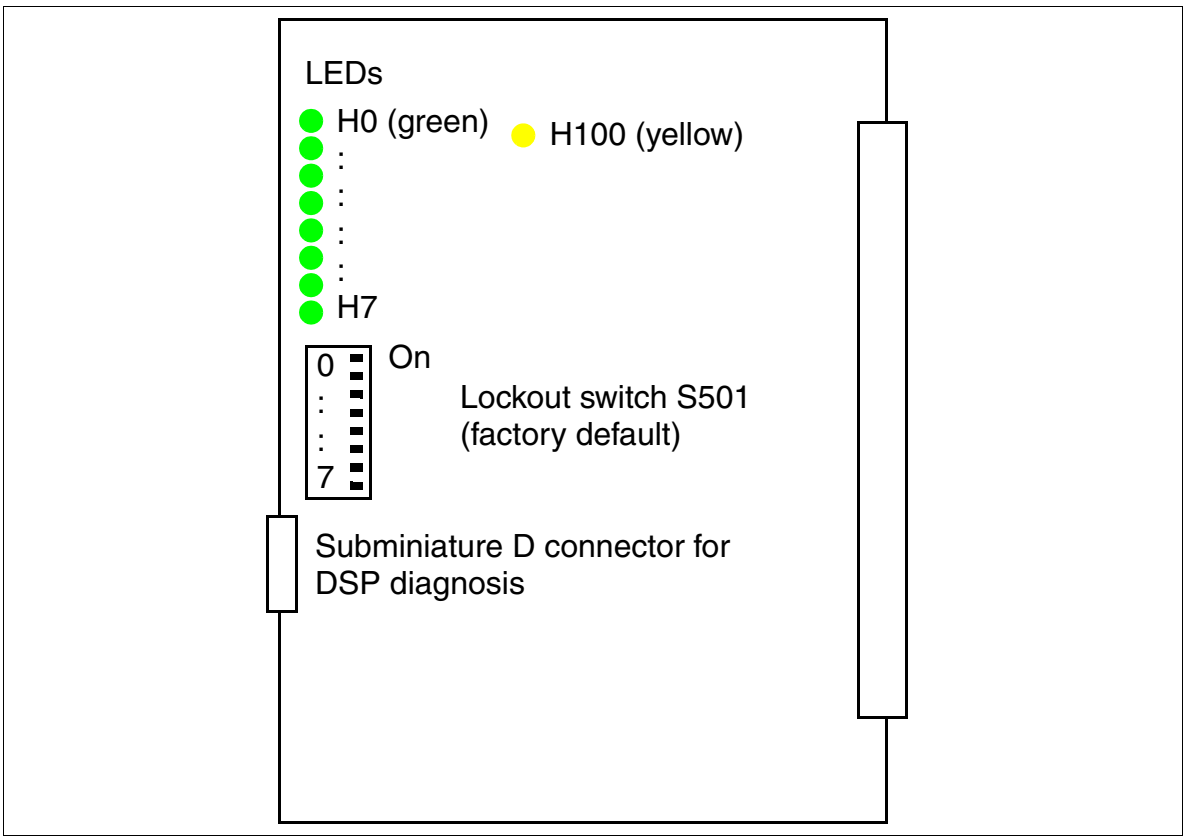


Figure 3-101 TMAMF (S30810-Q2587-Axxx)

Notes on DSP diagnosis

You can use the trace function built into the TMAMF module to diagnose malfunctions or obtain more precise error analysis. The subminiature D connector provides information about MFC-R2 signaling. To activate the trace function, you must connect a PC with a terminal emulation program (such as, Microsoft HyperTerminal).

Terminal configuration:

- Bits per second = 19,200
- Data bits = 8
- Stop bit = 1
- Parity = none
- Flow control = none

Pin assignments of the diagnostic cable

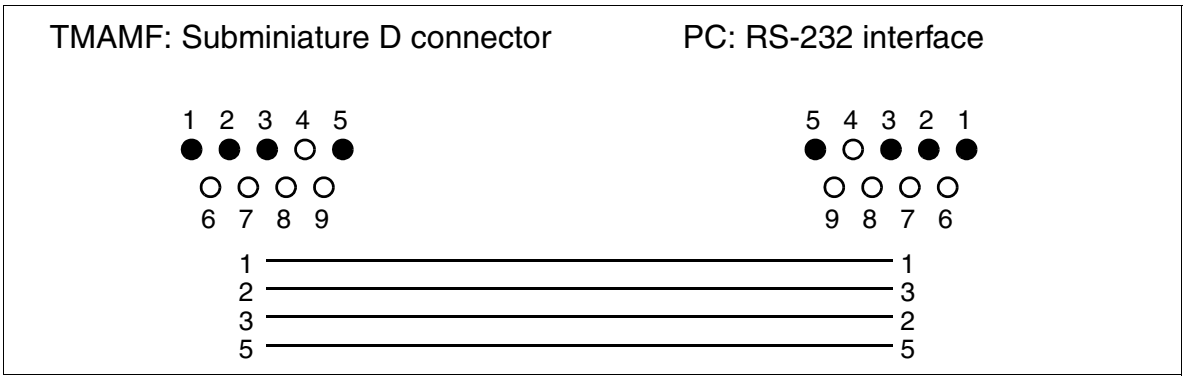


Figure 3-102 Pin Assignments of the TMAMF Diagnostic Cable

LED statuses and their meanings

- H100 LED (see Figure 3-101): signal processor status

  Table 3-131 TMAMF - LED Statuses (H100)

LED status (on/off)	Meaning	Action
During Startup and Initialization		
Off	–	
Flashing (250/250 ms)	The DSP (digital signal processor) is waiting for DID digits	
On	The DSP is being reset	
During Operation		
Off	The DSP is idle	
Flashing (250/250 ms)	Error: the DSP has not yet received the DID digits.	Replace the board.
On	The MFC-R2 filter is on	

- LEDs H0 to H7 (see Figure 3-101): trunk status

  Table 3-132 TMAMF - LED Statuses (H0 to H7)

LED status (on/off)	Meaning	Action
During Operation		
Off	The trunk is idle; no seizure	
On	The trunk was seized	
Flashing (500/500 ms)	Trunk out of service (e.g. S1/x “closed”)	Check whether the trunk was de-activated using HiPath 3000/ 5000 Manager E or the lockout switch.

Cable and connector assignment (backplane, MDFU/MDFU-E, patch panel)

Table 3-133 TMAMF - Cable Assignment

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector BP: Xx8	TMAMF		MDFU/ MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.34 TLANI2, TLANI4, TLANI8

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

TLANI2, TLANI4 and TLANI8 boards provide 2, 4 and 8 interfaces for the analog trunk connection (MSI: ground start or loop start) for HiPath 3550 and HiPath 3350 (wall housing).

The interfaces for analog trunk connection support the CLIP feature and call detail recording with 12 kHz and 16 kHz impulses. Call detail recording is automatically selected in the country setting for the system. Call detail recording with 50 Hz impulses is not supported.

Not all board country variants support call detail recording with 12 kHz and 16 kHz impulses.

Call detail recording can be activated and deactivated with HiPath 3000/5000 Manager E (Settings menu: Lines/networking ... -> Trunks -> (double-click) Parameters -> MSI flags -> Flags -> Charge module activated).

"Silent Reversal" is also supported, which is used to register the beginning and end of an outgoing call in different countries. It can be activated with HiPath 3000/5000 Manager E (Settings menu: Lines/networking ... -> Trunks -> (double-click) Parameters -> MSI flags -> Flags -> Silent Reversal).

The ÜFS (Supervisory Frequency System) trunks with direct inward dialing used in Austria are not supported.

Warning
According to U.S. and Canadian installation instructions, analog trunks must be connected over fuse elements in compliance with UL 497A or CSA C22.2 No. 226.

TLANI8 occupation

The TLANI8 can be occupied in the following variants based on a common PCB:

- TLANI8-CE (S30810-Q2954-X100): Fully occupied board, i.e. with call charge filter, call detail recording and jumper for ground start/loop start configuration
- TLANI8-IM (S30810-Q2954-X101): Board without call charge filter and call detail recording, loop start only
- TLANI8-BRA (S30810-Q2954-X182): Board without call charge filter

Interfaces

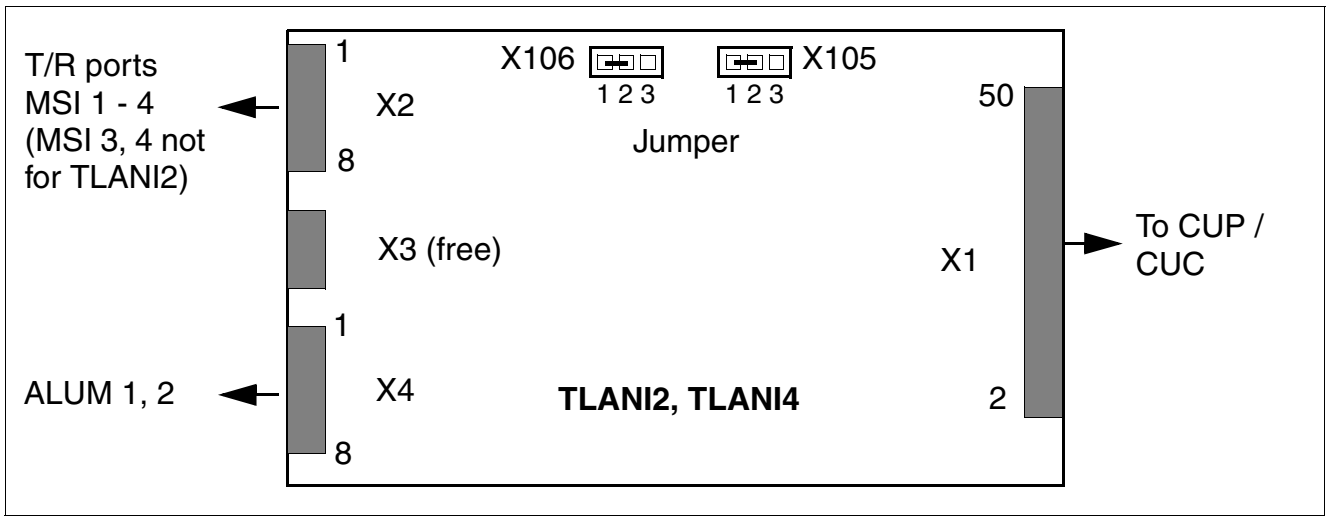


Figure 3-103 TLANI2, TLANI4 – Interfaces (S30810-H2953-X1xx / -Xxx)

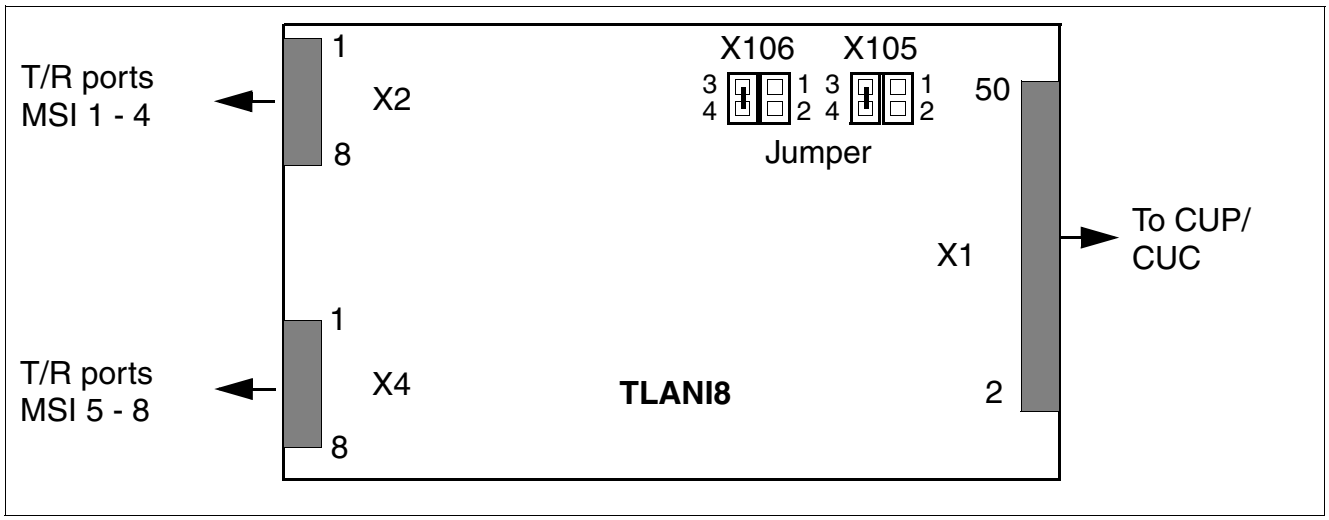


Figure 3-104 TLANI8 – Interfaces (S30810-H2954-X1xx)

Jumper for setting the process for the analog trunk interfaces

Process settings for the analog trunk interface is via X105 and X106 jumpers.

- TLANI2, TLANI4
  - Loop start setting = pins 1–2 closed (default)
  - Ground start setting = pins 2–3 closed

- TLANI8
  - Loop start setting = pins 3–4 closed (default)
  - Ground start setting = pins 1–2 closed
    [ground start not possible for TLANI8-IM and TLANI8-BRA]

Contact assignments

Table 3-134 TLANI2, TLANI4 – Contact Assignments

Contact	Connector X2	Connector X3	Connector X4 (ALUM)	
1	a, trunk 1	Not used	b	ALUM1: Subsc. line module connection
2	b, trunk 1		a	
3	a, trunk 2		b	ALUM2: Subsc. line module connection
4	b, trunk 2		a	
5	a, trunk 3		b	ALUM1: Analog telephone connection
6	b, trunk 3		a	
7	a, trunk 4		b	ALUM2: Analog telephone connection
8	b, trunk 4		a	

Table 3-135 TLANI8 – Contact Assignments

Contact	Connector X2	Connector X4
1	a, trunk 1	a, trunk 5
2	b, trunk 1	b, trunk 5
3	a, trunk 2	a, trunk 6
4	b, trunk 2	b, trunk 6
5	a, trunk 3	a, trunk 7
6	b, trunk 3	b, trunk 7
7	a, trunk 4	a, trunk 8
8	b, trunk 4	b, trunk 8

3.3.35 TLANI4R

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TLANI4R board provides four interfaces for the analog trunk connection (MSI: ground start or loop start) for HiPath 3500 and HiPath 3300 (19’-inch housing).

The interfaces for analog trunk connection support the CLIP feature and call detail recording with 12 kHz and 16 kHz impulses. Call detail recording is automatically selected in the country setting for the system. Call detail recording with 50 Hz impulses is not supported.



Not all board country variants support call detail recording with 12 kHz and 16 kHz impulses.

Call detail recording can be activated and deactivated with HiPath 3000/5000 Manager E (Settings menu: Lines/networking ... -> Trunks -> (double-click) Parameters -> MSI flags -> Flags -> Charge module activated).

"Silent Reversal" is also supported, which is used to register the beginning and end of an outgoing call in different countries. It can be activated with HiPath 3000/5000 Manager E (Settings menu: Lines/networking ... -> Trunks -> (double-click) Parameters -> MSI flags -> Flags -> Silent Reversal).

The ÜFS (Supervisory Frequency System) trunks with direct inward dialing used in Austria are not supported.



Warning
According to U.S. and Canadian installation instructions, analog trunks must be connected over fuse elements in compliance with UL 497A or CSA C22.2 No. 226.

Interfaces

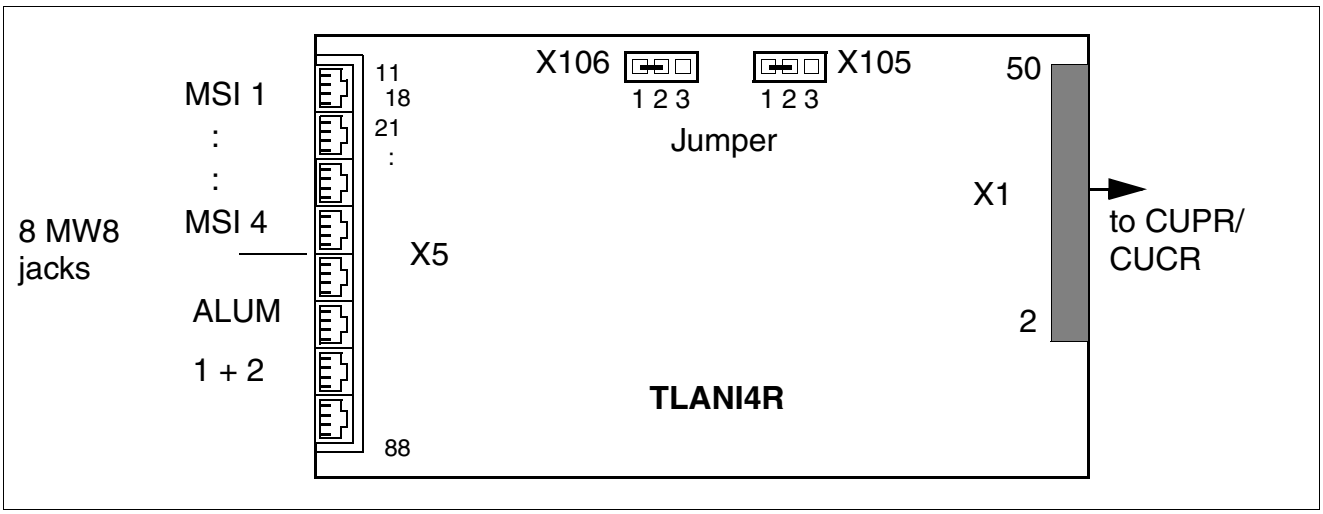


Figure 3-105 TLANI4R – Interfaces (S30810-K2953-X2xx)

Contact assignments

Table 3-136 TLANI4R – Contact Assignments

RJ45 jack	X5, pin	Trunk connections 1-4
1	14	a, trunk 1
	15	b, trunk 1
2	24	a, trunk 2
	25	b, trunk 2
3	34	a, trunk 3
	35	b, trunk 3
4	44	a, trunk 4
	45	b, trunk 4

Table 3-136 TLANI4R – Contact Assignments

RJ45 jack	X5, pin	ALUM 1 + 2	
5	54	b	ALUM1: Subsc. line module connection
	55	a	
6	64	b	ALUM2: Subsc. line module connection
	65	a	
7	74	b	ALUM1: Analog telephone connection
	75	a	
8	84	b	ALUM2: Analog telephone connection
	85	a	

Jumper for setting the process for the analog trunk interfaces

Process settings for the analog trunk interface is via X105 and X106 jumpers.

- Loop start setting = Pins 1–2 closed (default)
- Ground start setting = Pins 2 – 3 closed

3.3.36 TMANI, TMANI-IM, TMANI-BRA [TMANI8]

NOTE: Danger of property damage from overvoltage. Appropriate lightning protection measures need to be taken for this board, see Section 2.1.2, “Lightning Protection”.

TMANI8 occupation

The TMANI8 for HiPath 3800 can be occupied in the following variants based on a common PCB:

- TMANI (S30810-Q2327-X): Fully occupied board, i.e. with call charge filter, call detail recording and jumper for ground start/loop start configuration.
- TMANI-IM (S30810-Q2327-X1): Board without call charge filter and call detail recording, loop start only, no ground start.
- TMANI-BRA (S30810-Q2327-X82, for Brazil): Board without call charge filter and call detail recording, loop start only, no ground start, special overvoltage protection with varistors.

Features

- Interfaces:

  The TMANI, TMANI-IM and TMANI-BRA boards provide 8 interfaces for the analog CO (MSI: Ground Start [not for IM and BRA] or loop start) for HiPath 3800. The ground start functionality is only used in the USA and Canada.

- The interfaces for the analog CO support the CLIP feature.
- Dial pulsing and DTMF processes
- Call detail recording in TMANI:

  The interfaces for the analog trunk connection support call detail recording with 12 kHz and 16 kHz pulses. Call detail recording is selected automatically via the country setting of the system. Call detail recording with 50 Hz pulses is not supported.

  Important: Call detail recording at 12 kHz and 16 kHz pulses and process changeover for analog trunk interfaces (jumper X100 and X101) are not supported by all country variants for modules.

  With HiPath 3000/5000 Manager E, call detail recording can be activated and deactivated (Settings menu: Lines/networking ... -> Trunks -> (double-click) Parameters -> MSI flags -> Flags -> Charge module activated).

- Silent Reversal:

  "Silent Reversal", which is used to register the beginning and end of an outgoing call in different countries, is also supported. It can be activated with HiPath 3000/5000 Manager E (Settings menu: Lines/networking ... -> Trunks -> (double-click) Parameters -> MSI flags -> Flags -> Silent Reversal).

- ÜFS direct inward dialing:

  The Austrian direct inward dialing system ÜFS is not supported.

Installation instructions in the U.S. and Canada:

According to U.S. and Canadian installation instructions, analog trunks must be connected over fuse elements in compliance with UL 497A or CSA C22.2 No. 226.

Front panel, LEDs

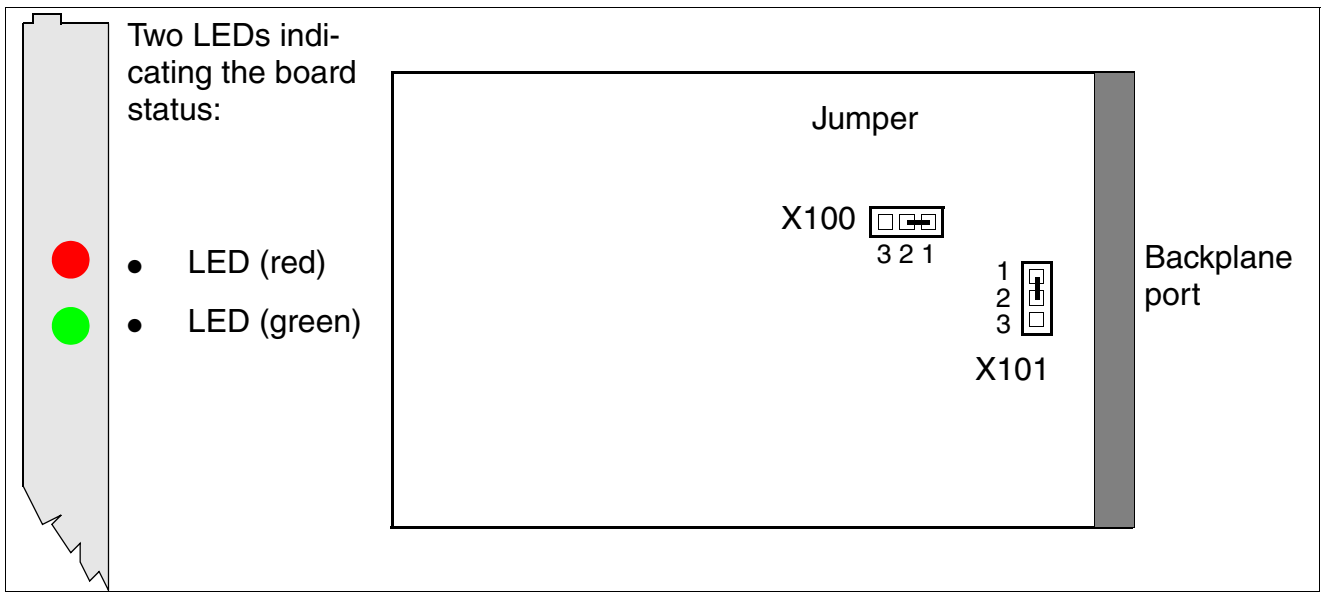


Bild 3-106 TMANI8 – front panel, LEDs (S30810-Q2327-Xxx)

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

Jumper for setting the procedure for analog trunk interfaces

The procedure for the analog trunk interfaces is set via jumper X100 and X101.

- Loop start setting = pins 1–2 closed (default)
- Ground start setting = Pins 2 – 3 closed [not with IM and BRA]

LED statuses and their meanings

Table 3-137 TMANI8 – LED States

Red LED	Green LED	Status	Measure
off	off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
on	off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace board.
		Loadware loading not successfully completed. Board is faulty.	Replace board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
flashing	off	Loadware is being loaded.	
off	on	Board test completed successfully. Board is OK (idle state).	
off	flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-138
- For connecting to the connector panels using RJ45 jacks: Table 3-139
- For U.S. only: For connecting to the connector panels with CHAMP jack: Table 3-140
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-141

Table 3-138 TMANI8 - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (Tip)	b-wire[1] (Ring)	SIVAPAC connector	TMANI8		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17		Free		
		brn/red	18				
10	red/gry		19		Free		
		gry/red	20				
11	blk/blu		24		Free		
		blu/blk	25				
12	blk/ora		26		Free		
		ora/blk	27				
13	blk/grn		29		Free		
		grn/blk	30				
14	blk/brn		31		Free		
		brn/blk	32				
15	blk/gry		34		Free		
		gry/blk	35				
16	yel/blu		37		Free		
		blu/yel	38				

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-139 TMANI8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TMANI8	Notes
No.	Pin		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4		Free
	5		
10	4		Free
	5		
11	4		Free
	5		
12	4		Free
	5		
13	4		Free
	5		
14	4		Free
	5		
15	4		Free
	5		
16	4		Free
	5		
17	4		Free
	5		

Table 3-139 TMANI8 - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TMANI8	Notes
No.	**Pin**		
18	4		Free
	5		
19	4		Free
	5		
20	4		Free
	5		
21	4		Free
	5		
22	4		Free
	5		
23	4		Free
	5		
24	4		Free
	5		

Table 3-140 TMANI8 - Connector Panel Assignment with CHAMP Jack (for U.S. only)

CHAMP jack	TMANI8			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9			Free	
34				
10			Free	
35				
11			Free	
36				
12			Free	
37				
13			Free	
38				
14			Free	
39				
15			Free	
40				
16			Free	
41				

Table 3-141 TMANI8 - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (Tip)	b-wire[1] (Ring)	SU con-nector	TMANI8		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.37 TMC16 (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The trunk module TMC16 (**T**runk **M**odule **C**entral Office) connects up to 16 analog ground-start or loop-start trunks with the HiPath 3800.

Front panel

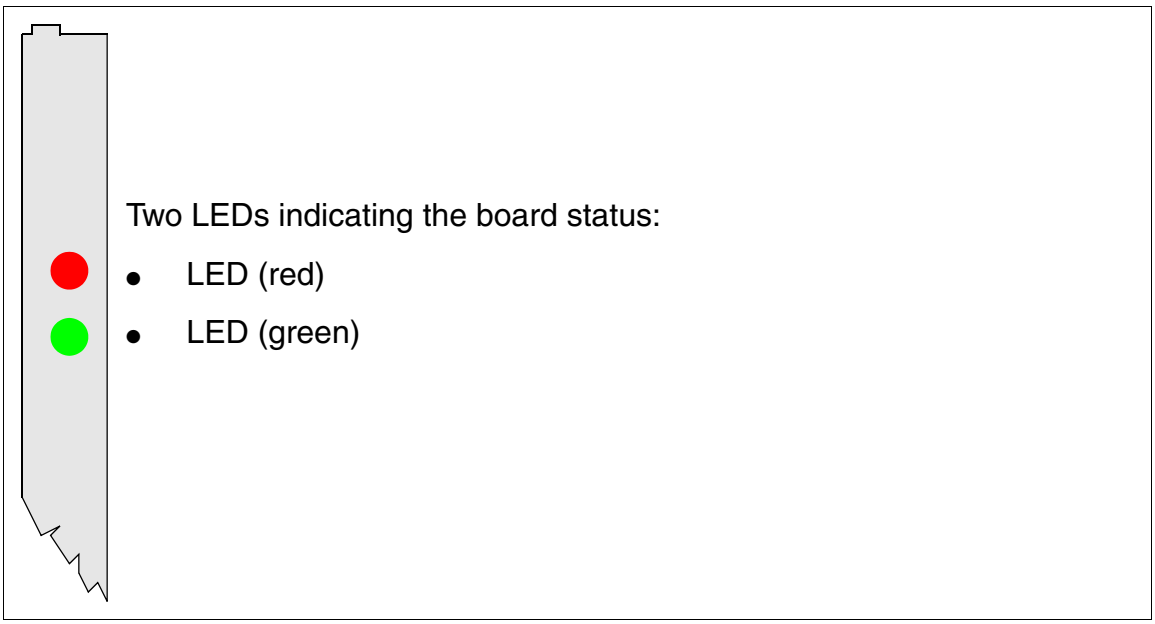


Figure 3-107 TMC16 (for selected countries only) (S30810-Q2485-X) - Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-142 TMC16 (for selected countries only) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-143
- For connecting to the connector panels with CHAMP jack: Table 3-144
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-145

Table 3-143 TMC16 (for selected countries only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	TMC16		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17	9a	Port 9	9a	
		brn/red	18	9b		9b	
10	red/gry		19	10a	Port 10	10a	
		gry/red	20	10b		10b	
11	blk/blu		24	11a	Port 11	11a	
		blu/blk	25	11b		11b	
12	blk/ora		26	12a	Port 12	12a	
		ora/blk	27	12b		12b	
13	blk/grn		29	13a	Port 13	13a	
		grn/blk	30	13b		13b	
14	blk/brn		31	14a	Port 14	14a	
		brn/blk	32	14b		14b	
15	blk/gry		34	15a	Port 15	15a	
		gry/blk	35	15b		15b	
16	yel/blu		37	16a	Port 16	16a	
		blu/yel	38	16b		16b	

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-144 TMC16 (for selected countries only) - Connector Panel Assignment with CHAMP Jack

CHAMP jack	TMC16			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9	9a	9 Ring	Port 9	
34	9b	9 Tip		
10	10a	10 Ring	Port 10	
35	10b	10 Tip		
11	11a	11 Ring	Port 11	
36	11b	11 Tip		
12	12a	12 Ring	Port 12	
37	12b	12 Tip		
13	13a	13 Ring	Port 13	
38	13b	13 Tip		
14	14a	14 Ring	Port 14	
39	14b	14 Tip		
15	15a	15 Ring	Port 15	
40	15b	15 Tip		
16	16a	16 Ring	Port 16	
41	16b	16 Tip		

Table 3-145 TMC16 (for selected countries only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU con-nector	TMC16		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11	9a	Port 9	9a	4	
			brn/red	31	9b		9b	5	
	10	red/gry		02	10a	Port 10	10a	4	
			gry/red	22	10b		10b	5	
3	11	blk/blu		13	11a	Port 11	11a	4	
			blu/blk	33	11b		11b	5	
	12	blk/ora		04	12a	Port 12	12a	4	
			ora/blk	24	12b		12b	5	
	13	blk/grn		15	13a	Port 13	13a	4	
			grn/blk	35	13b		13b	5	
	14	blk/brn		06	14a	Port 14	14a	4	
			brn/blk	26	14b		14b	5	
	15	blk/gry		17	15a	Port 15	15a	4	
			gry/blk	37	15b		15b	5	
4	16	yel/blu		08	16a	Port 16	16a	4	
			blu/yel	28	16b		16b	5	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.38 TMCAS (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

For V1.0 and later, TMCAS (**T**runk **M**odule **C**hannel **A**ssociated **S**ignaling) boards can be used in HiPath 3550 to support the country-specific CAS protocol.

The board converts the Euro-ISDN protocol on an S_{2M} link into the Channel Associated Signaling (CAS) protocol. The board functions only in connection with a TS2 (HiPath 3550). There is no direct connection between the TMCAS board and the system’s central control unit. The TMS2/TS2 handles all signaling and data traffic.

Switches and display

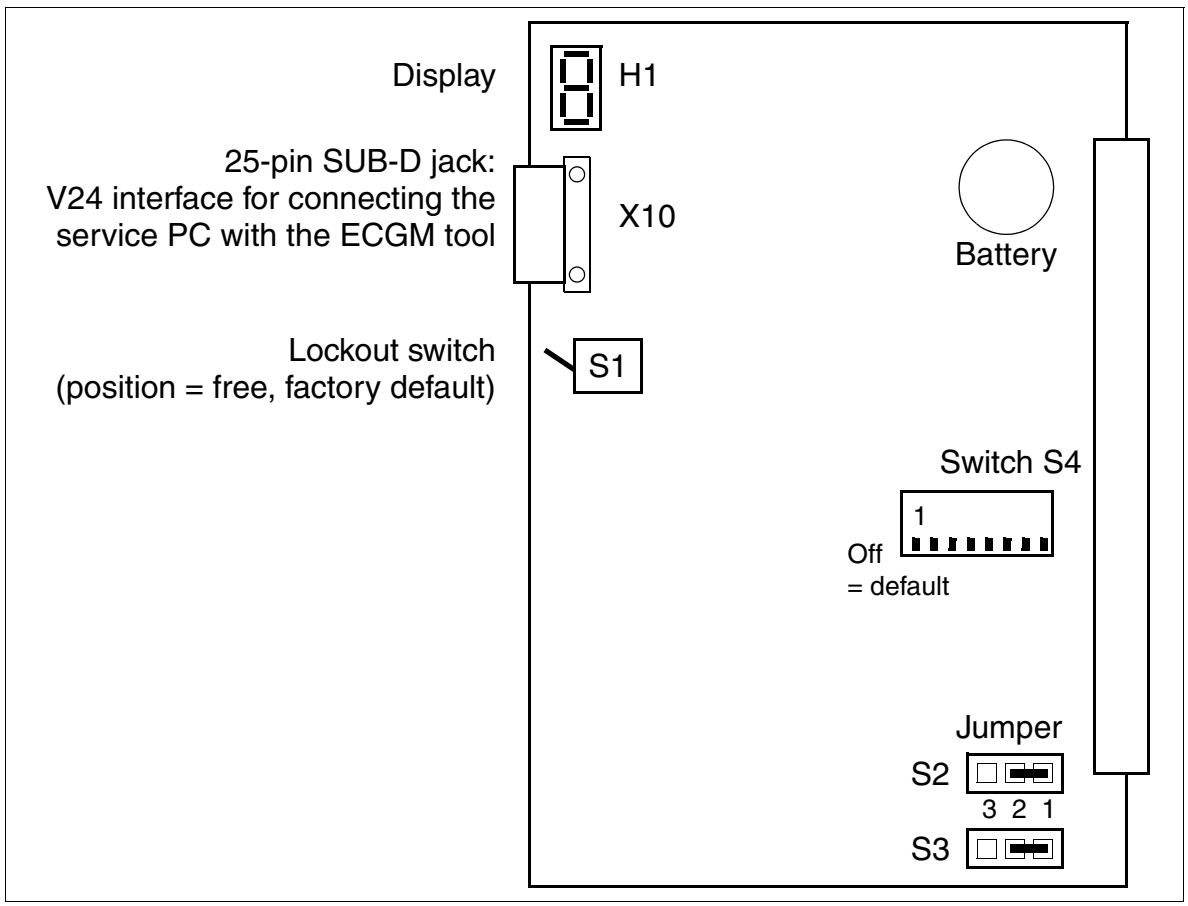


Figure 3-108 TMCAS (S30810-Q2938-X)

Administration of the CAS protocol converter

Use the ECGM tool for administration. For information on installing the software on the service PC and on the required settings, see Page 3-303.

You can use the C39195-Z7267-C13 cable for the connection between jack X10 and the service PC.

Switches S4-1 to S4-4 for setting the impedance

To ensure that the TMCAS works properly, the same impedance must be selected both on the S_{2M} side of the TMCAS and on the TS2 (HiPath 3550) board.

Impedance on the CAS Side	**Switch settings**	
	S4-1	**S4-2**
120 ohms (default)	Off	Off
100 ohms	On	Off
75 ohms	Off	On
No function	On	On
Impedance on the S_{2M} Side	**Switches**	
	S4-3	**S4-4**
120 ohms (default)	Off	Off
100 ohms	On	Off
75 ohms	Off	On
No function	On	On

Switches S4-5 to S4-8

Switches	**Function**
S4-5	Reserved
S4-6	Flash memory: only for laboratory purposes (the flash memory is erased when switch is set to “On”).
S4-7	Reserved
S4-8	Battery: Select the “On” switch position to make the connection to the processor’s real-time clock only after the protocol converter has been configured.

Jumpers S2 and S3 for GND connection

You can set the GND connection (signal ground) of the receiving (Rx) and transmitting (Tx) lines on the CAS side here.

GND connection	Jumper setting
no signal ground (default)	S2 = 1 - 2, S3 = 1 - 2
signal ground on receive lines (Rx) on the CAS side	S2 = 2 - 3
signal ground on the transmit lines (Tx) on the CAS side	S3 = 2 - 3

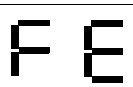
Recommendations for the GND connection:

- symmetrical trunk (120 ohms)
  Ground the cable's shield on the side of the connected device (NT, MUX, modem).
- coaxial line (75 ohms)
  Do not ground the shield on both ends of the cable.
  - Tx: Ground the cable's shield on the TMCAS side.
  - Rx: Ground the cable's shield on the side of the connected device (NT, MUX, modem).

Seven-segment display H1

The board statuses listed in the following table are displayed on H1.

Table 3-146 TMCAS - Seven-Segment Display H1

Display	Meaning
	Waiting for the TMCAS software download
	TMCAS software download start
	TMCAS software download
	Writing the TMCAS software/extender software into the flash memory
	Loading the TMCAS software/extender software from the flash memory
	Waiting for ECGM command (10 s)
	Calculating the checksum
	No TMCAS software in the flash memory, waiting for reload
	Flash memory erased (changing display)
	TMCAS board active
	TMCAS board active, boot process completed

Assignments for the two TMCAS cables for HiPath 3550

You can use one of the following two cables to connect the network terminator NT, multiplexer MUX, or modem to the TMCAS board:

- symmetrical trunk (120 ohms)

  Table 3-147 Assignment of the TMCAS Cable C39195-A9700-B512

SU connector Xx8, pin	Function	Color code
2	a-wire (T), receive	grn
22	b-wire (R), receive	blk
6	a-wire (T), transmit	red
26	b-wire (R), transmit	blk

- coaxial line (75 ohms)

  Table 3-148 Assignment of the TMCAS Cable C39195-A9700-B514

SU connector Xx8, pin	Function	Wire
2	a-wire (T), receive	BNC shield, cable 1
22	b-wire (R), receive	BNC signal, cable 1
6	a-wire (T), transmit	BNC shield, cable 2
26	b-wire (R), transmit	BNC signal, cable 2

Procedure for retrofitting a TMCAS board

Step	Activity
1.	Disconnect system from power supply and open system.
2.	Insert TS2 (HiPath 3550).
3.	• HiPath 3550 (wall housing): Insert TMCAS in slot 10.
4.	Plug in TMS2/TS2-TMCAS connection cable.
5.	Connect the NT to the system using the TMCAS cable.
6.	Close the system and connect it to the power supply.
7.	After the system has booted, both boards are entered in the system's database (TMS2 or TS2 and TMCAS).
8.	If necessary, configure with HiPath 3000/5000 Manager E.

Possible problems:

- TMCAS not entered in HiPath 3000/5000 Manager E
  The TMCAS is displayed automatically after the generation/regeneration of the database in a system with a correctly inserted and connected TMCAS-TMS2/TS2 combination.
- Missing electrical connection between TMS2/TS2 and TMCAS
  No TMCAS entry in the database. If a correctly configured database (with TMCAS inserted offline) is then loaded into the system using generation/regeneration, the TMCAS configured in HiPath 3000/5000 Manager E appears only in the software configuration.
- Incompatible board configuration
  There is a correctly inserted TMCAS-TMS2/TS2 combination in the system. If there is a different board entered in HiPath 3000/5000 Manager E in the HiPath 3550's large slot, the generation is rejected.

Installing the ECGM tool and configuring the CAS protocol converter

This section describes how to install the ECGM tool on the service PC and configure the CAS protocol converter on the TMCAS board.

The ECGM tool supports the following actions:

- Extender, database and software download
- CAS protocol configuration
- Database programming
- Trace options

Procedure

Step	Activity
1.	Create directory `c:\ecginst` on the service PC.
2.	Set up the connection to the download server (for information on this, contact your local ITSC) and copy the following files into the directory `c:\ecginst`: • `e1v0xx.exe` (for example, `e140ah.exe`) • `Ee1v0yy.exe` (for example, `Ee140am.exe`) • `Ecgm_vzz.exe` (for example `Ecgm_4aa.exe`) Explanation of the variables: • `v =` software version • `xx =` country version of a file • `yy =` file version for channels • `zz =` file version for maintenance
3.	Run .exe files. This will extract the following files, for example: • `Ecgm.cab` (WinZip file) • `Setup.lst` (LST file) • `Setup.exe` (EXE file) • `4brazil.iam` (IAM file) • `Ecg_edb4.ein` (EIN file) • `4brazil.eam` (EAM file) • `E140ah.sin` (SIN file) • `E140ah.pnm` (PNM file) • `X140pai.pnm` (PNM file) • `X130aq.pnm` (PNM file)
4.	Execute `Setup.exe` file. This will create the directory `ecgm` and extract various files.
5.	Copy `vbrazil.iyy` (for example, `4brazil.iam`) to the directory `ecgm`.
6.	Run the file `ecgm.exe`.

Step	Activity
7.	Make the following settings in the ECGM tool: • `File/Options` menu: Select the service PC's COM interface (for example: COM1) • `File/Install Software` menu: Select the file `E1v0xx.pnm` (for example, `E140ah.pnm` from the directory `ecginst`. • `File/Install Edb` menu: Select the file `Ecg_edbv.ein` (for example `Ecg_edb4.ein`) from the directory ecginst. • `File/Update Site` menu: – Under ECG SOFTWARE, select loadware file `E1v0xx.pnm`. – Under "ECG EDB", select file `vbrazil.iyy`. – Under "FILE NAME", select file extension `.db` for logging TMCAS events. – Enter the customer name under "ECG NAME.
8.	Close the ECGM tool and then restart (`ecgm.exe`).
9.	Enter the COM interface under "COMM" and the customer name in the `Settings/ECG Name` menu. All other windows are updated automatically.
10.	Channel configuration Define the channel parameters in the `View/Database` menu (reserve unused channels with "Out of Service"): • Protocol • Signaling method (incoming and outgoing) • Clock master (always central office) • Operator number (corresponds to the number of the attendant console of the HiPath 3000)
11.	Software download If the seven-segment display H1 on the TMCAS displays "H", it is necessary to download the extender software (`Download/Extender` menu). Otherwise, continue with the next step.
12.	Start the software/database download using the `Download/Software and Database` menu. This procedure takes approximately 8 minutes. The download is complete when the configured channels display the "Idle" status. The seven-segment display H1 on the TMCAS shows "A" (= active).

3.3.39 TMCAS-2 (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TMCAS-2 card (**T**runk **M**odule **C**hannel **A**ssociated **S**ignaling) can be used in HiPath 3800 for V5.0 SMR-10 and later to support country-specific CAS protocols.

The card features two E1-CAS interfaces, which together support up to 60 B channels.

Both coaxial trunks (75 ohms) and symmetrical trunks (120 ohms) can be connected to the 15-pin sub-D jacks on the card.

TMCAS-2 functions as a converter, which converts the Euro-ISDN protocol on an S_{2M} link to the Channel Associated Signaling (CAS) protocol. In contrast to the predecessor PBXXX card, TMCAS-2 communicates directly with the central control in the system. All signaling and data traffic goes through TMCAS-2. Unlike PBXXX, a connection with an S_{2M} card is therefore not required.

Up to three TMCAS-2 cards can be used in a HiPath 3800.

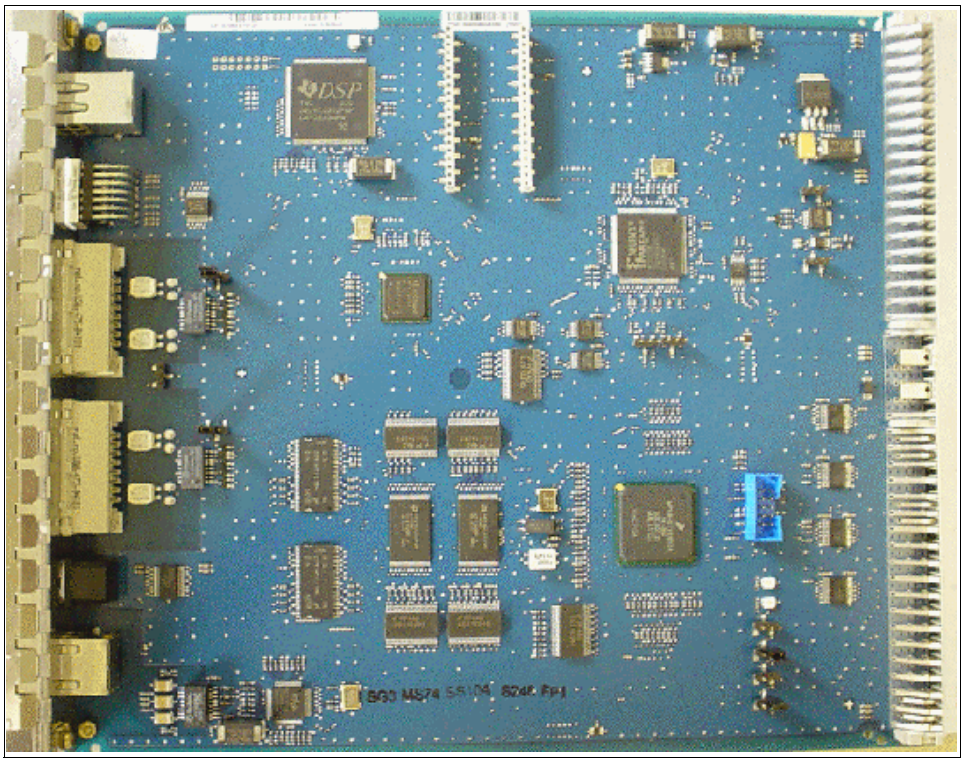


Figure 3-109 TMCAS-2 (S30810-Q2946-X) (for selected countries only) – Figure

Interfaces and jumpers

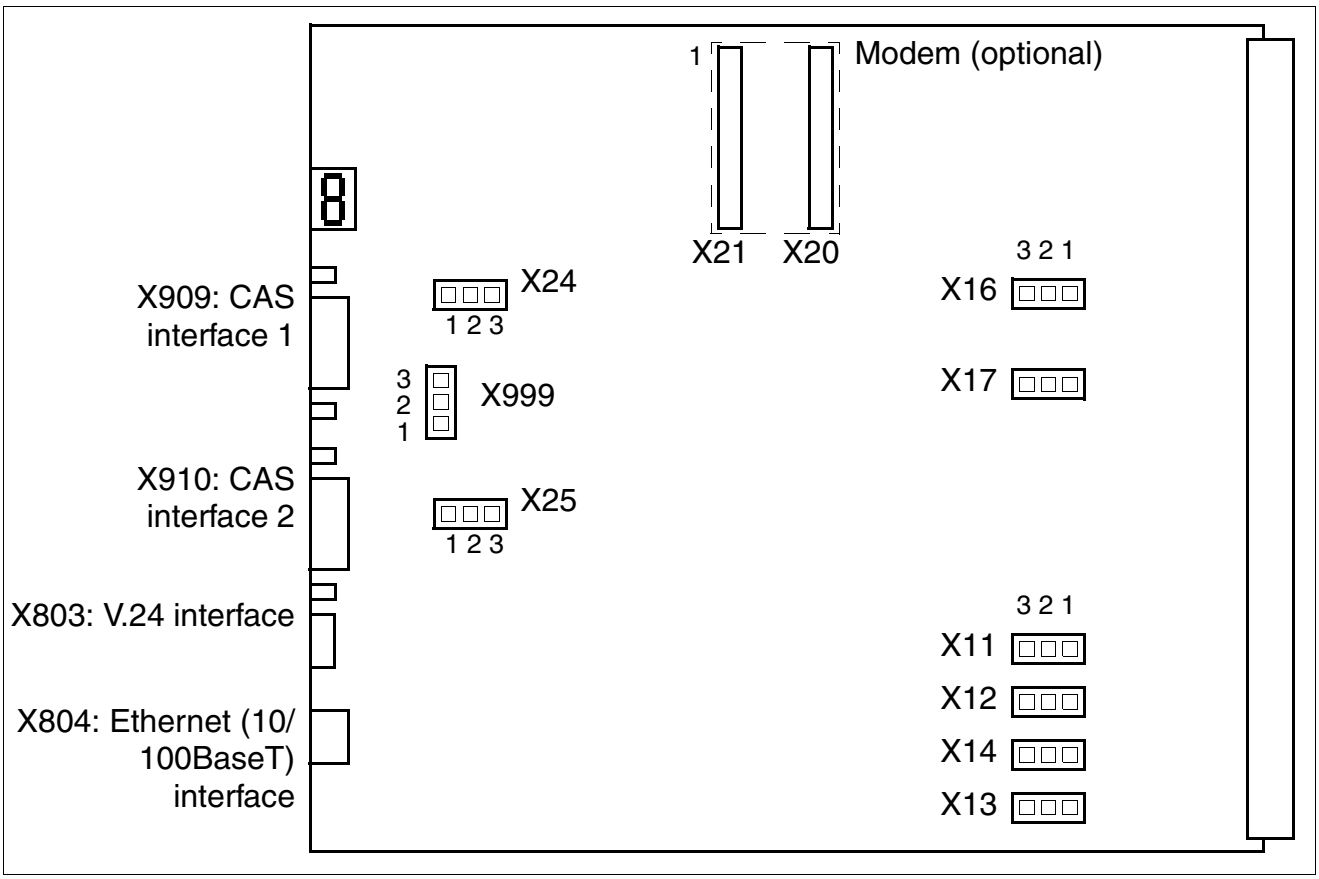


Figure 3-110 TMCAS-2 (for selected countries only) – Interfaces and Jumpers

Settings

Table 3-149 TMCAS-2 (for selected countries only) – Jumper Functions

Jumper	Function	Setting	
		Pins 1–2 closed	**Pins 2–3 closed**
X11	Sets the V.24 baud rate	See Table 3-150	
X12			
X14			
X13	Deletes the flash memory	Flash memory is deleted (all sectors apart from U-boot (firmware)).	Flash memory is not deleted. (default setting)
X16	Resets card	Reset performed.	Reset not performed. (default setting)
X17	Hardware watchdog	Watchdog active. (default setting)	Watchdog is not active.
X24	Sets trunk impedance for CAS interface 1	75 ohms (default setting)	120 ohms
X25	Sets trunk impedance for CAS interface 2	75 ohms (default setting)	120 ohms
X999	Grounding: card / CAS cable	Grounding for the card is connected to the grounding for the CAS cable.	Grounding for the card is not connected to the grounding for the CAS cable. (default setting)

Table 3-150 TMCAS-2 (for selected countries only) – Jumper for Setting the V.24 Baud Rate

V.24 baud rate (Kbps)	Jumper		
	X11	**X12**	**X14**
9.6 (default setting)	Open	Open	Open
19.2	Open	Open	Closed
38.4	Closed	Open	Closed
57.6	Open	Closed	Closed
115.2	Closed	Closed	Closed
9.6	All other configurations		

Front panel



Seven-segment display

X909 (15-pin Sub-D jack): CAS interface 1

X910 (15-pin Sub-D jack): CAS interface 2

X803 (9-pin MINI DIN jack): V.24 interface

X804 (RJ45 jack): Ethernet (10/100BaseT) interface
Two LEDs indicate the current interface status:

- Yellow LED = transmitting data
- Green LED = receiving data

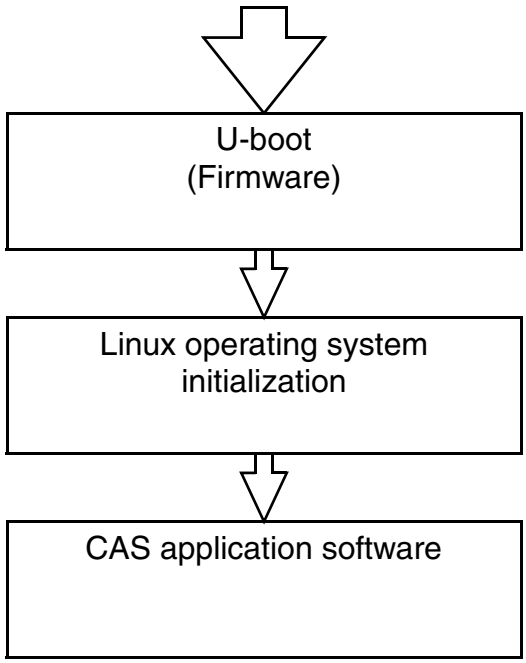
Figure 3-111 TMCAS-2 (for selected countries only) – Front Panel

The front of this board does not require an additional plate because EMC shielding has already been achieved by the front panel.

Seven-segment display

The card's software status can be ascertained on the basis of the seven-segment display. For this a distinction is made between the following boot phases:

Power supply unit switched on



The decimal point is flashing to indicate that the U-boot firmware is operational.

The decimal point is activated (not flashing) to indicate initialization of the Linux operating system.

The decimal point is activated when the card supplies the clock reference for the system.

- U-boot (firmware) states

Table 3-151 TMCAS-2 (for selected countries only) – U-boot (firmware) States

Display	Meaning
H	Initializing hardware Downloading DSP (Digital Signal Processor) firmware Downloading FPGA (Field Programmable Gate Array) firmware
F	Accessing flash EPROM (Save and Delete)
b	Activating built-in self test BIST (BIST1 or BIST2)
A	Administration (Service PC connected)
C	Copying software (from SDRAM to FEPROM)

Table 3-151 TMCAS-2 (for selected countries only) – U-boot (firmware) States

Display	Meaning
1	Downloading image file (Linux and CAS application)
L	Initializing the Linux operating system
E	Error
8	Resetting card
.	U-boot (firmware) operational (decimal point flashing)

- Linux operating system states

Table 3-152 TMCAS-2 (for selected countries only) – Linux Operating System States

Display	Meaning
	Linux kernel boot
.	User space boot
1.	Check and mount flash
2.	Error found, mounted file system rebuild, reboot
3.	Mounting flash file system
4.	Error mounting flash (flashing display)
5.	Configuring network interface
7.	Loading real-time kernel modules
9.	Loading board-specific modules
.	Core files available

- CAS application software states

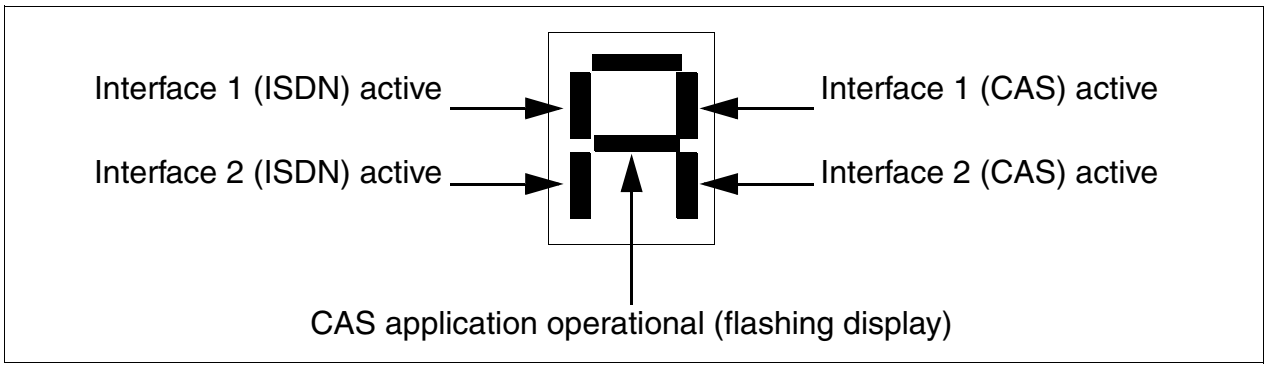


Figure 3-112 TMCAS-2 (for selected countries only) – CAS Application Software States

Modem (optional)

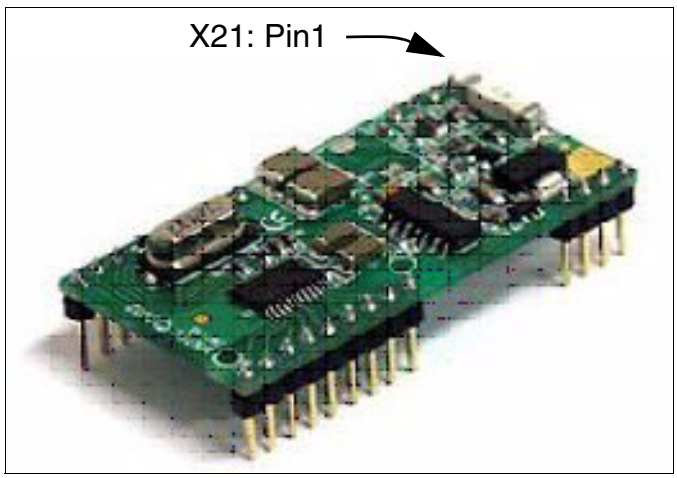


Figure 3-113 TMCAS-2 (for selected countries only) – Optional Modem

The analog modem (S30122-X8004-X22) is an optional subboard for the TMCAS-2 card, which is plugged into the X20 and X21 ports. This facilitates remote administration of the CAS protocol converter on the TCAS-2 and TCASR-2 cards (see Page 3-312).

Administration of the CAS protocol converter

A separate tool, the CAS Manager, is used to download the software and administer the TMCAS-2. The CAS Manager software is stored on a CD supplied with the card. For information on how to install the CAS Manager software on the Service PC, refer to the readme file.

The following options are available for accessing the card:

- Via the V.24 interface (9-pin MINI DIN jack X803) and the connection cable C39195-A9700-B532.
- Via the Ethernet (10/100BaseT) interface (RJ45 jack X804).
- Via the optional analog modem (S30122-X8004-X22). In this case, you will need to establish a connection from the analog modem to a free port on an analog subscriber line module. Use a connection cable (open-end cable (24 DA): S30267-Z196-A150 = 15 m long, S30267-Z196-A250 = 25 m long) (blue in Figure 3-114) to connect the backplane (TMCAS-2) to the main distributor frame or patch panel and vice versa. Insert the required jumpers in the main distributor frame or patch panel (green in Figure 3-114).

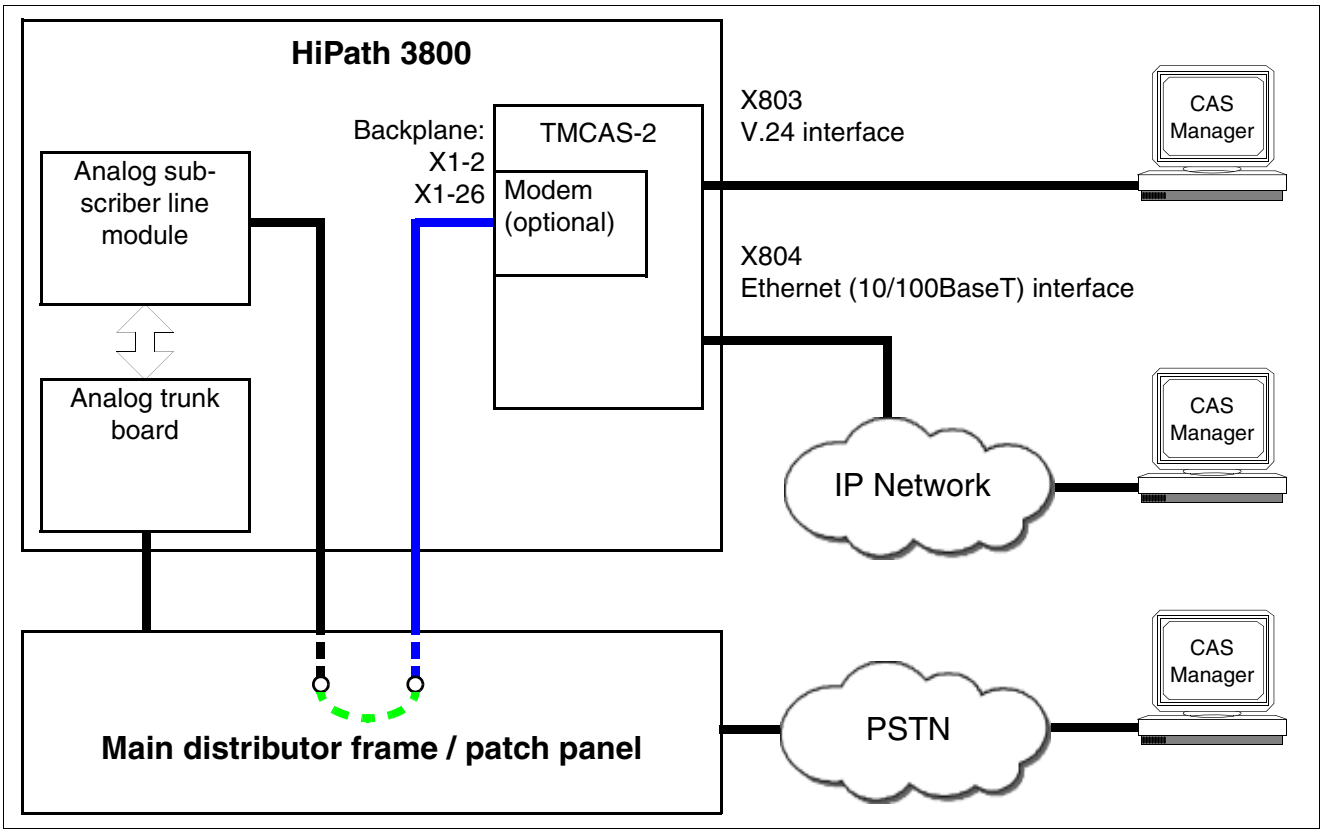


Figure 3-114 TMCAS-2 (for selected countries only) – Connection Options for Card Administration using CAS Manager

Assigning both CAS cables

You can use one of the following two cables to connect network terminators (NT), multiplexers (MUX), or modems to the TMCAS-2 card (15-pin sub-D jacks X909 and X910):

- Symmetrical trunk (120 ohms), length = 10 m

  Table 3-153 TMCAS-2 (for selected countries only) – Assignment of the CAS Cable S30267-Z167-A100

15-pin Sub-D connector pin	Function	Color code
9	a-wire (T), transmit	wht/blu
1	b-wire (R), transmit	blu/wht
15	a-wire (T), receive	wht/ora
8	b-wire (R), receive	ora/wht

- Coaxial trunk (75 ohms), length = 10 m

  Table 3-154 TMCAS-2 (for selected countries only) – Assignment of the CAS Cable C39195-A7700-B14

Wire	Function	15-pin Sub-D connector Pin	BNC connector
1	Receive, Tip	8	Shield
	Receive, Ring	15	Conductor
2	Transmit, Tip	1	Shield
	Transmit, Ring	9	Conductor

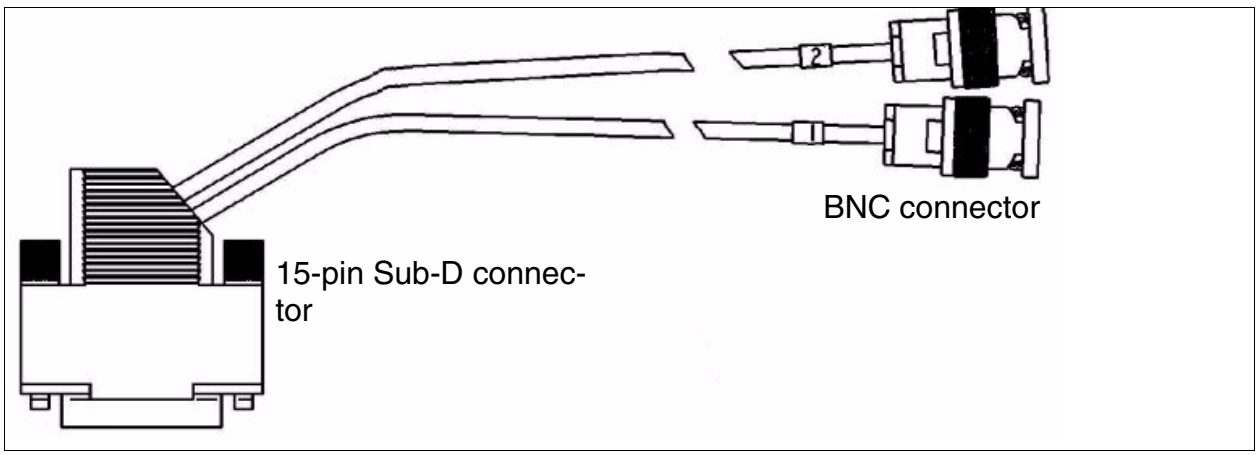


Figure 3-115 TMCAS-2 (for selected countries only) – CAS Cable C39195-A7700-B14

3.3.40 TMDID (for U.S. only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TMDID board (**T**runk **M**odule **D**irect **I**nward **D**ialing) provides direct inward dialing from the central office (CO) to HiPath 3800.

The board has eight trunk circuits that connect to analog trunks.

The circuits can be set up for Immediate Start or Wink Start.

The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. Since the TMDID board has SIVAPAC connector strips, you will have to install a SIVAPAC-SIPAC board adapter in order to be able to use it in HiPath 3800. For information on upgrade procedures, please see Section 4.1.5.5.

Switches

- Switches for manual trunk selection. In this case, all trunks are filtered one after the other until the LED of the desired trunk flashes.
- Lockout switch which can be used to manually block the selected trunk circuit.

LED statuses and their meanings

Table 3-155 TMDID (for U.S. only) - LED Statuses

LED status 0 - 7	Meaning
Off	The trunk circuit is free.
On	The trunk circuit is assigned.
Slow flashing	The trunk circuit was deactivated by the software.
Fast flashing	The switch was pressed and the trunk circuit was selected for manual activation or deactivation.

Front panel

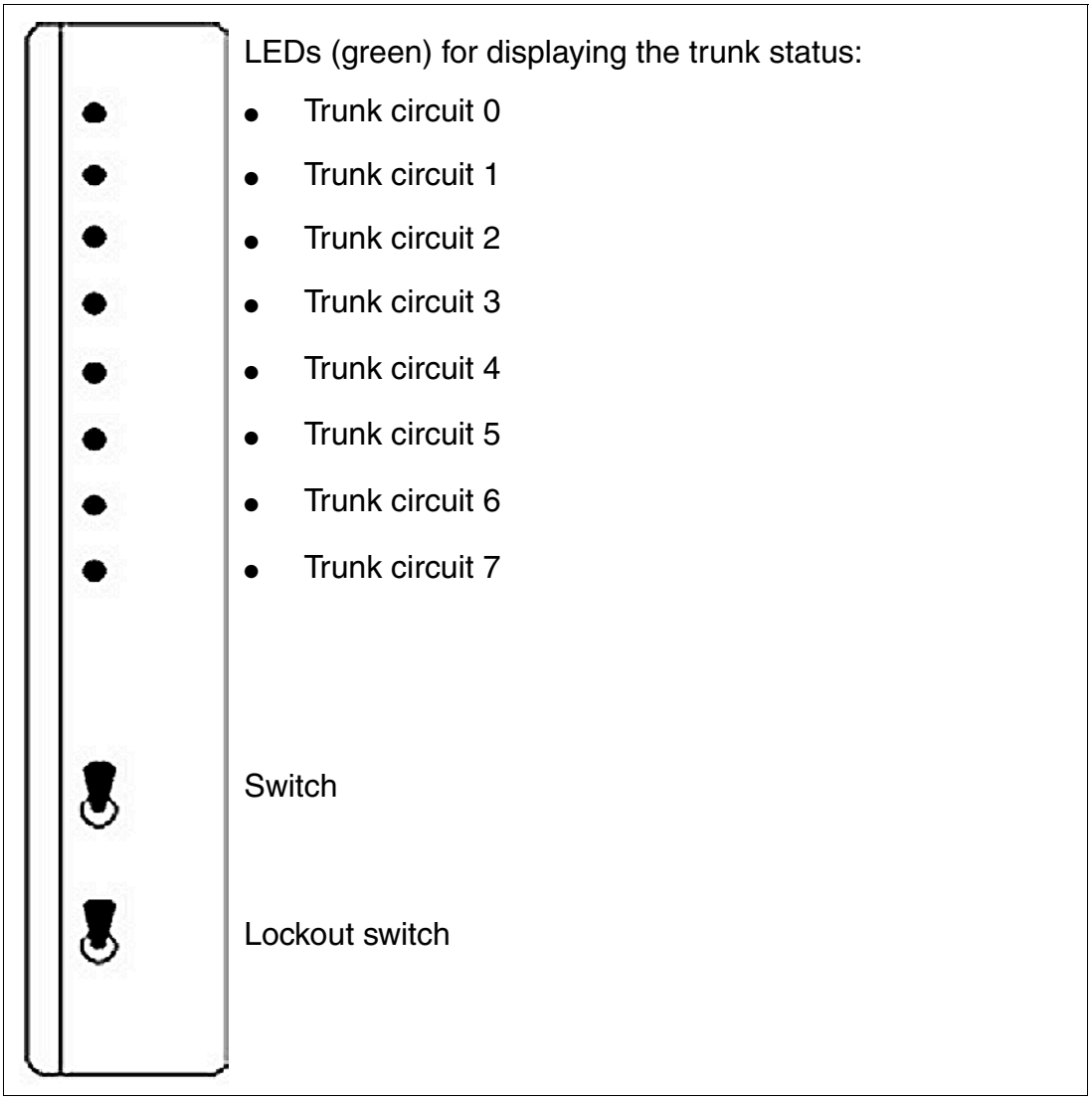


Figure 3-116 TMDID (for U.S. only) (S30810-Q2452-X) - Front Panel

To ensure adequate shielding, the board must be equipped with a shielding cover. Information on installing the shielding cover is contained in Section 4.1.5.3.

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-156
- For connecting to the connector panels with CHAMP jack: Table 3-157
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-158

Table 3-156 TMDID (for U.S. only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	TMDID		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17		Free		
		brn/red	18				
10	red/gry		19		Free		
		gry/red	20				
11	blk/blu		24		Free		
		blu/blk	25				
12	blk/ora		26		Free		
		ora/blk	27				
13	blk/grn		29		Free		
		grn/blk	30				
14	blk/brn		31		Free		
		brn/blk	32				
15	blk/gry		34		Free		
		gry/blk	35				
16	yel/blu		37		Free		
		blu/yel	38				

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-157 TMDID (for U.S. only) - Connector Panel Assignment with CHAMP Jack

CHAMP jack	TMDID			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9			Free	
34				
10			Free	
35				
11			Free	
36				
12			Free	
37				
13			Free	
38				
14			Free	
39				
15			Free	
40				
16			Free	
41				

Table 3-158 TMDID (for U.S. only) - Connector Panel Assignment with SIPAC 1 SU Connectors (Cable for Ports 1 - 16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU connector	TMDID		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.41 TMDID2 (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

TMDID2 (**T**runk **M**odule **D**irect **I**nward **D**ialing) provides direct inward dialing from the central office (CO) to HiPath 3800 V6.0 SMR-10 or later.

The board has eight trunk circuits that connect to analog trunks. The board supports the protocols Wink Start, Delay Dial, and Immediate Start.

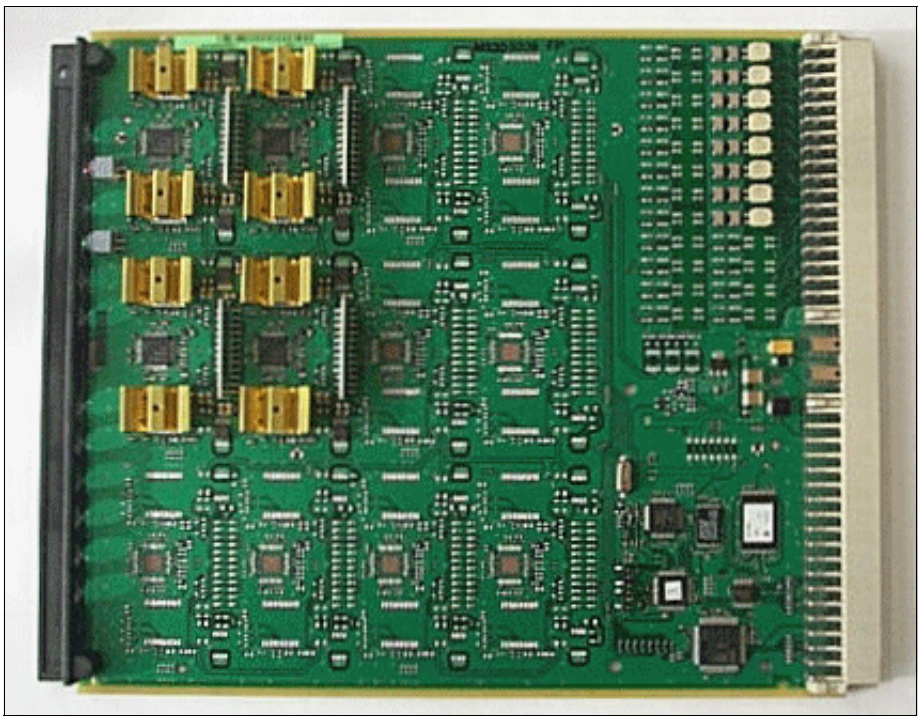


Figure 3-117 TMDID2 (S30810-Q2197-T) (for selected countries only)

Front panel

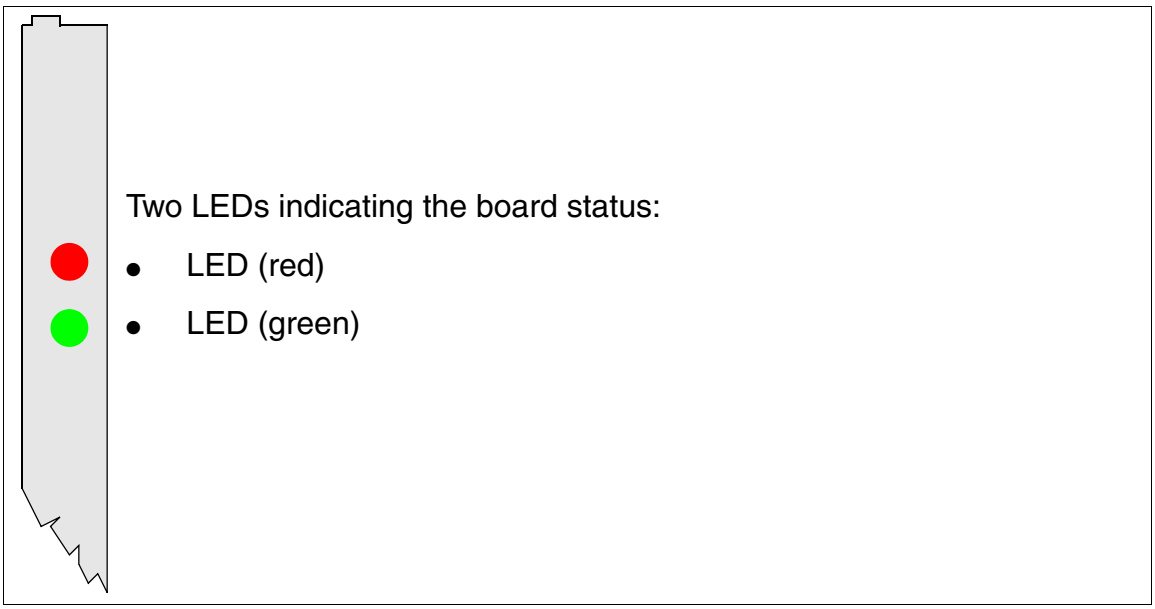


Figure 3-118 TMDID2 (for selected countries only) - LEDs on the Front Panel

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-159 TMDID2 (for selected countries only) - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

- For connecting to the SIVAPAC connector on the backplane: Table 3-156
- For connecting to the connector panels using RJ45 jacks: Table 3-128
- For connecting to the connector panels with CHAMP jack: Table 3-157
- For connecting to the connector panels using SIPAC 1 SU connectors: Table 3-158

Table 3-160 TMDID2 (for selected countries only) - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	TMDID2		MDFU-E	Notes
1	wht/blu		1	1a	Port 1	1a	
		blu/wht	23	1b		1b	
2	wht/ora		3	2a	Port 2	2a	
		ora/wht	4	2b		2b	
3	wht/grn		5	3a	Port 3	3a	
		grn/wht	6	3b		3b	
4	wht/brn		7	4a	Port 4	4a	
		brn/wht	8	4b		4b	
5	wht/gry		9	5a	Port 5	5a	
		gry/wht	10	5b		5b	
6	red/blu		11	6a	Port 6	6a	
		blu/red	12	6b		6b	
7	red/ora		13	7a	Port 7	7a	
		ora/red	14	7b		7b	
8	red/grn		15	8a	Port 8	8a	
		grn/red	16	8b		8b	
9	red/brn		17		Free		
		brn/red	18				
10	red/gry		19		Free		
		gry/red	20				
11	blk/blu		24		Free		
		blu/blk	25				
12	blk/ora		26		Free		
		ora/blk	27				
13	blk/grn		29		Free		
		grn/blk	30				
14	blk/brn		31		Free		
		brn/blk	32				
15	blk/gry		34		Free		
		gry/blk	35				
16	yel/blu		37		Free		
		blu/yel	38				

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-161 TMDID2 (for selected countries only) - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TMDID2	Notes
No.	**Pin**		
1	4	1a	
	5	1b	
2	4	2a	
	5	2b	
3	4	3a	
	5	3b	
4	4	4a	
	5	4b	
5	4	5a	
	5	5b	
6	4	6a	
	5	6b	
7	4	7a	
	5	7b	
8	4	8a	
	5	8b	
9	4		Free
	5		
10	4		Free
	5		
11	4		Free
	5		
12	4		Free
	5		
13	4		Free
	5		
14	4		Free
	5		
15	4		Free
	5		
16	4		Free
	5		

Table 3-161 TMDID2 (for selected countries only) - Connector Panel Assignment with RJ45 Jacks

RJ45 jack		TMDID2	Notes
No.	**Pin**		
17	4		Free
	5		
18	4		Free
	5		
19	4		Free
	5		
20	4		Free
	5		
21	4		Free
	5		
22	4		Free
	5		
23	4		Free
	5		
24	4		Free
	5		

Table 3-162 TMDID2 (for selected countries only) - Connector Panel Assignment with CHAMP Jacks (for U.S. only)

CHAMP jack	TMDID2			Notes
1	1a	1 Ring	Port 1	
26	1b	1 Tip		
2	2a	2 Ring	Port 2	
27	2b	2 Tip		
3	3a	3 Ring	Port 3	
28	3b	3 Tip		
4	4a	4 Ring	Port 4	
29	4b	4 Tip		
5	5a	5 Ring	Port 5	
30	5b	5 Tip		
6	6a	6 Ring	Port 6	
31	6b	6 Tip		
7	7a	7 Ring	Port 7	
32	7b	7 Tip		
8	8a	8 Ring	Port 8	
33	8b	8 Tip		
9			Free	
34				
10			Free	
35				
11			Free	
36				
12			Free	
37				
13			Free	
38				
14			Free	
39				
15			Free	
40				
16			Free	
41				

Table 3-163 TMDID2 (for selected countries only) - Connector Panel Assignment with SIPAC 1 SU Connectors (cable for ports 1-16)

Color Group	Pair	a-wire[1] (tip)	b-wire[1] (ring)	SU con-nector	TMDID2		MDFU-E	Patch Panel, MW8 pin	Notes
1	1	wht/blu		19	1a	Port 1	1a	4	
			blu/wht	39	1b		1b	5	
	2	wht/ora		38	2a	Port 2	2a	4	
			ora/wht	48	2b		2b	5	
	3	wht/grn		27	3a	Port 3	3a	4	
			grn/wht	47	3b		3b	5	
	4	wht/brn		16	4a	Port 4	4a	4	
			brn/wht	46	4b		4b	5	
	5	wht/gry		05	5a	Port 5	5a	4	
			gry/wht	45	5b		5b	5	
2	6	red/blu		14	6a	Port 6	6a	4	
			blu/red	44	6b		6b	5	
	7	red/ora		23	7a	Port 7	7a	4	
			ora/red	43	7b		7b	5	
	8	red/grn		32	8a	Port 8	8a	4	
			grn/red	42	8b		8b	5	
	9	red/brn		11		Free			
			brn/red	31					
	10	red/gry		02		Free			
			gry/red	22					
3	11	blk/blu		13		Free			
			blu/blk	33					
	12	blk/ora		04		Free			
			ora/blk	24					
	13	blk/grn		15		Free			
			grn/blk	35					
	14	blk/brn		06		Free			
			brn/blk	26					
	15	blk/gry		17		Free			
			gry/blk	37					
4	16	yel/blu		08		Free			
			blu/yel	28					

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.42 TMEW2

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The TMEW2 board (**T**runk **M**odule for **E**&M **W**orld) provides four analog tie trunk circuits for E&M signaling for HiPath 3800. Each tie trunk circuit has eight connectors: incoming speech path (2), outgoing speech path (2), incoming signaling (2) and outgoing signaling (2). This allows tie trunk traffic to other private communication systems.

Interface types 1A and 5 are released for E&M networking with the Immediate Start, Wink Start, and Delay Dial protocols. Interface types 1A and 5 are identical.

The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. Since the TMEW2 board has SIVAPAC connector strips, you will have to install a SIVAPAC-SIPAC board adapter in order to be able to use it in HiPath 3800. For information on this procedure, please see Section 4.1.6.6.

Note on E&M networking compatibility

TMEW2 does not support E&M interface types 1, 1B, 2 and 3 on the TIEL board.

The following options are available when replacing a HiPath 3750 or HiPath 3700 system with a HiPath 3800 system:

1. Switch customer-specific E&M networking to interface type 1A (or 5) on the TMEW5 board (Immediate Start, Wink Start or Delay Dial protocols).
2. If option 1 is not possible for technical reasons, HiPath 3750 or HiPath 3700 remains active as the E&M gateway. Create a TDM network with the CorNet protocol between the HiPath 3750 or HiPath 3700 system and HiPath 3800.

Speech paths

Speech paths always use four wires (two wires for the incoming speech path and two wires for the outgoing speech path). The advantage of providing separate speech paths for incoming and outgoing calls is that it helps maintain call stability (echo). In addition, repeaters in the transmission equipment compensate for attenuation loss on the line.

Signaling paths

E&M trunks are used for signaling between networked communications systems: E-wire = ear (receive), M-wire = mouth (transmit).

Protocol settings

TMEW2 supports interface types 1A and 5. Interface types 1A and 5 are identical.

Before starting up the tie trunk, you must ensure that the two participating systems support the specified interface types.

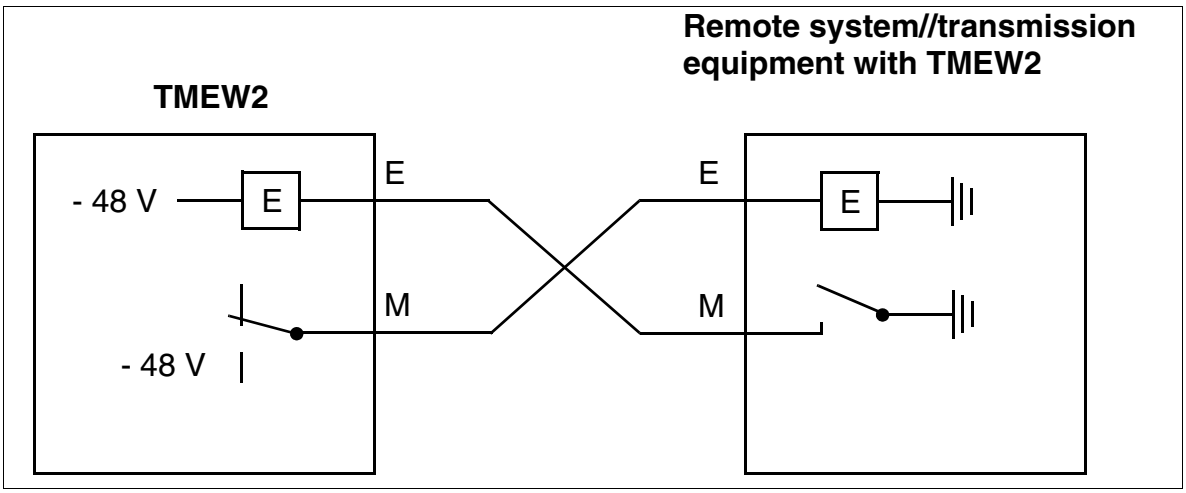


Figure 3-119 E&M Interface Type 1A

The following signaling protocols are supported:

- “Delay Dial” protocol
- “Wink Start” protocol
  This is the most widely used protocol internationally.
- “Immediate Start” protocol

HiPath 3000/5000 Manager E is used to set the signaling protocol. Go to the Settings menu and select Lines/networking –> Trunks –> (double-click) Parameters –> Template Editor:

- Board type = TMDID, TIEL, TMEW2
- Template: the following settings are possible:
  – 4. E/M tieline with winkstart/delayed (= “Wink Start” protocol)
  – 11. E/M tieline with delayed dialing (= “Delay Dial” protocol)
  – 12. E/M tieline with immediate dialing (= “Immediate Start” protocol)

  Interface type 1A (or 5) is used in all cases.

SIVAPAC connector assignment on the backplane with tie trunk traffic via interface type 1A (or 5) is shown in Table 3-165.

Connecting the Genius announcement device

The TMEW2 board may be installed on interface type 2 for connecting the Genius announcement device.

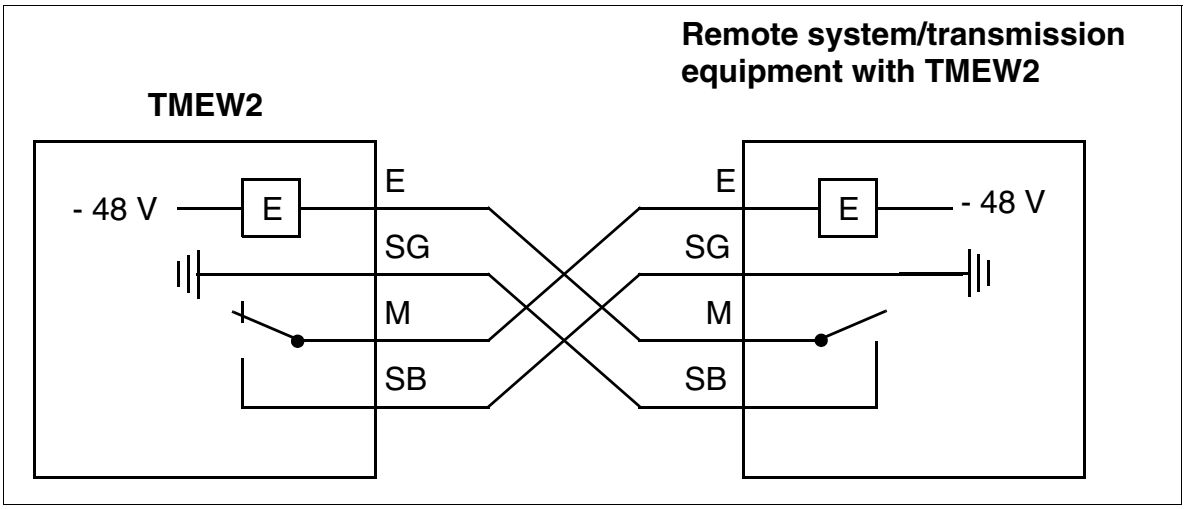


Figure 3-120 E&M Interface Type 2

Use HiPath 3000/5000 Manager E to configure the settings for the Genius announcement device: Go to the Settings menu and select Auxiliary equipment –> Announcement.

SIVAPAC connector assignment on the backplane with a Genius announcement device connected (interface type 2A) is shown in Table 3-166.

Front panel

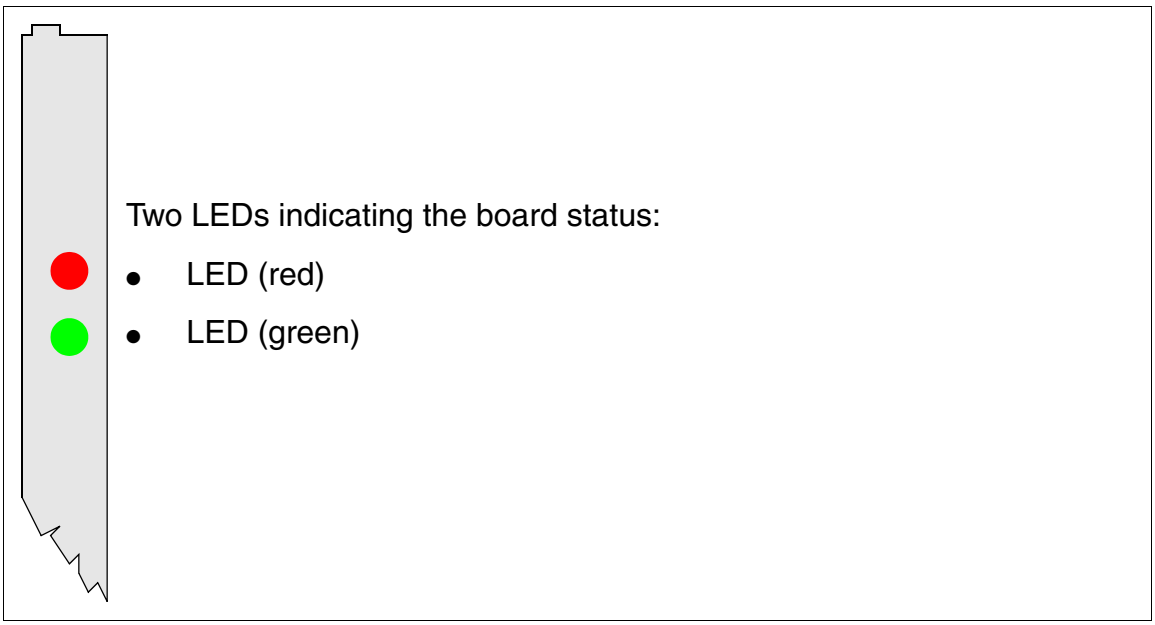


Figure 3-121 TMEW2 - Front Panel (S30810-Q2292-X100)

To ensure sufficient shielding, provide the board with a shielding panel. For information on mounting the shielding panel, see Section 4.1.5.3.

LED statuses and their meanings

Table 3-164 TMEW2 - LED Statuses

Red LED	Green LED	Status	Action
Off	Off	Board not receiving power or not plugged in correctly. Board is out of order.	Check plug contact on board.
On	Off	Board is receiving power and board test is in progress. Board is defective if status remains unchanged (board test unsuccessful).	Replace the board.
		Loadware loading not successfully completed. Board is faulty.	Replace the board.
		Error detected on board. Board is deactivated (not applicable to errors detected by test loops) or board was deactivated using HiPath 3000/5000 Manager E.	Check whether the board was deactivated using HiPath 3000/5000 Manager E. If not, replace board.
Flashing	Off	Loadware is being loaded.	
Off	On	Board test completed successfully. Board is OK (idle state).	
Off	Flashing	At least one subscriber line circuit is activated.	

Cable and connector assignment

SIVAPAC connector assignment on the backplane depends on how the board is used.

- Assignment in the case of tie trunk traffic via interface type 1A (or 5): Table 3-165.
- Assignment in the case of Genius announcement device connection (interface type 2): Table 3-166.

Tabelle 3-165 TMEW2 - SIVAPAC Connector Assignment on the Backplane in Tie Trunk Traffic via Interface Type 1A (or 5)

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	TMEW2		MDFU-E	Notes	
1	wht/blu		1	1ka	Port 1	1a	Ring	Transmit
		blu/wht	23	1kb		1b	Tip	
2	wht/ora		3	1ka	Port 2	2a	Ring	Transmit
		ora/wht	4	1kb		2b	Tip	
3	wht/grn		5	1ka	Port 3	3a	Ring	Transmit
		grn/wht	6	1kb		3b	Tip	
4	wht/brn		7	1ka	Port 4	4a	Ring	Transmit
		brn/wht	8	1kb		4b	Tip	
5	wht/gry		9	1ga	Port 1	5a	Ring	Receive
		gry/wht	10	1gb		5b	Tip	
6	red/blu		11	1ga	Port 2	6a	Ring	Receive
		blu/red	12	1gb		6b	Tip	
7	red/ora		13	1ga	Port 3	7a	Ring	Receive
		ora/red	14	1gb		7b	Tip	
8	red/grn		15	1ga	Port 4	8a	Ring	Receive
		grn/red	16	1gb		8b	Tip	
9	red/brn		17	1E	Port 1	9a	Ear	
		brn/red	18	1M		9b	Mouth	
10	red/gry		19	1E	Port 2	10a	Ear	
		gry/red	20	1M		10b	Mouth	
11	blk/blu		24	1E	Port 3	11a	Ear	
		blu/blk	25	1M		11b	Mouth	
12	blk/ora		26	1E	Port 4	12a	Ear	
		ora/blk	27	1M		12b	Mouth	
13	blk/grn		29		Port 1	13a	System ground, system battery	
		grn/blk	30			13b		
14	blk/brn		31		Port 2	14a	System ground, system battery	
		brn/blk	32			14b		
15	blk/gry		34		Port 3	15a	System ground, system battery	
		gry/blk	35			15b		
16	yel/blu		37		Port 4	16a	System ground, system battery	
		blu/yel	38			16b		

1 see "Abbreviations for colors" at the start of Section 3.3.

Table 3-166 TMEW2 - SIVAPAC Connector Assignment on the Backplane with Genius Announcement Device Connected (Interface Type 2):

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC connector	TMEW2		MDFU-E	Notes	
1	wht/blu		1	1ka	Port 1	1a	Ring	Transmit
		blu/wht	23	1kb		1b	Tip	
2	wht/ora		3	1ka	Port 2	2a	Ring	Transmit
		ora/wht	4	1kb		2b	Tip	
3	wht/grn		5	1ka	Port 3	3a	Ring	Transmit
		grn/wht	6	1kb		3b	Tip	
4	wht/brn		7	1ka	Port 4	4a	Ring	Transmit
		brn/wht	8	1kb		4b	Tip	
5	wht/gry		9	1ga	Port 1	5a	Free	
		gry/wht	10	1gb		5b		
6	red/blu		11	1ga	Port 2	6a	Free	
		blu/red	12	1gb		6b		
7	red/ora		13	1ga	Port 3	7a	Free	
		ora/red	14	1gb		7b		
8	red/grn		15	1ga	Port 4	8a	Free	
		grn/red	16	1gb		8b		
9	red/brn		17	1E	Port 1	9a	Ear	
		brn/red	18	1M		9b	System ground	
10	red/gry		19	1E	Port 2	10a	Ear	
		gry/red	20	1M		10b	System ground	
11	blk/blu		24	1E	Port 3	11a	Ear	
		blu/blk	25	1M		11b	System ground	
12	blk/ora		26	1E	Port 4	12a	Ear	
		ora/blk	27	1M		12b	System ground	
13	blk/grn		29		Port 1	13a	Mouth	
		grn/blk	30			13b	System battery	
14	blk/brn		31		Port 2	14a	Mouth	
		brn/blk	32			14b	System battery	
15	blk/gry		34		Port 3	15a	Mouth	
		gry/blk	35			15b	System battery	
16	yel/blu		37		Port 4	16a	Mouth	
		blu/yel	38			16b	System battery	

1 see "Abbreviations for colors" at the start of Section 3.3.

3.3.43 TMGL4 (for U.S. only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

A TMGL4 trunk module connects up to four analog ground-start or loop-start trunks to HiPath 3550 and HiPath 3350.

Ground start is the default.

Warning
You must disconnect the power and remove the slip-on connectors from the TMGL4 board before removing it from the system.
Do not connect the slip-on connectors to the TMGL4 board until the board is seated in its slot and the system power is on.
Failure to follow these instructions may severely damage the system.

Interfaces

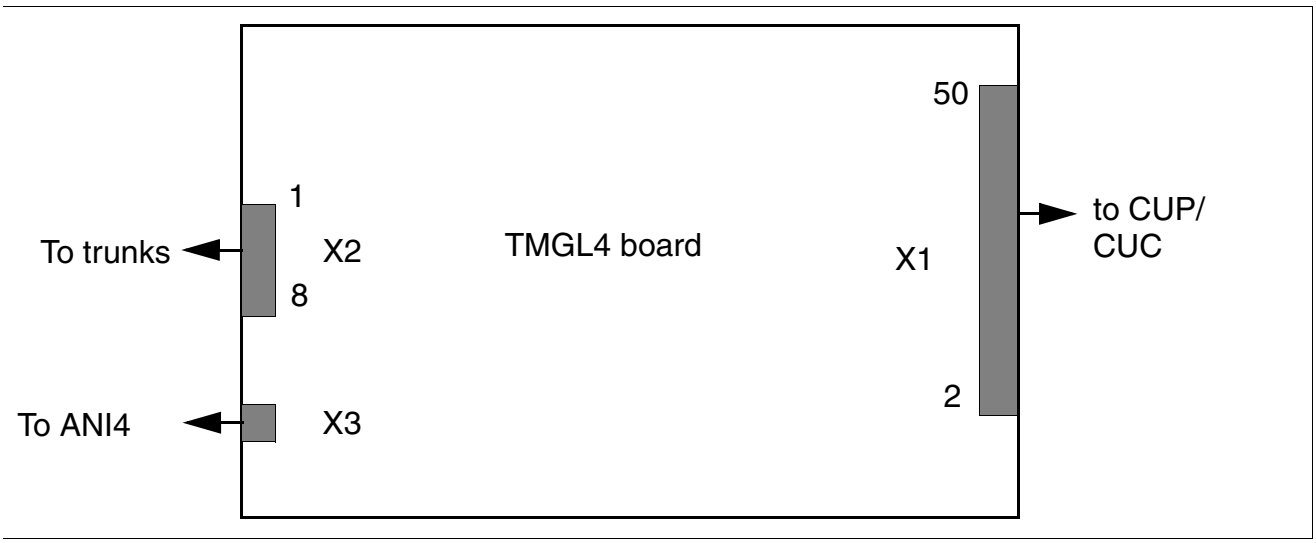


Figure 3-122 TMGL4 (for U.S. only) - Interfaces (S30810-Q2918-X)

Contact assignment

Table 3-167 TMGL4 (for U.S. only) - Contact Assignment

Contact	Connector X2	Port
1	b-wire (ring), trunk 1	1
2	a-wire (tip), trunk 1	
3	b-wire (ring), trunk 2	2
4	a-wire (tip), trunk 2	
5	b-wire (ring), trunk 3	3
6	a-wire (tip), trunk 3	
7	b-wire (ring), trunk 4	4
8	a-wire (tip), trunk 4	

Note: The pinouts shown are on the board itself. The main distribution frame cable (MDF cable) supplied reverses the signal order before the MDF.

3.3.44 TMGL4R (for U.S. only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

A TMGL4R trunk module connects up to four analog ground-start or loop-start trunks to HiPath 3500 and HiPath 3300.

Ground start is the default.

Interfaces

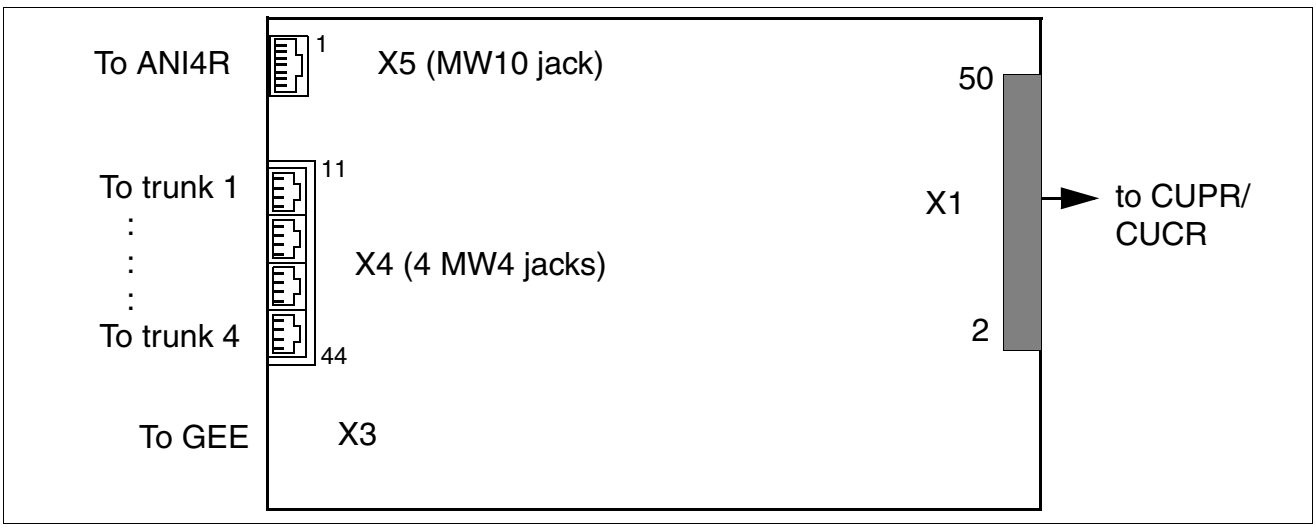


Figure 3-123 TMGL4R (for U.S. only) (S30810-K2918-Z)

If ANI4R is installed as option 1 or 2, TMGL4R board must be inserted in slot 4, 6 or 8 (slots 6 and 8 are not available with HiPath 3300).

Contact assignment

Table 3-168 TMGL4R (for U.S. only) - Contact Assignment

Port	X3 Pin (To GEE)	X4 Pin (To trunks 1-4)	X5 Pin (To ANI4R)	Signal
1	3	12	3	b-wire (ring), trunk 1
	2	13	2	a-wire (tip), trunk 1
2	5	22	5	b-wire (ring), trunk 2
	4	23	4	a-wire (tip), trunk 2
3	7	32	7	b-wire (ring), trunk 3
	6	33	6	a-wire (tip), trunk 3
4	9	42	9	b-wire (ring), trunk 4
	8	43	8	a-wire (tip), trunk 4
–	10	–	10	Call charging module assignment (GMZ)

3.3.45 TMQ4 (for U.S. only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

An TMQ4 (ISDN BRI) trunk module connects up to four digital trunks to the HiPath 3550 and HiPath 3350.

The TMQ4 board provides basic rate interface (BRI) ISDN via a $U2B_1Q$ interface. The interface supports the following central office protocols:

- AT&T 5Ess NI-1
- AT&T 5ESS Custom
- Nortel DMS100 NI-1
- Siemens EWSD NI-1

Interfaces

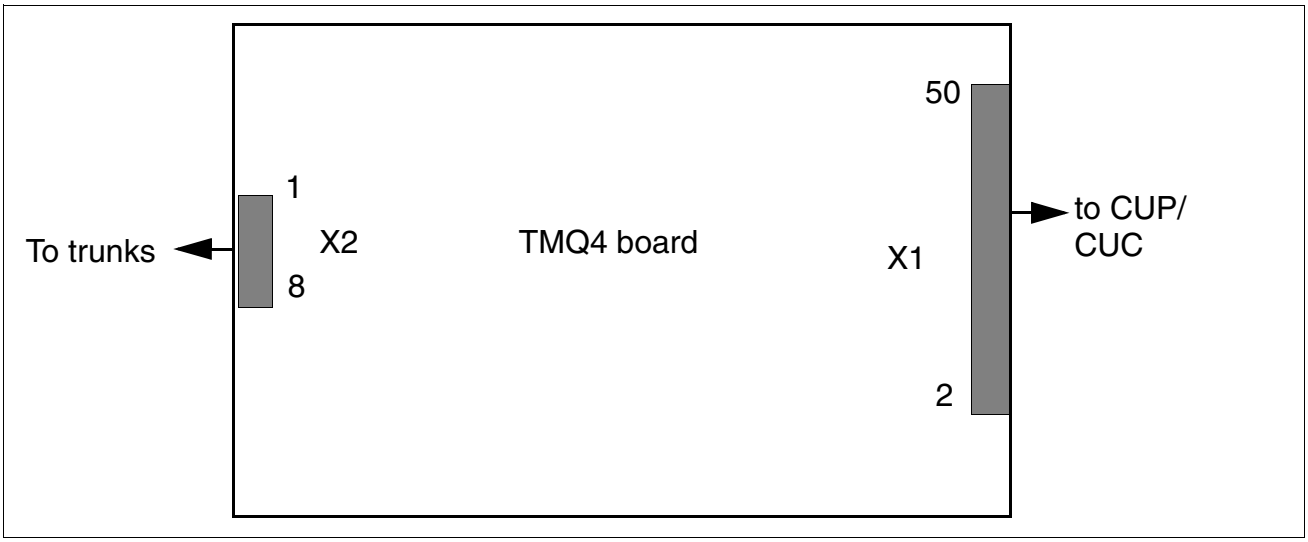


Figure 3-124 TMQ4 (for U.S. only) (S30810-Q2917-X)

Contact assignment

Table 3-169 TMQ4 (for U.S. only) - Contact Assignment

Contact	Connector X2	Port		Contact	Connector X2	Port
1	b-wire (ring), trunk 1	1		5	b-wire (ring), trunk 3	3
2	a-wire (tip), trunk 1			6	a-wire (tip), trunk 3	
3	b-wire (ring), trunk 2	2		7	b-wire (ring), trunk 4	4
4	a-wire (tip), trunk 2			8	a-wire (tip), trunk 4	

Note: The pinouts shown are on the board itself. The main distribution frame cable (MDF cable) supplied reverses the signal order before the MDF.

3.3.46 TST1 (for U.S. only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The digital T1/PRI trunk module (TST1) connects the communications server to primary rate interface (PRI) ISDN via a T1 interface.

There are two versions of this board:

- S30810-Q2919-X - for use in the HiPath 3550 (wall housing)
- S30810-K2919-Z - for use in the HiPath 3500 (19-inch housing)

The board can also be used for the following layer-1 operating modes:

- Super Frame SF
- Extended Super Frame ESF

Board usage is subject to the following restrictions:

- Only one TST1 board allowed (primary multiplex access)
- For slot 7 or 9 only

Rather than connecting to a main distribution frame (MDF), the TST1 connects to a channel service unit (CSU). The CSU provides the required primary protection.

Interfaces

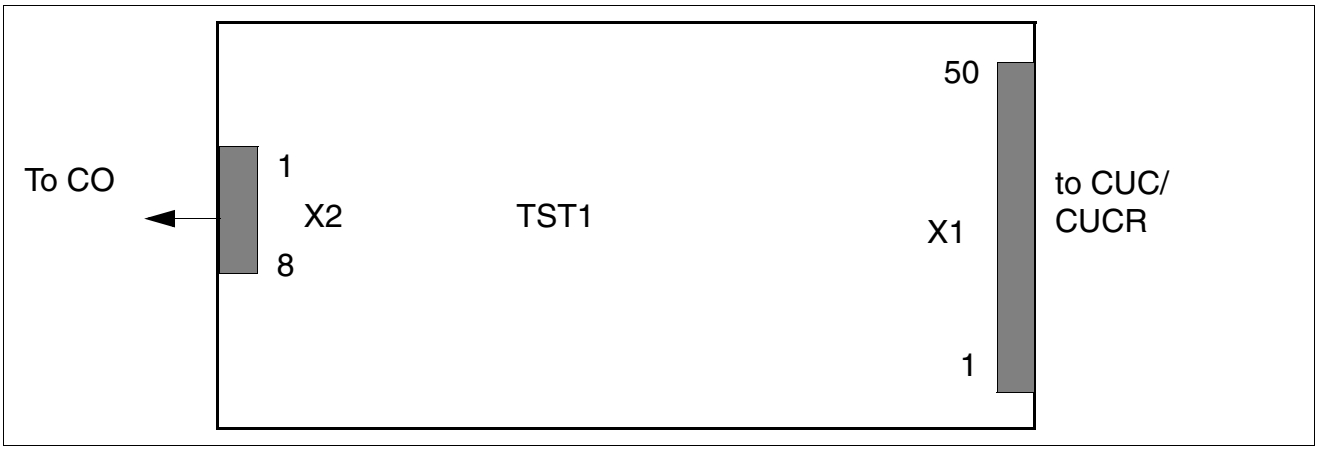


Figure 3-125 TST1 (for U.S. only) (S30810-Q2919-X/S30810-K2919-Z)

Contact assignment

Table 3-170 TST1 (for U.S. only) - Contact Assignment

Contact	X2		Contact	X2
1	b-wire (ring), receive		5	a-wire (tip), transmit
2	a-wire (tip), receive		6	not connected
3	not connected		7	not connected
4	b-wire (ring), transmit		8	not connected

3.3.47 TS2 (Not for U.S.), TS2R (not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The board contains a four-wire interface with S_{2M} code for connection to the public telecommunications network or private networks.

Up to thirty trunk calls can be conducted simultaneously via the S_{2M} interface. The total transmission speed including signaling and synchronization is 2048 Mbps.

Two trace files are available:

- Implemented up to and including V4.0:
  - TS2 (**T**runk Module **S2**M) S30810-Q2913-X100 (Figure 3-126) - for use in HiPath 3550 (wall housing)
  - TS2R (**T**runk Module **S2**M **R**ack) S30810-K2913-Z100 (Figure 3-127) - for use in HiPath 3500 (19-inch housing)
- Implemented in V5.0 and later:

  In HiPath 3000/5000 V5.0 and later, the B channels in the TS2 and TS2R boards are subject to license. Consequently, the two boards below have been assigned a new hardware identification code. The new codes prevent the boards from being used in earlier versions. Functionality and layout of the boards have not been changed.

  - TS2 (**T**runk Module **S2**M) S30810-Q2913-X300 (Figure 3-126) - for use in HiPath 3550 (wall housing)
  - TS2R (**T**runk Module **S2**M **R**ack) S30810-K2913-Z300 (Figure 3-127) - for use in HiPath 3500 (19-inch housing)

Board usage is subject to the following restrictions:

- Only one TS2/TS2R board allowed (primary multiplex access)
- For slot 7 or 9 only

To support country-specific CAS protocols, you can use the Euro-ISDN CAS gateway ECG. The ECG cabinet is a protocol converter that converts the Euro-ISDN protocol into the Channel Associated Signaling CAS protocol. Refer to the installation instructions, which are provided with each ECG cabinet, for information on the connection and power supply.
For HiPath 3000 V1.0 and later, you can also use the new TMCAS board to support country-specific CAS protocols.

TS2 interfaces

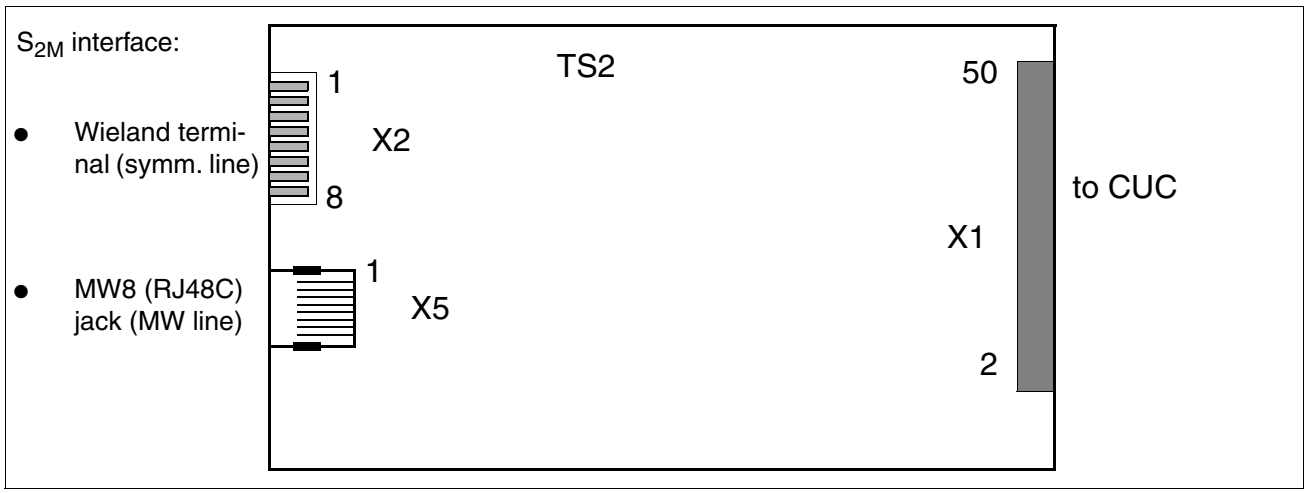


Figure 3-126 TS2 (not for U.S.) - Interfaces (S30810-Q2913-X100, -X300)

TS2R interfaces



Figure 3-127 TS2R (not for U.S.) - Interfaces (S30810-K2913-Z100, -Z300)

Network interfaces

The TS2 board is connected to the network transfer point (NT1) via the symmetrical line (120 ohms, four-wire twisted-pair cable) at X2 or via an MW line at X5.

Note: use the connection kits listed on Page 3-346 for NT connections in Spain and Portugal.

- Symmetrical line (120 ohms)
  The maximum cable length (approx. 130 m) depends on the quality of the cable used and its signal attenuation. Use shielded cables only to guarantee proper operation.

  Connect the cable to the X2 using an 8-pin Wieland terminal (TS2 only).

  Table 3-171 Contact Assignments for X2 Connector

Contact	X2 (TS2 only)
1	–48 V (NT1 feeding), max. 15 W
2	0 V (NT1 feeding)
3	GND
4	Board ID for TMCAS
5	a-wire (T), transmit
6	b-wire (R), transmit
7	a-wire (T), receive
8	b-wire (R), receive

- RJ line (MW8 (RJ48C) jack)
  The shielded 8-pin MW8 (RJ48C) jack X5 is provided for connecting MW lines. The maximum cable length (approx. 100 m) depends on the quality of the cable used and its signal attenuation.

  Table 3-172 Contact Assignments for the MW8 (RJ48C) jack X5

Pin	X5	Pin	X5
1	b-wire (R), receive	6	Free
2	a-wire (T), receive	7	Free
3	Free	8	Free
4	b-wire (R), transmit	11	GND
5	a-wire (T), transmit	12	GND
An additional line must be provided from pins 1 and 2 on the X2 connector to NT1 for NT1 feeding.			

S_{2M} trunk connection

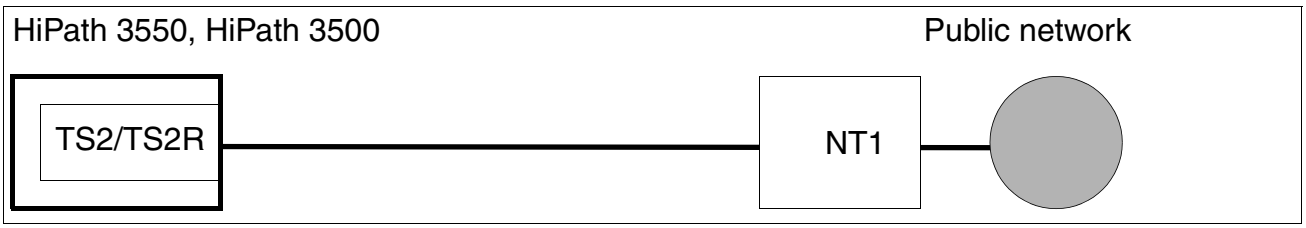


Figure 3-128 S_{2M} Trunk Connection

Keep the cable from the NT to HiPath 3550 or HiPath 3500 as short as possible to ensure proper operation.

Caution
There should be absolutely **no** ground connection between the HiPath 3550 wall housing and the NT. Do not connect the shield of the connection cable you are using either on the HiPath 3550 side or on the NT side.
If the HiPath 3550 system is separately grounded (such as with the 19-inch housing of the HiPath 3500), you may make a connection between HiPath 3550 and NT.

NT1 power supply

- TS2 board
  The NT1 supply voltage of –48 V can be tapped from the X2 connector (see Table 3-171). There is a power limit of < 15 W for this voltage, which the system feeds over the CUC.
- TS2R board
  The NT1 power supply must come from an S30122-X7321-X (S30122-X7321-X100 with UPS operation) power supply unit.

Cable set for NT connections (Spain and Portugal only)

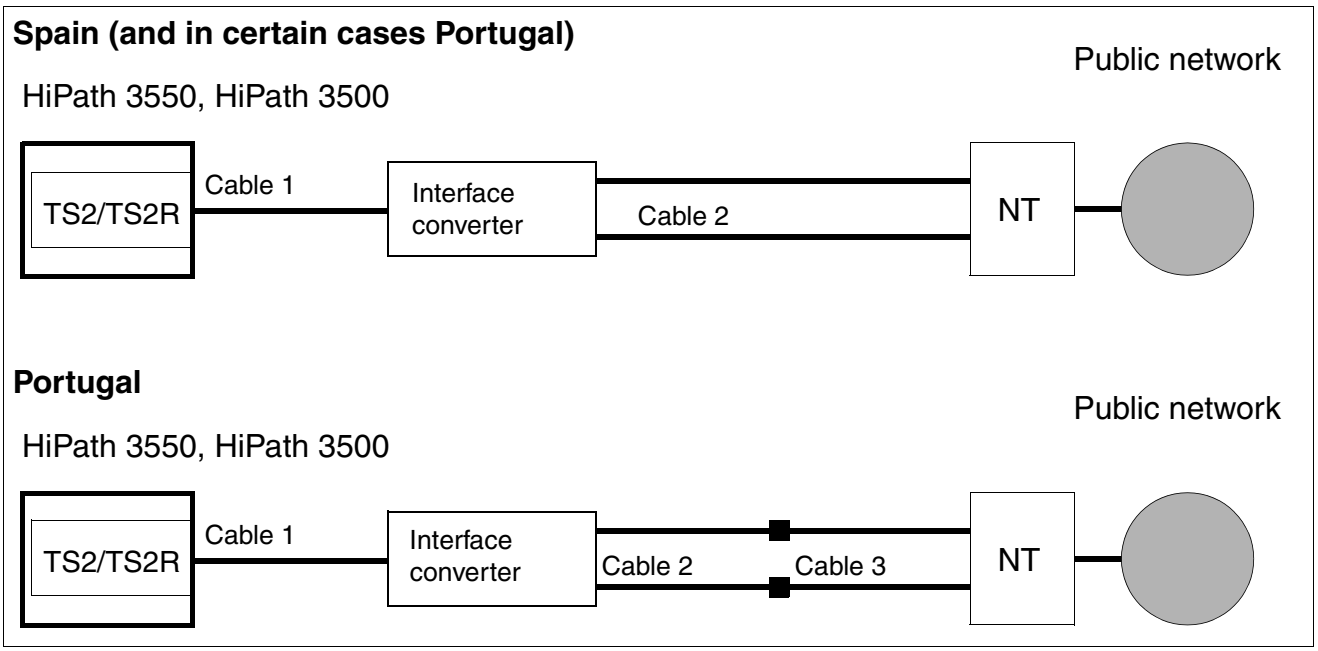


Figure 3-129 S_{2M} - NT Connections for Spain and Portugal

Connection kit contents and part numbers:

- TS2/TS2R connection kit for Spain and Portugal: F50035-E2-X63 containing the following:
  - Interface converter: S30122-X7357-X
  - Cable 1 = Patch cable MW8 (RJ48C), 10 m: C39195-Z7208-A100
  - Cable 2 (2 units) = coaxial adapter cable, 30 cm: S30267-Z354-A3
- TS2/TS2R upgrade kit for Portugal: L30252-U600-A190 containing the following:
  - Cable 3 (2 units) = Mini-coaxial cable, 10 cm: S30267-Z353-A1

3.3.48 4SLA (not for U.S.), 8SLA, 16SLA (Not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The 4SLA, 8SLA, and 16SLA (**S**ubscriber **L**ine **A**nalog) modules for analog T/R interfaces connect HiPath 3550 and HiPath 3350 (wall housing) to conventional analog telephones and supplementary equipment (such as, Group 3 fax machines and entrance telephone adapters).

Interfaces

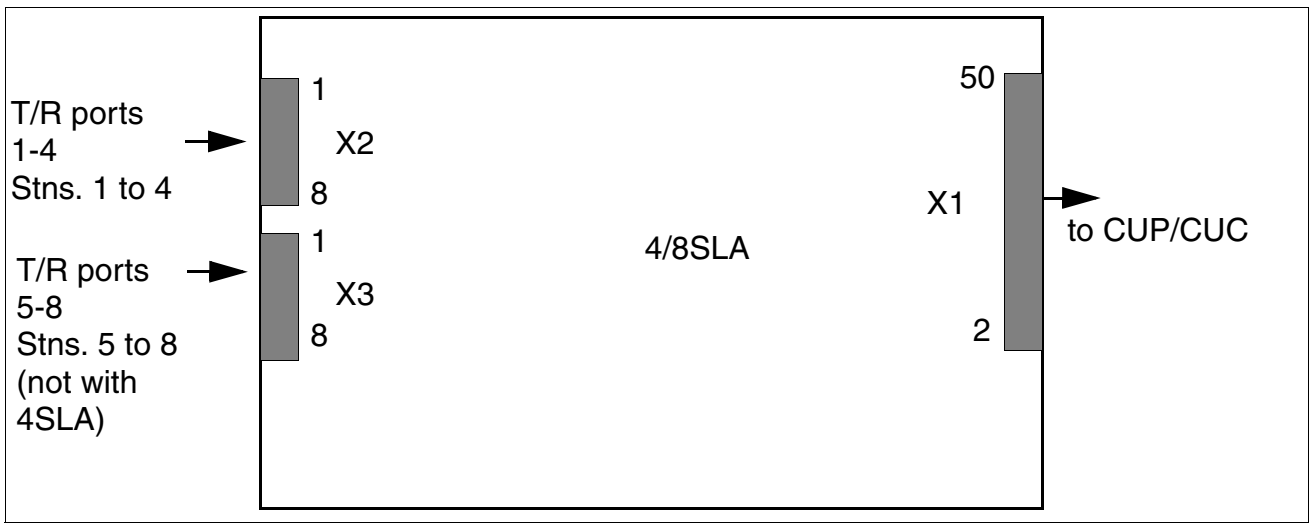


Figure 3-130 4SLA (not for U.S.), 8SLA - Interfaces (S30810-Q2923-X200, -X100)

Table 3-173 4SLA (not for U.S.), 8SLA Contact Assignments

Contact	X2 (T/R ports 1 to 4)	X3 (T/R ports 5 to 8)
1	a 1	a 5
2	b 1	b 5
3	a 2	a 6
4	b 2	b 6
5	a 3	a 7
6	b 3	b 7
7	a 4	a 8
8	b 4	b 8

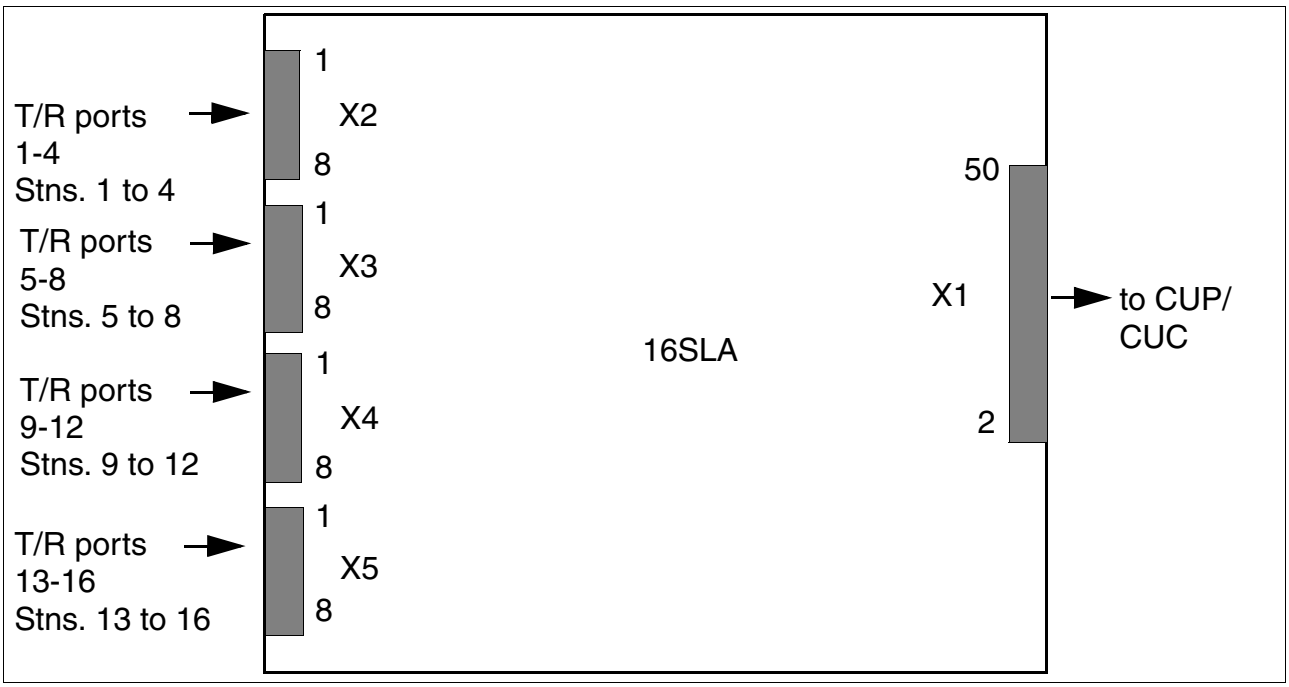


Figure 3-131 16SLA (not for U.S.) - Interfaces (S30810-Q2923-X)

Table 3-174 16SLA (not for U.S.) - Contact Assignments

Contact	X2 (T/R ports 1 to 4)	X3 (T/R ports 5 to 8)	X4 (T/R ports 9 to 12)	X5 (T/R ports 13-16)
1	a 1	a 5	a 9	a 13
2	b 1	b 5	b 9	b 13
3	a 2	a 6	a 1	a 14
4	b 2	b 6	b 10	b 14
5	a 3	a 7	a 11	a 15
6	b 3	b 7	b 11	b 15
7	a 4	a 8	a 12	a 16
8	b 4	b 8	b 12	b 16

The operating mode (short or long line with the appropriate flash times) can be set up for each subscriber line interface with HiPath 3000/5000 Manager E (the menu settings: Set up station –> Station –> Param –> Flags).

Technical connection conditions

- Maximum supply current: approximately 34 mA; maximum supply voltage: approximately 40 Vdc
- Ring voltage against negative supply voltage (a-wire (tip)/RING): two telephones maximum
- Range, see Section 2.7
- Loop current detection > 10 mA
- Ground button detection > 20 mA
- The transmission technology is set according to the specific country through the respectively entered country code (for country initialization, see Chapter 5, “Starting Up HiPath 3000”).

3.3.49 8SLAR

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The 8SLAR (**S**ubscriber **L**ine **A**nalog **R**ack) board provides eight T/R interfaces for connecting analog telephones and supplementary equipment (such as group 3 fax machines and TFE adapters) in HiPath 3500 and HiPath 3300 (19-inch housing).

Interfaces

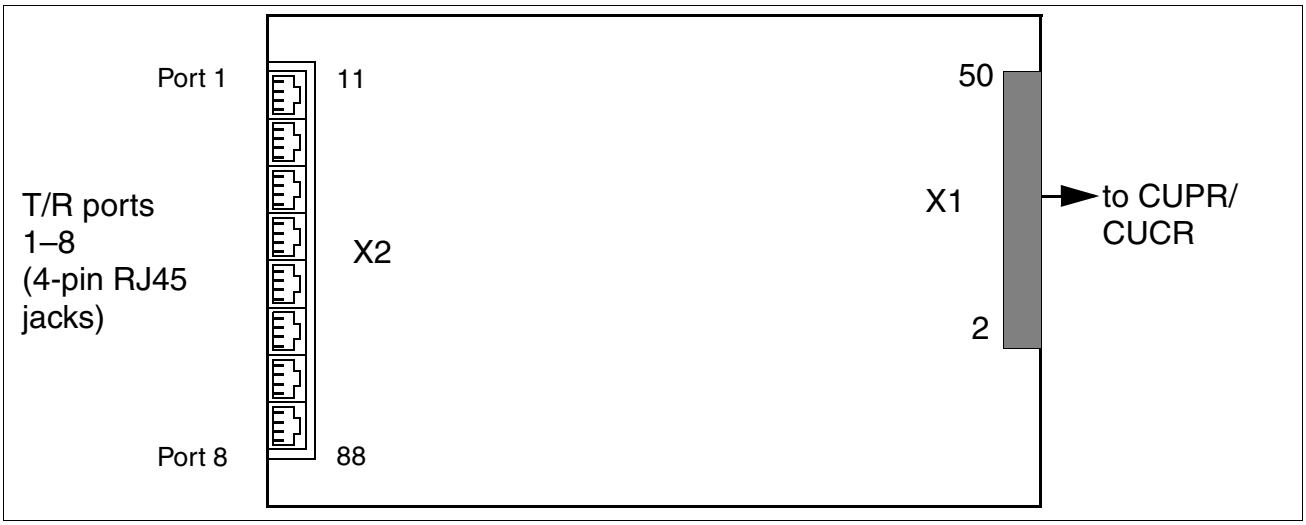


Figure 3-132 8SLAR Interfaces (S30810-K2925-Z)

Table 3-175 8SLAR Contact Assignments

RJ45 jack	X2, Pin	T/R ports 1-4	RJ45 jack	X2, Pin	T/R ports 5-8
1	14	a 1	5	54	a 5
	15	b 1		55	b 5
2	24	a 2	6	64	a 6
	25	b 2		65	b 6
3	34	a 3	7	74	a 7
	35	b 3		75	b 7
4	44	a 4	8	84	a 8
	45	b 4		85	b 8

Technical connection conditions

- Maximum supply current: approximately 34 mA; maximum supply voltage: approximately 40 Vdc
- Ring voltage against negative supply voltage (a-wire (tip)/RING): two telephones maximum
- Range, see Section 2.7
- Loop current detection > 10 mA
- Ground button detection > 20 mA
- The transmission technology is set according to the specific country through the respectively entered country code (for country initialization, see Chapter 5, “Starting Up HiPath 3000”).

3.4 Options

Abbreviations for colors

The tables in this section use abbreviations to denote the colors of connector assignments. The abbreviations used are as follows:

- wht: white
- gry: gray
- yel: yellow
- ora: orange
- red: red
- grn: green
- blu: blue
- vio: violet
- brn: brown
- blk: black

3.4.1 ALUM4

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

In the event that HiPath 3550 or HiPath 3350 experience a voltage drop, voltage dip or unrecoverable system errors, a trunk failure transfer (ALUM) is activated (MSI only).

The module implements a power failure transfer for four analog telephones. The only kind of telephone that can be used is an analog telephone. The signaling method of the connected telephones should be the same as that on the trunk line, otherwise signaling will not be possible.

When the system is deactivated or if an error occurs, the trunk lines are connected directly to the telephones. When normal operation is resumed, the transfer represented in the figure below takes place.

ALUM4 module function

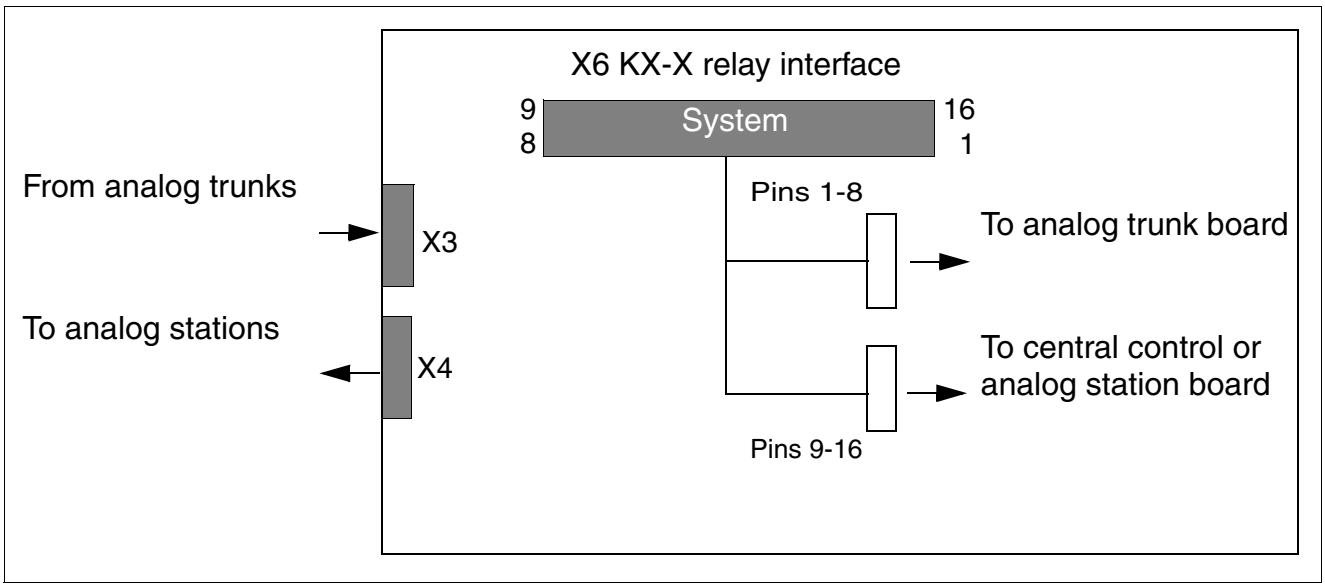


Figure 3-133 ALUM4 - Function

Interfaces

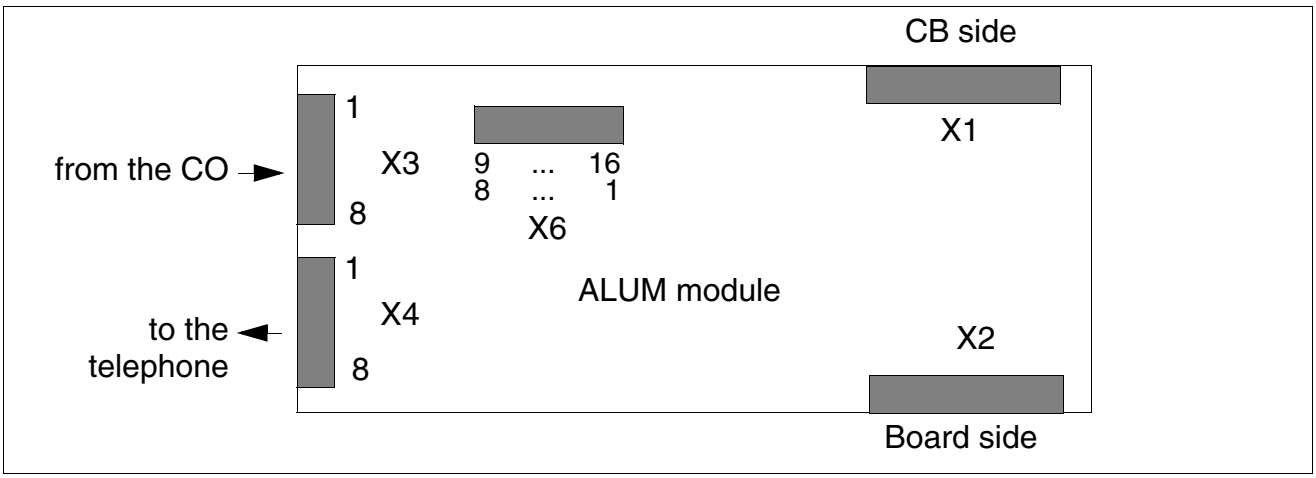


Figure 3-134 ALUM4 - Interfaces (S30817-Q935-A)

The cable that is plugged in by default is split and is connected to the TLA and to the 4/8/16SLA board.

ALUM module contact assignments

Table 3-176 ALUM4 - Interface Assignments (not for U.S.)

Contact	Connector X3	Connector X4	Connector X6
1	R1 from trunk 1a	AE1 to Stn. 1a	AT1 to TLA a
2	T1 from trunk 1b	BE1 to Stn. 1b	BT1 to TLA b
3	R2 from trunk 2a	AE2 to Stn. 2a	AT2 to TLA a
4	T2 from trunk 2b	BE2 to Stn. 2b	BT2 to TLA b
5	R3 from trunk 3a	AE3 to Stn. 3a	AT3 to TLA a
6	T3 from trunk 3b	BE3 to Stn. 3b	BT3 to TLA b
7	R4 from trunk 4a	AE4 to Stn. 4a	AT4 to TLA a
8	T4 from trunk 4b	BE4 to Stn. 4b	BT4 to TLA b
9	–	–	TA4 to SLA* a
10	–	–	TB4 to SLA* b
11	–	–	TA3 to SLA* a
12	–	–	TB3 to SLA* b

Table 3-176 ALUM4 - Interface Assignments (not for U.S.)

Contact	Connector X3	Connector X4	Connector X6
13	–	–	TA2 to SLA* a
14	–	–	TB2 to SLA* b
15	–	–	TA1 to SLA* a
16	–	–	TB1 to SLA* b
* = or to free analog port			

Table 3-177 ALUM4 - Interface Assignments (for U.S. only)

Pin	X3 (to MDF)	X4 (to MDF)	Y-Cable from X6 to TMGL4		Y-Cable from X6 to Analog Ports[1]	
			Pin	Assignment	Pin	Assignment
1	R from trunk 1	R to station 1	1	T to TMGL4 port 1	9	T to analog port 4
2	T from trunk 1	T to station 1	2	R to TMGL4 port 1	10	R to analog port 4
3	R from trunk 2	R to station 2	3	T to TMGL4 port 2	11	T to analog port 3
4	T from trunk 2	T to station 2	4	R to TMGL4 port 2	12	R to analog port 3
5	R from trunk 3	R to station 3	5	T to TMGL4 port 3	13	T to analog port 2
6	T from trunk 3	T to station 3	6	R to TMGL4 port 3	14	R to analog port 2
7	R from trunk 4	R to station 4	7	T to TMGL4 port 4	15	T to analog port 1
8	T from trunk 4	T to station 4	8	R to TMGL4 port 4	16	R to analog port 1
Note: Pinouts shown are at the board itself. The supplied main distribution frame cable (MDF cable) reverses the signal order for X3 and X4 before the MDF.						

1 To the analog station ports on the CBCC (recommended) or to four consecutive ports on an 8SLA board.

ALUM module block diagram

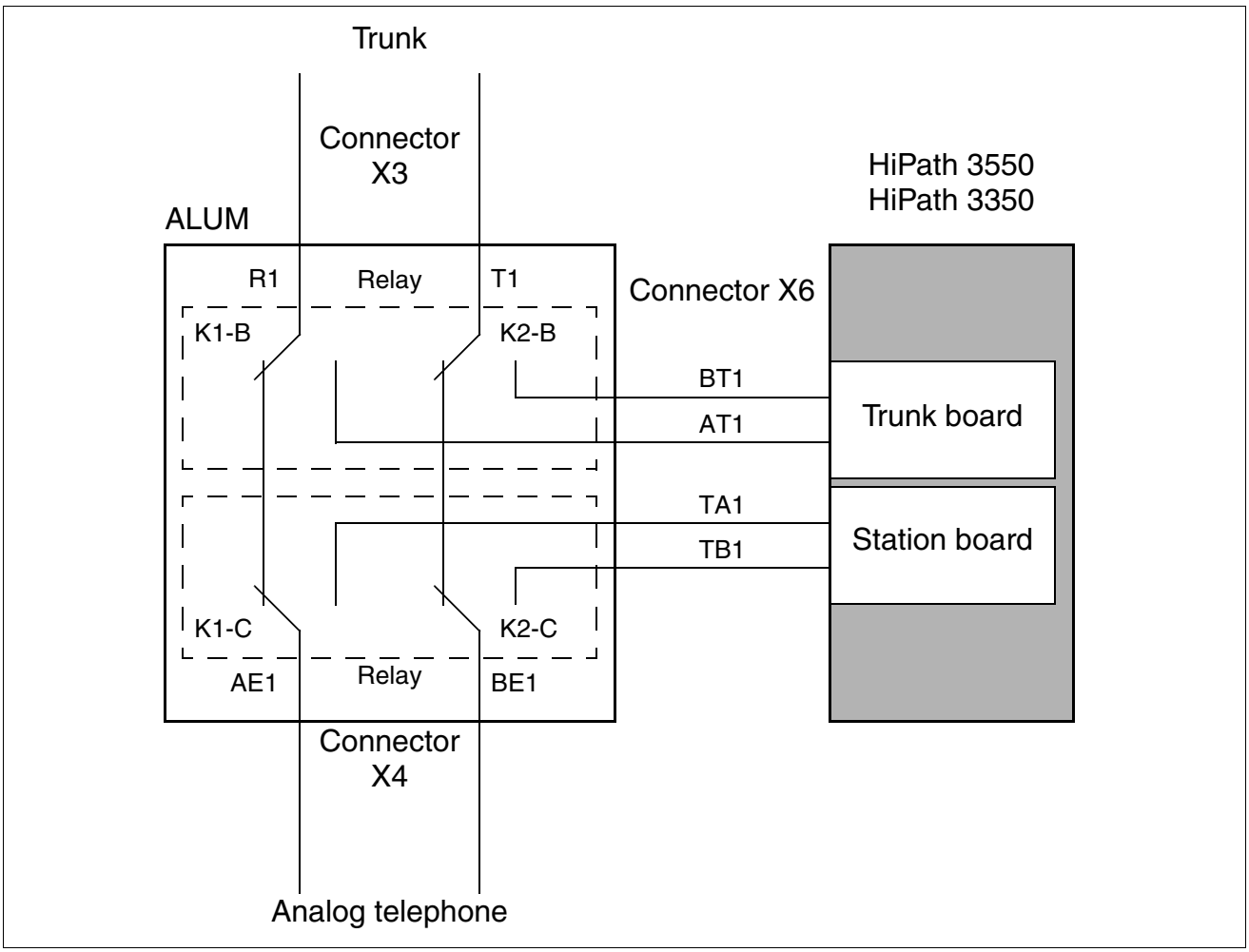


Figure 3-135 ALUM4 - Basic Structure

3.4.2 AMOM

Introduction

AMOM is an opto-electronic converter that can be used to connect fiber optic cables to the Sub-D jacks on the front panel of the DIU2U, DIUN2, and DIUT2 boards.

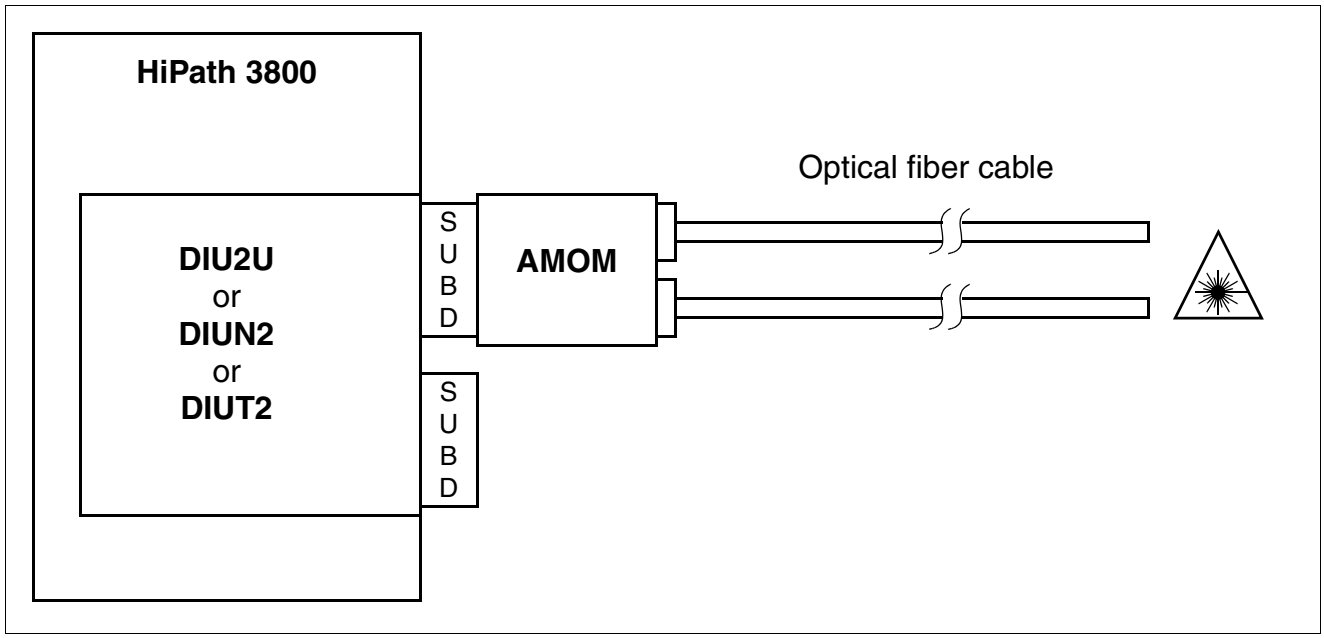


Figure 3-136 AMOM - Connection to DIUN2, DIU2U, and DIUT2

AMOM variants

AMOM variant	Wave length	Op.fiber cable	Cable length (km)	Cable attenuation (dB/km)	Maximum attenuation[1] (dB)
S30807-K5480-X100	850/820 nm multimode	50 µm 62.5 µm	2,5 3	3 3,5	11,5 14,5
S30807-K5480-X200	1300 nm multimode	50 µm and 62.5 µm	6	1	10
S30807-K5480-X300	1300 nm mono mode	9 µm/125	8	0,5	8

1 Maximum optical attenuation in an AMOM to AMOM connection: a reserve of 4 dB attenuation must be included for ageing and splicing.

Connector assignment

Table 3-178 AMOM - 15-Pin Sub-D Plug Assignment

Pin	Signal	Signal description	Direction
4	LWLO0_FRONT	Data output on the optical fiber interface	Input
5	GND	Ground return path for the +5-V power supply	Input/output
6	SCAN_IN0	Adapter test	Output
7	SCAN_IN0	Adapter test	Output
10	+ 5 V	+5-V power supply	Input
11	LWLI0_FRONT	Data input on the optical fiber interface (front)	Output
12	GND	Ground return path for the +5-V power supply	Input/output
14	+ 5 V	+5-V power supply	Input
No other pins used.			

3.4.3 ANI4 (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The ANI4 (**A**utomatic **N**umber **I**dentification) board is responsible for receiving station numbers modulated using the CPFSK method, demodulating them, and forwarding them to the base system HiPath 3550 and HiPath 3350. In V4.0 SMR-7 or later, the station name is analyzed in addition to the call number and shown on the telephone display.

Each ANI4 can serve four trunks. It contains the external trunk board hardware interfaces (TMGL4) as well as a trunk and options bus interface. The trunks are transferred directly on the board between the trunk and the trunk board interfaces.

Interfaces on the ANI4 module

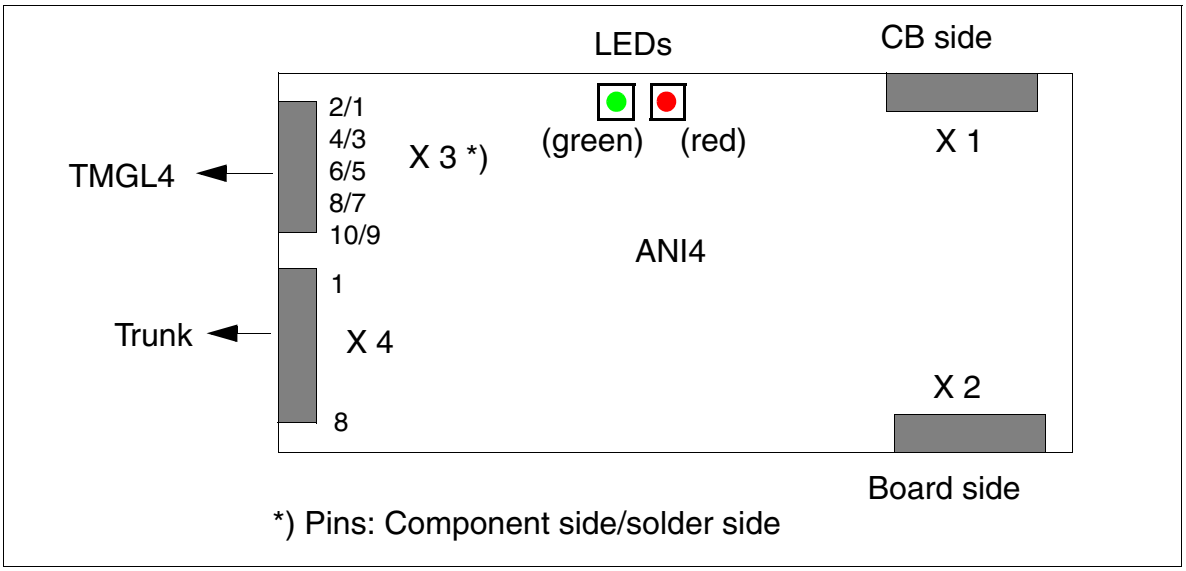


Figure 3-137 ANI4 (for selected countries only) - Interfaces (S30807-Q6917-Axxx)

LED statuses and their meanings

On the ANI4 board two LEDs are implemented that show the status of trunk channel 1.

After system startup the green LED is on and the red LED is off. This signals that the layer-1 firmware has started correctly.

If ANI4 is properly detected by the system, the green LED is reset (after the initialization of all system software) and the bottom line of the display on the optiPoint 500 phones appears. This means that the ANI4 has received system software activation for all four channels.

Table 3-179 ANI4 (for selected countries only) - LED Statuses for Trunk 1

LED	Meaning	Action
Green LED - Firmware Condition		
Off	No caller ID signals on the line.	Call service provider and ask if feature is available.
	Line is not connected to trunk channel 1.	Connect line to trunk channel 1.
	The incoming signal is lower than –36 dBm (as defined in Bellcore SR3004 for the lowest caller ID signal (space - signal)): the Mitel chip on ANI4 shows no reaction.	Call service provider and ask if feature is available. If so, the signal that appears on the customer side is too low (not Bellcore-compliant). This must be corrected by the service provider.
	The LED or the microcontroller is defective.	Replace ANI4 board.
	The system has not yet started.	Start up system.
On (but glowing weakly)	The Mitel chip interprets the signal on the line as an FSK carrier signal. However, this could mean that there is noise or speech on the line, too. The firmware is in the state of recognition.	–
On (for approx. 1 s)	A valid caller ID signal (correct channel seizure/mark - bit sequence + valid message byte) on the line is being recognized at the moment. If a message is not displayed on the optiPoint 500 telephone, there may be too much noise on the line. In other words, some bits in the signal have “tipped over” into the other logical status. The firmware builds the checksum for the received caller ID message byte and compares this checksum with the one received.	–

Table 3-179 ANI4 (for selected countries only) - LED Statuses for Trunk 1

LED	Meaning	Action
Red LED - Checksum Status		
On	The received caller ID signal has a checksum error. The LED is reset after the next correct caller ID message is received.	If the red LED is on after every call: the FSK signal is provided, but is not Bellcore-compliant on the customer side. This must be corrected by the service provider.
Off	Checksum is OK.	–

ANI4 module contact assignments

Table 3-180 ANI4 (for selected countries only) - Contact Assignments

Contact	Connector X3 Component Side	Connector X3 Solder Side	Connector X4
1	--	Not assigned	a-wire (tip), trunk 1
2	b-wire (ring), trunk 1	--	b-wire (ring), trunk 1
3	--	a-wire (tip), trunk 1	a-wire (tip), trunk 2
4	b-wire (ring), trunk 2	--	b-wire (ring), trunk 2
5	--	a-wire (tip), trunk 2	a-wire (tip), trunk 3
6	b-wire (ring), trunk 3	--	b-wire (ring), trunk 3
7	--	a-wire (tip), trunk 3	a-wire (tip), trunk 4
8	b-wire (ring), trunk 4	--	b-wire (ring), trunk 4
9	--	a-wire (tip), trunk 4	–
10	GMZ	--	–
GMZ= Call charging module assignment			

ANI4 installation instructions

Follow the steps below to install ANI4 in the HiPath 3550 or HiPath 3350 system.

> **Caution**
> Remove the trunk slip-on connectors from the TMGL4 board before starting to work on the system.
> Be sure to reinstall the ANI4 and TMGL4 boards in their slots before reconnecting the trunks.

1. Disconnect the trunks from theTMGL4 board (Figure 3-138: Figure 1).
2. Unplug the system from the power supply.
3. Install the ANI4 board in the system.
4. Connect the OPAL adapter cable to the ANI4 board.
5. Use the ribbon cable supplied with the board to connect ANI4 and TMGL4, making sure that the colored markings (pin 1) at both ends of the cable are facing upwards (Figure 3-138: Figure 2).
6. Connect the trunk slip-on connectors to the ANI4 (Figure 3-138: Figure 3).
7. Restart the system by reconnecting the power plug.

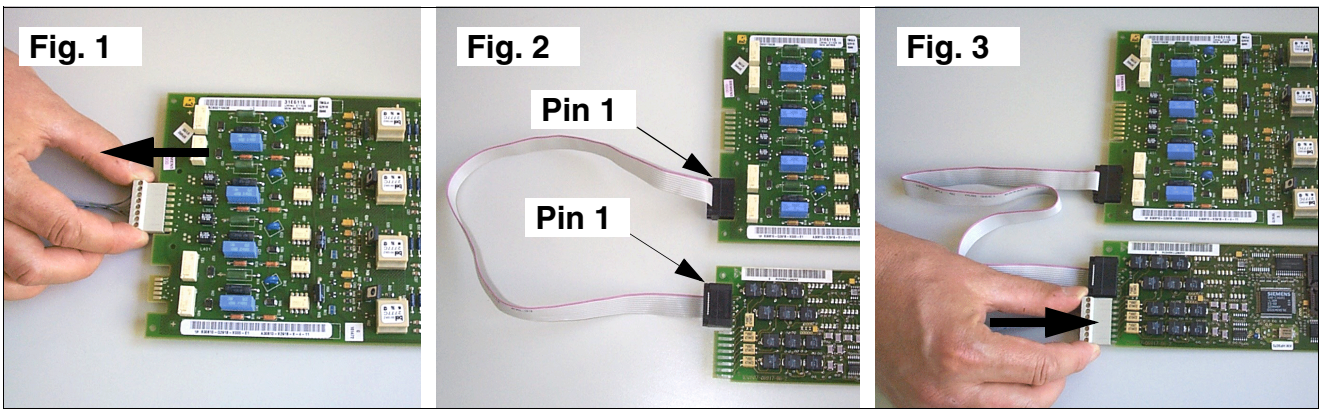


Figure 3-138 ANI4 (for selected countries only) - Installation Steps

3.4.4 ANI4R (for selected countries only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The ANI4R (Automatic Number Identification Rack) board is responsible for receiving station numbers modulated using the CPFSK method, demodulating them, and forwarding them to the HiPath 3500 or HiPath 3300 base system. In V4.0 SMR-7 or later, the station name is analyzed in addition to the call number and shown on the telephone display.

Each ANI4R module can serve four trunks. It contains the external trunk board hardware interfaces (TMGL4R) and the options bus interface.

If ANI4R is installed as option 1 or 2, TMGL4R board must be inserted in slot 4, 6 or 8 (slots 6 and 8 not available with HiPath 3300).

Interfaces

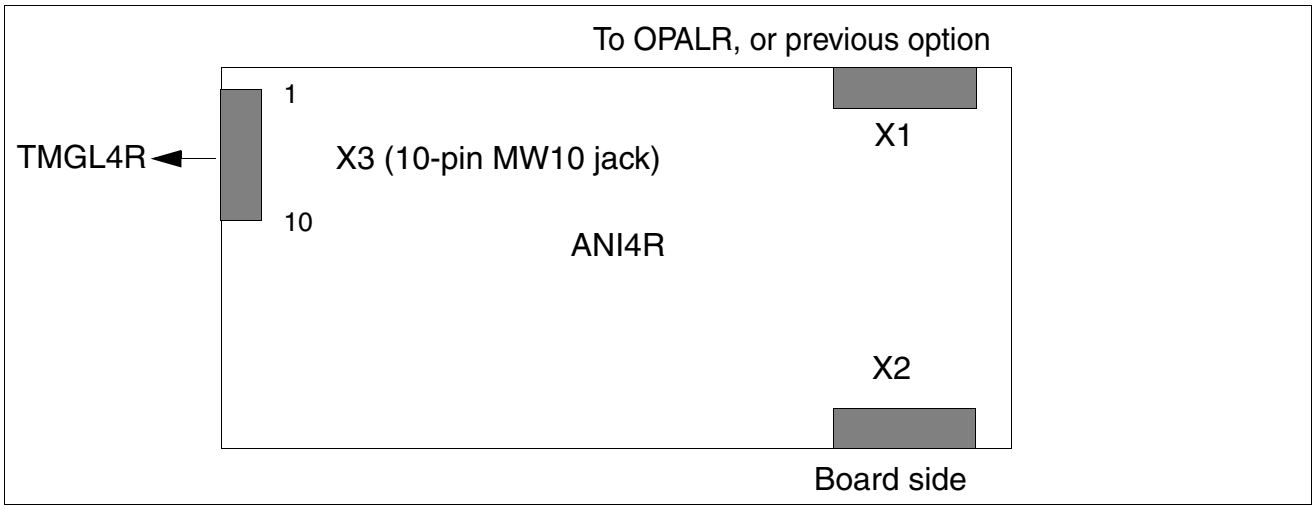


Figure 3-139 ANI4R (for selected countries only) (S30807-Q6917-Z103)

Contact assignment

Table 3-181 ANI4R (for selected countries only) - Contact Assignment

X3 Pin	Signal		X3 Pin	Signal
1	–		6	a-wire (tip), trunk 3
2	a-wire (tip), trunk 1		7	b-wire (ring), trunk 3
3	b-wire (ring), trunk 1		8	a-wire (tip), trunk 4
4	a-wire (tip), trunk 2		9	b-wire (ring), trunk 4
5	b-wire (ring), trunk 2		10	Call charging module assignment (GMZ)

3.4.5 Announcement and Music Modules

Caution
Place the central control board on a flat surface before inserting a subboard. Otherwise you may damage the board.

Introduction

The HiPath 3000 systems use different modules or boards for playing announcements and music on hold. For details on connecting these boards, refer to the manufacturer's installation instructions.

The following HiPath Xpressions Compact boards support music on hold in V4.0 SMR-7 or later and announcements in V5.0 or later:

- VMNL, IVMN8 (HiPath 3800)
- IVMP8 (not for U.S.) and IVMP8R (not for U.S.) (HiPath 3350, HiPath 3300)
- IVMS8, IVMS8R (HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300)

For detailed information on HiPath Xpressions Compact, startup and administration, see the manual for the product.

Overview of Boards

Tabelle 3-182 Announcement and Music Modules

Module / Board	Part number	Use
EXM	S30817-Q902-B401	• Used in HiPath 3550 and HiPath 3350 (wall housing), see Figure 3-140. • Connected via cable to X4 connector on CBCC/ CBCP.
EXMNA (for U.S. only)	S30807-Q6923-X	• Implemented in HiPath 3550, HiPath 3350 (wall housing), see Section 3.4.7.
EXMR	S30122-K7403-Z	• Implemented in HiPath 3550, HiPath 3350 (wall housing), and HiPath 3500, HiPath 3300 (19" housing). • Module installed directly on CBCC/CBRC (X19 and X20). • Wall housing: Direct connection to external music source (see Figure 3-141). • 19" housing: Connected via cable to Cinch jack on the front panel (see Figure 3-142).

Tabelle 3-182 Announcement and Music Modules

Module / Board	Part number	Use
UAM (not for U.S.)	S30122-X7217-X	• Used in HiPath 3550 and HiPath 3350 (wall housing). • Connected to OPAL and T/R interface (for the announcement function)
UAMR (not for U.S.)	S30122-X7402-Z	• Used in HiPath 3500 and HiPath 3300 (19-inch housing). • Connected to OPALR and T/R interface (for the announcement function)
Telroth Modules		
MUSIC plug-in module (internal music on hold) L30250-U600-A337, CUA337	S30122-K7275-T	• Use in all HiPath 3000 systems • The module is plugged directly on the central control board CBCC/CBRC (X19 and X20) of HiPath 3550/3350 and HiPath 3500/3300
Sound Player eMusic L30251-U600-A722, DUA722	S30122-X8005-X8	• Connection via analog interface or via 3.5 mm jack plug at an EXMR board • Music is transferred online as an email attachment to the Sound Player eMusic. Following initial startup, no further service intervention is required for music on hold.
Beyertone module		
MPPI	S30122-K7275-B	• Use in all HiPath 3000 systems • The module is plugged directly on the central control board CBCC/CBRC (X19 and X20) of HiPath 3550/3350 and HiPath 3500/3300

Notes on displaying options

You can use HiPath 3000/5000 Manager E to display the presence of options. The presence of UAM (HiPath 3550 and HiPath 3350 only) is displayed as “Option 5”.

The ALUM4 module cannot be displayed.

Slot for EXM

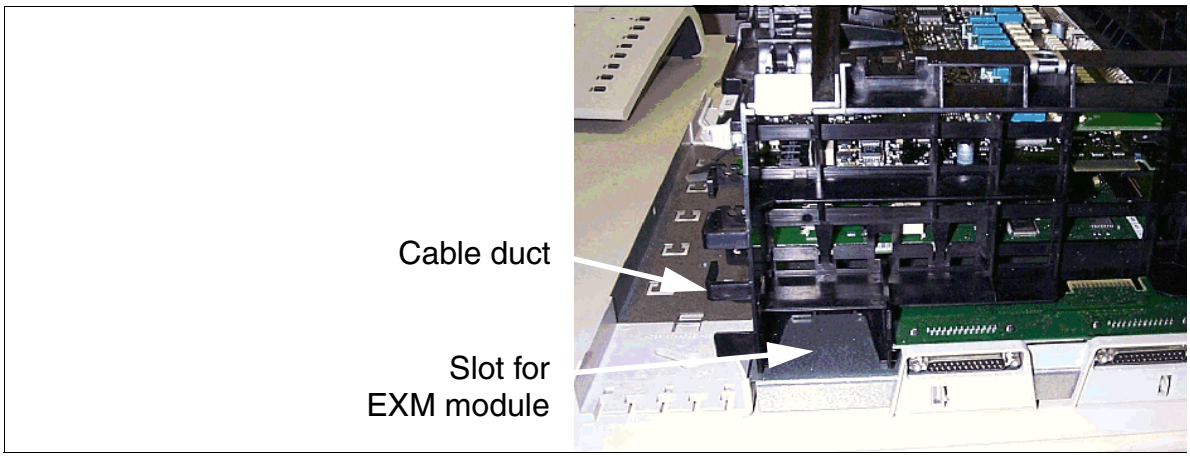


Figure 3-140 EXM Slot for HiPath 3550 and HiPath 3350 Wall Housing

Connection of EXMR

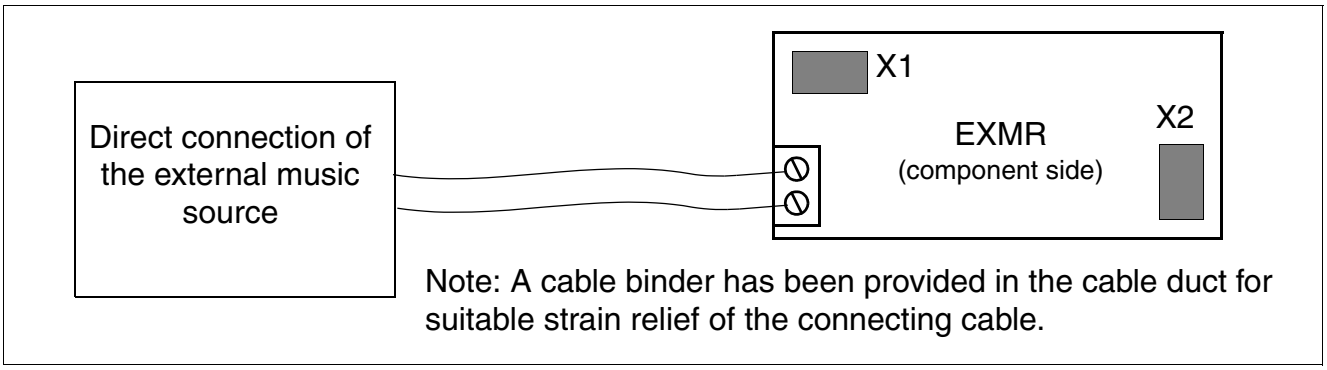


Figure 3-141 EXMR connection to HiPath 3550 and HiPath 3350

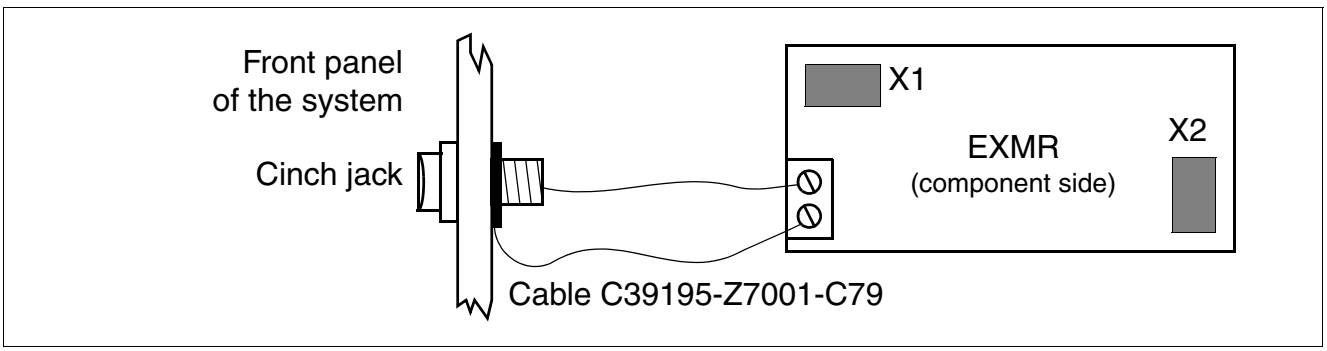


Figure 3-142 EXMR Connection to HiPath 3500 and HiPath 3300

3.4.6 EVM

Introduction

The optional EVM (**E**ntry **V**oice **M**ail) subboard enables the function of integrated voice mail in HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300. The prerequisite for this is the use of the S30810-Q2935-A301/-A401 (CBCC) and S30810-Q2935-Z301/-Z401 (CBRC) central boards.

The EVM subboard is installed on the central CBCC and CBRC controls as follows:

- Up to HiPath 3000/5000 V7:

  The board is plugged directly into the X32 connector on the central control boards CBCC (see Section 3.2.1) or CBRC (see Section 3.2.2) using the connector strip X2.

  Caution
  The EVM subboard must not be plugged in or out when the system is energized. Place the central control board on a flat surface before inserting the EVM subboard.
  The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-143).
  Otherwise you may damage the board.

- As of HiPath 3000/5000 V8:

  The module is securely soldered on the central CBCC and CBRC controls.

HiPath Entry Voice Mail has capacity to store up to two hours of recorded messages. You can create up to 24 standard mailboxes and up to four of these can be configured as Auto Attendant mailboxes (attendant mailboxes with automatic call acceptance, greeting with routing options, day and night mode, speed dialing).

Information on administering HiPath Entry Voice Mail for HiPath 3000 can be found in the HiPath 3000/5000 Manager E Help.

Caution
If using a different voicemail application (such as HiPath Xpressions Compact), the EVM voice mail ports must be deactivated. To do this, set the ports to the "Standard" station type and remove them from the active voicemail hunt group. Next set the number of mailboxes for autoconfiguration to "0". This prevents the user making accidental changes to Call Management.

Interfaces

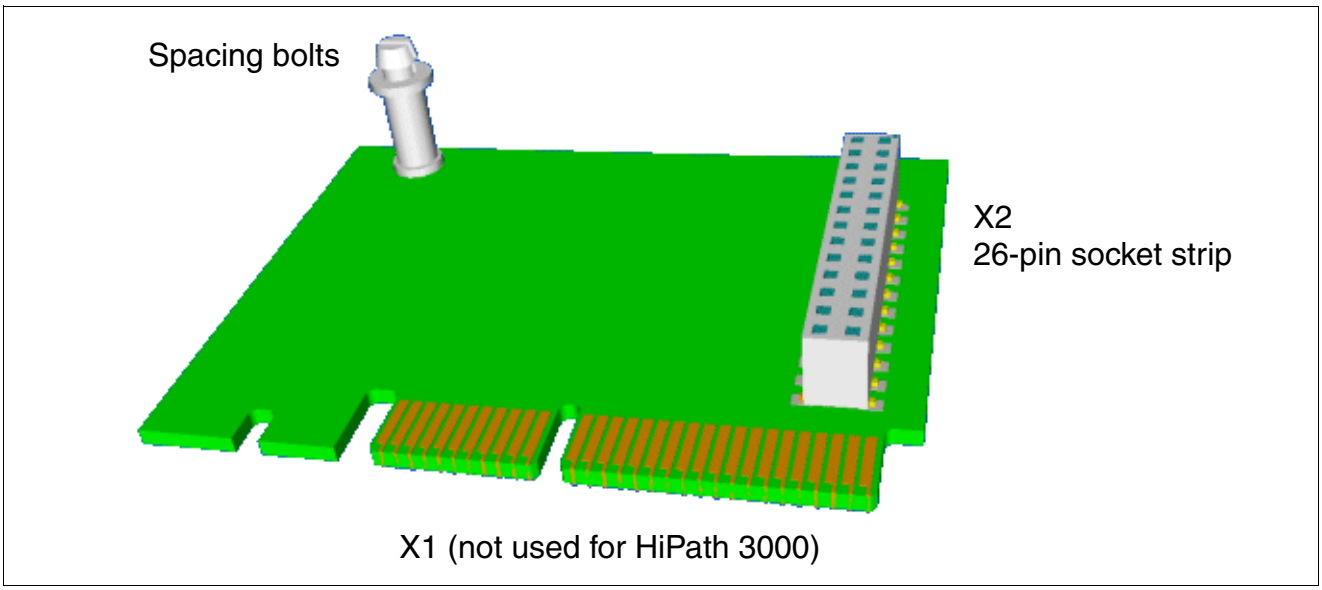


Figure 3-143 EVM (S30807-Q6945-X) - Interfaces

Individual announcements in the case of upgrades

In the case of a Fast Upgrade, i.e. within a release, the individual announcements and messages are retained. In the case of an upgrade from HiPath 3000 V7 to V8, these announcements and messages are deleted.

3.4.7 EXMNA (for U.S. only)

Introduction

The EXMNA (external music on hold) module provides a connection for external music on hold in HiPath 3550 and HiPath 3350.

The EXMNA connects to the CBCC and CBCP board (connector X4) by means of a ribbon cable.

- Ribbon cable connected = External music
- Ribbon cable not connected = Internal music

Expert mode code 22 11 allows you to choose between music on, music off, ring tone, or music on unscreened transfer. If the EXMNA module is connected, you must select Music on using Manager T or HiPath 3000/5000 Manager E. The module is operational as soon as it is plugged in.

Interfaces

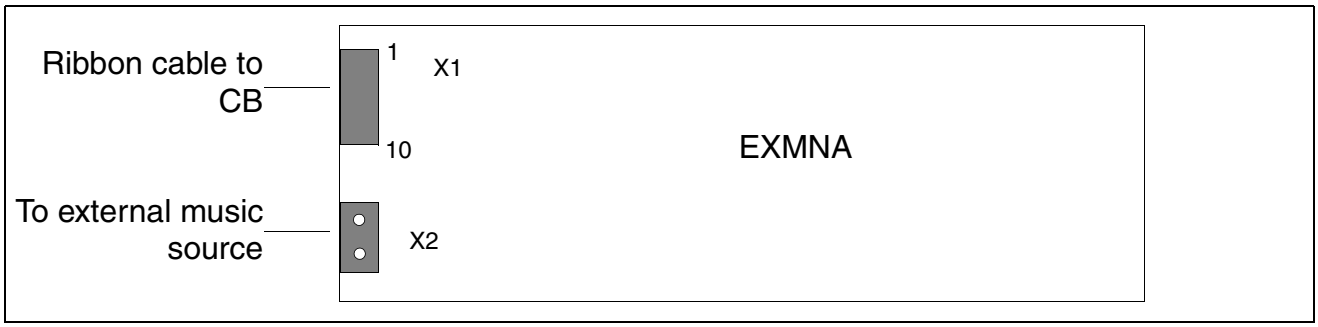


Figure 3-144 EXMNA (for U.S. only) (S30807-Q6923-X)

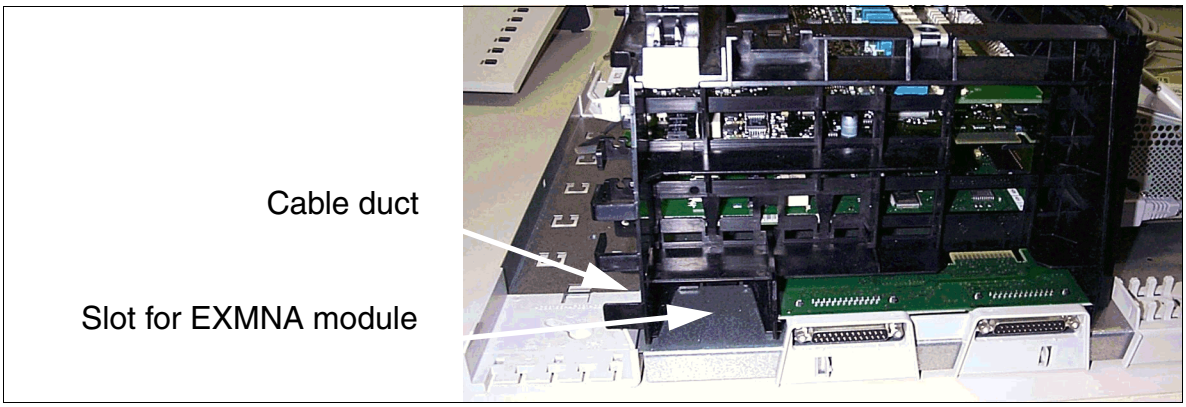


Figure 3-145 EXMNA (for U.S. only) - Slot for HiPath 3550 and HiPath 3350

Contact assignment

Table 3-183 EXMNA (for U.S. only) - Contact Assignments

Contact	Connector X1	Connector X2
1	GND	Input
2	Not assigned	Input
3	Not assigned	Not assigned
4	EXMCL	Not assigned
5	EXMDIR	
6	HRES	
7	EXMD	
8	EXMDET	
9	+5 V	
10	Not assigned	

3.4.8 GEE12 (not for U.S.), GEE16 (not for U.S.), GEE50 (not for U.S.)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

Each of the modules listed below supports four call-metering receiving units for recording and preprocessing call charge pulses in HiPath 3550 and HiPath 3350.

Table 3-184 GEE12/GEE16/GEE50 (not for U.S.) Modules

Module	Frequency	Remarks
GEE 12	12 kHz	also for Silent Reversal
GEE 16	16 kHz	
GEE 50	50 Hz	

The call charge detection channel is looped in the trunk and then routed to the TLA

Interfaces

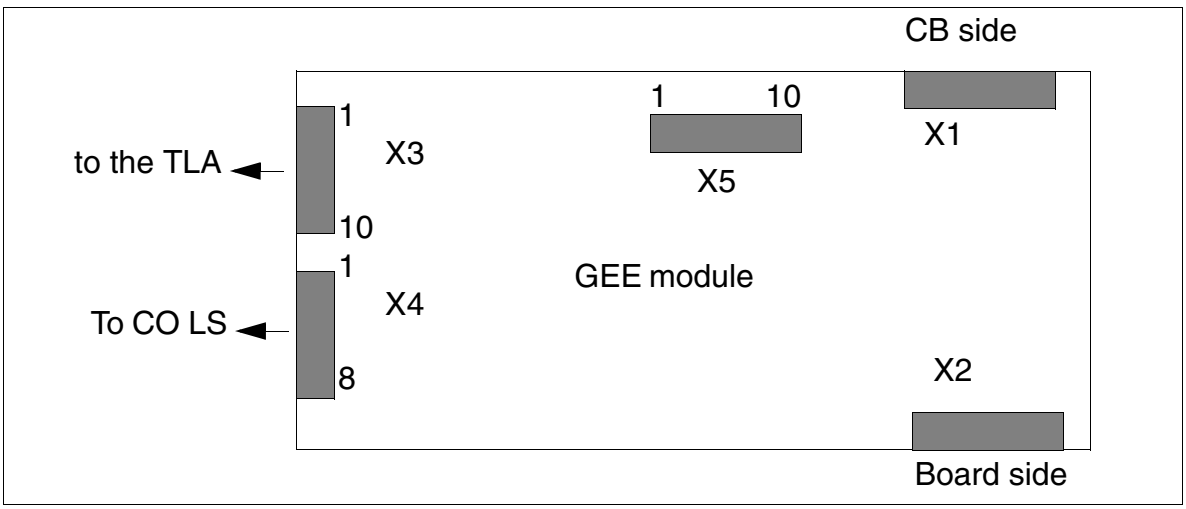


Figure 3-146 GEE12, GEE16, GEE50 (not for U.S.) - Interfaces (S30817-Q951-Axxx)

Contact assignments

Table 3-185 GEE12, GEE16, GEE50 (not for U.S.) - Contact Assignments

Contact		Connector X3	Connector X4	Connector X5
1	a	GND *	CO 1 (AL1)	0V
2	b	CO 1 (BN 1)	CO 1 (BL1)	0V
3	a	CO 1 (AN 1)	CO 2 (AL2)	RTS
4	b	CO 2 (BN 2)	CO 2 (BL2)	CTS
5	a	CO 2 (AN 2)	CO 3 (AL3)	RxD
6	b	CO 3 (BN 3)	CO 3 (BL3)	TxD
7	a	CO 3 (AN 3)	CO 4 (AL4)	0V
8	b	CO 4 (BN 4)	CO 4 (BL4)	+5V
9	a	CO 4 (AN 4)	–	0V
10		Call charging module assignment	–	+5V
* for GEE 50 in France; otherwise free				

3.4.9 HOPE (for U.S. only)

Introduction

The HOPE (Hicom Office PhoneMail Entry) board provides Hicom Office PhoneMail Entry functions.

The HOPE board does not identify itself to the system and is therefore not visible in the HiPath 3000/5000 Manager E card map. When expanding a system (such as HiPath 3350 or HiPath 3550), ensure that a free slot is available.

Interfaces

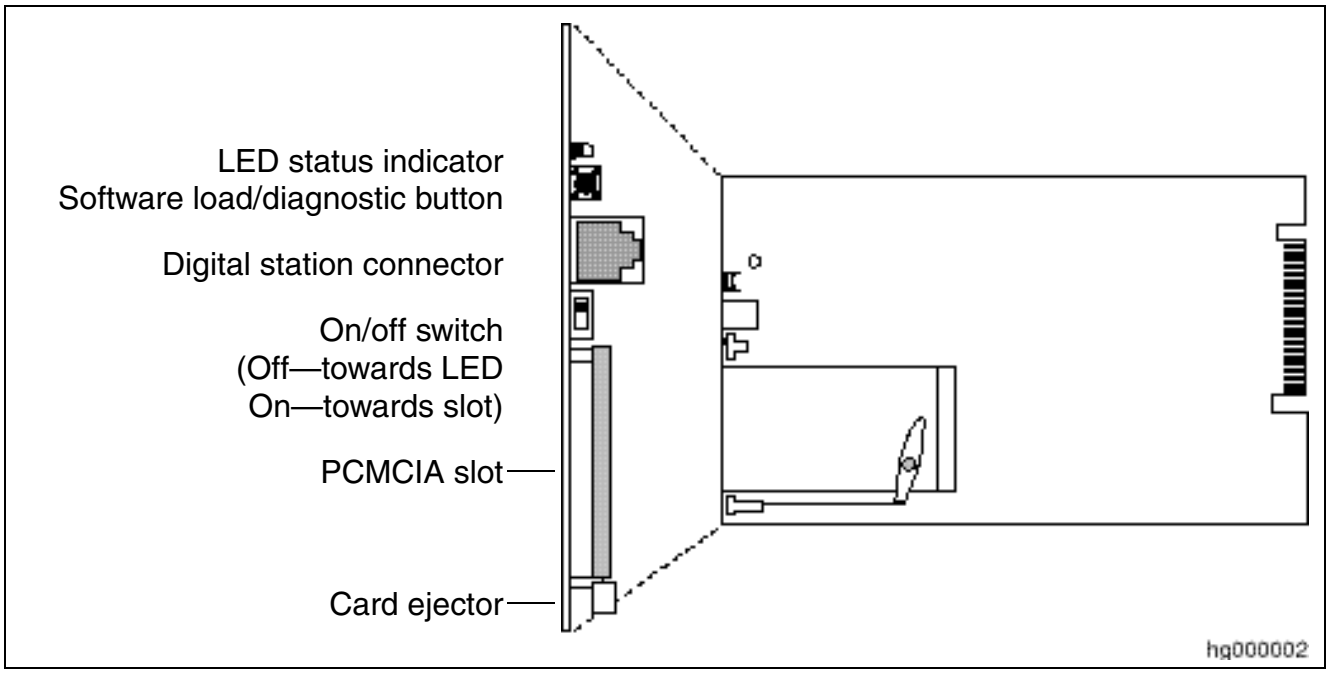


Figure 3-147 HOPE (for U.S. only) (S30122-Q7078-X; S30122-Q7079-X)

Board components

The following list describes the purpose of the components on the HOPE board:

- The LED status indicator signals the state of the Hicom Office PhoneMail system
- The software load/diagnostic button is for software loads (for example, loading a specific language).
- The digital station connector connects the HOPE board to the corresponding digital ports, using a modular cable

- The on/off switch turns the Office PhoneMail system on and off
- The PCMCIA slot is for Office PhoneMail software cards (for example, voice cards).
- The card ejector ejects the software cards from the PMCIA slot

Installation, servicing, and connectivity

For information on installing, connecting, and servicing the HOPE board, refer to the Hicom Office PhoneMail Entry Installation and System Administration Guide.

3.4.10 OPAL and OPALR

Introduction

The adapter cable for connecting the central board to the first optional board comes in two versions:

- OPAL **(Op**tions **A**dapter Cable **L**ong) C39195-A7001-B130 (Figure 3-148 - for use in HiPath 3550 and HiPath 3350 (wall housing).
- OPALR **(Op**tions **A**dapter Cable **L**ong **R**ack) C39195-A7001-B142 (Figure 3-149) - for use in HiPath 3500 and HiPath 3300 (19-inch housing).

OPAL interfaces

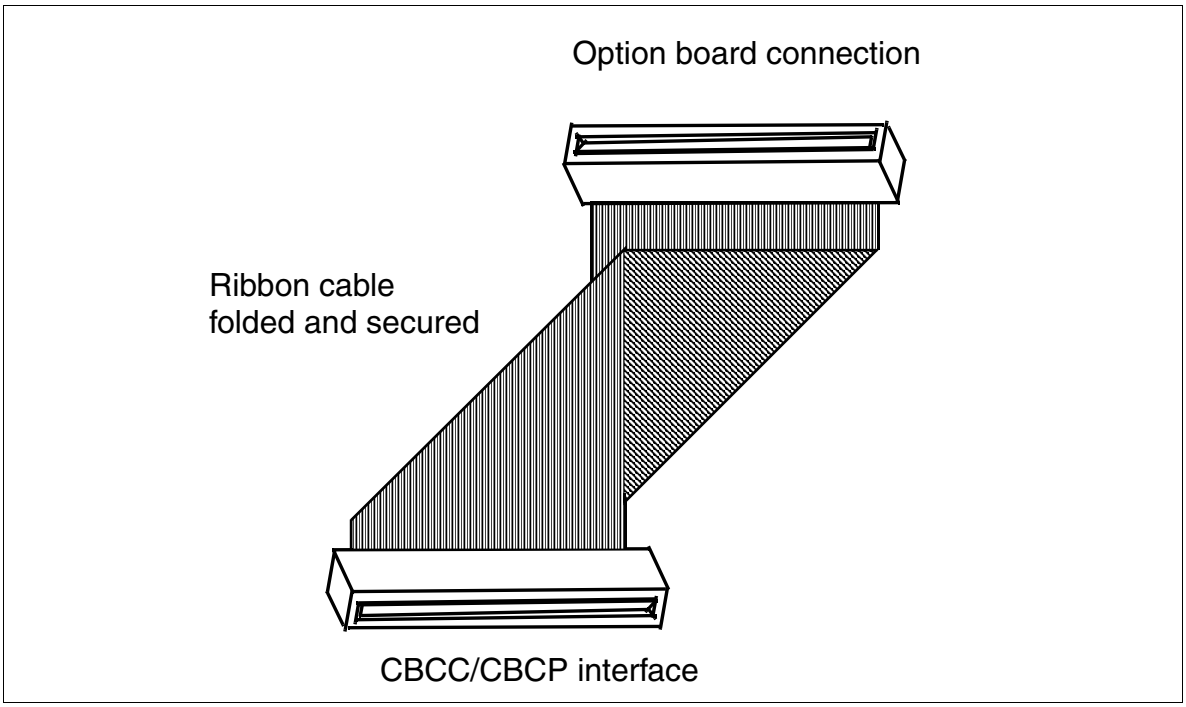


Figure 3-148 OPAL (C39195-A7001-B130)

OPALR interface

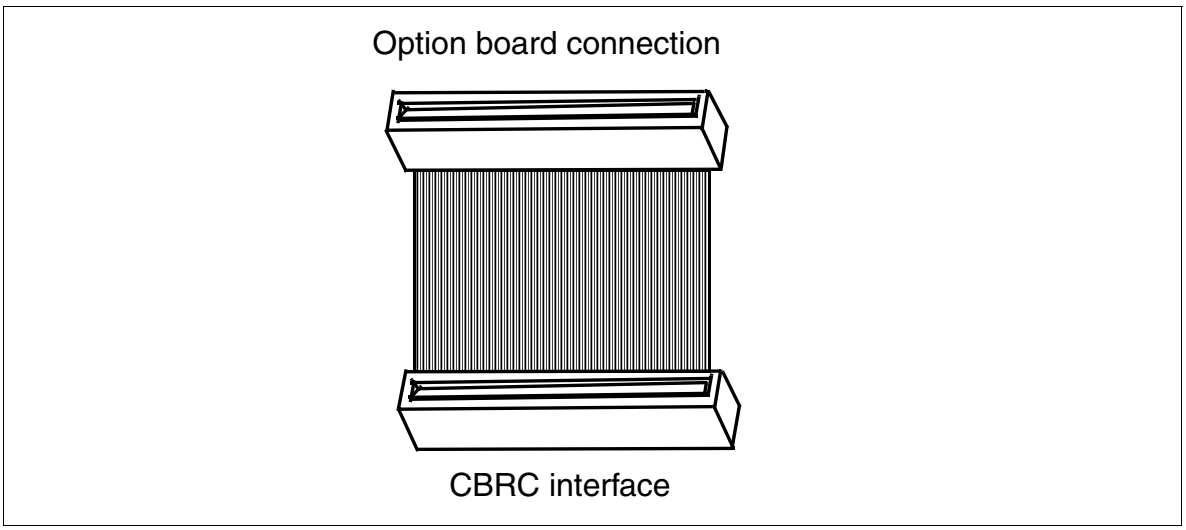


Figure 3-149 OPALR (C39195-A7001-B142)

3.4.11 PFT1 (not for U.S.), PFT4 (not for U.S.)

Introduction

In the event of a power failure or system error in HiPath 3800, analog trunks can be transferred (ALUM) to designated analog telephones. These are:

- 1 analog trunk with a PFT1 (**P**ower **F**ailure **T**ransfer) board
- 4 analog trunks with a PFT4 board

When using an analog telephone for outgoing calls, you may need to adapt its signaling method to match the signaling method of the connected trunk.

ALUM using PFT1/PFT4

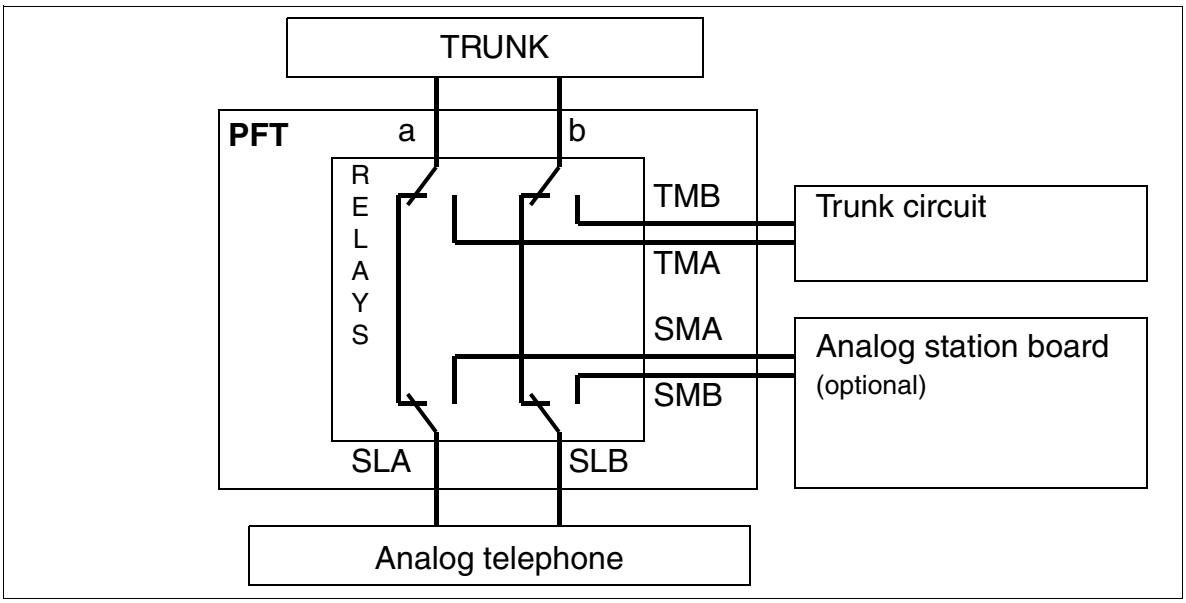


Figure 3-150 ALUM Using PFT1/PFT4 (not for U.S.)

Installation location of the PFT1 and PFT4 board (MDFU/MDFU-E)

Wire PFT1 or PFT4 into the MDFU or MDFU-E. The boards require -48 V. For the assignments of both boards, see Figure 3-152.

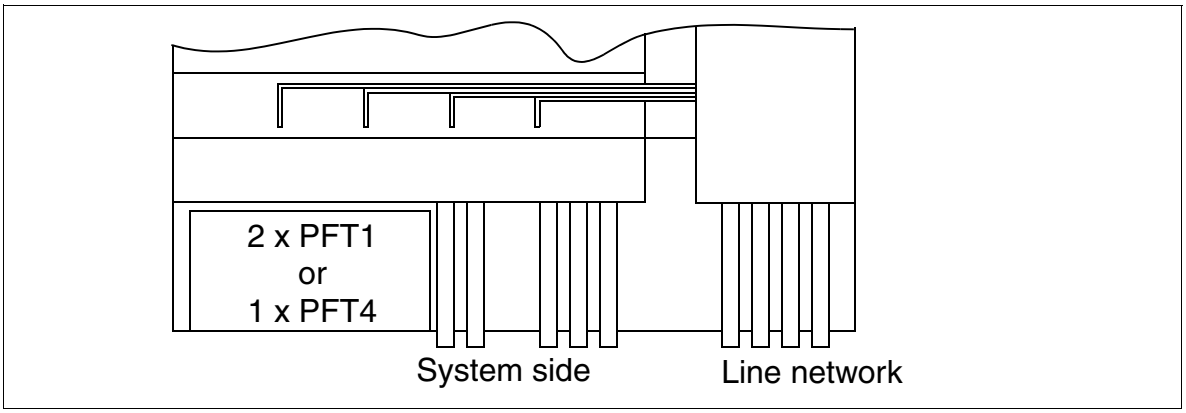


Figure 3-151 Installation Location of PFT1 and PFT4 (MDFU/MDFU-E) (not for U.S.)

PFT1 and PFT4 board assignment

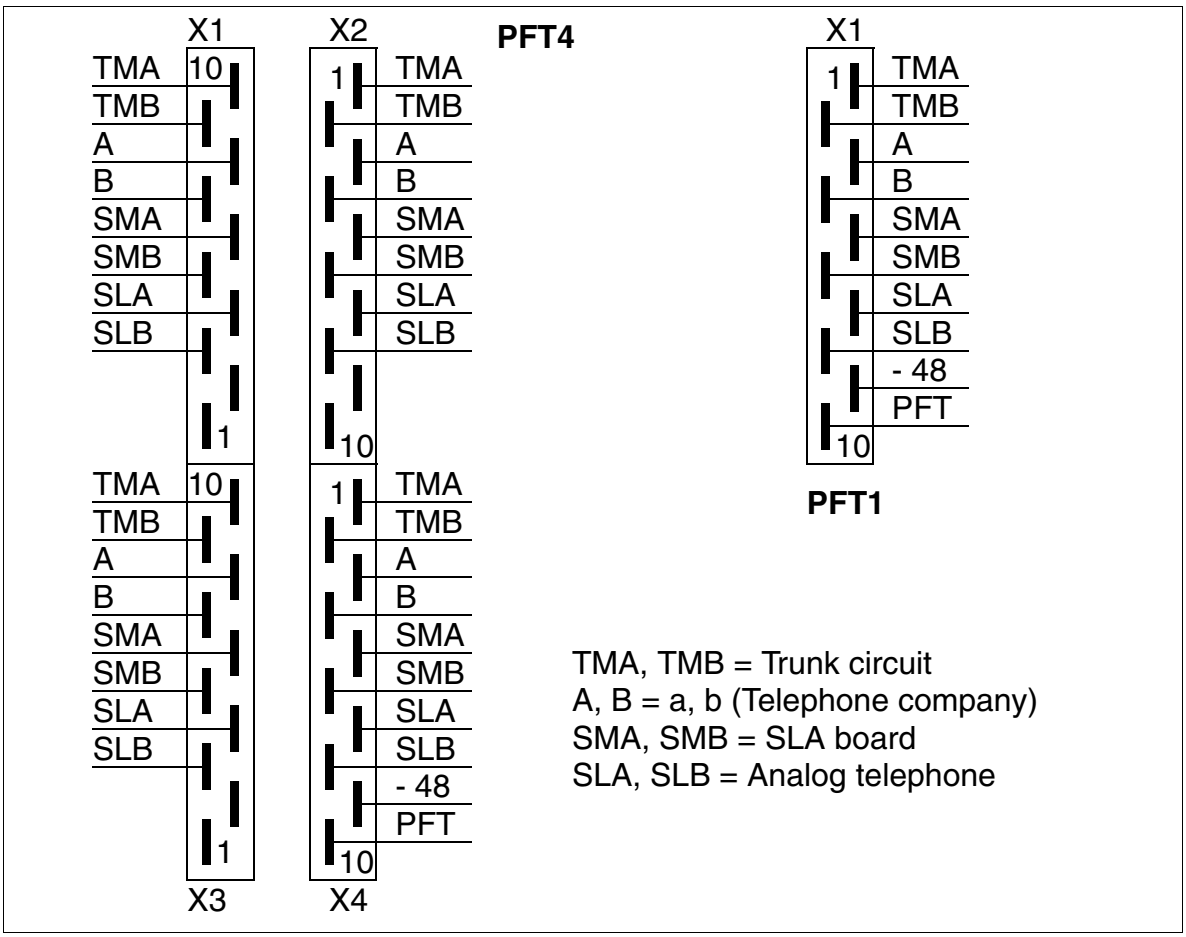


Figure 3-152 PFT1 (S30777-Q539-X) and PFT4 (S30777-Q540-X) Board Assignment

3.4.12 REALS

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

The REALS (**Re**lay and **AL**UM for **S**APP) board is used in HiPath 3800 to provide the following functions:

- Four individual, controllable relays are available for special connections, such as door openers.
  The switch contacts for all relays are floating and protected by surge protectors.

  Electrical characteristics of the relays are as follows:

  – Maximum current drain at – 48 V: 80 mA

  – Operating voltage: + 5 V

  – Contact current: max. 1.25 A

  – Contact power: max. 30 W

- Trunk failure transfer (ALUM)
  In the event of a power failure or a system restart or reload, an analog trunk is transferred from the system to an analog telephone. If the power supply voltage returns after an interruption and a trunk call is in progress, activation of the trunk failure transfer relay is prevented by optocoupler.

  – Default = HiPath 3800 is in normal mode:

    PFTALa/b (trunk) is connected to PFTASa/b (trunk module).

    PFTTLa/b (terminal) is connected to PFTTSa/b (subscriber line module).

  – Error = HiPath 3800 does not have any power

    PFTTLa/b (terminal) is connected to PFTALa/b (trunk).

  ALUM relay electrical data:

  – Operating voltage: + 5 V

  – Contact current: max. 1.25 A

  – Contact power: max. 30 W

All of the functions are controlled by the CBSAP board.

Two –48-V lines fused using a PTC resistor are available for external applications. The voltage is picked up via MDFU-E (Table 3-186: M48VF1 / 0V_F and M48VF2 / 0V_F). Each trunk has a maximum load capacity of 300 mA.

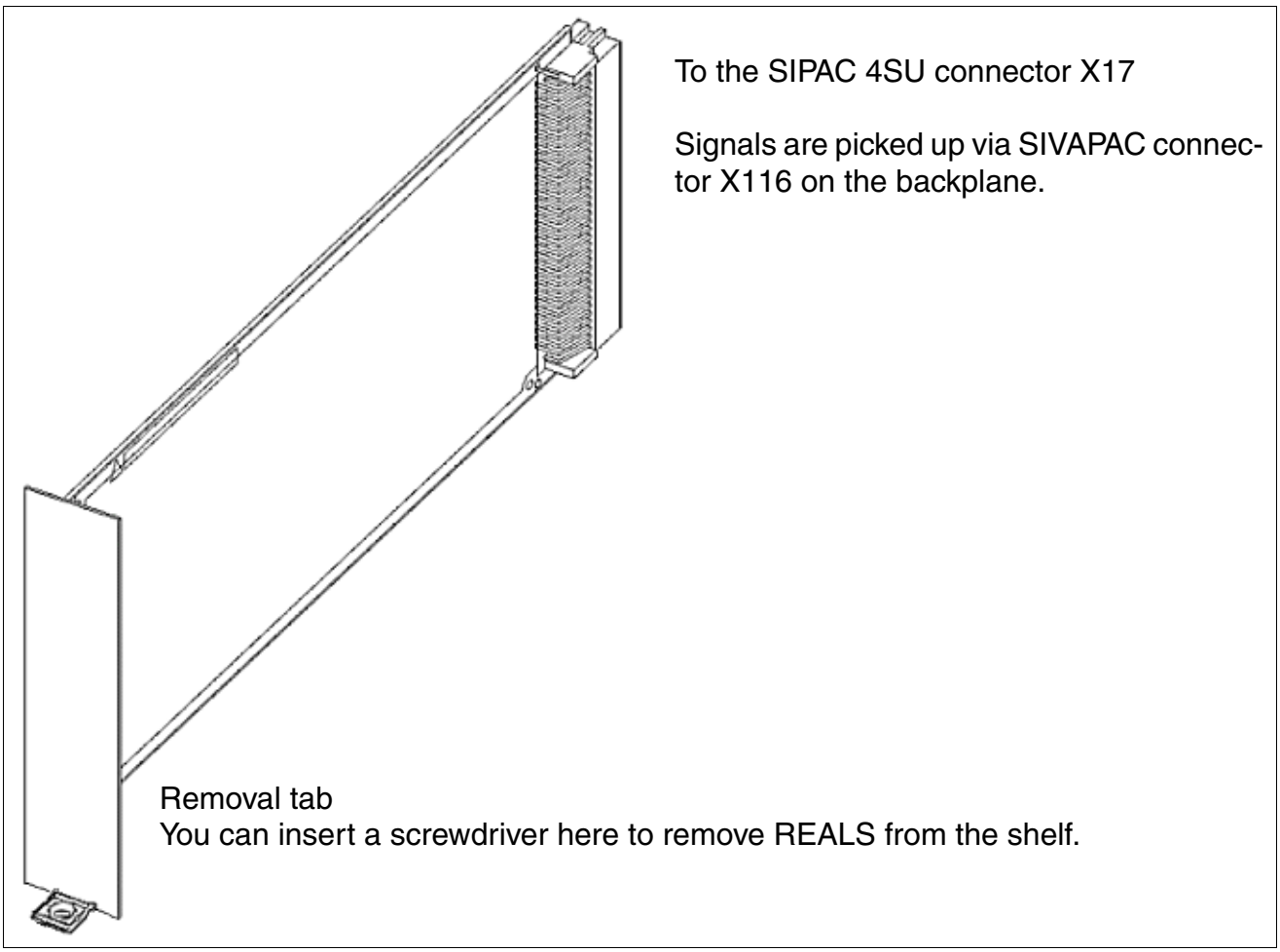


Figure 3-153 REALS (S30807-Q6629-X)

Slot

Insert the REALS board into the slot marked 3 in the lower part of the shelf in the basic cabinet and apply pressure until you hear a click (see Figure 4-21).

The slots for the power supply units and for the REALS board must be covered with an outer panel before the system is started up. The outer panel is fixed onto the shelf with screws (see Figure 3-154).

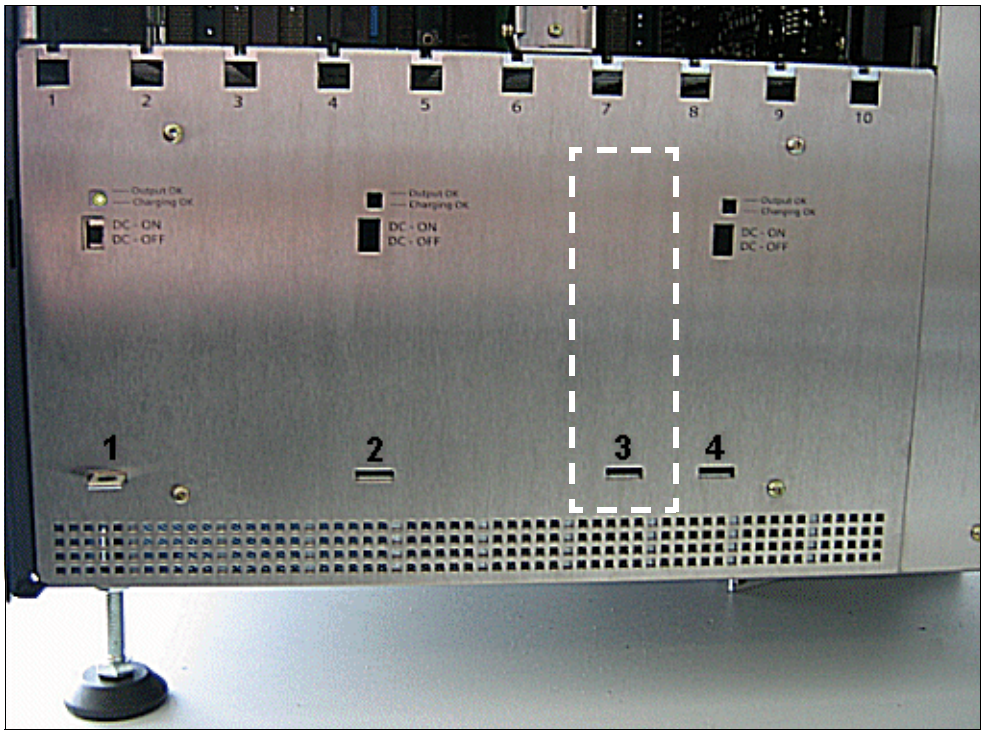


Figure 3-154 REALS Slots in the Basic Cabinet (With Outer Panel Mounted)

Cable and connector assignment

Table 3-186 shows the assignment of the SIVAPAC connector X116 on the backplane and the assignment of the jumper strip in the MDFU-E.

Table 3-186 REALS - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC Connector X116	REALS	MDFU-E	Notes
1	wht/blu		20	M48VF1	1a	– 48 V (max. 300 mA)
		blu/wht	38	0V_F	1b	
2	wht/ora		18	PFTTLb	2a	ALUM: Subscriber line (telephone)
		ora/wht	17	PFTTLa	2b	
3	wht/grn		16	0 V	3a	
		grn/wht	15	–	3b	
4	wht/brn		14	0V_F	4a	
		brn/wht	13	M48VF2	4b	– 48 V (max. 300 mA)
5	wht/gry		12	–	5a	
		gry/wht	11	0 V	5b	
6	red/blu		10	AK1	6a	Relay 1: Normally open contact
		blu/red	9	AK2	6b	Relay 2: Normally open contact
7	red/ora		8	AK3	7a	Relay 3: Normally open contact
		ora/red	7	AK4	7b	Relay 4: Normally open contact
8	red/grn		6	0 V	8a	
		grn/red	5	PFTASa	8b	ALUM: Trunk module
9	red/brn		4	PFTASb	9a	
		brn/red	3	PFTALa	9b	ALUM: Trunk
10	red/gry		2	PFTALb	10a	
		gry/red	1	–	10b	
11	blk/blu		37	–	11a	
		blu/blk	36	0 V	11b	
12	blk/ora		35	–	12a	
		ora/blk	34	–	12b	
13	blk/grn		32	RK3	13a	
		grn/blk	31	0 V	13b	
14	blk/brn		30	RK1	14a	
		brn/blk	29	RK2	14b	
15	blk/gry		27	RK4	15a	
		gry/blk	26	0 V	15b	

Table 3-186 REALS - SIVAPAC Connector Assignment on the Backplane

Pair	a-wire[1] (tip)	b-wire[1] (ring)	SIVAPAC Connector X116	REALS	MDFU-E	Notes
16	yel/blu		24	PFTTSb	16a	ALUM: Subscriber line module
		blu/yel	23	PFTTSa	16b	
17	yel/ora		58	–	17a	
		ora/yel	57	S5	17b	
18	yel/grn		56	0 V	18a	
		grn/yel	55	–	18b	
19	yel/brn		54	–	19a	
		brn/yel	53	S3	19b	
20	yel/gry		52	S4	20a	
		gry/yel	51	0 V	20b	
21	vio/blu		50	UK1	21a	Relay 1: Switch contact
		blu/vio	49	UK2	21b	Relay 2: Switch contact
22	vio/ora		48	UK3	22a	Relay 3: Switch contact
		ora/vio	47	UK4	22b	Relay 4: Switch contact
23	vio/grn		46	0 V	23a	
		grn/vio	45	–	23b	
24	vio/brn		44	–	24a	
		brn/vio	43	S6	24b	

1 see "Abbreviations for colors" at the start of Section 3.4.

3.4.13 STBG4 (for France only)

NOTE: Danger of damage to property due to surge voltage. The required lightning protection measures must be taken for this board, see Section 2.1.2, “Lightning Protection”.

Introduction

This current-limiting board is for connecting loop start trunks in France (HiPath 3550 and HiPath 3350). It includes the current-limiting components and surge-protection elements required by law.

No options bus lines are needed.

The slot X3 wiring is polarized.

The STBG4 channel is looped between TLA and the trunk.

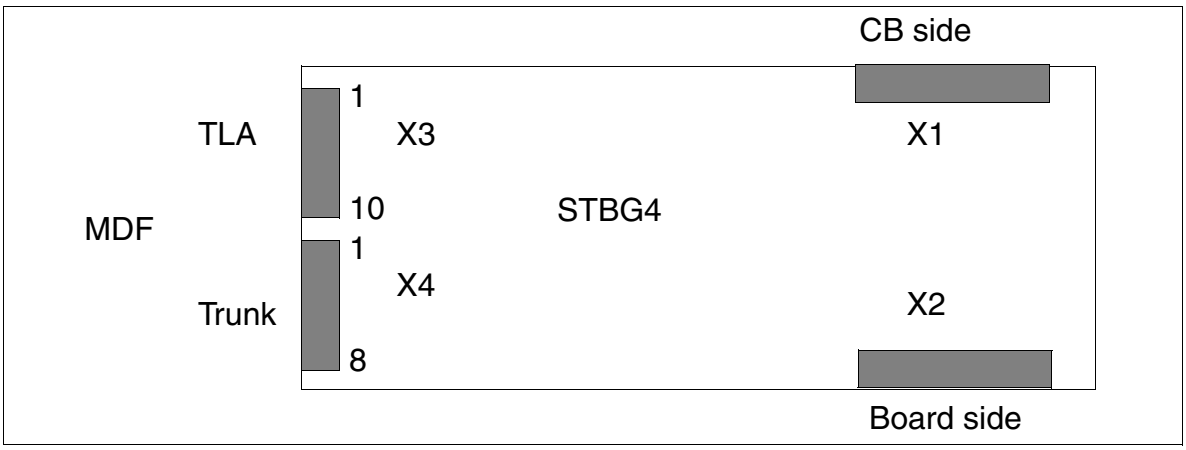


Figure 3-155 STBG4 (for France only) - Interfaces (S30817-Q934-A)

Table 3-187 STBG4 (for France only) - Contact Assignment

Contact	Connector X3	Connector X4
1	Not used	AL 1
2	BL 1	BL 1
3	AN 1	AL 2
4	BL 2	BL 2
5	AN 2	AL 3
6	BL 3	BL 3
7	AN 3	AL 4
8	BL 4	BL 4
9	AN 4	–
10	Not used	–

3.4.14 STRB, STRBR

Introduction

This option comes in two versions:

- STRB (**C**ontrol **R**elay **B**oard) S30817-Q932-A (Figure 3-156) - for use in HiPath 3550 and HiPath 3350 (wall housing)
- STRBR (**C**ontrol **R**elay **B**oard **R**ack) S30817-K932-Z (Figure 3-157) - for use in HiPath 3500 and HiPath 3300 (19-inch housing)

The STRB or STRBR has four double-pin, double-throw relays as shown in Figure 3-158).

Actuators and sensors for monitoring, alerting, controlling and regulating can be connected to the control relay board. Actuators are relays that can be energized from any station by means of a code (such as a door opener). Sensors (such as thermostats or motion detectors) can detect a change of status in the connected equipment and activate a feature or dial a station number stored in the system.

The board has a total of four outputs (in the form of two floating switch contacts each) and four control inputs in the form of optocouplers for externally activating an electrically isolated normally open (NO) contact.

Caution
CDB data is stored on the board. When replacing the board, be sure to store the CDB data elsewhere. If a used board is used, old data may still be present on the board.
The "Reset options" procedure should only be used by factory technicians (Expert Mode code 29-3-3). Using the procedure during operation returns all options to their factory defaults, and they must be reset before they can accept data again from the central board.

Example: You can route the +12-V signal for power failure alert to the control input of the optocoupler for connector X4 or X6. Route the signal through a normally open (NO) contact that is electrically isolated from the external device, then program the alert type. For safety, the control voltage for the optocoupler is electrically isolated from the system's other partial voltages.

For the manual relay on/off function and door opener, you must enter the desired switching time (expert mode code 26 2).

STRB interfaces

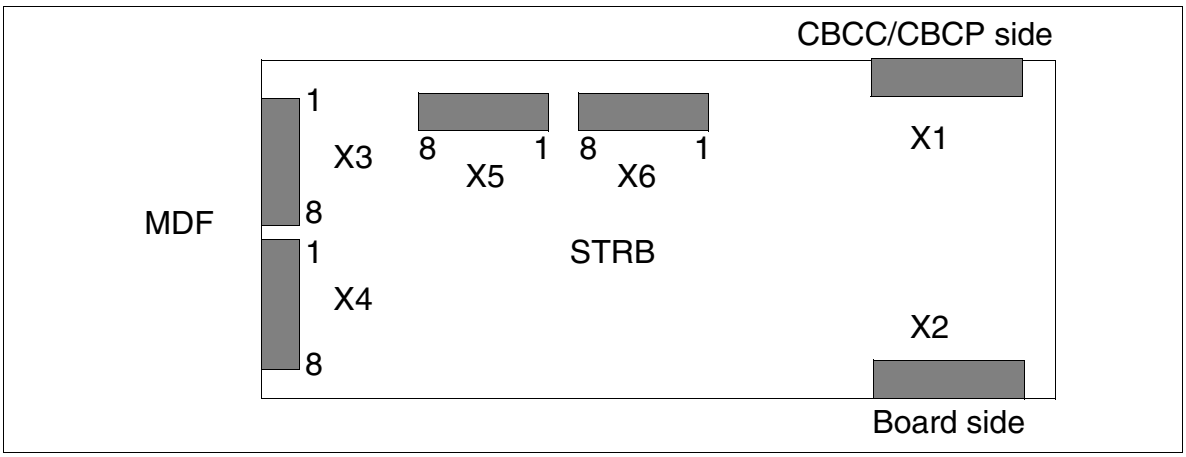


Figure 3-156 STRB Interfaces (S30817-Q932-A)

STRBR interfaces

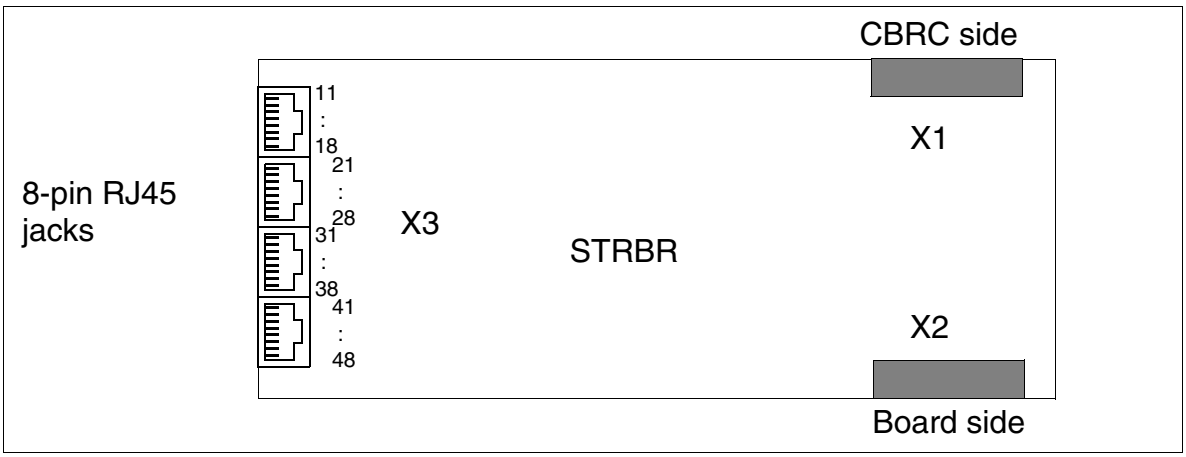


Figure 3-157 STRBR Interfaces (S30817-Q932-Z)

Control relay connection values

Warning
The STRB or STRBR interface is an SELV (**S**afety **E**xtra-**L**ow **V**oltage Circuit) interface, as defined by IEC 60950.
Do not connect any circuits whose voltages exceed the following limit values:
Maximum: 30 Vac (42 V_{peak}) or 60 Vdc.

STRB and STRBR board relay and sensor functions

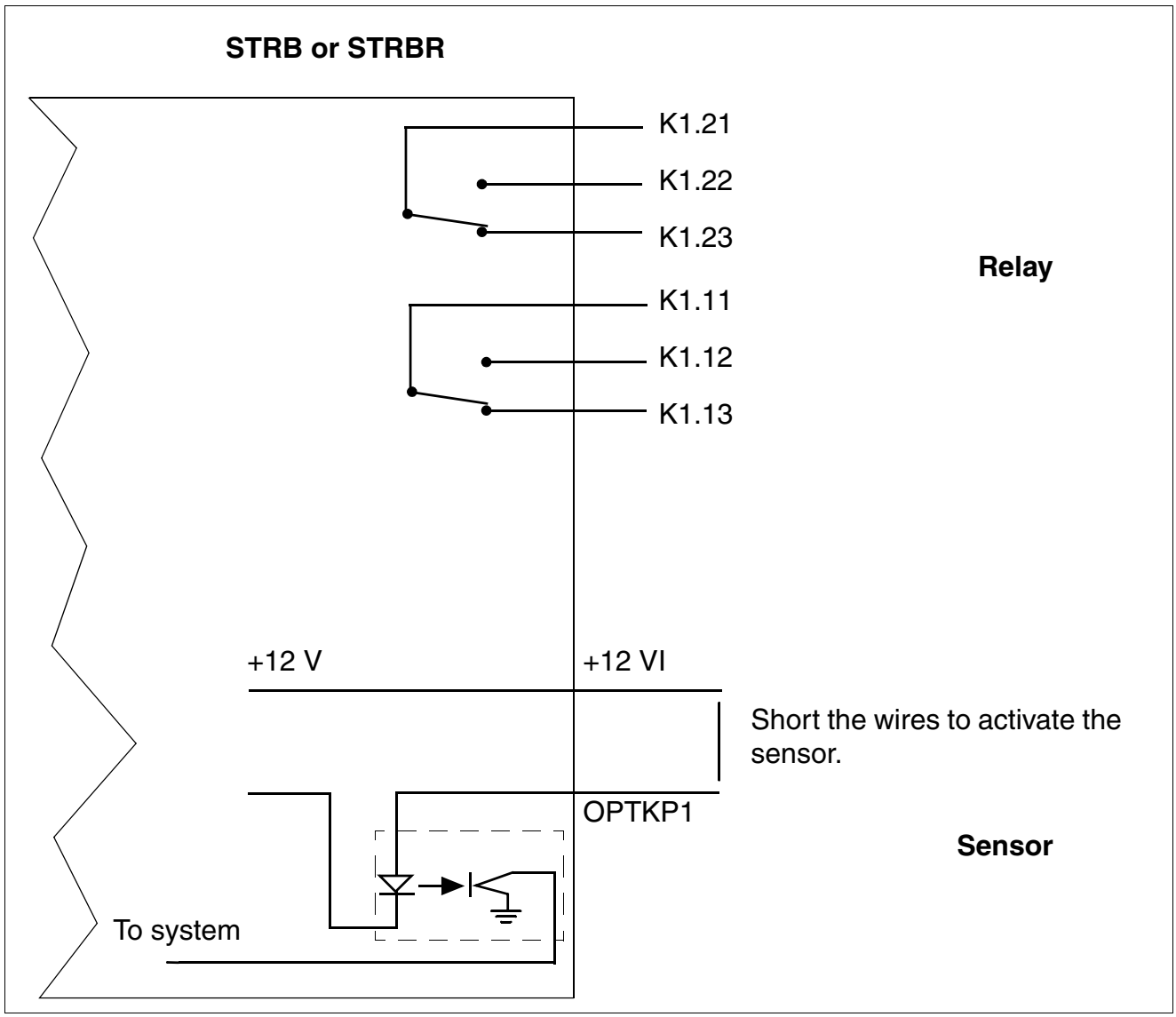


Figure 3-158 STRB and STRBR Board Relay and Sensor Functions

STRB contact assignment

Table 3-188 STRB Contact Assignments

Connector	Contact	Signal Name	Function
X3	1	K 4.21	Relay contact K4.2 (common)
	2	K 4.22	Relay contact K4.2 (NO)
	3	K 4.23	Relay contact K4.2 (NC)
	4	K 3.21	Relay contact K3.2 (common)
	5	K 3.22	Relay contact K3.2 (NO)
	6	K 3.23	Relay contact K3.2 (NC)
	7	K 2.21	Relay contact K2.2 (common)
	8	K 2.22	Relay contact K2.2 (NO)
X4	1	K 2.23	Relay contact K2.2 (NC)
	2	K 1.21	Relay contact K1.2 (common)
	3	K 1.22	Relay contact K1.2 (NO)
	4	K 1.23	Relay contact K1.2 (NC)
	5	+12VI	+12-V control voltage optocoupler
	6	OPTKP 2	Control input optocoupler 2
	7	+12VI	+12-V control voltage optocoupler
	8	OPTKP 1	Control input optocoupler 1
X5	1	K 3.12	Relay contact K3.1 (NO)
	2	K 3.13	Relay contact K3.1 (NC)
	3	K 2.11	Relay contact K2.1 (common)
	4	K 2.12	Relay contact K2.1 (NO)
	5	K 2.13	Relay contact K2.1 (NC)
	6	K 1.11	Relay contact K1.1 (common)
	7	K 1.12	Relay contact K1.1 (NO)
	8	K 1.13	Relay contact K1.1 (NC)
X6	1	OPTKP 3	Control input optocoupler 3
	2	+12VI	+12-V control voltage optocoupler
	3	OPTKP 4	Control input optocoupler 4
	4	+12VI	+12-V control voltage optocoupler
	5	K 4.11	Relay contact K4.1 (common)
	6	K 4.12	Relay contact K4.1 (NO)
	7	K 4.13	Relay contact K4.1 (NC)
	8	K 3.11	Relay contact K3.1 (common)

STRBR contact assignments

Table 3-189 STRBR Contact Assignments

X3, Pin	Signal Name	Function
11	ACT4-2M	Relay contact K203 (common) 2
12	ACT4-2B	Relay contact K203 (NO) 2
13	ACT4-2A	Relay contact K203 (NC) 2
14	ACT4-1M	Relay contact K203 (common) 1
15	ACT4-1B	Relay contact K203 (NO) 1
16	ACT4-1A	Relay contact K203 (NC) 1
17	P12VI	+ 12-V optocoupler 4
18	SENSE4	Control input optocoupler 4
21	ACT3-2M	Relay contact K202 (common) 2
22	ACT3-2B	Relay contact K202 (NO) 2
23	ACT3-2A	Relay contact K202 (NC) 2
24	ACT3-1M	Relay contact K202 (common) 1
25	ACT3-1B	Relay contact K202 (NO) 1
26	ACT3-1A	Relay contact K202 (NC) 1
27	P12VI	+ 12-V optocoupler 3
28	SENSE3	Control input optocoupler 3
31	ACT2-2M	Relay contact K201 (common) 2
32	ACT2-2B	Relay contact K201 (NO) 2
33	ACT2-2A	Relay contact K201 (NC) 2
34	ACT2-1M	Relay contact K201 (common) 1
35	ACT2-1B	Relay contact K201 (NO) 1
36	ACT2-1A	Relay contact K201 (NC) 1
37	P12VI	+ 12-V optocoupler 2
38	SENSE2	Control input optocoupler 2
41	ACT1-2M	Relay contact K200 (common) 2
42	ACT1-2B	Relay contact K200 (NO) 2
43	ACT1-2A	Relay contact K200 (NC) 2
44	ACT1-1M	Relay contact K200 (common) 1
45	ACT1-1B	Relay contact K200 (NO) 1
46	ACT1-1A	Relay contact K200 (NC) 1
47	P12VI	+ 12-V optocoupler 1
48	SENSE1	Control input optocoupler 1

3.4.15 USB V.24 Adapter

The following adapters have been tested for connecting serial devices to the USB interface on the service PC:

- Serial USB adapter F5U103 from Belkin Corporation (www.belkin.com)
- Serial USB adapter BF-810 from BAFO Technologies (www.bafo.com)

The delivery includes one USB cable, the adapter and a CD-ROM with drivers.

Notes:

- The drivers provided must be used.
- If a connection cannot be established between the PC and the system, close the Transfer dialog and then reopen it.

3.4.16 V24/1 (not for U.S.)

Introduction

In connection with the CBCC central board (up to and including S30810-Q2935-A301), the V24/1 module can be used in HiPath 3550 and HiPath 3350. This provides a serial V.24 interface for connecting PCs, printers or applications.

Interfaces

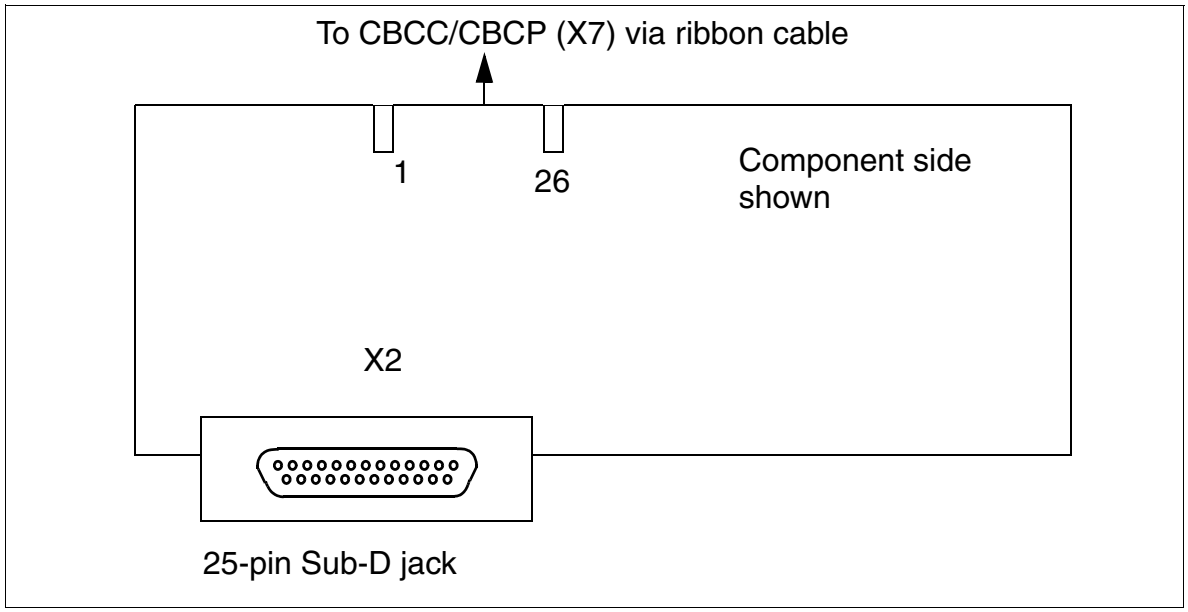


Figure 3-159 V24/1 (not for U.S.) (S30807-Q6916-X100)

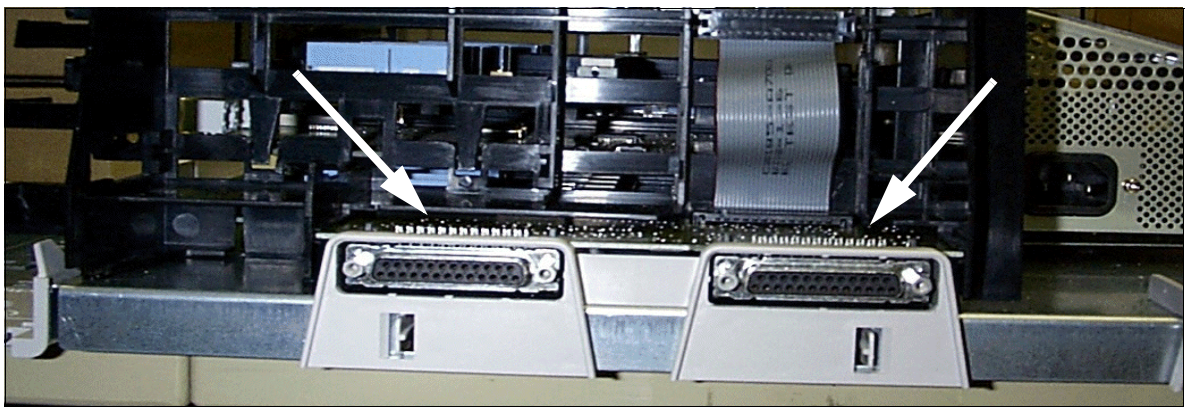


Figure 3-160 HiPath 3550 and HiPath 3350 - V.24 Connections

Connector assignment

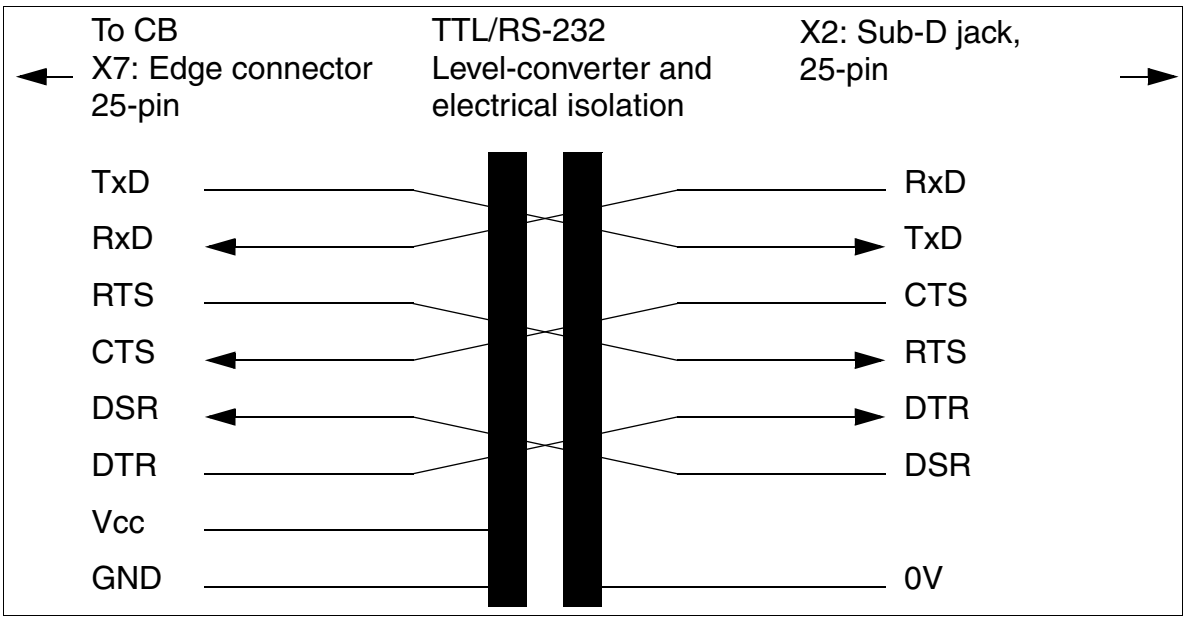


Figure 3-161 V.24 (RS-232) Connector Assignment, HiPath 3550 and HiPath 3350

Table 3-190 Pin Assignments of the V.24 Socket X2

Connector X2	Signal	I/O
2	TxD	O
3	RxD	I
4	RTS	O
5	CTS	I
6	DSR	I
20	DTR	O
7	0V	-
No other pins in connector X2 are used.		

3.4.17 V.24 Adapter

The V.24 adapter is required as an adapter between the 25-pin connector on the cable (C39195-Z7267-C13) and a 9-pin jack for connection to the V.24 interface on all HiPath 3000 V1.2 (or later) systems.

V.24 adapter assignment

Table 3-191 V.24 Adapter Assignment (C39334-Z7080-C2)

9-pin jack	Signal	25-pin jack
Pin		Pin
1	DCD	8
2	RxD	3
3	TxD	2
4	DTR	20
5	GND	7
6	DSR	6
7	RTS	4
8	CTS	5
9	RI	22

3.4.18 V.24 Cable

The V.24 cable is used, for example, for connecting a service PC to the V.24 interface on all HiPath 3000 systems (V1.2 or later).

V.24 cable assignment

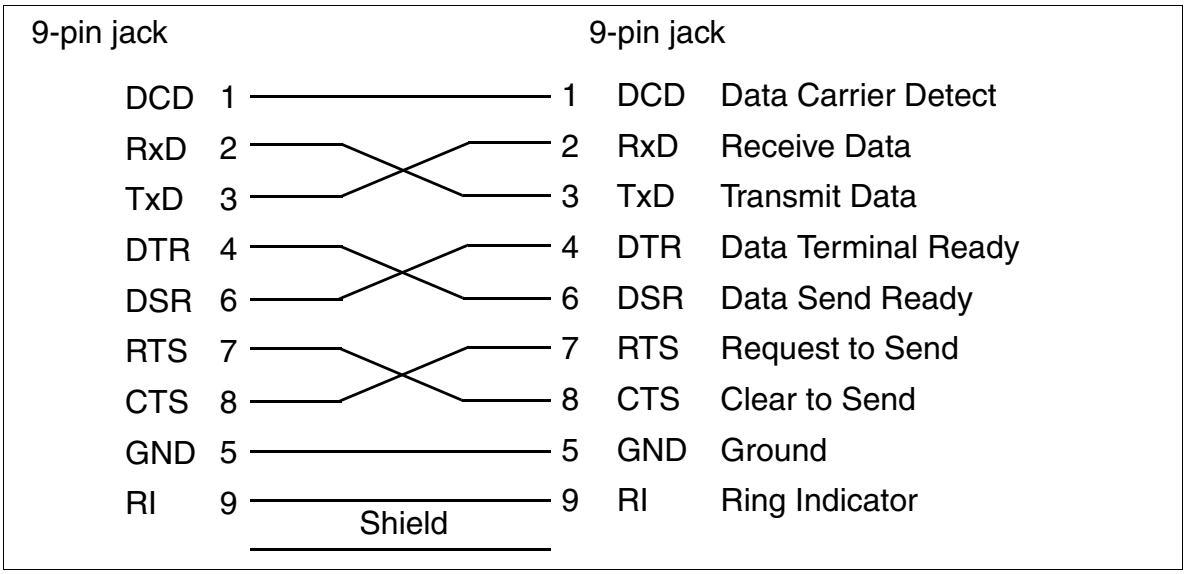


Figure 3-162 V.24 Cable Assignment (C30267-Z355-A25)

4 Installing HiPath 3000

Chapter contents

This chapter covers the following topics:

Topic
Installing HiPath 3800, page 4-2
• Installation Prerequisites, page 4-2
• Installation Procedure, page 4-3
• Installing HiPath 3800 (Standalone), page 4-4
• Installing HiPath 3800 (19-Inch Cabinet), page 4-20
• Installing Boards (Configuration Notes), page 4-31
• Connecting the Cable to the Backplane, page 4-50
• Using an External Main Distribution Frame or External Patch Panel, page 4-65
• Loading the System Software and Installing Subboards on the CBSAP, page 4-80
• Connecting Workpoint Clients, page 4-81
• Making Trunk and Networking Connections, page 4-81
• Performing a Visual Inspection, page 4-82
Installing HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300, page 4-84
• Installation Prerequisites, page 4-84
• Installation Procedure, page 4-85
• Installing HiPath 3550 and HiPath 3350, page 4-86
• Installing HiPath 3500 and HiPath 3300 (19-Inch Housing), page 4-108

4.1 Installing HiPath 3800

4.1.1 Installation Prerequisites

> **Warning**
> Only authorized service personnel should install and start up the system.

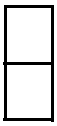
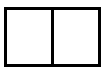
Tools and resources needed

The following are needed for installing the HiPath 3800 system:

- **Tools**:
  - Hex or open-end wrench, 8 mm, open-end wrench 13 mm
  - Diagonal cutting pliers, telephone pliers, wire stripper, flat-nosed pliers
  - Slotted screwdrivers, from 2 to 8 mm (1/4 to 5/16 in.)
  - Phillips or cross-point screwdrivers, sizes 1 and 2
  - TORX screwdriver
  - Wire stripper (for example, from Krone)
  - Board wrench (part no. C39300-A7194-B10)
  - Electric drill, hammer
  - Level, tape measure
  - For U.S. only: Punch-down tool suitable for the block used (such as block 66)
- **Resources**:
  - Manager T or HiPath 3000/5000 Manager E
  - Digital multimeter for testing ground connections and partial voltages
  - Telephone test set for analog interfaces
  - Not for U.S.: ISDN tester (such as K3000 or Aurora)
  - For U.S. only: Aurora^{Duet}, Aurora^{Expert,} Aurora^{Remote} or similar, ISDN protocol analyzer

4.1.2 Installation Procedure

Table 4-1 HiPath 3800 - Installation Procedure

Step	Installation Activity	
	Installing HiPath 3800 (Standalone)	**Installing HiPath 3800 (19-Inch Cabinet)**
1.	Selecting the Installation Site, page 4-4 (usually predetermined)	Selecting the Installation Site, page 4-20 (generally determined by the existing 19-inch cabinet)
2.	Unpacking the Components, page 4-6	Unpacking the Components, page 4-23
3.	Setting up the System Cabinets (from Page 4-7): Single Cabinet  Two cabinets (stacked)  Two cabinets (side by side) 	Mounting System Cabinets in the 19-Inch Cabinet, page 4-24
4.	Grounding the System, page 4-14 Checking the Grounding, page 4-19	Grounding the System, page 4-27 Checking the Grounding, page 4-30
5.	Installing Boards (Configuration Notes), page 4-31	
6.	Connecting the Cable to the Backplane, page 4-50	
7.	If required: use an external main distribution frame or external patch panel, from Page 4-65: • Main Distribution Frame MDFU-E • Patch Panel S30807-K6143-X • S_0 Patch Panel C39104-Z7001-B3	
8.	Loading the System Software and Installing Subboards on the CBSAP, page 4-80	
9.	Connecting Workpoint Clients, page 4-81	
10.	Making Trunk and Networking Connections, page 4-81	
11.	Performing a Visual Inspection, page 4-82	

4.1.3 Installing HiPath 3800 (Standalone)

This section contains information on how to install the HiPath 3800 communication system. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment or expansions.

4.1.3.1 Selecting the Installation Site

Selecting a site

The customer usually has a preferred installation site in mind.

Make sure that the customer's site meets the following guidelines:

- To guarantee sufficient system ventilation, allow a minimum of 50 mm clearance between the base of the cabinet and the ground and between stacked cabinets.
- When cabinets are stacked, the basic cabinet must always be at the bottom of the stack.
- Allow a minimum clearance of 10 cm both at the rear and the front of the cabinets for maintaining boards and for wiring.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.11.
- Install additional primary protection.
- Avoid standard carpeting, as it tends to produce electrostatic charges.
- Ensure the availability of a power source that meets the requirements described in Section 4.1.3.1.1.
- Ensure that a distance of at least 40 in. (101.6 cm) is left between Siemens Enterprise Communications GmbH & Co. KG equipment and other electrical equipment. The National Electrical Code (NEC) requires 36 in. (91.44 cm) of clearance in front of electrical equipment and 40 in. (101.6 cm) of clearance from other electrical service equipment.

Information on the design of the HiPath 3800 can be found in Section 2.1.4.1.

4.1.3.1.1 For U.S. only: AC Outlet

An AC connection is required for each cabinet. The AC connection must fulfill the requirements specified in Table 4-2.

Table 4-2 Electrical Connection Values (USA only)

Nominal voltage	Nominal voltage range		Nominal Frequency Range		Wall Outlet Configurations
	from	to	from	to	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

WARNING
Never connect a HiPath 3800 system or a combination of HiPath 3800 systems directly to a wall socket. Use a UL-listed or CSA-certified surge protector for every two cabinets.

AC Power Outlet Requirements

- A UL-listed or CSA-certified surge protector must be connected between the socket and the system. Two cabinets can be connected to each surge protector. Never connect a HiPath 3800 system or a combination of systems directly to a wall socket.
- The power source may not be more than 2.4 m (8 ft.) from the system.
- The power source must provide 120 V AC (single-phase, fused) power at 50-60 Hz and 20 A.
- A warning should be attached to the circuit breaker to prevent accidental removal of power.
- An independent electric circuit with an isolated ground conductor should be used.

The system must be properly grounded before startup (see description in Section 4.1.3.4).

4.1.3.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.



Caution
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.1.3.3 Setting up the System Cabinets

Introduction

The cabinets are not supplied with pre-installed boards. For information on board installation, please see Section 4.1.5, “Installing Boards (Configuration Notes)”.

If it has been agreed to provide connector panels for connecting peripherals, these are included in the delivery. For information on the installation procedure, please see Section 4.1.5.4, “Mounting Connector Panels (if required)”.

The front plastic cover (for board servicing) and the rear plastic cover (for cable servicing) are not attached to the system cabinets. Both covers are supplied in separate packages.



Danger
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before starting the system and before connecting up the peripherals (for example, potential equalization bus). The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

4.1.3.3.1 Overview

System configurations

The following setup options are possible for system cabinets:

- Single cabinet
- Two cabinets (stacked)
- Two cabinets (side by side)

4.1.3.3.2 Setting Up a Single Cabinet

> **Caution**
> To guarantee sufficient ventilation for the system cabinet, allow a minimum clearance of 50 mm between the base of the cabinet and the ground.

Procedure

Step	Activity
1.	Place the system cabinet in the installation site and make sure that it is level and stable.
2.	Check that the space between the base of the cabinet and the ground is at least 50 mm.
3.	If necessary, set up the basic cabinet in the following way: • Unscrew lock nut (Figure 4-1, A) on one of the cabinet feet using an open-end wrench (wrench size = 13 mm). • Adjust the height of the cabinet foot by turning the screw nut (Figure 4-1, B) so that the cabinet is steady and the minimum clearance is observed. • Fix the cabinet foot in position by tightening the lock nut (Figure 4-1, A).

Basic cabinet setup

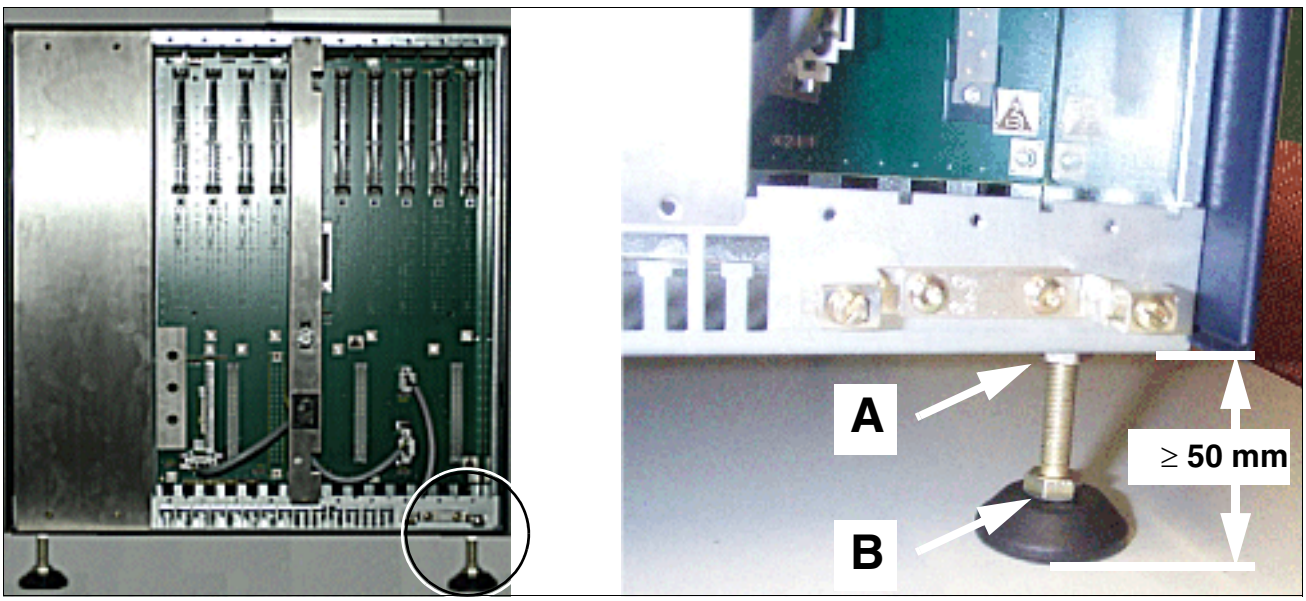


Figure 4-1 HiPath 3800 - Setting Up the Basic Cabinet

4.1.3.3.3 Stacking Two Cabinets

Caution
To guarantee sufficient ventilation for the system cabinets, comply with the following requirements:

- The basic cabinet must be set up as the bottom cabinet.
- Allow a minimum of 50 mm clearance between the base of the cabinet and the floor, and between basic and expansion cabinets.

Procedure

Step	Activity
1.	Place the system cabinet in the installation site and make sure that it is level and stable.
2.	Check that the space between the base of the basic cabinet and the ground is at least 50 mm.
3.	If necessary, set up the basic cabinet in the following way: • Unscrew lock nut (Figure 4-1, A) on one of the cabinet feet using an open-end wrench (wrench size = 13 mm). • Adjust the height of the cabinet foot by turning the screw nut (Figure 4-1, B) so that the cabinet is steady and the minimum clearance is observed. • Fix the cabinet foot in position by tightening the lock nut (Figure 4-1, A).
4.	Place the expansion cabinet on top of the basic cabinet. The cabinet feet have indents. When placing the expansion cabinet on top of the basic cabinet, ensure that these indents are sitting precisely on top of the screw heads in the four corners of the basic cabinet (Figure 4-2).
5.	Check that the space between the base of the basic cabinet and the ground is at least 50 mm.
6.	If necessary, set up the expansion cabinet as described in Step 3.

Positioning the cabinet feet

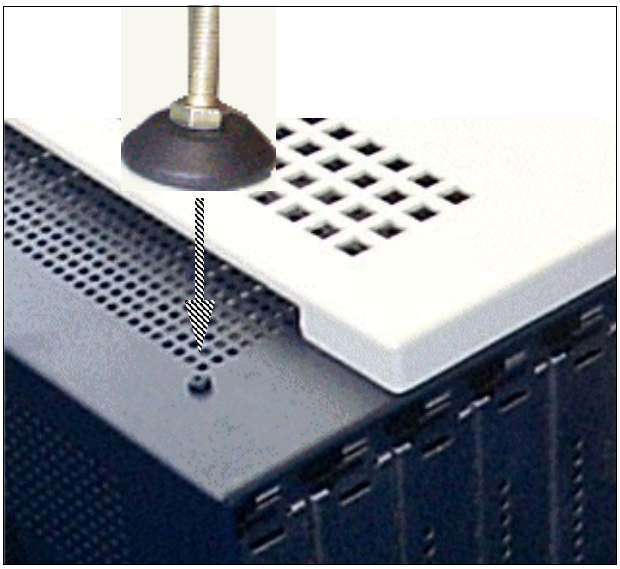


Figure 4-2 HiPath 3800 - Positioning the Cabinet Feet

Installing a stacked two-cabinet system

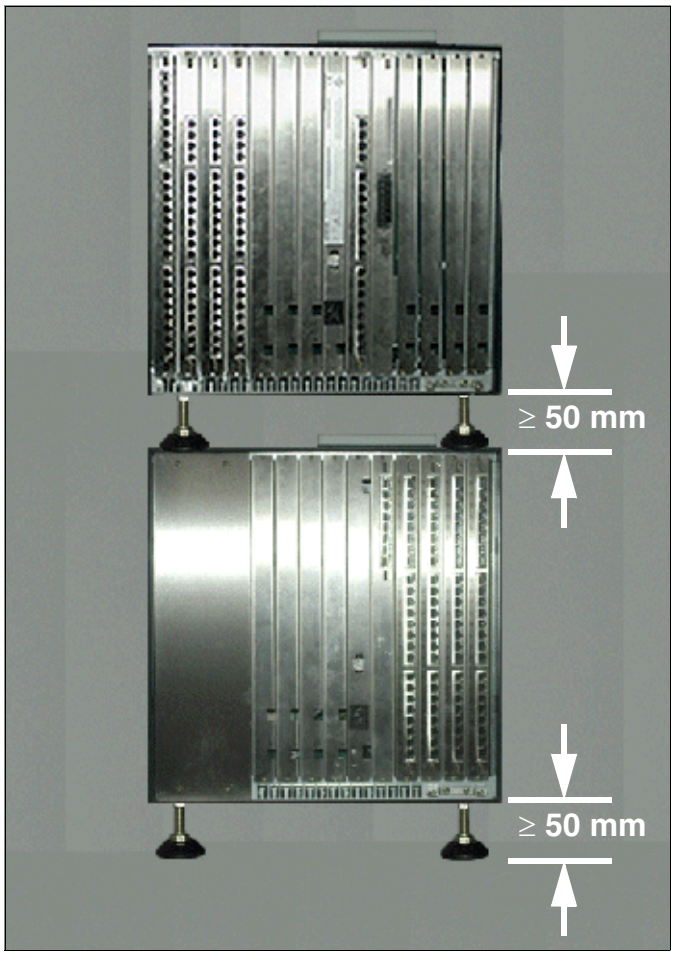


Figure 4-3 HiPath 3800 - Installing a Stacked Two-Cabinet System (Rear View)

4.1.3.3.4 Setting Up a Two-Cabinet System Side by Side

> **Caution**
> To guarantee sufficient ventilation in the system cabinets, allow a minimum clearance of 50 mm between the base of the cabinets and the ground.

Procedure

Step	Activity
1.	Place the system cabinet in the installation site and make sure that it is level and stable.
2.	Check that the space between the base of the basic cabinet and the ground is at least 50 mm.
3.	If necessary, set up the basic cabinet in the following way: • Unscrew lock nut (Figure 4-1, A) on one of the cabinet feet using an open-end wrench (wrench size = 13 mm). • Adjust the height of the cabinet foot by turning the screw nut (Figure 4-1, B) so that the cabinet is steady and the minimum clearance is observed. • Fix the cabinet foot in position by tightening the lock nut (Figure 4-1, A).
4.	Place the expansion cabinet beside the basic cabinet. Note: The cabinets can be placed directly beside one another.
5.	Check that the space between the base of the expansion cabinet and the ground is at least 50 mm.
6.	If necessary, set up the expansion cabinet as described in Step 3 ensuring that both cabinets are at exactly the same level.

Installing a Two-Cabinet System Side by Side

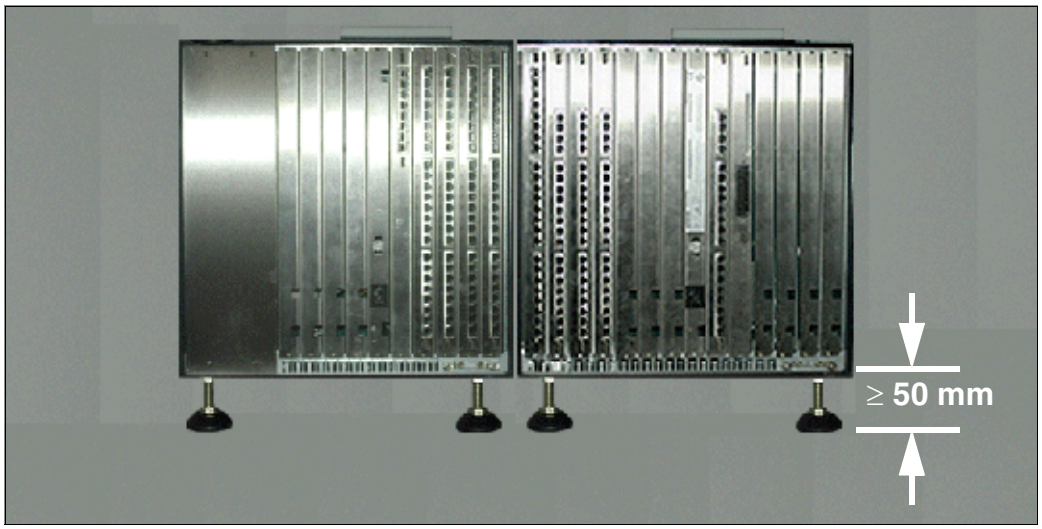


Figure 4-4 HiPath 3800 - Installing a Two-Cabinet System Side by Side (Rear View)

4.1.3.4 Grounding the System

Ground the system as described.

4.1.3.4.1 Not for U.S.: Grounding the System

Grounding: Grounding options

Implementation guidelines in accordance with IEC 60364 and IEC 60950-1 must be adhered to during installation.

Danger
Each HiPath 3800 system cabinet and all external main distribution frames (for example, MDFU-E) must be grounded as shown in Figure 4-5 by a separate ground conductor (minimum cross-section = 2.5 mm^2). Make sure that the ground conductor is securely installed and strain-relieved.
If external factors can impact on the ground conductor and if protected installation is not possible, the ground conductor must have a minimum cross-section of 4 mm^2.
Failure to follow these instructions can result in electrical shock.

The illustrations starting with Figure 4-6 show different grounding options.

Danger
If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to ground the system separately using option 1b (Figure 4-7). The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.

Note on possible ground loops

To avoid ground loops from remotely operated devices (V.24 system peripherals), the devices should be connected to the same low-voltage network (sub-distribution board) if possible.
If the building floor plan does not permit this, you may need a line driver to isolate the external devices in the event of a malfunction.

Grounding the system(s) and a possible main distribution frame

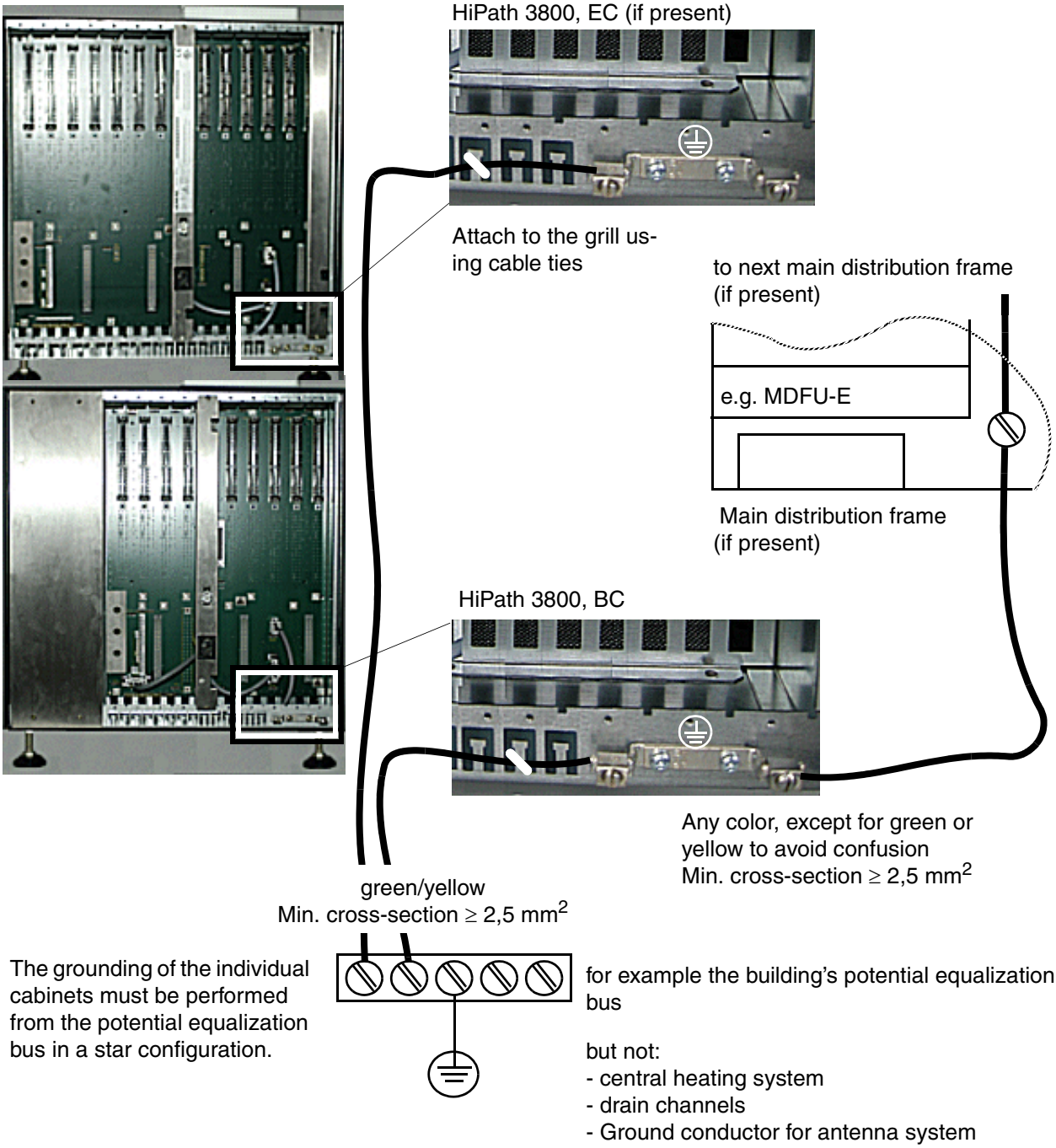


Figure 4-5 HiPath 3800 - Grounding the System Cabinets and Main Distribution Frame (nor for U.S.)

Grounding option 1a

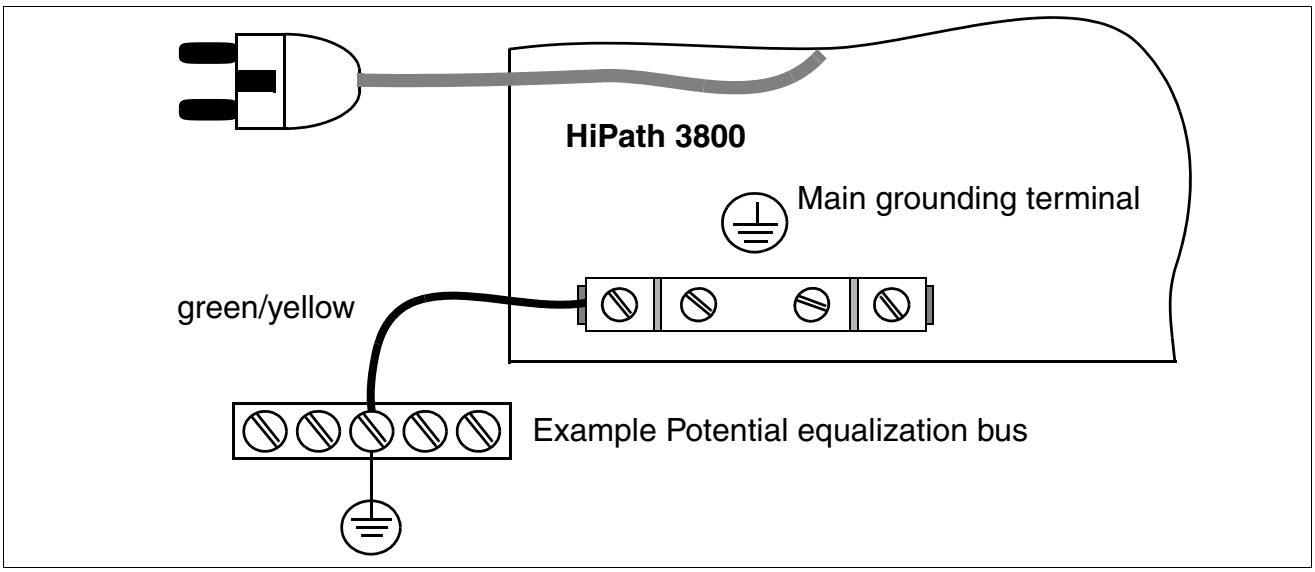


Figure 4-6 HiPath 3800 - Grounding Option 1a (not for USA)

Grounding option 1b

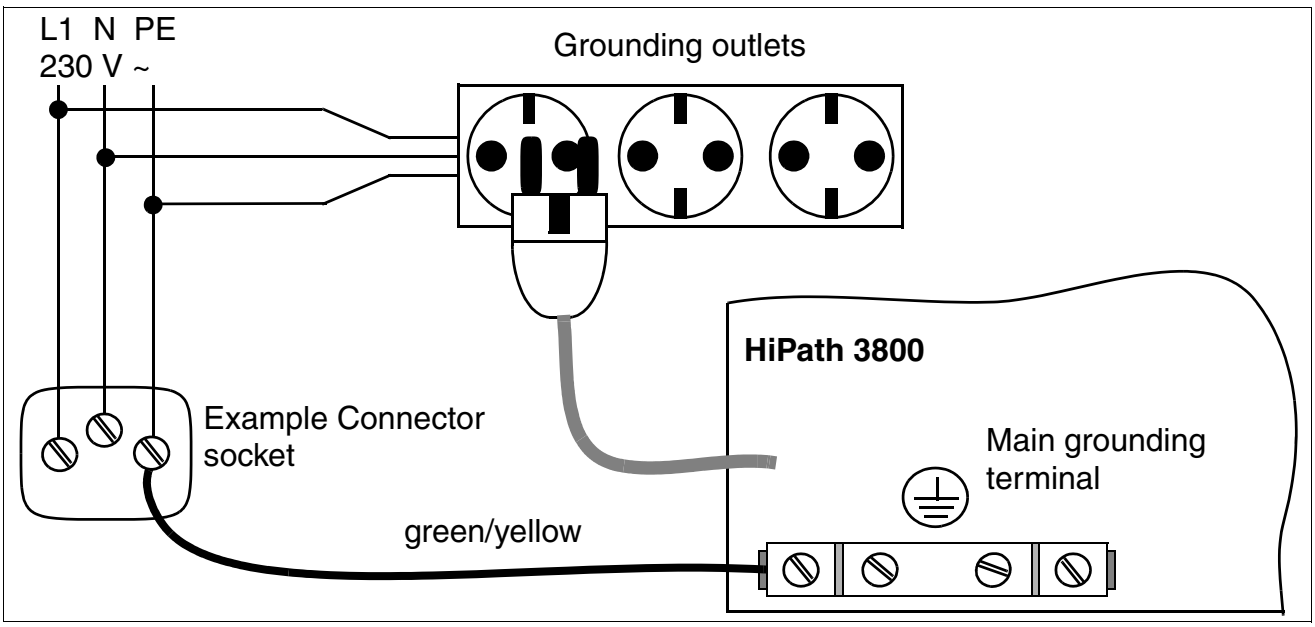


Figure 4-7 HiPath 3800 - Grounding Option 1b (not for USA)

4.1.3.4.2 For U.S. only: Grounding the System

Implementation guidelines in accordance with NEC (National Electrical Code), UL 60950-1 and IEC 60364 must be adhered to during installation.

A connecting cable is used for grounding the system cabinets. The system must also be grounded by a separate ground conductor. Choose a ground connection with less than 2 ohms of resistance, such as:

- Master ground busbar
- Ground field
- Copper ground rod

Run a separate earth ground conductor from the earth ground to the cabinet frame ground (located in the lower right corner of the backplane). The minimum cross-section required is 12 AWG.

Figure 4-8 shows the safety conductor connectors for the basic cabinet. An expansion cabinet requires a separate earth ground.

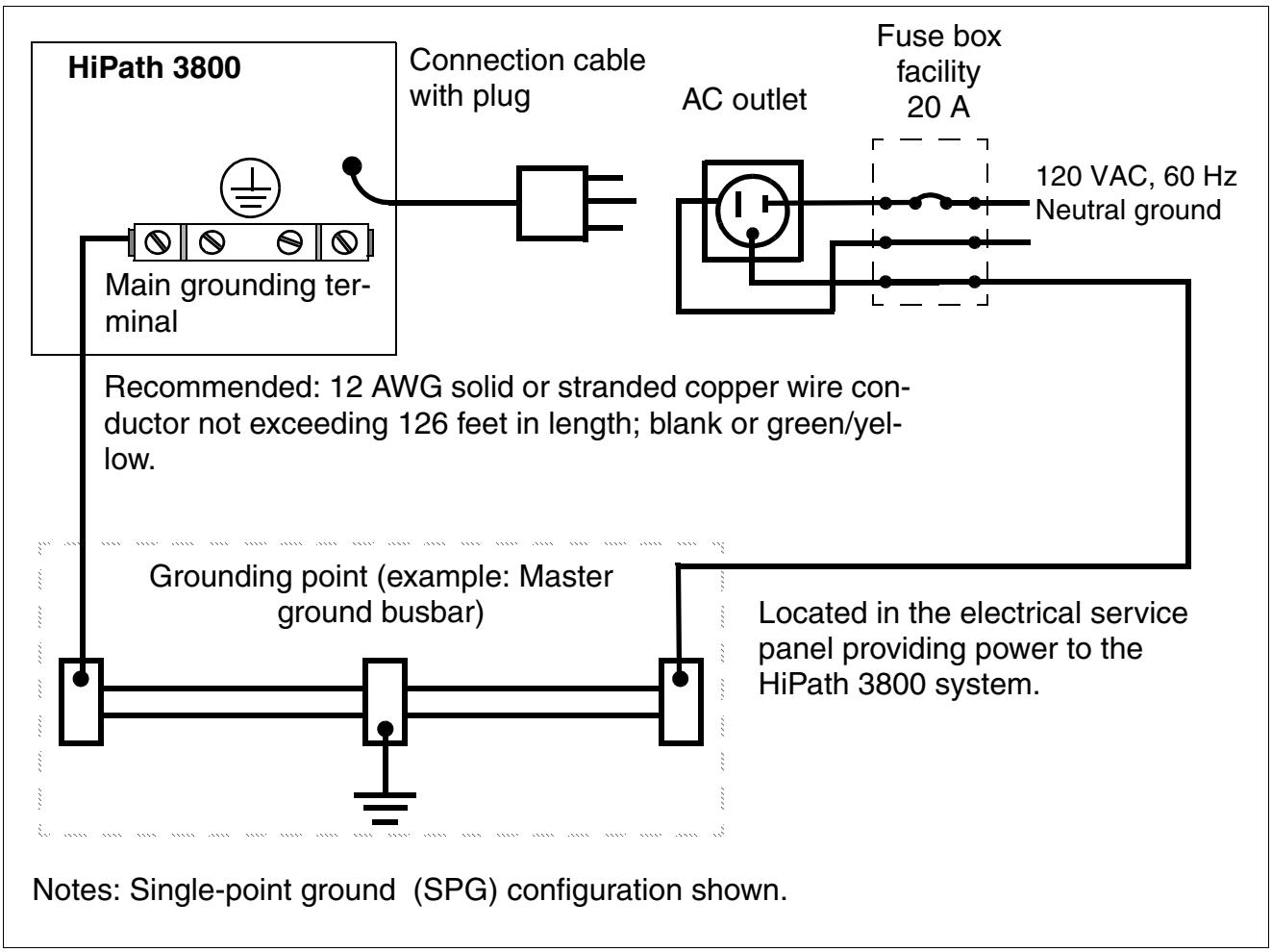


Figure 4-8 HiPath 3800 - Earth ground connection (for U.S. only)

DANGER
This wire installation must be completed by a qualified electrician and must comply with the national and local electrical codes. The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.

Grounding the Main Distribution Frame

Mount and ground the MDF in accordance with the manufacturer’s instructions.

4.1.3.5 Checking the Grounding

Procedure

Perform the tests in the table below to ensure that the system is properly grounded before start-up.

Step	Activity	Target
1.	Check the ohmic resistance of the ground connection to the system: Perform measurement between the PE (protective earth) on a socket in the internal installation (at the system's installation site) and HiPath 3800. Prerequisites: • HiPath 3800 is not yet connected to the low-voltage network via the power cable. • The system's separate grounding is connected.	< 10 ohms
2.	Check the ohmic resistance between the individual system parts (basic cabinet, expansion cabinet, main distribution frame). Prerequisite: HiPath 3800 is not yet connected to the low-voltage network via the power cable.	< 1 ohm

4.1.4 Installing HiPath 3800 (19-Inch Cabinet)

This section contains information on how to install the HiPath 3800 communication system in a 19-inch cabinet. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment or expansions.

4.1.4.1 Selecting the Installation Site

The installation site is generally determined by the 19-inch cabinet already installed.

The following specifications must be observed when selecting a location:

- The 19-inch cabinets provided for installing the HiPath 3800 components must have the following characteristics:
  - Components installed in the 19-inch cabinet must be accessible from both the front and the rear.
  - It should be possible to install 19-inch components both at the front and at the rear (≥ four vertical bars).
  - It is recommended that the width of the cabinet measure 700 to 800 mm; the depth at least 600 mm. Deeper cabinets (800 - 900 mm) make installation, cable servicing, and the installation of additional components in the rear of the cabinet much easier.
  - The support brackets required for installing the system cabinets must have a minimum ultimate load of 40 kg. The support brackets must be purchased from the relevant 19-inch cabinet supplier.
  - The system cabinets must be fixed to the cabinet bars using the angle brackets included in the delivery.
- One height unit (one height unit is approx. 1.7” = 43 mm) must be kept clear above the cabinet to accommodate the gray plastic cover (Figure 4-9) attached to the top of the system cabinets. Never remove this plastic cover.
- The following minimum clearance must be provided in order to ensure adequate ventilation of the system cabinets in the 19-inch cabinet (see Figure 4-10):
  - three height units between two stacked system cabinets.
  - one height unit above one system cabinet if a patch panel is being installed, for example.
- To guarantee sufficient heat dissipation, the basic cabinet must be mounted at the lowest position in a 19-inch cabinet. In a 19-inch cabinet with active (heat-emitting) components already installed, the lowest position must be cleared for installation of the basic cabinet. If inactive components (e.g. patch panel) are involved, the basic cabinet can also be installed above them.



Figure 4-9 HiPath 3800 - System Cabinet with Plastic Cover

- Do not expose the 19-inch cabinet to direct sources of heat (such as sunlight and heaters.).
- Do not expose the 19-inch cabinet to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.11.

Information on the design of the HiPath 3800 can be found in Section 2.1.4.1.

Examples for installation in a 19-inch cabinet

Caution
The height units represented in yellow in Figure 4-10 must be kept clear to ensure adequate ventilation of the system cabinets.

Examples of a 19-inch cabinet height of 1.92 m with 37 height units

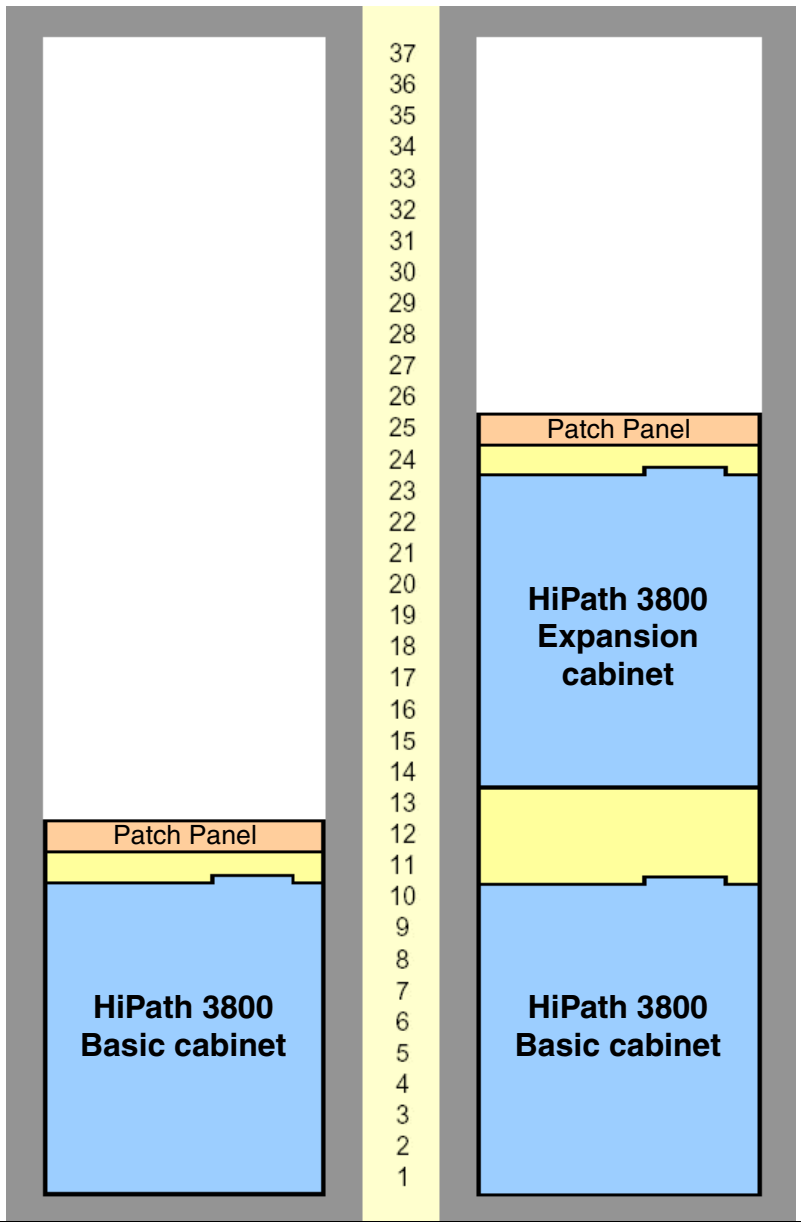


Figure 4-10 HiPath 3800 - Installation Examples in the 19-Inch Cabinet

4.1.4.1.1 For U.S. only: AC Outlet

An AC connection is required for each cabinet. The AC connection must fulfill the requirements specified in Table 4-3.

Table 4-3 Electrical Connection Values (USA only)

Nominal voltage	Nominal voltage range		Nominal Frequency Range		Wall Outlet Configurations
	from	to	from	to	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

The system must be properly grounded before startup (see description in Section 4.1.4.4).

4.1.4.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.



Caution
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.1.4.3 Mounting System Cabinets in the 19-Inch Cabinet

4.1.4.3.1 Introduction

The cabinets are not supplied with pre-installed boards. For information on board installation, please see Section 4.1.5, “Installing Boards (Configuration Notes)”.

If it has been agreed to provide connector panels for connecting peripherals, these are included in the delivery. For information on the installation procedure, please see Section 4.1.5.4, “Mounting Connector Panels (if required)”.



Danger
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before starting the system and before connecting up the peripherals (for example, potential equalization bus). The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

4.1.4.3.2 Mounting a System Cabinet using Support and Angle Brackets

If a two-cabinet system is to be installed in a 19-inch cabinet, each system cabinet should be installed separately.

The following components are required to install a system cabinet:

- Two cabinet-specific support brackets with an ultimate load > 40 kg, which must be provided by the 19-inch cabinet supplier.
- Two angle brackets (order no. C39165-A7075-D1), which are supplied with the system cabinet.



Caution
To guarantee sufficient ventilation for the system cabinets, comply with the following requirements:

- The basic cabinet may only be mounted at the lowest position in a 19-inch cabinet. In a 19-inch cabinet with active (heat-emitting) components already installed, the lowest position must be cleared for installation of the basic cabinet. If inactive components (e.g. patch panel) are involved, the basic cabinet can also be installed above them.
- A minimum clearance of three height units must be maintained between two stacked system cabinets. A minimum clearance of one free height unit above a system cabinet is sufficient if a patch panel is to be installed, for example.

Procedure

Warning
Never attempt to lift a system cabinet into the 19-inch cabinet without assistance.

Step	Activity
1.	Remove all four cabinet feet from the system cabinet. To do this, unscrew the lock nuts (Figure 4-11, A) on the cabinet feet using an open-end wrench (wrench size = 13 mm). Unscrew cabinet feet completely.
2.	Attach the two angle brackets (A in Figure 4-12) to the sides of the system cabinet using the screws that have been supplied (four per bracket).
3.	Attach a right-handed and a left-handed support bracket (B in Figure 4-12) in the 19-inch cabinet using the screws provided. Note: the use of cabinet floors is not permitted to prevent overheating.
4.	Lift the system cabinet into the 19-inch cabinet and sit the cabinet on the two support brackets (B in Figure 4-12). Slide the cabinet into the 19-inch cabinet until the front edge of the system cabinet is flush with the front of the 19-inch frame.
5.	Secure the system cabinet using the two angle brackets (A, in Figure 4-12) on the frame of the 19-inch cabinet using the screws provided. Please note that a minimum clearance of three height units must be observed between two stacked system cabinets. A minimum clearance of one free height unit above a system cabinet is sufficient if a patch panel is to be installed, for example.
6.	Repeat steps 1 to 5 if you want to install an expansion cabinet.

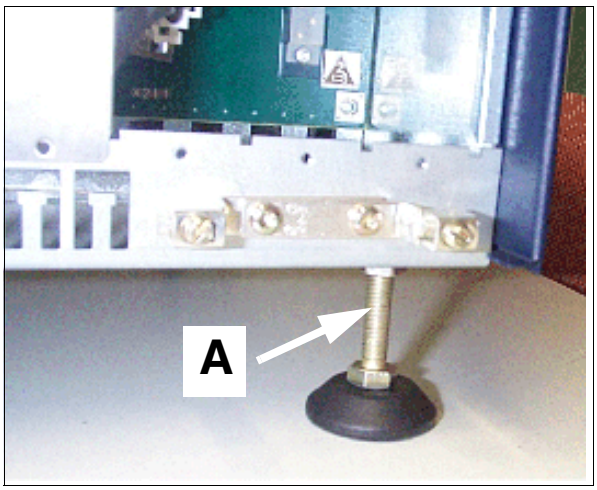


Figure 4-11 HiPath 3800 - Removing Cabinet Feet

Installation in the 19-inch cabinet

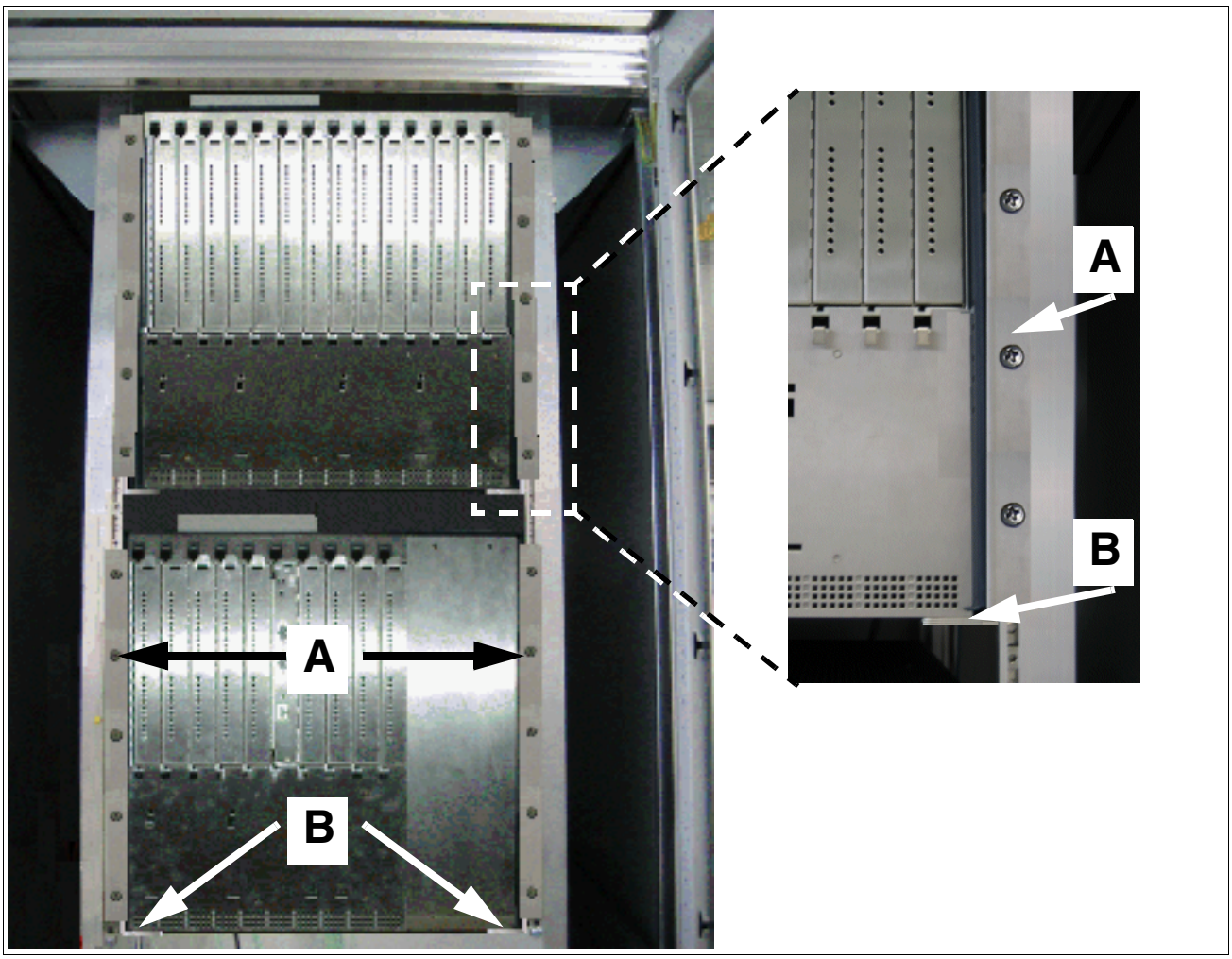


Figure 4-12 HiPath 3800 - Installing System Cabinets in 19-Inch Cabinet

4.1.4.4 Grounding the System

Ground the system as described.

Grounding: Inspection and Implementation

Implementation guidelines in accordance with IEC 60364 and IEC 60950-1 must be adhered to during installation.

Preliminary Inspection of the 19-Inch Cabinet:		
Is the 19-inch cabinet grounded by a separate **ground conductor** (green/yellow)?	**NO**	The 19-inch cabinet must be grounded by a separate ground conductor (green/yellow). **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground. The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.
YES		
Does the 19-inch cabinet have a **potential equalization bus** at which the HiPath 3800 can be grounded as shown in Figure 4-13 ?	**NO**	A potential equalization bus must be installed in the 19-inch cabinet and connected to the ground conductor. **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground. The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.
YES		
If you answer “Yes” to both questions, the system (system cabinets, patch panels) may be grounded as described below.		

Danger
Each HiPath 3800 system cabinet and any patch panel (S30807-K6143-X) that may be installed must be grounded as shown in Figure 4-13 by a separate ground conductor (minimum cross-section = 2.5 mm^2). Make sure that the ground conductor is securely installed and strain-relieved.
If external factors can impact on the ground conductor and if protected installation is not possible, the ground conductor must have a minimum cross-section of 4 mm^2.
Please note:
The 19-inch cabinet's potential equalization bus may only be used if it is grounded by a separate ground conductor.
Failure to follow these instructions can result in electrical shock.

Grounding the system cabinets and possible patch panels

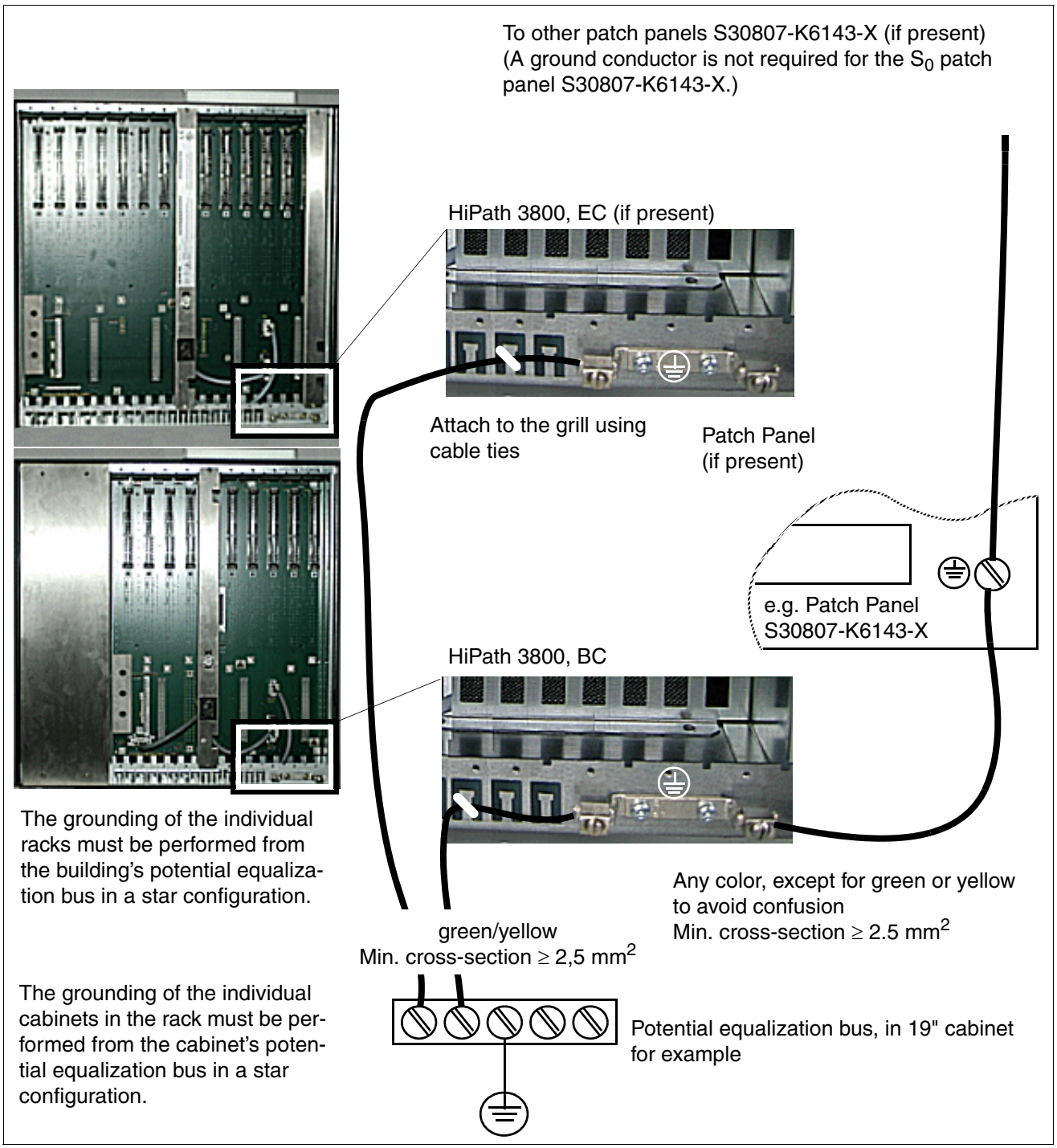


Figure 4-13 HiPath 3800- Grounding the Systems and Patch Panels in a 19-Inch Cabinet

Note on possible ground loops

To avoid ground loops from remotely operated devices (V.24 system peripherals), the devices should be connected to the same low-voltage network (sub-distribution board) if possible.
If the building floor plan does not permit this, you may need a line driver to isolate the external devices in the event of a malfunction.

4.1.4.5 Checking the Grounding

Procedure

Perform the tests in the table below to ensure that the system is properly grounded before start-up.

Step	Activity	Target
1.	Check the ohmic resistance of the ground connection to the 19-inch cabinet: Perform measurement between the PE (protective earth) on a socket in the internal installation (at the system's installation site) and HiPath 3800. Prerequisites: • No device in the 19-inch cabinet is connected to the low-voltage network via the power cable. • The system's separate grounding (basic cabinet, expansion cabinet, patch panel) and the grounding of the 19-inch cabinet are connected.	< 10 ohms
2.	Check the ohmic resistance between the individual system parts (basic cabinet, expansion cabinet, patch panel). Prerequisite: HiPath 3800 is not yet connected to the low-voltage network via the power cable.	< 1 ohm

4.1.5 Installing Boards (Configuration Notes)

Caution
Always wear an antistatic wristband when working on the system (especially when handling boards).

Caution

- To ensure that the system operates without blocking, you must follow the instructions in Section 4.1.5.7 concerning PCM highway distribution.
- In a HiPath 3800 19-inch cabinet configuration, the IVMNL board may only be installed in the basic cabinet to avoid overheating.
- To avoid inactive IVM channels caused by slow IVM board startup, the recommendations on Page 3-103 must be followed.

4.1.5.1 System Factory Default

According to the sales order, a distinction is made between the following delivery states:

- Pre-configured systems
  - The system cabinet(s) is/are supplied with customer-specific boards.
  - The current system software (without customer data) is installed.
  - The system has passed the startup test.
- Unconfigured systems

  The system cabinet(s) is/are not supplied with pre-installed boards. Install the boards as described in the following information.

4.1.5.2 Board Slots in the Basic and Expansion Cabinet

There are nine slots available in the basic cabinet BC (slots 1 to 5 and slots 7 to 10) and thirteen in the expansion cabinet EC (slots 1 to 6 and slots 8 to 14) for peripheral boards.

The central control board CBSAP has a fixed slot (slot 6, only in the basic cabinet BC).

Depending on your requirements, up to three LUNA2 power supply units can be used in the basic cabinet BC and up to four in the expansion cabinet EC.

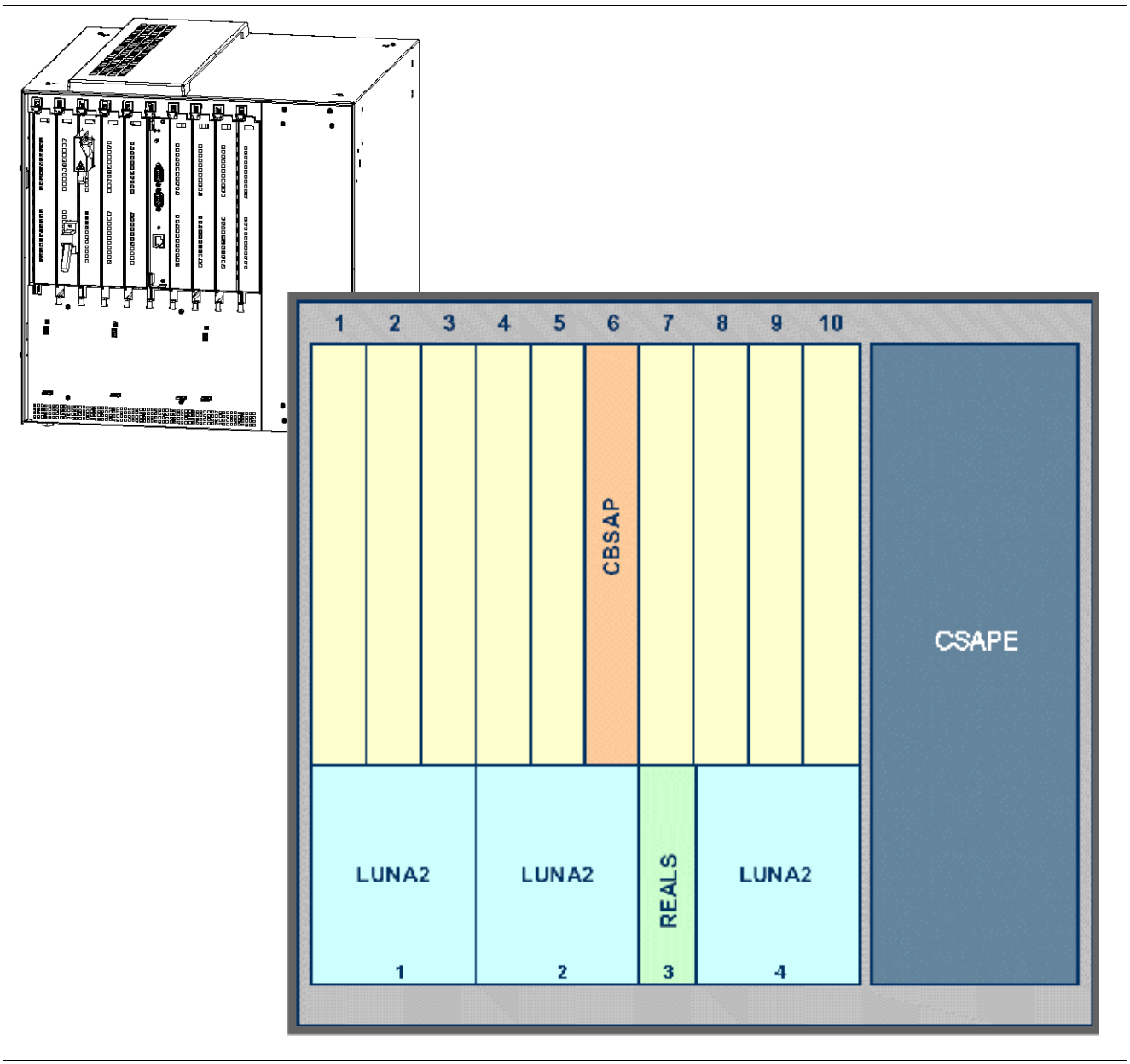


Figure 4-14 HiPath 3800 - Board Slots in the Basic Cabinet

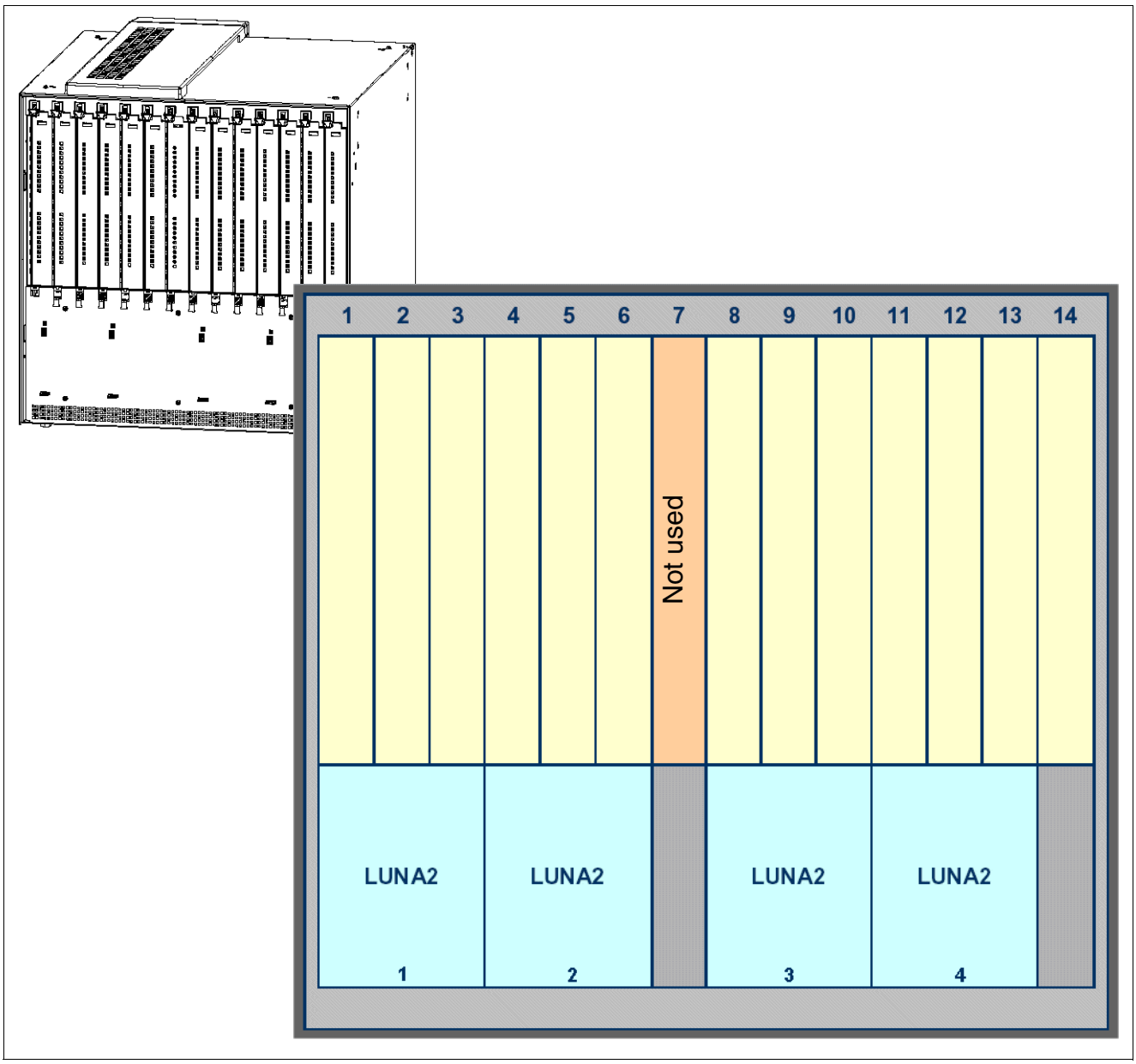


Figure 4-15 HiPath 3800 - Board Slots in the Expansion Cabinet

4.1.5.3 Inserting or Removing Boards

> **Caution**
> Always wear an antistatic wristband when working on the system (especially when handling boards).
> Observe the measures for protecting electrostatically sensitive devices (see Section 1.4.6, “Notes”).

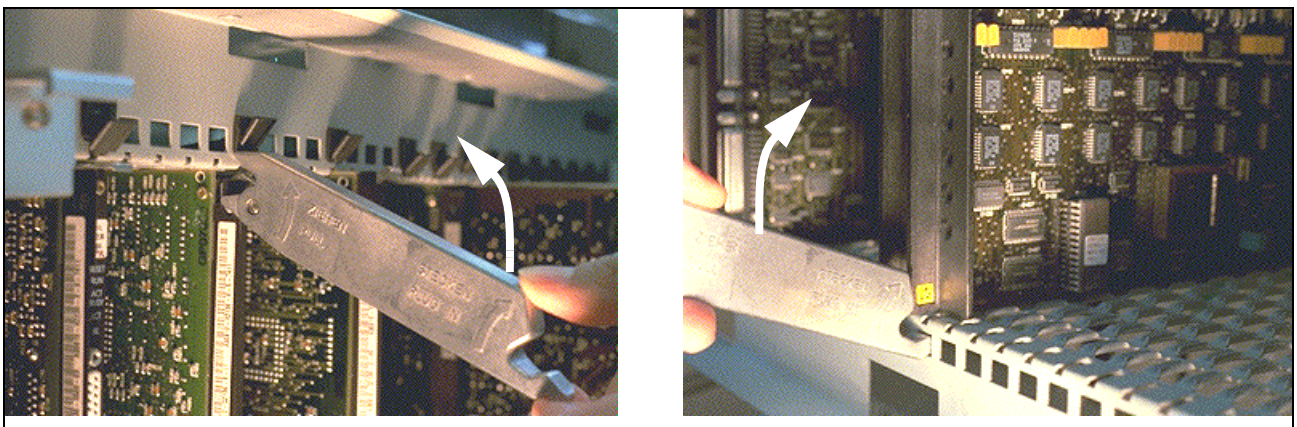
Introduction

Peripheral boards can be inserted and removed while the power is connected. Always use the board wrench provided for removing and inserting boards.

See Section 9.1.1 for information on upgrading peripheral boards.

Procedure for inserting and removing the boards

If	Then
Board is to be removed.	Insert the tip of the board wrench marked “Pull” into the top opening on the front cover of the board to be removed. Lever the board out of the shelf by pushing the board wrench upwards (Figure 4-16, left). Then you can pull the module out of the system cabinet over the guide rails.
Board is to be added.	Using its guide rails slide the board into the system cabinet until it stops. Insert the tip of the board wrench marked “Plug In” into the bottom opening in the front cover of the board. Lever the board into the shelf of the cabinet by pushing the board wrench upwards (Figure 4-16, right).



Removing a board — Inserting a board

Figure 4-16 HiPath 3800 - Removing/Inserting the Board Using the Board Wrench

Installing shielding covers

Please observe the following rules when installing shielding covers:

- In the case of boards with no connection option on the front, a shielding cover (C39165-A7075-B15) must be installed as these only have a plastic cover C39228-A402-C21. These are:

  SLMA24, SLMA8, SLMAE8, SLMAE200, SLMO2, SLMO8, STMD3, TM2LP, TMC16, TMDID/TMDID2, TMEW2
- In the case of boards with a connection option on the front, a shielding cover is not installed as these have a special shielded front panel. These are:

  DIUT2, DIUN2, DIU2U, STMI2, TMCAS-2, TMANI8, SLCN, IVMNL
- Empty board slots must be equipped with shielding covers at the front and at the back.
- When using internal patch panels:

  The number of rear shielding covers (DUA437) depends on the number of internal patch panels used.

  Example: Basic cabinet (9 slots): 4 internal patch panels ==> 5 shielding covers. Patch panels should be handled in the same way as shielding covers.
- Board slots with MDFU (CABLUs), external patch panels or with OpenEnd cabling must be covered with additional blind panels for shielding purposes.

Install the shielding cover as follows:

1. Insert the two bottom pins on the shielding cover into the openings provided for this purpose on the slide-in shelf.
2. Push the shielding cover in the direction of the board until it locks into position (see Figure 4-17).

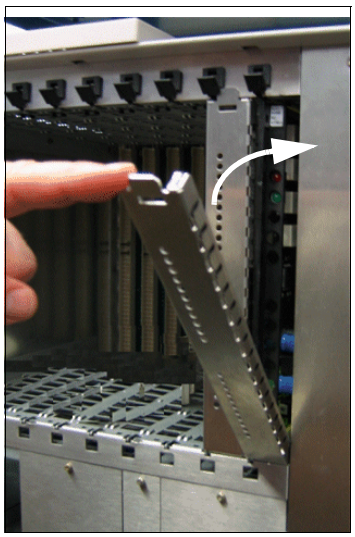


Figure 4-17 Installing the Board Shielding Cover

Special board attachments

- DBSAP
  The DBSAP board is plugged into four socket contacts on the backplane of the expansion cabinet and fixed with screws.
- LUNA2
  Depending on the system configuration up to three LUNA2 modules can be used in the basic cabinet and up to four LUNA2 modules can be used in the expansion cabinet. For information on how to calculate the number of LUNA2 modules required, see the LUNA2 board description.

  Push the LUNA2 power supply unit into the slots provided in the lower part of the system cabinet shelf until you hear a click.

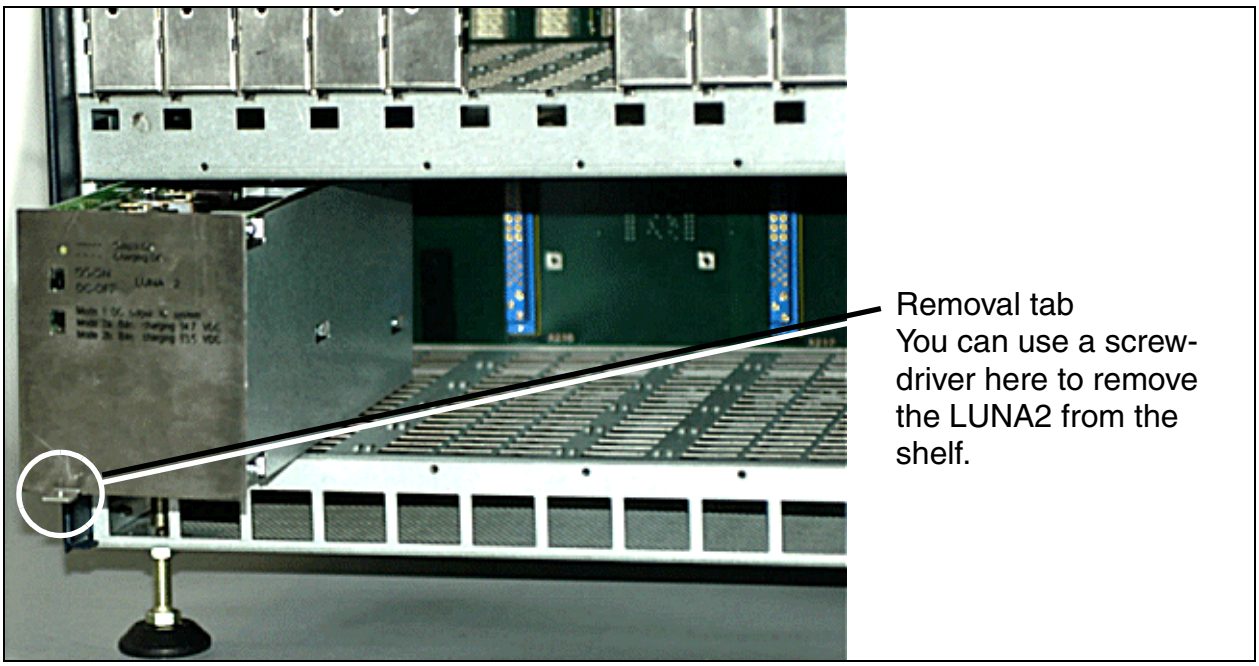


Figure 4-18 HiPath 3800 - Installing the LUNA2 Power Supply Unit

The slots for the power supply units must be covered with an outer panel before the system is started up. The outer panel is fixed onto the shelf with screws (see Figure 4-19 and Figure 4-20).

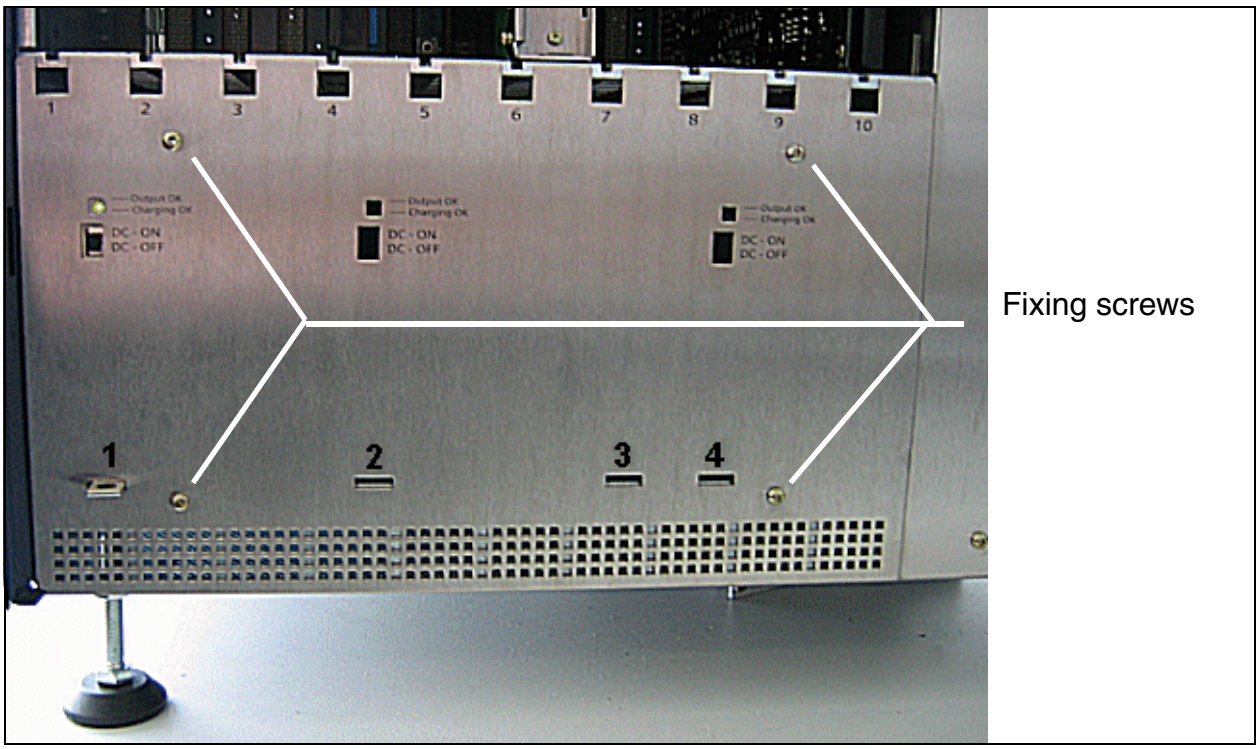


Figure 4-19 HiPath 3800 - Slots for LUNA2 and REALS in the Basic Cabinet (With Outer Panel Mounted)

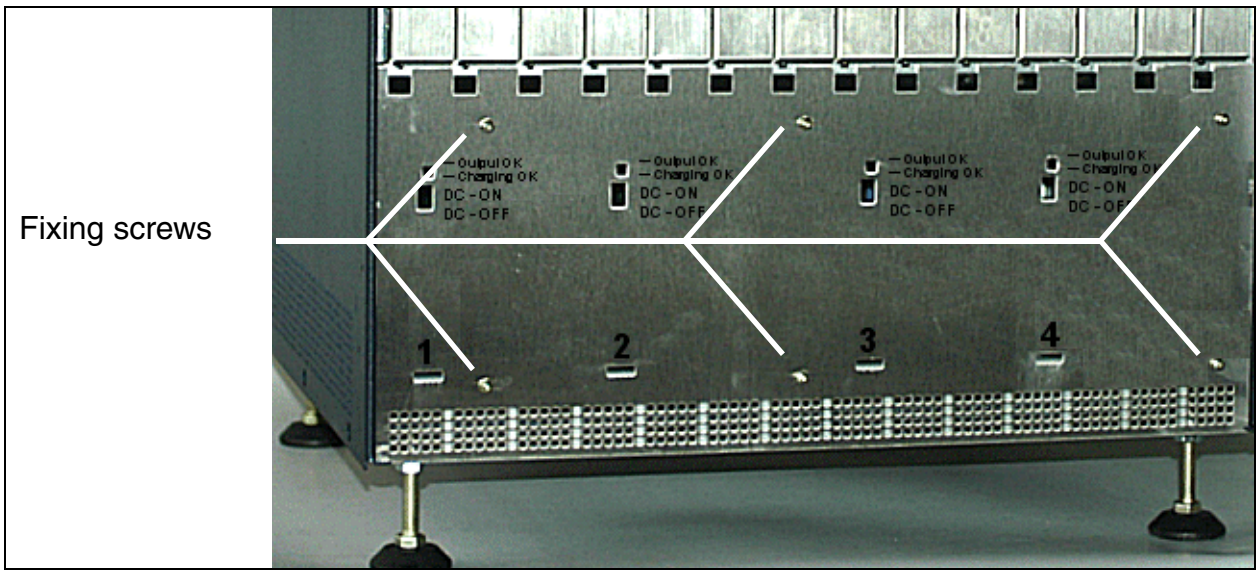


Figure 4-20 HiPath 3800 - Slots for LUNA2 in the Expansion Cabinet (With Outer Panel Mounted)

- REALS
  Insert the REALS board into the slot marked 3 in the lower part of the shelf in the basic cabinet and apply pressure until you hear a click.



Figure 4-21 HiPath 3800 - Installing the REALS Board

The slots for the power supply units and for the REALS board must be covered with an outer panel before the system is started up. The outer panel is fixed onto the shelf with screws (see Figure 4-19).

4.1.5.4 Mounting Connector Panels (if required)

The HiPath 3800 has various connection options for connecting the peripherals. If you intend to use connector panels, mount the panels supplied as follows:

If		Then
Connector panels with RJ45 jacks (see Section 4.1.6.5)	Slot with STMD3	Attach a connector panel with 8 RJ45 jacks (S30807-Q6624-X) to the SIVAPAC connector on the backplane.
	Slot with SLCN SLMA SLMA2[1] SLMA8 SLMO2 SLMO8 TM2LP TMC16[1] TMDID[2]	Attach a connector panel with 24 RJ45 jacks (S30807-Q6622-X) to the SIVAPAC connector on the backplane.
	different or no assignment	Equip the backplane sections of other boards and empty board slots with blind panels (see Section 4.1.5.3, “Inserting or Removing Boards” -> Installing shielding covers).
For U.S. only: Connector panels with CHAMP jack (see Section 4.1.6.6)	Slot with SLMA SLMA2[1] SLMA8 SLMO2 SLMO8 STMD3 TM2LP TMC16[1] TMDID[2]	Attach a connector panel with CHAMP jacks (S30807-Q6626-X) to the SIVAPAC connector on the backplane.
	different or no assignment	Equip the backplane sections of other boards and empty board slots with blind panels (see Section 4.1.5.3, “Inserting or Removing Boards” -> Installing shielding covers).

If		Then
Connector panels with SIPAC 1 SU connectors (see Section 4.1.6.7)	Slot with SLCN SLMA SLMA2[1] SLMA8 SLMO2 SLMO8 STMD3 TM2LP TMC16[1] TMDID[2]	Plug a connector panel with SIPAC 1 SU connectors (S30807-Q6631-X) into the SIVAPAC connector on the backplane.
	different or no assignment	Equip the backplane sections of other boards and empty board slots with blind panels (see Section 4.1.5.3, “Inserting or Removing Boards” -> Installing shielding covers).

1 for selected countries only
2 for U.S. only

4.1.5.5 Installing the SIVAPAC-SIPAC Board Adapter

The peripheral board slots on the HiPath 3800 are fitted with SIPAC 9 SU connectors. The TMEW2 and TMDID (for U.S. only) boards have SIVAPAC connector strips and as a result, SIVAPAC-SIPAC board adapters have to be installed in order to use them in HiPath 3800.

The SIVAPAC-SIPAC board adapter consists of three individual parts (refer to Figure 4-22):

- two adapter modules
- one startup module

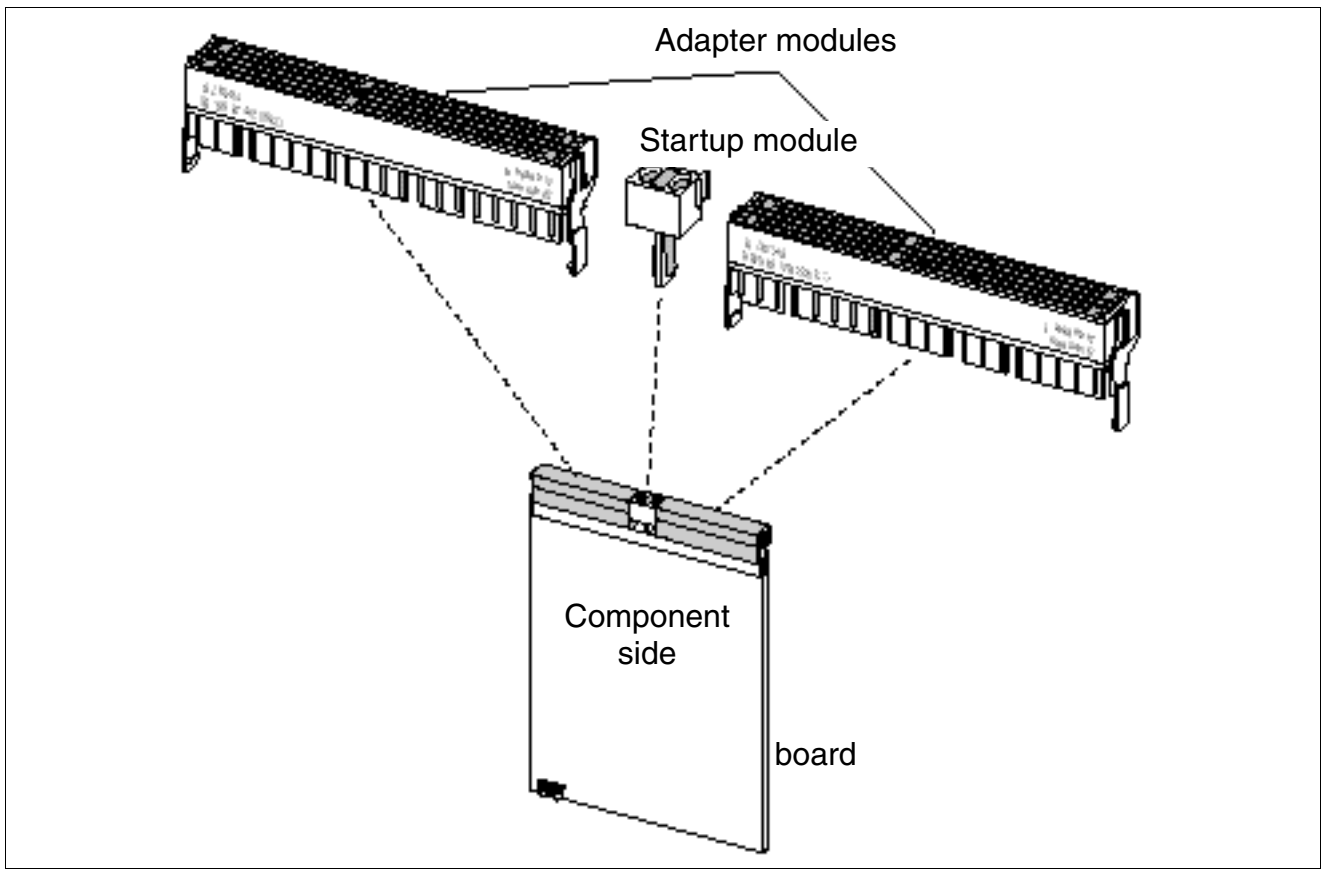


Figure 4-22 SIVAPAC-SIPAC Board Adapter

Procedure: Installing the SIVAPAC-SIPAC Board Adapter

Step	Activity
1.	Rotate the board so that the backplane connector is pointing towards you.
2.	Carefully pull the locking hooks (Figure 4-23, A) on an adapter module apart.
3.	Align the adapter module on the connector strip (Figure 4-23, B) of the board. The outside edges of the adapter module must match the outside edges of the connector strip.
4.	Make sure that the outermost row of pins on the adapter module and the outermost row of jacks on the connector strip are aligned flush with one another and press the adapter module fully into the connector strip.
5.	Close the locking hooks.
6.	Repeat steps 2 to 5 to install the second adapter module.
7.	Plug the startup module (Figure 4-23, C,) into the hotplug connector on the board.

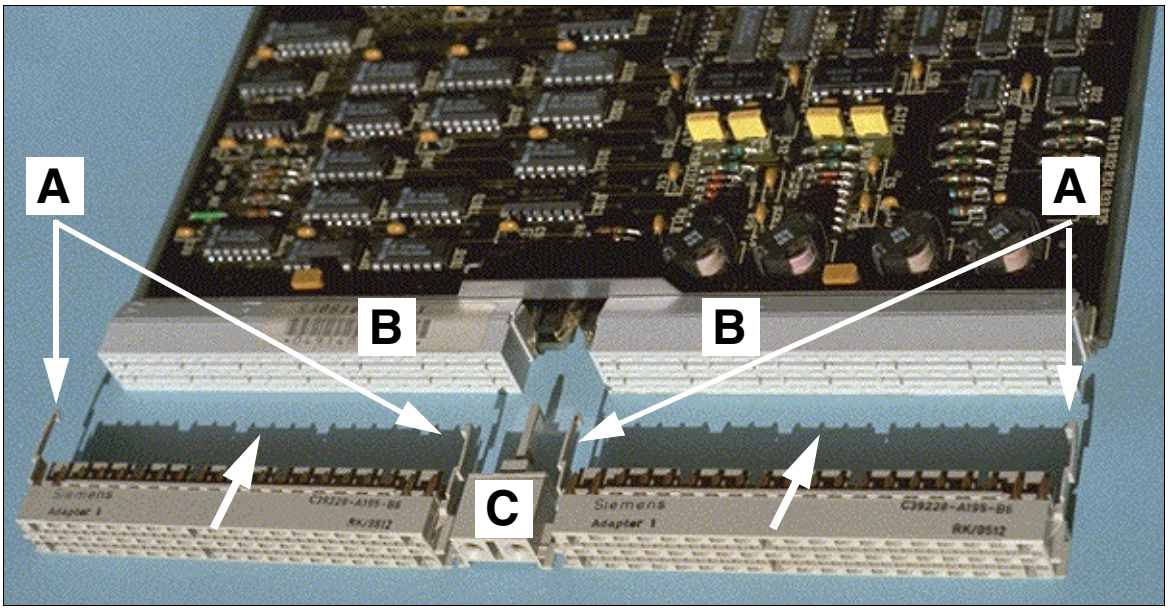
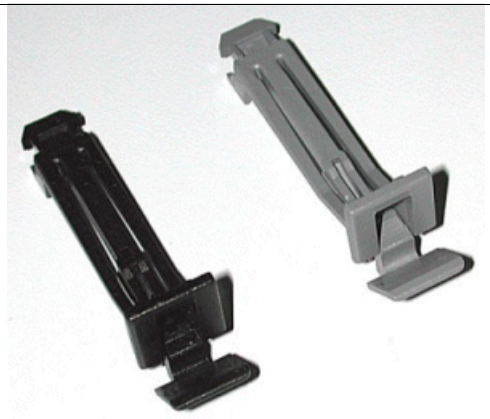


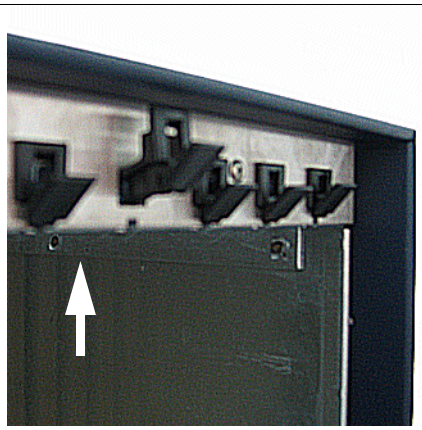
Figure 4-23 Installing the SIVAPAC-SIPAC Board Adapter

Replacing the Board Lock

Install the board adapter increases the board length. The boards jut out slightly from the board shelf. To ensure that these boards can still snap into place in spite of the board adapter, the upper black lock must be replaced with a gray lock.



Black and gray board locks



Remove the black lock
(At the point marked with the arrow press the lock out of its seating and pull it out of the shelf.)

Figure 4-24 Replacing the Board Lock

4.1.5.6 Initializing the Boards

The system software detects the boards in ascending order, starting with the lowest installation position the first time the system starts up. The system initializes subscriber line circuits and ports in the sequence indicated by the arrow (Figure 4-25).

The system activates all connected boards in the following situations:

- The maximum configuration has not yet been reached. While sequentially scanning the slots for each board, the system software checks whether the maximum number of stations or trunks has been exceeded. If it has, the board is not activated. The board LED shows the board's status.
- At least one B channel on line trunk modules is available for the slot (only the available number of B channels is activated).

Assignment of subscriber line circuits and ports

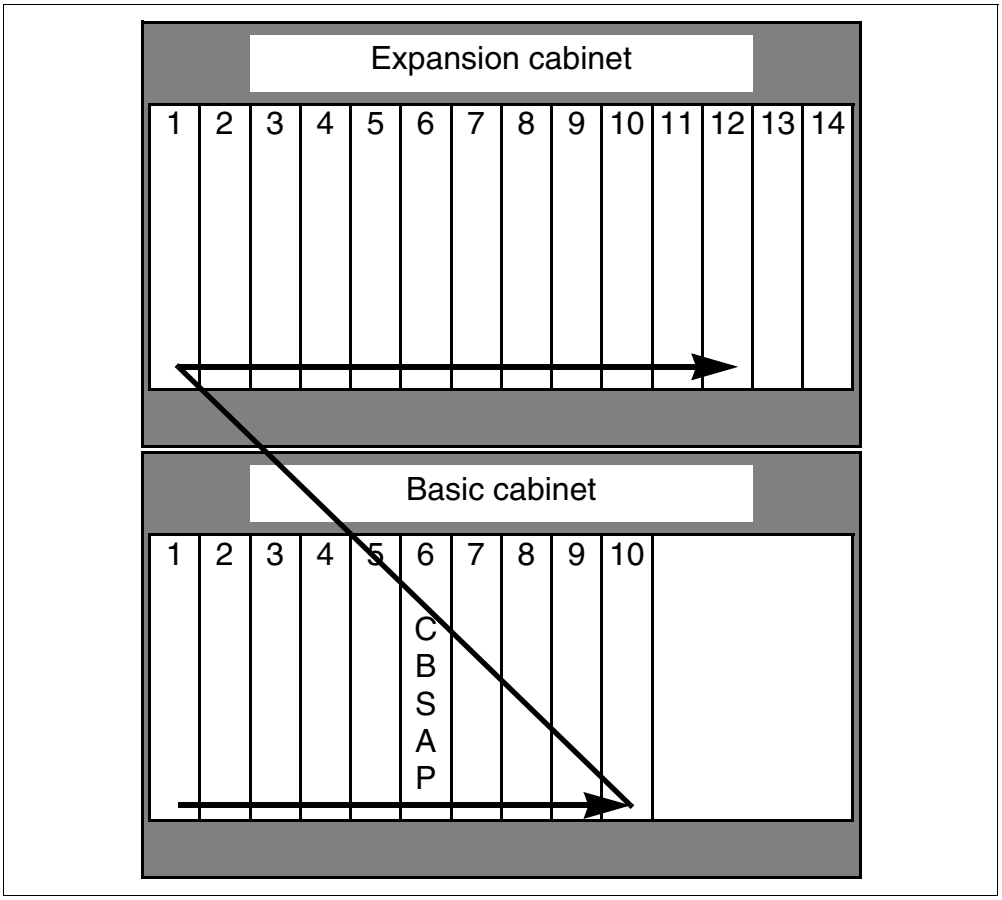


Figure 4-25 HiPath 3800 - Initialization of Subscriber Line Circuits and Ports

4.1.5.7 Distribution of the PCM Highway

HiPath 3800 provides PCM highway bundles with 2 x 4 PCM highways for each peripheral board slot. There are 32 time-division multiplex channels available for each PCM highway. Blockages occur if these are busy. The system cannot execute any more call requests.

To guarantee that the system operates without blocking, make sure when performing configuration that the boards on a PCM segment do not require more than the number of time-division multiplex channels available. The following figures show the PCM highways for both system cabinets of the HiPath 3800.

Basic cabinet: PCM highways

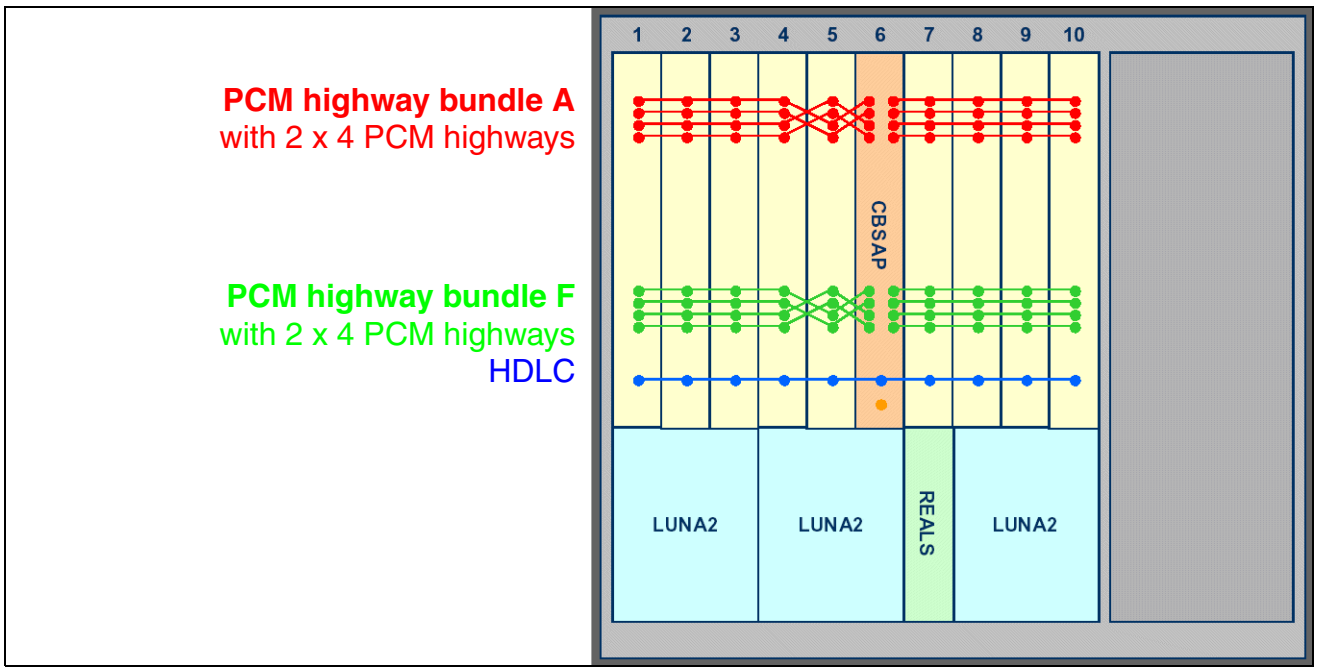


Figure 4-26 HiPath 3800 - PCM Highways in the Basic Cabinet

The basic cabinet provides two PCM highway bundles with 2 x 4 PCM highways each. There are 32 time-division multiplex channels available for each PCM highway.

The PCM highway bundles in the basic cabinet are used by peripheral boards according to the following rules:

- **Single-cabinet system** (basic cabinet only)
  With the exception of boards DIUT2, DIUN2, DIU2U (for U.S. only), and STMI2, the peripheral boards only use the PCM highways of trunk group A:
  - PCM segment for board slots 1 – 5 = 128 time-division multiplex channels (four PCM highways)

– PCM segment for board slots 7 – 10 = 128 time-division multiplex channels (four PCM highways)

DIUT2, DIUN2, DIU2U (for U.S. only) and STMI2 use the PCM highways from bundle F. Thus there are an additional 128 time-division multiplex channels available for slots 1 – 5 and for slots 7 – 10 for these boards.
If more than the 2 x 128 time-division multiplex channels from bundle F are required because of the configuration with these boards, the system will automatically resort to time-division multiplex channels from bundle A. However, only complete boards are activated on the other trunk group. The remaining time-division multiplex channels remain free.

- **Two-cabinet system** (basic cabinet + expansion cabinet)
  All peripheral boards use the PCM highways from bundle A only.

Expansion cabinet: PCM highways

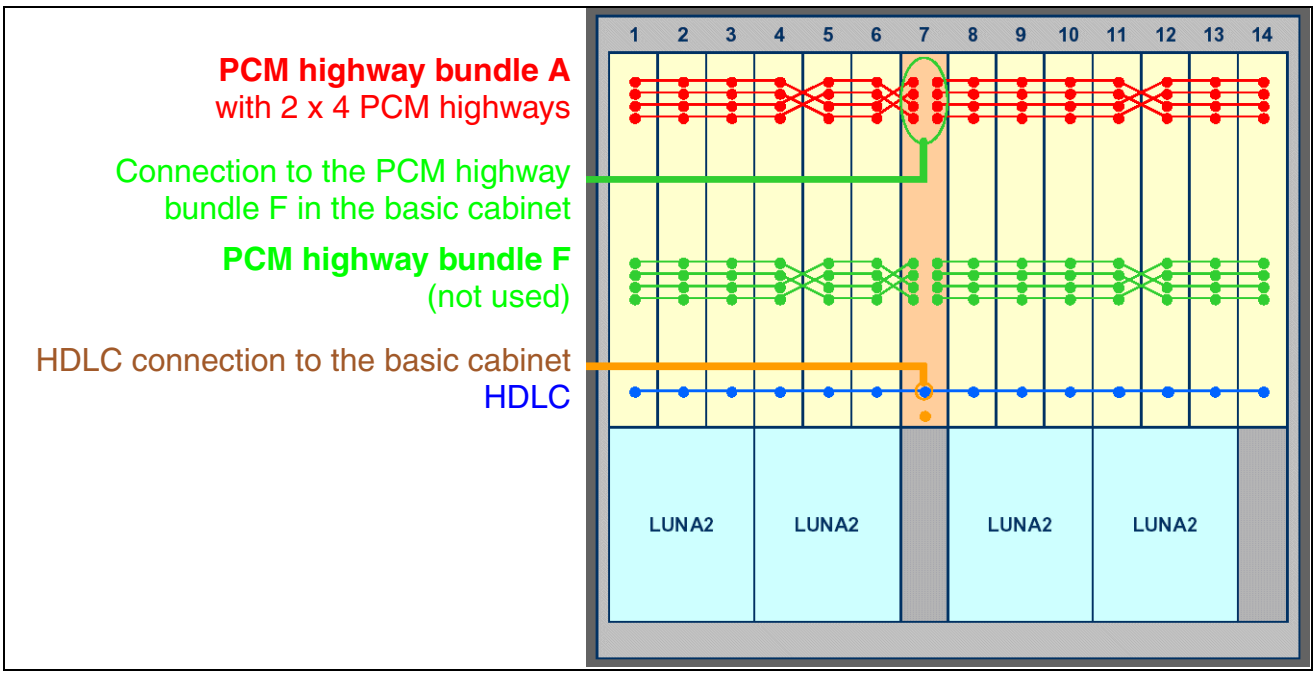


Figure 4-27 HiPath 3800 - PCM Highways in the Expansion Cabinet

The expansion cabinet provides a PCM highway bundle with 2 x 4 PCM highways. There are 32 time-division multiplex channels available for each PCM highway.

- PCM segment for board slots 1 – 6 = 128 time-division multiplex channels (four PCM highways)
- PCM segment for board slots 8 – 14 = 128 time-division multiplex channels (four PCM highways)

PCM highway bundle F is not used.

Time-division multiplex channels for peripheral boards

The following table lists the maximum number of time-division multiplex channels that the different boards require. A distinction is made here between:

- static time-division multiplex channels
  Time-division multiplex channels are subject to static assignment in trunk boards. This ensures that all incoming calls can be processed.
- dynamic time-division multiplex channels
  Time-division multiplex channels are subject to dynamic assignment in subscriber line modules. Channels are seized for each call and released afterwards. This means that the current number of time-division multiplex channels required is determined by the number of active stations.



Restrictions for using the TMDID board
The TMDID board only uses the first half of a PCM segment. Consequently, a maximum of 64 channels is available on each PCM segment for TMDID-specific static time-division multiplex channels.
To guarantee that the system operates without blocking when using the TMDID, the boards on a PCM segment must not require more than the 64 static time-division multiplex channels.
Examples for a PCM segment:

- 2 x TMDID + 1 x DIU2U = 64 static time-division multiplex channels = approved equipment
- 1 x TMDID + 1 x TMC16 + 1 x DIU2U = 72 static time-division multiplex channels = unapproved equipment
- 1 x TMDID + 2 x SLMO2 = 8 static and 96 dynamic time-division multiplex channels = approved equipment

Table 4-4 Maximum Number of Time-Division Multiplex Channels Required Per Board

Board	Maximum number of time-division multiplex channels required	Time-division multiplex channel assignment
DIU2U	48	static
DIUN2	60	static
DIUT2	60	static
IVMN8	8	dynamic
IVMNL	24	dynamic
SLCN	128[1]	dynamic
SLMA	24	dynamic
SLMA2	24	dynamic

Table 4-4 Maximum Number of Time-Division Multiplex Channels Required Per Board

Board	Maximum number of time-division multiplex channels required	Time-division multiplex channel assignment
SLMA8	8	dynamic
SLMO2	48[2]	dynamic
SLMO8	16[2]	dynamic
STMD3	16	static/dynamic[3]
STMI2	32	dynamic
STMI2	64	dynamic
TM2LP	8	static
TMC16	16	static
TMCAS-2	60	static
TMDID	8	static
TMEW2	4	static

1 A time-division multiplex channel is required if a call is being conducted over the “home SLCN board” of a mobile telephone. If a call is being conducted over a “Current location SLCN board”, additional time-division multiplex channels will be required. More information is provided in Section 11.5, “Multi-SLC and System-Wide Networking”.

2 The maximum number of masters and slaves possible is taken into consideration.

3 Static time-division multiplex channel assignment for operation as a trunk board, dynamic assignment for operation as a subscriber line module.

4.1.5.8 Static Traffic Capacity

The static traffic capacity of the HiPath 3800 system can be determined as follows.

Table 4-5 HiPath 3800 - Static Traffic Capacity

HiPath 3800	Slots per PCM segment	Static traffic capacity per PCM segment	Total static traffic capacity of the system
Single-cabinet system (see Page 4-45)	1 – 5	128 erlangs + (128 erlangs[1])	512 erlangs
	7 – 10	128 erlangs + (128 erlangs[1])	
Two-cabinet system (see Page 4-46)	1 – 5	128 erlangs	512 erlangs
	7 – 10	128 erlangs	
	11 – 16	128 erlangs	
	18 – 24	128 erlangs	

1 The basic cabinet provides two PCM highway bundles with 2 x 4 PCM highways each. DIUT2, DIUN2, DIU2U (for U.S. only), and STMI2 use the PCM highways from trunk group F. Thus there are an additional 128 time-division multiplex channels available for these boards in the basic cabinet for slots 1 – 5 and slots 7 – 10. If HiPath 3800 is used as a two-cabinet system, the PCM highway trunk group F cannot be used.

4.1.6 Connecting the Cable to the Backplane

All cables that leave the system cabinet must be attached to the metal back panel using cable ties.

Connection options

Peripheral devices can be connected up to the HiPath 3800 in a number of different ways:

- SIVAPAC connector on the backplane for connecting the external main distribution frame via CABLUs (prefabricated cabling units) or for connecting external patch panels (see Section 4.1.6.4).
- Connector panels with RJ45 jacks for direct connection of peripherals (see Section 4.1.6.5). The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- For U.S. Only: Connector panels with CHAMP jack for direct connection of peripherals (see Section 4.1.6.6). The connector panels are clipped onto the SIVAPAC connectors on the backplane.
- Connector panels each with two SIPAC 1 SU connectors for connecting the external mail distribution frame MDFU-E or external patch panels using CABLUs (see Section 4.1.6.7). The connector panels are clipped onto the SIVAPAC connectors on the backplane.

The type of connection used will be decided in consultation with the customer on conclusion of the agreement. The cabinets will be delivered accordingly with or without clipped-on connector panels.

Danger
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

4.1.6.1 Backplane of the Basic Cabinet

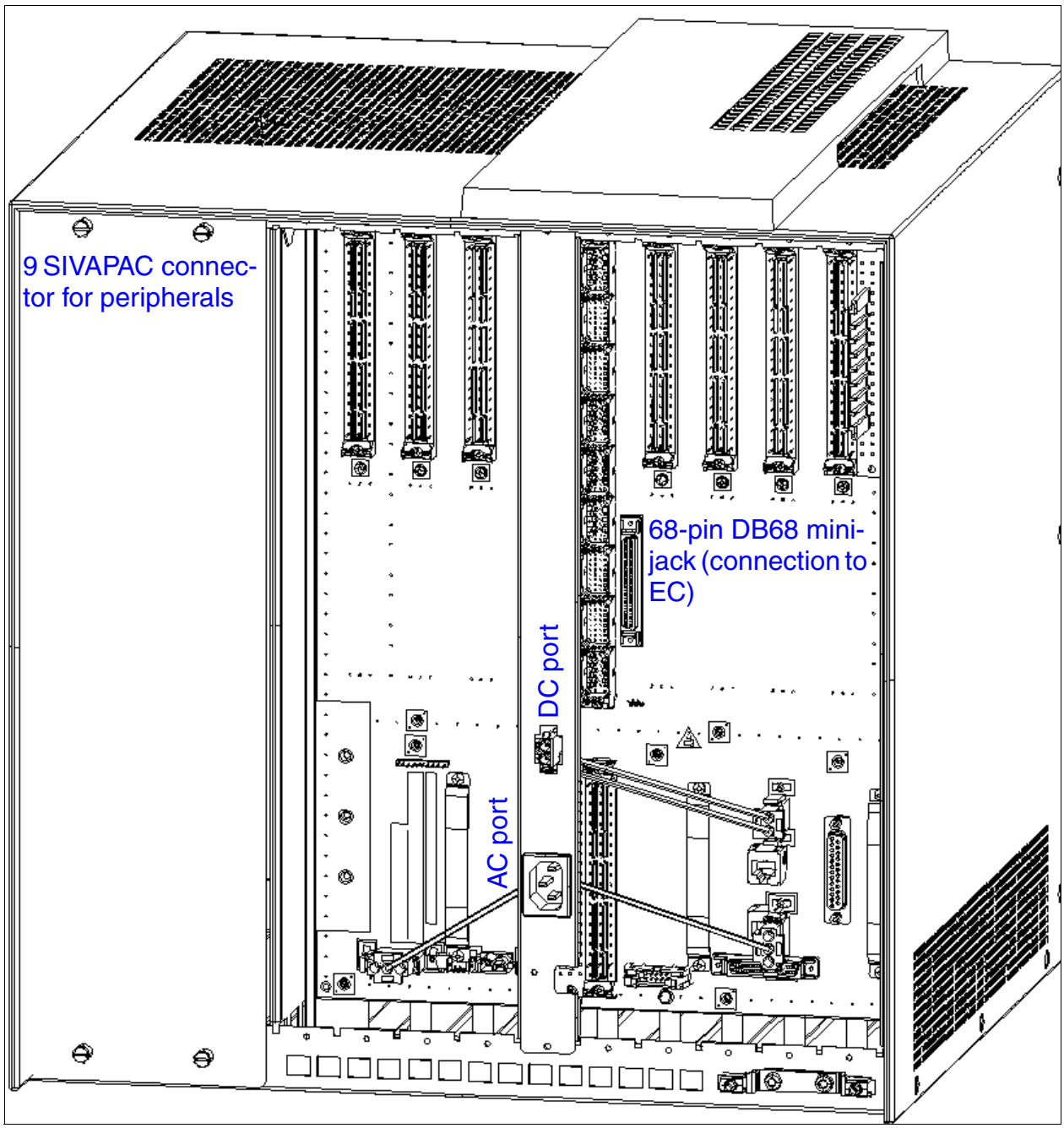


Figure 4-28 HiPath 3800 - Backplane (S30804-Q5392-X) of the Basic Cabinet

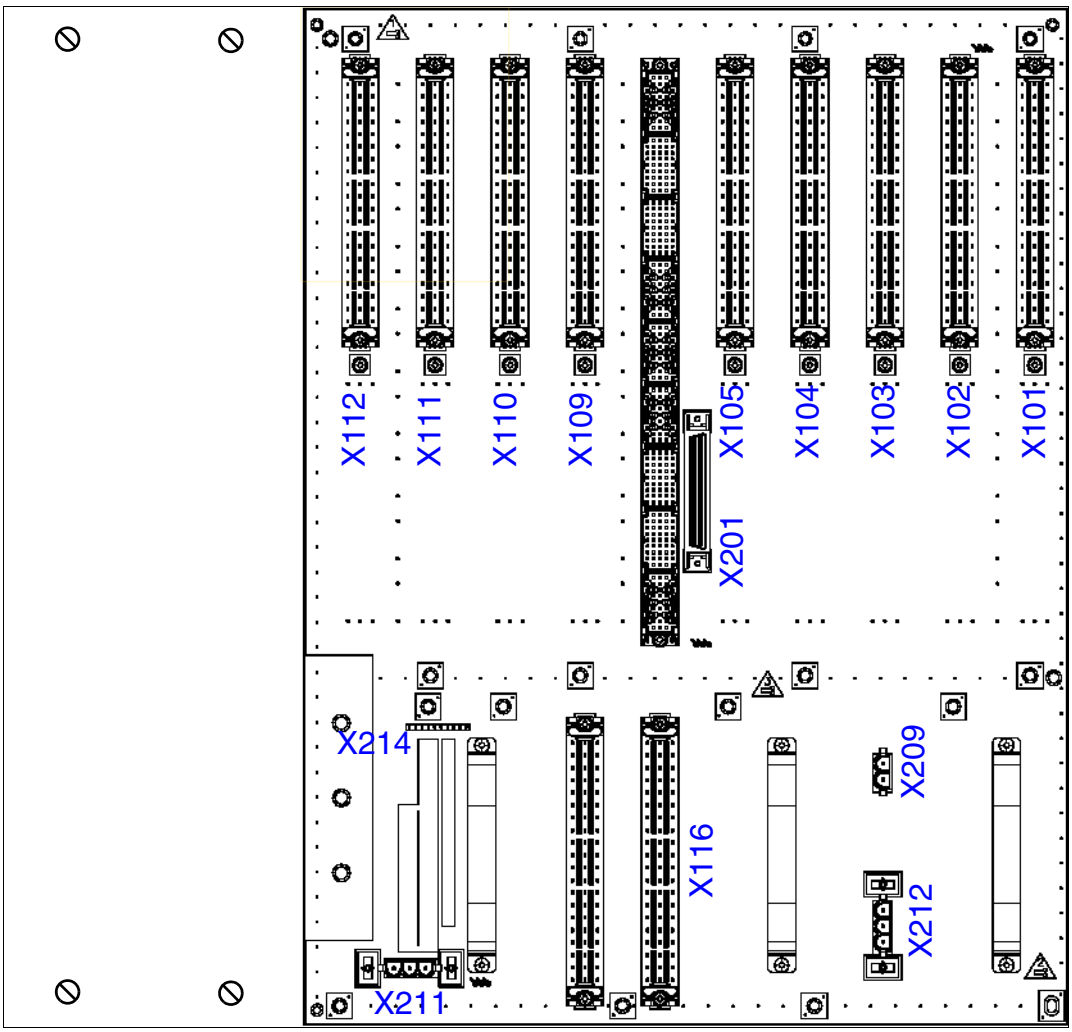


Figure 4-29 HiPath 3800 - Connectors and Jacks on the Backplane of the Basic Cabinet

Table 4-6 HiPath 3800 - Assignment of Connectors and Jacks on the Backplane of the Basic Cabinet

Connector	Function
X101 – X105 X109 – X112	SIVAPAC connector for connecting peripherals: CABLUs and open-end cables are used for connection to the MDFU-E or to an external patch panel (see Section 4.1.6.4). Note: The SIVAPAC connectors can have the following connector panels: • Connector panels with RJ45 jacks for direct connection of peripherals (see Section 4.1.6.5). • For U.S. only: Connector panels with CHAMP jack for direct connection of peripherals (see Section 4.1.6.6). • Connector panels each with two SIPAC 1 SU connectors for connecting an external main distribution frame or external patch panel using CABLUs (see Section 4.1.6.7). For selected countries only: PBXXX board: An APPCU adapter (S30807-K5415-X) is used to connect the CAS cable and the DIUN2 connection cable.
X116	SIVAPAC connectors for picking up the signals from the REALS board. CABLUs for connection to the MDFU-E (jumper strip for 25 TW): • C39195-A7267-A372: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) • C39195-A7267-A373: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) Open-end cable (24 TW) for connection to an external patch panel: • S30267-Z196-A150: 15 m in length • S30267-Z196-A250: 25 m in length • S30267-Z196-A350: 35 m in length • S30267-Z196-A550: 55 m in length • S30267-Z196-A950: 95 m in length
X201	68-pin DB68 mini-jack for connecting the cable C39195-Z7611-A10 to the expansion cabinet (for the DBSAP board)
X209	DC port
X211, X212	AC power
X214	10-pin connection for the ring voltage generator RGMOD (for selected countries only)

4.1.6.2 Expansion Cabinet Backplane

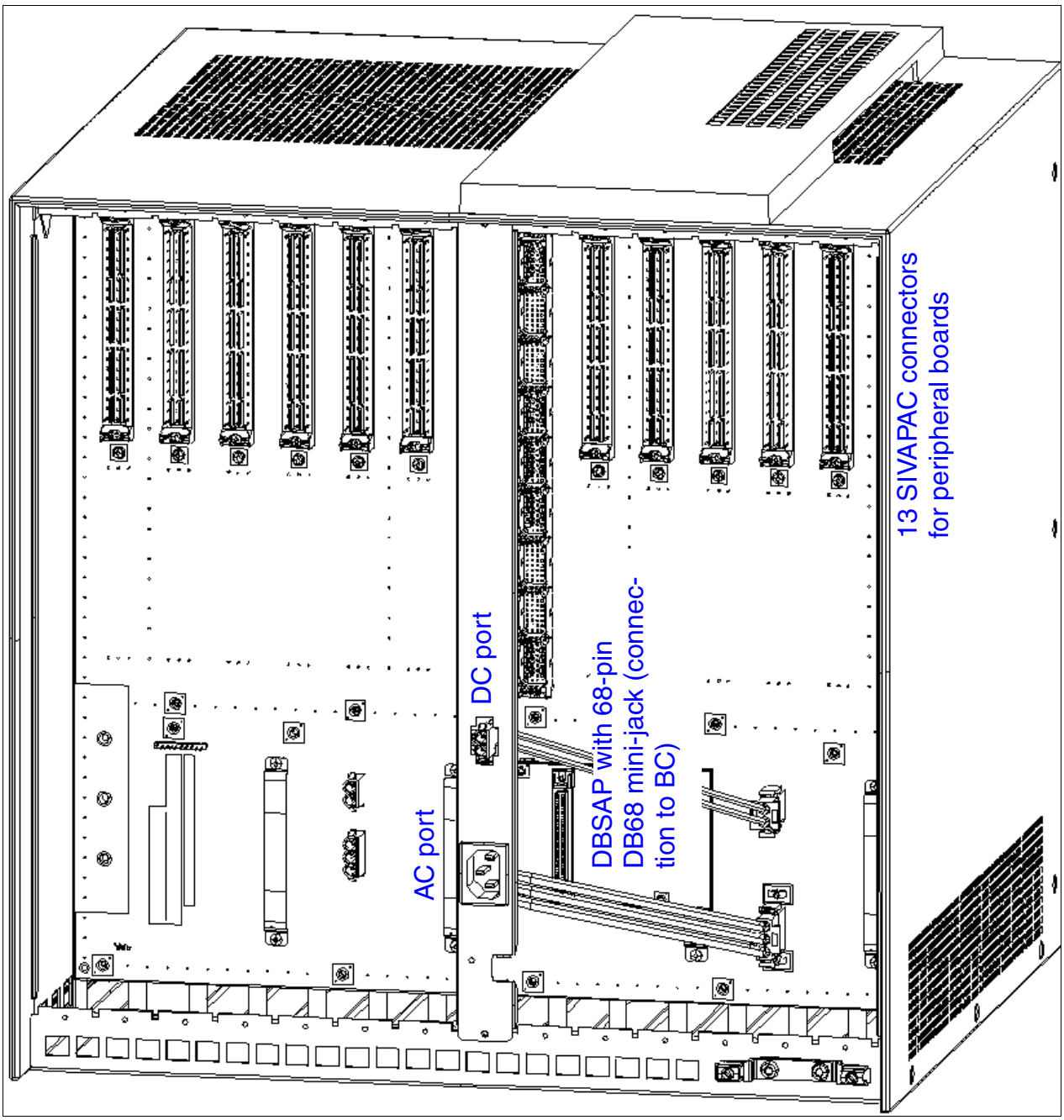


Figure 4-30 HiPath 3800 - Expansion Cabinet Backplane (S30804-Q5393-X)

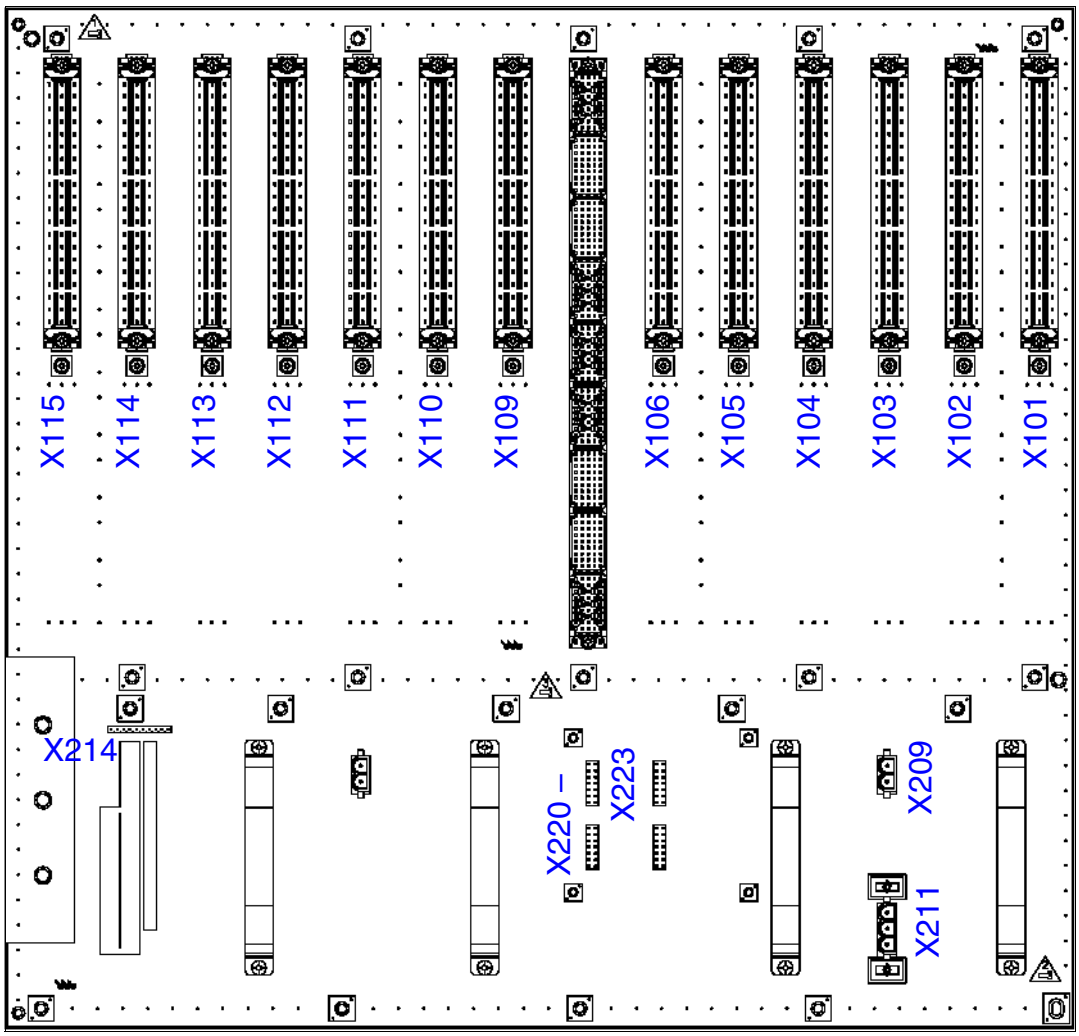


Figure 4-31 HiPath 3800 - Connectors and Jacks on the Backplane of the Expansion Cabinet

Table 4-7 HiPath 3800 - Assignment of Connectors and Jacks on the Backplane of the Expansion Cabinet

Connector	Function
X101 – X106 X109 – X115	SIVAPAC connector for connecting peripherals: CABLUs and open-end cables are used for connection to the MDFU-E or to an external patch panel (see Section 4.1.6.4). Note: The SIVAPAC connectors can have the following connector panels: • Connector panels with RJ45 jacks for direct connection of peripherals (see Section 4.1.6.5). • For U.S. only: Connector panels with CHAMP jack for direct connection of peripherals (see Section 4.1.6.6). • Connector panels each with two SIPAC 1 SU connectors for connecting an external main distribution frame or external patch panel using CABLUs (see Section 4.1.6.7). For selected countries only: PBXXX board: An APPCU adapter (S30807-K5415-X) is used to connect the CAS cable and the DIUN2 connection cable.
X209	DC port
X211	AC power
X214	10-pin connection for the ring voltage generator RGMOD (for selected countries only)
X220 – X223	Connections for plugging in the DBSAP board. DBSAP has a 68-pin DB68 mini-jack for connecting the cable C39195-Z7611-10 to the basic cabinet (to the jack X201).

4.1.6.3 Connecting Cables Between the Basic and Expansion Cabinet

The connection cable C39195-Z7611-A10 has to be connected up for feeding the HDLC, PCM, and clock signals from the basic cabinet to the expansion cabinet:

- Basic cabinet = X201 jack
- Expansion cabinet = DBSAP board



To ensure smooth operation, use only shielded cables with a maximum length of 1 m.

4.1.6.4 Connecting Peripherals to the SIVAPAC Connector on the Backplane

The boards should be installed in the cabinets as described in Section 4.1.5.

> **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
> The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Use the CABLUs (prefabricated cabling units) that are listed in the following table to establish the connection with the MDFU-E. Open-end cables must be used if an external patch panel is being used. See also Section 4.1.7, “Using an External Main Distribution Frame or External Patch Panel”.

CABLUs and open-end cables for SIVAPAC connectors

If	Then
Slot with SLCN SLMA8 SLMO8 STMD3 TM2LP TMC16[1] TMDID[2]	CABLUs for connection between backplane (SIVAPAC connector) and MDFU-E (splitting strip for 16 TW): • C39195-A7267-A370: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) • C39195-A7267-A371: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU for connection between backplane (SIVAPAC connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): • S30267-Z333-A20: 2 m in length (refer to Figure 4-42) • S30267-Z333-A50: 5 m in length (refer to Figure 4-42) Open-end cable (24 TW) for connection between backplane (SIVAPAC connector) and external patch panel: • S30267-Z196-A150: 15 m in length • S30267-Z196-A250: 25 m in length • S30267-Z196-A350: 35 m in length • S30267-Z196-A550: 55 m in length • S30267-Z196-A950: 95 m in length

If	Then
Slot with SLMA SLMA2[1] SLMO2	CABLUs for connection between backplane (SIVAPAC connector) and MDFU-E (jumper strip for 25 TW): • C39195-A7267-A372: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) • C39195-A7267-A373: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU for connection between backplane (SIVAPAC connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): • S30267-Z333-A20: 2 m in length (refer to Figure 4-42) • S30267-Z333-A50: 5 m in length (refer to Figure 4-42) Open-end cable (24 TW) for connection between backplane (SIVAPAC connector) and external patch panel: • S30267-Z196-A150: 15 m in length • S30267-Z196-A250: 25 m in length • S30267-Z196-A350: 35 m in length • S30267-Z196-A550: 55 m in length • S30267-Z196-A950: 95 m in length
Slot with PBXXX[1]	A CAS cable is connected via an APPCU adapter (S30807-K5415-X).

1 for selected countries only
2 for U.S. only

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

Closing the backplane of the system cabinets



After the cable has been connected, the backplane of the basic cabinet and that of the expansion cabinet (if applicable) must be closed with the dummy panels provided (C39165-A7075-C44).



Figure 4-32 HiPath 3800 - Backplane of the Basic Cabinet with Mounted Filler Panels

4.1.6.5 Connecting Peripherals to the Connector Panels with RJ45 Jacks

The boards should be installed in the cabinets as described in Section 4.1.5. The connector panels plugged into the SIVAPAC connectors of the backplane are equipped with eight or 24 RJ45 jacks according to the relevant board.

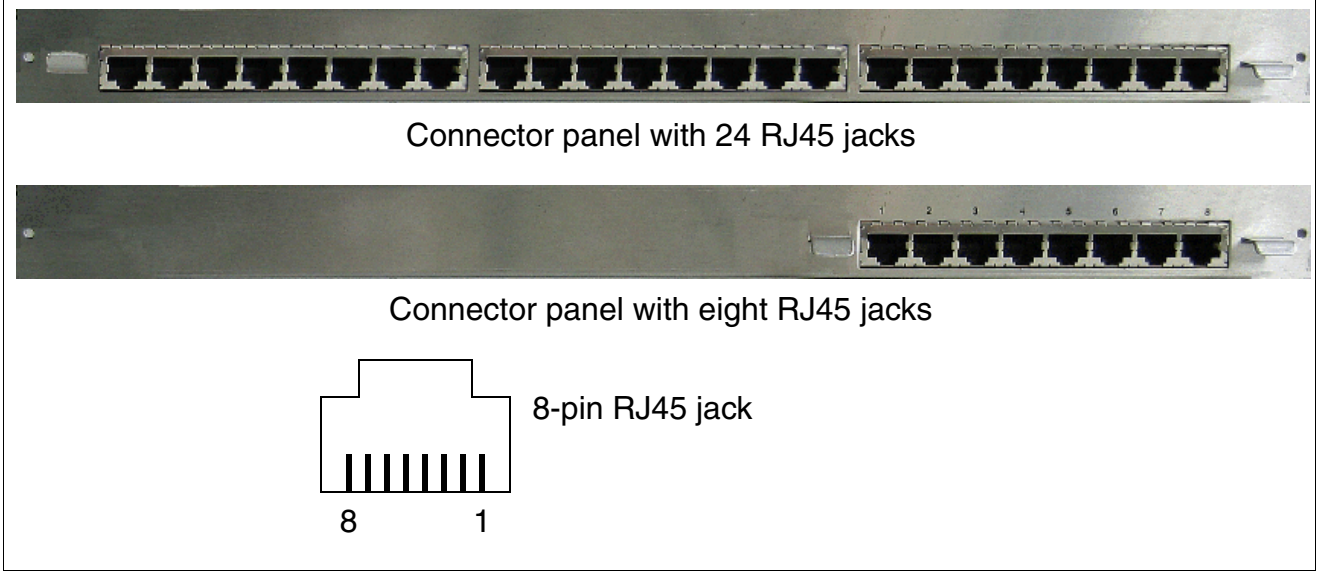


Figure 4-33 HiPath 3800 - connector panels with RJ45 Jacks

Danger
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Connect the peripheral directly to the 8-pin RJ45 jacks on the connector panels.

If	Then
Slot with STMD3	Connector panel with eight RJ45 jacks: S30807-Q6624-X The RJ45 jacks are configured with four wires. S_0 stations can be directly connected (1:1 cable). The receive and send lines should be switched for trunk connections.

If	Then
Slot with SLCN SLMA SLMA2[1] SLMA8 SLMO2 SLMO8 TM2LP TMC16[1] TMDID[2]	Connector panel with 24 RJ45 jacks: S30807-Q6622-X The RJ45 jacks are configured with two wires.
different or no assignment	The backplane sections of other boards and empty board slots must be covered with filler panels.

1 for selected countries only
2 for U.S. only

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

4.1.6.6 Connecting Peripherals to the Connector Panels with CHAMP Jack (for U.S. only)

The boards should be installed in the cabinets as described in Section 4.1.5. The S30807-Q6626-X connector panels attached to the SIVAPAC connectors on the backplane are equipped with a CHAMP jack.

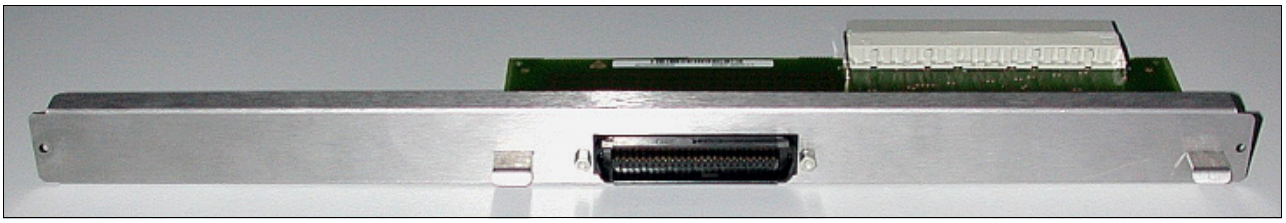


Figure 4-34 HiPath 3800 - Connector Panel with CHAMP Jack (for U.S. only)

> ⚠ **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
> The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Connect the peripheral directly to the CHAMP jack in the connector panels.

If	Then
Slot with peripheral card	A cable with CHAP jack should be used to connect to a main distributor frame or external patch panel.
No assignment	The backplane sections with empty board slots must be covered with filler panels.

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

4.1.6.7 Connecting Peripherals to Connector Panels with SIPAC 1 SU Connectors

The boards should be installed in the cabinets as described in Section 4.1.5. The S30807-Q6631-X connector panels attached to the SIVAPAC connectors on the backplane have two SIPAC 1 SU connectors each.

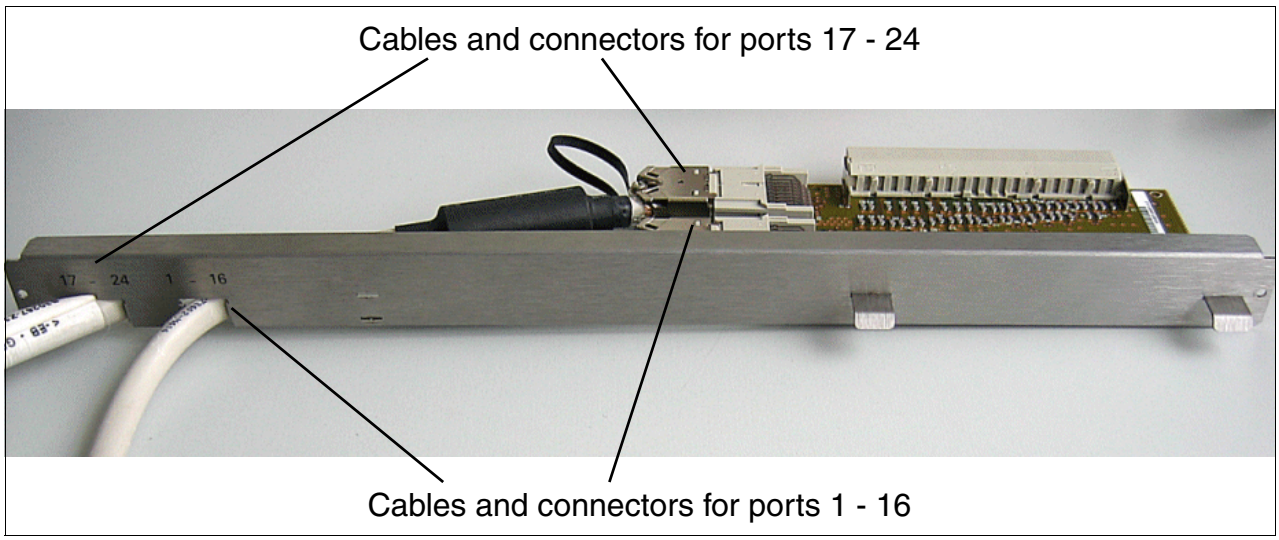


Figure 4-35 HiPath 3800 - Connector Panel with Two SIPAC 1 SU Connectors (S30807-Q6631-X)

Danger
Be sure to connect the main protective earthing terminal on all system cabinets to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

Use the CABLUs that are listed in the following table to establish the connection with the MDFU-E or an external patch panel. See also Section 4.1.7, “Using an External Main Distribution Frame or External Patch Panel”.

In special cases where the prefabricated CABLUs cannot be used, open-end cables should be used.

CABLUs and open-end cables for SIPAC 1 SU connectors

If	Then
Slot with SLCN SLMA8 SLMO8 STMD3 TM2LP TMC16[1] TMDID[2]	CABLUs for connection between connector panel (SIPAC 1 SU connectors) and MDFU-E (splitting strip for 16 TW): • S30269-Z100-A11: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) • S30269-Z100-A21: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU with 16 TW for connection between connector panel (SIPAC 1 SU connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): • S30267-Z362-A20: 2 m in length (refer to Figure 4-42) Open-end cable (16 TW) for connection between backplane (SIPAC 1 SU connectors) and external patch panel: • S30267-Z192-A60: Open-end cable with 16 TW, 6 m in length • S30267-Z192-A100: Open-end cable with 16 TW, 10 m in length • S30267-Z192-A200: Open-end cable with 16 TW, 20 m in length (Information on the required stripped lengths for open-end cables is provided in Figure 4-47.)
Slot with SLMA SLMA2[1] SLMO2	CABLUs for connection between connector panel (SIPAC 1 SU connectors) and MDFU-E (jumper strip for 25 TW): • S30269-Z100-A14: 3 m in length, short stripped length for MDFU-E slots 11-21 (see Figure 4-36) • S30269-Z100-A24: 3 m in length, long stripped length for MDFU-E slots 1-10 (see Figure 4-36) CABLU with 24 TW for connection between connector panel (SIPAC 1 SU connectors) and external patch panel S30807-K6143-X (SIVAPAC socket terminal strip): • S30267-Z363-A20: 2 m in length (refer to Figure 4-42) Open-end cable (16 TW) for connection between backplane (SIPAC 1 SU connectors) and external patch panel: • S30267-Z192-A60: Open-end cable with 16 TW, 6 m in length • S30267-Z192-A100: Open-end cable with 16 TW, 10 m in length • S30267-Z192-A200: Open-end cable with 16 TW, 20 m in length (Information on the required stripped lengths for open-end cables is provided in Figure 4-47.)
different or no assignment	The backplane sections of other boards and empty board slots must be covered with filler panels.

1 for selected countries only
2 for U.S. only

Information on cable and connector assignment is provided in the board descriptions in Chapter 3.

4.1.7 Using an External Main Distribution Frame or External Patch Panel

The HiPath 3800 has various connection options for connecting the peripherals. The type of connection used will be decided in consultation with the customer on conclusion of the agreement. This may involve the implementation of an external main distribution frame or an external patch panel.

This section contains information on the following external components:

- Main distribution frame MDFU-E, Section 4.1.7.1
- Patch panel S30807-K6143-X, Section 4.1.7.2
- S_0 patch panel C39104-Z7001-B3, Section 4.1.7.3
- For U.S. only: Connecting Network Facilities, Section 4.1.7.4

4.1.7.1 Using an External Main Distribution Frame MDFU-E S30805-U5283-X

For U.S. only:

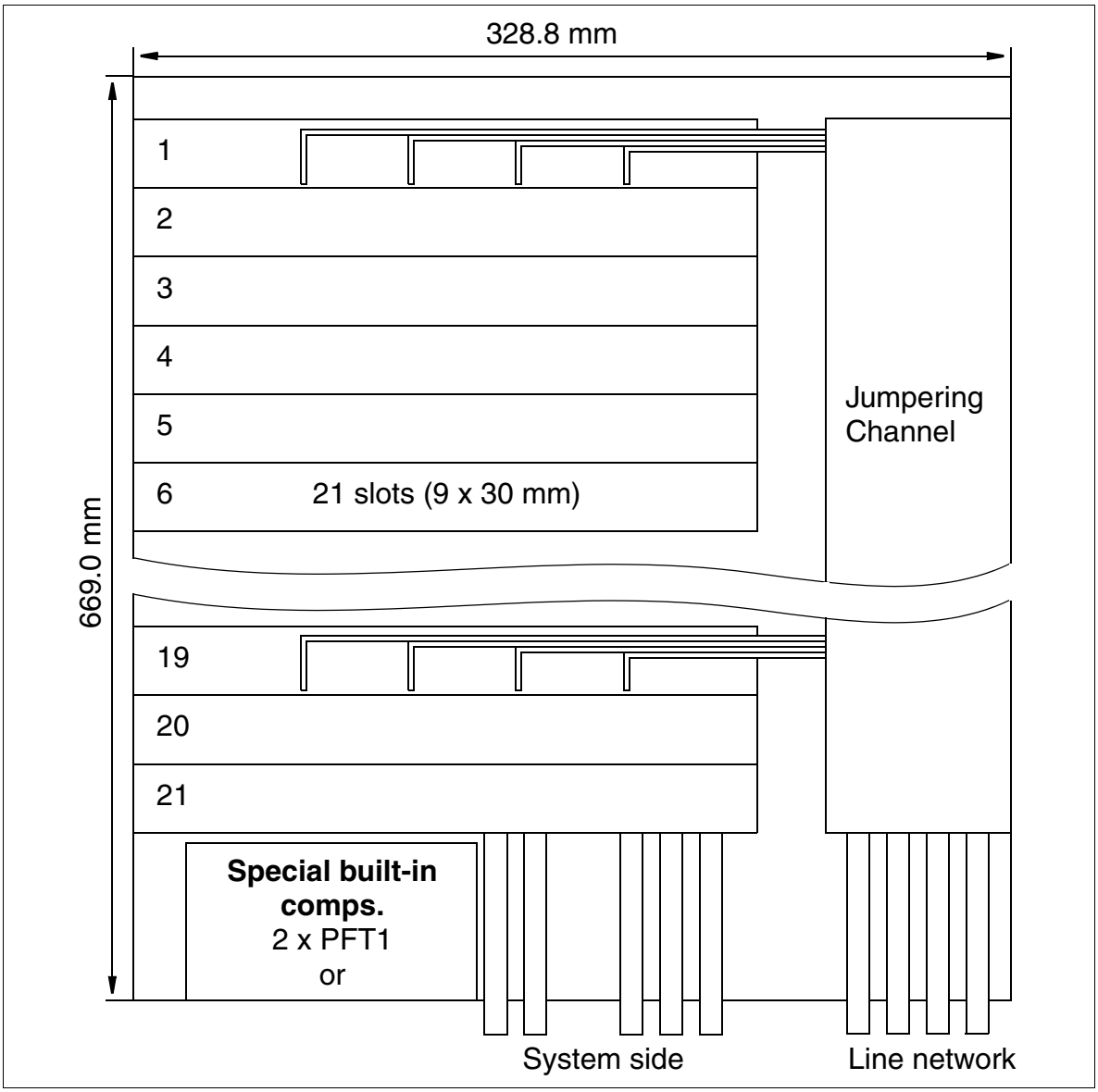


Figure 4-36 MDFU-E - Layout and Dimensions (669.0 x 328.8 x 125.4 mm)

Not more than 21 CABLUs per MDFU-E with one 16-TW strip or 25-TW strip (9 x 30 mm) can be implemented.

4.1.7.1.1 Mounting the Main Distribution Frame (MDFU-E)

The MDFU-E main distribution frame should be installed in the direct vicinity of the system (note length of connection cable) and at eye level.

The packing material contains a drawing that can be used as a drilling template.

Procedure for wall mounting

Step	Activity
1.	Use the template to drill the holes.
2.	Insert the wall anchors and screw in the screws, leaving 5 mm projecting.
3.	Remove the housing cover and mount the MDFU-E on the brackets.
4.	Tighten the screws through the holes.

4.1.7.1.2 Laying the Line Network and Jumpers on the MDFU-E



Danger
Be sure to connect the main protective earthing terminal on all system cabinets and all main distribution frames to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).

Jumpers, external line network

Most main distribution frames do not have an external side. You must jumper them to the incoming line network (see jumpering duct, Figure 4-36). Use a standard wiring tool for laying the cable wires.

Surge protector

To divert surge voltage caused by lightning, insert surge protectors on:

- lines that leave the system buildings (outside stations)
- lines > 500 m long

Connect the polarized surge protectors to the plugging locations on the splitting strip described above (see Figure 4-38).

Splitting and jumper strips

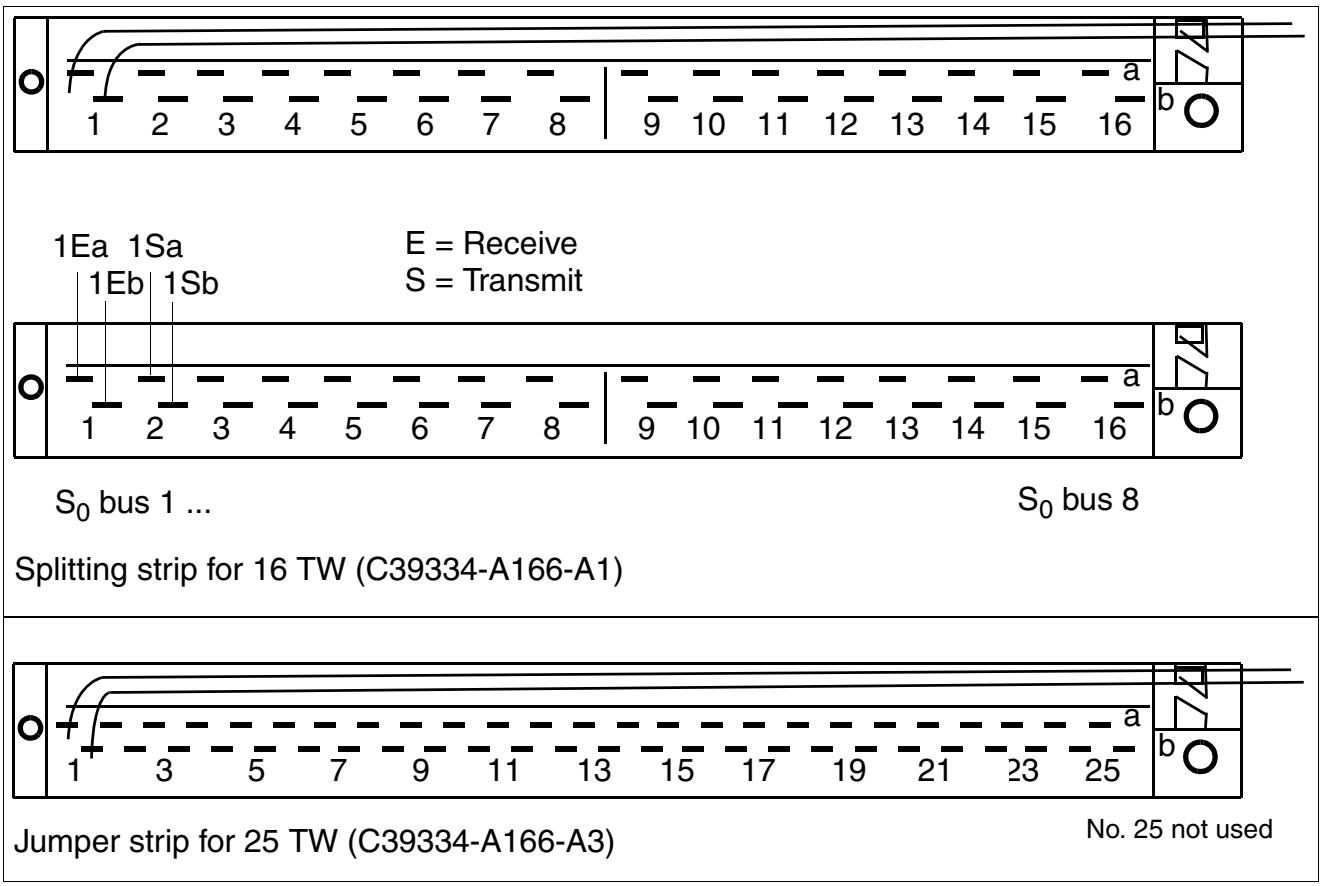


Figure 4-37 Assignment (Numbering) of the Splitting/Jumper Strips (view from above)

Stripping the open-end cable for the MDFU-E

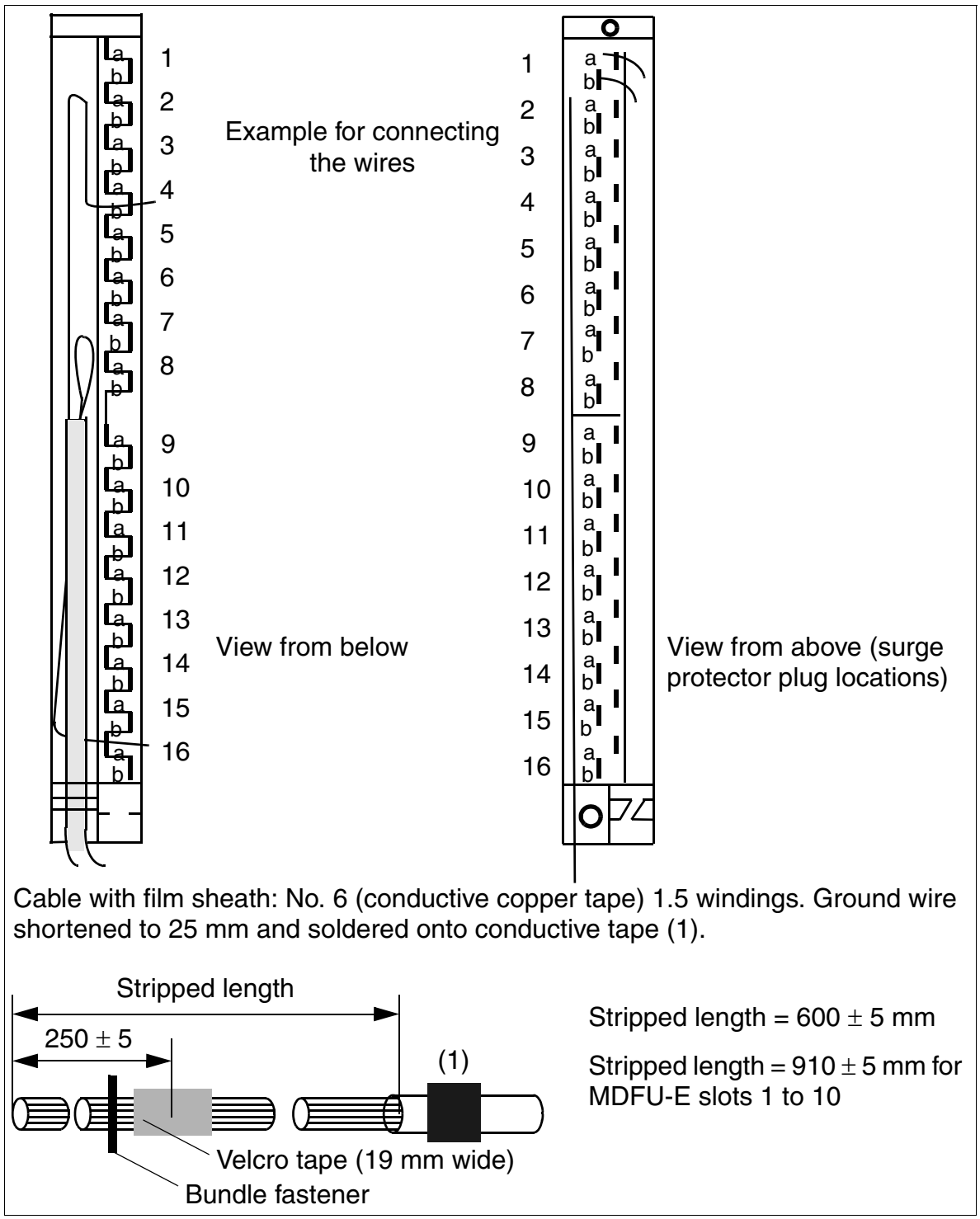


Figure 4-38 Stripping an Open-End Cable for the MDFU-E

Color Codes for the Open-End Cable

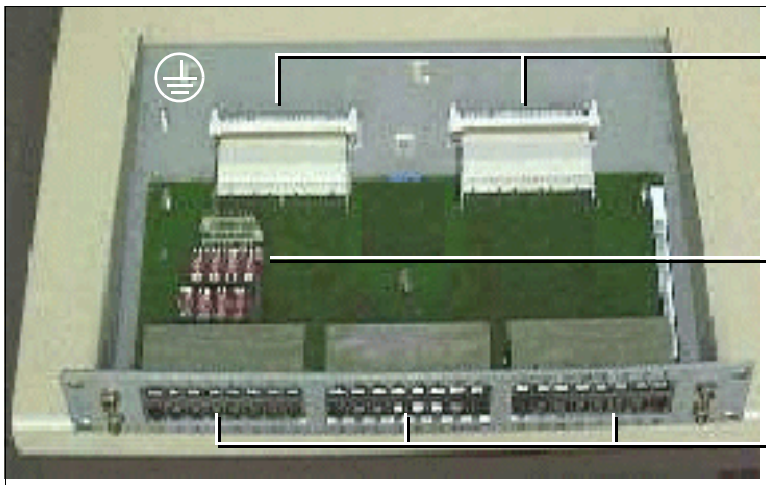
Table 4-8 Color Codes for the Open-End Cable

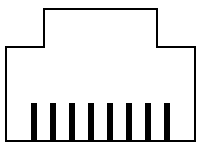
Color Group	Pair	a-Wire (Tip)	b-Wire (Ring)	Color Group	Pair	a-Wire (Tip)	b-Wire (Ring)
1	1	wht/blu		4	16	yel/blu	
			blu/wht				blu/yel
	2	wht/ora			17	yel/ora	
			ora/wht				ora/yel
	3	wht/grn			18	yel/grn	
			grn/wht				grn/yel
	4	wht/brn			19	yel/brn	
			brn/wht				brn/yel
	5	wht/gry			20	yel/gry	
			gry/wht				gry/yel
2	6	red/blu		5	21	vio/blu	
			blu/red				blu/vio
	7	red/ora			22	vio/ora	
			ora/red				ora/vio
	8	red/grn			23	vio/grn	
			grn/red				grn/vio
	9	red/brn			24	vio/brn	
			brn/red				brn/vio
	10	red/gry		Note: In the case of cables with 16 double wires, the specifications for pairs 17 to 24 are not relevant.			
			gry/red				
3	11	blk/blu					
			blu/blk				
	12	blk/ora					
			ora/blk				
	13	blk/grn					
			grn/blk				
	14	blk/brn					
			brn/blk				
	15	blk/gry					
			gry/blk				

4.1.7.2 Inserting the External Patch Panel S30807K6143-X

Structure

All incoming cables must be attached to the patch panel using cable ties.





RJ45 jack assignment:
4 = a-wire
5 = b-wire

Necessary height units for 19-inch cabinet assembly: 1
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 4-39 Patch Panel S30807-K6143-X

4.1.7.2.1 Installing the Patch Panel in a 19-Inch Cabinet

Installation procedure

> **Caution**
> The patch panel must be installed above the system cabinet.
> A minimum of one height unit must be kept clear above the cabinet to guarantee sufficient ventilation of the system cabinet. This is achieved by the gray plastic cover fixed to the top of the system cabinets. Never remove this plastic cover.

Insert the patch panel (A, in Figure 4-40) above the system cabinet and secure it to the 19-inch frame on both the left and the right using two screws on each side.

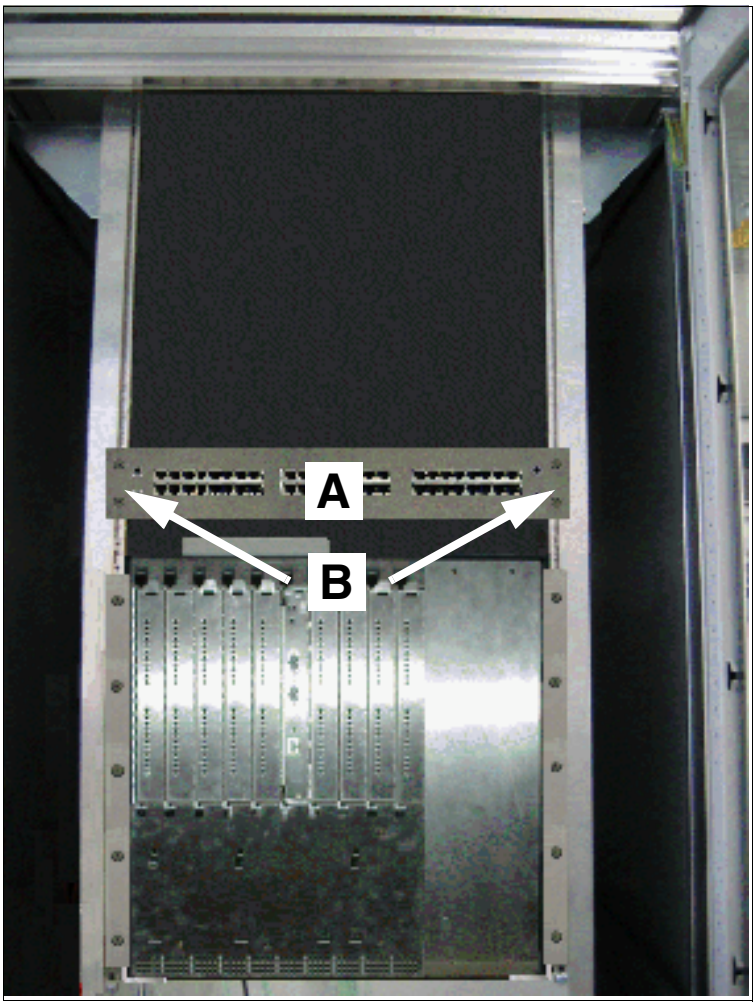


Figure 4-40 Installing the External Patch Panel in the 19-Inch Cabinet

4.1.7.2.2 Connecting the Line Network to the External Patch Panel

> **Danger**
> Be sure to connect the main protective earthing terminal on all system cabinets and all patch panels to the grounding point of the electrical building installation before connecting up the peripherals (for example, potential equalization bus).

Telephones and trunks are connected directly to the RJ45 jack on the front of the patch panel. Information on RJ45 jack assignment on the front of the patch panel is provided in the board descriptions (in the “Cable and Connector Assignment” table) in Chapter 3.

Surge protector

To divert surges caused by lightning, insert surge protectors on

- lines that leave the system buildings (outside stations)
- lines > 500 m long.

Connect the polarized surge protectors to the plugging locations F1 to F8 provided on the patch panel (see Figure 4-42).

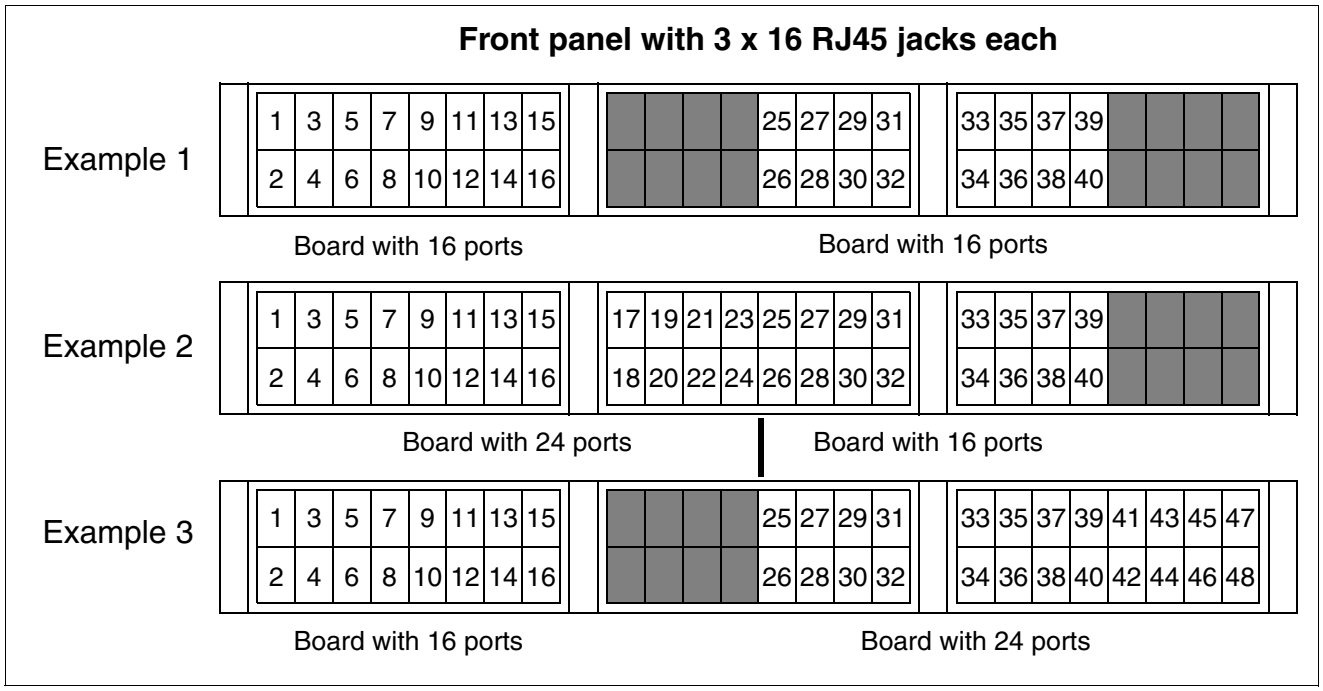
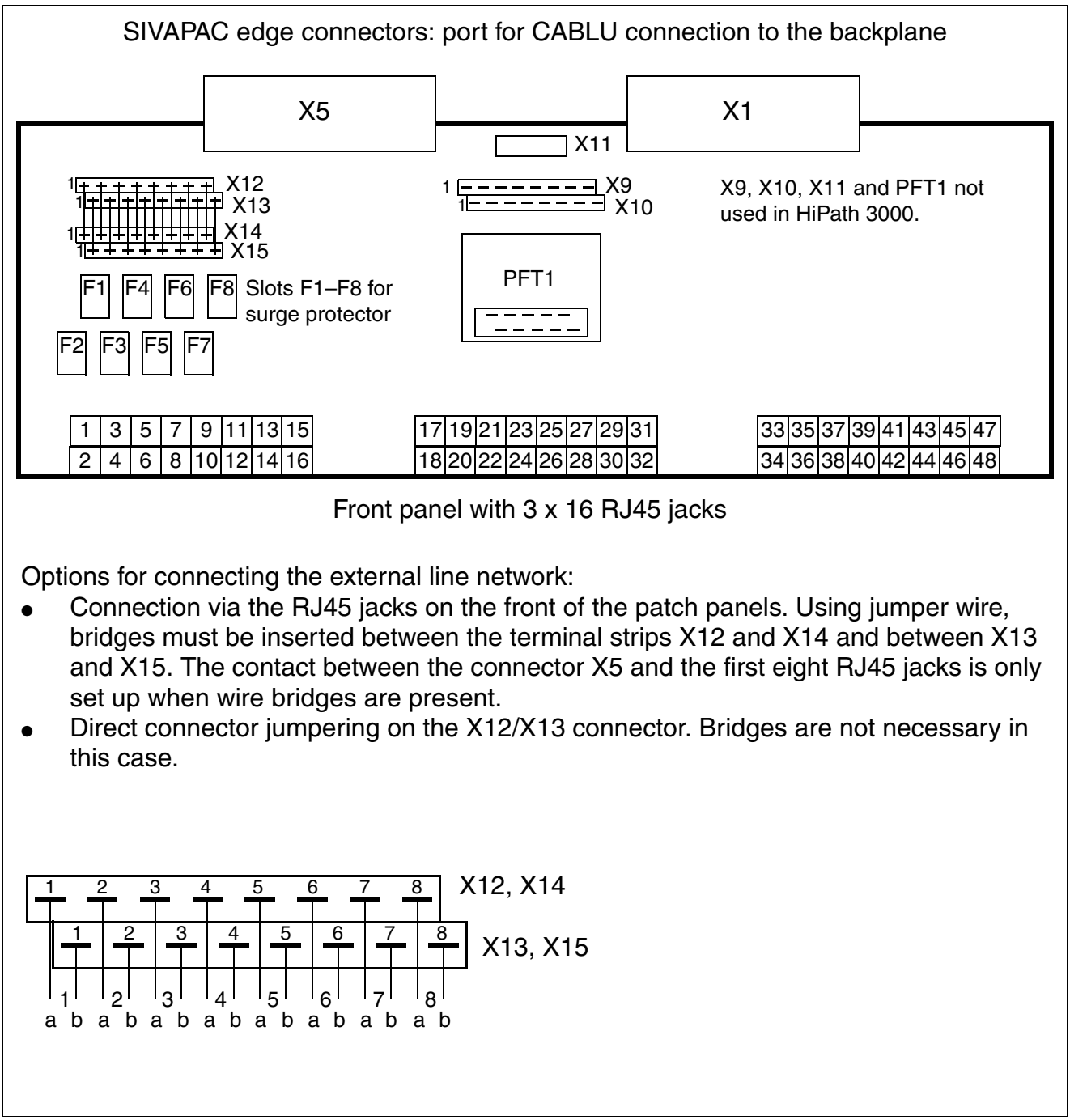


Figure 4-41 Layout of the Patch Panel S30807-K6143-X for Different Peripheral Boards



Front panel with 3 x 16 RJ45 jacks

Options for connecting the external line network:

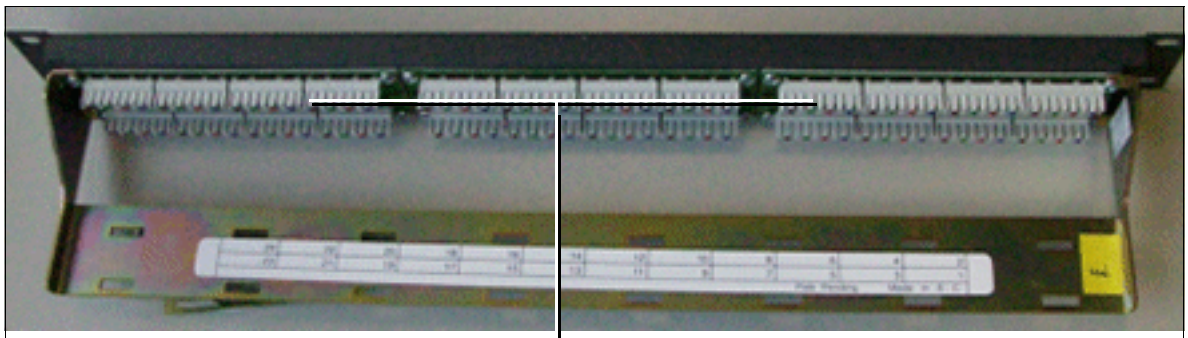
- Connection via the RJ45 jacks on the front of the patch panels. Using jumper wire, bridges must be inserted between the terminal strips X12 and X14 and between X13 and X15. The contact between the connector X5 and the first eight RJ45 jacks is only set up when wire bridges are present.
- Direct connector jumpering on the X12/X13 connector. Bridges are not necessary in this case.

Figure 4-42 Assignment of Patch Panel S30807-K6143-X

4.1.7.3 Inserting External S_0 Patch Panel C39104-Z7001-B3

Structure

All incoming cables must be attached to the patch panel using cable ties.



3 x 8 RJ45 jacks

Necessary height units for 19-inch cabinet assembly: 1
(one height unit corresponds to approx. 1.7”=43 mm)

Figure 4-43 S_0 Patch Panel C39104-Z7001-B3

4.1.7.3.1 Installing the S_0 Patch Panel in the 19-Inch Cabinet

Installation Procedure

> **Caution**
> The patch panel must be installed above the system cabinet.
> A minimum of one height unit must be kept clear above the cabinet to guarantee sufficient ventilation of the system cabinet. This is achieved by the gray plastic cover fixed to the top of the system cabinets. Never remove this plastic cover.

Insert the S_0 patch panel (A, in Figure 4-44) above a system cabinet and secure it to the 19-inch frame on both the left and the right using two screws (B) on each side.

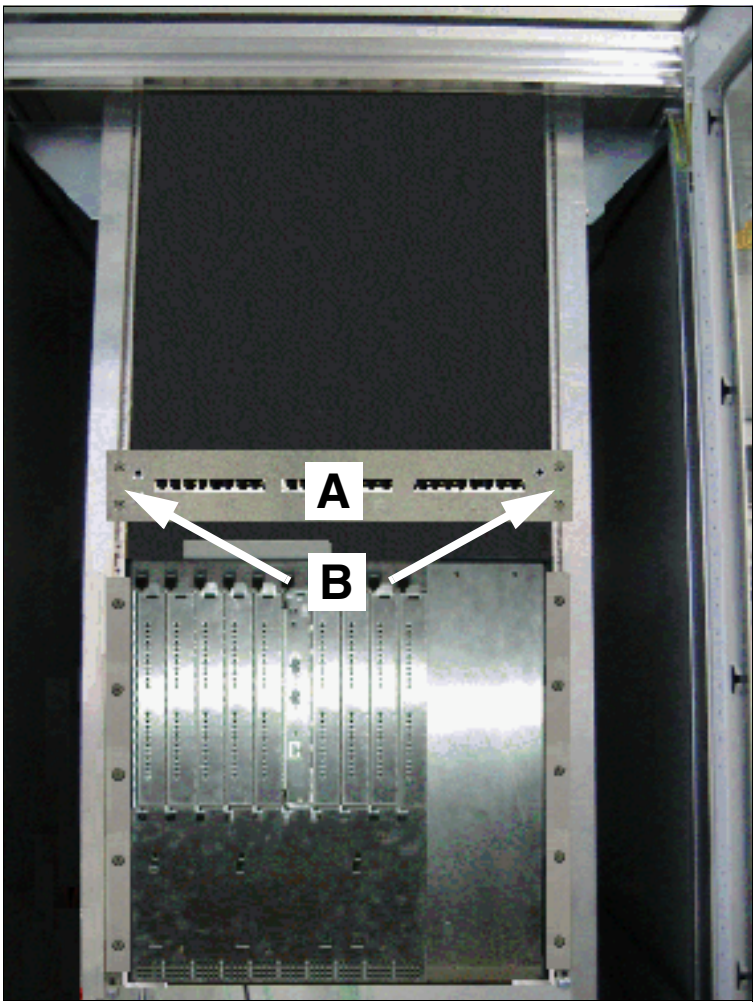
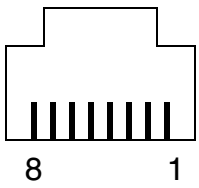


Figure 4-44 Installing the External S_0 Patch Panel in the 19-Inch Cabinet

4.1.7.3.2 Connecting Lines to the External S_0 Patch Panel



3 x 8 RJ45 jacks, numbering

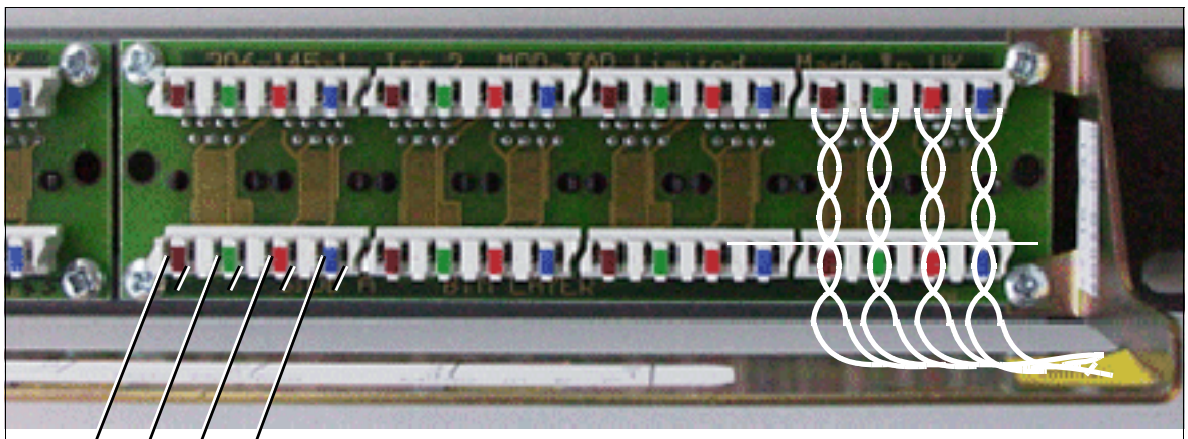


RJ45 jack assignment:

Pin	as a subscriber line	as a trunk connection
3	Transmit +	Receive +
4	Receive +	Transmit +
5	Receive –	Transmit –
6	Transmit –	Receive –

Figure 4-45 Assignment of the S_0 Patch Panel C39104-Z7001-B3

CABLUs must be manually connected to the S_0 patch panel (Figure 4-46). You can use the Krone wiring tool for this.

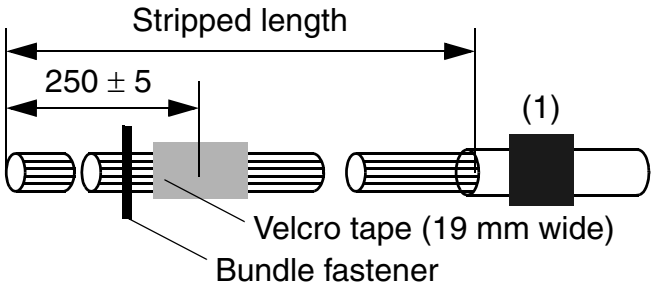


Pin assignment of RJ45 jacks

Twist the wire pairs before laying them.

Figure 4-46 Laying Wire Pairs at the S_0 Patch Panel

Stripping the open-end cable for the S_0 patch panel



Cable with film sheath: No. 6 (conductive copper tape) 1.5 windings. Ground wire shortened to 25 mm and soldered onto conductive tape (1).

Stripped length = 600 mm ± 5 mm

Figure 4-47 Stripping the Open-End Cable for the S_0 Patch Panel

The color codes for open-end cables are provided in Table 4-8.

4.1.7.4 For U.S. only: Connecting Network Facilities

NOTE: Before installing the outgoing lines, the grounding of the system must be ensured.

Connecting to the Point of Demarcation

Most main distribution frames are designed with a network demarcation block. You must cross-connect the MDF to the incoming trunks. Use a standard wiring tool for laying the cable wires.

Connecting to T1, PRI, or CorNet

NOTE: The DIU2U and DIUT2 boards can only be installed in conjunction with a listed CSU (channel service unit).

Additional primary protection

NOTE: Danger of damage to property due to surge voltage. Lines from the following boards that exit the building must be protected with an additional primary protection against surge voltage as a result of lightning:

- DIU2U*
- DIUT2*
- SLMA / SLMA8
- TMC16
- TMDID
- TMEW2
- TM2LP

* When this board is connected to the public network, an additional primary protection must be provided by the CSU.

4.1.8 Loading the System Software and Installing Subboards on the CBSAP

Caution
Always wear an antistatic wristband when working on the system (especially when handling boards). Connect the wristband to the slide-in shelf in the cabinet using the alligator clip.

The boards should be installed in the cabinets as described in Section 4.1.5.

The central control boards are not always fully equipped when delivered. Optional plug-in boards are packaged individually.

See Section 3.2.3 for information on slots for subboards on the central control board CBSAP.

Caution
Place the central control board on a flat surface before installing subboards.
The spacing bolts supplied guarantee the correct insertion of the subboard, so you should always mount them (see Figure 3-7).
Otherwise you may damage the board.

4.1.9 Connecting Workpoint Clients

Refer to Chapter 10 for details.

4.1.10 Making Trunk and Networking Connections

Refer to the following board descriptions for information:

- DIUN2 (S_{2M})
- DIUT2 (S_{2M}, T1)
- STMD3 (S_0)
- STMI2 (IP)
- TM2LP (MSI)
- TMEW2 (E&M)
- DIU2U (for U.S. only)
- TMC16 (for selected countries only)
- TMDID (for U.S. only)

4.1.11 Performing a Visual Inspection

Introduction

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The procedure is shown in Table 4-9. The visual inspection must be performed while the system is disconnected from the power supply.

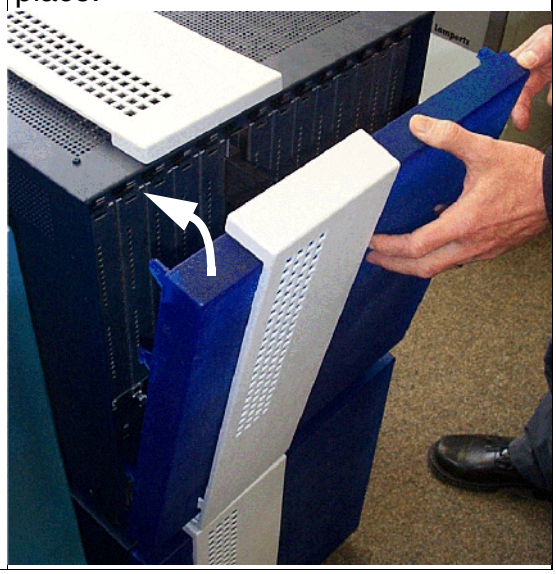
> **Caution**
> Before beginning work, make sure that the system is grounded and disconnected from the power supply.
> Observe the measures for protecting electrostatically sensitive devices (see Section 1.4.6, “Notes”).

Visual Inspection Procedure

Table 4-9 Visual Inspection Procedure

Step	Activity	Resources/ Remarks	Action
1.	Compare the slots of the available boards with the component mounting diagram.	Board assignment map	If necessary, correct the board configuration and notify the sales department.
2.	Check that all boards are secure.	See Page 4-34	If necessary, plug the boards in again.
3.	Check that a shielding cover has been attached for all boards with no connection options in the front cover.		If necessary, replace missing shielding covers (refer to Page 4-35).
4.	Check whether the slots for LUNA2 and for REALS (basic cabinet only) are covered by an outer panel.		If necessary, attach the outer panel (see Page 4-36).
5.	Check whether all system cabinets have been sealed at the rear with the connection and filler panels provided.		Get additional connection and filler panels where required.

Table 4-9 Visual Inspection Procedure

Step	Activity	Resources/ Remarks	Action
6.	Check whether a separate grounding is connected to the main grounding terminals of all system cabinets.		If necessary, ground the system as described in the following sections: • Section 4.1.3.4, for installing the standalone HiPath 3800 • Section 4.1.4.4, for installing the HiPath 3800 in the 19-inch cabinet.
7.	Check the local supply voltage.	Digital multimeter	
8.	Only for installing HiPath 3800 as a standalone system: close all system cabinets with the front and back plastic covers provided.		Fit the cover into the guides and press down on the cover unit it snaps into place. 

After finishing the visual inspection, you can begin starting up the HiPath 3800 as described in Chapter 5.

4.2 Installing HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300

4.2.1 Installation Prerequisites



Warning
Only authorized service personnel should install and start up the system.

Tools and resources needed

The following are needed for installing the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300 systems:

- **Tools**:
  - Diagonal cutting pliers, telephone pliers, wire stripper, flat-nosed pliers
  - Slotted screwdrivers, from 2 to 8 mm (1/4 to 5/16 in.)
  - Phillips or cross-point screwdrivers, sizes 1 and 2
  - TORX screwdriver
  - Electric drill, hammer
  - Level, tape measure
  - For U.S. only: Punch-down tool suitable for the block used (such as block 66)
- **Resources**:
  - Manager T or HiPath 3000/5000 Manager E
  - Digital multimeter for testing ground connections and partial voltages
  - Telephone test set for analog interfaces
  - Not for U.S.: ISDN tester (such as K3000 or Aurora)
  - For U.S. only: Aurora^{Duet}, Aurora^{Expert,} Aurora^{Remote} or similar, ISDN protocol analyzer

4.2.2 Installation Procedure

Table 4-10 HiPath 3550, 3350, 3500, 3300 - System Installation Procedure

Step	Installation Activity	
	Installing HiPath 3550 and HiPath 3350	**Installing HiPath 3500 and HiPath 3300 (19-Inch Housing)**
1.	Selecting the Installation Site, page 4-86 (usually predetermined)	Selecting the Installation Site, page 4-109 (usually predetermined)
2.	Unpacking the Components, page 4-89	Unpacking the Components, page 4-110
3.	Not for U.S.: Mounting the Main Distribution Frame (HiPath 3550 only), page 4-89	Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall, page 4-111
4.	Removing the System Housing Cover, page 4-91	Installing a HiPath 3500 or HiPath 3300 in a Cabinet, page 4-112
5.	Attaching the System to the Wall, page 4-93	Grounding the System, page 4-114
6.	Grounding the System and the Main Distribution Frame, page 4-94	Installing the Boards, page 4-115
7.	Installing the Boards, page 4-97	Connecting Cables and the Line Network, page 4-116
8.	Laying the Line Network and Connection Cables, page 4-97	Configuration Notes, page 4-118
9.	Attaching Ferrite, page 4-101	Connecting Workpoint Clients, page 4-121
10.	Configuration Notes, page 4-103	Making Trunk Connections, page 4-121
11.	Connecting Workpoint Clients, page 4-107	Performing a Visual Inspection, page 4-121
12.	Making Trunk Connections, page 4-107	
13.	Performing a Visual Inspection, page 4-107	

4.2.3 Installing HiPath 3550 and HiPath 3350

This section contains information on how to install HiPath 3550 and HiPath 3350. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment and expansions.

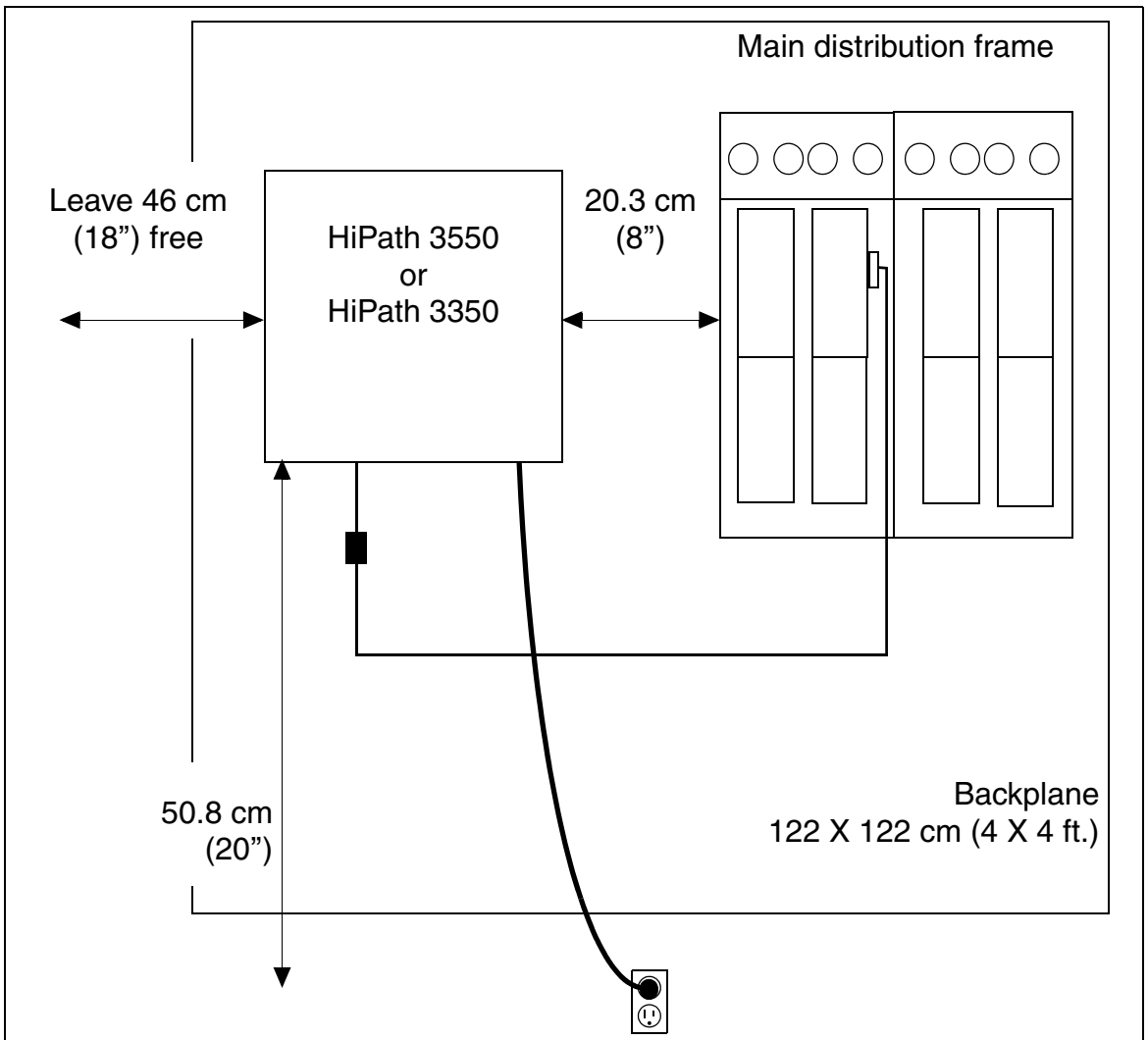
4.2.3.1 Selecting the Installation Site

Selecting a site

The customer usually has a preferred installation site in mind.

Make sure that the customer's site meets the following guidelines:

- To guarantee sufficient system ventilation, keep the area surrounding the housing clear as follows: allow 30 cm clearance on the left (for board replacement), and 10 cm clearance on the right, top and bottom of the housing.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.11.
- Ensure that the installation site is in the immediate vicinity of an electrical outlet
- Allow space for a main distribution frame or other additional equipment.
- Install lightning and surge arrester equipment.
- Avoid standard carpeting, as it tends to produce electrostatic charges.
- Ensure that a distance of at least 40 in. (101.6 cm) is left between Siemens Enterprise Communications GmbH & Co. KG equipment and other electrical equipment. The National Electrical Code (NEC) requires 36 in. (91.44 cm) of clearance in front of electrical equipment and 40 in. (101.6 cm) of clearance from other electrical service equipment.
- Ensure that the equipment room for the system provides adequate space for installation and maintenance activities, including removing and replacing the cover). See Figure 4-48 for space requirements on the sides of the system. We recommend using a plywood backboard at least 0.5 in. (127 mm) thick and measuring at least 4 ft. (122 cm) by 4 ft. (122 cm.).



The system measures 18 by 17.7 inches (46 x 45 cm). The following spaces should be allowed: 18 in. (46 mm) of clearance on the left, and at least 8 in. (203 mm) of clearance on the top and right. Allow 20 in. (50.8 cm) of clearance on the bottom (for cables).

Bild 4-48 HiPath 3550 and HiPath 3350 – Space Requirements

You will find information on the design and dimensions in the following section:

- HiPath 3550 Section 2.1.4.2
- HiPath 3350 Section 2.1.4.3

4.2.3.1.1 For U.S. only: AC Outlet

The AC connection must fulfill the requirements specified in Table 4-11.

Table 4-11 Electrical Connection Values (for U.S. only)

Nominal voltage	Nominal voltage range		Nominal Frequency Range		Wall Outlet Configurations
	from	to	from	to	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

AC Power Outlet Requirements

- The power source may not be more than 2 m (6 ft.) from the system.
- The power source must supply a voltage of 120 V AC (single phase, fused) in 50-60 Hz.
- A warning should be attached to the circuit breaker to prevent accidental removal of power.
- An independent electric circuit with an isolated ground conductor should be used.
- Recommendation: Add a power surge protector between the outlet and the system.

4.2.3.2 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.



Caution
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.2.3.3 Not for U.S.: Mounting the Main Distribution Frame (HiPath 3550 only)

Introduction

MDFU is the main distribution frame used (see Figure 4-49).

Installation notes

The MDFU-E main distribution frame should be installed in the direct vicinity of the system (note length of connection cable) and at eye level. Mount it on the wall according to the instructions that came with it. The bag attached to the cover contains a drill template. It also contains the necessary screws and wall anchors for attaching the MDF to the wall.

The MDFU must be grounded. Refer to Section 4.2.3.6 for an explanation of the procedure.

Procedure for mounting the MDFU on the wall

Step	Activity
1.	Use the template to drill the holes.
2.	Insert the wall anchors and screw in the screws, leaving 5 mm projecting.
3.	Remove the housing cover and mount the MDFU-E on the brackets.
4.	Tighten the screws through the holes.

Layout and dimensions of the MDFU

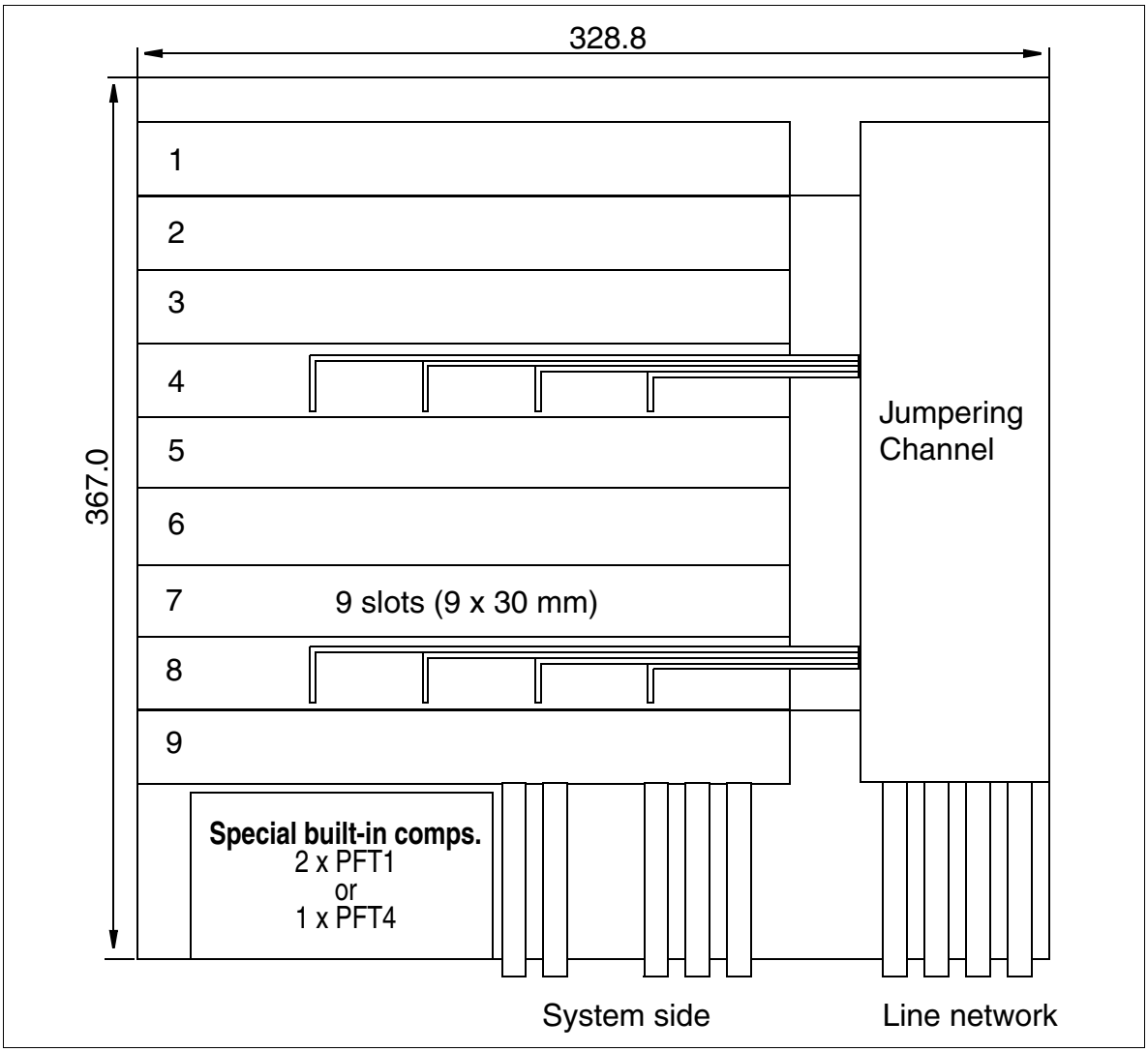


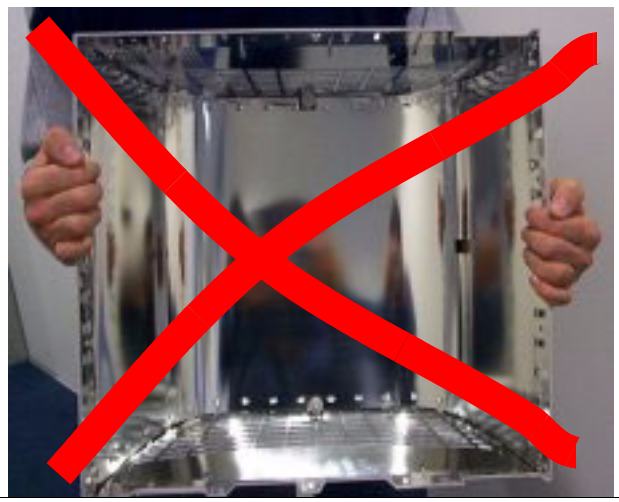
Figure 4-49 MDFU - Layout and Dimensions (367.0 x 328.8 x 125.4 mm) (not for U.S.)

4.2.3.4 Removing the System Housing Cover

Warning
To prevent injuries, you must observe the following instructions for the removal and attachment of the HiPath 3550 and HiPath 3350 housing cover.

Procedure

Step	Activity
1.	Loosen the two screwed plugs on the housing cover with a slotted screw driver. Hold the housing cover so that it does not fall. 

Step	Activity
2.	Remove the housing cover. **Warning** **Grasp the housing cover by its outside walls only.** The shielding plate on the inside of the cover may have sharp edges which can cause cuts.   

Mounting the housing cover

To close the system housing again, put the cover on and fasten it with the two screwed plugs. To avoid injuries, grasp the housing cover by its outside walls only when mounting it.

4.2.3.5 Attaching the System to the Wall

Attach the system to the wall as shown in Figure 4-50.

Attaching the HiPath 3550 and HiPath 3350 housing to the wall

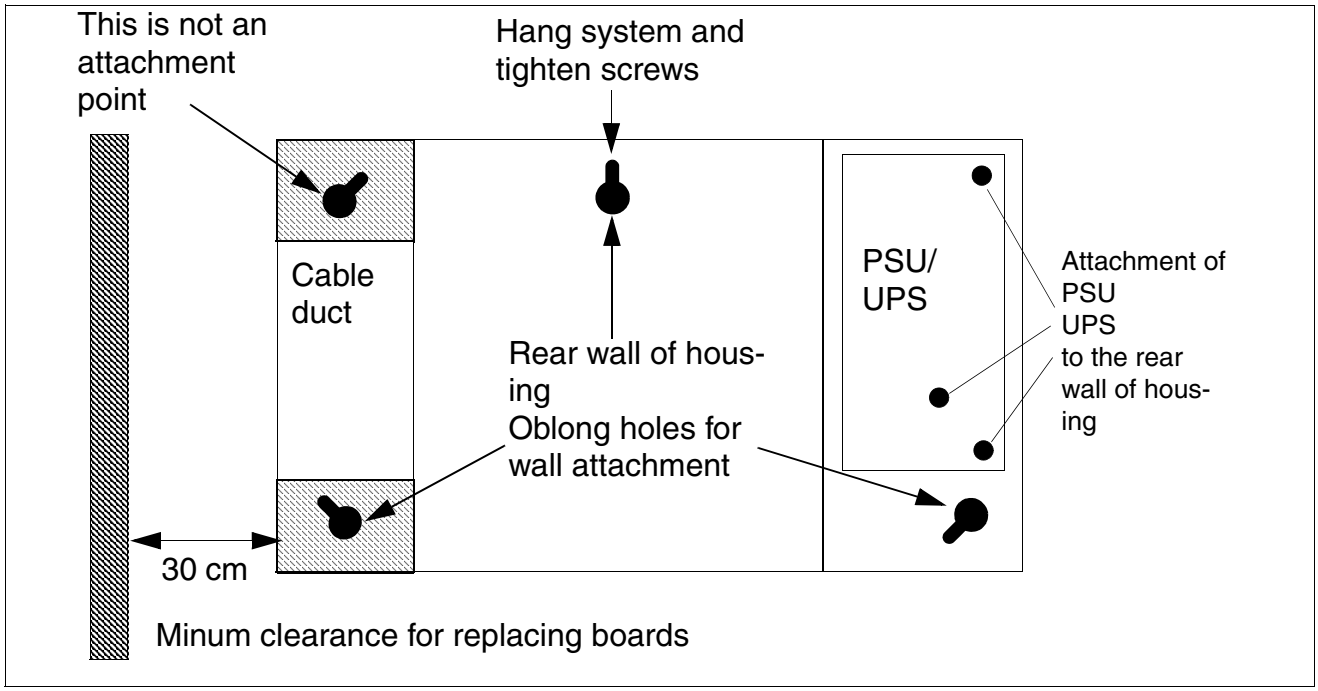


Figure 4-50 HiPath 3550 and HiPath 3350 - Wall Attachment

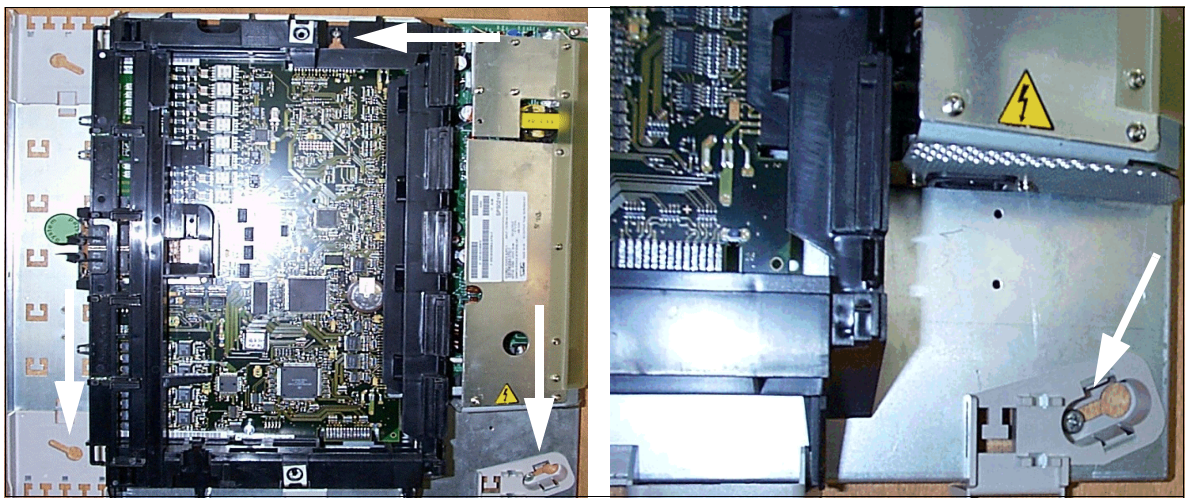


Figure 4-51 HiPath 3550 and HiPath 3350 - Wall Attachment

4.2.3.6 Grounding the System and the Main Distribution Frame

Implementation guidelines in accordance with IEC 60364 and IEC 60950-1 must be adhered to during installation.

DANGER
Risk of electric shock through contact with live wires
If your personnel are not qualified to work on the low-voltage network (230Vac) you must hire a licensed electrician. The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.

Grounding of the System

NOTE:
Because of their safety class, the HiPath 3550 and HiPath 3350 do not require additional grounding.
If additional grounding is necessary due to specific national requirements (for example in Finland, Norway, U.S.), the wall housing HiPath 3550 and HiPath 3350 must be grounded by a separate ground conductor via the ground connection marked "⏚".

USA and Canada: Design of the separate ground conductor

The connector cables of systems HiPath 3550 and HiPath 3350 have a ground conductor. The system must also be grounded by a separate ground conductor. This grounding connection must meet the requirements of the relevant authorities (U.S. National Electrical Code, Canadian Electrical Code). Lay a separate ground conductor from the grounding point to the system’s ground connection. The cross-section of the ground conductor must measure at least 14 AWG.

Grounding for the external main distribution frame

The system ground and that of the external MDF must be set from the building’s potential equalization bus in a star configuration.

- Not for U.S.:
  - HiPath 3550: Shipments always include an MDFU (Germany only) and two grounding cables. Use one of the cables to ground the MDFU. It is not necessary to ground the connection between the MDFU and HiPath 3550 (see Figure 4-52).
  - HiPath 3350: This system type does not require an external main distribution frame. The connection cables to the peripherals are attached directly to the boards and routed to the outside via a cable duct inside the housing.

DANGER
Risk of electric shock through contact with live wires
An external main distribution frame which requires grounding (if the existing ground connection is marked "⏚") must be grounded by a separate ground conductor (minimum cross-section = 2.5 mm^2)

Refer to Figure 4-52 when replacing a customer system but maintaining the existing external main distribution frame.

- For U.S. only:

  The customer supplies a main distribution frame to complete the communications system. Mount and ground the MDF in accordance with the manufacturer's instructions.

Grounding an external main distribution frame

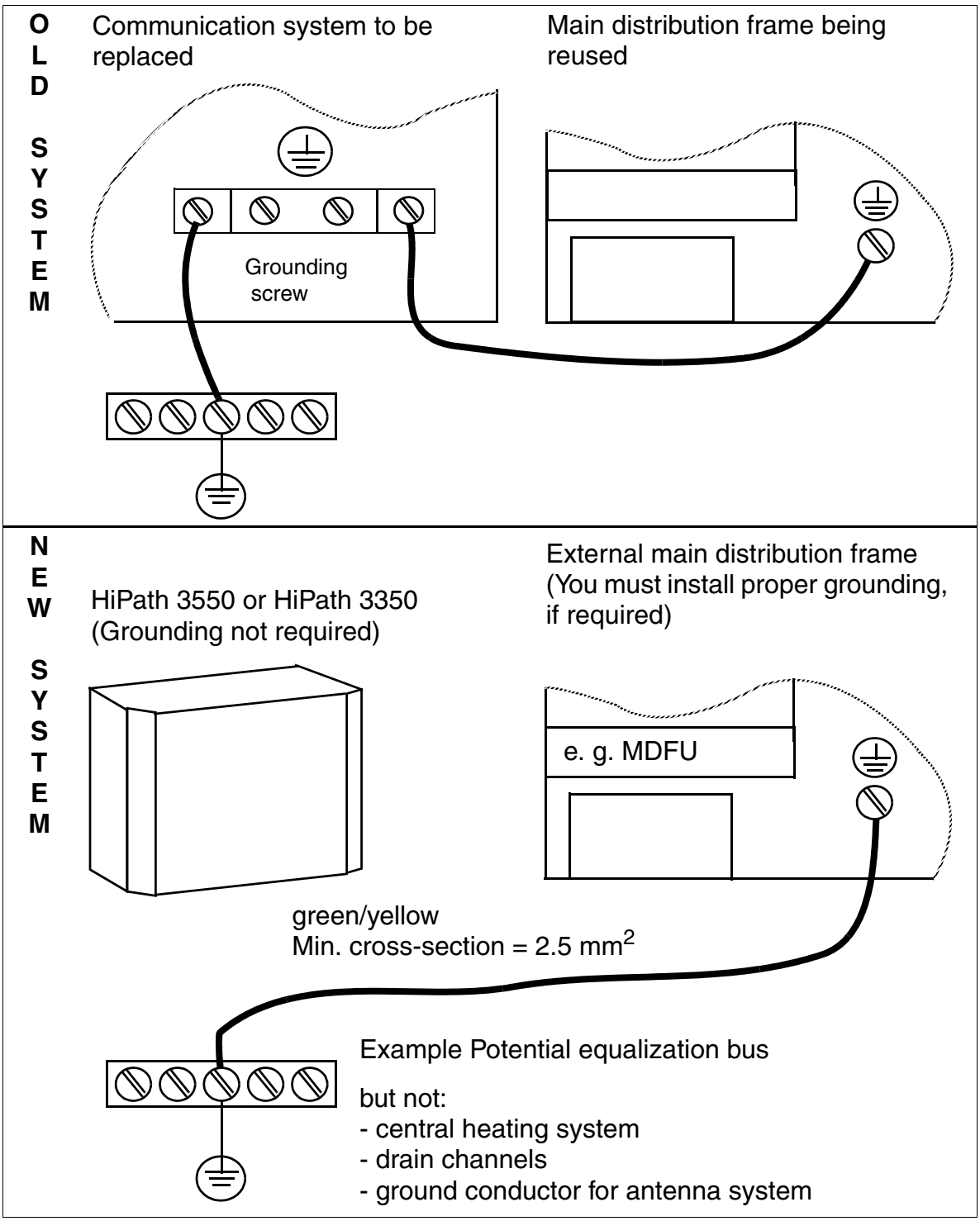


Figure 4-52 HiPath 3550, HiPath 3350 - Grounding an External Main Distribution Frame

4.2.3.7 Installing the Boards

Outside the U.S., the system is already equipped with the boards needed for the customer-specific requirements when the system is delivered.

In the U.S., you may need to install the boards.

Connecting to T1, PRI, or CorNet (for U.S. only)

> **Caution**
> The TST1 Module (HiPath 3550) can be installed only in conjunction with a listed channel service unit (CSU).

4.2.3.8 Laying the Line Network and Connection Cables

HiPath 3550 and HiPath 3350 - CABLU for connection to the external main distribution frame

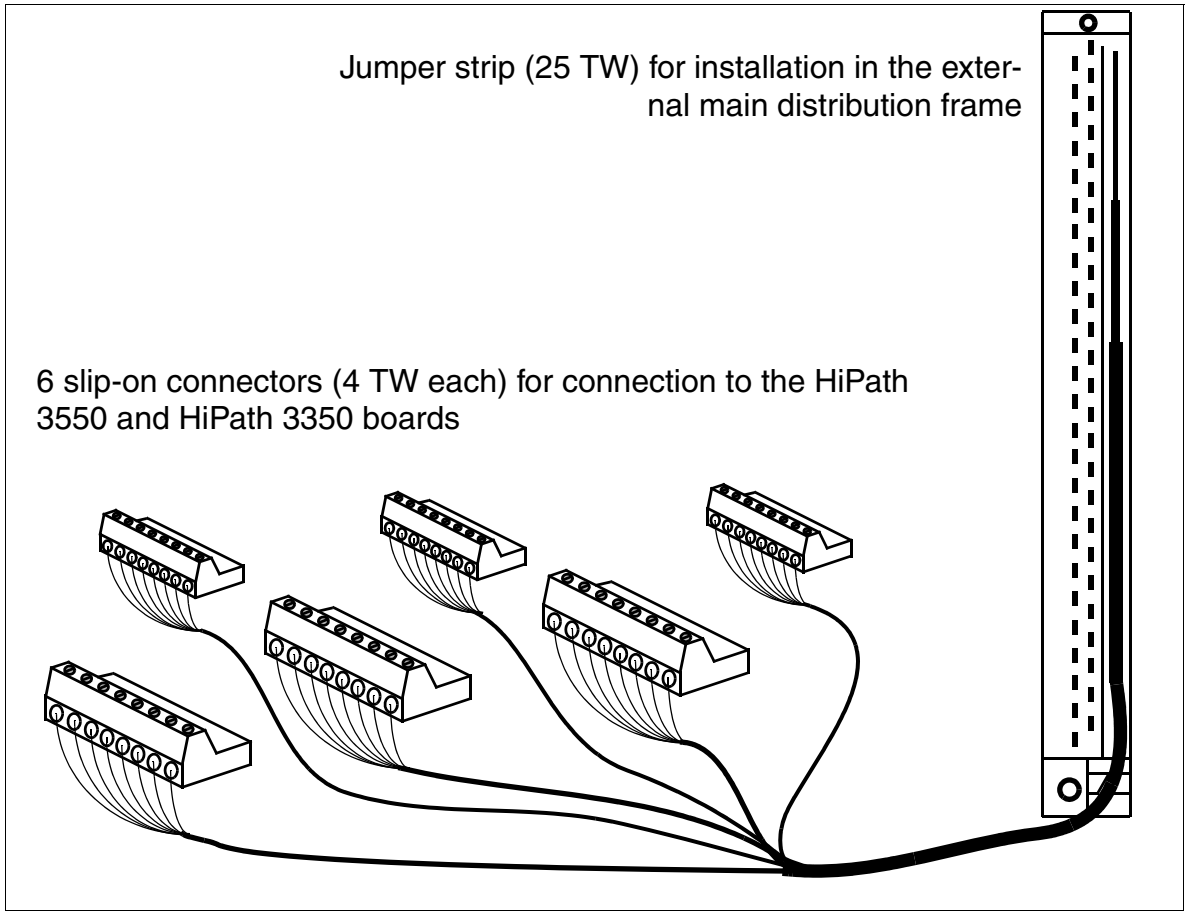
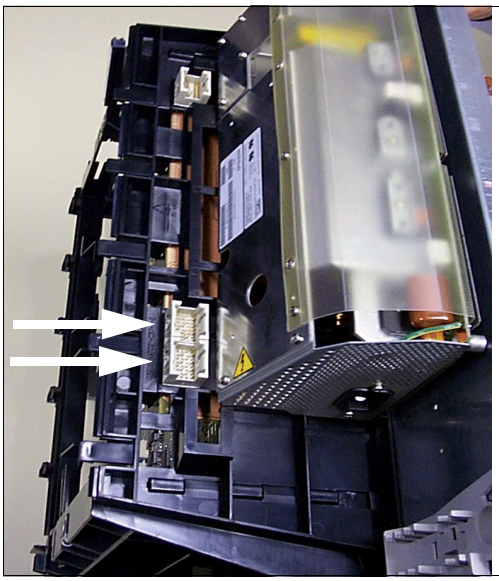


Figure 4-53 Layout of CABLU S30269-Z41-A30 (Length = 3 m)

HiPath 3550 - MDFU ports for peripheral boards



The two arrows on the left mark the connections for the cables coming from the main distribution frame (MDFU).

Figure 4-54 HiPath 3550 - Backplane port for peripheral board

Not for U.S.: HiPath 3550: Connecting the Cabling

If	Then
SLA8N SLA16N SLA24N SLC16N SLMO24	Route the 16 TW to the MDFU via the SU X8 and 8 TW via SU X9 (see Figure 4-54) using a standard cable (with 16 TW). Connect both cables (= 1 CABLU with SU connectors labeled 8 and 9) to the same jumper strip (25 TW).
Slot with any other peripheral board	• Without an external main distribution frame (MDFU): You can attach cables for the peripheral boards directly to the boards (see Figure 4-55 for the slip-on connectors) and route them to the MDFU through the cable duct inside the housing. • With an external main distribution frame (MDFU): Use CABLU S30269-Z41-A30 (Figure 4-53) to connect the peripheral boards to the customer's line network. As shown in Figure 4-55, you can connect the eight-pin slip-on connectors to the boards directly. The line network connects directly to the jumper strip.

Not for U.S.: HiPath 3350: Connecting the Cabling

The **integrated distribution frame** in HiPath 3350 allows you to connect the cable network to the trunk and the stations using screw connections on slip-on connectors. The slip-on connectors (C39334-Z7089-C13) can be easily removed for easy system connection and disconnection.

The peripheral boards and optional boards contain a distribution frame component in the form of edge connectors on the boards.
The slip-on connectors for these edge connectors are supplied with the boards.

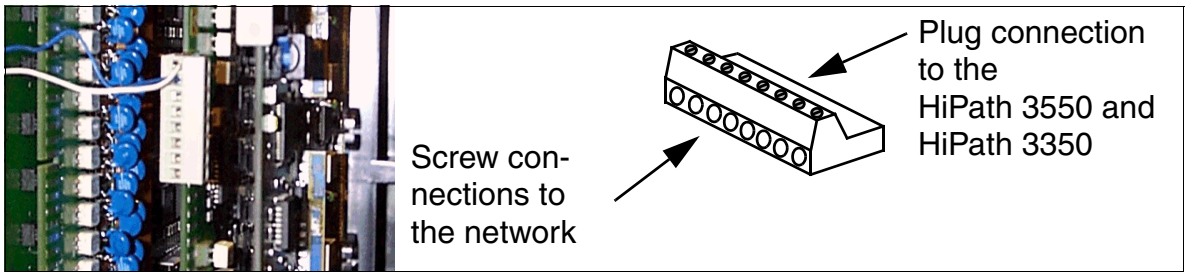


Figure 4-55 Integrated Distribution Frame - Slip-On Connector Screw Connections

If you have an **external main distribution frame** (MDFU), use CABLU S30269-Z41-A30 (Figure 4-53) to connect the peripheral boards to the customer's line network. As shown in Figure 4-55, you can connect the 8-pin slip-on connectors directly to the boards. The line network connects directly to the jumper strip.

For U.S. only: HiPath 3550 and HiPath 3350: Connecting the Cabling

If the boards are not already connected to the appropriate cables leaving the system, you need to connect them.

- The TST1 Module (HiPath 3550) connects to a customer-supplied channel service unit (CSU) using the supplied cable. The CSU offers the required additional primary protection.
- Each port on the STLS4 Module connects to an S_0 bus using the supplied, silver-satin connector cord and a surface-mounted RJ21X jack. The surface-mounted RJ21X jack is not supplied.

  The signals must be reversed in the RJ45X jack. See Figure 3-76.
- The board in Slot 10 of HiPath 3550 connects using a special cable from the backplane to the main distribution frame (MDF).
- The remaining peripheral boards and options are connected by means of a mains distributor provided on the customer side or a comparable unit. This is where the MDF cables supplied are used (Octopus cable with Amphenol terminators). You select the output pattern on the Amphenol connector by which slip-on connector you use on each board edge connector.

- Note: The MDF cable reverses the signals coming from the board. This means that R/T on the board interface becomes T/R on the Amphenol connector.

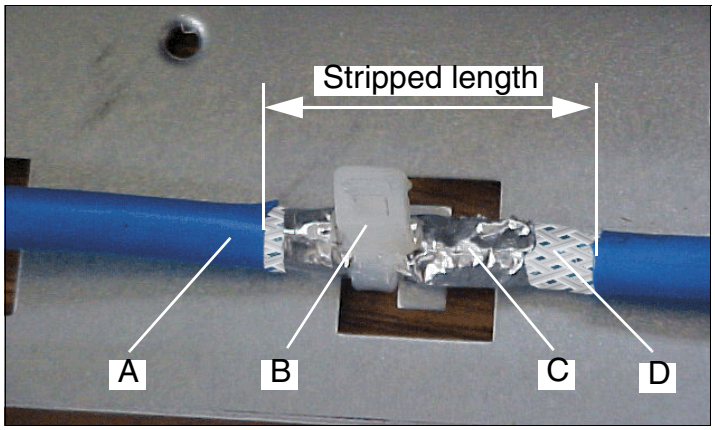
HiPath 3550 and HiPath 3350: connecting the LAN cable for HXGS3

LAN cables are connected to HXGS3 boards in a HiPath ... 3550 or HiPath ... 3350 according to the description in Section 3.3.4.

- **Electromagnetic shielding**

  To ensure sufficient electromagnetic shielding (according to EN 55022), a shielded LAN cable must be used, or the LAN cable being used must already be shielded.

- **Procedure: LAN cable shield contacts**

Step	Activity
1.	Expose the external shield (D) by stripping the LAN cable sheath (A). Stripped length = approx. 30 mm. 
2.	Wrap conductive tape (C) around the exposed external shielding at least 1.5 times and use a cable binder (B) to attach it to the housing, maintaining a continuous conducting contact between the tape and the housing (see figure).

4.2.3.9 Attaching Ferrite

To keep within the interference limit required by EMC Class B, you must attach ferrite to the following lines.

HiPath 3550 and HiPath 3350 power cables (wall housing)

The wall housing's power cable must be guided through the C39022-Z7000-C7 ferrite sleeve that is included in the accessory pack. Position the ferrite sleeve as shown in Figure 4-56 so that you will be able to close the housing cover.

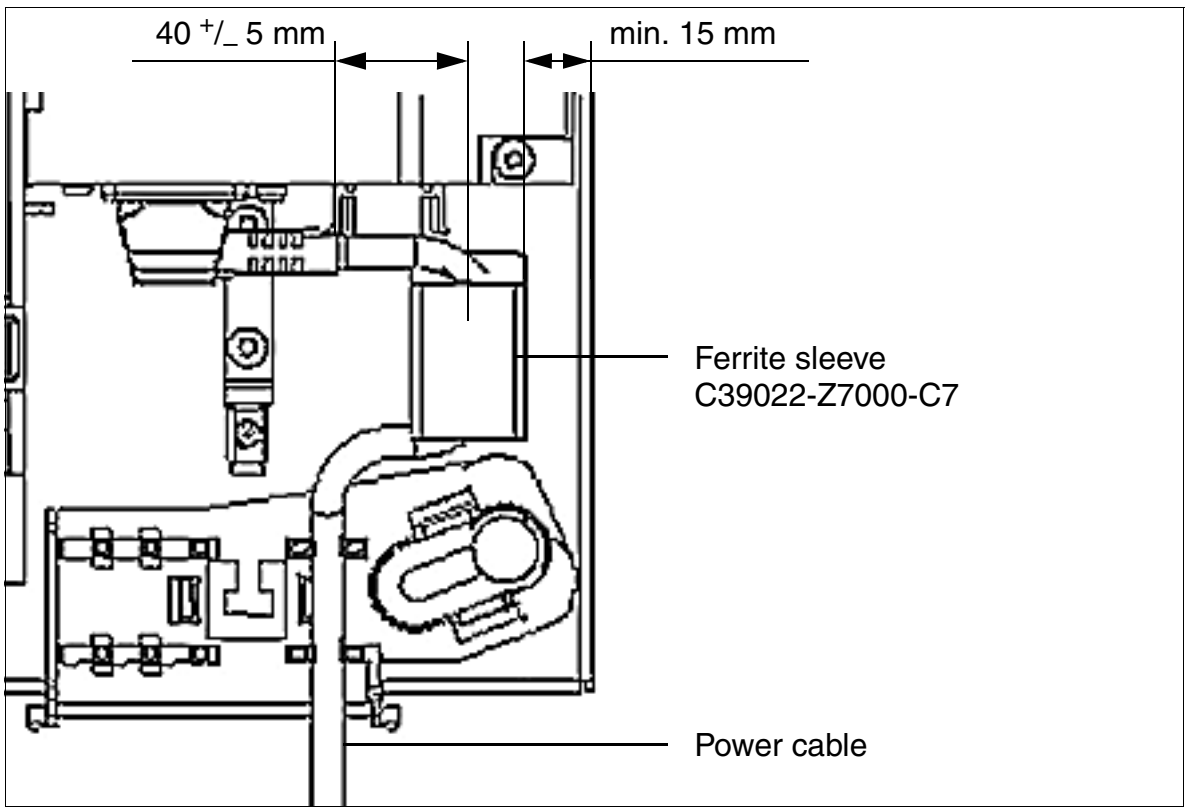


Figure 4-56 HiPath 3550 and HiPath 3350 - Power Cable with Ferrite Sleeve

Digital and analog trunk and subscriber lines of the HiPath 3550 and HiPath 3350 (wall housing)

If	Then
HiPath 3550	• Trunk or subscriber line modules in “large” format: Guide both standard cables from SUX8 and SUX9 (see Fig. 4-55) to the MDFU through two ferrite sleeves (C4-Z55-C39022) each. The ferrite should be placed as far inside the housing as possible. • Trunk or subscriber line modules in “small” format: Guide the trunk and subscriber lines of all ports connected on a board through a ferrite sleeve (C39022-Z7000-C6) twice, i.e. in a loop. More than one trunk or subscriber line can be guided through a ferrit sleeve. You can guide as many lines through a ferrit sleeve as long as the ferrit sleeve can still be closed properly. These means there can be no gap between the two ferrit halves. The ferrit sleeves should where possible be mounted in the cable duct. If the number of lines makes this impossible, the ferrite can be attached directly at the output of the cable duct.
HiPath 3350	Guide the trunk and subscriber lines of all ports connected on a board through a ferrite sleeve (C39022-Z7000-C6) twice, i.e. in a loop. More than one trunk or subscriber line can be guided through a ferrit sleeve. You can guide as many lines through a ferrit sleeve as long as the ferrit sleeve can still be closed properly. These means there can be no gap between the two ferrit halves. The ferrit sleeves should where possible be mounted in the cable duct. If the number of lines makes this impossible, the ferrite can be attached directly at the output of the cable duct.

If there are insufficient ferrit sleeves supplied in the accessory pack for all trunk and subscriber lines, additional ferrit sleeves must be ordered:

- L30460-X1358-X-* (direct sales) / L30251-U600-A229 (export): Contains 5 ferrit sleeves C39022-Z7000-C6
- L30460-X1359-X-* (direct sales) / L30251-U600-A230 (export): Contains 9 ferrit sleeves C39022-Z7000-C6

4.2.3.10 Configuration Notes

Restrictions for equipment with IVMP8, IVMS8, TST1 and TS2 boards must be observed.

HiPath 3550: system overview and slots

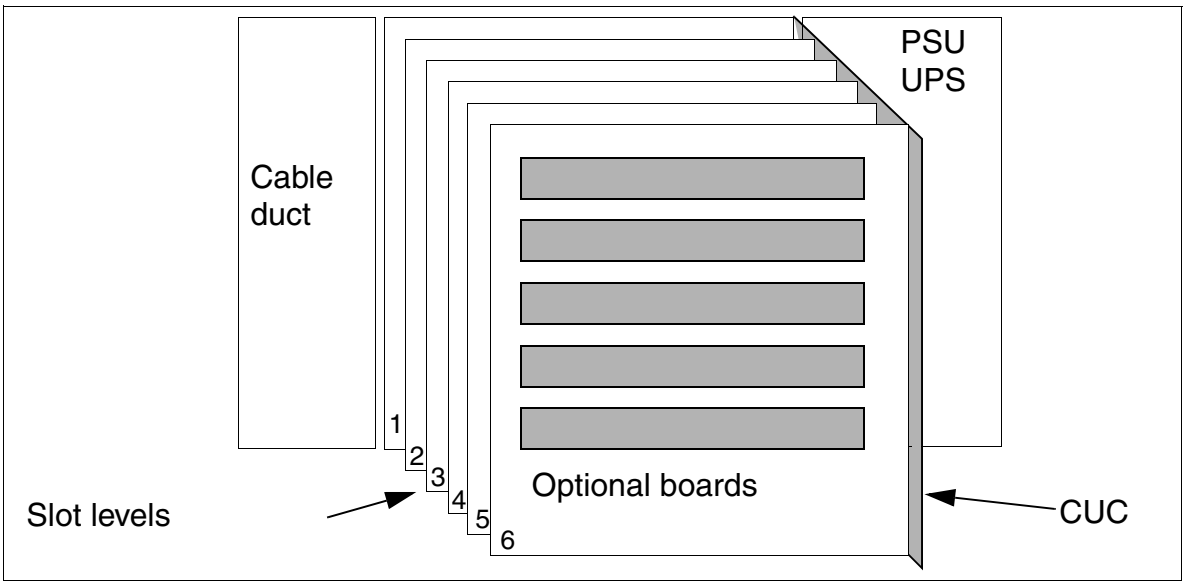


Figure 4-57 HiPath 3550 - Wall Housing System Overview

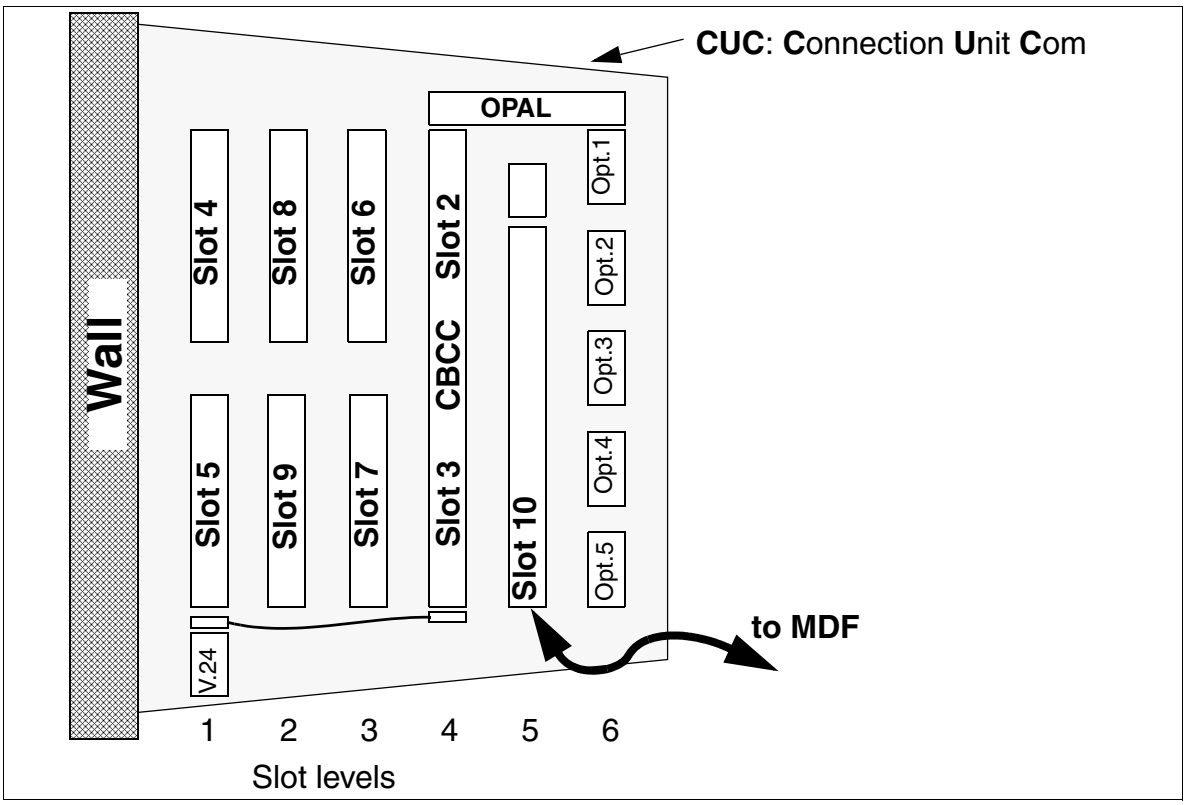
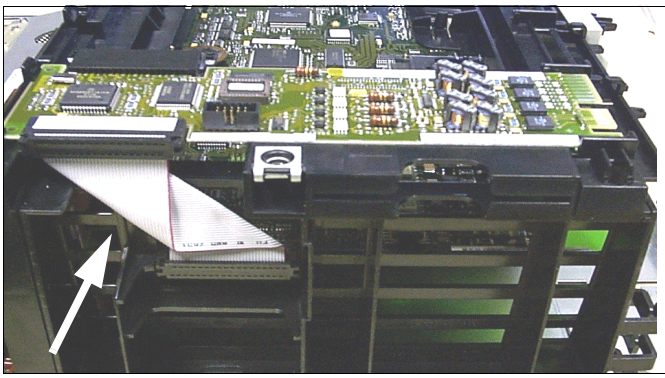


Figure 4-58 HiPath 3550 - Slots in the Wall Housing



The CBCC board is connected to the optional board via a ribbon cable (OPAL) (see adjacent figure).

Figure 4-59 HiPath 3550 - Option Adapter Long (OPAL)

HiPath 3350: system overview and slots

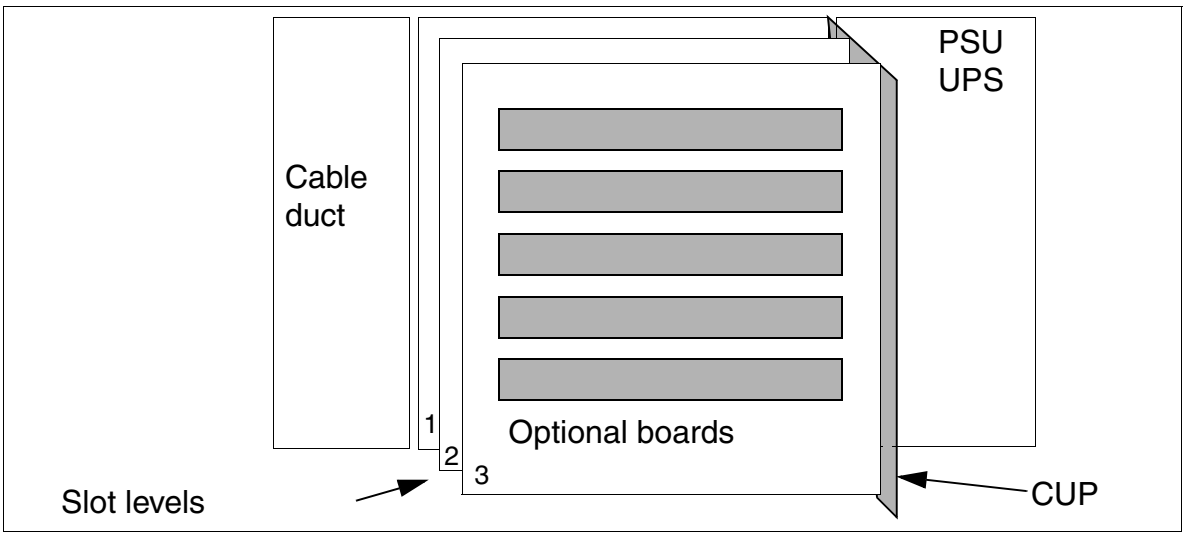


Figure 4-60 HiPath 3350 - Wall Housing System Overview

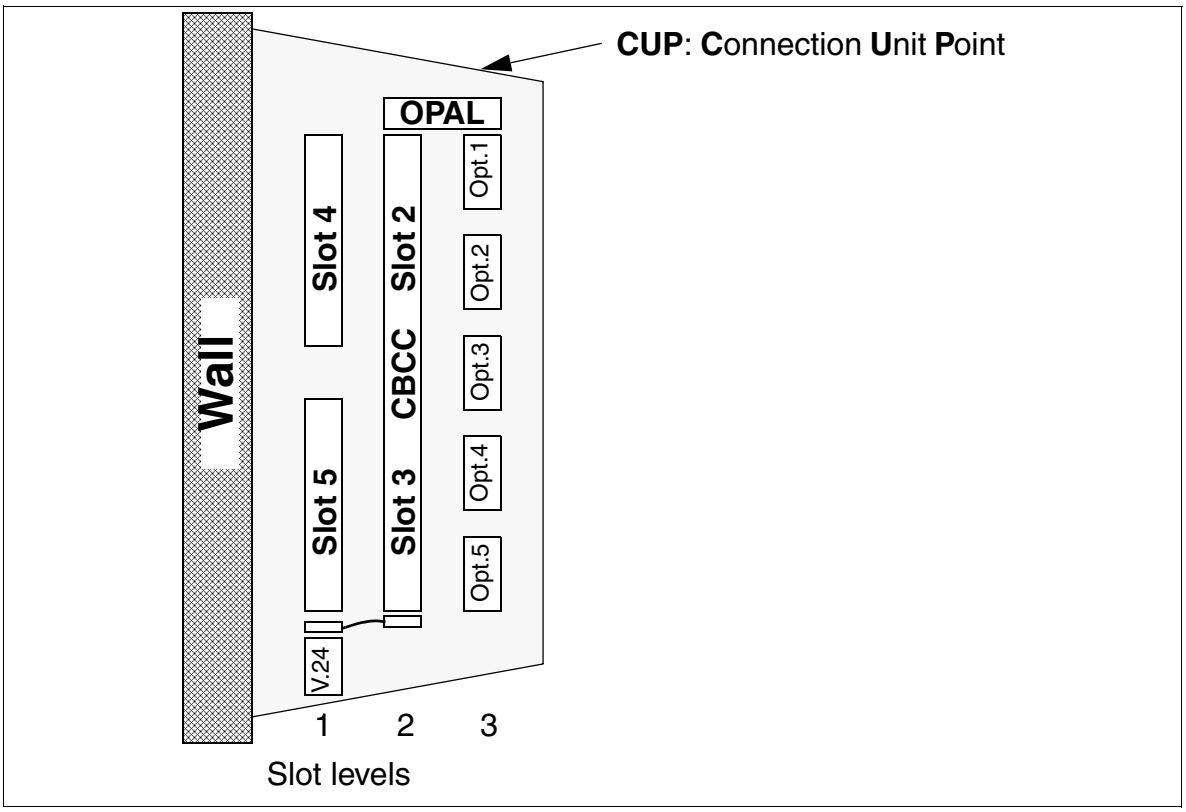


Figure 4-61 HiPath 3350 - Slots in the Wall Housing

Static traffic capacity

The HiPath 3550 and HiPath 3350 systems have the following static traffic capacities.

Table 4-12 HiPath 3550 and HiPath 3350 - Static Traffic Capacity

System	Slots	Static traffic capacity	Total static traffic capacity of the system
HiPath 3550 (see Figure 4-58)	2 / 3 (CBCC)	24 erlangs	198 erlangs
	4	16 erlangs	
	5	16 erlangs	
	6	16 erlangs	
	7	16 erlangs	
	8	16 erlangs	
	9	30 erlangs[1]	
	10	64 erlangs	
HiPath 3350 (see Figure 4-61)	2 / 3 (CBCC)	24 erlangs	56 erlangs
	4	16 erlangs	
	5	16 erlangs	

1 Use of a TS2 board results in a capacity of 30 erlangs. A maximum of one TS2 per HiPath 3550 is possible, and the board may only be installed in slot 7 or 9, thus resulting in 30 Erlangs for slot 7 or 9.

4.2.3.11 Connecting Workpoint Clients

For information, see Chapter 10.

4.2.3.12 Making Trunk Connections

Refer to the following board descriptions for information:

- STLS2 (not for U.S.), STLS4 (S_0 trunk connection)
- TS2, HiPath 3550 only (S_{2M} trunk connection)
- TLA2 (Not for U.S.), TLA4 (Not for U.S.), TLA8 (not for U.S.) (MSI)
- TMAMF (for selected countries only), HiPath 3550only
- TMGL4 (for U.S. only)
- TMQ4 (for U.S. only)
- TST1 (for U.S. only), HiPath 3550only

4.2.3.13 Performing a Visual Inspection

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The visual inspection must be performed while the system is disconnected from the power supply.



Caution
Conduct the visual inspection only while the system is disconnected from the power supply.
Always wear an antistatic wristband and observe the measures for protecting electrostatically sensitive devices (see Section 1.4.6, “Notes”).

Step	Activity	Resources/Remarks	Possible remedies
1.	Compare the slots for the installed boards with the board assignment map.	Board assignment map	Correct the board configuration and notify the sales department.
2.	Check the local line voltage.	Digital multimeter	



After finishing the visual inspection, you can begin starting up the system as described in Chapter 5.

4.2.4 Installing HiPath 3500 and HiPath 3300 (19-Inch Housing)

This section contains information on how to install the HiPath 3500 and HiPath 3300 19-inch housing. This chapter describes the standard installation procedures for the basic system. Refer to Chapter 9 for information about supplementary equipment and expansions.



Danger
The HiPath 3500 and HiPath 3300 systems can only be operated with a closed housing.
Before opening the housing, make sure that the system is de-energized as follows:

- by disconnecting the line cord attached to any connected battery pack (for UPSC-DR only).
- by disconnecting the line cord attached to any connected Powerbox PB3000.
- by disconnecting the power plug.

4.2.4.1 Installation Versions

HiPath 3500 and HiPath 3300 are designed for the following types of installation:

- Wall attachment (with assembly kit)
- Desk installation (assembly kit includes adhesive feet)
  Stick the adhesive feet to the bottom of the housing.
- Installation into 19" cabinet (with assembly kits for HiPath 3500 and HiPath 3300)

These systems also support the use of Powerbox PB3000. PB3000 can accommodate four batteries and/or an additional LUNA2 external power supply unit. The batteries guarantee uninterruptible power supply. LUNA2 is needed if the system's internal power supply unit is insufficient. Additional information can be found in Section 9.1.3, "Inserting Powerbox PB3000".

4.2.4.2 Selecting the Installation Site

Selecting a site

The customer usually has a preferred installation site in mind, for example an existing 19-inch cabinet.

Make sure that the customer's site meets the following guidelines:

- To guarantee sufficient system ventilation, allow a minimum of 10 cm clearance around the housing.
- Do not expose the systems to direct sources of heat (for example sunlight and heaters).
- Do not expose the systems to extremely dusty environments.
- Avoid contact with chemicals.
- Take every precaution to prevent the formation of condensation on the system during operation. Systems covered with condensation must be dried before being used.
- Observe the environmental conditions specified in Section 2.11.

You will find information on the design and dimensions in the following section:

- HiPath 3500 Section 2.1.4.4
- HiPath 3300 Section 2.1.4.5

4.2.4.2.1 For U.S. only: AC Outlet

The AC connection must fulfill the requirements specified in Table 4-13.

Table 4-13 Electrical Connection Values (for U.S. only)

Nominal voltage	Nominal voltage range		Nominal Frequency Range		Wall Outlet Configurations
	from	to	from	to	
120 V AC/ 60 Hz	110 V AC	130 V AC	47 Hz	63 Hz	NEMA 5-15, 2-pin, 3-wire, earth

4.2.4.3 Unpacking the Components

Procedure

Step	Activity
1.	Compare the components with the packing slip or customer receipt to make sure that they are correct and complete.
2.	Determine whether any damage has occurred during transport and report it to the proper departments.
3.	Dispose of the packing materials properly.



Caution
Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.

4.2.4.4 Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall

Procedure for wall mounting (Figure 4-62)

Step	Activity
1.	Drill a hole in the selected wall, insert a wall anchor and screw in the screws.
2.	Screw the angle brackets (A) and (B) for HiPath 3500 or HiPath 3300 onto the base of the device.
3.	Mount the system with the angle bracket (A) on the screws.
4.	Drill a second hole in the wall for the lower angle bracket (B), insert a wall anchor and attach the angle bracket with a screw.

Wall mounting

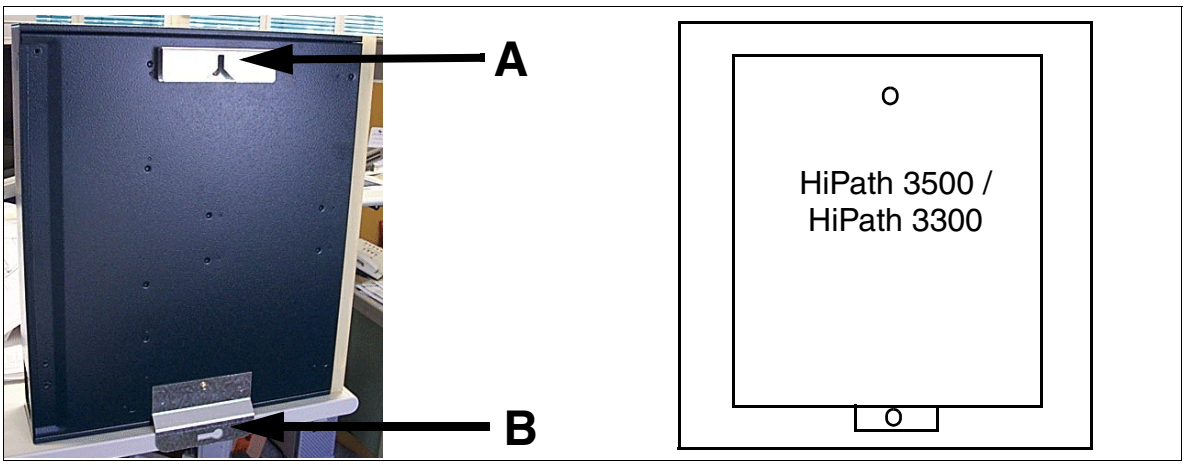


Figure 4-62 HiPath 3500 and HiPath 3300 - Wall Installation (for U.S.)

4.2.4.5 Installing a HiPath 3500 or HiPath 3300 in a Cabinet

Procedure for 19-inch cabinets (Figure 4-63)

Step	Activity
1.	HiPath 3500 only: Attach the two angle brackets (A) to the 19-inch cabinet using two screws per bracket.
2.	Attach the two angle brackets (B) to the left and right of the HiPath 3500 or HiPath 3300 using two screws per bracket.
3.	Slide the HiPath 3500 or HiPath 3300 system into the 19-inch cabinet and attach it to the left and right of the 19-inch frame with screws.

Mounting the 19-inch cabinet

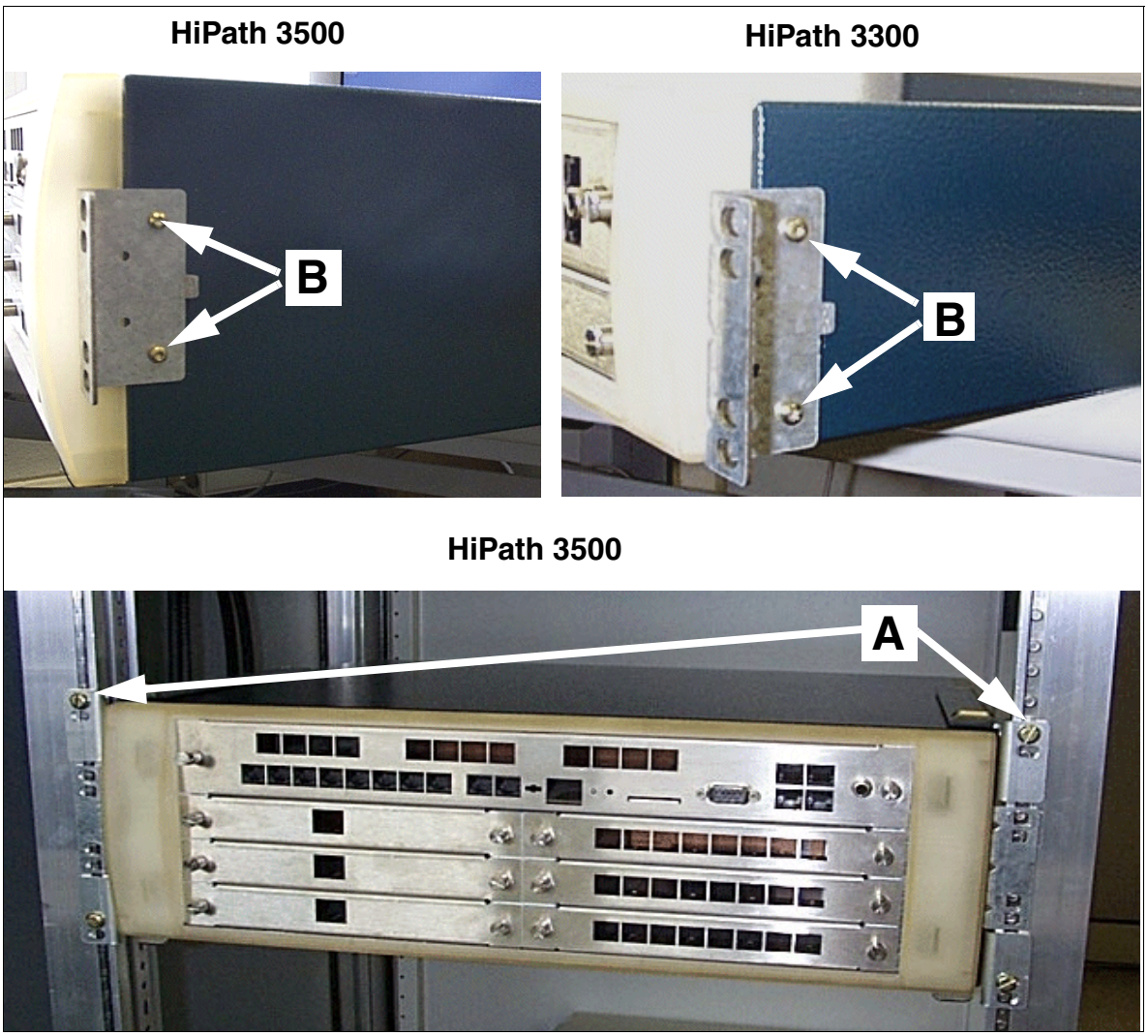


Figure 4-63 HiPath 3500 and HiPath 3300 - Mounting the 19-Inch Cabinet

4.2.4.6 Grounding the System

Implementation guidelines in accordance with IEC 60364 and IEC 60950-1 must be adhered to during installation.

Grounding: Inspection and Implementation

Preliminary Inspection of the 19-Inch Cabinet:		
Is the 19-inch cabinet grounded by a separate **ground conductor** (green/yellow)?	**NO**	The 19-inch cabinet must be grounded by a separate ground conductor (green/yellow). **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground. The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.
YES		
Does the 19-inch cabinet have a **potential equalization bus** at which the HiPath 3500 or HiPath 3300 can be grounded?	**NO**	A potential equalization bus must be installed in the 19-inch cabinet and connected to the ground conductor. **Danger** If your personnel are not qualified to work on the low-voltage network (230 Vac), you must hire a licensed electrician to install the ground. The Section 1.8.1, “Connection to the Power Circuit” is to be adhered to.
YES		
If you answer “Yes” to both questions, the HiPath 3500 or HiPath 3300 systems may be grounded as described below.		

Procedure: Ground the system

Proceed as follows to ground the HiPath 3500 and HiPath 3300 systems (see also diagram below).

Step	Activity
1.	Connect the grounding cable to the potential equalization bar on the 19-inch cabinet.
2.	Connect the grounding cable to the system's ground connection with the grounding screw supplied (point A).
3.	Attach the grounding cable (strain relief) to the system (point B) with a cable tie.

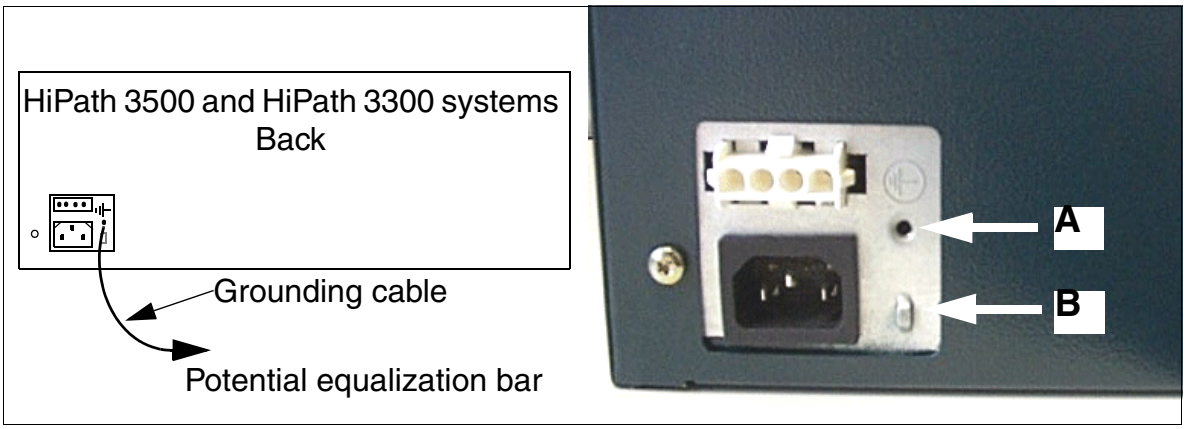


Figure 4-64 HiPath 3500 and HiPath 3300 - Grounding

Danger
The HiPath 3500 and HiPath 3300 housing to be wall-mounted must be grounded by a separate ground conductor (such as a potential equalization bar). Make sure that the ground conductor is securely installed and strain-relieved.
Failure to follow these instructions can result in electrical shock.

4.2.4.7 Installing the Boards

The systems are already equipped with the boards needed for the customer's specific requirements.

4.2.4.8 Connecting Cables and the Line Network

Not for U.S. and Canada: PB3000 connection cable (if present)

To meet EMC requirements, the braided shields on the connection cable must be connected to the housing on both the HiPath 3500 or HiPath 3300 side **and** on the PB3000 side.

- Attaching to the HiPath 3500 or HiPath 3300 side

  Use a clip, a tooth lock washer, and a housing cover mounting screw to attach the braided shield to the HiPath 3500 or HiPath 3300 housing (as shown in Figure 4-65). The tooth lock washer must be mounted between the painted surface of the cover and the clip.

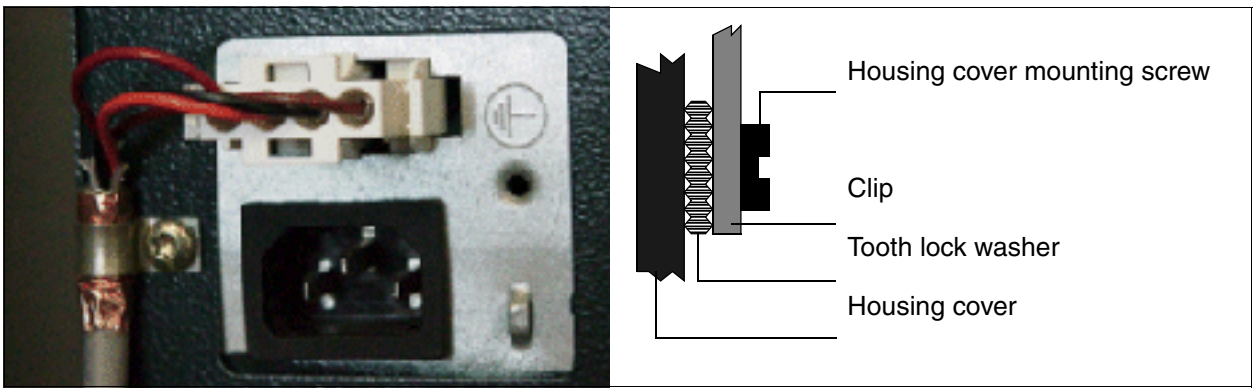


Figure 4-65 HiPath 3500 and HiPath 3300 - Connection Cable for PB3000

- Attaching to the PB3000 side (see Section 9.1.3)

Line network

The connecting cords to the peripherals can be connected directly to the relevant RJ45 jacks on the front panel of the 19-inch housing.

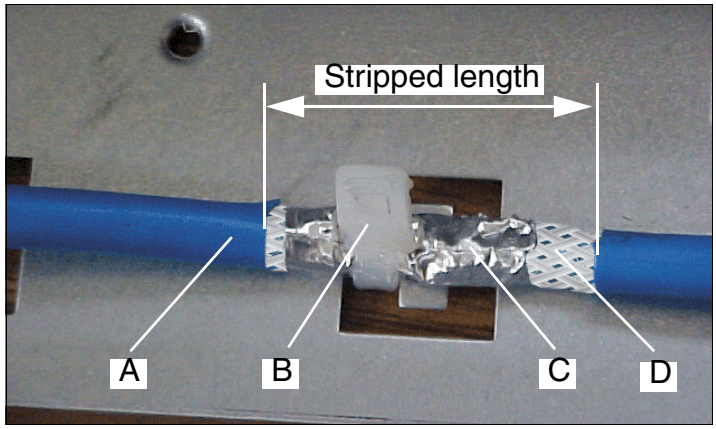
Connecting the LAN cable for HXGR3

LAN cables are connected to HXGR3 boards in a HiPath ... 3500 or HiPath ... 3300 according to the description in Section 3.3.4.

- **Electromagnetic shielding**

  To ensure sufficient electromagnetic shielding (according to EN 55022), a shielded LAN cable must be used, or the LAN cable being used must already be shielded.

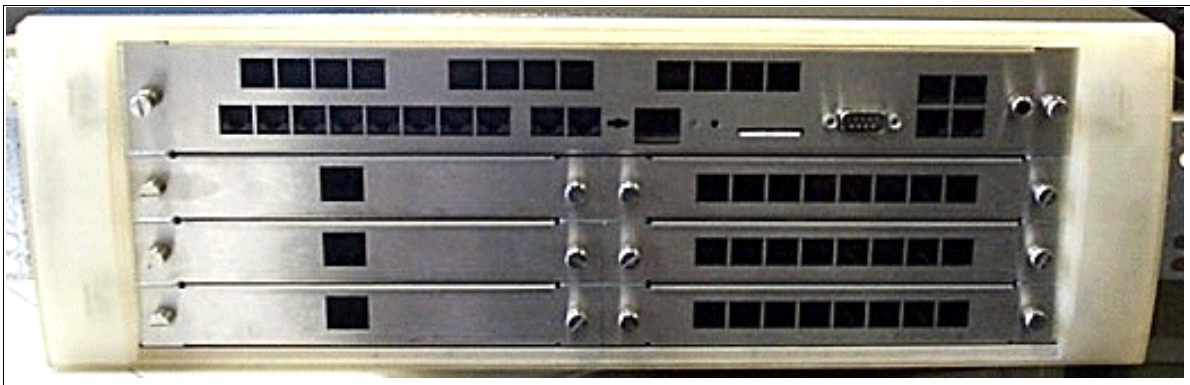
- **Procedure: LAN cable shield contacts**

Step	Activity
1.	Expose the external shield (D) by stripping the LAN cable sheath (A). Stripped length = approx. 30 mm. 
2.	Wrap conductive tape (C) around the exposed external shielding at least 1.5 times and use a cable binder (B) to attach it to the housing, maintaining a continuous conducting contact between the tape and the housing (see figure).

4.2.4.9 Configuration Notes

HiPath 3500: system overview and slots

Caution
For safety, operate HiPath 3500 only with the housing front closed. Always use dummy panels (C39165-A7027-B115) to close slots that are not equipped with boards.



Slots 1-3	
Slot 6	Slot 7
Slot 8	Slot 9
Slot 4	Slot 5

Slot levels:
5 (options)
4 (CBRC)
3 (Peripheralboards)
2 (Peripheralboards)
1 (Peripheralboards)

Figure 4-66 HiPath 3500 - Slot Levels in the 19-Inch Housing

It is imperative that you observe the restrictions regarding TS2R installation.

HiPath 3300: system overview and slots

Caution
For safety, operate HiPath 3300 only with the housing front closed. Always use dummy panels (C39165-A7027-B115) to close slots that are not equipped with boards.



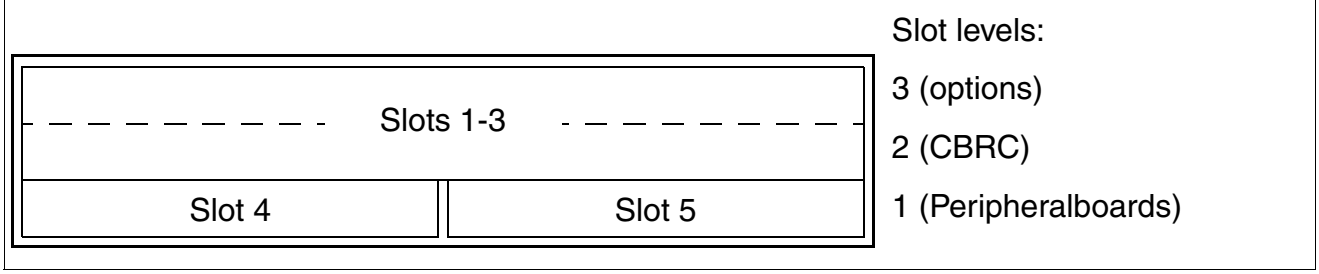


Figure 4-67 HiPath 3300 - Slot Levels in the 19-Inch Housing

Static traffic capacity

The HiPath 3500 and HiPath 3300 systems have the following static traffic capacities.

Table 4-14 HiPath 3500 and HiPath 3300 - Static Traffic Capacity

System	Slots	Static traffic capacity	Total static traffic capacity of the system
HiPath 3500 (see Figure 4-66)	2/3 (CBRC)	24 erlangs	134 erlangs
	4	16 erlangs	
	5	16 erlangs	
	6	16 erlangs	
	7	16 erlangs	
	8	16 erlangs	
	9	30 erlangs[1]	
HiPath 3300 (see Figure 4-67)	2/3 (CBRC)	24 erlangs	56 erlangs
	4	16 erlangs	
	5	16 erlangs	

1 Use of a TS2R board results in a capacity of 30 erlangs. A maximum of one TS2R per HiPath 3500 is possible, and the board may only be installed in slot 7 or 9, thus resulting in 30 Erlangs for slot 7 or 9.

4.2.4.10 Connecting Workpoint Clients

For information, see Chapter 10.

4.2.4.11 Making Trunk Connections

Refer to the following board descriptions for information:

- STLS4R (S_0 trunk connection)
- TS2R, only HiPath 3500 (S_{2M} trunk connection)
- TLA4R (not for U.S.) (MSI)
- TMGL4R (for U.S. only)
- TST1 (for U.S. only), HiPath 3500 only

4.2.4.12 Performing a Visual Inspection

Before starting up the system, you must perform a visual inspection of the hardware, cables, and the power supply. The visual inspection must be performed while the system is disconnected from the power supply.



Caution
Conduct the visual inspection only while the system is disconnected from the power supply.
Always wear an antistatic wristband and observe the measures for protecting electrostatically sensitive devices (see Section 1.4.6, “Notes”).

Step	Activity	Resources/Remarks	Possible remedies
1.	Compare the slots for the installed boards with the board assignment map.	Board assignment map	Correct the board configuration and notify the sales department.
2.	Check the local line voltage.	Digital multimeter	



After finishing the visual inspection, you can begin starting up the system as described in Chapter 5.

5 Starting Up HiPath 3000

Chapter contents

This chapter covers the following topics:

Topic
Starting Up HiPath 3800, page 5-2
Starting Up HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300, page 5-11

Privacy and Data Security



For startup and maintenance, please follow the instructions on data protection and data security (see Section 1.9, “Privacy and Data Security”).

5.1 Starting Up HiPath 3800

This section contains information on how to start up the HiPath 3800 communication system.

Warning
Only authorized service personnel should start up the system.

Danger
The system may only be started (connected to the power supply) if all system cabinets are sealed at the rear with the connection and filler panels provided.

5.1.1 Startup Procedure

Table 5-1 HiPath 3800 - Startup Procedure

Step	Startup Activity (Remarks)
1.	Supplying the System with Power, page 5-2 (Plugging in the power supply cable for the system cabinet(s) and positioning the switches for all LUNA2 power supplies to “DC-ON” –> starting system boot)
2.	Carrying Out a System Reload, page 5-6
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-7
4.	Not for U.S.: Entering the System Number, page 5-9
5.	Customer-Specific Programming, page 5-10
6.	Performing a System Check, page 5-10

5.1.2 Supplying the System with Power

Caution (for Brazil only)
The use of the outlet strip with overvoltage protection with part number C39334-Z7052-C33 is absolutely mandatory. The AC power of the system cabinet(s) must be conducted through the outlet strip with overvoltage protection.

Procedure

Step	Activity
1.	Plug in the power supply cable for the system cabinet(s). Note (for Brazil only): The AC power of a system cabinet is internally equipped with transient overvoltage protection up to approx. 2kV. Since additional lightning protection is prescribed for Brazil, the AC power of the system cabinet(s) must be conducted through the outlet strip with overvoltage protection (part number C39334-Z7052-C33). In this way, transient overvoltage protection is guaranteed up to approx. 4kV.
2.	Position all LUNA2 power supply switches to “DC-ON”. Note: Startup does not begin until the switches on all LUNA2 units are in “DC-ON” position.
3.	Monitor the RUN LED of the CBSAP. The individual steps of the system boot (Table 5-2) can be observed this way.

RUN LED HiPath 3800

The CBSAP has a RUN LED that indicates the system status.

Table 5-2 RUN LED - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

1 The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.



The HiPath 3800 is ready when the date “1. JAN 00” and the time “00:00” appear in the display on the system telephone.

5.1.2.1 Assigning Station Numbers

The first time the system is initialized, the system determines its capacity and stores the result in the CDB (customer database). After each system reset, the system accesses this data and generates a continuous numbering plan.

If the system detects changes to the board configuration during startup, the following action is taken:

If	Then
Missing or defective board	No action.
Different board type	The system does not automatically activate the board.
Underequipped or same board variant	Board is activated. The same station range is used.
Over-equipped board variant	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available.
New board in empty slot	• Board was the last one installed in accordance with the placement sequence: All boards are activated and the numbering plan continues without a gap. • Board was inserted ahead of another board in the placement sequence: Board is activated and appended to the last board in the numbering plan.

Procedure: Reinitialization

Proceed as follows if measures to expand the system configuration require reinitialization of the numbering plan:

Step	Activity	Description
1.	Disconnect the system from the power supply. Check that the system is de-energized. Expand as required.	
2.	Connect system to power supply.	A continuous numbering plan is generated (as was the case when the system was first initialized). **Notes:** • Changes to the extension numbers result in changes to the individual, extension-specific data. • Only those ports provided for in accordance with the maximum configuration are activated if the maximum line configuration is exceeded (too many trunk boards). • A mixture of subscriber line circuits and trunk lines on one S_0 board can result in gaps in line numbering. This is because all S_0 ports are initially activated as trunks and are only subsequently reconfigured.

5.1.3 Carrying Out a System Reload

After supplying the system with power, you must carry out a system reload.

Procedure



The reset/reload switch is tested by a Field Programmable Gate Array (FPGA). This FPGA is loaded by the processor when starting up the HiPath 3800 and is only fully functional after the loading process is complete. If the reset/reload switch is activated during loading, then it is not possible to evaluate the cause of the restart. For this reason, the reset/reload switch may only be activated after the system startup (green Run LED lights up).

Press and hold down the reset switch for at least 5 seconds (FAIL LED (red) goes out). If you do not hold down the reset switch for a full 5 seconds, the system may perform a reset rather than a reload or may not reload properly.

5.1.4 Carrying Out the Country Initialization and Selecting the Password Type

Since the system software no longer provides all languages, some systems no longer start up in the customary local language after the country code is entered. You must now load the local language **prior to country initialization**, using HiPath 3000/5000 Manager E (see information on multilingual text output in the Feature Description HiPath 3000/5000).
After carrying out the country initialization, but before loading the required local language, the displays come up in German.

Carry out the country initialization on the system telephone with internal station number 100 (port 01). This process loads the country-specific language and features and ensures that the system meets the country's conditions for approval.
In Germany, no country adaptation is required after a reload because the system boots with the German country code by default.

The next step involves selecting the password type.

Input procedure

Table 5-3 Entering the Country Code and Selecting the Password Type

Step	Input	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)
5.	XXXXX	You are prompted to confirm the password entered in the previous step.
6.	29-5	Country initialization
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password
8.	XX	You are prompted to enter the country code (see Page A-25). The system then boots up with the country-specific default information.

Table 5-3 Entering the Country Code and Selecting the Password Type

Step	Input	Description
Notes: • On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again. • On step 6: No country adjustment is necessary for Germany because the system starts up with German codes. • On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered in step 4.		

Entering the country code starts the system. Any data that has already been stored, such as system speed-dialing destinations and classes of service, is deleted or reset to the default value.

For Brazil only: CO call privileges, ringback protection per trunk
If the system was initialized with the country code for Brazil, the option for saving the digits dialed and transmitting them via the system (dial rule 1A) is not activated. This can lead to dialing problems at DTMF terminals because the system waits for the dial tone from the analog trunk and does not set up the connection between the DTMF terminal and the trunk until it recognizes the dial tone. Digits dialed before dial tone recognition are therefore not recognized by the CO. This in turn can impact CO call privileges.
To avoid this, Least Cost Routing LCR should be activated for all systems with the country code for Brazil and with connection to analog trunks with DTMF signaling.

After you enter a country code, the default data is only guaranteed to load correctly if the system software has been officially released for that country.

5.1.5 Not for U.S.: Entering the System Number

Introduction

Corresponding to the configuration, the system station number must be entered (without the DID number or attendant code) on the system telephone that is assigned 100 as its internal station number.

The system station number is determined by the network or service provider.

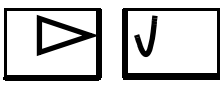
Depending on the configuration type, system station numbers should not be entered for point-to-multipoint operation or for tie trunks to HiPath 4000, for example.

Example

Port number: 98008
National number: 2302 (prefix without 0)
International number: 49 (country code)
Station number type: international

Input procedure

Table 5-4 Entering the System Number

Step	Entry	Description
1.	*95	System administration code
2.	Service	User name (identification)
3.	XXXXX	Enter password
4.		Watch the display. Scroll until “ISDN parameters” and “System station number” appear. Confirm your selection. OR: Expert mode: Enter the code 20 2 1 to 4.
5.		Follow the user prompting on the display.

5.1.6 Customer-Specific Programming

You can program the system using one of the following tools:

- Manager T (programming telephone, see Annex A)
- HiPath 3000/5000 Manager E (PC tool)

> Changes to the system (for example key programming) made using HiPath 3000/5000 Manager E during an offline programming session will be lost when the database is loaded.
> When you program the system offline, the assignments of trunk and subscriber ports depend on the order in which the boards are inserted. Usually, the boards are inserted from the lowest slot to the highest.

Refer to the HiPath 3000/5000 Manager E Help for information on programming individual features.

5.1.7 Performing a System Check

Checking the telephones

- The display must be checked on every telephone. The phone number, date and time are normally shown in the display.

  If a different text appears (“Gateway not found”, for example), this means that there is an error.
  Correct the error by following the administration instructions for the relevant telephone.
- Perform random terminal tests as described in Section 12.2.11 on all telephones.

Checking for proper system booting

- Set up internal and external calls at random to check if the system is functioning properly.

5.2 Starting Up HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300

This section contains information on how to start up the HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 communication systems.

Warning
Only authorized service personnel should start up the system.

Caution
For safety, operate HiPath 3500 and HiPath 3300 only with the housing front closed. Always use dummy panels (C39165-A7027-B115) to close slots that are not equipped with boards.

5.2.1 Startup Procedure

Table 5-5 Startup Procedure

Step	Startup Activity (Remarks)
1.	Supplying the System With Power, page 5-12 (starting system boot).
2.	Carrying Out a System Reload, page 5-15
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-15
4.	Not for U.S.: Entering the System Number, page 5-17
5.	Customer-Specific Programming, page 5-18
6.	Performing a System Check, page 5-18

5.2.2 Supplying the System With Power

Caution (for Brazil only)
The use of the outlet strip with overvoltage protection with part number C39334-Z7052-C33 is absolutely mandatory. The AC power of the system must be conducted through the outlet strip with overvoltage protection.

Procedure

Step	Activity
1.	Plug in the power supply cable and, where applicable, the battery cable. Note (for Brazil only): The AC power of the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300 systems is internally equipped with transient overvoltage protection up to approx. 2 kV. Since additional lightning protection is prescribed for Brazil, the AC power of a system must be conducted through the outlet strip with overvoltage protection (part number C39334-Z7052-C33). In this way, transient overvoltage protection is guaranteed up to approx. 4 kV.
2.	Monitor the Run LED of the central controller. The individual steps of the system boot (Table 5-6) can be observed this way.

HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300 RUN LED

The central board has a RUN LED that indicates the system status.

Table 5-6 RUN LED - LED Status Meaning

RUN LED	Meaning
Off	No power
on	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data.
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

1 The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

The system is ready when the date “1. JAN 00” and the time “00:00” appear in the display on the system telephone.

5.2.2.1 Assigning Station Numbers

The first time the system is initialized, the system determines its capacity and stores the result in the CDB (customer database). After each system reset, the system accesses this data and generates a continuous numbering plan.
If the system detects changes to the board configuration during startup, the following action is taken:

If	Then
Missing or defective board	No action.
Different board type	The system does not automatically activate the board.
Underequipped or same board variant	Board is activated. The same station range is used.
Over-equipped board variant	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available.
New board in empty slot	• Board was the last one installed in accordance with the placement sequence: All boards are activated and the numbering plan continues without a gap. • Board was inserted ahead of another board in the placement sequence: Board is activated and appended to the last board in the numbering plan.

Procedure: Reinitialization

Proceed as follows if measures to expand the system configuration require reinitialization of the numbering plan:

Step	Activity	Description
1.	Disconnect the system from the power supply. Check that the system is de-energized. Expand as required.	
2.	Connect system to power supply	A continuous numbering plan is generated (as was the case when the system was first initialized). **Notes:** • Changes to the extension numbers result in changes to the individual, extension-specific data. • Only those ports provided for in accordance with the maximum configuration are activated if the maximum line configuration is exceeded (too many trunk boards). • A mixture of subscriber line circuits and trunk lines on one S_0 board can result in gaps in line numbering. This is because all board ports are initially activated as trunks and are only subsequently reconfigured. • S_0 station: If stations are connected to an S_0 board (S_0 bus), their station numbers result from the MSN programmed in the telephone, regardless of the connection. If no MSN is programmed on a telephone or if no MSN can be programmed, the system uses a default MSN. The default MSN can be administered by S_0 port (HiPath 3000/5000 Manager E). • The system does not assign the MSN until the S_0 port is configured on the “Euro bus”; the MSN can be read out via administration.

5.2.3 Carrying Out a System Reload

After supplying the system with power, you must carry out a system reload. This can be performed during the initial system boot.

Procedure

Press and hold down the reset switch for at least 5 seconds (RUN LED goes out). If you do not hold down the reset switch for a full 5 seconds, the system may perform a reset rather than a reload or may not reload properly.

5.2.4 Carrying Out the Country Initialization and Selecting the Password Type



Since the system software no longer provides all languages, some systems no longer start up in the customary local language after the country code is entered. You must now load the local language **prior to country initialization**, using HiPath 3000/5000 Manager E (see information on multilingual text output in the Feature Description HiPath 3000/5000).
After carrying out the country initialization, but before loading the required local language, the displays come up in German.

Carry out the country initialization on the system telephone with the internal station number **100** (HiPath 3550 and HiPath 3500) or **11** for (HiPath 3350 and HiPath 3300) (port 01). This process loads the country-specific language and features and ensures that the system meets the country's conditions for approval.
In Germany, no country adaptation is required after a reload because the system boots with the German country code by default.

The next step involves selecting the password type.

Input procedure

Table 5-7 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)
5.	XXXXX	You are prompted to confirm the password entered in step 4.
6.	29 - 5	Country initialization

Table 5-7 Entering the Country Code and Selecting the Password Type

Step	Entry	Description
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password
8.	XX	You are prompted to enter the country code (see Page A-26). The system then boots up with the country-specific default information.

Notes:
- On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again.
- On step 6: No country adjustment is necessary for Germany because the system starts up with German codes.
- On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered under step 4.

Note

Entering the country code starts the system. Any data that has already been stored, such as system speed-dialing destinations and classes of service, is deleted or reset to the default value.



For Brazil only: CO call privileges, ringback protection per trunk
If the system was initialized with the country code for Brazil, the option for saving the digits dialed and transmitting them via the system (dial rule 1A) is not activated. This can lead to dialing problems at DTMF terminals because the system waits for the dial tone from the analog trunk and does not set up the connection between the DTMF terminal and the trunk until it recognizes the dial tone. Digits dialed before dial tone recognition are therefore not recognized by the CO. This in turn can impact CO call privileges.
To avoid this, Least Cost Routing LCR should be activated for all systems with the country code for Brazil and with connection to analog trunks with DTMF signaling.



After you enter a country code, the default data is only guaranteed to load correctly if the system software has been officially released for that country.
Table A-3, HiPath 3550, HiPath 3350 and HiPath 3500 have not been introduced in some of the countries listed in HiPath 3300. The correct loading of the default data is not guaranteed for those countries.

5.2.5 Not for U.S.: Entering the System Number

Introduction

Corresponding to the configuration, the system station number must be entered (without the DID number or attendant code) on the system telephone that is assigned 100 as its internal station number for HiPath 3550 and HiPath 3500 and 11 in the case of HiPath 3350 and HiPath 3300.

The system station number is determined by the network or service provider.

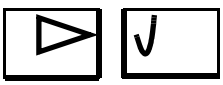
Depending on the configuration type, system station numbers should not be entered for point-to-multipoint operation or for tie trunks to HiPath 4000, for example.

Example

- Port number: 98008
- National number: 2302 (prefix without 0)
- International number: 49 (country code)
- Station number type: international

Input procedure

Table 5-8 Entering the System Number

Step	Entry	Description
1.	*95	System administration code
2.	Service	User name (identification)
3.	XXXXX	Enter password
4.		Watch the display. Scroll until “ISDN parameters” and “System station number” appear. Confirm your selection. OR: Expert mode: Enter the code 20 2 1 to 4.
5.		Follow the user prompting on the display.

5.2.6 Customer-Specific Programming

You can program the system using one of the following tools:

- Manager T (programming telephone, refer to Annex A)
- HiPath 3000/5000 Manager E (PC tool)



Changes to the system (for example key programming) made using during an HiPath 3000/5000 Manager E offline programming session will be lost when the database is loaded.
When you program the system offline, the assignments of trunk and subscriber ports depend on the order in which the boards are inserted. Usually, the boards are inserted from the lowest slot to the highest.

Refer to the HiPath 3000/5000 Manager E Help for information on programming individual features.

5.2.7 Performing a System Check

Checking the telephones

- The display must be checked on every telephone. The phone number, date and time are normally shown in the display.
- If a different text appears (“Gateway not found”, for example), this means that there is an error.
  Correct the error by following the administration instructions for the relevant telephone.
- Perform random terminal tests as described in Section 12.2.11 on all telephones.

Checking for proper system booting

- Set up internal and external calls at random to check if the system is functioning properly.

6 HiPath 5000 Startup and Administration

Chapter contents

This chapter covers the following topics:

Topic
Introduction, page 6-2
Software Structure, page 6-4
Notes on Open Numbering in a HiPath 3000/5000 Network, page 6-7
Installation Requirements, page 6-8
HiPath 5000, page 6-10
• Preparing for Installation, page 6-10
• Integrating the HiPath 5000 Server in the Customer LAN, page 6-11
• HiPath 5000 Installing Standard Components, page 6-12
• Installing HiPath Fault Management, page 6-20
• Installing the TAPI Service Provider, page 6-24
• Installing the HiPath Inventory Server Separately, page 6-26
• Verifying Installation, page 6-31
Modifying HiPath 5000 Components (Retro-Fitting, Updating, Deleting), page 6-33
• Version-Wide Upgrading of a HiPath 5000 Installation, page 6-34
Performing Licensing, page 6-36
Optimizing Operating System Settings, page 6-37
Perform HiPath 5000 Basic Configuration, page 6-39
• Configuring HiPath 5000 RSM as a Central Admin. Unit in an IP Network, page 6-40
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Connecting an Uninterruptible Power Supply to HiPath 5000, page 6-48

6.1 Introduction

HiPath 5000 Real-Time Services Manager RSM is operated as a central administration unit in an IP network of HiPath 3000 systems. All participating nodes can be administered from a central point through the formation of a “single system image”.

HiPath 5000 RSM is the platform for providing applications at a central point and enables them to be used by all stations in the IP network.

Parts of the following setup applications for HiPath 5000 are optional and can be installed both on the HiPath 5000 RSM (RSM: Real-time Services Manager) and on a separate PC.

These applications are:

- Server (central administration service in a HiPath 3000/5000 network)
- Real-time Telephony Presence Manager (service for LED signaling of call processing station statuses and network-wide DSS keys)
- Database Synchronization for HiPath 3000
- HiPath 3000/5000 Manager E (MS Windows-based tool for system administration of all service and customer-specific data by Service)
- HiPath 3000/5000 Manager C (MS Windows-based tool for system administration of customer-specific data by the customer)
- Inventory Manager (service for detecting software components installed and system information in a HiPath 3000/5000 network)
- Backup Manager
- Software Update Manager
- Customer License Agent CLA (service for analyzing and decrypting a HiPath License Management license file)
- Central License Manager CLM (CLA front-end for reading in licenses in online and offline mode)
- Central Fault Management V3.0 (Java-based application for error signaling)
- GetAccount (application that prepares generated call data records for further processing)

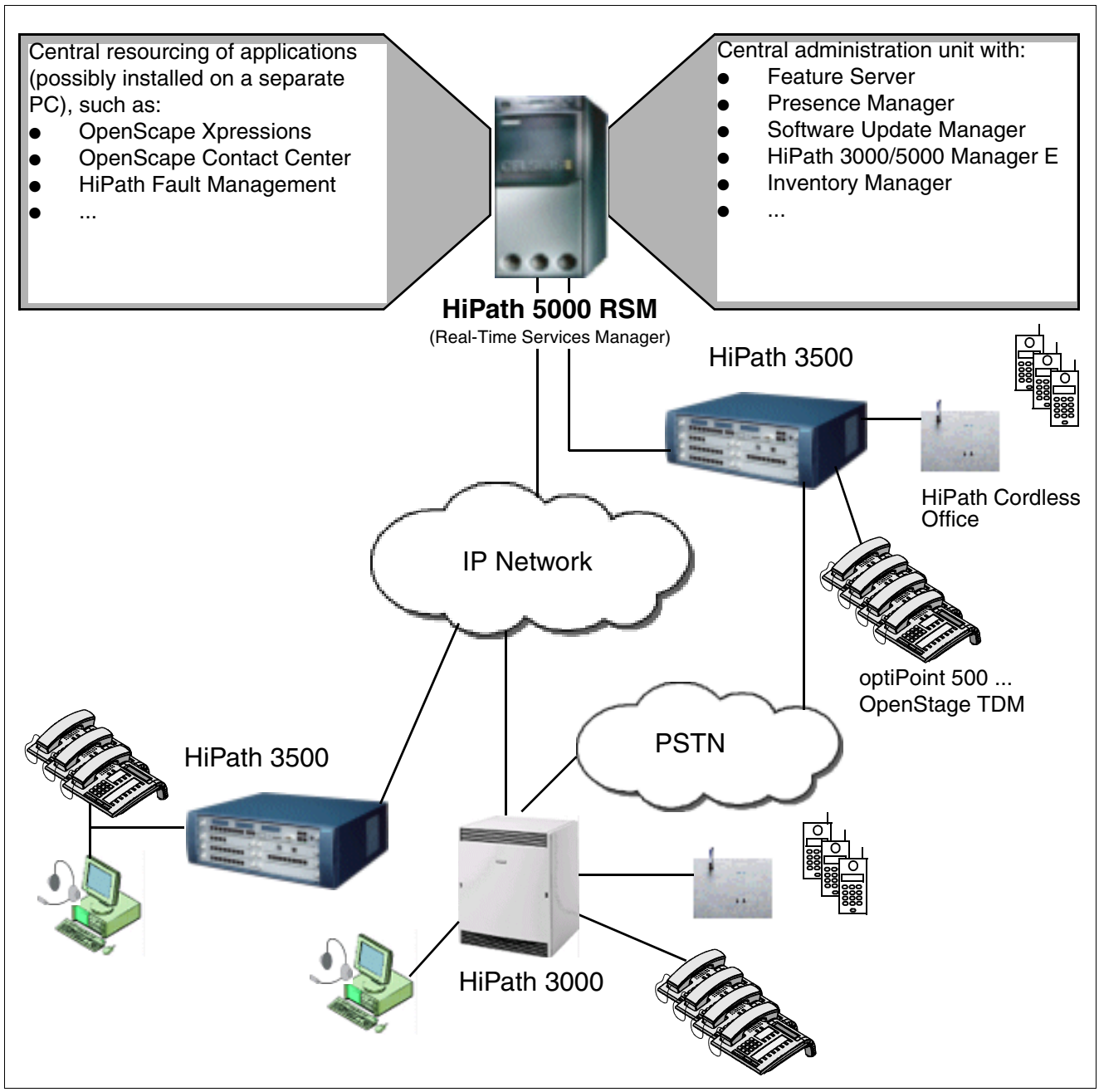


Figure 6-1 HiPath 5000 RSM Multi-Node IP System

6.2 Software Structure

Feature Server

The Feature Server is an essential component in the HiPath 5000 software architecture and serves as a central point for administration and as a data interface for applications and middleware. In addition, the Feature Server synchronizes the HG 1500 boards with all necessary data for digit analysis in a HiPath 3000/5000 network.

The networked HiPath 3000 systems (nodes) are administered over the Feature Server. The HiPath 3000/5000 Manager E administration tool does not communicate with the individual systems but exchanges data with the Feature Server. The Feature Server ensures that the networked HiPath 3000 systems receive synchronized CDB data.

The individual systems are accessed directly by HiPath 3000/5000 Manager E in the course of maintenance and online functions.

HG 1500 boards are still administered on a board-specific basis using Web-based management (WBM).

The Feature Server is an MS Windows service that automatically starts at the same time as the HiPath 5000 RSM.

Communication with the individual HiPath 3000 systems belonging to the network takes place over their HG 1500 boards.

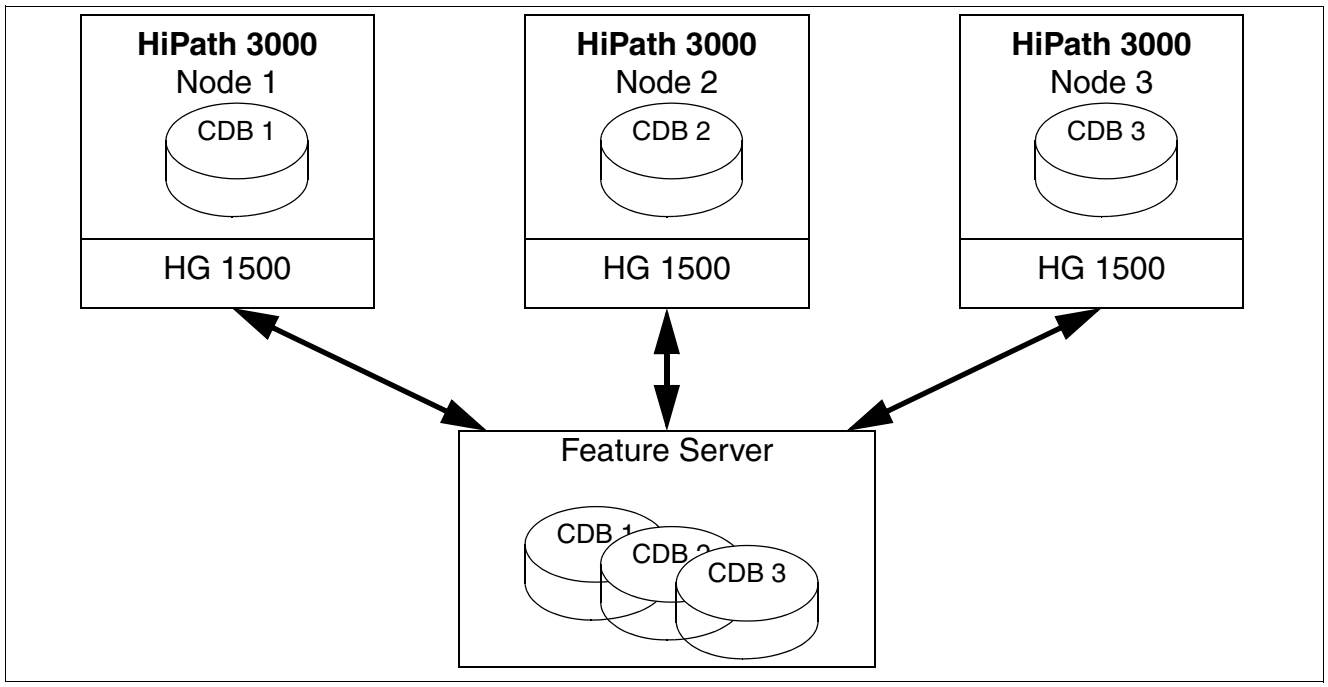


Figure 6-2 Customer Data Exchange Between the Feature Server and Nodes

The following figure shows the services and routines associated with the Feature Server.

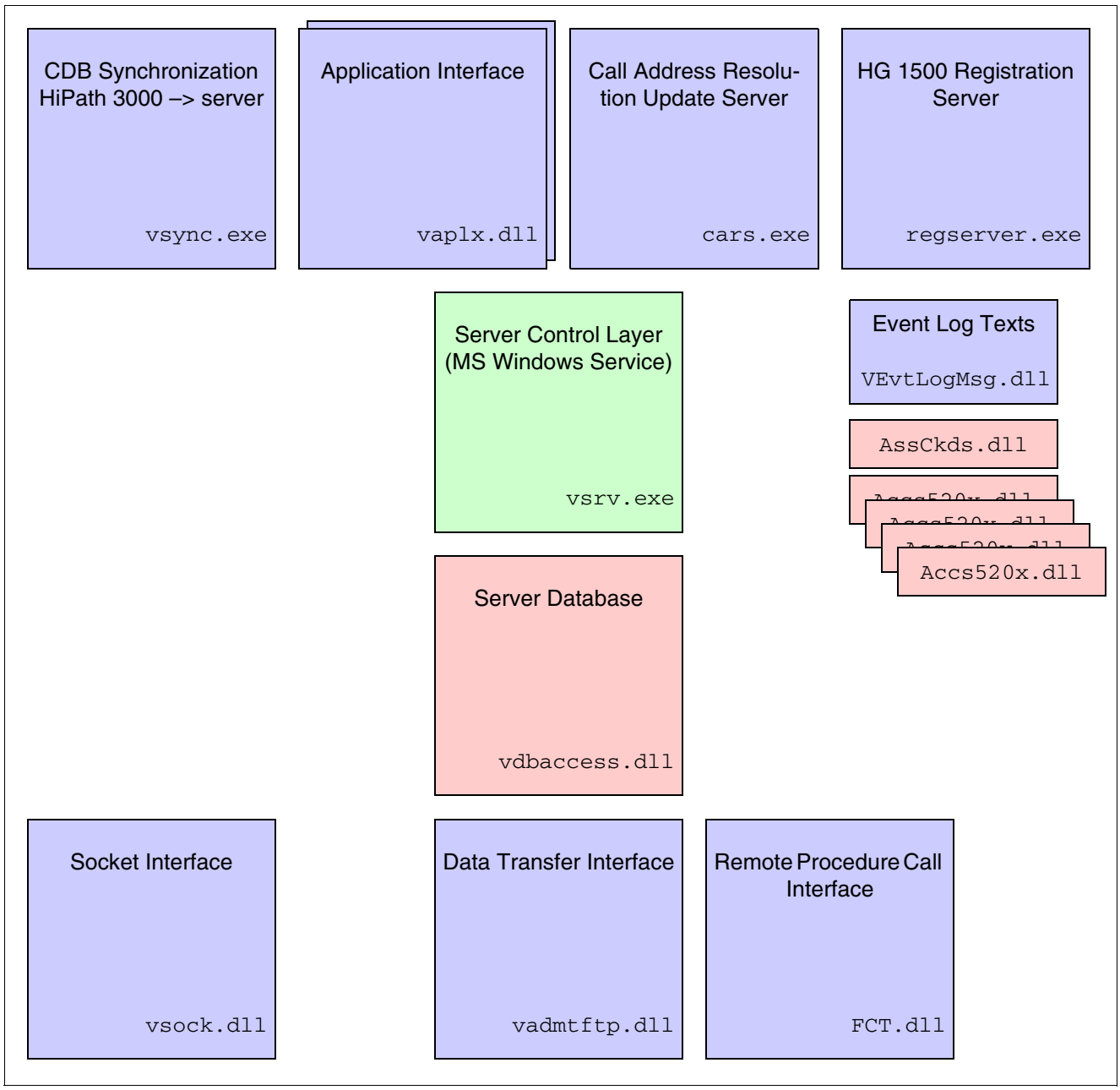


Figure 6-3 Feature Server Services and Routines

The following table shows the **most important** features of the Feature Server.

Table 6-1 Feature Server Components

Component	Function
`vsrv.exe`	Basic Feature Server component. As an MS Windows service, it starts all other components.
`vaplx.dll`	Logical interface for applications. Provides read-only and read/write access to CDB data.
`cars.exe`	The Call Address Resolution Server provides the HG 1500 boards with the call numbers of all HiPath 3000 systems (nodes) that belong to the network. Note: Event 1027 confirms that the corresponding HG 1500 board was successfully downloaded with the call numbers of all HiPath 3000 systems associated with the network (see Section 12.2.17).
`regserver.exe`	Following startup, the HG 1500 boards automatically log on to the Feature Server over the Registration Server.
`vsync.exe`	All “node-specific” CDB changes (for example, by key programming, Manager T) are reported by the node to the Feature Server’s VSYNC process. This ensures the automatic synchronization of the Feature Server with the new CDB data.
`FCT.dll`	Interface to the systems for direct CDB data access.

Presence Manager

This is a Feature Server service for signaling the call processing station states “free”, “busy” and “call” using the LEDs on the optiPoint telephones in a HiPath 3000/5000 network. You can pick up a call by pressing the appropriate button.

Call processing states can only be signaled for a station if the Presence Manager can set a CSTA monitor point on the relevant station. The status of a MULAP call number cannot be signaled, for example, because a CSTA monitor point cannot be set on a call number of this type.

The dssserver.exe service for the Presence Manager is installed with the HiPath 5000 software. This is a user-configured service that receives its information from `vaplx.dll`. The TAPI Service Provider is required for the Presence Manager to work.



Note for troubleshooting and diagnosis
The Feature Server and Presence Manager components generate entries in the Event Viewer (event log) which are used for troubleshooting and diagnosis. Section 12.2.17 provides information on the possible entries and any necessary user responses.

6.3 Notes on Open Numbering in a HiPath 3000/5000 Network

In contrast to standalone systems, a HiPath 3000/5000 network performs call number evaluation in a number of stages. All station and group numbers for the relevant HiPath 3000 systems (nodes) are kept on the HG 1500 boards and subject to digit analysis. The Feature Server sends the IP addresses of the relevant HiPath 3000 systems to the HG 1500 boards. The Feature Server also assigns every HG 1500 board a call number table in which all call numbers of the other HiPath 3000 systems are saved. This means that every call number dialed can be uniquely assigned to a node. These call number tables are also known as CAR (Call Address Resolution) tables. The call number tables can be displayed using HG 1500's Web-based management (WBM). Changes made to tables with the WBM can impact the digit analysis functionality and are not permitted. The CAR tables are updated and overwritten by the Feature Server after every administration activity.

Internal call numbers can be assigned more than once in a network using open numbering. However, to enable unique call number evaluation, every HiPath 3000 system is assigned a unique node number. A station in node A always dials a station in node B by entering the node number + internal call number.

The "Open numbering" system flag in HiPath 3000/5000 Manager E must be set for every HiPath 3000 system involved. This flag must be set to permit the administration of the node number.



The node number (Settings/System parameters.../Flags: Node number) and the incoming PABX number for route 16 (HG 1500 route) (Settings/Lines / networking.../ Routes: PABX number - incoming) should be identical for every HiPath 3000 system.

In HiPath 3000/5000 V7 and higher, it is possible to administer the node number of each associated HiPath 3000 system using HiPath 3000 Manager E, regardless of the status of the system flag "Open numbering scheme".

In HiPath 3000/5000 V7 and higher, the node number (Settings/System parameters.../Flags: Node number) and the incoming PABX number for route 16 (HG 1500 route) (Settings/Lines / networking.../Routes: PABX number - incoming) do not need to be identical. With an open numbering scheme only the node number needs to be administered.

6.4 Installation Requirements

To use HiPath 5000, the following minimum requirements must be met:

- Hardware and software

  Table 6-2 HW and SW Minimum Requirements for HiPath 5000

Component	New system	Upgrade an existing system to V8
Processor	3 GHz CPU	Pentium III 1 GHz
RAM space	See Table 6-3	See Table 6-3
Hard disk	80 GB	18 GB
Operating system	MS Windows Server 2000 or MS Windows Server 2003	MS Windows Server 2000
Interfaces	2 x serial	2 x serial
Slots	free PCI slots (for S_0/S_{2M} boards for HPCO and HiPath Xpressions)	free PCI slots (for S_0/S_{2M} boards for HPCO and HiPath Xpressions)
Drives	3.5-inch floppy disk drive CD-ROM/DVD drive	3.5-inch floppy disk drive CD-ROM/DVD drive
Network card	10/100/1000 Mbps Ethernet network card	10/100 Mbps Ethernet network card
Monitor	17-inch color monitor	17-inch color monitor

- Licenses

  Information on features, interfaces, and products subject to mandatory licensing can be found in Chapter 8, “Licensing”.

- RAM requirements of the HiPath 5000 server

  Table 6-3 can be used to determine the required RAM expansion (RAM space) of the HiPath 5000 server depending on the number of nodes in the HiPath 3000/5000 network and the applications installed on the server.

Table 6-3 RAM Space of the HiPath 5000 Server

	Minimum RAM				
	Up to 2 nodes	**Up to 8 nodes**	**Up to 16 nodes**	**Up to 32 nodes**	**Up to 64 nodes[1]**
HiPath 5000 V8 + HiPath FM V3.0 + Teledata Office V3.0 + HiPath Software Manager	512 MB	1 GB	1 GB	1.5 GB	2 GB
DLS	+ 250 MB	+ 250 MB	+ 250 MB	+ 250 MB	+ 250 MB

1 Networks are currently released with up to 32 nodes. Larger configurations can be released on a project-specific basis.

6.5 HiPath 5000

6.5.1 Preparing for Installation

To ensure successful installation, you should check the points listed in the table below **before** installing the HiPath 5000 software.

Table 6-4 HiPath 5000 - Preparing for Installation

Component	Description
Hard disk partitioning	The server PC hard disk should be divided into **two** NTFS partitions. The **main partition C** should have a capacity of at least 4 GB and should be reserved for the operating system and the HiPath 5000 software. For safety reasons, partitioning with the format FAT 16/32 is **not permitted**.
Hardware	Make sure that no unnecessary hardware is connected to the server PC; any sound cards should be removed.
Access privileges	To install HiPath 5000, you must log on to the operating system with administrator rights or, if necessary, log on as the server domain administrator.
LAN integration	Check to ensure that the server PC has been correctly integrated in the customer LAN (see Section 6.5.2).
Miscellaneous	All applications running in the background must be closed prior to software installation.

6.5.2 Integrating the HiPath 5000 Server in the Customer LAN

Network analysis must be performed before the relevant systems and applications are installed to guarantee smooth operation in the IP customer network. Network analysis determines the conditions under which the IP customer's network is suitable for a HiPath 3000/5000 network.
The data necessary for integrating the HiPath 5000 server, for example, IP addresses, is defined as part of network analysis and in consultation with the customer (requirements specifications).

The settings are made under `Control Panel - Network - Protocols`.

- Modify the IP address
- Adapt the subnet mask, gateway.
- Adapt the DNS entries, WINS entries.
- Once the data has been customized, a reboot is required.
- Test the LAN connection with a "ping" to another computer
- Integrate the HiPath 5000 in the Windows domain under Control Panel - Network - Identification (a domain administrator account is required here!)

6.5.3 HiPath 5000 Installing Standard Components

6.5.3.1 Overview

The installation program (Master Setup) enables both the basic installation of a HiPath 5000 system including middleware and components for system administration/analysis and the post-installation of individual software components and tools (update, see Section 6.6).

Table 6-5 Software Components and Master Setup Tools

Component	Server PC	Client PC	Standard component (default setup)[1]
MSDE 2000 SQL database with SP3	Yes	No	Yes
TFTP Server	Yes	Yes	Yes
Common Web Service	Yes	Yes	Yes
HiPath Call Accounting (GetAccount)	yes, optional	No	No (see Section 6.10)
HiPath 3000/5000 Manager E	Yes	Yes	Yes
HiPath 3000/5000 Manager C	yes, optional	No	No
HiPath Inventory	Yes	Yes	Yes (see Section 6.5.6)
HiPath Software Manager	Yes	No	Yes
Feature Server, Presence Manager	Yes	No	Yes
HiPath Fault Management[2]	Yes	Yes	No (see Section 6.5.4)
Customer License Agent (CLA)	Yes	yes (MS Windows 2000 Pro. or later)	Yes
Customer License Manager CLM	yes, optional	No	No

1 Standard components should generally always be installed and are therefore already selected in the master setup (= default setup).
2 Refer to current information in HiPath Fault Management release documentation.

6.5.3.2 Licensing

Please refer to Chapter 8, “Licensing” for information on how to proceed.

A grace period of 30 days begins after startup. Licensing must be performed for all features, interfaces, and products subject to mandatory licensing within this grace period.

HiPath 3000/5000 Manager E comes with a customer-specific file which is used by the Customer License Agent CLA to generate a GPCF (Grace Period Configuration File) file. This file ensures that the maximum expansion of all features subject to mandatory licensing is possible within the 30-day grace period. The system or systems are not licensed.

The system falls into licensing default if licensing is not performed within the 30-day grace period. This means that features which subject to mandatory licensing will suffer from reduced functionality.

6.5.3.3 Starting the Installation

A TAPI service provider must be installed on the relevant PC to enable the default setup to be performed. Installation information can be found in Section 6.5.5.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

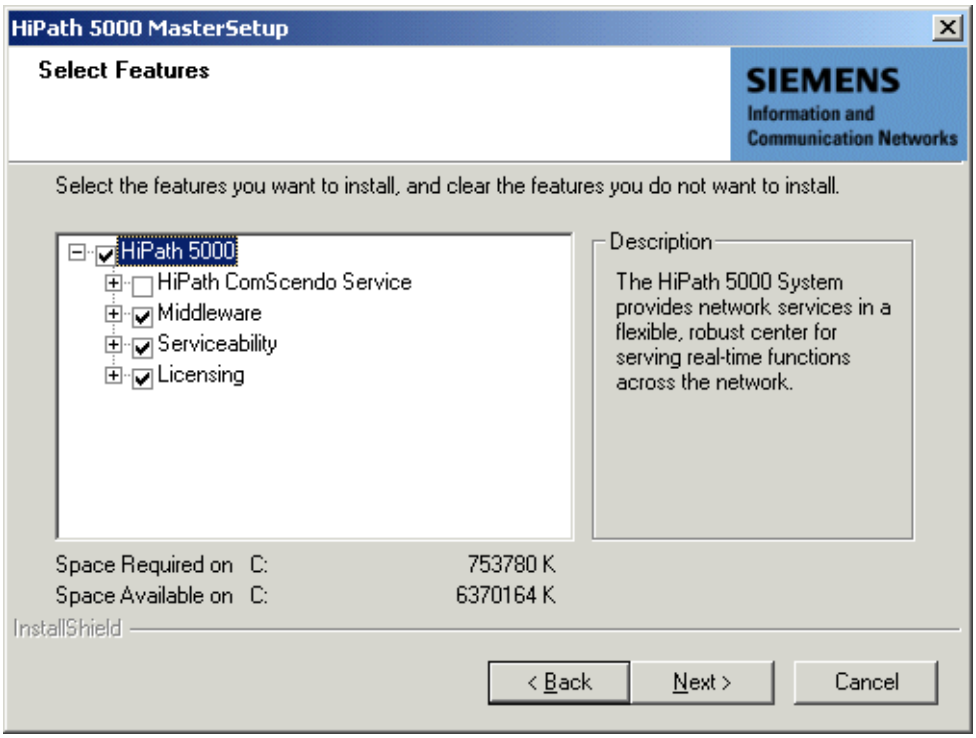
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

7. The **Select Features** dialog appears.



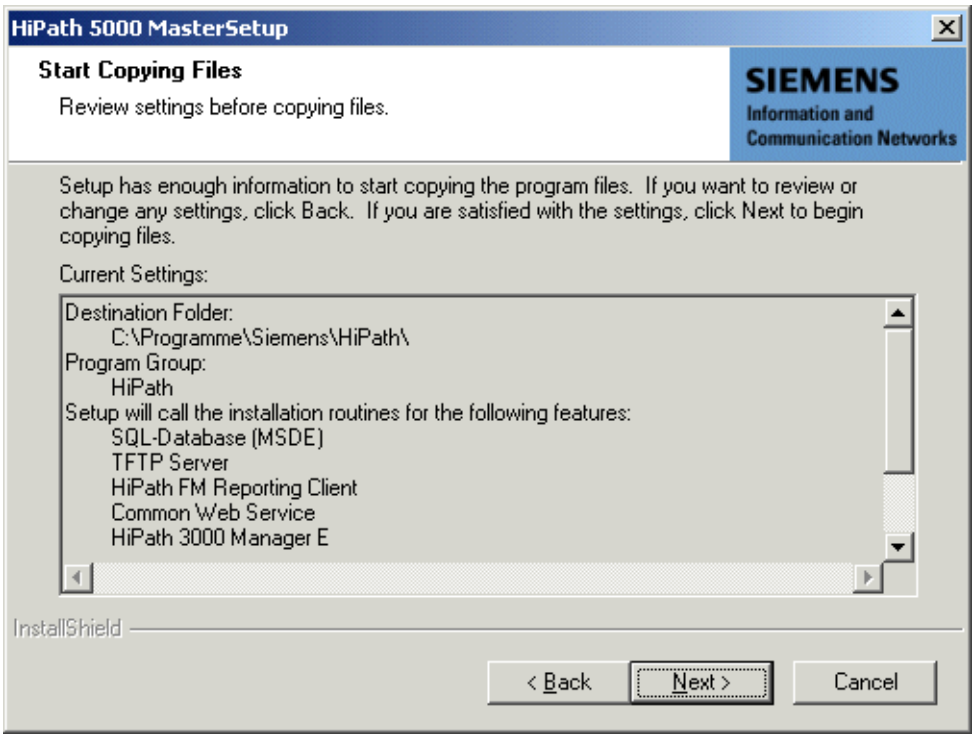
Mark the components you want to install and unmark the ones you don't.

> The components marked by default (Default Setup) are standard components that as a rule should always be installed. For information on the exact components to install, refer to your order.
> The subsequent description of the installation procedure relates to the default setup.

8. Then click **Next**.

> At this point your attention is drawn to the fact that a TAPI service provider must be installed for the current selection of components.
> If this requirement is met, click Yes to continue with the procedure.
> If there is no TAPI service provider installed, click No to cancel the procedure.
> Install the TAPI service provider on the basis of the information in Section 6.5.5.
> Then restart the master setup.

The **Start Copying Files** dialog appears.

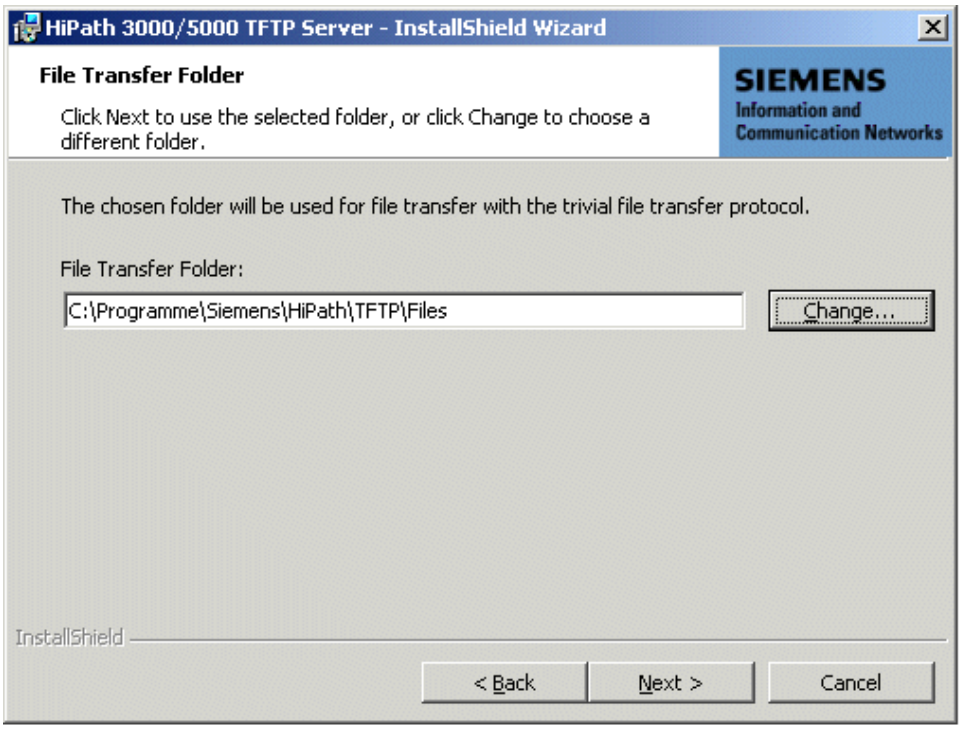


Check if the correct destination directory and program group are specified and if all necessary components are installed.

9. Click **Next** to start the copy operation.

> The PC reboots after installing the MSDE 2000 SQL database.
> The installation procedure is automatically continued after rebooting.

10. The **File Transfer Folder** appears.

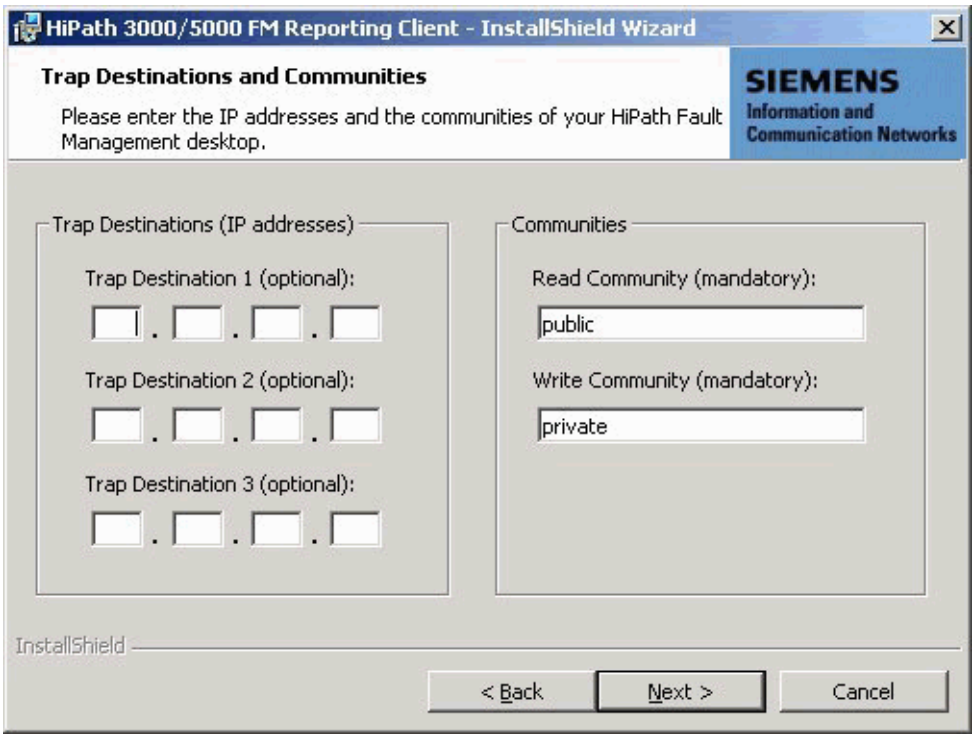


Select the folder where you want to install the files.

Confirm the default folder `c:\program files\siemens\hipath\tftp\files\` with **Next** or click **Change** to select a different folder.

11. Click **Next** to proceed with the setup routine.

    The **Trap Destinations and Communities** dialog appears.

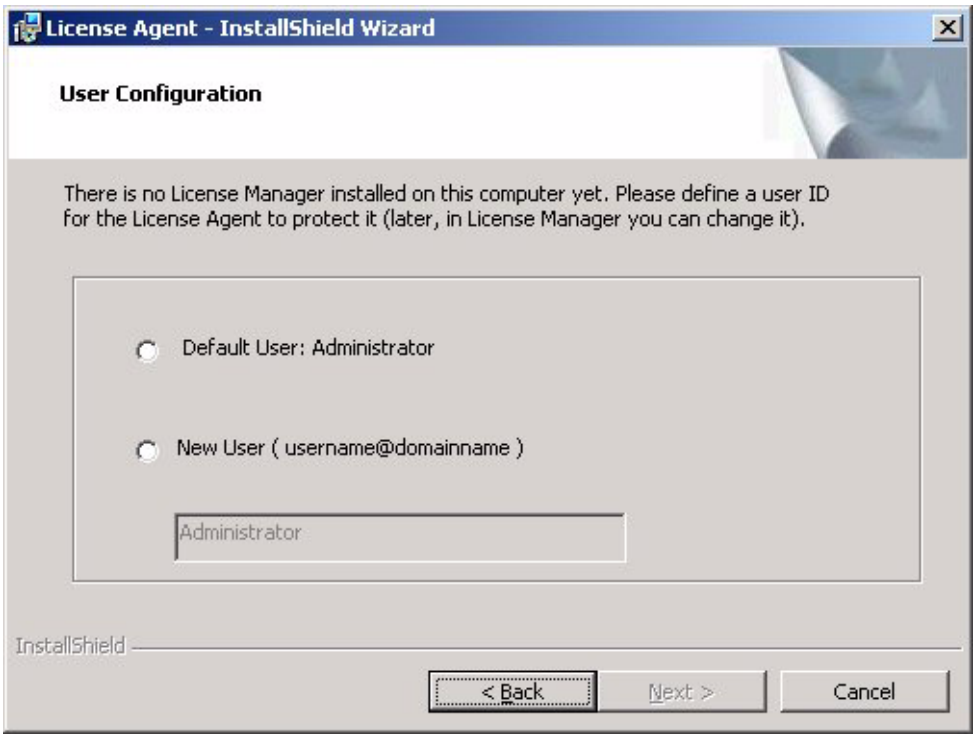


Enter the trap destinations (if necessary) and the HiPath Fault Management desktop community names.

The FM Reporting Client does not have its own user interface. The trap destinations and community names defined during installation may only be changed by uninstalling and then reinstalling the FM Reporting Client.
Users with sufficient knowledge of SNMP can change trap destinations and community names by editing the file `snmpd.cnf` (see Annex E).

12. Click **Next** to proceed with the setup routine.

    The **User Configuration** dialog appears.



    Configure the user account for the license agents (Customer License Agent CLA).

13. Click **Next** to proceed with the setup routine.
14. When all selected components are installed, a dialog appears in which you can terminate the setup with **Finish**.

6.5.4 Installing HiPath Fault Management

HiPath Fault Management can read information from the HiPath 3000 and HiPath 5000 system MIB via SNMP requests. This allows the system to permanently monitor the status of the network components and to include changes of status in the network administrator information.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

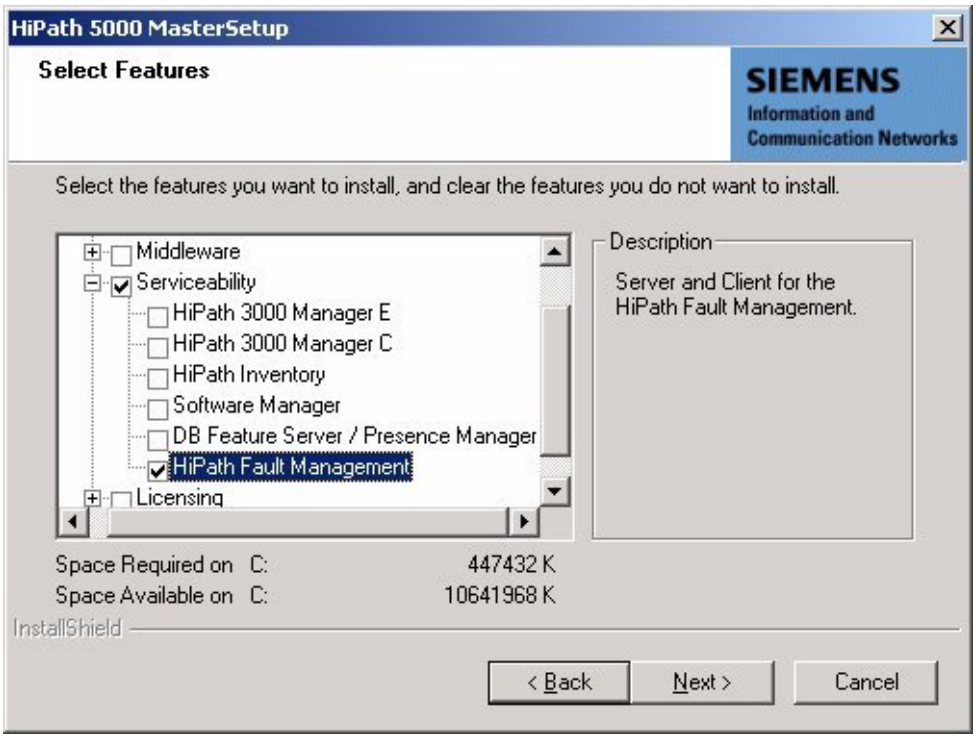
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

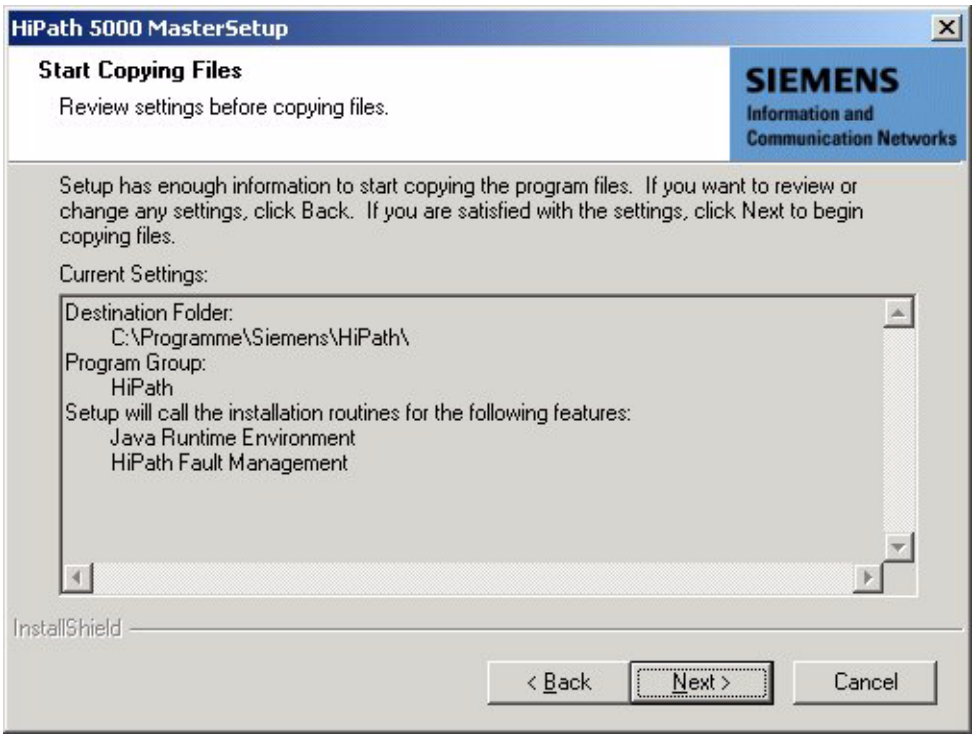
7. The **Select Features** dialog appears.



Select the HiPath Fault Management components you want to install and deselect the ones you do not want to install.

8. Then click **Next**.

   The **Start Copying Files** dialog appears.



   Check if the correct destination directory and program group are specified and if all necessary components are installed.

9. Click **Next** to start the copy procedure.

   The software license agreement is displayed. The license terms must be accepted before continuing with the setup.

10. Confirm the license agreement with **Yes**.

11. The **Choose Destination Location** dialog appears.

    Select the folder where you want to install the Java Runtime Environment.

    Confirm the default folder `c:\program files\javasoft\jre\<version>\` with **Next** or click **Browse** and select a different folder.

12. The **Select Browser** dialog appears.

    Select one of the available browsers for which the Java plugin is to be used as the standard runtime environment for Java.

13. Confirm your selection with **Next**.

    The **InstallShield Wizard for HiPath Fault Management** is started.

14. Click **Next** to proceed with the installation routine.

    The **licensing conditions for HiPath Fault Management** are displayed. The license terms must be accepted before continuing with the installation.

    Click **I accept the terms of the license agreement**.

15. Click **Next** to proceed with the installation routine.

    The **installation options** are displayed.

    Select the **Server & Client** option.

16. Continue installation with **Next**.

    The **Directory Name** dialog is displayed.

    Confirm the name suggested with Next or click Browse to select a different directory.

17. Once installation is complete, a final dialog appears. Close the InstallShield Wizard for HiPath Fault Management with **Finish**.

18. A message appears indicating that the master setup has been successful. Close the setup with **Finish**.

6.5.5 Installing the TAPI Service Provider

This section describes the separate installation of the TAPI 170 Service Provider.

You will find detailed information on how to install and configure the individual installation components in the online help for the TAPI 170 Service Provider.

1. Insert the TAPI 170 Service Provider installation CD and run Setup.
2. Confirm the welcome dialog by clicking **Next**.
3. The Setup Type dialog appears. The following options are available:

   - Standalone
     For using the TAPI Service Provider in standalone scenarios with no more than one HiPath 3000 system.
   - AllServe
     For using the TAPI Service Provider in networked HiPath AllServe scenarios.
   - HiPath 3000/5000 V4.0
     For using the TAPI Service Provider in networked HiPath 3000/5000 scenarios in V4.0 and later.
   - User-defined
     In this case you can manually select the components to be installed.

   When you select the setup types Standalone, AllServe and HiPath 3000/5000 V4.0, the required installation components are automatically preselected.

Setup type	Installation component				
	TAPI Service Provider TSP	**CSTA Message Dispatcher CMD**	**CSTA Service Provider CSP**	**Dongle driver[1]**	**Central Configuration Manager Client CCMC**
Standalone	X	–	–	–	–
AllServe	X	–	–	–	X
HiPath 3000/ 5000 V4.0	X	X	X	–	X

1 The dongle driver is only relevant to installations for which a dongle is used for licensing. When reinstalling TAPI 170 Version 2.0 or later, MAC IDs and license codes are used for the licensing procedure. The dongle driver is therefore not required.

4. Select the appropriate option and confirm with **Next**.
5. The system starts to install the selected components.



At the beginning of the installation routine (the precise time will depend on the installation components you selected), a dialog is displayed prompting you to enable ACD support. Confirm this prompt with **Yes**.
The relevant ACD support utility can also be enabled or disabled at a later stage. For further information, please refer to the online help for the TAPI 170 Service Provider.

When a component is successfully installed, the associated configuration dialog opens. You can set the required parameters here or postpone configuration until a later time.

6. When all of the selected components have been installed, a final dialog is displayed in which you can conclude installation with **Finish**.

The TAPI Service Provider is now installed.

6.5.6 Installing the HiPath Inventory Server Separately

The software components and tools of the master setup mentioned in Table 6-5 can be installed on several PCs. In such a scenario the Inventory Server should be installed on all PCs that are to support the HiPath Inventory Manager.

Procedure

1. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM drive letter>:\setup.exe`.

2. Select the language you require for the Setup browser. German (Germany) and English (USA) versions are currently available.

   The system is prepared for installation.

3. Click **Next** to start the installation routine.

   Important installation information is displayed.

   This includes the latest information on installation. Please read this information carefully.

4. Click **Next** to proceed with the installation routine.

5. **Select destination path**.

   Select the folder where you want to install the program.

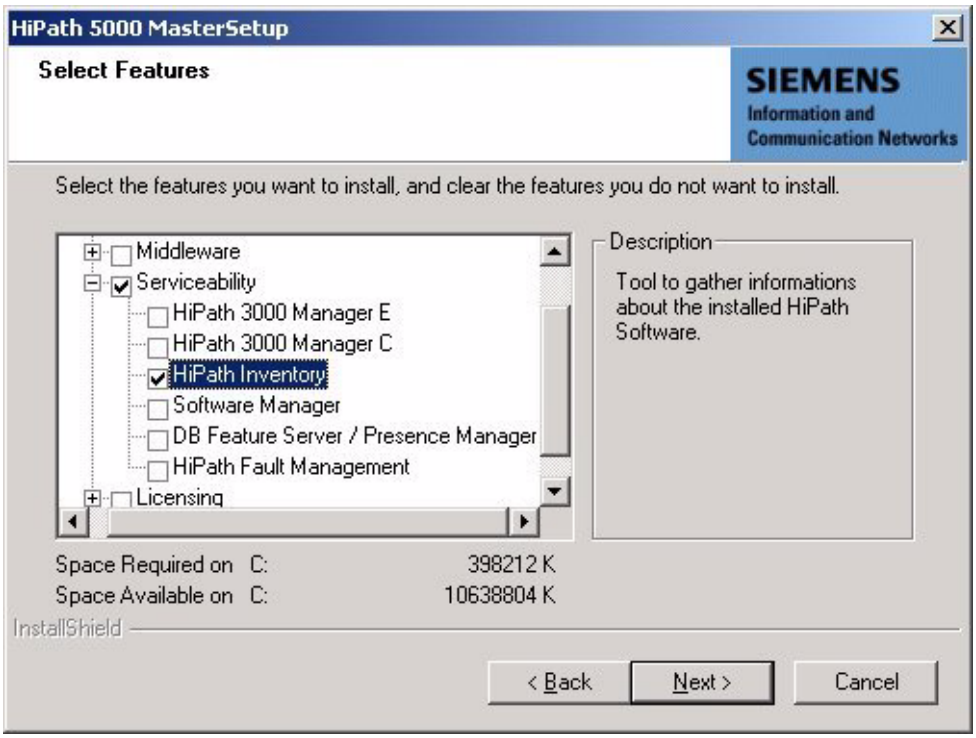
   Confirm the default folder `c:\program files\siemens\hipath\` with **Next** or click **Browse** and select a different folder.

6. **Select program folder**.

   Select the location where the setup should create the new shortcuts.

   Confirm the default folder `HiPath` with **Next** or select a different folder.

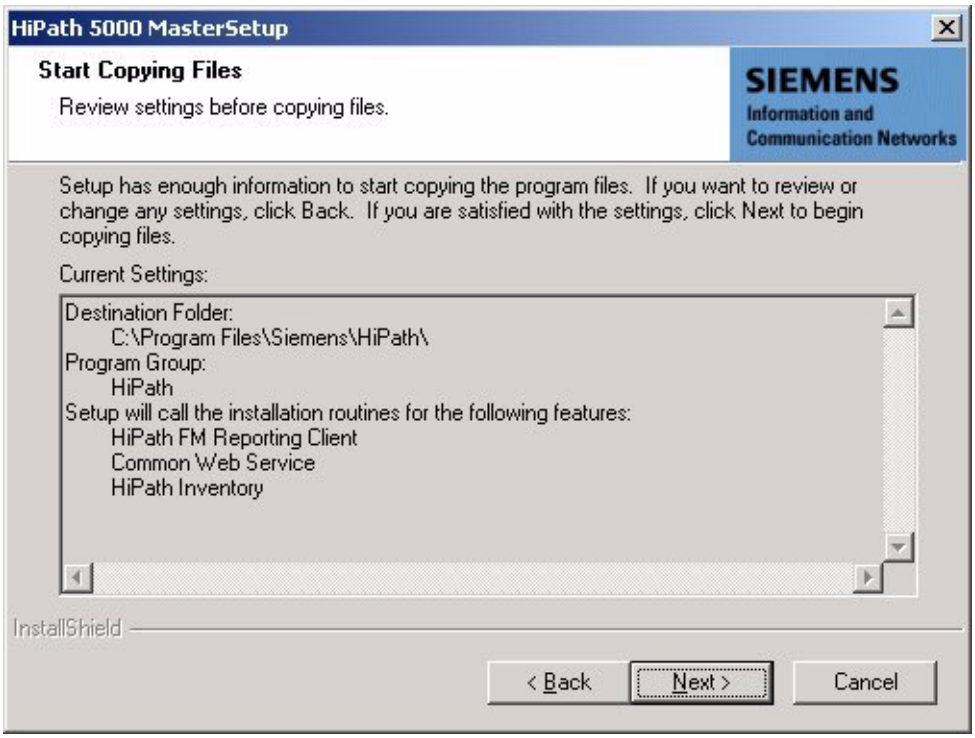
7. The **Select Features** dialog appears.



Select the HiPath Inventory components you want to install and deselect the ones you do not want to install.

8. Then click **Next**.

   The **Start Copying Files** dialog appears.

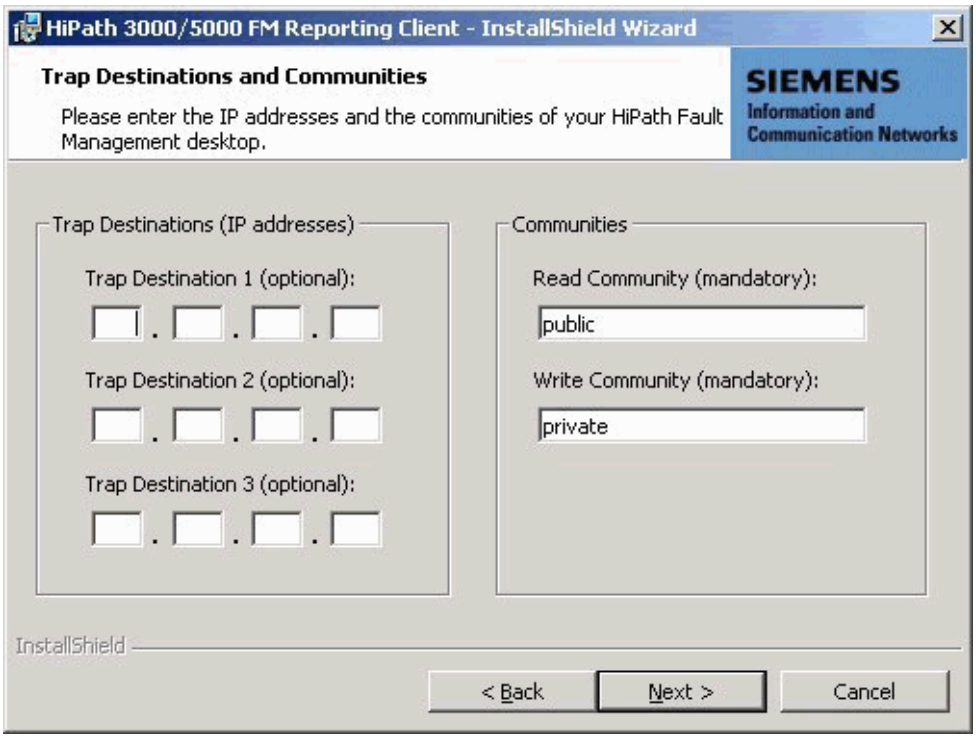


Check if the correct destination directory and program group are specified and if all necessary components are installed.

To be able to implement the setup for HiPath Inventory, both an FM Reporting client and a Common Web Service must be installed on the relevant PC. Both components are automatically selected and installed by the Master Setup.

9. Click **Next** to start the copy operation.

   The **Trap Destinations and Communities** dialog appears.

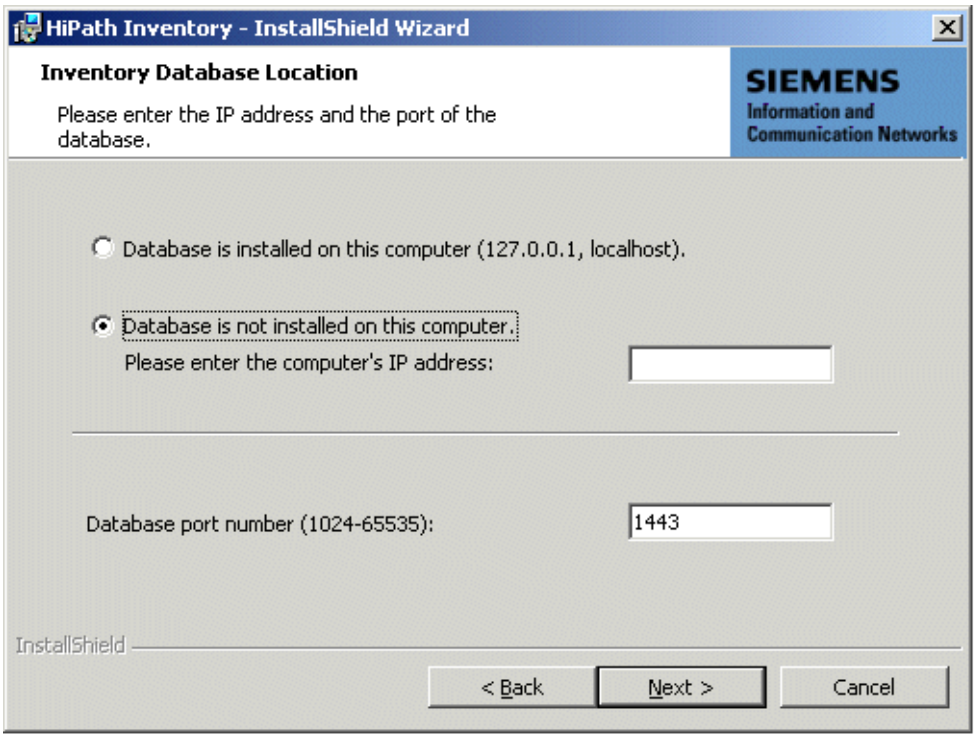


   Enter the trap destinations (if necessary) and the HiPath Fault Management desktop community names.

> The FM Reporting Client does not have its own user interface. The trap destinations and community names defined during installation may only be changed by uninstalling and then reinstalling the FM Reporting Client.
> Users with sufficient knowledge of SNMP can change trap destinations and community names by editing the file `snmpd.cnf` (see Annex E).

10. Click **Next** to proceed with the installation routine.

    The **Inventory Database Location** dialog appears.



    Enter the IP address and the port number of the PC where the database is installed (MSDE SQL database server).

11. Confirm your entries with **Next**.

12. When installation is complete, a dialog appears in which you can terminate the setup with **Finish**.

6.5.7 Verifying Installation

Computer Management can be used to verify that all components are correctly installed. This is included in NT-based operating system packages (MS Windows NT, MS Windows 2000, MS Windows XP, etc.).

To start this component, select `Settings - Control Panel - Administrative Tools - Computer Management`.

This program is a sophisticated desktop tool for performing remote maintenance on computers. Possible actions include the following:

- monitoring system events, for example, logon times and application errors.
- creating and managing releases
- starting and ending system services, for example task schedulers and spoolers.
- defining properties for memory devices
- displaying device configurations and adding new device drivers
- administering server applications and services, for example, DNS (Domain Name System) or DHCP (Dynamic Host Configuration Protocol).

Computer Management is displayed in a separate window, like Windows Explorer. The console structure (for the navigation and service program selection) contains the system programs, data memory, services, and applications available on the computer. The right pane - the event area - shows the tool's attributes and data as well as any subordinate tools available.



Administrator user rights are required to use the full range of Computer Management functions.
Working with Computer Management requires an appropriate level of familiarity with the operating system.

6.5.7.1 Verifying the Start and Function of HiPath 5000 Services

Select `Computer Management - Services and Applications - Services` to check if all necessary services were started.

6.5.7.2 Checking Entries in the Event Viewer

The Event Viewer (event log) provides status information on the HiPath 5000 server and any application servers available.

All events associated with the server(s) and its (their) applications are saved. The events provide a quick and, above all, time-specific overview of all relevant actions (status, information, warning, error, etc.).

To open the Event Viewer, select `Computer Management - System Tools - Event Viewer`.

For more information, see Section 12.2.12, “Event Viewer for HiPath 5000 (Eventlog)”.
Table 12-8 shows the possible entries that may appear in the Event Viewer.

6.6 Modifying HiPath 5000 Components (Retro-Fitting, Updating, Deleting)

The Setup maintenance program can be used for

- retro-fitting additional components (features) to the current HiPath 5000 installation.
- updating components (features) in the current HiPath 5000 installation,
  Note: When upgrading from one version to another (from V7 to V8, for example), all components (features) must first be uninstalled. The components from the new version can then be installed (for more information, refer to Section 6.6.1).
- deleting all components (features) of the current HiPath 5000 installation.

When activated, the Setup creates the relevant selection lists based on the current HiPath 5000 installation.



The WinAccount software for evaluating call data records is no longer used in HiPath 3000/5000 V4.0 or later.
Call data records must be evaluated with WinAccount before starting an update because updating uninstalls the WinAccount application.
Refer to the WinAccount user manual for information about the procedure



Before starting the Setup maintenance program, note the following information:

- The TAPI Service Provider configuration (configuration and lines - see TAPI 170 Service Provider Help) and the CDB files for all connected systems (refer to HiPath 3000/5000 Manager E Help) should be saved for security reasons.
- The HiPath 5000 server must be stopped (`Start/Programs/HiPath/HiPath 5000 State Viewer`, Stop Server button).

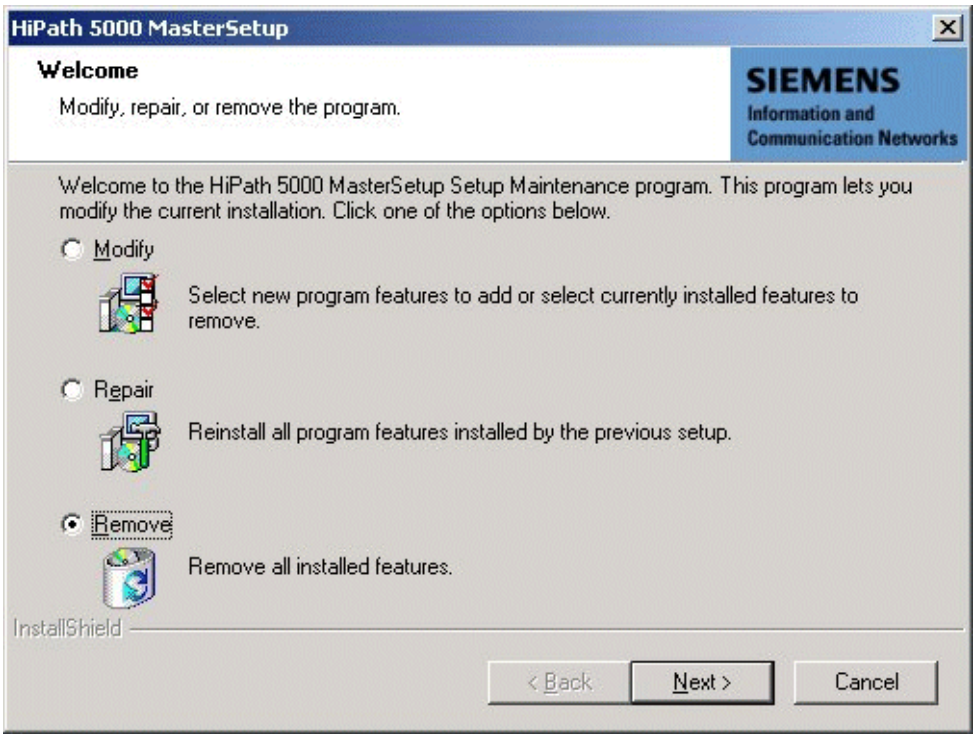
6.6.1 Version-Wide Upgrading of a HiPath 5000 Installation

When upgrading from one version to another (from V7 to V8, for example), all components (features) must first be uninstalled. The components of the new version can then be installed.

1. Save the current TAPI service provider configuration (configuration and lines - see TAPI 170 Service Provider Help).
2. Save the current CDB files of all connected systems (see HiPath 3000/5000 Manager E Help).
3. Call up the HiPath 5000 State Viewer with `Start/Programs/HiPath/HiPath 5000 State Viewer`.
4. Exit the HiPath 5000 server by clicking **Stop Server**.
5. Insert the installation CD.

   The installation program is started via the autorun function. Alternatively you can initiate Setup via Windows Explorer under `<CD-ROM-drive letter>:\setup.exe`.
6. Select the language you require for the Setup browser.

7. The Setup maintenance program appears.



   Select the option **Remove**.

8. Then click **Next**.

9. Confirm the deletion of all installed components (features).

   Follow the on-screen user prompts.

10. Delete the following directories (default paths are provided):

    ```
    c:\Program Files\Microsoft SQL Server\MSSQL\
    ```

    ```
    C:\Program Files\Siemens\HiPath\DB Feature Server\
    ```

    ```
    C:\Program Files\Siemens\HiPath\HiPath5000\
    ```

    Note: As these directories are not installed via Master Setup, it is not possible to delete them via the setup maintenance program.

11. Install the components (features) for the new version (refer to the instructions in Section 6.5.3).

6.7 Performing Licensing

Version 5.0 and later features a new, centralized licensing procedure, called HiPath License Management. The procedure is used in all HiPath products, for example communication systems, workpoint clients, and applications.

A grace period of 30 days begins when HiPath 5000 is started up. Licensing must be performed for all features, interfaces, and products subject to mandatory licensing within this grace period.

HiPath 3000/5000 Manager E comes with a customer-specific file which is used by the Customer License Agent CLA to generate a GPCF (Grace Period Configuration File) file. This file ensures that the maximum expansion of all features that are subject to mandatory licensing is possible within the 30-day grace period. The system or systems are not licensed.

The system falls into licensing default if licensing is not performed within the 30-day grace period. This means that features which subject to mandatory licensing will suffer from reduced functionality.



Please refer to Chapter 8, “Licensing” for information on how to proceed.

6.8 Optimizing Operating System Settings

Windows 2000 Server

This section describes how you can optimize the Windows 2000 Server operating system for the implementation of HiPath 5000.

Table 6-6 Operating System Settings for HiPath 5000

Component	Description
Optimizing the physical memory	Windows 2000 Server is normally optimized for maximum throughput as a file server. For a HiPath 5000 server, however, significantly less memory is needed for the system-wide disk cache. Go to `Start/Settings/Network and Dial-up Connections/LAN Connection: Properties– File and Printer Sharing for Microsoft Networks: Properties` and select the **Balance** option.
Optimizing the virtual memory	Go to `Start/Settings/Control Panel/System: Advanced – Performance Options: Virtual Memory: Change` to set the **maximum size of the swap file for all drives** to 512 MB. The same values should be entered for the virtual memory's upper and lower thresholds so that the paging file does not have to be extended during operation.
Optimizing availability	If the operating system crashes (blue screen), it creates a file containing debugging information from the paging file the next time the system starts. If the size of this file is the same size as the system's physical memory, almost all of the virtual memory will be used for generating this file during system startup. This may cause certain services on the HiPath 5000 server to experience problems in starting up. To combat this problem, go to `Start/Settings/Control Panel/System: Advanced– Startup and Recovery`, **Save debug information** and select the option **None**. All other options are viable. The **Auto restart** option forces an automatic restart in the event of a system crash, thus considerably increasing the server's availability.
SMTP service	The operating system's SMTP service should always be disabled as HiPath 5000 provides its own SMTP link which may conflict with the operating system's service. To do this, go to `Start/Settings/Control Panel: Software: – Add or Remove Programs: Internet Information Service (IIS) – Details`: and **deactivate SMTP Service**.

Windows Server 2003

No information is available on how to optimize Windows Server 2003.

Windows Server 2008

The information for Windows Server 2008 we could not insert into this issue. We refer to the document „HiPath 3000/5000 V8, Last Changes“ A31003-H3580-T100-02-7618.

6.9 Perform HiPath 5000 Basic Configuration

A distinction should be drawn between the basic configuration of a

- HiPath 5000 RSM as central administration unit in an IP network. The formation of a “single system image” allows the central administration of all associated nodes.

  The IP network is administered via the Feature server. The HiPath 3000/5000 Manager E administration tool does not communicate with the individual nodes but exchanges data with the Feature server. The Feature server ensures that the networked nodes receive synchronized CDB data. The Feature Server is an MS Windows service that automatically starts at the same time as the HiPath 5000 RSM.

  HG 1500 boards are still administered on a board-specific basis using Web-based management (WBM).

  The administration of IP networking with HiPath 3000/5000 Manager E is divided into the following steps:

  a) Configuring the individual nodes belonging to the network = Configuration of the individual customer databases.

  b) Configuring the Feature server = Create an empty server net file.

  c) Start data transfer = registration of the individual nodes and transfer of the node data to the server net file.

  d) Transfer the central database for IP networking = Load the server net file to the Feature server. The customer database is then automatically distributed to the various nodes.

  Future administrative node work is then performed by the server.

6.9.1 Configuring HiPath 5000 RSM as a Central Admin. Unit in an IP Network

The IP network is administered via the Feature server. The HiPath 3000/5000 Manager E administration tool does not communicate with the individual nodes but exchanges data with the Feature server. The Feature server ensures that the networked nodes receive synchronized CDB data. To facilitate this, a central customer database, the so called server net file, must be created for IP networking.

6.9.1.1 Creating a Central Customer Database for IP Networking

An empty server net file must be created in order to create a central customer database for IP networking.

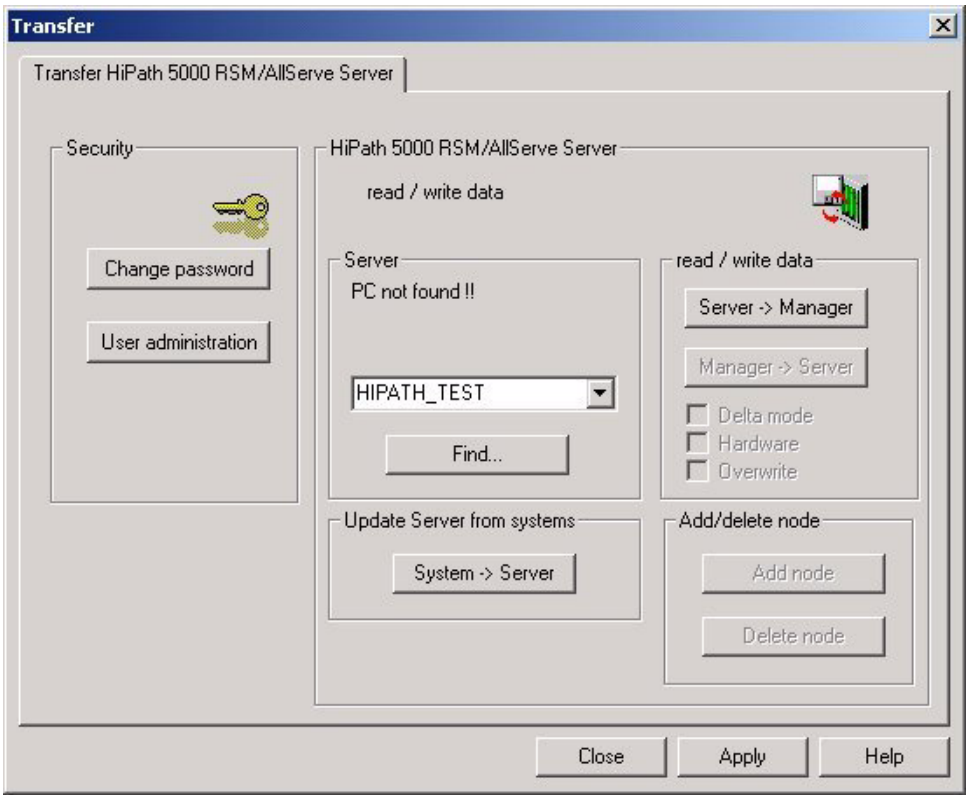
Procedure

1. StartHiPath 3000/5000 Manager E.
2. Activate the **HiPath 5000 RSM/AllServe server** by selecting **File - HiPath 5000 RSM/ AllServe - Transfer** or via the appropriate button in the toolbar.



The menu item **File - HiPath 5000 RSM/AllServe - New - HiPath 5000 RSM/ AllServe Server** is only used to create a CDB memory generated offline.

3. The **Transfer** (HiPath 5000 RSM/AllServe Server) dialog appears.



4. The PC to be used as the HiPath 5000 server should be entered in the **Server** field.

   Note: If the required software is not installed on the specified PC, the error message “HiPath 5000 RSM/AllServe Server not Installed on this PC” appears.

5. Click **Server –> Manager** to create an empty server net file.

6. Then click **Close**.

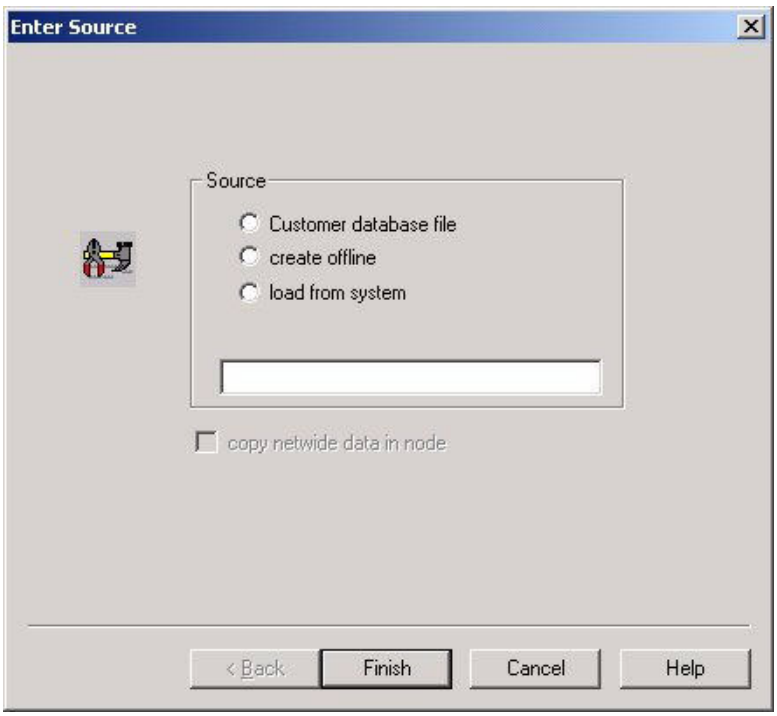
6.9.1.2 Adding Individual Nodes for IP Networking

The next steps in creating a central database for IP Networking are the registration of the individual nodes and the transfer of the node data to the server net file. The server net file is now loaded to the Feature server. The customer database is then automatically distributed to the various nodes.

The prerequisite for adding nodes (HiPath 3000) to a HiPath 3000/5000 network is the successful installation (see Chapter 4, “Installing HiPath 3000”) and startup (see Chapter 5, “Starting Up HiPath 3000”) of these systems.

Procedure

1. To select the node to be added to the CDB, call **File - HiPath 5000 RSM/AllServe - New - HiPath 3000**.
2. The **Enter Source** dialog appears.

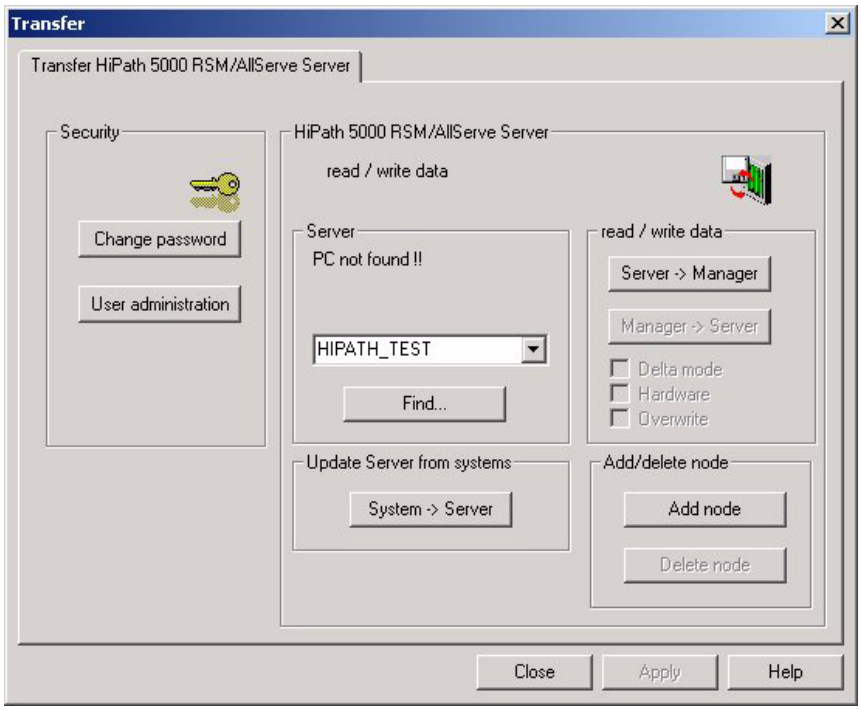


3. Select the appropriate source:
   - Customer database file (to open a saved CDB file)
     In this case, select the appropriate CDB file in the **Open customer database** dialog displayed.
   - Create offline (to create a CDB generated offline)
     In this case, define the new CDB in the **Enter node data** dialog displayed. You must then configure customer-specific data.

- Load from system (to load a CDB directly from a node)
  In this case, select the HiPath 3000 node with the CDB that is to be loaded from the subsequent **Transfer** (Communication) dialog that appears. You must then start the transfer (system -> PC).

If the **Copy netwide data in node** option is activated, the service and substitution codes are copied from the CDB firstly created to all other CDB files of the node belonging to IP networking.

4. Clicking **Finish** opens the **Transfer...** dialog. Here, specify the node whose data should be read.
5. To add the node, invoke **File - HiPath 5000 RSM/AllServe - Transfer - HiPath 5000 RSM/ AllServe Server**.
6. The **Transfer** (HiPath 5000 RSM/AllServe Server) dialog appears.



Apply the node data to the server net file by clicking the **Add node** button.

The number of nodes loaded during previous actions is displayed.

7. Finally, rewrite the data from HiPath 3000/5000 Manager E to the HiPath 5000 server (**Manager –> Server** button).

Refer to the Help for HiPath 3000/5000 Manager E for additional information about the procedure.

6.10 GetAccount

Overview

The call data records generated during HiPath 3000/5000 operation can be copied to a text file for further processing using the GetAccount program.

The WinAccount software for evaluating call data records is **no longer** used in HiPath 3000/5000 V4.0 or later.

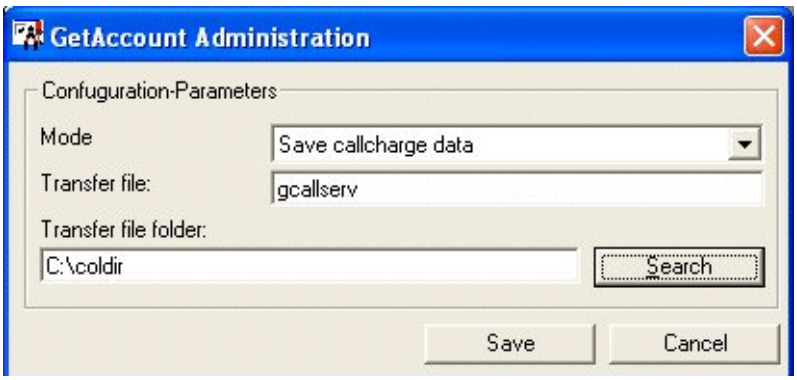
6.10.1 Parameters for Call Data Export

For HiPath 5000, you can forward the existing call data, for example, for external call charge calculation. The call data is forwarding in an ASCII file.

Proceed as follows to set the parameters for call data export:

1. Start the **GetAccount Administration** program.

   The following dialog appears.



2. Enter the following data:

Field name	Meaning
Mode	Select the call data forwarding mode in this list field. The following modes are available: • None save call charge data The call data is not written to the transfer file. Select this option. • Save call charge data The call data is written to the transfer file. The modes Export calls with calculation and Export and save calls with calculation are intended for a future expansion.
Transfer file	Confirm the default file name (`gcallserve`) or enter a different file name.
Transfer file folder	Confirm the default folder name (`C:\coldir`) or enter a different folder name. The transfer file is stored in the folder set here.

3. Click **Save** to save your inputs.

   The changes you made only become effective after the GetAccount service is restarted.

   The ASCII transfer file is automatically saved in the specified folder and extended to include the new call data. The file is extended by one line for each call data record. Each call data record (line) is ended with `CR+LF`.

Data record structure

Table 6-7 GetAccount - Data Record Structure

No.	Pos.	Length	Description
1	1 - 8	8	Date of call end Format DD.MM.YY, for example “13.09.00”
2	9 - 16	8	Time of call end Format hh:mm:ss, for example “14:14:00”
3	17 - 19	3	Trunk number right-aligned with leading blanks, for example “ 1”
4	20 - 22	3	Node ID for HiPath 3000 (matches the configuration in HiPath 3000/ 5000 Manager E) right-aligned with leading blanks
5	23 - 28	6	Internal extension number right-aligned with leading blanks
6	29 - 33	5	Call duration in seconds
7	34 - 41	8	Call duration Format hh:mm:ss, for example “00:04:34”
8	42 - 66	25	• For incoming calls: external caller number • For outgoing calls: external call number dialed including the call-by-call number left-aligned with succeeding blanks
9	67 - 77	11	Number of tariff units right-aligned with leading blanks
10	78	1	Call type • 1: incoming • 2: outgoing (default)
11	79 - 89	11	Account code ACCT left-aligned with succeeding blanks
12	90 - 100	11	MSN used
13	101 - 105	5	Trunk right-aligned with leading blanks
14	106 - 109	4	LCR Selected Route (corresponds to configuration in HiPath 3000/ 5000 Manager E) right-aligned with leading blanks
15	110	1	CR
16	111	1	LF

Copying/renaming the transfer files

Proceed as follows if you want to use the call information in the transfer file for external processing:

- Switch to the folder containing the transfer file (default: `C:\coldir`).
- Rename the transfer file (default: `gcallserve`). The renamed file is now available for external processing.
- The transfer file is automatically recreated in the specified folder with the file name saved in the parameters and can be renamed again at a later point.



To avoid uncontrolled folder growth with the transfer file, an option is available for deleting the renamed transfer file after forwarding it for external use in this folder.

6.11 Connecting an Uninterruptible Power Supply to HiPath 5000

Online's P 500 uninterruptible power supply (UPS) was certified for use with HiPath 5000.

The P 500 UPS is fed through the AC power cord to the HiPath 5000 server. The device bridges power failures lasting 5 - 10 minutes by means of an integrated battery.

Caution
For safety reasons and for protection against guarantee claims, changes to the UPS settings may only be performed by specially trained technicians.
The manufacturer's safety and operating instructions must be observed.

P 500 UPS - Front and Rear Panel

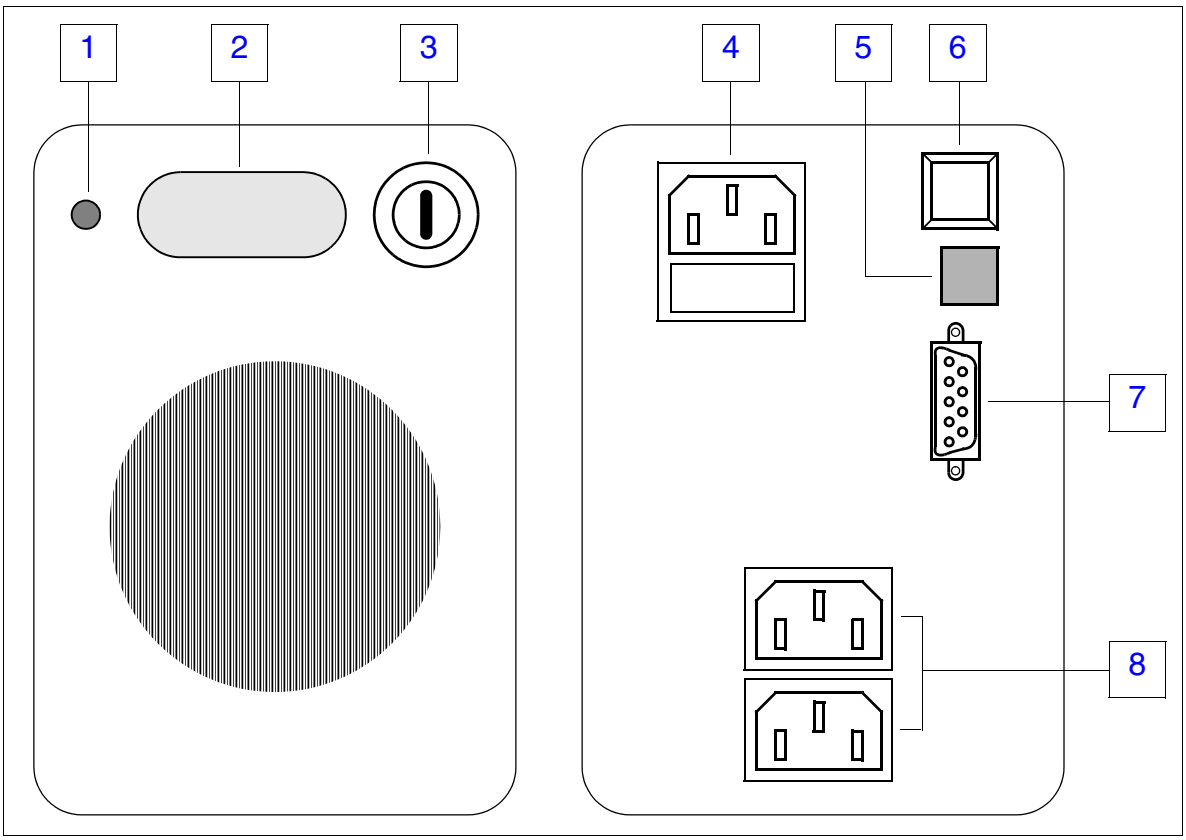


Figure 6-4 P 500 UPS - Front and Rear Panel

P 500 UPS - Meaning of Displays, Switches and Jacks

Table 6-8 P 500 UPS - Meaning of Displays, Switches and Jacks

No.	Description
1	LED displays the status of the P 500 UPS. • green = input voltage (line voltage) is functioning • red = UPS is suppling voltage or fault has been detected
2	Display shows UPS operating status • NORMAL • CHARG'G • BATTERY and reports the charging status of the battery (25, 50, 75 or 100%).
3	On/off switch
4	Input (jack for input voltage (line voltage)) There is a cavity under the jack for the input fuse (with spare fuse enclosed).
5	3-pin DIP-FIX switch: • 1: reduces the response voltage (minimum line voltage value before UPS activation) – 10 V with 220/240-V systems – 5 V with 110/120-V systems. • 2: increases the response voltage by 5% • 3: reduces the response voltage by 5% Switch positions normally: DIP FIX 1 = off, DIP FIX 2 and 3 = on
6	Reset key • deactivates the acoustic alarm if the input voltage fails, that is, when using the UPS. This alarm cannot be deactivated if the battery voltage falls under a certain value. • activates the UPS cold start. To protect the battery from deep discharging, the UPS can only be activated when the line voltage is connected. By activating the "on" switch (1) and then pressing the reset key, the P 500 UPS can also be activated without a network connection (cold start). The connected server must be disconnected before a cold start. The P 500 UPS needs between 5 and 20 s to reach the set output voltage. To avoid malfunctions the connected server should not be connected immediately.
7	9-pin jack for connection to the communication server **NOT USED IN HiPath 3000/5000.** Special monitoring software can shut down the specified server via this jack, for example, in the case of extended power failures.
8	Jacks for power supply to the communication server to be monitored.

7 Starting HiPath 3000 as a Gateway

Introduction

So-called gateways provide the HiPath 5000 with interfaces for trunk and tie trunk connections to the telecommunications network. For HiPath 3000 V8, HiPath 3800, HiPath 3500 and HiPath 3300 systems can be used as gateways.

Chapter contents

This chapter covers the following topics:

Topic
Starting HiPath 3800 as a Gateway, page 7-2
Starting HiPath 3500 as a Gateway, page 7-5
Starting HiPath 3300 as a Gateway, page 7-8

7.1 Starting HiPath 3800 as a Gateway

7.1.1 Prerequisites

Warning
Only authorized service personnel should install and start up the system.

Refer to Section 4.1.1 for information on the tools and resources needed to install the HiPath 3800 system.

7.1.2 Procedure for Installation and Startup

To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Caution (for Brazil only)
The use of the outlet strip with overvoltage protection with part number C39334-Z7052-C33 is absolutely mandatory. The AC power of the system cabinet(s) must be conducted through the outlet strip with overvoltage protection.

Table 7-1 HiPath 3800 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
Installing HiPath 3800 (19-Inch Cabinet)	
1.	Selecting the Installation Site, page 4-20 (generally determined by the existing 19-inch cabinet)
2.	Unpacking the Components, page 4-23
3.	Mounting System Cabinets in the 19-Inch Cabinet, page 4-24
4.	Grounding the System, page 4-27 Checking the Grounding, page 4-30
5.	Connecting the Cable to the Backplane, page 4-50
6.	If required: Inserting the External Patch Panel, Page 4-65
7.	Loading the System Software and Installing Subboards on the CBSAP, page 4-80
8.	Installing Boards (Configuration Notes), page 4-31 (cabinet(s) are already equipped with the boards) We recommend that you check the board population using the configuration notes.

Table 7-1 HiPath 3800 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
9.	Making Trunk Connections Refer to the following board descriptions for information: • STMD3 - for S_0 trunk connection • DIUN2 - for S_{2M} trunk connection • DIU2U (for U.S. only) - for T1 PRI trunk • DIUT2 - for the S_{2M} trunk connection and the T1 trunk connection (PRI or analog)
10.	Making IP connections Perform the IP connection over the HG 1500 board, STMI2. For information on configuration, refer to the HG 1500 Administration Manual .
11.	Performing a Visual Inspection, page 4-82
Startup of HiPath 3800 (Section 5.1)	
1.	Supplying the System with Power, page 5-2 (Plugging in the system cabinet(s) -> starting system boot) Note (for Brazil only): The AC power of a system cabinet is internally equipped with transient overvoltage protection up to approx. 2kV. Since additional lightning protection is prescribed for Brazil, the AC power of the system cabinet(s) must be conducted through the outlet strip with overvoltage protection (part number C39334-Z7052-C33). In this way, transient overvoltage protection is guaranteed up to approx. 4 kV.
2.	Carrying Out a System Reload, page 5-6
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-7
4.	Not for U.S.: Entering the System Number, page 5-9
5.	Conducting customer-specific programming with HiPath 3000/5000 Manager E. Refer to the HiPath 3000/5000 Manager E Help for information on programming individual features.

Table 7-1 HiPath 3800 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
6.	Performing a system check • The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.2.11 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. • Test IP configuration Ping the HG 1500 IP address in the gateway Make random external calls (from IP phones or clients to HiPath 5000)

7.2 Starting HiPath 3500 as a Gateway

7.2.1 Prerequisites

Warning
Only authorized service personnel should install and start up the system.

Refer to Section 4.2.1 for information on the tools and resources needed to install the HiPath 3500 system.

7.2.2 Procedure for Installation and Startup

To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Caution (for Brazil only)
The use of the outlet strip with overvoltage protection with part number C39334-Z7052-C33 is absolutely mandatory. The AC power of the system must be conducted through the outlet strip with overvoltage protection.

Table 7-2 HiPath 3500 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
HiPath 3500 Installation (19-Inch Cabinet) (Section 4.2)	
1.	Selecting the Installation Site, page 4-109 (usually predetermined)
2.	Unpacking the Components, page 4-110
3.	Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall, page 4-111
4.	Installing a HiPath 3500 or HiPath 3300 in a Cabinet, page 4-112
5.	Grounding the System, page 4-114
6.	Connecting Cables and the Line Network, page 4-116
7.	Configuration Notes, page 4-118

Table 7-2 HiPath 3500 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
8.	Making trunk connections Refer to the following board descriptions for information: • STLS4R - for S_0 trunk connection • TS2R - for the S_{2M} trunk connection • TST1 (for U.S. only) - for T1 PRI trunk Note: Analog workpoint clients can be connected to the CBRC's T/R ports in emergencies. This ensures telephone operation via the telecommunications network in the event of IP network failure.
9.	Making IP connections Perform the IP connection over the HG 1500 board, HXGR3. For information onconfiguration, refer to the HG 1500 Administration Manual .
10.	Performing a Visual Inspection, page 4-121
Startup of HiPath 3500 (Section 5.2)	
1.	Supplying the System With Power, page 5-12 (starting system boot). Note (for Brazil only): The AC power of the system is internally equipped with transient overvoltage protection up to approx. 2 kV. Since additional lightning protection is prescribed for Brazil, the AC power of the system must be conducted through the outlet strip with overvoltage protection (part number C39334-Z7052-C33). In this way, transient overvoltage protection is guaranteed up to approx. 4 kV.
2.	Carrying Out a System Reload, page 5-15
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-15
4.	Not for U.S.: Entering the System Number, page 5-17
5.	Conducting customer-specific programming with HiPath 3000/5000 Manager E. Refer to the HiPath 3000/5000 Manager E Help for information on programming individual features.

Table 7-2 HiPath 3500 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
6.	Performing a system check • The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.2.11 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. • Test IP configuration Ping the HG 1500 IP address in the gateway Make random external calls (from IP phones or clients to HiPath 5000)

7.3 Starting HiPath 3300 as a Gateway

7.3.1 Prerequisites

Warning
Only authorized service personnel should install and start up the system.

Refer to Section 4.2.1 for information on the tools and resources needed to install the HiPath 3300 system.

7.3.2 Procedure for Installation and Startup

To ensure that IP addresses are not assigned more than once in the customer network, you must ping each new IP address to be configured before each IP address is assigned. If an IP address responds, then this address cannot be used again.

Caution (for Brazil only)
The use of the outlet strip with overvoltage protection with part number C39334-Z7052-C33 is absolutely mandatory. The AC power of the system must be conducted through the outlet strip with overvoltage protection.

Table 7-3 HiPath 3300 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
HiPath 3300 Installation (19-Inch Cabinet) (Section 4.2)	
1.	Selecting the Installation Site, page 4-109 (usually predetermined)
2.	Unpacking the Components, page 4-110
3.	Not for U.S.: Attaching a HiPath 3500 and HiPath 3300 to the Wall, page 4-111
4.	Installing a HiPath 3500 or HiPath 3300 in a Cabinet, page 4-112
5.	Grounding the System, page 4-114
6.	Connecting Cables and the Line Network, page 4-116
7.	Configuration Notes, page 4-118

Table 7-3 HiPath 3300 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
8.	Making trunk connections Refer to the following board descriptions for information: • STLS4R - for S_0 trunk connection Note: Analog workpoint clients can be connected to the CBRC's T/R ports in emergencies. This ensures telephone operation via the telecommunications network in the event of IP network failure.
9.	Making IP connections Perform the IP connection over the HG 1500 board, HXGR3. For information onconfiguration, refer to the HG 1500 Administration Manual .
10.	Performing a Visual Inspection, page 4-121
Startup of HiPath 3300 (Section 5.2)	
1.	Supplying the System With Power, page 5-12 (starting system boot). Note (for Brazil only): The AC power of the system is internally equipped with transient overvoltage protection up to approx. 2 kV. Since additional lightning protection is prescribed for Brazil, the AC power of the system must be conducted through the outlet strip with overvoltage protection (part number C39334-Z7052-C33). In this way, transient overvoltage protection is guaranteed up to approx. 4 kV.
2.	Carrying Out a System Reload, page 5-15
3.	Carrying Out the Country Initialization and Selecting the Password Type, page 5-15
4.	Not for U.S.: Entering the System Number, page 5-17
5.	Conducting customer-specific programming with HiPath 3000/5000 Manager E. Refer to the HiPath 3000/5000 Manager E Help for information on programming individual features.

Table 7-3 HiPath 3300 as a GW, Procedure for System Installation and Startup

Step	Activity (Remarks)
6.	Performing a system check • The following tests must be performed if telephones are directly connected to the gateway: – Check the telephones Check the time and date display on each telephone. If a display does not appear, either the telephone or the link is defective. Replace the terminal or fix the link. Perform random terminal tests as described in Section 12.2.11 on all telephones. – Check for proper system booting Set up internal and external calls at random to check if the system is functioning properly. • Test IP configuration Ping the HG 1500 IP address in the gateway Make random external calls (from IP phones or clients to HiPath 5000)

8 Licensing

Chapter contents

This chapter covers the following topics:

Topic
Licensing Fundamentals, page 8-2
Licensing for HiPath 3000 V8, HiPath 5000 V8, page 8-4
• Products and Components subject to Mandatory Licensing, page 8-4
• Grace Period, page 8-9
• License Failure Period, page 8-9
• Performing Licensing, page 8-10
Licensing Scenarios, page 8-15
• HiPath 3000 as a Standalone System, page 8-15
• Networked HiPath 3000 Systems without HiPath 5000 RSM, page 8-17
• Networked HiPath 3000 Systems with HiPath 5000 RSM, page 8-17
• Upgrading to HiPath 3000 V8, HiPath 5000 V8, page 8-20
• Merging Standalone Systems (HiPath 3000) to Form a Network with HiPath 5000 RSM, page 8-23
• Removing a Standalone System from a Network with HiPath 5000 RSM, page 8-25
• Replacing License-sensitive Hardware (Changing the MAC Address), page 8-26
Licensing optiClient Attendant (V8) at HiPath 3000 V8, page 8-29
Protection Against License Manipulation, page 8-31

8.1 Licensing Fundamentals

Licensing system statuses

HiPath 3000/5000 V8 supports two licensing system statuses, exception status and licensed status:

1. **Exception status**: Exception status is when:
   - a system has not (yet) been licensed after an initial system boot. The features HG 1500, S2M, BS4 and ComScendo Security each have two default licenses.
   - the grace period licenses or the regular licenses have expired. The system returns to exception status.
2. **Licensed status**: The following statuses occur in sequence in licensed status:
   a) The system is running on grace period licenses. Grace period licenses are automatically generated when the Manager E licensing mask opens so that licensing can be performed for the entire system, see Section 8.2.2, “Grace Period”.
   b) The system operates with regular licenses. The system does not use the grace period licenses in this status, only the licenses that were downloaded via Manager E.

This guarantees that an emergency call can be made in every system status.

Licensing procedure

Version 5.0 and later of HiPath 3000/5000 uses a new, centralized licensing procedure: HiPath License Management. The procedure is used in all HiPath products, for example communication systems, workpoint clients, and applications.

To license a product you must first establish a connection with the Central License Server (CLS) via the Customer License Manager (CLM). The customer-specific data entered is used to uniquely identify the product configuration for which the relevant license file is to be supplied in encrypted format. The license file contains the licenses for all products which are subject to mandatory licensing.

The CLM is responsible for activating the license file and allocating it to the Customer License Agent (CLA). This is where the license data is validated. Distribution of the licenses to the individual products using HiPath 3000/5000 Manager E can then begin.

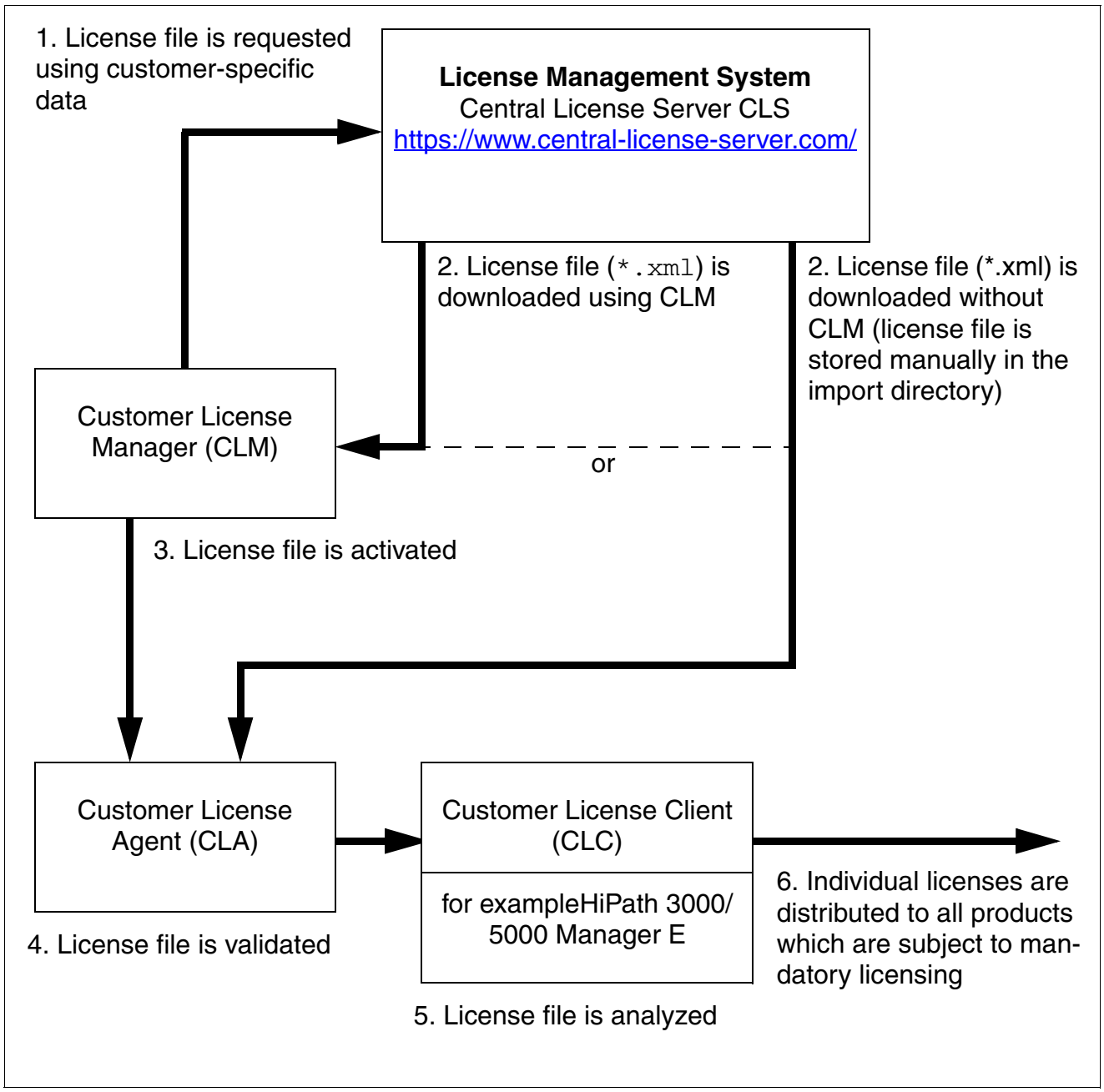


Figure 8-1 Licensing Process with Central License Server (CLS)

8.2 Licensing for HiPath 3000 V8, HiPath 5000 V8

8.2.1 Products and Components subject to Mandatory Licensing

The following products and components used with HiPath 3000 and HiPath 5000 V8 must be licensed (i.e. are subject to mandatory licensing). The required licenses are combined in a license file and must be distributed to the relevant products using HiPath 3000/5000 Manager E.

Table 8-1 Features subject to mandatory licensing

Feature subject to mandatory licensing	Details in license file			Default values in unlicensed state		Distribution of Licenses with HiPath 3000/5000 Manager E			
	Feature name	Maximum number	Minimum number	During grace period	After grace period	Network-wide	Per board	Per port/ per device	boards per system
HiPath ComScendo licenses (system clients, H.323 clients, SIP clients)	HiPath 3000 V8 ComScendo IP Workpoint HiPath 3000 V8 ComScendo Security	2000	0	2000	0	–	HiPath 3000: 500 per Gatekeeper HiPath 5000: 1000 per Gatekeeper	–	–
HiPath 5000 V8 basic package, incl. administration, IP networking, SNMP	HiPath 3000 V8 Central Admin H5000	1	0	1	0	X	–	–	X
S_{2M} license for 1 B channel for HiPath 3000 V8 (TS2, TS2R, DIUN2, DIUT2)	HiPath 3000 V8 B channel S2M	8960	0	8960	TS2/ TS2R: 2 per board DIUN2: 2 licenses port 1, 0 licenses port 2 DIUT2: 2 licenses port 1, 0 licenses port 2	–	TS2/TS2R: 0 - 28 licenses per port DIUN2: 0 - 28 licenses port 1, 0 - 30 licenses port 2 DIUT2: 0 - 28 licenses port 1, 0 - 30 licenses port 2	–	–

Table 8-1 Features subject to mandatory licensing

Feature subject to mandatory licensing	Details in license file			Default values in unlicensed state		Distribution of Licenses with HiPath 3000/5000 Manager E			
	Feature name	Maximum number	Minimum number	During grace period	After grace period	Network-wide	Per board	Per port/ per device	boards per system
HG 1500 V3.0 expansion B channels for HiPath 3000 V8	HiPath 3000 V8 B channel HG1500	2000	0	2000	2	–	58 per HG 1500 board	–	–
HG 1500 V3.0 expansion B channels for HiPath 3000 V8	HiPath 3000 V8 B channel HG1500 HiPath 3000 V8 ComScendo Security	2000	0	2000	2	–	58 per HG 1500 board	–	–
Xpressions Compact Announcements for V8	HiPath 3000 V8 Xpressions Compact Announcement	1024	0	1024	0	–	max. 16 per IVM board	–	–
BS4 B channel for V8 (HiPath Cordless Office)	HiPath 3000 V8 BS4 Channel	6420 One license = one registration	0	6420	2 B channels per BS4	–	–	0 - 10 licenses per port	–
HG 1500 V3.0 VPN (Virtual Private Network) LWCA package for HiPath 3000 V8	HiPath 3000 V8 LWCA HG 1500	1	0	1	0	–	Only on one HG 1500 board	–	–
optiClient Attendant V8 for HiPath 3000 V8	HiPath 3000 V8 optiClient Attendant V8	6	0	6	0	–	–	–	Max. 6 on a central board
Xpressions Compact Mobility for HiPath 3000 V8	HiPath 3000 V8 Xpressions Compact Mobility	6	0	6	0	–	6	–	–
Mobility Entry system license for HiPath 3000 V8	HiPath 3000 V8 System Mobility Entry	100	0	100	0	–	–	–	X

The following features which are subject to mandatory licensing are licensed using separate license files:

- VPN Workpoint Clients
- CSTA Service Provider (CSP)
- TAPI Service Provider (TSP)
- HiPath Fault Management

Information on the licensing procedure can be found in the appropriate product documentation.

Licensing for OpenScape Office

Licenses are required to use the OpenScape Office applications. License management of HiPath 3000/5000 has been expanded for this reason from V8. In order to transfer license data, OpenScape Office must be connected to HiPath 3000.

The licenses for OpenScape Office are available in addition to the existing licenses of the HiPath 3000/5000 system. The following licenses are supported for OpenScape Office and for CSP (CSTA service provider):

- Basic license package:
  - 1 OpenScape Office basic license
  - 10 standard user licenses
- User licenses:

User license	Description
VoiceMail or VoiceMail-license	Voicemail only The voice mail function can only be operated via the telephone. The VoiceMail license and the "Standard User" license cannot be used simultaneously. Upgrading to the "Standard User" license is not possible and not necessary.
Standard User	myPortal Presence, CTI, voicemail and fax (inbound and outbound) 1 license per user, up to 384 licenses. The VoiceMail license and the "Standard User" license cannot be used simultaneously.
Standard User (100)	myPortal Presence, CTI, voicemail and fax (inbound and outbound) 1 license per user, package with 100 licenses. The VoiceMail license and the "Standard User" license cannot be used simultaneously.

Tabelle 8-2 User licenses

User license	Description
myPortal for Outlook	Integrated in Microsoft Outlook, 1 license per user, up to 384 licenses In order to use myPortal for Outlook, a Standard User license is necessary. If more myPortal for Outlook licenses are required than the number of Standard User licenses available, an additional Standard User license must also be acquired for each additional myPortal for Outlook license.
myPortal for Outlook (100)	Integrated in Microsoft Outlook, 1 license per user, package with 100 licenses In order to use myPortal for Outlook, a Standard User license is necessary. If more myPortal for Outlook licenses are required than the number of Standard User licenses available, an additional Standard User license must also be acquired for each additional myPortal for Outlook license.
myAttendant	Soft client solution for the phone operator or teamworker 1 license per myAttendant, 20 licenses maximum Via myAttendant, a user can be awarded access to the applications of other users, namely voicemail, fax and LAN messages of the message center. The myAttendant application can therefore only be started under the following conditions: • HiPath 3000 contains at least 1 VoiceMail license and myAttendant licenses **or** For each instance of myAttendant, HiPath 3000 contains 1 myAttendant license and 1 standard user license

Tabelle 8-2 User licenses

- B-channel in HG 1500: Additional bandwidth for access to voicemail, fax, Auto Attendant services and announcements, 1 license per channel
- Evaluation license for 30 B-channels in HG 1500: This evaluation license is only used in conjunction with evaluation licenses for OpenScape Office and for OpenScape Office Contact Center.

- Contact center licenses:

Contact center license	Description
Contact Center basic license package	• Distribution of incoming calls, contains 21 pre-configured reports • For HiPath 3800 V8 only • max. Max. 1 Contact Center basic license per system, incl. 4 free licenses for myAgent An OpenScape Office basic license is required to use this feature.
myAgent	• For additional Contact Center agents or inspectors • For HiPath 3800 V8 only • 1 license per user, max. 64 licenses per system myAgent licenses are "floating", meaning that you can define any number of stations as agents, but only a limited number of agents may be logged in simultaneously, depending on the number of licenses.
myReports	• Generating reports • max. 1 license per system
Contact Center email	• Distribution of e-mails for the contact center • For HiPath 3800 V8 only • max. 1 license per system
Contact Center Fax	• Distribution of fax messages for the contact center • For HiPath 3800 V8 only • max. 1 license per system

Tabelle 8-3 Contact center licenses

- Evaluation license for OpenScape Office (90 days, free):

  This evaluation license is aimed at HiPath 3000 customers that have never used OpenScape Office before. All OpenScape Office features are enabled for a grace period of 90 days, after which they are automatically disabled. If regular licenses for OpenScape Office are enabled during the grace period, the evaluation license is also disabled. License activation is performed via the Customer License Agent (CLA) and is only possible once, and only when no OpenScape Office licenses were previously active.

  To be able to use all OpenScape Office features, the number of HG 1500 B-channels for an HG 1500 board is increased to 30 during the grace period.

- Evaluation license for OpenScape Office Contact Center (90 days, free):

  This evaluation license is for HiPath 3000 customers already using OpenScape Office but without Contact Center. Only the Contact Center is enabled. The grace period is 90 days, after which the license is automatically disabled. If regular licenses are enabled for the

Contact Center during the grace period, the evaluation license is also disabled. License activation is performed via the Customer License Agent (CLA) and is only possible once, and only when no OpenScape Office Contact Center licenses were previously active.

To be able to use all Contact Center features, the number of HG 1500 B-channels for an HG 1500 board is increased to 30 during the grace period.

Licensing is performed by Manager E, see Manager E Administrator documentation - Licensing.

8.2.2 Grace Period

A product-specific Grace Period Configuration File (`<file name>.gpcf`) is installed with HiPath 3000/5000 Manager E. If there is no valid license file (Real License File RLF) for the Customer License Agent (CLA) when the HiPath 3000/5000 Manager E license dialog is opened, the CLA automatically generates a grace period license file using the .gpcf file. The grace period licenses can be distributed in exactly the same way as RLF licenses. The only difference is the validity period of the licenses. For a grace period license, this is limited to 30 days.

The .gpcf file ensures that the maximum expansion of all features that are subject to mandatory licensing is possible within the 30-day grace period. The system or systems are not licensed.

The.gpcf file must be stored in the HiPath 3000/5000 Manager E installation directory.

The 30-day grace period begins with the licensing of a standalone system or networked systems using the GPCF file. The licensing of all features, interfaces and products that are subject to mandatory licensing must take place during this period.

The system falls into licensing default if licensing is not performed within the 30-day grace period. This means that features which subject to mandatory licensing will suffer from reduced functionality.

The activation of a grace period is recorded by the Customer License Agent (CLA) and in the system CDB. This ensures that the 30-day period cannot be extended and that a second grace period cannot be started.

8.2.3 License Failure Period

If a licensing error occurs, there is a period of 30 days (License Failure Period), within which the error must be rectified.

If the error has not been rectified by the time the 30-day license failure period has expired, the systems enter system default mode. This means that features which subject to mandatory licensing will suffer from reduced functionality.

8.2.4 Performing Licensing

The details specified below are based on the assumption that valid license files are available to the user.

During installation of the Customer License Agent (CLA) on the service PC or on the HiPath 5000 server (see Figure 8-2), an `import` subdirectory is created in the installation directory.

If the user has received a valid license file (`<license>.xml`), there are two options:

- The license file can be stored manually in the specified subdirectory `import`.
- The Customer License Manager CLM can be activated and used to make the license file automatically available for the CLA. Information about this can be found in the Customer License Manager online help.

The license file in XML format contains information about all products that are subject to mandatory licensing and the MAC address with which these licenses are linked. Feature IDs define the number of licenses available and the length of time for which they are valid. A signature ensures that subsequent manipulation of the license file content is always detected. Invalid changes to the license file are therefore not possible.

Distribution of the licenses to the relevant features, interfaces, and products is performed using HiPath 3000/5000 Manager E.

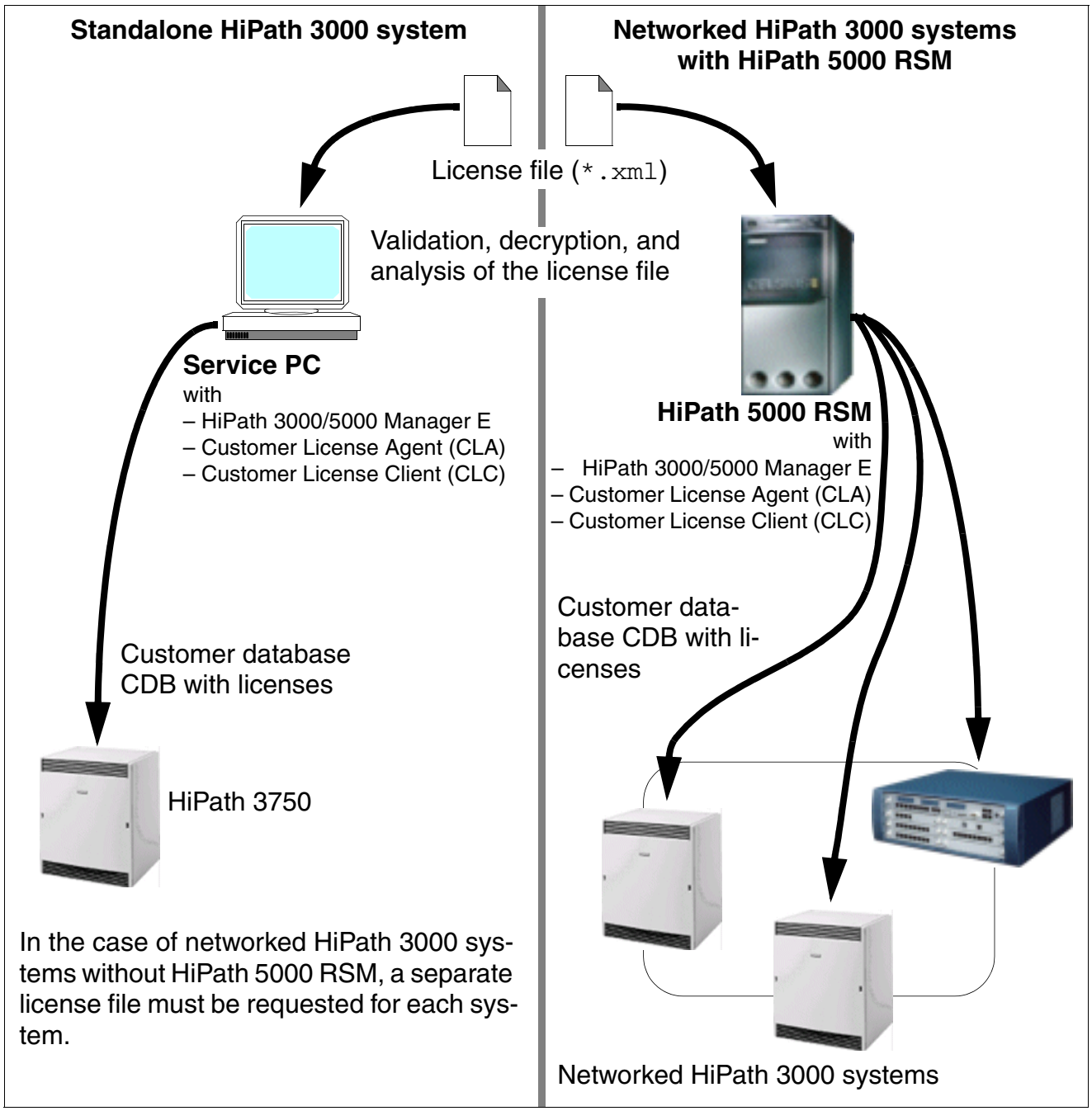


Figure 8-2 Distribution of Licenses with HiPath 3000/5000 Manager E

Procedure for distributing licenses

The license distribution procedure described below requires successful installation (see Chapter 4, “Installing HiPath 3000”) and startup (see Chapter 5, “Starting Up HiPath 3000”) of the HiPath 3000 systems (nodes) and, if available, of the HiPath 5000 RSM (see Chapter 6, “HiPath 5000 Startup and Administration”).

<table>
<tr><th rowspan="2">Step</th><th colspan="2">Activity (Remarks)</th></tr>
<tr><th>Standalone or networked HiPath 3000 systems without HiPath 5000 RSM</th><th>Networked HiPath 3000 systems with HiPath 5000 RSM</th></tr>
<tr><td>1.</td><td>Download and save the available CDB for the HiPath 3000 to be licensed using HiPath 3000/5000 Manager E.</td><td>Download and save the available CDB for the HiPath 5000 RSM to be licensed using HiPath 3000/5000 Manager E.</td></tr>
<tr><td rowspan="3">2.</td><td colspan="2">Open the “Licensing...” dialog in the “Settings” menu.
The Customer License Agent (CLA) installed on the PC opens the license file that corresponds to the MAC address.</td></tr>
<tr><td>• Licenses: The content of the license file is displayed.
In a configuration without HiPath 5000 RSM, these are the licenses for the open CDB and the corresponding node (HiPath 3000).</td><td>• Licenses: The content of the license file is displayed.
In a network with HiPath 5000 RSM, these are the licenses for the server CDB and all of the nodes (HiPath 3000) belonging to the network.
Note: When a single CDB is downloaded from a HiPath 3000/5000 network, only the license-sensitive CDB content is displayed. It is not possible to make any changes.</td></tr>
<tr><td colspan="2">– Feature: All features, interfaces, and products which are subject to mandatory licensing are displayed.
– Available: The number of licenses purchased for the feature in question is specified.
– Used: The number of licenses already assigned for the feature in question is specified. The number of available licenses not yet assigned is the difference between this number and the number specified under “Number”.
– Expiration date: If licenses are only available for a specific time, the date on which they expire is specified here.</td></tr>
</table>

Step	Activity (Remarks)	
	Standalone or networked HiPath 3000 systems without HiPath 5000 RSM	**Networked HiPath 3000 systems with HiPath 5000 RSM**
	• CDB: The license-sensitive data for the open CDB is displayed. You can specify which data you want to display in the tabs “HXG” (HG 1500 boards HXGS3, HXGR3, STMI2), “S2M” (S_{2M} boards TS2, TS2R, DIUN2, DIUT2), “IVM” (HiPath Xpressions Compact boards IVML8, IVML24, IVMN8, IVMNL, IVMP8, IVMP8R, IVMS8, IVMS8R), “Base station” (HiPath Cordless Office base station BS4), and “System-wide” (the licenses assigned for the system-wide feature “DBFS” are displayed; no changes can be made. – Type - Slot: The board type and the slot in which the board is inserted are displayed. – Port: The board port used is displayed. – Feature: The features, interfaces, and products which are subject to mandatory licensing are displayed. – Assigned: The number of licenses assigned for this feature is specified. – Base: The default value for each feature is displayed. – Expiration date: The date displayed here specifies when the validity of the licenses assigned for this feature is due to expire. For “Base station” tab only: – Type - Slot - Port: The board type, the slot in which the board is inserted, and the board port used are displayed. – BS Type: The base station type is displayed. – Name: The name of the base station is displayed. Note: If the right license is not available, only the license-sensitive CDB content is displayed. It is not possible to make any changes.	
3.	Distribute licenses. You can select the features to be licensed (features, interfaces, and products) in the “HXG”, “S2M”, “IVM” and “Base station” tabs. Distribute the licenses defined in the license file to the individual features. Note that in a network with HiPath 5000 RSM, these are the licenses for all of the nodes (HiPath 3000) belonging to the network. Note: The DBFS network-wide feature that may be included is automatically transferred to the CDB when the licensing dialog is started.	

Step	Activity (Remarks)	
	Standalone or networked HiPath 3000 systems without HiPath 5000 RSM	**Networked HiPath 3000 systems with HiPath 5000 RSM**
4.	Save CDB and transfer to HiPath 3000.	Save CDB and transfer to HiPath 5000 RSM. The server transfers the CDB files to the networked systems autonomously. The HG 1500 boards are then registered automatically. Note: Unlike previous versions, this version does not require a reset of the HG 1500 boards. A reset should therefore not be carried out. as it may disrupt data transfer.



Note on licensing the Feature Server

The Feature Server can be started without a license. In this case a message indicating that licensing needs to be performed is displayed.

Given that the Feature Server receives its license from the CDB of the first node, the licensing dialog for this node must be opened first and, as a minimum requirement, licensing must be performed using a .gcpf file. The first node must then be added to the HiPath 3000/5000 network. The Feature Server now has its (grace period) license.

If the Feature Server is not licensed through the first node within one hour, the server automatically stops operating after an hour has elapsed. When the server is restarted there is a new one-hour period in which to perform licensing.

Preconfiguration can be performed in preparation for installation of a HiPath 3000/5000 network for a customer. Licensing is required for the network at the preconfiguration stage. If there is no valid license file available, licensing can also be performed using a GPCF file.

8.3 Licensing Scenarios

During production, the HiPath 3000 control boards are assigned a board-specific number with a MAC address that is unique worldwide. To guarantee unique licensing, the license file is linked to the MAC address of a HiPath 3000 control board. The various licensing scenarios are described below.

8.3.1 HiPath 3000 as a Standalone System

The components for this system which require licensing are licensed using one license file. This file is linked with the MAC address of the HiPath 3000 control board.

Procedure

Step	Activity (Remarks)
1.	**HiPath 3000/5000 Manager E (In cases where the MAC address is not already available):**
	Determine the MAC address of the control board of the HiPath 3000 system requiring licensing.
2.	**HiPath License Management:**
	Invoke the Central License Server CLS via: https://www.central-license-server.com/ Select the language version for the License Management Center. Log on by entering the user name and password.
3.	Activate the “Generate and Download License Key” function under “Management of Available Licenses”. Various search criteria is displayed for activating the available licenses.
4.	In the “LAC” input field, enter the part number and the packing slip number (separated by a dash). Click *Search* to display a list of the features which are subject to mandatory licensing and for which licenses are available.
5.	From this list, select the features which are subject to mandatory licensing and which you want to generate a license. Activate the *Generate Key* button. In the subsequent dialog, define the number of licenses to be generated and specify the MAC address to which the license should be linked.

Step	Activity (Remarks)
6.	In the “MAC Address” input field, enter the MAC address for the HiPath 3000 control board as specified in step 1. In the “Number” field, define the number of licenses to be generated for each feature. Click *Next*.
7.	The customer and the user (contact partner) specified for this transaction are displayed. If there are still no entries available, these can be selected using the search mask for companies and the search mask for users. Click *Next*.
8.	Before generating a license key, the following content of the displayed dialog must be observed: • Legal notice: The licensing conditions must be accepted. • Notes: Notes on the generation procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). • Registered company and user: Company and user-specific data is displayed. • Technical specifications: MAC address of the HiPath 3000 control board. • Licenses to be used: The outcome of the generation procedure is displayed. Click the *Execute* button. A new license key is generated.
9.	After successful execution, the message “License Key Generation Complete” appears The generation information and license key data is displayed. Click *License Key*.
10.	Details on the selected license key are displayed: • “Display” tab: Type and number of licensed features, customer-specific information. • “Transactions” tab: Actions performed for each feature
11.	Select *Download*. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.2.4 describes the procedure for distributing licenses with HiPath 3000/5000 Manager E.

8.3.2 Networked HiPath 3000 Systems without HiPath 5000 RSM

Licensing of the components which are subject to mandatory licensing is performed on a system-wide basis. This means that a separate license file must be requested for each system. This file is linked with the MAC address of the control board belonging to the relevant system.

The procedure for generating the various license keys is the same as that in Section 8.3.1.

8.3.3 Networked HiPath 3000 Systems with HiPath 5000 RSM

Licensing of the components which are subject to mandatory licensing is performed on a network-wide basis. This means that a single license file is required for the entire HiPath 3000/ 5000 network. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).



When a single CDB is downloaded from a HiPath 3000/5000 network, only the license-sensitive CDB content is displayed. It is not possible to make any changes.

A cyclic check carried out every 24 hours guarantees continuous protection against manipulation. Each node belonging to the network sends a request to the Feature Server to verify whether the license is still valid. The time at which the daily check takes place depends on the time at which licensing takes place. The time of the daily check is redefined with each system reset.

Example: Licensing takes place at 5:00 p.m. Based on the 24-hour cycle, this means that the licensing check begins at 5:00 p.m. every day.
A system reset is performed at 10:00 p.m. The time of the daily check is redefined as a result. The licensing check begins at 10:00 p.m. every day with immediate effect.
Each additional reset results in the time of the daily check being redefined.

The system distinguishes between the following two types of error:

- The Feature Server is unable to reach the first node needed for licensing. The 30-day License Failure Period begins.
- A standalone HiPath 3000 system (node) is unable to reach the Feature Server. The 30-day License Failure Period begins.

If the error is rectified within 30 days, the system(s) revert(s) to the licensed state. If the error has not been rectified by the time the 30-day license failure period has expired, the systems enter system default mode. This means that features which subject to mandatory licensing will suffer from reduced functionality.

Procedure

Step	Activity (Remarks)
1.	**HiPath 3000/5000 Manager E (In cases where the MAC address is not already available):**
	The MAC address of the HiPath 3000 system control board with the lowest node number (node ID) should be determined.
2.	**HiPath License Management:**
	Invoke the Central License Server CLS via: https://www.central-license-server.com/ Select the language version for the License Management Center. Log on by entering the user name and password.
3.	Activate the “Generate and Download License Key” function under “Management of Available Licenses”. Various search criteria is displayed for activating the available licenses.
4.	In the “LAC” input field, enter the part number and the packing slip number (separated by a dash). Click *Search* to display a list of the features which are subject to mandatory licensing and for which licenses are available.
5.	From this list, select the features which are subject to mandatory licensing and which you want to generate a license. Activate the *Generate Key* button. In the subsequent dialog, define the number of licenses to be generated and specify the MAC address to which the license should be linked.
6.	In the “MAC Address” input field, enter the MAC address for the HiPath 3000 control board as specified in step 1. In the “Number” field, define the number of licenses to be generated for each feature. Click *Next*.
7.	The customer and the user (contact partner) specified for this transaction are displayed. If there are still no entries available, these can be selected using the search mask for companies and the search mask for users. Click *Next*.

Step	Activity (Remarks)
8.	Before generating a license key, the following content of the displayed dialog must be observed: • Legal notice: The licensing conditions must be accepted. • Notes: Notes on the generation procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). • Registered company and user: Company and user-specific data is displayed. • Technical specifications: MAC address of the HiPath 3000 control board. • Licenses to be used: The outcome of the generation procedure is displayed. Click the *Execute* button. A new license key is generated.
9.	After successful execution, the message “License Key Generation Complete” appears The generation information and license key data is displayed. Click *License Key*.
10.	Details on the selected license key are displayed: • “Display” tab: Type and number of licensed features, customer-specific information. • “Transactions” tab: Actions performed for each feature
11.	Select *Download*. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.2.4 describes the procedure for distributing licenses with HiPath 3000/5000 Manager E.

8.3.4 Upgrading to HiPath 3000 V8, HiPath 5000 V8

To upgrade from a version earlier than HiPath 3000/5000 V8 5.0, you must request a new license file and repeat the licensing procedure.

The Central License Server (CLS) enables the old licenses (< V5.0) to be converted into new licenses that are valid for the latest version of HiPath 3000/5000.

The following features that are subject to mandatory licensing are converted:

- HG 1500 B channels (previous designation: max. no. of B channels)
- HiPath ComScendo licenses (previous designation: max. no. of workpoint clients)
- IP Sec
- CA functionality
- Feature Server (previous designation: HiPath 5000 RSM)

Features that were not previously subject to mandatory licensing cannot be migrated. The base station BS4 is a new product. DIUN2 (S30810-Q2196-X), DIUT2 (S30810-Q2226-X100), TS2 (S30810-Q2913-X300), and TS2R (S30810-K2913-Z300) are new boards. Up to now, no license was required for the IVM announcement feature. These features are released with the maximum configuration following an upgrade.

- BS4 (number of B channels per BS4)
- DIUN2, DIUT2, TS2, TS2R (number of B channels per port)
- IVM announcements (IVM boards, number of B channels per port)

Procedure

Step	Activity (Remarks)
1.	**Web-based Management (WBM) (in the event that the MAC addresses are not already available):**
	Determine the MAC addresses (locking IDs) of all HG 1500 boards belonging to the HiPath 3000 system to be upgraded. If this involves the networking of several HiPath 3000 systems, then the MAC addresses (locking IDs) of all available HG 1500 boards are to be determined.

Step	Activity (Remarks)	
2.	**HiPath 3000/5000 Manager E (In cases where the MAC addresses are not already available.):**	
	A single HiPath 3000 system or several networked HiPath 3000 systems must be upgraded without HiPath 5000 RSM: The MAC address of the associated control board should be determined for every system.	Upgrading involves several networked HiPath 3000 systems with HiPath 5000 RSM: The MAC address of the control board is to be determined solely for the HiPath 3000 system with the lowest node number (node ID).
3.	**HiPath License Management:**	
	Invoke the Central License Server CLS via: https://www.central-license-server.com/ Select the language version for the License Management Center. Log on by entering the user name and password.	
4.	Activate the “View Used Licenses and Certificates” function under “Management of Used Licenses”. Different search criteria are displayed in order to invoke the licenses to be converted (B channels of HG 1500 boards.)	
5.	The MAC address (locking ID) of a HG 1500 board determined under step 1 should be entered in the Locking ID input field. Click the *Search* button to display a list of the licenses belonging to the MAC address (locking ID).	
6.	Click the *Show Details* button. Details on the selected license key are displayed: • “Display” tab: Type and number of licensed features, customer-specific information. • “Transactions” tab: Actions performed for each feature	
7.	Click *Upgrade License*. Specify the upgrade path in the subsequent dialog.	
8.	Use the upgrade path selection list to define the required upgrade (for example, HG1 500 -> HiPath 3000 V8). Click *Next*. In the subsequent dialog, define the MAC address to which the new license should be linked.	
9.	The MAC address of the HiPath 3000 control board to which the HG 1500 board specified under step 5 belongs should be entered in the MAC Address input field. Click *Next*.	

<table>
<tr><th>Step</th><th colspan="2">Activity (Remarks)</th></tr>
<tr><td>10.</td><td colspan="2">Before upgrading a license key, the following content of the displayed dialog must be observed:
• Legal notice: The licensing conditions must be accepted.
• Notes: Notes on this procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible).
• Registered company and user: Company and user-specific data is displayed.
• Upgrade details: MAC address of the HiPath 3000 control board.
• Licenses to be used: The outcome of this procedure is displayed.
Example:
HG 1500 V2 & V3:
– 6 features (Licenses) will be upgraded as a result of this transaction.
– 6 features (Licenses) will be disabled as a result of this transaction.
This means that all six available licenses have been linked with the new MAC address. The old link with the HG 1500 board MAC address (Locking ID) was disabled for all six licenses.
Click the Execute button. The license key is upgraded.</td></tr>
<tr><td>11.</td><td colspan="2">After successful execution, the message “License Key Generation Complete” appears The upgrade information and the information about the license key will be displayed.
Note: The number of pre-installed HG 1500-B channels is no longer displayed, nut only the effective total for the released licenses.</td></tr>
<tr><td>12.</td><td>Upgrading involves either a single HiPath 3000 system or several networked systems without HiPath 5000 RSM:
Repeat steps 4 to 11 for all available HG 1500 boards.
Note: The new licensing applies on a system-by-system basis. A separate license key is generated for each HiPath 3000 system.</td><td>Upgrading involves several networked HiPath 3000systems with HiPath 5000 RSM:
Repeat steps 4 to 11 for all available HG 1500 boards.
Note: New licenses apply to the entire network. In other words, a single license key is generated for the entire HiPath 3000/5000 network. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).</td></tr>
<tr><td>13.</td><td colspan="2">Open the License Management Center home page.</td></tr>
<tr><td>14.</td><td colspan="2">Activate the “View Used Licenses and Certificates” function under “Management of Used Licenses”.
Various search criteria are displayed for calling the recently upgraded license key.</td></tr>
</table>

Step	Activity (Remarks)
15.	In the “Locking ID” input field, enter the control board MAC address to which the license key is linked (see step 6). Click the *Search* button to display a list of the license keys belonging to the MAC address.
16.	Select the relevant license key and click the *Display Details* button. Details on the selected license key are displayed: • “Display” tab: Type and number of licensed features, customer-specific information. • “Transactions” tab: Actions performed for each feature
17.	Select *Download*. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.2.4 describes the procedure for distributing licenses with HiPath 3000/5000 Manager E.

8.3.5 Merging Standalone Systems (HiPath 3000) to Form a Network with HiPath 5000 RSM

Only one license file is required if combining multiple standalone systems to create a network with HiPath 5000 RSM.

The “Rehost” function of the Central License Servers (CLS) enables the various license files to be converted into a new, network-wide overall license file. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).

Procedure

Step	Activity (Remarks)
1.	**HiPath 3000/5000 Manager E (In cases where the MAC addresses are not already available.):**
	The MAC address of the associated control board should be determined for every HiPath 3000 system. The new network-wide overall license file is linked to the MAC address of the HiPath 3000 system with the lowest node number (node ID).
2.	**HiPath License Management:**
	Invoke the Central License Server CLS via: https://www.central-license-server.com/ Select the language version for the License Management Center. Log on by entering the user name and password.

Step	Activity (Remarks)
3.	Call the “Rehost Licenses” function under “Management of Used Licenses”. Different search criteria are displayed in order to call up the licenses to be converted.
4.	The MAC address of a HiPath 3000 control board determined under step 1 should be entered in the Locking ID input field. Click *Search* to show the licenses belonging to the MAC address.
5.	Activate the *Rehost* button. In the subsequent dialog, define the MAC address to which the new license should be linked.
6.	The MAC address of the control board whose HiPath 3000 system has the lowest node number (node ID) should be entered in the MAC address input field. Click *Next*.
7.	Before you start to generate a new license key, note the following content of the mask displayed: • Legal notice: The licensing conditions must be accepted. • Notes: Notes on this procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). • Registered company and user: Company and user-specific data is displayed. • Rehost details: MAC address of the HiPath 3000 control board. • Licenses to be used: The outcome of this procedure is displayed. Example: HG 1500 V2 & V3: – 6 features (Licenses) will be upgraded as a result of this transaction. – 6 features (Licenses) will be disabled as a result of this transaction. This means that all six available licenses have been linked with the new MAC address. The old link with the HG 1500 board MAC address (Locking ID) was disabled for all six licenses. Click the *Execute* button. A new license key is generated.
8.	After successful execution, the message “License Key Generation Complete” appears The generation information and license key data is displayed.
9.	Steps 4 to 8 should be repeated for all HiPath 3000 systems. Note: New licenses apply to the entire network. In other words, a single license key is generated for the entire HiPath 3000/5000 network. This file is linked with the MAC address of the HiPath 3000 control board with the lowest node number (node ID).
10.	Open the License Management Center home page.
11.	Activate the “View Used Licenses and Certificates” function under “Management of Used Licenses”. Various search criteria are displayed for invoking the generated license key.

Step	Activity (Remarks)
12.	In the “Locking ID” input field, enter the control board MAC address to which the license key is linked (see step 6). Click the *Search* button to display a list of the license keys belonging to the MAC address.
13.	Select the relevant license key and click the *Display Details* button. Details on the selected license key are displayed: • “Display” tab: Type and number of licensed features, customer-specific information. • “Transactions” tab: Actions performed for each feature
14.	Select *Download*. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.2.4 describes the procedure for distributing licenses with HiPath 3000/5000 Manager E.

8.3.6 Removing a Standalone System from a Network with HiPath 5000 RSM

If a standalone node (HiPath 3000) is to be removed from a network with HiPath 5000 RSM, a new license file is required for the standalone system. A new, network-wide general license file must also be requested for the rest of the network.

This function can only be triggered via User Support. User Support can split the contents of existing license files and distribute the licenses to other individual MAC addresses.

8.3.7 Replacing License-sensitive Hardware (Changing the MAC Address)

A new license file is always required if you replace a license-sensitive HiPath 3000 control board due to a hardware defect. In this case, the MAC address changes and the license becomes invalid.

The “Rehost” function of the Central License Server (CLS) enables the licenses to be moved from the old MAC address (the old HiPath 3000 control board to be replaced) to a new MAC address (a new HiPath 3000 control board).

Procedure

Step	Activity (Remarks)
1.	**HiPath License Management:**
	Invoke the Central License Server CLS via: https://www.central-license-server.com/ Select the language version for the License Management Center. Log on by entering the user name and password.
2.	Call the “Rehost Licenses” function under “Management of Used Licenses”. Different search criteria are displayed in order to call up the licenses to be converted.
3.	Enter the MAC address of the HiPath 3000 control board to be replaced (defective) in the Locking ID input field. Click *Search* to show the licenses belonging to the MAC address.
4.	Activate the *Rehost* button. In the subsequent dialog, define the MAC address to which the new license should be linked.
5.	In the “MAC Address” input field, enter the MAC address for the new control board. Click *Next*.

Step	Activity (Remarks)
6.	Before you start to generate a new license key, note the following content of the mask displayed: • Legal notice: The licensing conditions must be accepted. • Notes: Notes on this procedure can be entered here. A distinction is made here between internal notes (only accessible to users authorized to create licenses) and customer notes (generally accessible). • Registered company and user: Company and user-specific data is displayed. • Rehost details: MAC address of the HiPath 3000 control board. • Licenses to be used: The outcome of this procedure is displayed. Example: HG 1500 V2 & V3: – 6 features (Licenses) will be upgraded as a result of this transaction. – 6 features (Licenses) will be disabled as a result of this transaction. This means that all six available licenses have been linked with the new MAC address. The old link to the MAC address of the defective HiPath 3000 control board has been deactivated for all six licenses. Click the *Execute* button. A new license key is generated.
7.	After successful execution, the message “License Key Generation Complete” appears The generation information and license key data is displayed.
8.	Open the License Management Center home page.
9.	Activate the “View Used Licenses and Certificates” function under “Management of Used Licenses”. Various search criteria are displayed for invoking the generated license key.
10.	In the “Locking ID” input field, enter the control board MAC address to which the license key is linked (see step 5). Click the *Search* button to display a list of the license keys belonging to the MAC address.
11.	Select the relevant license key and click the *Display Details* button. Details on the selected license key are displayed: • “Display” tab: Type and number of licensed features, customer-specific information. • “Transactions” tab: Actions performed for each feature

Step	Activity (Remarks)
12.	Select *Download*. In the subsequent dialog, specify the storage location for the license key you want to download. Section 8.2.4 describes the procedure for distributing licenses with HiPath 3000/5000 Manager E.



Note on Replacing the HiPath 3000 Control Board:
When the control board has been successfully replaced, the CDB must be transferred to HiPath 3000. A warning will appear that the MAC address is invalid. All licenses become invalid if the CDB is installed. The system goes into default and features that are subject to mandatory licensing will suffer from reduced functionality. The new license key (see step 12) must be used to achieve valid licensing.
Section 8.2.4 describes the procedure for distributing licenses with HiPath 3000/5000 Manager E.

8.4 Licensing optiClient Attendant (V8) at HiPath 3000 V8

Overview

In optiClient Attendant, licensing is performed via HiPath License Management. The full version of optiClient Attendant V8 is available as an order item.

optiClient Attendant V8 operates with HiPath 3000 V8, HiPath 3000/5000 V7 and higher, HiPath 2000 V2 and higher, and HiPath OpenOffice EE and higher.

optiClient Attendant V7.0 no longer operates with HiPath 3000 V7 and higher, HiPath 2000 V2 and higher or HiPath OpenOffice EE.

optiClient Attendant versions < 7.0 cannot be upgraded.

Licensing is performed on the associated HiPath 3000 system. In order to ensure unique licensing, the license file is linked with the MAC address of the HiPath 3000 control board.

Procedure

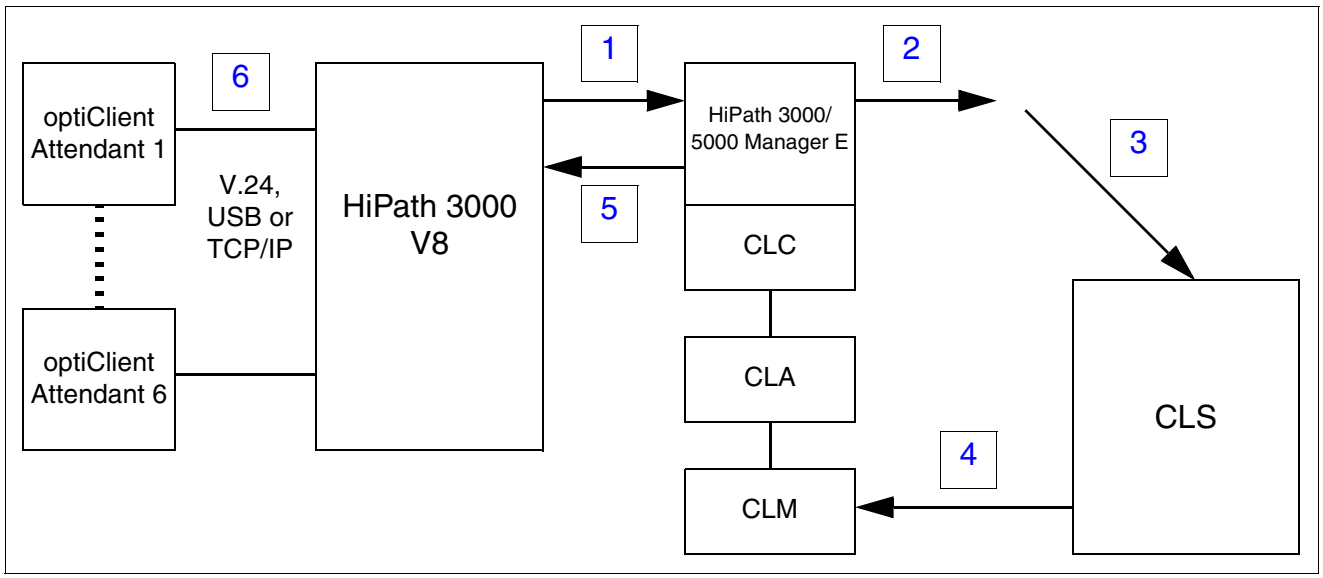


Figure 8-3 Procedure for Licensing optiClient Attendant V8 on HiPath 3000 V8

Step	Activity (Remarks)
1.	Read the HiPath 3000 V8 customer database.
2.	Read out the MAC address of the HiPath 3000 control board.

Step	Activity (Remarks)
3.	Enter the LAC and MAC address at the CLS in order to generate the license key either • a) via CLM/CLS communication, or • b) via direct communication with the CLS via a web browser.
4.	Transfer the license key from the CLS via the CLM to the CLA (CLC - HiPath 3000/ 5000 Manager E). • a) via CLM/CLS communication, or • b) manually on the CLM (license key is already available, offline activation).
5.	Write the CDB to HiPath 3000 V8. (Once the license data has been transferred to HiPath 3000, the CLA is no longer required.)
6.	Install optiClient Attendant(s). “Any” number of optiClient Attendants can be installed. However, HiPath 3000 monitors the number of licensedoptiClient Attendants as part of the logon procedure. Depending on the model, up to six optiClient Attendants can be started per system. When the HiPath 3000 is started for the first time, a 30-day grace period begins. During this time, all HiPath 3000 features that require licensing (including optiClient Attendant) can be operated without a license. All features that require a license (including optiClient Attendants that have been subsequently installed) must be licensed before the grace period of the HiPath 3000 expires. The 30-day limit cannot be extended and a second grace period will not be granted. In this case, the CLS generates a license key for HiPath 3000 V8.

8.5 Protection Against License Manipulation

HiPath License Management guarantees protection against any manipulation of the licenses. This includes, for example

- editing a license file
- changing the system time
- multiple read-in of licenses
- extension of the grace period
  When a Grace Period Configuration File (GPCF) is created, a flag is set in the system CDB and the Customer License Agent (CLA) to indicate that a GPCF file was created. This ensures that the 30-day period cannot be extended and the GPCF file cannot be regenerated.



To guarantee the security and consistency of the product licenses generated, changes to the system time on the PC of an installed Customer License Agent (CLA) must not exceed one day.
If the system clock is reset by more than one day, the Customer License Agent stops functioning and cannot be reactivated. The full functionality of the CLA on this PC can only be restored by means of a repair or a reinstallation (see the License Agent Installation Manual).

9 Expanding and Upgrading HiPath 3000

Chapter contents

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• Connecting a Printer, page 9-4
• Inserting Powerbox PB3000, page 9-5
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Upgrading HiPath 3000, page 9-27
• Hardware Upgrade, page 9-27
• Software Upgrade, page 9-29
• Upgrading from V7 to V8, page 9-34
• Upgrade HiPath 3000 for Signalling & Payload Encryption (SPE), page 9-40

9.1 HiPath 3000 Expanding

The following section provides information on supplementary equipment or extensions that are not described in Chapter 4, “Installing HiPath 3000”.

9.1.1 Replacing Peripheral Boards for HiPath 3800

Caution
Always wear an antistatic wristband when working on the system (especially when handling boards).

HiPath 3800 lets you remove and insert peripheral boards during operation (hot plugging). The following startup rules apply.

Rules for removing and inserting boards

Caution
To ensure that the system operates without blocking, you must follow the rules in Section 4.1.5 concerning board configuration.

Table 9-1 Startup Rules for Inserting and Removing Boards

If	Then
Inserting new board in free slot	Board is integrated into the system according to the rules for initial startup (Section 4.1.5.6). • System with default numbering plan The station numbers from the new board are appended (consecutively and in ascending order) to the numbers already assigned. • System with modified numbering plan The station numbers on the new board can be in any order. Using HiPath 3000/5000 Manager E or Manager T, you can assign a specific station to a port. If the number is already assigned to a different object, you can switch both numbers.
Replacing board with same or underequipped board type	Board is activated. The same station range is used.

Table 9-1 Startup Rules for Inserting and Removing Boards

If	Then
Replacing board with over-equipped board of same type	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available. In the case of subscriber line modules, you can use HiPath 3000/5000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.
Replacing with a different board type	The system does not automatically activate the board. After removing the old board, you can delete it from the database using HiPath 3000/5000 Manager E or Manager T. After you have inserted the new board, the system activates it as if it had been inserted into a free slot. However, the CDB area used by the old board is left as a gap. In the case of subscriber line modules, you can use HiPath 3000/5000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.

9.1.2 Connecting a Printer

Caution
Follow the safety and operating instructions provided by the printer manufacturer.

Introduction

You can use a printer as a CDR printer (serial data transmission) or as a call charge computer output device (parallel data transmission).

Connecting a CDR printer

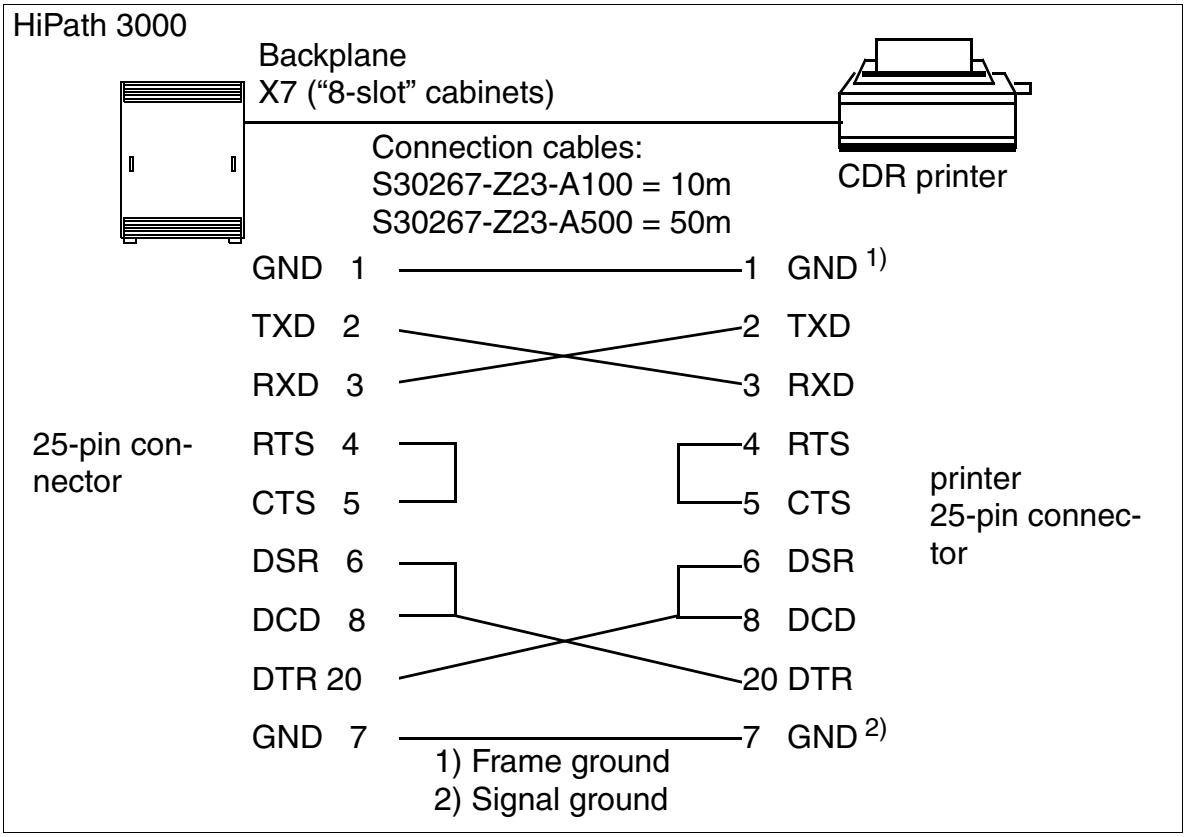


Fig. 9-1 Sample Connection of a CDR Printer to HiPath 3000

Information on assigning V.24 interfaces from other systems is provided in the board descriptions in Chapter 3.

Output formats

For information about the output formats (compressed or uncompressed) for call detail recording central, see HiPath 3000/5000 Feature Description.

9.1.3 Inserting Powerbox PB3000

Danger
The Powerbox PB3000 must be operated with a closed housing.
Before opening the housing, disconnect the ECR from the power supply by:

- turning the switch for the line voltage on the front panel of the PB3000 to the "Off" position.
- turning the switch for the battery voltage on the back side of the PB3000 housing to the "Off" position.
- removing the battery fuse (back side of the PB3000 housing).
- unplugging all power and connection cables.

Introduction

Powerbox PB3000 is a compatible successor to the expansion cabinet rack (ECR), which is being discontinued and can no longer be ordered.

The Powerbox PB3000 is needed in a system:

- for emergency battery operation in the event of power failure; i.e., if an uninterruptible power supply function is required.
- if the internal system power supply unit for the HiPath 3000 is not sufficient to provide power to all connected terminals (corded or cordless).

The PB3000 can be equipped with:

- 4 batteries, each 12 V / 7 Ah and/or
- the LUNA2 power supply

The PB3000, the batteries and the LUNA2 power supply are supplied in a separate package.

Caution
To avoid transport damage, Powerbox PB3000 must not be transported with the batteries installed.

The batteries should be installed as described in Section 9.1.3.6.1. Only use batteries approved for HiPath 3000. The LUNA2 power supply should be installed as described in Section 9.1.3.6.2.

9.1.3.1 PB3000 Control, Display, and Connecting Elements

Front panel (Figure 9-2)

1: Switch for activating and deactivating the line voltage

2: Switch for activating and deactivating the LUNA2 power supply

(ON = left switch position/LED lights up green (for more information on LUNA2, see Section 3.2.12)

3: LED LUNA2



Fig. 9-2 Front Panel of the PB3000

Rear panel (Figure 9-3)

- Line voltage connections (1 and 2)
  - 1: Line output of the power plug of HiPath 3000
  - 2: Line input
- S1: Switch FAN, not assigned
- F1 and F2: Fuse 2.5 A/T
- X1 and X2: Connection to HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300 (UPSC-D/ UPSC-DR)
- F3: Fuse for battery 16 A/T
- X3: Output for the battery to the external loads (HiPath 3000)
- X7: Output for the battery XBatt. (Powerbox Controller (PBC) < > battery connection)
- XBatt.: Input for X7 (battery < > Powerbox Controller (PBC) connection)
- 3: Switch for activating and deactivating the battery voltage
- F4: Fuse for the switch (battery voltage) 16 A/T



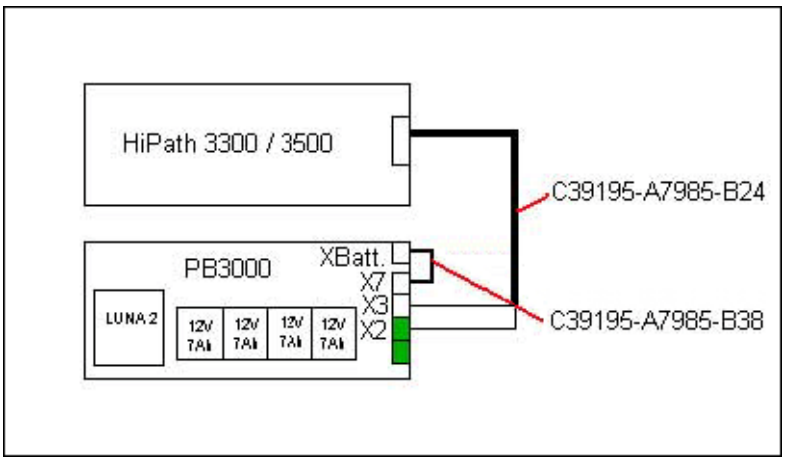
Fig. 9-3 Back of the PB3000

9.1.3.2 Components

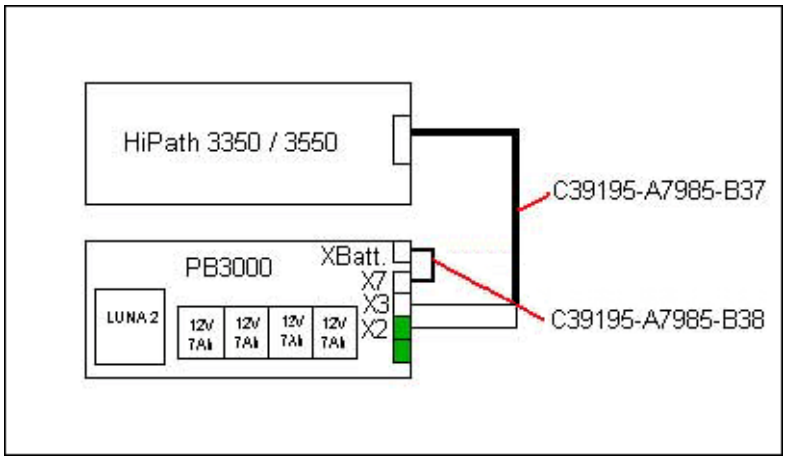
- Powerbox PB3000 housing: S30177-U773-X
  including assembly kit for 19-inch cabinet installation (C39165-A7027-D1)
- Assembly kit for the wall attachment or desk installation of the PB3000 (optional): C39165-A7027-D2.
  Can be ordered as required with the following separate component:
  LM/PHW: L30251-U600-A170, PST number: DUA170, "Wall bracket for HiPath 3300/3500 and Powerbox 3000"
- Power supply cable (to be ordered separately):

EU:	C39195-Z7001-C11
Switzerland:	C39195-Z7001-C38
Britian:	C39195-Z7001-C32
Australia:	C39195-Z7001-C57
Euro:	C39195-Z7001-C46
Brazil:	For HiPath 3350 and 3550: C39195-Z7001-C121 (IEC 60320 jack, straight) For HiPath 3300, 3500 and 3800: C39195-Z7001-C191 (IEC 60320 jack, 90° right-angled)

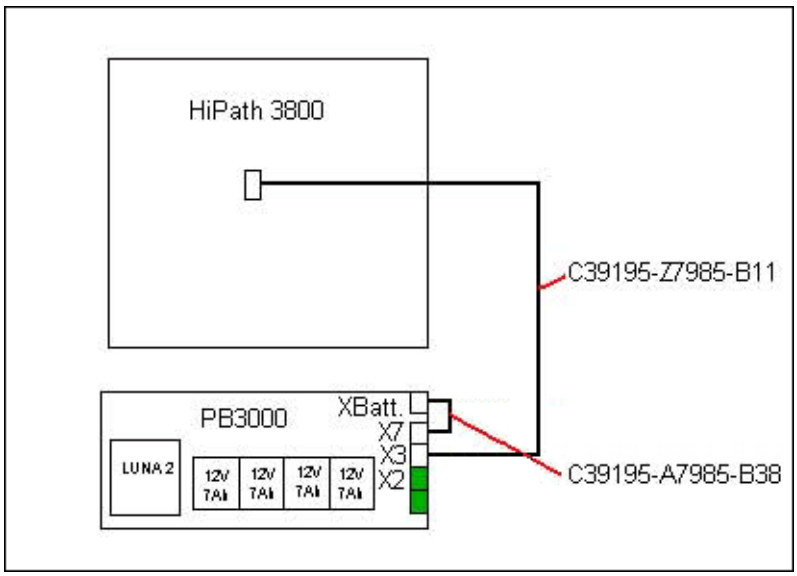
- 4 batteries, 12 V/7 Ah: 4 x V39113-W5123-E891 (optional)
- Power supply LUNA2: S30122-K7686-M1 (optional)
- Connection cable for PB3000, with batteries and LUNA2
  Depending on the system, one of the following connection cables is used in addition to the cable C39195-A7985-B38:
  – HiPath 3500, HiPath 3300: PB3000 is connected via connection cable C39195-A7985-B24



– HiPath 3550, HiPath 3350: PB3000 is connected via connection cable C39195-A7985-B37



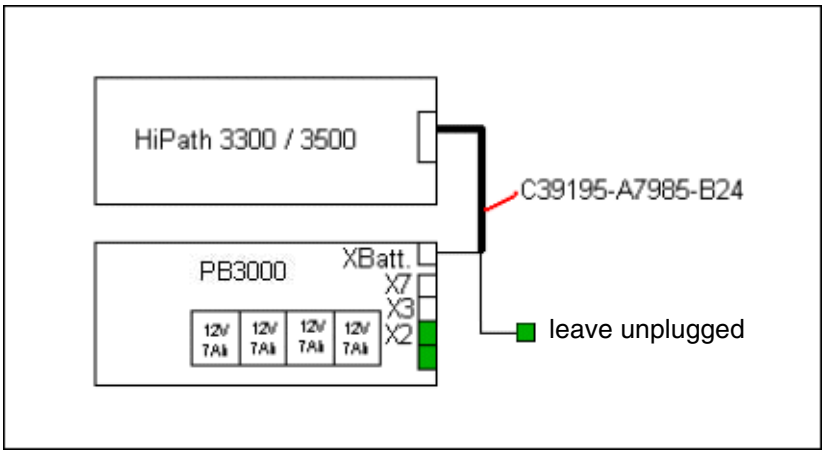
– HiPath 3800: PB3000 is connected via connection cable C39195-Z7985-B11



- Connection cable for PB3000, with batteries but without LUNA2
  One of the following connection cables is used depending on the system:

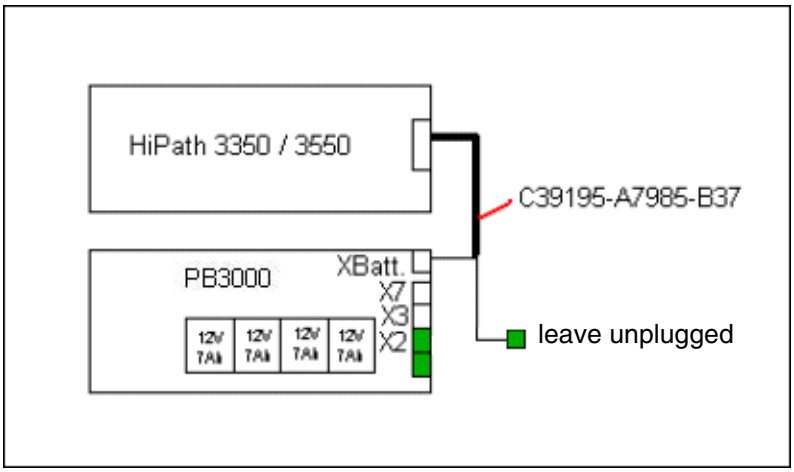
  – HiPath 3500, HiPath 3300: PB3000 is connected via connection cable C39195-A7985-B24

    Note: To avoid system errors and failures, connection cable C39195-A7985-B24 must not be plugged in at the X2 jack on PB3000 (see figure below).

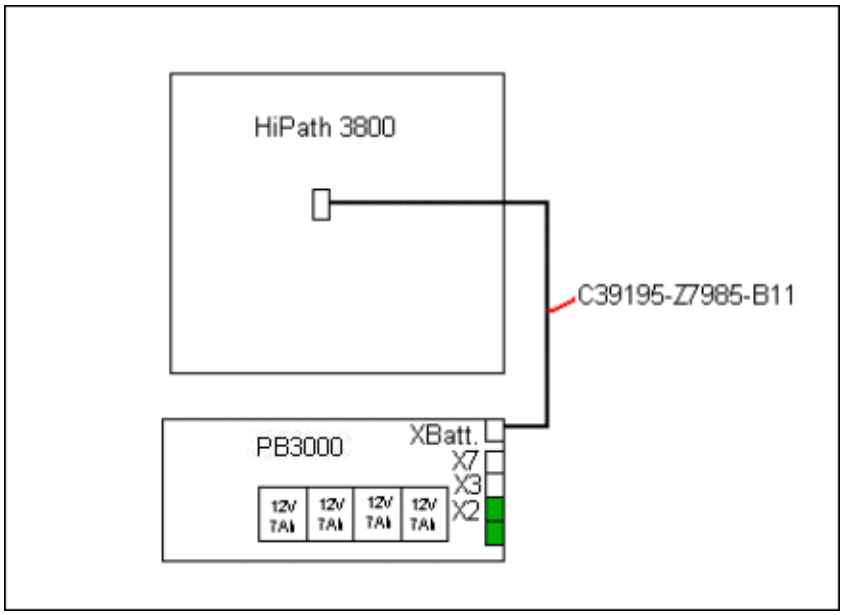


  – HiPath 3550, HiPath 3350: PB3000 is connected via connection cable C39195-A7985-B37

    Note: To avoid system errors and failures, connection cable C39195-A7985-B37 must not be plugged in at the X2 jack on PB3000 (see figure below).



– HiPath 3800: PB3000 is connected via connection cable C39195-Z7985-B11



9.1.3.3 Installation Options

Use the power cable to ground the Powerbox PB3000. Fixed, separate grounding is not required.

The Powerbox PB3000 can be installed as follows:

- in a 19-inch cabinet (see Section 9.1.3.8).
- mounted on a wall (see Section 9.1.3.7)
- on a desktop using four adhesive mounting feet

For information on the assembly kit for wall attachment or desktop installation, see Section 9.1.3.2.

9.1.3.4 Technical Specifications

Table 9-2 Technical Specifications for PB3000

Powerbox PB3000 / Components	Technical specifications
Powerbox PB3000 - including batteries and LUNA2 power supply	Weight when empty: 7.0 kg Total weight: 21.0 kg (13.22 lb.)
Battery compartment - including 4 batteries	Weight: 12.0 kg
Single battery (12 V / 7 Ah)	Weight: 2.65 kg
LUNA2 power supply	Weight: 2.0 kg For further information on LUNA2 power supply, see Section 3.2.12

9.1.3.5 UPS Bridging Time/Charging Time

USP bridging times and charging times when using the PB3000 with 48 V / 7 Ah batteries and LUNA2 power supply (at maximal continuous current less than 2A, for all loads):

- Example PB3000 - HiPath 3300/3500
  - UPS bridging time: >1 h 30 min
  - Battery charging time: ~ 2 h
- Example PB3000 - HiPath 3800
  - UPS bridging time: > 30 min
  - Battery charging time: ~ 2 h

9.1.3.6 Powerbox PB3000 with Batteries and LUNA2

The following figure shows the position of the four batteries and the LUNA2 power supply inside the PB3000.

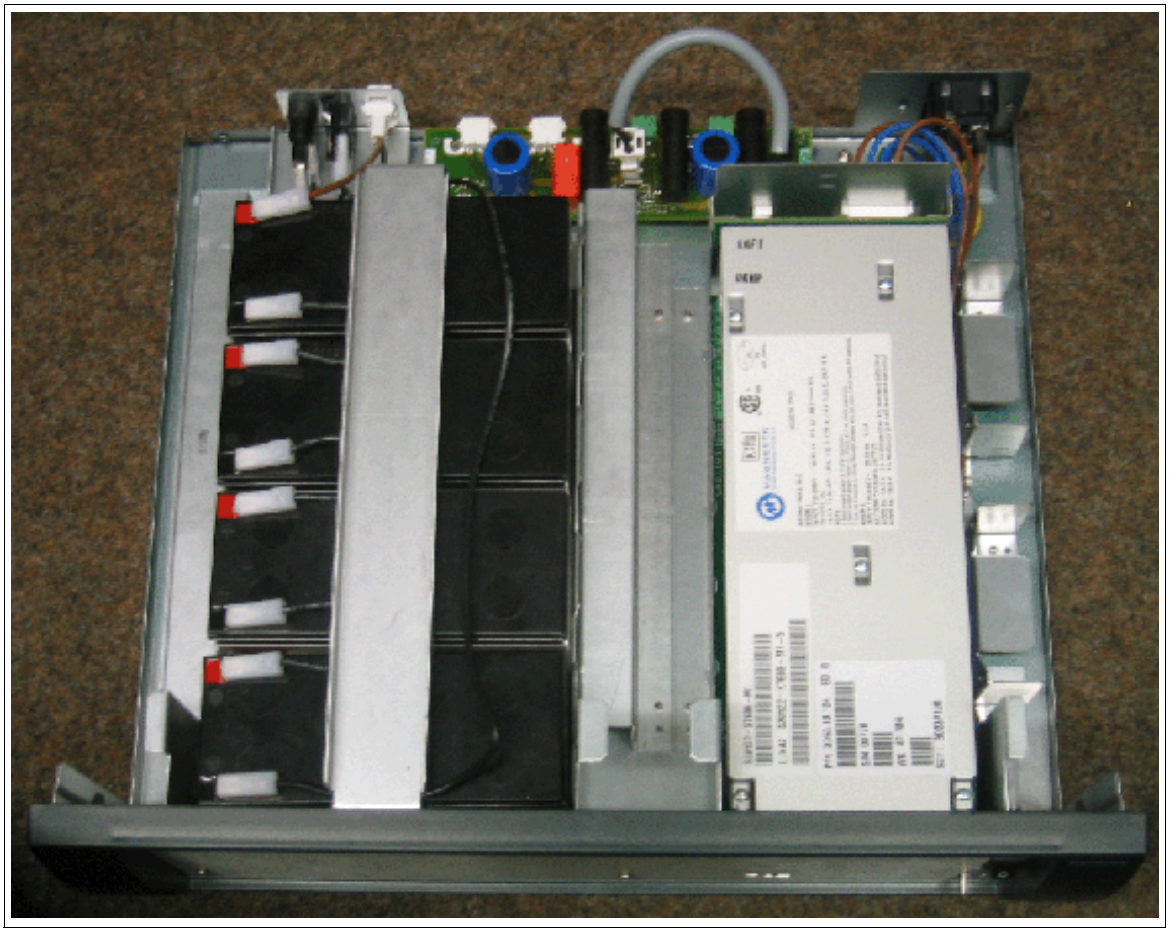


Fig. 9-4 PB3000 with batteries and LUNA2

The following block diagrams illustrate the cable run between the batteries, the LUNA2 power supply and the power supply unit of the system:

- Block diagram of PB3000 with batteries, without LUNA2

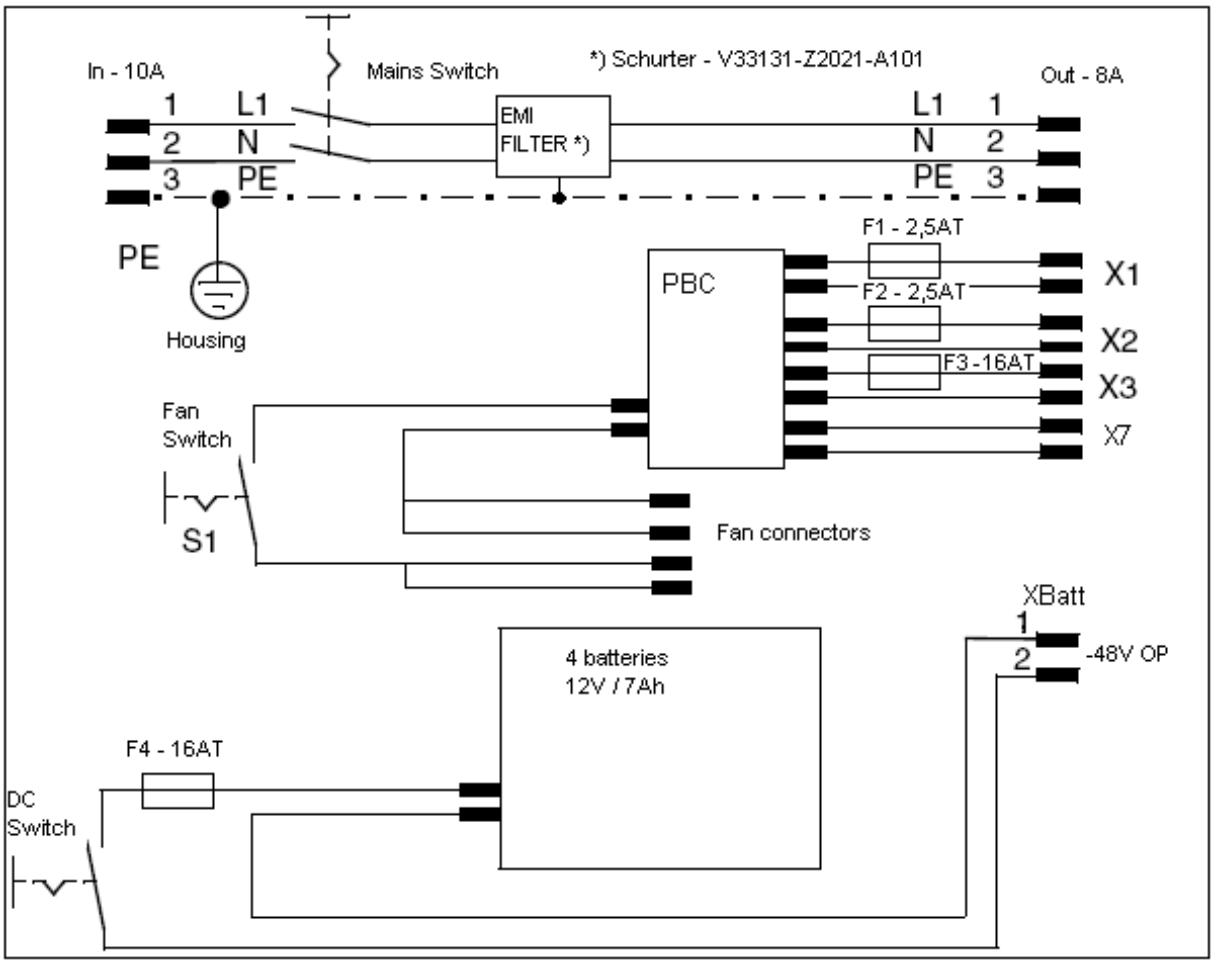


Fig. 9-5 PB300 with Batteries – Block Diagram

Caution
When storing a PB3000 equipped with batteries or if it is inactive for a long period of time, remove the battery fuse (F3: Fuse for battery 16 A/T) at the rear of the PB3000 housing.
Powerbox PB3000 must not be transported be the batteries installed. The batteries must first be removed.

- Block diagram of PB3000 with batteries and LUNA2

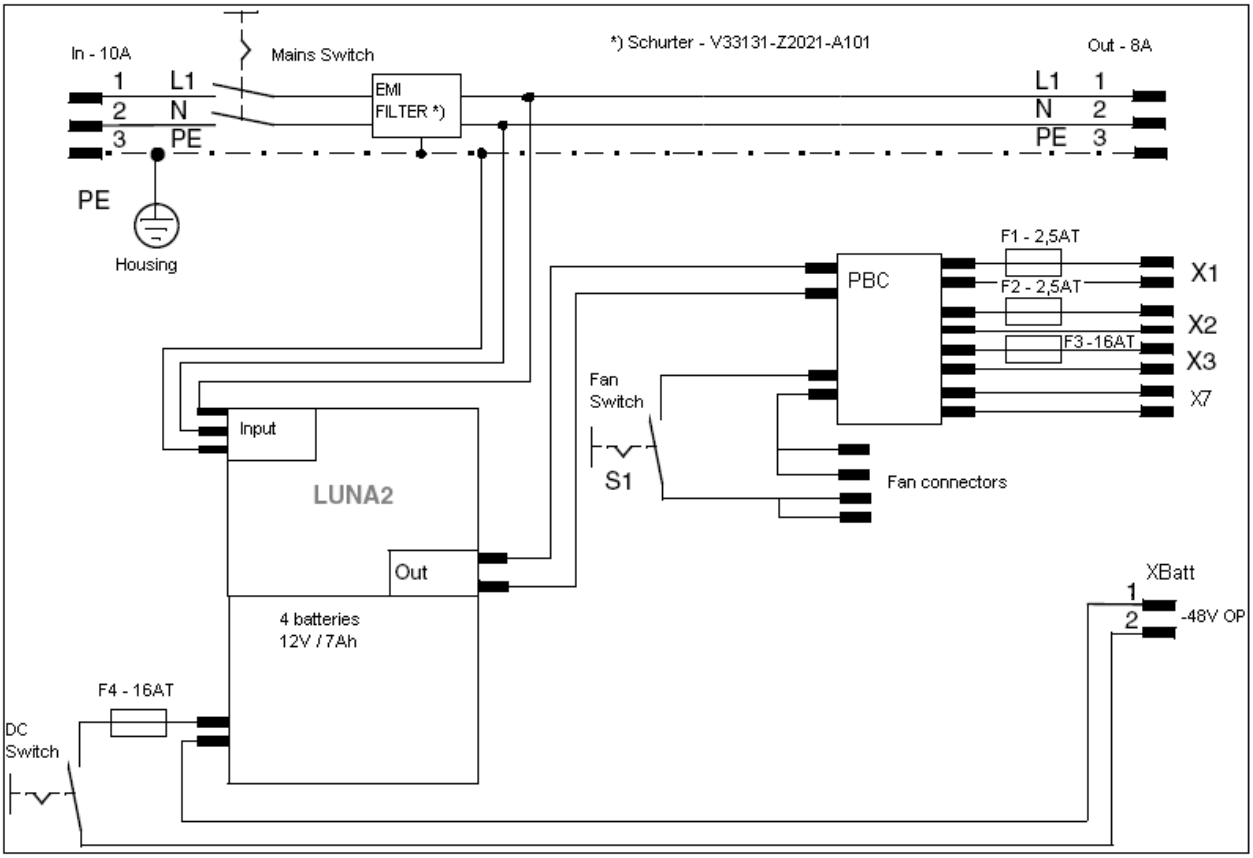


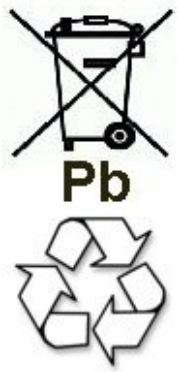
Fig. 9-6 PB3000 with Batteries and LUNA2 - Block Diagram

Caution
When storing a PB3000 equipped with batteries or if it is inactive for a long period of time, remove the battery fuse (F3: Fuse for battery 16 A/T) on the rear of the PB3000 housing
Powerbox PB3000 must not be transported be the batteries installed. The batteries must first be removed.

9.1.3.6.1 Installing Batteries in PB3000

Danger
The only batteries approved for connection are V39113-W5123-E891 (12 V/7 Ah). The use of other battery types is prohibited.

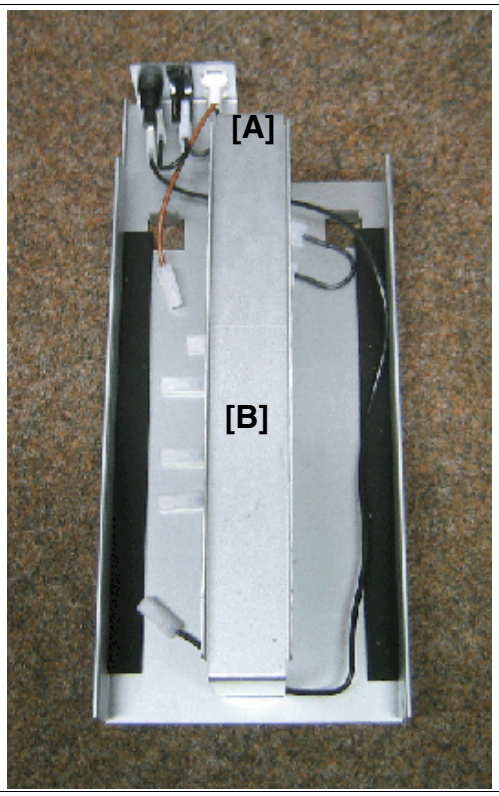
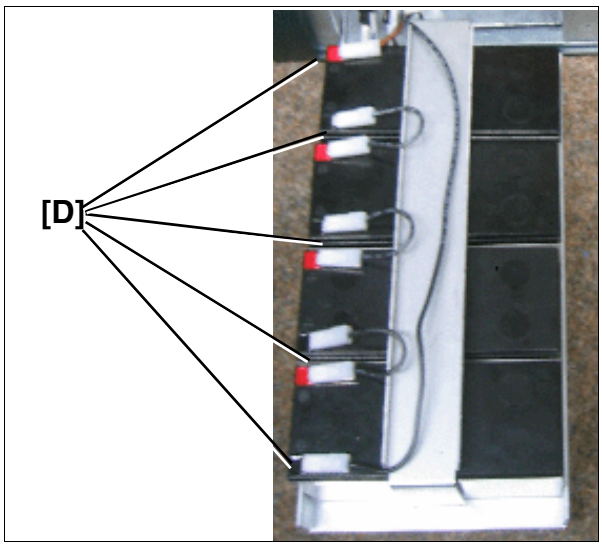
Note on recycling:



Old batteries with this symbol are utilizable economic units and must be recycled. Old batteries that are not recycled are to be disposed of as special refuse in accordance with all requirements.

The PB3000 and batteries are packaged separately and included in the delivery. Proceed as follows to install the batteries in the PB3000:

Step	Activity
1.	Turn the switch for the line voltage on the front of the PB3000 housing and the switch for the battery voltage on the back of the PB3000 housing to the "Off" position (see Section 9.1.3.1).
2.	Remove the battery fuse on the rear of the PB3000 housing (see Section 9.1.3.1).
3.	Unplug all of the power and connection cables of the PB3000.
4.	Remove the front panel of the PB3000: to do so, remove the four screws.
5.	Pull the plug-in battery module out of the left housing compartment.

Step	Activity
6.	Remove the mounting screw [A] on the battery retainer [B]. 
7.	Remove the battery retainer and set aside.
8.	Insert the battery carefully and connect it: To do this, slide the eight cable connector lugs [D] carefully onto the two connection contacts on each of the four batteries. 

Step	Activity
9.	Fix the connection cable into place using cable binders.
10.	Replace the battery retainer and secure the mounting screw.
11.	Push the plug-in battery module into the left housing compartment up to the limit stop. 
12.	Screw on the front panel of the PB3000: To do so, tighten the four screws.
13.	Connect all of the power and connection cables of the PB3000.
14.	Insert the battery fuse on the rear of the PB3000 housing (see Section 9.1.3.1).
15.	Turn the switch for the line voltage in the front panel of the PB3000 and the switch for the battery voltage on the back side of the PB3000 housing to the "On" position (see Section 9.1.3.1).

9.1.3.6.2 Installing the LUNA2 Power Supply in PB3000

PB3000 and LUNA2 power supply are supplied in a separate package. Proceed as follows to install the LUNA2 in the PB3000:

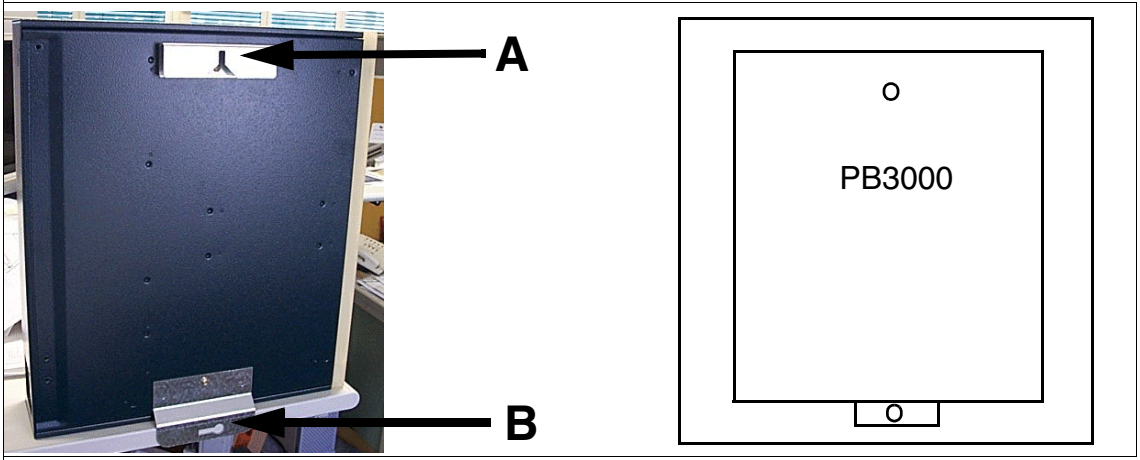
Step	Activity
1.	Set the switches for the line voltage and the LUNA2 voltage on the front of the PB3000 housing to the "Off" position (see Section 9.1.3.1).
2.	Remove the fuse on the rear of the PB3000 housing (see Section 9.1.3.1).
3.	Unplug all of the power and connection cables of the PB3000.
4.	Remove the front panel of the PB3000: to do so, remove the four screws.
5.	Push LUNA2 into the right housing compartment up to the limit stop. 
6.	Screw on the front panel of the PB3000: To do so, tighten the four screws.
7.	Connect all of the power and connection cables of the PB3000.
8.	Insert the battery fuse on the rear of the PB3000 housing (see Section 9.1.3.1)
9.	Set the switches for the line voltage and the LUNA2 voltage on the front panel of the PB3000 to the "On" position (see Section 9.1.3.1).

9.1.3.7 Wall Mounting PB3000 (Not for USA)

Caution

- If the Powerbox PB3000 is wall mounted, you must install it in the proper direction and sequence.
- The battery compartment including batteries and/or LUNA2 power supply must be removed before installation!
- Wall anchors and screws (not supplied) must be selected according to the wall the device will be mounted on. The head of the screw must be big enough to fit securely behind the mounting bracket! The wall mounting point (wall and screw) must be suitable to support 90kg!

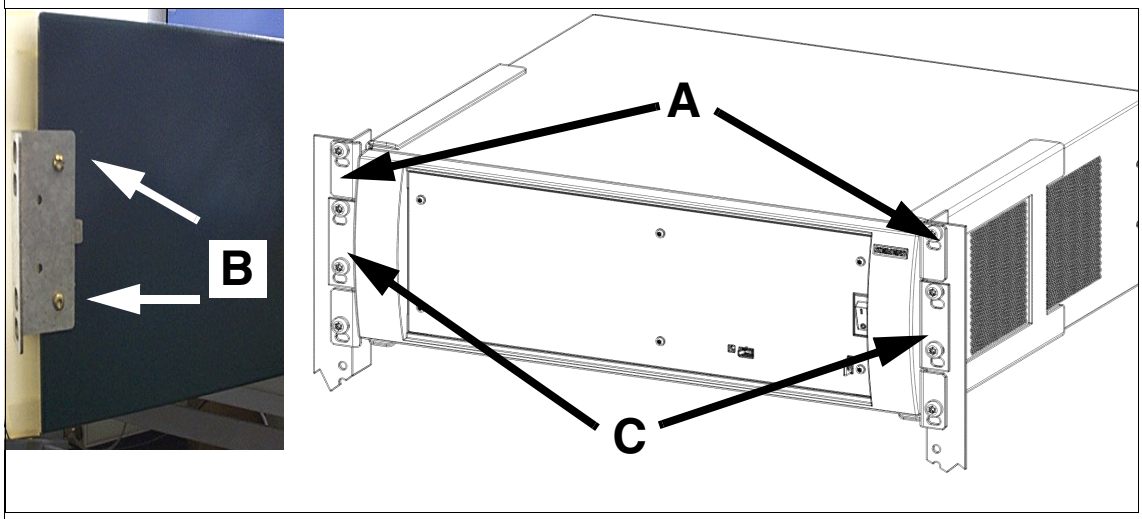
Proceed as follows to wall mount the PB3000:

Step	Activity
1.	Drill a hole in the selected wall, insert a wall anchor in the hole, and screw in the respective screw.
2.	Screw the angle brackets (A) and (B) for the PB3000 onto the base of the device.  **Note:** In the process, pay attention to the precise seat of the angle brackets in the centering recess. These must lock into each other.
3.	Mount the PB3000 with the angle bracket (A) on the screws.
4.	Drill a second hole in the wall for the lower angle bracket (B), insert a wall anchor and attach the angle bracket with a screw.
5.	Reinstall the battery compartment and/or the LUNA2 power supply and reattach the front panel of the PB3000 (see Section 9.1.3.6.1 and Section 9.1.3.6.2). The PB3000 can now be used.

9.1.3.8 19-Inch Cabinet Installation for PB3000

Caution
The battery compartment including batteries and/or LUNA2 power supply must be removed before installation!

Proceed as follows to install the PB3000 in a 19-inch cabinet:

Step	Activity
1.	Attach the angle brackets (A), to attach the PB3000 with two screws on both sides (left and right) of the frame of the 19-inch cabinet.  **Note:** Necessary height units for 19-inch cabinet assembly: 4 HE (one height unit (HE) corresponds to approx. 1.7”=43 mm)
2.	Attach both angle brackets (B) to the PB3000 with 2 screws on both sides (left and right).
3.	Insert the PB3000 between the angel brackets in the 19-inch cabinet (to the limit stop).
4.	Secure the two angle brackets of the PB3000 each with 2 screws on the frame of the 19-cabinet.
5.	Reinstall the battery compartment and/or the LUNA2 power supply and reattach the front panel of the PB3000 (see Section 9.1.3.6.1 and Section 9.1.3.6.2). The PB3000 can now be used.

9.1.4 Connecting Special Equipment

9.1.4.1 Entrance Telephones

Connection options

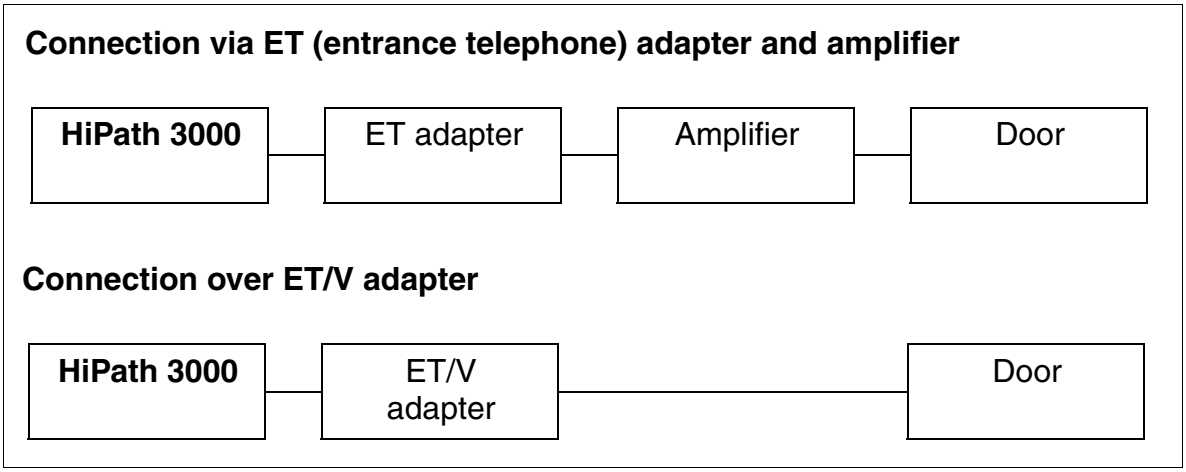


Fig. 9-7 Connection Options for Entrance Telephones

The new central control boards CBCC (S30810-Q2935-A301) and CBRC (S30810-Q2935-Z301) only support TFE-S-Adapter S30122-K7696-T313.

You can also make a direct connection if needed. In this case, only voice connections to the entrance telephone are possible, without the support of the opener and signal functions.

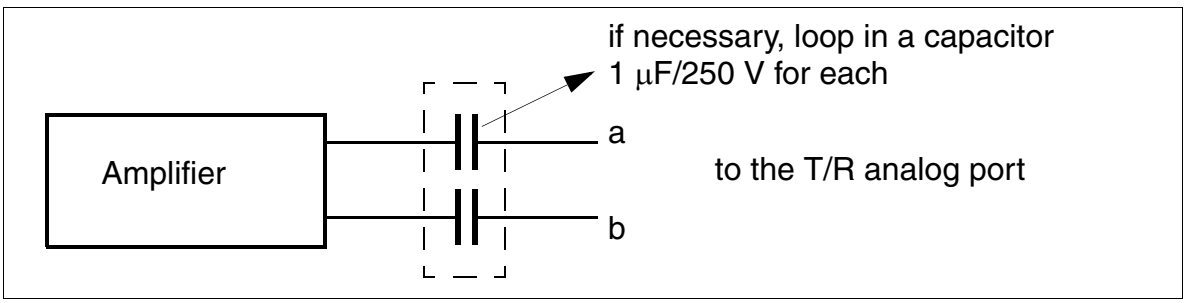


Fig. 9-8 Direct Connection of Entrance Telephones

9.1.4.1.1 Information on Third-Party Entrance Telephones

DoorCom Analog

General information

The plus product DoorCom® Analog is a universal entrance telephone adapter box for Siedle entrance telephones (such as the Vario TLM 612). It is released for use with all HiPath 3000 systems, V1.2 and later.

It is connected to an analog port in the system. DoorCom Analog behaves like an analog telephone (DTMF tone dialing, detection, and control). It can be operated with DTMF signals.

DoorCom Analog can function only in combination with the following components:

- DoorCom Analog DCA 612-0
- Siedle-Vario TLM 612 entrance telephone
- Switching remote control interface DCSF 600
  For the voice connection of an internal user to the entrance telephone: Without this module, it is not possible to call back to the entrance telephone, for example, if a call was unintentionally cleared down by the entrance telephone.)
- Power supply NG 602-0

Connection

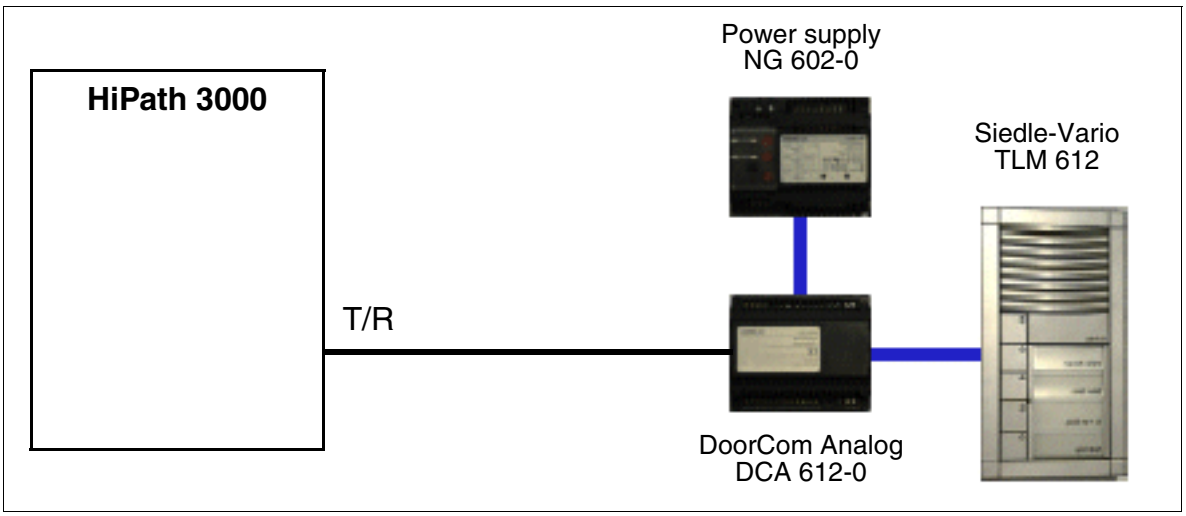


Fig. 9-9 Connecting DoorCom Analog to HiPath 3000

Configuration notes for HiPath 3000/5000 Manager E

DoorCom Analog

Set up station: Stations: Parameters:
Extension Type = Standard
Flags = Call waiting rejection on

System parameters:
Flags = DTMF automatic

Remote station (telephone)

Set up station: Stations: Parameters:
Flags = Call waiting rejection off
Flags = Missed Calls List

Device control features (open doors, select entrance telephone, etc.) can be programmed on procedure keys. The stored DTMF signal sequence is sent to the application.

9.1.4.2 Connecting Speakers

You have the following options:

- Connection to an analog station port (the amplifier may require level adaptation)
- Connection to an analog station port over an ET adapter
  Note: The ET adapter requires a 12V power supply (DC or AC).
- Connection to an analog trunk circuit

Connecting speakers to an analog station port

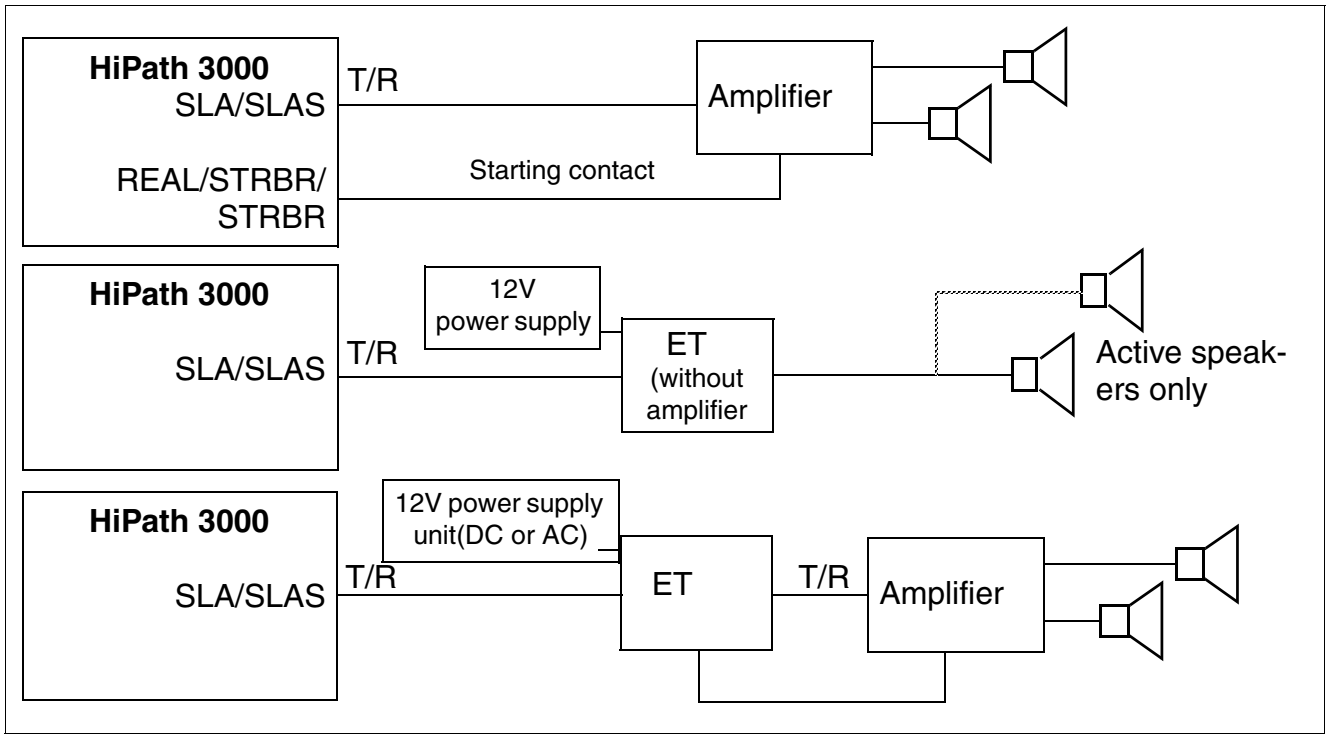


Fig. 9-10 Connecting Speakers to an Analog Station Port

Connecting speakers to an analog trunk port

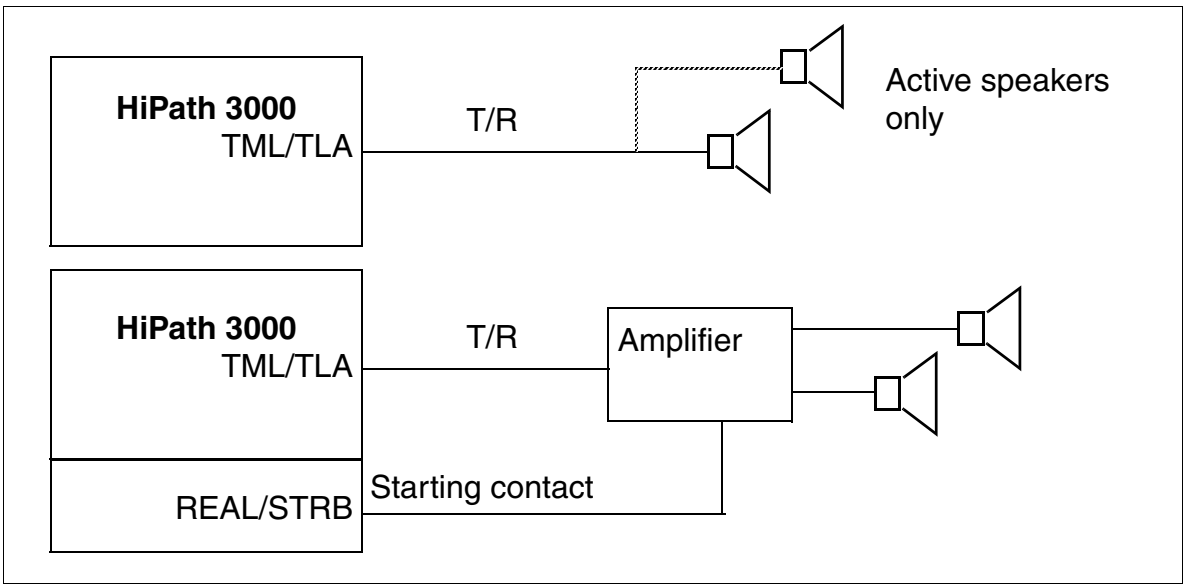


Fig. 9-11 Connecting Speakers to an Analog Trunk Port

9.2 Upgrading HiPath 3000

The following information describes the measures that are needed to upgrade the hardware and software.



It is not possible to upgrade HiPath 3550 to HiPath 3500 or HiPath 3350 to HiPath 3300. This would require replacing the complete system.

9.2.1 Hardware Upgrade

The following hardware requirements apply to HiPath 3000/5000 V5.0 and higher.

Control boards

If the control board necessary for operating HiPath 3000/5000 V5.0 and higher is not available, a replacement must be performed.

System	Control board necessary for HiPath 3000/5000 V5.0 and higher
HiPath 3800	CBSAP (S30810-Q2314-X and higher)
HiPath 3550 HiPath 3350	CBCC (S30810-Q2935-A401, S30810-Q2935-A301)
HiPath 3500 HiPath 3300	CBRC (S30810-Q2935-Z401, S30810-Q2935-Z301)



Note for upgrading from hardware < version 1.2:
If the following subboards are present, they must be replaced: IMODN (replaces the IMOD), MMC (replaces the FMC), CMA/CMS (replaces the CGM/CGMC).

For Deutsche Telekom AG only: The CBCP board S30810-Q2935-B201 must be replaced by a CBCC board S30810-Q2935-A301.

Multimedia card MMC

An MMC with at least 128 MB is required to run HiPath 3000/5000 V8 and higher.

HG 1500 boards

The HG 1500 boards listed in the following table are necessary for using the HG 1500 functionality with HiPath 3000/5000 V5.0 and higher. Unnamed HG 1500 boards must be replaced.

System	HG 1500 board required for HiPath 3000/5000 V5.0 and higher
HiPath 3800	STMI2 (S30810-Q2316-X100)
HiPath 3550 HiPath 3350	HXGS3 (S30810-Q2943-X, S30810-Q2943-X1)
HiPath 3500 HiPath 3300	HXGS3 (S30810-K2943-Z1)
HiPath 3500 HiPath 3300	HXGR3 (S30810-K2943-Z)

9.2.2 Software Upgrade

If the software is a version earlier than V3.0, it must first be upgraded to V3.0. Only then is it possible to upgrade the software to V8.

CDB conversion is also necessary.

Procedure: Customer database (CDB) conversion

Please note the following:
S_0 stations can be configured as both HFA clients and vCAPI clients in V4.0. In addition, V4.0 does not have a selected gatekeeper board. This configuration will have to be re-defined when upgrading ≥ V5.0 (see Figure 9-12).
The flowchart on Page 9-30 describes the procedure for converting the CDB from V4.0 to ≥ V5.0. First, you must edit the V4.0 CDB. Then you must convert the CDB and finally, edit the ≥ V5.0 CDB.
No other changes are necessary apart from modifications for IP workpoint clients and IP lines. Only the gatekeeper and gateway data has to be edited. Telephone numbers and other properties of the IP workpoint clients are retained. The protocol has to be modified for the IP lines.

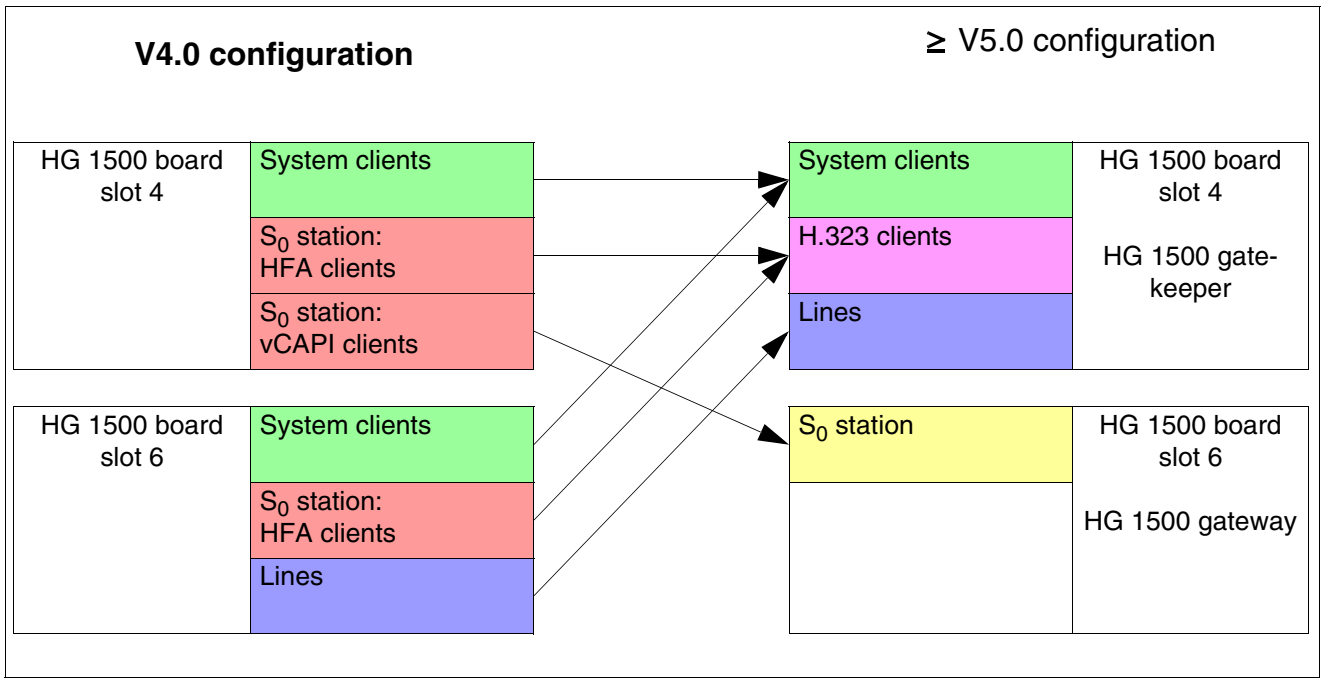


Fig. 9-12 Configuration differences between V4.0 and V5.0 or later

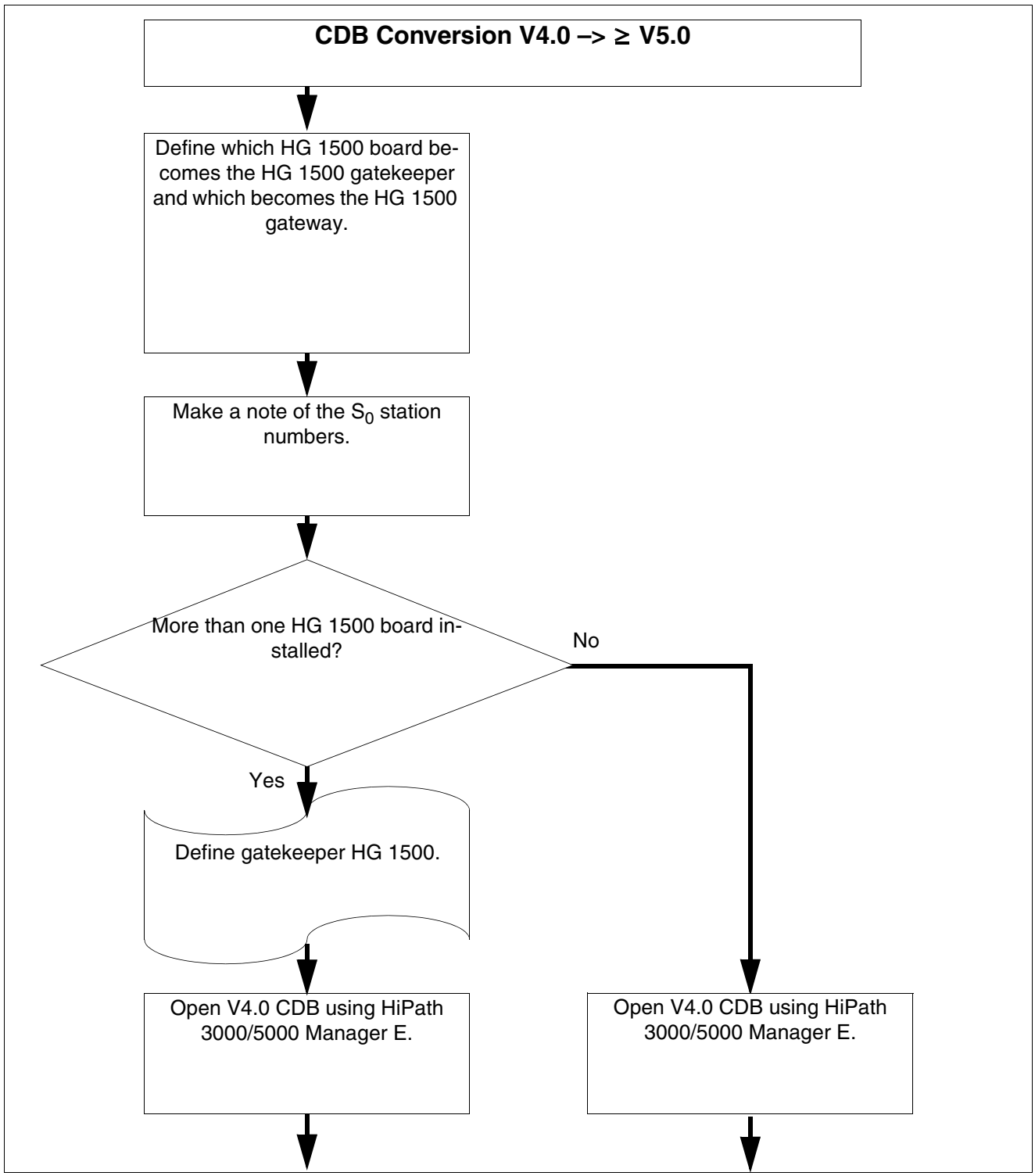


Fig. 9-13 CDB Conversion From V4.0 to V5.0 or Later (Part 1 of 4)

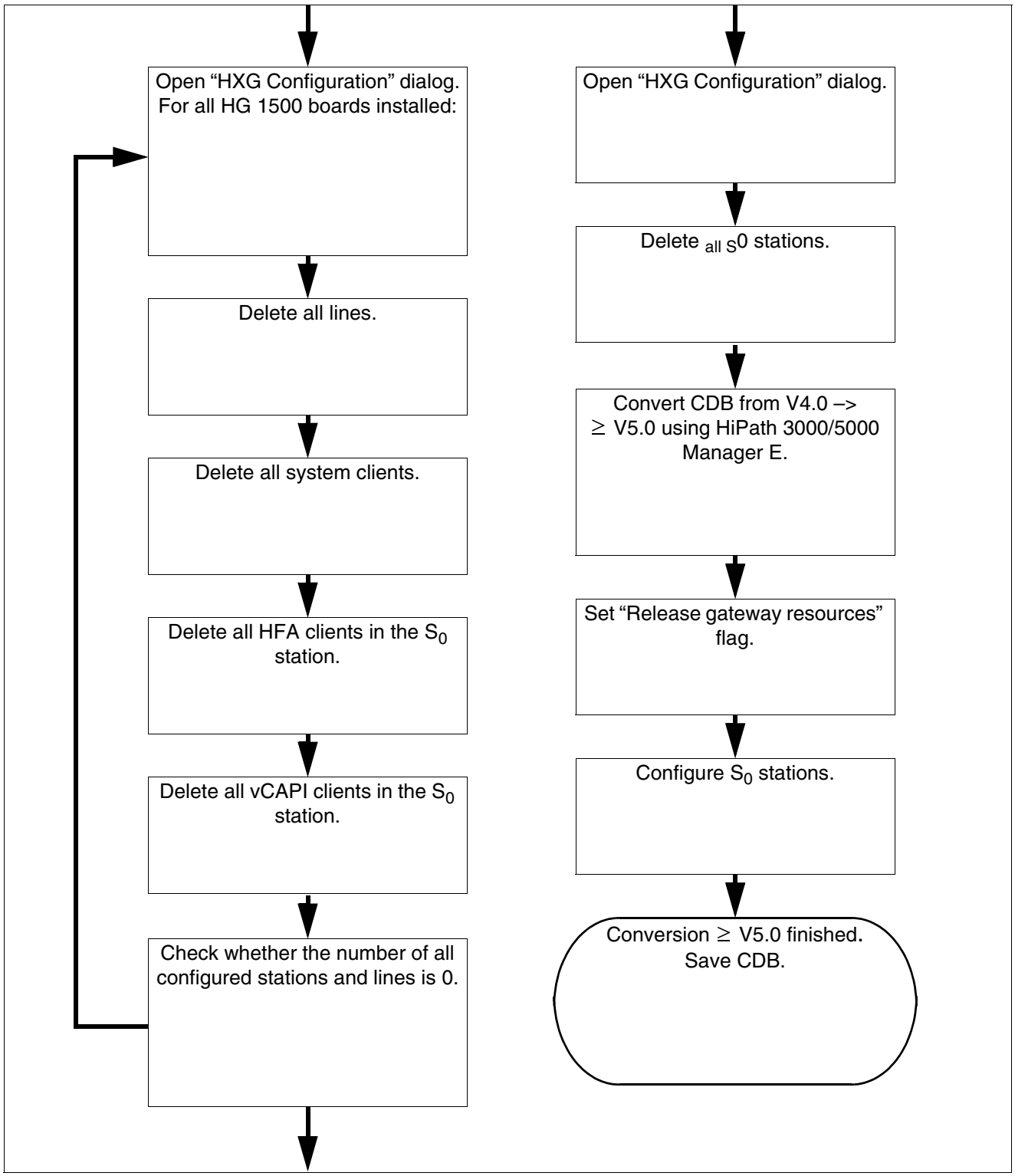


Fig. 9-14 CDB Conversion From V4.0 to V5.0 or Later (Part 2 of 4)

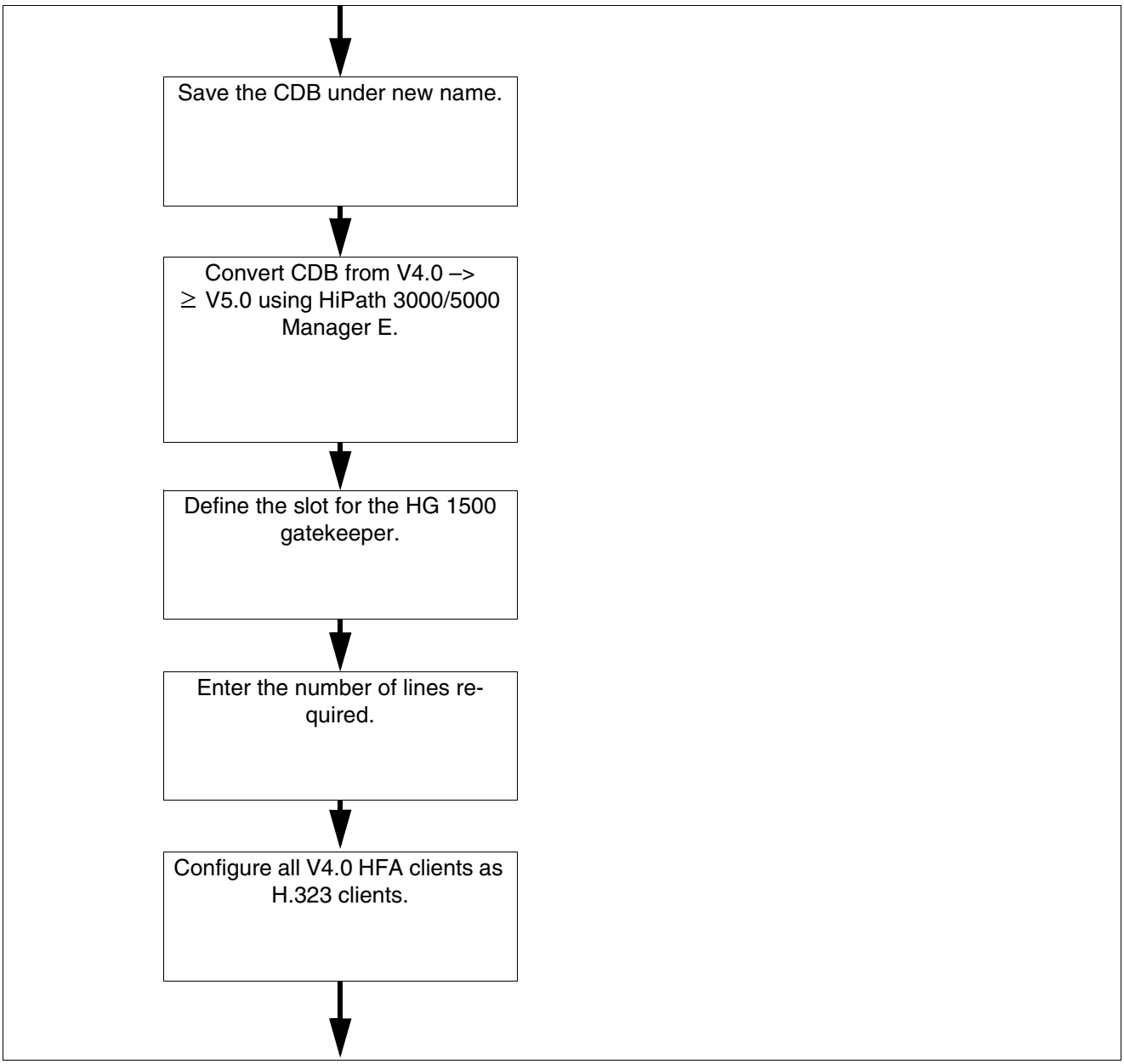


Fig. 9-15 CDB Conversion From V4.0 to V5.0 or Later (Part 3 of 4)

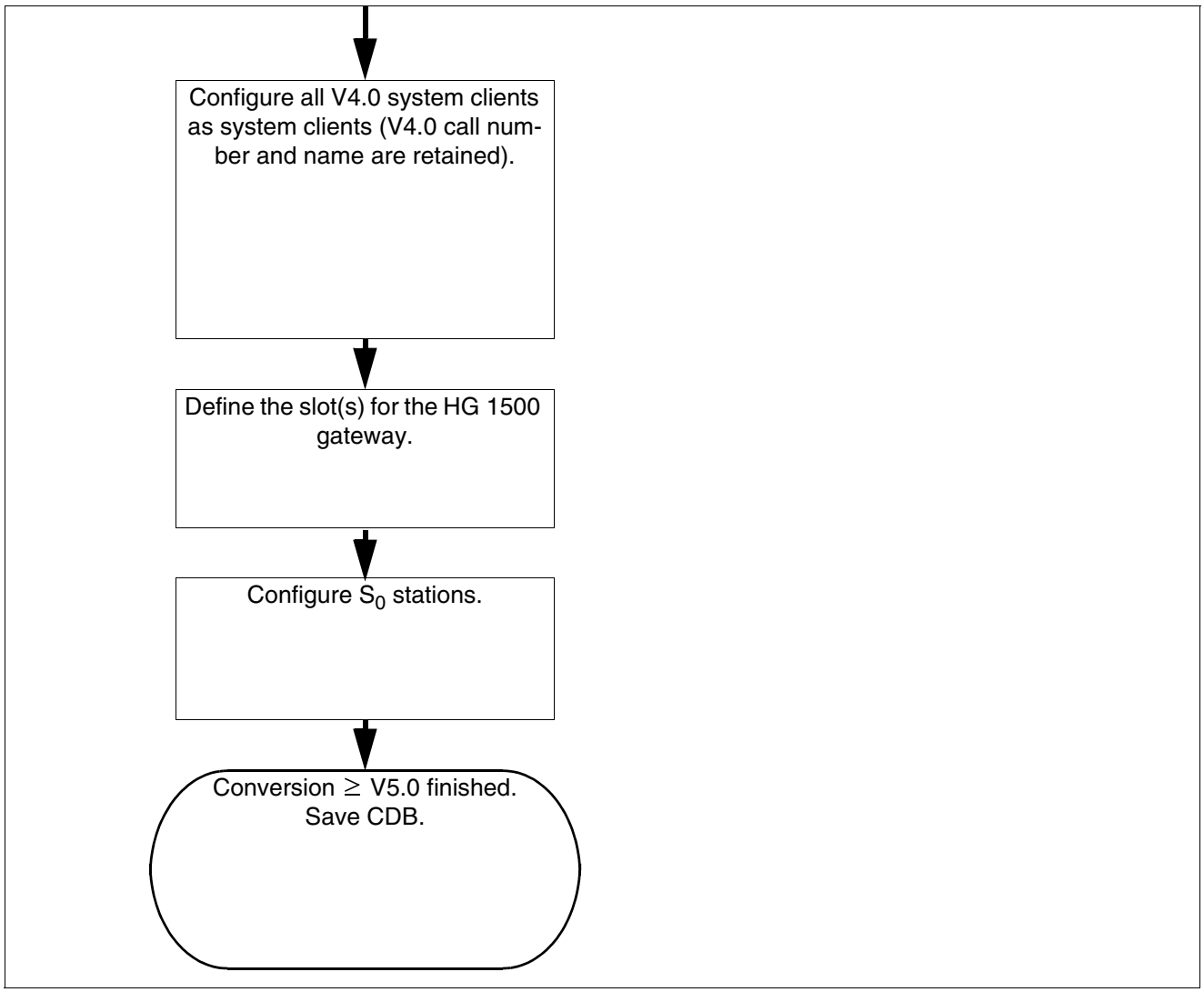


Fig. 9-16 CDB Conversion From V4.0 to V5.0 or Later (Part 4 of 4)

9.2.3 Upgrading from V7 to V8

9.2.3.1 Introduction

Prerequisites

The following prerequisites must be fulfilled when upgrading software from HiPath 3000/5000 V7 to HiPath 3000/5000 V8:

- There are new licenses available for HiPath 3000/5000 V8.
- All IP workpoints (HFA) in a system or all IP workpoints (HFA) in a network must be EFC-enabled.

  The CorNet-IP protocol was extended in HiPath 3000/5000 V7 to include the EFC (Extended Fast Connect) protocol variant.

  EFC is an absolute prerequisite to be able to fully use all features. It is only permitted to deactivate the EFC protocol variant when upgrading a network. Otherwise features can be interrupted.

  EFC is the basis to be able to use for example the following features:

  – Signaling & Payload Encryption SPE

    Signaling & Payload Encryption is supported in HiPath 3000/5000 V7 R4 and higher. This allows both signaling and payload data to be encrypted at station level.

    Signaling Encryption = signaling data encryption: The signaling transmission between HiPath 3000/5000 and the connected IP workpoints, e.g. OpenStage, OpenScape Personal Edition, is encrypted using a 128-bit key. The same mechanism is used to encrypt the signaling data between IP-networked systems (HiPath 2000/HiPath OpenOffice EE, HiPath 3000, HiPath 4000, HiPath 5000).

    Payload Encryption = encryption of the payload data (voice data): The payload data is transmitted using the Secure Real-time Transport Protocol (SRTP) and is encrypted with a 128-bit key. SRTP is also used to encrypt the payload data between IP-networked systems (HiPath 2000/HiPath OpenOffice EE, HiPath 3000, HiPath 4000, HiPath 5000). The Deployment Service DLS distributes the commonly used key for a secure domain. The procedure to swap out the key for SRTP is called Multimedia Internet Keying (Mikey).

– IP/IP E2E payload via enterprise proxy for Internet telephony

  IP/IP E2E payload via enterprise proxy is supported for Internet telephony in HiPath 3000/5000 V7 R2 or higher. This means that, for Internet telephony, data packets do not need to be processed by the digital signal processors of the system. Calls are routed via LANs, routers and the Internet Telephony Service Providers (ITSP).
  HiPath 3000 sets up a call to the remote station.

  Instead, the maximum number of simultaneous calls depends on the codec used and the available bandwidth of the Internet telephony connection.



The EFC protocol is activated in HiPath 3000/5000 by default.
This setting should not be modified as this can lead to feature interruptions.

The procedure for upgrading software depending on the various scenarios is described in the following sections.

Individual EVM announcements in the case of upgrades

In the case of an upgrade from HiPath 3000 V7 to V8, the individual announcements and messages are deleted.

9.2.3.2 Upgrading a HiPath 3000 Standalone System

Procedure

1. Check that all connected IP workpoints (HFA) are EFC-enabled:

If	Then
optiPoint 400 standard optiPoint 400 economy optiPocket	These IP workpoints do not support EFC and must be replaced with EFC-enabled IP workpoints.
OpenStage CorNet-IP (HFA) family optiPoint 410/420 family optiPoint WL2 professional OpenScape Personal Edition optiClient Attendant V8	These IP workpoints are EFC-enabled.

2. Upgrade all IP workpoints with the current EFC-enabled software.

   Refer to the Release Notes and Sales Release for information on the latest software versions.

3. Upgrade all HG 1500 boards to V8.
4. Convert the customer database (CDB) and reload it together with the V8 system software.
5. Install new licenses.

The upgrade is complete.

9.2.3.3 Upgrading a HiPath 5000 RSM Network

Procedure

1. Check that all IP workpoints (HFA) in the network are EFC-enabled:

If	Then
optiPoint 400 standard optiPoint 400 economy optiPocket	These IP workpoints do not support EFC and must be replaced with EFC-enabled IP workpoints.
OpenStage CorNet-IP (HFA) family optiPoint 410/420 family optiPoint WL2 professional OpenScape Personal Edition	These IP workpoints are EFC-enabled.

2. Upgrade all IP workpoints with the current EFC-enabled software.

   Refer to the Release Notes and Sales Release for information on the latest software versions.

3. Dissolve the network:

   a) Remove all systems (nodes) belonging to the network from HiPath 5000 RSM.

   a) FeatureStop the server service.

4. Upgrade each system that belongs to the network:

   a) Upgrade all HG 1500 boards to V8.

   b) Convert the customer database (CDB) and reload it together with the V8 system software.

5. Once all standalone systems have been upgraded, you can upgrade HiPath 5000 RSM on site. To do this, add all systems (nodes) belonging to the network to HiPath 5000 RSM.

6. Put the network into service with HiPath 3000/5000 V8 (commission the Feature server service).

7. Install new licenses.

The upgrade is complete.

9.2.3.4 Upgrading a HiPath 3000 System with HiPath 2000/HiPath OpenOffice EE

Procedure

1. Check that all IP workpoints (HFA) in the network are EFC-enabled:

If	Then
optiPoint 400 standard optiPoint 400 economy optiPocket	These IP workpoints do not support EFC and must be replaced with EFC-enabled IP workpoints.
OpenStage CorNet-IP (HFA) family optiPoint 410/420 family optiPoint WL2 professional OpenScape Personal Edition optiClient Attendant V8	These IP workpoints are EFC-enabled.

2. Upgrade all IP workpoints with the current EFC-enabled software.

   Refer to the Release Notes and Sales Release for information on the latest software versions.

3. Upgrade each system that belongs to the network:

   - Upgrade HiPath 3000 systems and the associated HG 1500 boards to V8.
     Convert the customer database (CDB) and reload it together with the V8 system software.
   - Upgrade HiPath 2000 systems to V2/HiPath OpenOffice EE.
     Convert the customer database (CDB) and reload it together with the V2 system software.

4. Install new licenses.

The upgrade is complete.

9.2.3.5 Upgrading a HiPath 3000 System Networked with HiPath 4000

All IP workpoints (HFA) in the HiPath 3000 system must be EFC-enabled.
The IP workpoints (HFA) in the relevant HiPath 4000 system remain unchanged.

Procedure

1. Check that all IP workpoints (HFA) in the HiPath 3000 system are EFC-enabled:

If	Then
optiPoint 400 standard optiPoint 400 economy optiPocket	These IP workpoints do not support EFC and must be replaced with EFC-enabled IP workpoints.
OpenStage CorNet-IP (HFA) family optiPoint 410/420 family optiPoint WL2 professional OpenScape Personal Edition optiClient Attendant V8	These IP workpoints are EFC-enabled.

2. Upgrade all IP workpoints in the HiPath 3000 system with the current EFC-enabled software.

   Refer to the Release Notes and Sales Release for information on the latest software versions.

3. Upgrade the HiPath 3000 system:

   a) Upgrade all HG 1500 boards to V8.

   b) Convert the customer database (CDB) and reload it together with the V8 system software.

4. Gateway Call Flag "Always Use DSP" in the direction of HiPath 4000
   (HiPath 3000 Manager E: *Settings – Lines/networking ... – Special*).

   - Activate flag, if the H.323 protocol is used for networking
     (old versions of HiPath 4000)
     Note: As HiPath 4000 is not EFC-enabled, activating this flag sets up gateway connections to the HiPath 4000 system.
   - Deactivate flag, if the SIP-Q protocol is used for networking
     (new versions of HiPath 4000)

The upgrade is complete.

9.2.4 Upgrade HiPath 3000 for Signalling & Payload Encryption (SPE)

Overview

The Signaling & Payload encryption feature is provided in HiPath 3000/5000 V7 R4 or higher. If a software version lower than V7 R4 is in use, it must be upgraded before the SPE feature can be used in HiPath 3000. Please refer to the published release notes.

A hardware upgrade is not required. As a result of the increased demand by SPE for resources further HG 1500 boards might be required.

9.2.4.1 Upgrading

If a software version lower than V7 R4 is in use, the following software upgrades must be performed before the SPE feature can be used without restriction:

- Upgrade of all HFA terminals to an SPE-enabled software version

  Due to the introduction of EFC, HiPath 3000 V7 and higher is no longer upwardly compatible with regard to the "Signaling & Payload Encryption" feature, except to HiPath 3000 V6.0 systems which have an EFC-enabled HG 1500 and EFC-enabled IP terminals.
- Upgrade of all HG 1500 gateways to V8
- Upgrade of the HiPath 3000/5000 to V8. The "VoIP Security" feature must be deactivated before upgrading a HiPath 3000/5000 V7 to HiPathV83000/5000 . This is necessary due to the fact that this feature is not compatible with the "Signaling & Payload Encryption (SPE) feature described here.
- Upgrade of administration program DLS and HiPath Manager E
- Configuration changes so that SIP-Q is used instead of CorNet-IP to network HiPath 3000 with HiPath 4000 V4.0 systems. The HiPath 4000 supports SPE only via the SIP-Q protocol.

  In HiPath 3000 V8 and HiPath 4000 V5 and later systems, only SIP-Q V2 protocol is supported for IP networking of these two systems. CorNet-IP protocol is no longer supported.
- Changes to the configuration of the "Always use DSP" option if HiPath 4000 networking should still be achieved using H.323-Q (CorNet-IP). In this case no SPE to the HiPath 4000 is possible.
- In HiPath 3000/5000 V7 and higher, the HiPath 4000 must be connected as an external H.323 gatekeeper or external SIP registrar.

9.2.4.2 Additional System Load

Overview

Activation of the Signalling & Payload Encryption feature has the following consequences for the HiPath network:

- Higher bandwidth requirement due to continuous TLS sessions for:
  - Connections to HFA terminals (CorNet-IP TC/TS, H.225 CS)
  - Connections for SIP terminals (SIP including SDP)
  - H.323 and SIP trunking connections
- Higher bandwidth requirement:
  - Due to the fill and authentication algorithms used by TLS during transmission of user data
  - Due to the proprietary encryption protocols used for IPDA and CTI connections
  - Due to SRTP/SRTCP
- Higher network traffic due to periodic downloads of CRL (Certificate Revocation List) or delta CRL by each Gateway
- Higher network traffic due to recently introduced protocols
  - H.235 Annex D for DMC Slave connections
  - MIKEY messages
- Additional data due to protocol extensions:
  - CorNet-TC/TS plus X messages
  - H.225 RAS (LEGK communication)
  - CorNet NQ

Because of the many configuration options and scenarios possible, it is difficult to accurately determine the effects of this feature on the system, that is, the additional bandwidth requirement and the increased data traffic volume. The following sections are intended as suggestions on how to calculate the additional system load.

Increased bandwidth requirement with SRTP

The table provides an overview of the increase in bandwidth requirements caused by the SRTP. The bandwidth is assumed to rise by 70 bytes as a result of RTP, UDP, IP, 802.1Q VLAN tagging and MAC (incl. preamble, FCS). SRTP accounts for an additional increase of 10 bytes. This brings the overall increase to 80 bytes.

Voice codec	Sample duration (ms)	Payload (bytes)	Ethernet data packet size (bytes)	RTP Ethernet bandwidth incl. preamble (Kbps)	SRTP Ethernet bandwidth incl. preamble (Kbps)	SRTP Increased Ethernet bandwidth (%)
G.711	20	160	240	92	96	4.3
	40	320	400	78	80	2.6
	60	480	560	73.3	74.7	1.9
G.723.1	30	24	104	25.1	27.7	10.4
G.723.1A	60	48	128	15.7	17.1	8.9
G.729A	20	20	100	36	40	11.1
	40	40	120	22	24	9.1
	60	60	140	17.3	18.7	8.1
G.729A DMC Master Call	100	6	86	6.1	6.9	13.1
G.711 DMC Master Call	100	11	91	6.5	7.3	12.3
G.723 DMC Master Call	90	6	86	6.8	7.6	11.8

Higher demand for resources by SPE

The following table provides an overview of the higher demand for resources caused by the SPE (Signaling & Payload Encryption) feature. The values are automatically applied by the system. If the SPE feature is active, a reduced number of channels is reported to the system.

Feature	Max. number of voice channels (per DSP)		Loss
	HG 1500 STMI2	HG 1500 HXGS3 HXGR3	
Standard	16	8	0%
QDC	16	8	6%
SRTP	12	6	20%
DMC	12	6	25%
QDC+ SRTP	12	6	24%
QDC+DMC	12	6	28%
SRTP+DMC	10	5	37%
QDC+SRTP+DMC	10	5	39%

Higher data volume as a result of SPE

This table can be used to calculate the additional system load resulting from the Signaling & Payload Encryption (SPE) feature:

Feature	Approximate data volume	Explanations
TLS session: • Server authentication • Both-way authentication	 1.5 KB 2.5 KB	These are 1-KB certificates that do not support hierarchical certification. Precisely one certificate or precisely two certificates are therefore transferred via LAN.
Fixed data volume for TLS encryption	+ 20 to 30 bytes per message	AES_128_CBC_SHA1 is assumed.

Feature	Approximate data volume	Explanations
CRL	250 bytes to several MB	The CRL size depends on the theoretically unlimited number of CRL entries (= revoked certificates). The entry is 40 bytes in size (ASN.1-enoded), therefore, for example: • CRL with 250 entries: ~10 KB • CRL with 1000 entries: ~40 KB
CorNet-TC/TS	+ ~70 bytes/call	Key for DMC and display updates
CorNet NQ	+ ~60 bytes/call	Security procedure and key for DMC
H.225 RAS	+ ~10 bytes/call	Security
H.235 Annex D	+ ~10 bytes/packet	Authentication code
MIKEY	~200 bytes to 2 KB per message	In MIKEY options #0 and #1, a MIKEY message is ~200 bytes long, in #3, the length of the message increases by 2 KB on account of the certificate included.
Proprietary encryption protocol	50 bytes for encryption messages + up to 15 bytes/message to pad the message if it is less than 16 bytes in size. + 10 bytes/message if the authentication code was configured.	
SRTP	+ 10 bytes/packet	Authentication code (MKI not used)
SRTCP	+ 14 bytes/packet	Authentication code and SRTCP index

If the individual data volumes are added together, then the per-call data traffic increases in the LAN as follows:

- for a local call: 2 KB
  (60 CorNet TC + 4 H.225 CS messages over TLS + 2 MIKEY#0 messages)
- for an external call: 700 bytes
  (12 H.225 CS messages incl. CorNet NQ messages over TLS + 2 MIKEY#0 messages)

The increased data traffic volume in payload connections is mainly due to the authentication code of 10 bytes, which is added to every data packet as a result of SRTP. The additional data volume due to SRTCP is negligible.

10 Workpoint Clients

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10.1 OpenStage Product Family

Connection variants

The following connection variants are available for selection for the terminals in HiPath 3000/ 5000:

- TDM connection
- CorNet-IP connection (also as gigabit version, Page 10-5)



Important: HiPath 3000/5000 does not support the SIP connection variant.

Product family

The following terminals belong to the OpenStage product family for HiPath 3000/5000:

- OpenStage TDM: 10 T, 15 T, 20 T, 30 T, 40 T, 60 T, 80 T
- OpenStage CorNet IP (HFA): 15, 20 E, 20, 20 G, 40, 40 G, 60, 60 G and 80, 80 G

Control elements

The following elements and the display guarantee convenient and interactive operation.

- 3-way navigator: in OpenStage 20.
- Programmable keys: in OpenStage 30. The function is displayed to the left of the keys on a paper label.
- Programmable touch/sensor keys next to the display (illuminated) and a 5-way navigator: in OpenStage 40. The function is displayed to the left of the keys on the display.
- Programmable touch/sensor keys next to the display (illuminated) and a TouchGuide: in OpenStage 60, OpenStage 80. The function is displayed to the left of the keys on the display.

Programmable keys can be used as function keys, speed dialing keys or trunk keys.

The number of available programmable keys can be increased by adding:

- OpenStage Key Module 15: in OpenStage 15, OpenStage 30
- OpenStage Key Module: in OpenStage 40, OpenStage 60, OpenStage 80
- OpenStage BLF: in OpenStage 30, OpenStage 40

10.1.1 Gigabit variant of OpenStage terminals

The CorNet-IP (HFA) connection variant is also available in a gigabit version.

These OpenStage terminals feature an integrated Ethernet switch which can be used, for instance, to connect the workstation PC to the local network. In the gigabit version, larger data packets (such as, video or audio data packets) can be transferred to the workstation PC that is connected to the network via the OpenStage terminal. This reduces spending on inhouse cabling and the IP network and at the same time increases network performance.

The gigabit Ethernet switch can only be used to advantage if the entire corporate network supports gigabit technology. CAT 5M, or even better CAT 6 network cables are essential for connecting the terminals. Older cable types can lead to significant speed losses.

The OpenStage terminals in the gigabit version are:

- OpenStage 20 G
- OpenStage 40 G
- OpenStage 60 G
- OpenStage 80 G

10.1.2 OpenStage Terminals

10.1.2.1 OpenStage 10

Product image



Fig. 10-1 OpenStage 10

Versions

HiPath 3000/5000 V7 R3 and higher supports the TDM connection variant (OpenStage 10 T).

Main features

Feature	Description
Pre-programmed function keys	Three audio keys for: • increasing the volume • activating/deactivating the loudspeaker • decreasing the volume
Dialing keypad	For entering digits 0 to 9, pound and asterisk symbols, letters, punctuation marks and special characters

Feature	Description
Programmable keys	3 keys: • Can be programmed as function, DSS or trunk keys by service personnel • Labeled with paper label
Additional features	• Open listening • Wall mounting

Downward compatibility to earlier systems

OpenStage 10 T can be registered as an optiPoint 500 entry on earlier HiPath communication systems (in other words, on HiPath 3000 V7 systems). OpenStage 10 T can be switched to optiPoint mode via a simple menu. In HiPath 3000 Manager E, an optiPoint 500 entry is visible instead of an OpenStage 10 T.

10.1.2.2 OpenStage 15

Product image



Fig. 10-2 OpenStage 15

Versions

OpenStage 15 is supported in the CorNet-IP (HFA) connection variant by HiPath 3000/5000 V8 R2 and higher and in the TDM connection variant (OpenStage 15 T) by HiPath 3000/5000 V7 R6 and higher.

Main features

Feature	Description
Display	LCD, immobile, two lines, monochrome, 24 x 2 characters
Pre-programmed function keys	• Three audio keys for: – decreasing the volume and brightening the display contrast – activating/deactivating the loudspeaker – increasing the volume and darkening the display contrast • Mailbox key for checking voicemail • Menu key for the communication system's Service menu
Dialing keypad	For entering digits 0 to 9, pound and asterisk symbols, letters, punctuation marks and special characters

Feature	Description
Navigation keys	Three keys for: • scrolling forward through the menu or opening the idle menu • executing actions • scrolling back through the menu or opening the idle menu
Programmable keys	• Eight keys • Each key can be programmed either as a function key or as a DSS key
Add-on device	"OpenStage Key Module 15": • 18 programmable keys • Each key can be programmed either as a function key or as a DSS key • A maximum of one "OpenStage Key Module 15" can be connected to the telephone
Port	U_{P0E}
Additional features	• Full-duplex speakerphone mode • Open listening • Suitable for wall mounting

Downward compatibility to earlier systems

OpenStage 15 T can be registered as an optiPoint 500 standard on earlier HiPath communication systems (in other words, on HiPath 3000 V7 systems). OpenStage 15 T can be switched to optiPoint mode via a simple menu. In HiPath 3000 Manager E, an optiPoint 500 standard is visible instead of an OpenStage 15 T.

10.1.2.3 OpenStage 20

Product image



Fig. 10-3 OpenStage 20

Versions

HiPath 3000/5000 V7 R3 and higher supports the CorNet-IP (HFA) and TDM connection variants (OpenStage 20 T). The following telephones are available for the CorNet IP (HFA) connection variant:

- OpenStage 20 E (without full-duplex speakerphone mode)
- OpenStage 20
- OpenStage 20 G (gigabit variant)

Main features

Feature	Connection variant	
	CorNet-IP (HFA)	**TDM**
General features	Tilt LCD graphics display, 24 x 2 character resolution, monochrome	
	multi-functional 3-way navigator	

Feature	Connection variant	
	CorNet-IP (HFA)	**TDM**
General features	7 pre-programmed function keys: Disconnect, call forwarding, redial, service/ application menu, voice messages, loudspeaker, mute	
	Full-duplex speakerphone mode (not for 20 E)	
	Open listening	
	Suitable for wall mounting	
Interfaces	Integrated Ethernet switch to connect a PC	
	LAN port (10/100 Base-T)	
IP features	CorNet-IP (HFA) based on H.323	
	Security and Encryption for H-Series Multimedia Terminals H.235 Annex D	
	Voice codecs G.711, G.729, G.722	
	DHCP, FTP, HTTP, HTTPS, SNMP	
	Port-Based Network Access Control 802.1x	
	QoS based on DiffServ	
	VLAN	
	IEEE 802.3af Power over Ethernet (PoE)	

10.1.2.4 OpenStage 30

Product image



Bild 10-4 OpenStage 30

Versions

HiPath 3000/5000 V8 R4 and higher supports the TDM connection variant (OpenStage 30 T).

Main features

Feature	Description
Display	LCD, immobile, two lines, monochrome, 24 x 2 characters
Pre-programmed function keys, first row	• End call (disconnect) • Number redial • Switch call forwarding on/off • Switch headset on/off • Switch microphone on/off

Feature	Description
Pre-programmed function keys, second row	• Three audio keys for: – decreasing the volume and brightening the display contrast – activating/deactivating the loudspeaker – increasing the volume and darkening the display contrast • Mailbox key for checking voicemail • Menu key for the communication system's Service menu
Dialing keypad	For entering digits 0 to 9, pound and asterisk symbols, letters, punctuation marks and special characters
Navigation keys	Three keys for: • scrolling forward through the menu or opening the idle menu • executing actions • scrolling back through the menu or opening the idle menu
Programmable keys	8 keys: • Each key can be programmed either as a function key or as a DSS key • Labeled with paper label
Key modules	1 "OpenStage Key Module 15": • 18 programmable keys • Each key can be programmed either as a function key or as a DSS key • A maximum of one "OpenStage Key Module 15" can be connected to the telephone Or: 1 "OpenStage BLF" busy lamp field
Connections	• U_{P0E} (CorNet-TS protocol) • USB-B (slave interface) for first-party CTI • 121TR9-5* for headset, 8 pins
Additional features	• Full-duplex speakerphone mode • Open listening • Wall mounting • Software download via SLMO • Downward compatibility to earlier systems

Downward compatibility to earlier systems

OpenStage 30 T can be registered as an optiPoint 500 advance on earlier HiPath communication systems (in other words, on HiPath 3000 V7 systems). OpenStage 30 T can be switched to optiPoint mode via a simple menu. In HiPath 3000 Manager E, an optiPoint 500 advance is visible instead of an OpenStage 30 T.

10.1.2.5 OpenStage 40

Product image

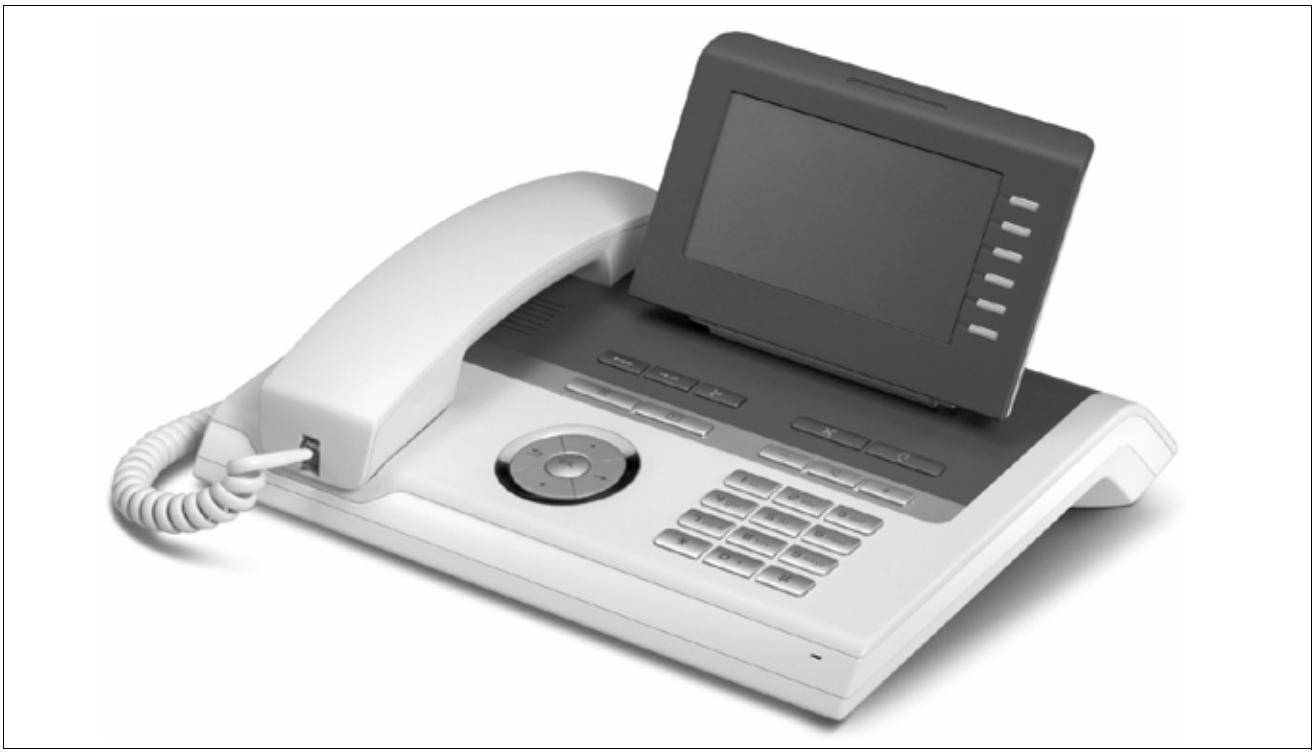


Bild 10-5 OpenStage 40

Versions

HiPath 3000/5000 V7 R3 and higher supports the CorNet-IP (HFA) and TDM connection variants (OpenStage 40 T). The following telephones are available for the CorNet IP (HFA) connection variant:

- OpenStage 40
- OpenStage 40 G (gigabit variant)

Main features

Feature	Connection variant	
	CorNet-IP (HFA)	**TDM**
General features	Tilt LCD graphics display with background lighting, 40 x 6 character resolution, monochrome	
	multi-functional 5-way navigator	

Feature	Connection variant	
	CorNet-IP (HFA)	**TDM**
General features	8 pre-programmed function keys: disconnect, call forwarding, redial, service/ application menu, voice messages, loudspeaker, mute, headset	
	6 programmable touch/sensor keys: function, speed dialing or trunk keys	
	Full-duplex speakerphone mode	
	Open listening	
	Suitable for wall mounting	
Interfaces	Integrated Ethernet switch to connect a PC	USB slave
	LAN port (10/100 Base-T)	
	Port for headset	
	Port for key module and BLF	
IP features	CorNet-IP (HFA) based on H.323	
	Security and Encryption for H-Series Multimedia Terminals H.235 Annex D	
	Voice codecs G.711, G.729, G.722	
	DHCP, FTP, HTTP, HTTPS, SNMP	
	Port-Based Network Access Control 802.1x	
	QoS based on DiffServ	
	VLAN	
	IEEE 802.3af Power over Ethernet (PoE)	

10.1.2.6 OpenStage 60

Product image

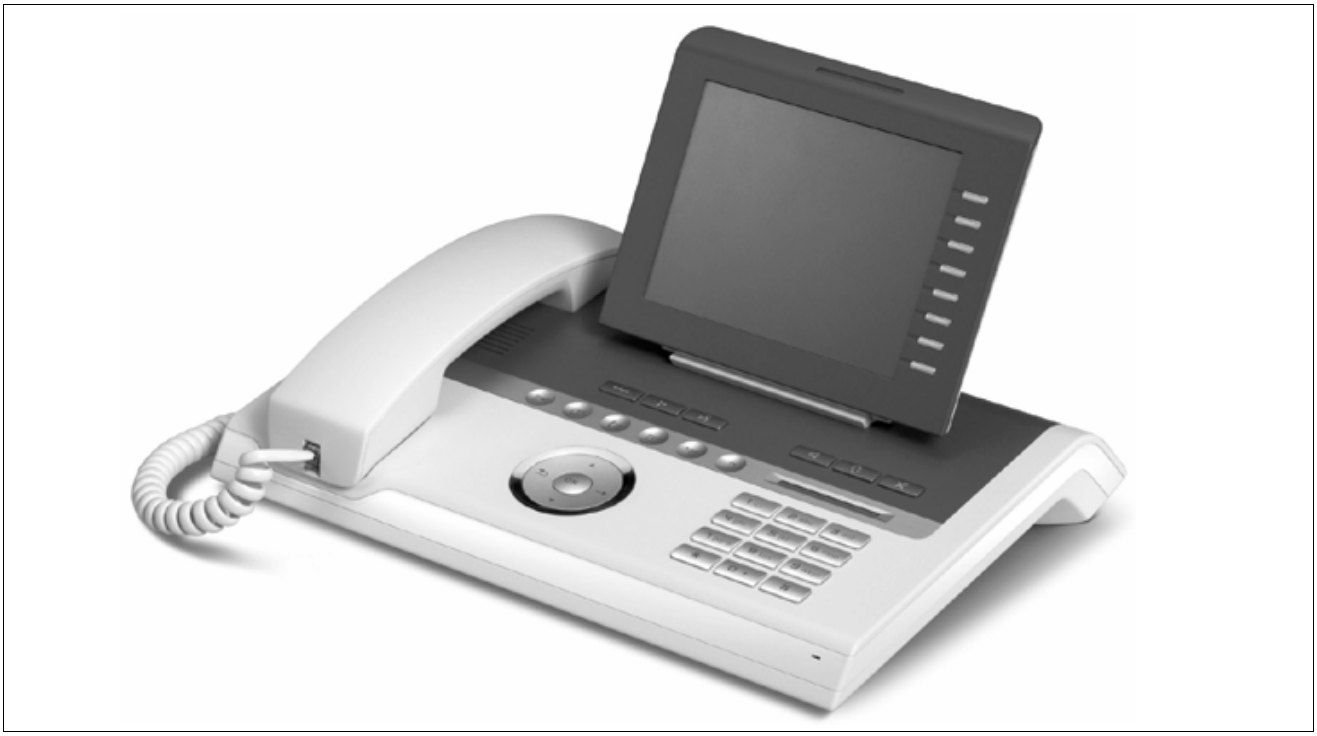


Fig. 10-6 OpenStage 60

Versions

OpenStage 60 is supported in the CorNet-IP (HFA) connection variant by HiPath 3000/5000 V7 R3 and higher and in the TDM connection variant (OpenStage 60 T) by HiPath 3000/5000 V7 R4 and higher. The following telephones are available for the CorNet IP (HFA) connection variant:

- OpenStage 60
- OpenStage 60 G (gigabit variant)

Main features

Feature	Description
Display	TFT, swivel, background lighting, 320 x 240 pixels, QVGA, 16 bit color depth, suitable for graphics
Pre-programmed function keys, left	• End call (disconnect) • Switch call forwarding on/off • Switch voice dialing on/off

Feature	Description
Pre-programmed function keys, right	• Activating/deactivating the loudspeaker • Switch headset on/off • Switch microphone on/off
Mode keys	• Display telephony interface (forexample, connection status, connection duration) • Display phonebooks: – Personal phonebook – LDAP directory – HiPath 3000 phonebook • Display call lists: – Dialed numbers (internal phone redial) – Missed calls – Received calls • Display messages: – Text messages – Voice mail • Menu key: – Service menu – User menu – Administration menu – Applications tab • Display Help function
TouchSlider	Set the current volume • Ringtone • Handset • Loudspeaker
TouchGuide	Navigate in lists, menus and input fields
Dialing keypad	For entering digits 0 to 9, pound and asterisk symbols, letters, punctuation marks and special characters.
Programmable sensor keys	Eight keys: • Each key can be programmed as a function, DSS or trunk keys. If programmed for redial, the key accesses the HiPath 3000 redial function. • Key labeling on the display
Key modules	2 "OpenStage Key Module 60/80" modules: • 12 programmable keys • Each key can be programmed as a function, DSS or trunk key • Up to two "OpenStage Key Module 60/80" modules can be connected to the telephone.

Feature	Description
Connections	• USB-A (master interface) for first-party CTI • 121TR9-5* for headset, 8 pins • Bluetooth • Port for key module • For TDM only: USB-B (slave interface) for first-party CTI • For CorNet-IP (HFA) only: LAN port (10/100 Base-T) • For CorNet-IP (HFA) only: Integrated Ethernet switch to connect a PC
Additional features	• Full-duplex speakerphone mode • Open listening • Voice dialing • Polyphonic and mp3 ring tones supported • No wall mounting
IP features [for CorNet-IP (HFA) only]	• CorNet-IP (HFA) based on H.323 • Security and Encryption for H-Series Multimedia Terminals H.235 Annex D • Voice codecs G.711, G.729, G.722 • DHCP, FTP, HTTP, HTTPS, SNMP • Port-Based Network Access Control 802.1x • QoS based on DiffServ • VLAN • IEEE 802.3af Power over Ethernet (PoE)

10.1.2.7 OpenStage 80

Product image



Figure 10-7 OpenStage 80 [CorNet-IP (HFA)]

Versions

OpenStage 80 is supported in the CorNet-IP (HFA) connection variant by HiPath 3000/5000 V7 R3 and higher and in the TDM connection variant (OpenStage 80 T) by HiPath 3000/5000 V7 R4 and higher. The following telephones are available for the CorNet IP (HFA) connection variant:

- OpenStage 80
- OpenStage 80 G (gigabit variant)

Main features

Feature	Description
Display	TFT, swivel, background lighting • TDM: 320 x 240 pixels, QVGA, 16 bit color depth, suitable for graphics • CorNet-IP (HFA): 640 x 480 pixels, VGA, 16 bit color depth, suitable for graphics

Feature	Description
Pre-programmed function keys, left	• End call (disconnect) • Switch call forwarding on/off • Switch voice dialing on/off
Pre-programmed function keys, right	• Activating/deactivating the loudspeaker • Switch headset on/off • Switch microphone on/off
Mode keys	• Display telephony interface (forexample, connection status, connection duration) • Display phonebooks: – Personal phonebook – LDAP directory – HiPath 3000 phonebook • Display call lists: – Dialed numbers (internal phone redial) – Missed calls – Received calls • Display messages: – Text messages – Voice mail • Menu key: – Service menu – User menu – Administration menu – Applications tab • Display Help function
TouchSlider	Set the current volume • Ringtone • Handset • Loudspeaker
TouchGuide	Navigate in lists, menus and input fields
Dialing keypad	For entering digits 0 to 9, pound and asterisk symbols, letters, punctuation marks and special characters
Programmable sensor keys	TDM: Eight keys/CorNet-IP (HFA): Nine keys • Each key can be programmed as a function, DSS or trunk keys. If programmed for redial, the key accesses the HiPath 3000 redial function. • Key labeling on the display

Feature	Description
Key modules	2 "OpenStage Key Module 60/80" modules: • 12 programmable keys • Each key can be programmed as a function, DSS or trunk key. • Up to two "OpenStage Key Module 60/80" modules can be connected to the telephone.
Connections	• USB-A (master interface) for first-party CTI • 121TR9-5* for headset, 8 pins • Bluetooth • Port for key module • For TDM only: USB-B (slave interface) for first-party CTI • For CorNet-IP (HFA) only: LAN port (10/100 Base-T) • For CorNet-IP (HFA) only: Integrated Ethernet switch to connect a PC
Additional features	• Full-duplex speakerphone mode • Open listening • Voice dialing • Polyphonic and mp3 ring tones supported • No wall mounting
IP features [for CorNet-IP (HFA) only]	• CorNet-IP (HFA) based on H.323 • Security and Encryption for H-Series Multimedia Terminals H.235 Annex D • Voice codecs G.711, G.729, G.722 • DHCP, FTP, HTTP, HTTPS, SNMP • Port-Based Network Access Control 802.1x • QoS based on DiffServ • VLAN • IEEE 802.3af Power over Ethernet (PoE)

10.1.2.8 Connection and Startup

CorNet-IP connection variant (HFA)

HiPath 3000 together with HiPath Xpressions Compact supports the central administration of the IP terminals connected to the system. For this purpose a Deployment Tool (DLS Interface DLI) has been implemented on the HiPath Xpressions Compact boards. The DHCP and FTP servers integrated in DLI support the following:

- the central configuration of parameters for all IP terminals connected enabling plug&play operation
- the central software update of all IP terminals connected

For information about the prerequisites for using the DLI function, see Section 10.3.



The DLI function can only be used for standalone systems.
The Deployment and Licensing service is available for networked HiPath 3000 systems with or without HiPath 5000 RSM. The Deployment and Licensing service can also be used for systems that do not satisfy the prerequisites for using the DLI function. For information on how to use this tool, see the Deployment Service Administrator Manual.

For information about OpenStage terminal administration, see CorNet-IP Connection Variants in the OpenStage Administrator Manual.

TDM connection variants

After connecting the terminal, all LEDs on the terminal and all LEDs on any other add-on devices connected light up (the LEDs on add-on device do not have to flash in synchronism with workpoint LEDs). All pixels on the display also activate briefly.
These indications show that the telephone is starting up and performing a self-test. Downloading has finished and the telephone is ready for operation when you see the date and time on the display.

Use HiPath 3000/5000 to configure the OpenStage terminals for HiPath 3000/5000 Manager E.

Administration and Software Upgrade

For the CorNet-IP connection variant (HFA) the administration and software upgrade is enabled by the Deployment and Licensing Service. The relevant information is provided in the Deployment Service Administrator Manual.

Software image releases are available on the MMC for the TDM connection variants.

Download

The manuals and tools mentioned can be downloaded here:
http://www.enterprise-communications.siemens.com/global/Products.aspx (... -> Downloads).

10.1.2.9 Ports on the Underside of the Telephone for the CorNet-IP Model

This section shows the ports on the underside of OpenStage CorNet IP (HFA) telephones. These ports are explained in Section 10.1.2.11, “OpenStage Terminals - Description of Ports”.

OpenStage 15 for CorNet IP

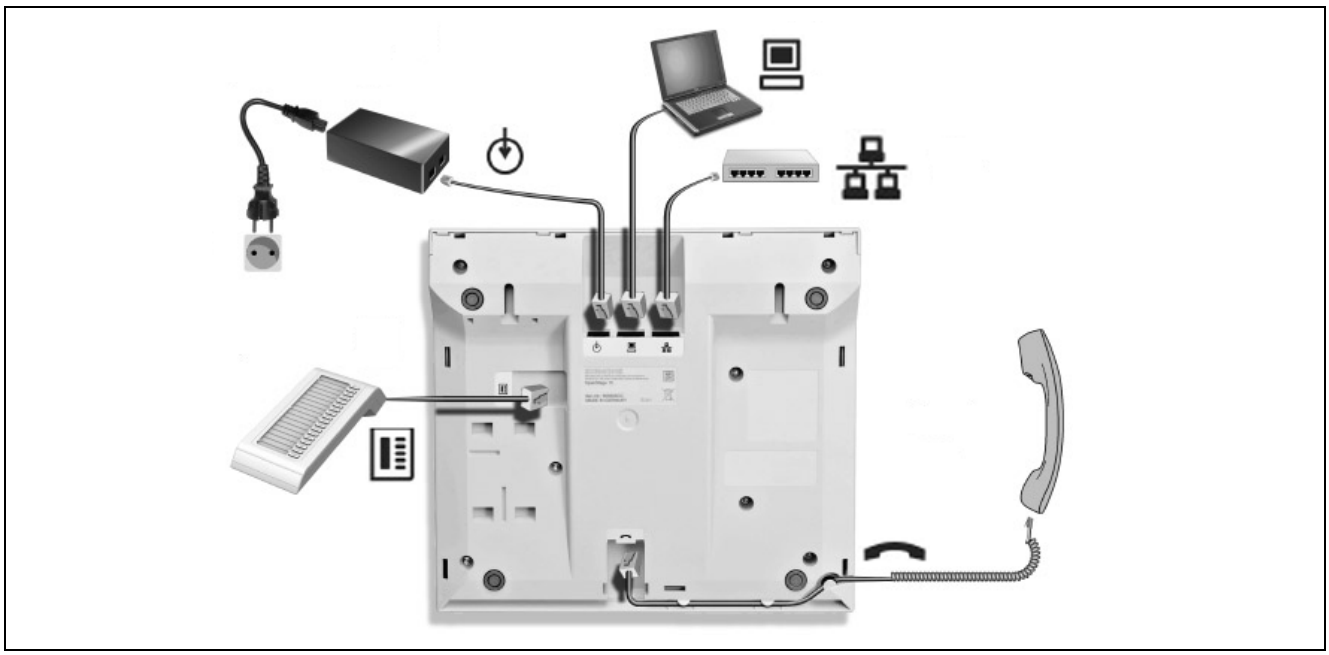
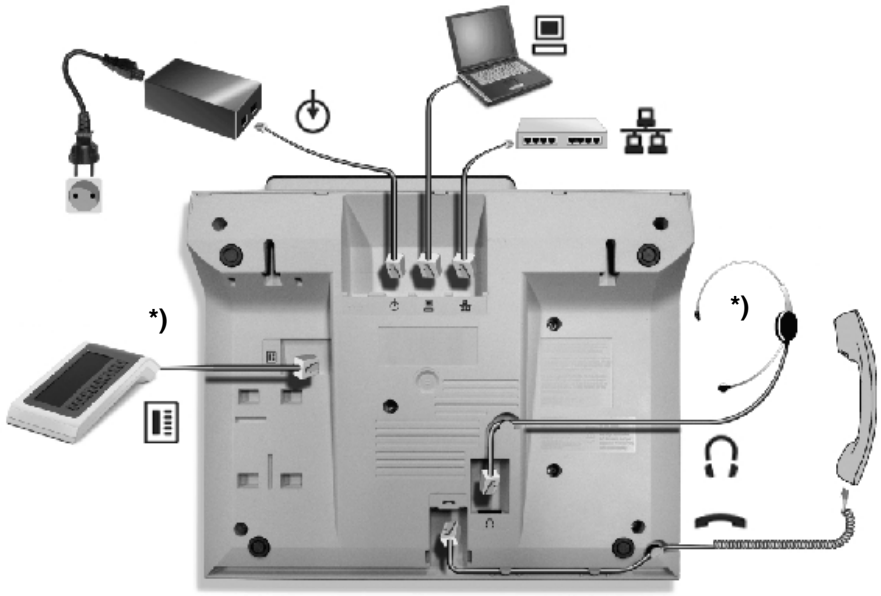


Bild 10-8 OpenStage 15 (CorNet IP) – Underside of the Telephone

OpenStage 20, OpenStage 40 for CorNet-IP



*) not available in OpenStage 20

Bild 10-9 OpenStage 20, OpenStage 40 (CorNet IP) – Underside of the Telephone

OpenStage 60, OpenStage 80 for CorNet-IP

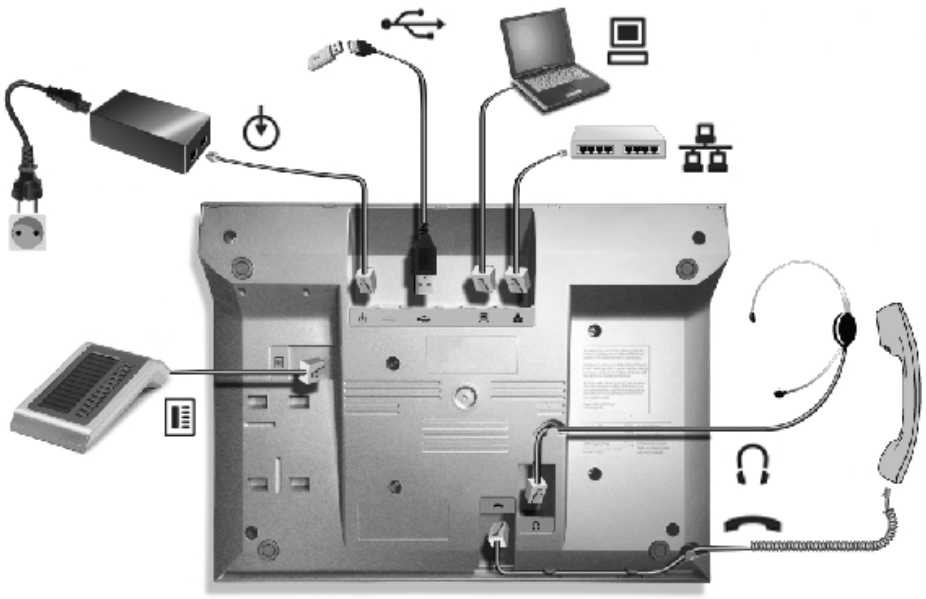


Bild 10-10 OpenStage 60, OpenStage 80 (CorNet IP) – Underside of the Telephone

10.1.2.10 Ports on the Underside of the Telephone for the TDM Model

This section shows the ports on the underside of OpenStage TDM telephones. These ports are explained in Section 10.1.2.11, “OpenStage Terminals - Description of Ports”.

OpenStage 10 T, OpenStage 20 T

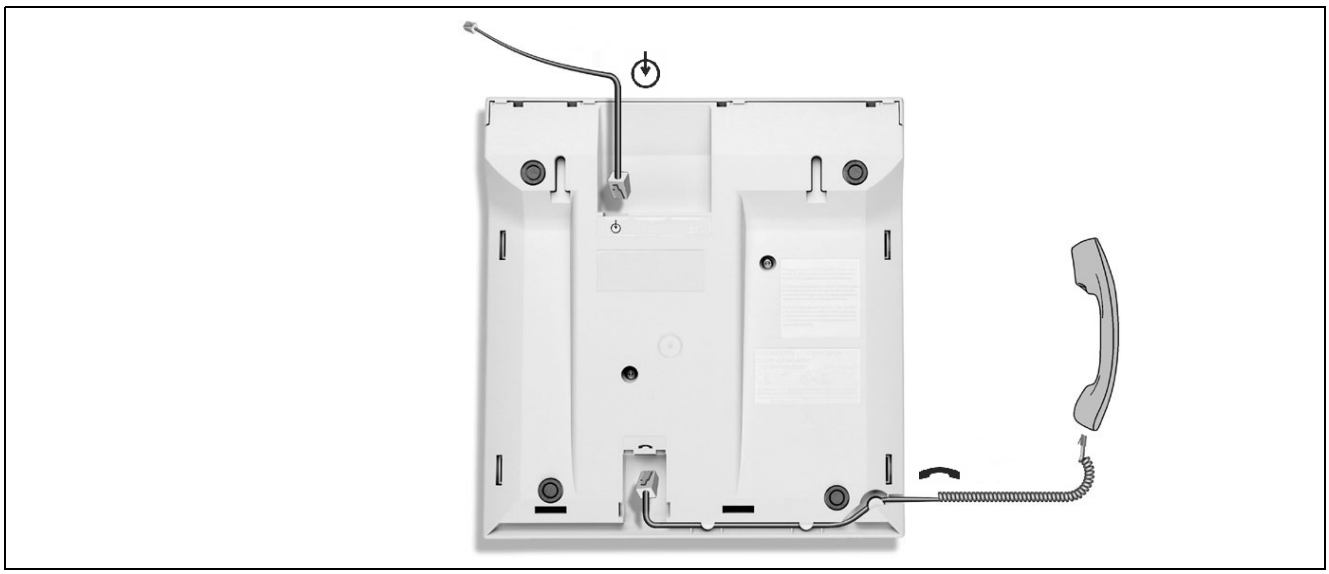


Bild 10-11 OpenStage 10 T, OpenStage 20 T – Underside of the Telephone

OpenStage 15 T

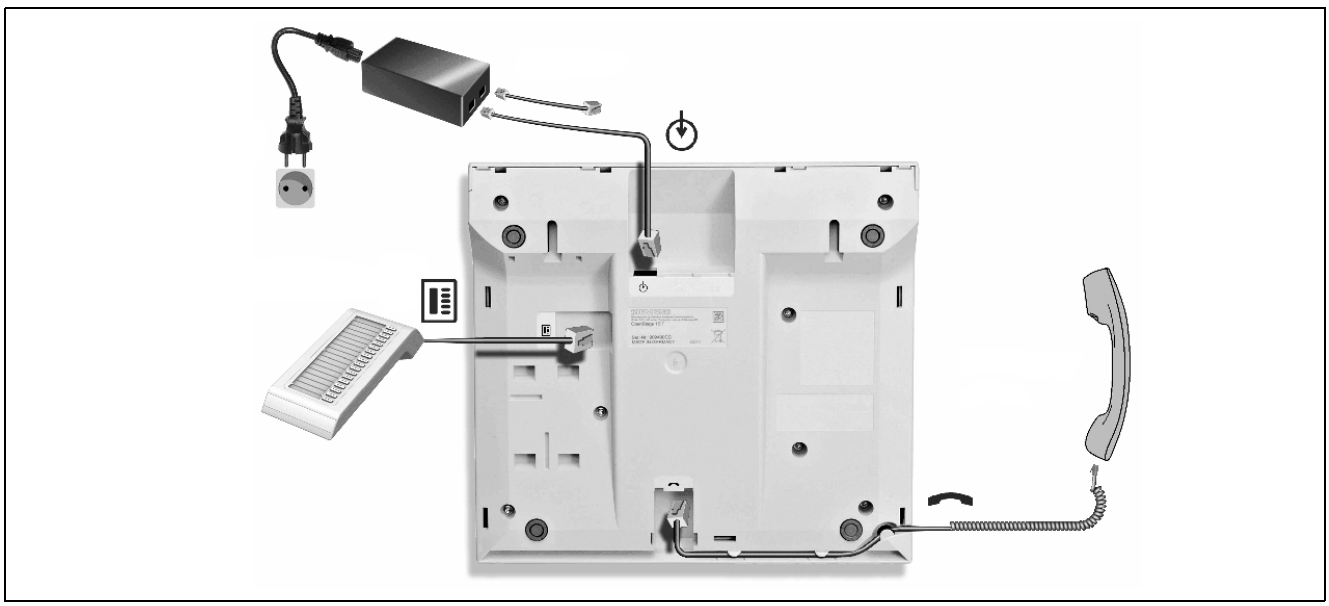


Bild 10-12 OpenStage 15 T – Underside of the Telephone

OpenStage 30 T, OpenStage 40 T

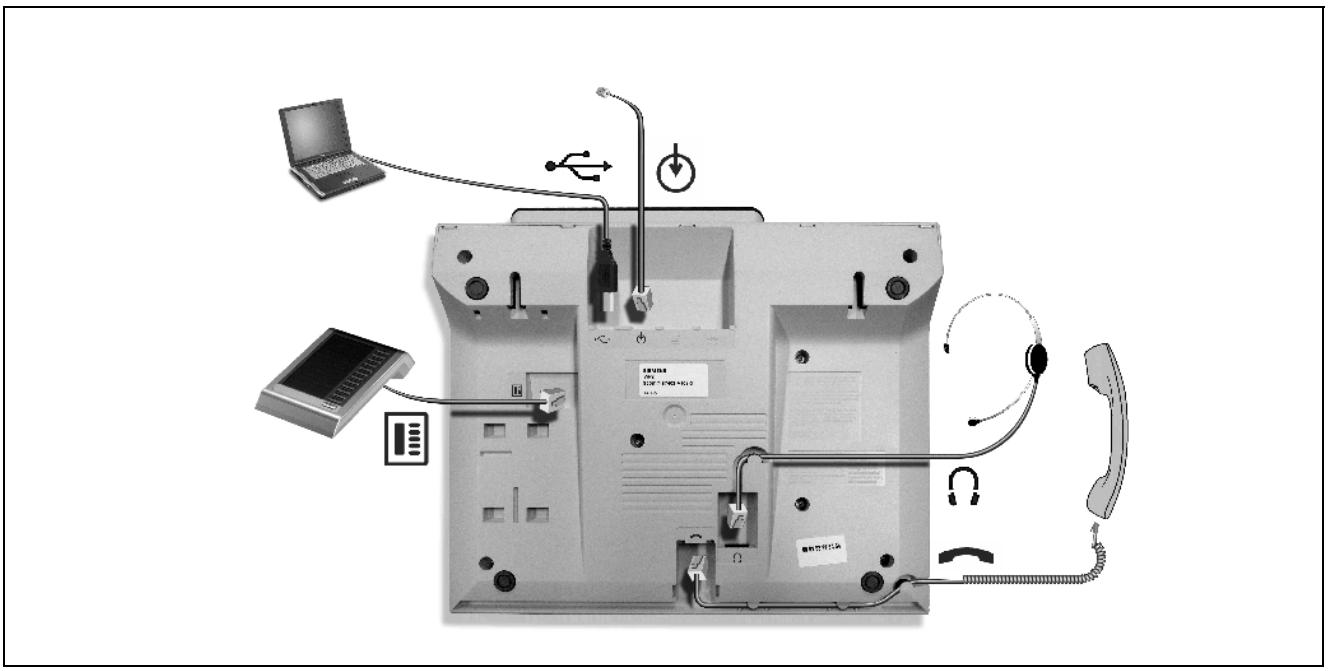


Bild 10-13 OpenStage 30 T, OpenStage 40 T – Underside of the Telephone

OpenStage 60 T, OpenStage 80 T

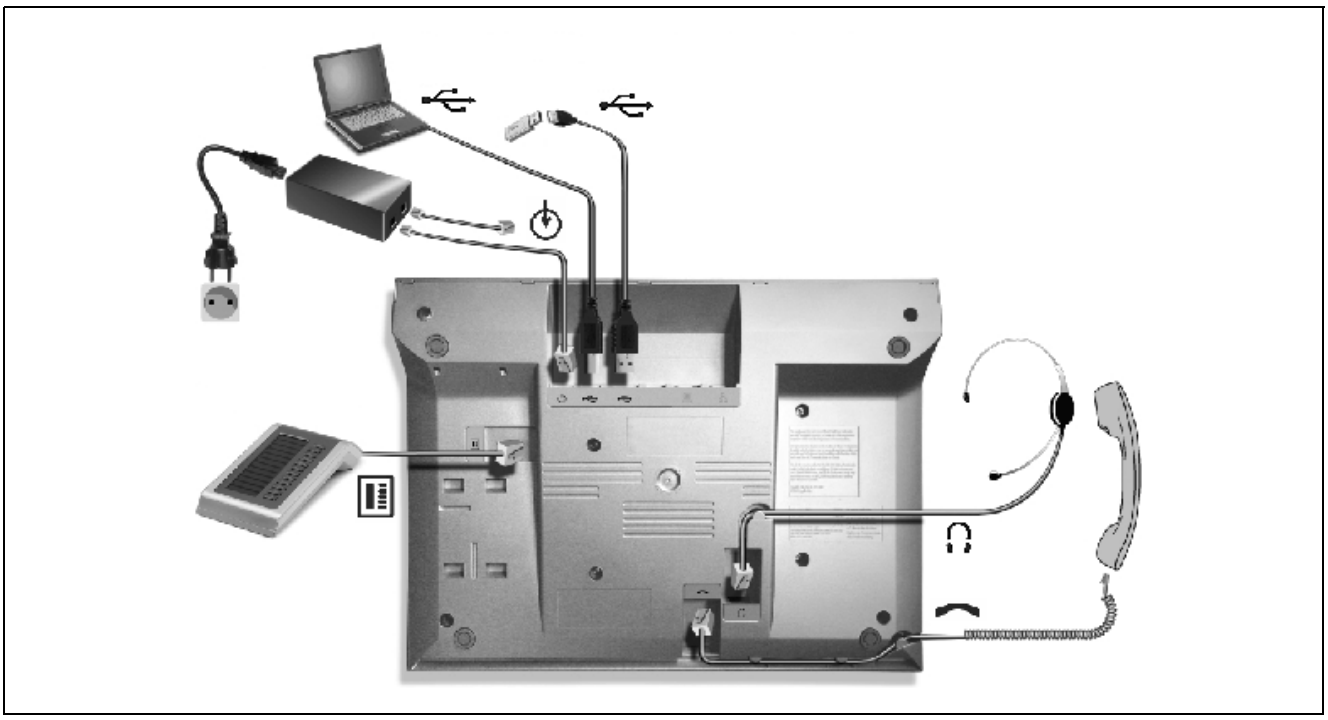


Bild 10-14 OpenStage 60 T, OpenStage 80 T – Underside of the Telephone

10.1.2.11 OpenStage Terminals - Description of Ports

Port	Description	Telephones
	**CorNet-IP connection variants** Connection for key module	OpenStage 15 OpenStage 40 OpenStage 60 OpenStage 80
	TDM connection variants Connection for key module	OpenStage 15 T OpenStage 30 T OpenStage 40 T OpenStage 60 T OpenStage 80 T
	**CorNet-IP connection variants** Port for an external power supply unit. Section 10.1.4 contains information about the cases in which an external power supply unit is required.	OpenStage 15 OpenStage 20 OpenStage 40 OpenStage 60 OpenStage 80
	TDM connection variants • Additional power supply not required: Connection to HiPath 3000 • Additional power supply required: Connection to an external power supply unit. Section 10.1.4 contains information about the cases in which an external power supply unit is required. • Port on OpenStage PhoneAdapter	OpenStage 10 T OpenStage 15 T OpenStage 20 T OpenStage 30 T OpenStage 40 T OpenStage 60 T OpenStage 80 T
	**CorNet-IP connection variants** First USB port; not used.	OpenStage 60 OpenStage 80
	TDM connection variants First USB port, e.g. for first-party CTI	OpenStage 30 T OpenStage 40 T OpenStage 60 T OpenStage 80 T
	**CorNet-IP connection variants** Second USB port, e.g. for USB memory stick	OpenStage 60 OpenStage 80
	TDM connection variants Second USB port, e.g. for USB memory stick	OpenStage 60 T OpenStage 80 T

Tabelle 10-1 OpenStage Terminals - Description of Ports

Port	Description	Telephones
	**CorNet-IP connection variants** Port for PC, e.g. for OpenStage Manager **TDM connection variants** –	OpenStage 15 OpenStage 20 OpenStage 40 OpenStage 60 OpenStage 80 –
	**CorNet-IP connection variants** LAN connection **TDM connection variants** –	OpenStage 15 OpenStage 20 OpenStage 40 OpenStage 60 OpenStage 80 –
	**CorNet-IP connection variants** Port for headset **TDM connection variants** Port for headset	OpenStage 40 OpenStage 60 OpenStage 80 OpenStage 30 T OpenStage 40 T OpenStage 60 T OpenStage 80 T
	**CorNet-IP connection variants** Handset port **TDM connection variants** Handset port	OpenStage 15 OpenStage 20 OpenStage 40 OpenStage 60 OpenStage 80 OpenStage 10 T OpenStage 15 T OpenStage 20 T OpenStage 30 T OpenStage 40 T OpenStage 60 T OpenStage 80 T

Tabelle 10-1 OpenStage Terminals - Description of Ports

10.1.3 OpenStage Add-On Devices

Caution
Always disconnect the line cord before connecting add-on devices to the telephone.

10.1.3.1 OpenStage Key Module 15

The "OpenStage Key Module 15" can be connected to OpenStage 15 CorNet-IP (HFA), Openstage 15 T, OpenStage 30 T and OpenStage 30 telephones.

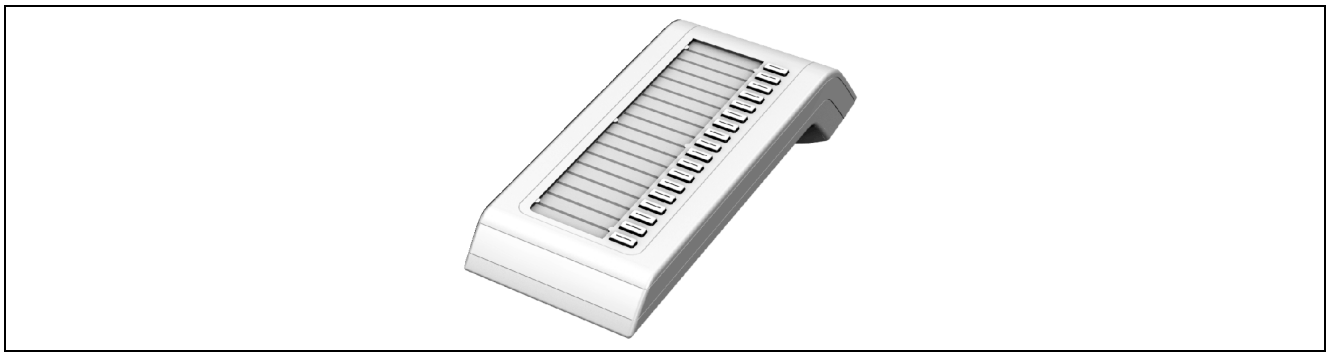


Bild 10-15 OpenStage Key Module 15

The OpenStage Key Module 15 is an add-on device that should be mounted on the side of the telephone; it provides an additional 18 programmable function keys. Each key can be programmed either as a function key or as a DSS key. Keys are labeled with paper labels.

A maximum of one OpenStage Key Module 15 can be connected to the telephone.

Downward compatibility to earlier systems

OpenStage 15 T and OpenStage 30 T can be registered on earlier HiPath communication systems (in other words, on HiPath 3000 V7 systems). If the OpenStage Key Module 15 is operating with one of these telephones on an older communication system, two programmable keys cannot be assigned a function.

10.1.3.2 OpenStage Key Module 40, 60, 80

The "OpenStage Key Module" can be connected to the telephones OpenStage 40, OpenStage 60, and OpenStage 80. Up to two key modules can be connected.



Bild 10-16 OpenStage Key Module

The OpenStage Key Module is an add-on device that should be mounted on the side of the telephone; it provides an additional 12 programmable function keys. In connection with the integrated level function, it is possible to use a total of 22 numbers of any key functions. Keys are labeled automatically on the display.

10.1.3.3 OpenStage BLF

The OpenStage BLF can be connected to OpenStage 30 and OpenStage 40 telephones. One OpenStage BLF can be connected. It cannot be combined with the OpenStage Key Module.

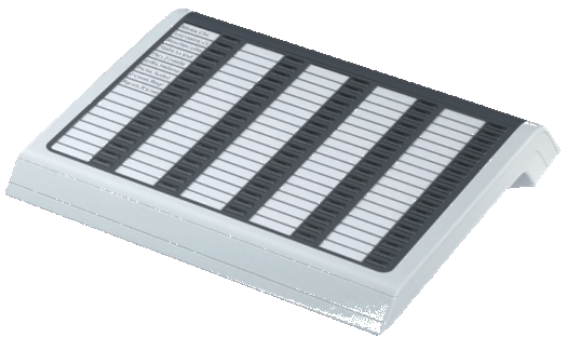


Bild 10-17 OpenStage BLF

The OpenStage BLF (busy lamp field) is an add-on device that should be mounted on the side of the telephone; it provides an additional 90 programmable function keys.

An external power supply unit is required to ensure sufficient power is supplied to operate the BLF. Only use the original power supply unit for this, see Section 10.1.5.1, “External Power Supply”. The port of the power supply unit depends on the hardware output of the OpenStage BLF.

10.1.3.4 Possible Configurations for the Key Modules

The following table shows the permitted configurations of add-on devices at OpenStage terminals for TDM and CorNet-IP connection variants. Add-on devices cannot be used on telephones that are not listed here.

Tabelle 10-2 OpenStage Terminals - Add-on Device Configurations

Telephone	First key module	Second key module
OpenStage 15	OpenStage Key Module 15	–
OpenStage 30 T	OpenStage Key Module 15	–
	OpenStage BLF	–
OpenStage 40	OpenStage Key Module 15	–
	OpenStage Key Module 40	OpenStage Key Module 40
	OpenStage BLF	–
OpenStage 60	OpenStage Key Module 60	OpenStage Key Module 60
OpenStage 80	OpenStage Key Module 80	OpenStage Key Module 80

10.1.4 Powering the OpenStage Telephones, Add-On Devices, and Adapters

The following tables provide information on the configurations at which a power supply is required using an external power supply. For the additional power supply, use only the associated original power supply (see Section 10.1.5.1, “External Power Supply”).

CorNet-IP connection variants

Telephone	Configuration	Additional power supply required?	Note
OpenStage 20	–	No[1]	
OpenStage 20 Gigabit variant	–	No[2]	
OpenStage 40	–	No[2]	
	1 x OpenStage key module 15	No[2]	
	1 x OpenStage Key Module 40	No[2]	
	2 x OpenStage Key Module 40	No[2]	
	1 x OpenStage BLF	Yes, for OpenStage BLF	• OpenStage BLF up to an including hardware output S30817-S7406-A101-7/-A103-2: The external power supply unit is connected to the BLF. **Caution:** The power supply unit used should only be used for this purpose. Using the free jack of the power supply unit to power another terminal or device is not permitted and can lead to the destruction of the OpenStage BLF. • OpenStage BLF, HW Release S30817-S7406-A101-8/ - A103-3 or higher: The external power supply unit is connected to the terminal (see Figure 10-18).

Telephone	Configuration	Additional power supply required?	Note
OpenStage 40 Gigabit variant	–	No[3]	
	1 x OpenStage Key Module 15	No[3]	
	1 x OpenStage key module 40	No[3]	
	2 x OpenStage Key Module 40	No[3]	
	1 x OpenStage BLF	Yes, for OpenStage BLF	• OpenStage BLF up to an including hardware output S30817-S7406-A101-7/-A103-2: The external power supply unit is connected to the BLF. **Caution:** The power supply unit used should only be used for this purpose. Using the free jack of the power supply unit to power another terminal or device is not permitted and can lead to the destruction of the OpenStage BLF. • OpenStage BLF, HW Release S30817-S7406-A101-8/ - A103-3 or higher: The external power supply unit is connected to the terminal (see Figure 10-18).
OpenStage 60	–	No[3]	
	1 x OpenStage key module 60	No[3]	
	2 x OpenStage Key Module 60	No[3]	
OpenStage 60 Gigabit variant	–	No[3]	
	1 x OpenStage key module 60	No[3]	
	2 x OpenStage Key Module 60	Yes	The external power supply unit is connected to the terminal (see Figure 10-18)

Telephone	Configuration	Additional power supply required?	Note
OpenStage 80	–	No[3]	
	1 x OpenStage key module 80	No[3]	
	2 x OpenStage Key Module 80	No[3]	
OpenStage 80 Gigabit variant	–	No[3]	
	1 x OpenStage key module 80	No[3]	
	2 x OpenStage Key Module 80	Yes	The external power supply unit is connected to the terminal (see Figure 10-18)

1 PoE class 1: PD maximum power = 0.44 W through 3.84 W, nominal classification signature current = 10.5 mA
2 PoE class 2: PD maximum power = 3.84 W through 6.49 W, nominal classification signature current = 18.5 mA
3 PoE class 3: PD maximum power = 6.49 W through 12.95 W, nominal classification signature current = 28.0 mA

TDM connection variants

Telephone	Configuration	Additional power supply required?	Note
OpenStage 10	–	No	
OpenStage 15 T	–	No	
	1 x OpenStage Key Module 15	No	
OpenStage 20	–	No	
	1 x OpenStage PhoneAdapter	Yes	The external power supply unit is connected directly to the OpenStage PhoneAdapter.
OpenStage 30	–	No	
	1 x OpenStage Key Module 15	Yes	
	1 x OpenStage BLF	Yes, for OpenStage BLF	• OpenStage BLF up to and including hardware output S30817- S7406-A101-7/-A103-2: The external power supply unit is connected to the BLF. **Caution:** The power supply unit used should only be used for this purpose. Using the free jack of the power supply unit to power another terminal or device is not permitted and can lead to the destruction of the OpenStage BLF. • OpenStage BLF, hardware release S30817-S7406-A101-8/ - A103-3 or higher: The external power supply unit is connected to the telephone (see Figure 10-19).

Telephone	Configuration	Additional power supply required?	Note
OpenStage 40	–	No	
	1 x OpenStage Key Module 15	No	
	1 x OpenStage Key Modules 40	Yes	Connecting an External Power Supply Unit (see Figure 10-19)
	2 x OpenStage Key Modules 40	Yes	
	1 x OpenStage BLF	Yes, for OpenStage BLF	• OpenStage BLF up to and including hardware output S30817- S7406-A101-7/-A103-2: The external power supply unit is connected to the BLF. **Caution:** The power supply unit used should only be used for this purpose. Using the free jack of the power supply unit to power another terminal or device is not permitted and can lead to the destruction of the OpenStage BLF. • OpenStage BLF, hardware release S30817-S7406-A101-8/ - A103-3 or higher: The external power supply unit is connected to the telephone (see Figure 10-19).
	1 x OpenStage PhoneAdapter	Yes	

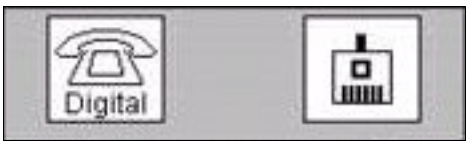
Telephone	Configuration	Additional power supply required?	Note
OpenStage 60	–	Yes	The external power supply unit is connected to the telephone (see Figure 10-19).
	1 x OpenStage Key Modules 60	Yes	
	2 x OpenStage Key Modules 60	Yes	
	1 x OpenStage USB extension	Yes	
	2 x OpenStage Key Modules + 1 x OpenStage USB Extension	Yes	
	1 x OpenStage PhoneAdapter	Yes	The external power supply unit is connected directly to the OpenStage PhoneAdapter.
OpenStage 80	–	Yes	The external power supply unit is connected to the telephone (see Figure 10-19)
	1 x OpenStage Key Modules 80	Yes	
	2 x OpenStage Key Modules 80	Yes	
	1 x OpenStage USB extension	Yes	
	2 x OpenStage Key Modules + 1 x OpenStage USB Extension	Yes	
	1 x OpenStage PhoneAdapter	Yes	The external power supply unit is connected directly to the OpenStage PhoneAdapter.

10.1.5 OpenStage Accessories

10.1.5.1 External Power Supply

In case of certain configurations, an external power supply unit is required (see Section 10.1.4).

The AC adapter features two MW6 connectors.



With the additional power supply of the OpenStage BLF, the connection of the power supply unit depends on the hardware output of the OpenStage BLF:

> **Caution**
> The power supply unit used for an OpenStage BLF should only be used for this purpose. Using the free jack of the power supply unit to power another terminal or device is not permitted and can lead to the destruction of the OpenStage BLF.

- OpenStage BLF up to an including hardware output S30817-S7406-A101-7/-A103-2:
  The external power supply unit is connected directly to the OpenStage BLF. The left jack of the power supply unit labelled "Digital" (Figure 10-19 for the TDM connection variant) must be connected to the BLF.
- OpenStage BLF from hardware output S30817-S7406-A101-8/-A103-3:
  The OpenStage BLF is powered by the associated terminal. The power supply unit (Figure 10-18 for CorNet-IP connection variant) should be connected to the terminal.

OpenStage terminals with the CorNet-IP connection variant

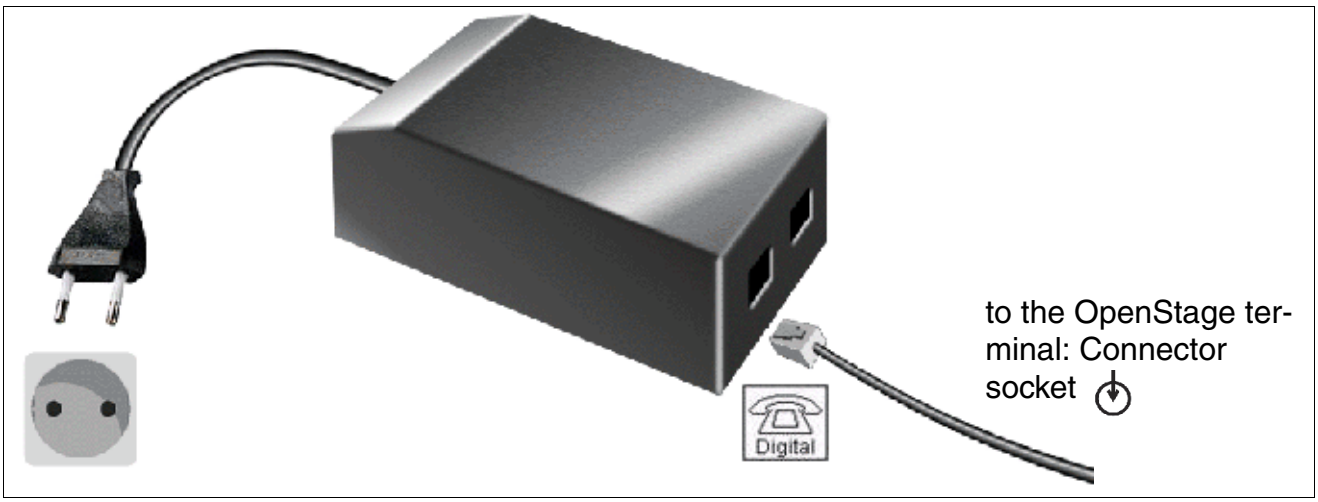


Fig. 10-18 OpenStage (CorNet-IP) – Connection of the External Power Supply Unit

OpenStage terminals with TDM connection variant

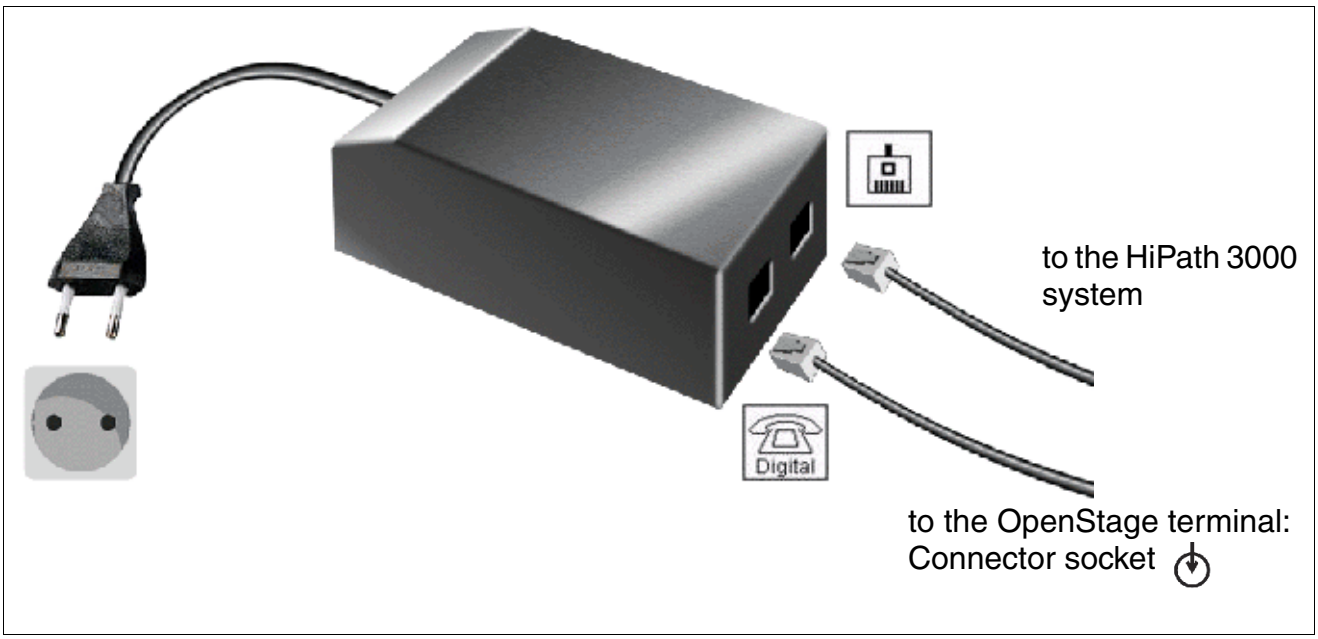


Fig. 10-19 OpenStage (TDM) – Connection of the External Power Supply Unit

Variants

- AC adapter, Euro: C39280-Z4-C510
- AC adapter, UK: C39280-Z4-C512
- AC adapter, 110 V USA: C39280-Z4-C511

Technical specifications

Technical specifications	AC adapter, Euro: C39280-Z4-C510	AC adapter, UK: C39280-Z4-C512	AC adapter, 110 V USA: C39280-Z4-C511
Line voltage	230 Vac	230 Vac	120 VAC
Line frequency	50 Hz	50 Hz	60 Hz
Output voltage	max. 43 Vdc, min. 30 Vdc	max. 43 Vdc, min. 30 Vdc	max. 43 Vdc, min. 30 Vdc
Output current	480 mA	480 mA	480 mA

10.1.5.2 OpenStage PhoneAdapter

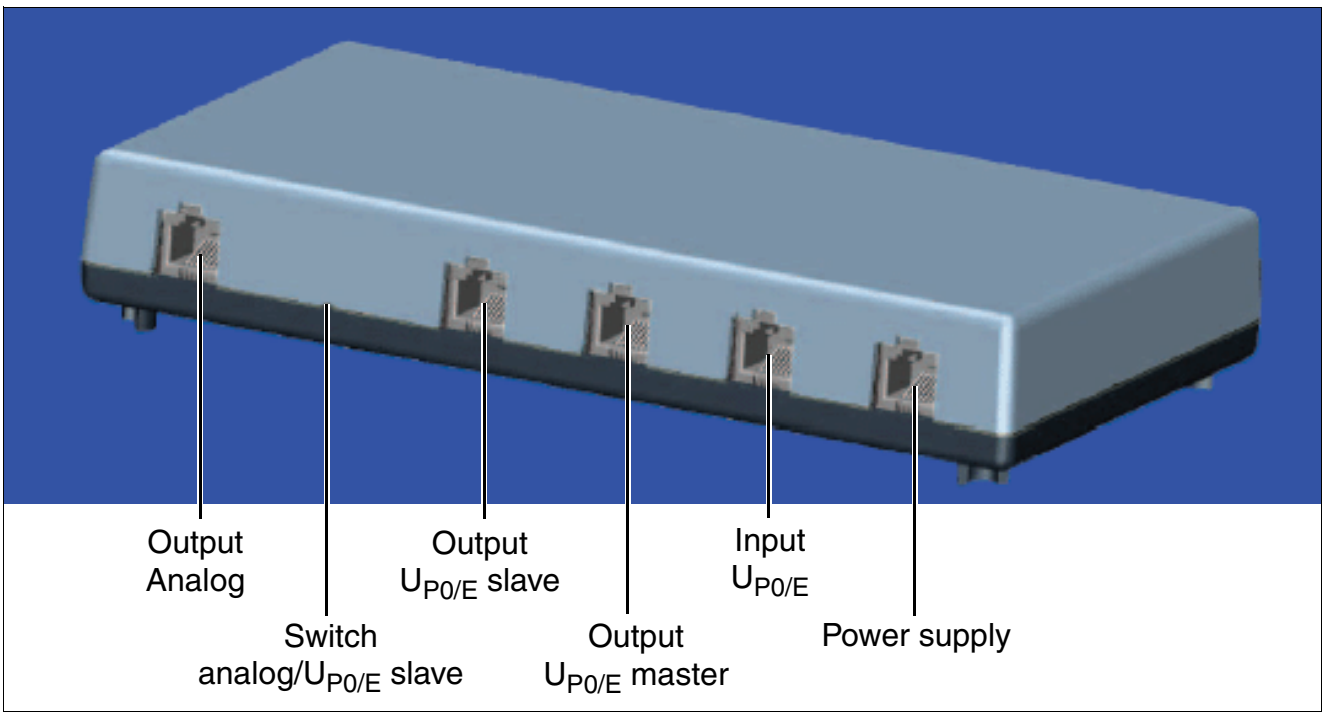


Fig. 10-20 OpenStage PhoneAdapter

The OpenStage PhoneAdapter is used to connect a second OpenStage (TDM) terminal ($U_{P0/E}$ or analog connection) with its own power supply.

The system treats the OpenStage telephone as an independent telephone with a separate phone number and its own B channel. The OpenStage telephone can send and receive calls regardless of the connection status of the host telephone.

The OpenStage PhoneAdapter can be operated only in the following combinations:

- An OpenStage TDM phone ($U_{P0/E}$ master)
- Two OpenStage TDM phones ($U_{P0/E}$ master, $U_{P0/E}$ slave)
- One OpenStage TDM telephone and an analog terminal ($U_{P0/E}$ master, a/b).

It is not possible to simultaneously operate two system telephones and an analog device.

T/R interface properties

The pin assignment of the modular jacks can be different on analog devices. Compare the pin assignment below with the pin assignment of your analog terminal.

Pin assignment of the Western Modular jack (RJ12):

Pin	Signal
1	free
2	free
3	a
4	b
5	free
6	free

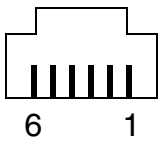


Fig. 10-21 Western-Modular jack (RJ12)

The properties of the T/T interface are:

- Supply current: 30 mA
- Busy signal when both B channels are busy
- Ring sequence: 2.2
- Supports only DTMF with Flash
- No ground signaling allowed

- Does not support: VoiceMail server with T/R interface, message waiting lamp, dictating equipment, speaker, announcement device (such as start/stop).

If the pins 3 and 4 are used on your analog device, you can use the supplied connection cable.

10.1.5.3 Headsets



Fig. 10-22 Headsets

The integrated Bluetooth technology supports user-friendly headsets.

The OpenStage 40/60/80 terminals are each equipped with a jack to connect corded (121 TR 9-5) and cordless headsets (121 TR 9-5).

Note: The headset ports for OpenStage terminals are coded RJ45 jacks. The headset connectors have RJ11 or RJ45 connectors. If there are contact problems (RJ45 jack <–> RJ11 connector), swat the RJ11 connector of the affected headset for an RJ45 connector. A coded RJ45 connector can be ordered using the part number C39334- Z93-C350 (normal RJ45 ISDN connectors do not fit).

10.1.6 Updating Software for the OpenStage TDM Telephone Service

Overview

OpenStage TDM telephones and OpenStage TDM Extenders that are connected to a HiPath 3000 system can be updated locally or remotely to a new software version. The new software application is loaded onto the HiPath 3000 with Manager E and then loaded onto the system's MMC.

In OpenStage 60 T and OpenStage 80 T telephones, the software can also be updated directly at the telephone with a USB stick.

Contents

This section covers the following topics:

- Section 10.1.6.1, "Updating Software with Manager E (Manual, Automatic)"
- Section 10.1.6.2, "Updating Software Manually via a USB Stick"
- Section 10.1.6.3, "Accessing Hardware and Software Version Information"
- Section 10.1.6.4, "Accessing the Update Log File"

10.1.6.1 Updating Software with Manager E (Manual, Automatic)

Once this step is complete, the update operation can be initiated automatically or manually from Manager E. An entry in the customer database permits or denies automatic software updates. If updates are permitted, you can choose either an immediate or scheduled update. In the case of the former, the telephones are reset and updated if they are ready to be loaded; in the case of the latter, they are reset and updated on a specific day.

This automatic procedure only updates telephones with an older software version; telephones with a newer version remain unchanged.

The manual update is initiated on Manager E using orders; these offer three update options: immediate, scheduled or during the next reset; they also offer an option for selecting specific telephones. Downgrading to an older software version can only be performed with orders.

To minimize the impact on ongoing telephone calls, the software update is split into different stages; first the software is downloaded from the MMC to a telephone and then copied from telephone to telephone in the B channel. The download operation itself does not affect the telephone user. (Exception: master/slave configurations only support one call during a download operation.)

The current status of the TDM OpenStage software update can be checked on Manager E. An update log file is also saved on the MMC and can be read over Manager E.

10.1.6.2 Updating Software Manually via a USB Stick

In **OpenStage 60 T** and **OpenStage 80 T** telephones, the software can be updated via a USB stick.

Recommended USB sticks

The telephone is unable to detect some USB sticks. If this happens, try a different type or a different manufacturer.

The following USB sticks have been tested and are recommended:

Description	Manufacturer	Manufacturer product number	EAN	Manufacturer ID	Product ID
Kingston DataTraveler USB2.0 1GB	Kingston	DTI/1GB	0740617086102	0951	1603
Kingston DataTraveler USB2.0 2GB	Kingston	DTI/2GB	0740617090185	13FE	1D00
Corsair Flash Voyager USB2.0 4GB	Corsair	CMFSUB2.0-4GB	0870584006527	090C	1000
PNY Outdoor Attaché USB2.0 1GB	PNY	P-FD1GBOUT-BX	3536401506737	13FE	1A00

Table 10-3 Recommended USB Sticks

Procedure

1. Insert an empty USB stick into a USB port on your PC. There must be no data on the USB stick.
2. Copy the official software package `OS_HI_TDM_V1_R3_13_0.bin` and the file `prepare.img` to the root directory on the USB stick.
3. Remove the USB stick from your PC's USB port.
4. Disconnect the telephone from the power supply.
5. Plug the USB stick into the master USB port on the telephone using a standard USB connection cable.

6. Connect the telephone to the power supply. If the telephone correctly detects the USB stick, the following text will appear on the display:

   SLBL: 1.1.0_0013_hs

   BOOT:1.3.1_0013_hs_nand128

   AUX power detected

   USB mass storage device detected

   Enter update code: _

7. Enter the update code "0167" via the programmable touch/sensor keys beside the display.

   The programmable keys start from "0" and continues in descending order.

   Once the update code has been entered:

   - If the data entered is incorrect: The telephone continues the boot procedure.
   - If the data entered is correct: The update procedure starts - the update progress can be followed on the display.

   The update procedure is successfully completed when the following text appears:

   Update script succeeded.

   Copy logs to USB stick … done.

   Unmounting USB device and exit

   Please remove USB device to reboot!

   The update procedure places a number of log files in the `log` folder on the USB stick.

8. Remove the USB stick from the telephone. If the update is successful, the telephone re-starts automatically to load the new software.

10.1.6.3 Accessing Hardware and Software Version Information

The hardware version (Siemens part number) and the software version of the OpenStage telephones are saved in the customer database and can be accessed by Manager E.

10.1.6.4 Accessing the Update Log File

OpenStage TDM telephones and the Extender keep an update log file that can be called up with Manager E for maintenance purposes.

10.2 optiPoint 410 / optiPoint 410 S and optiPoint 420 / optiPoint 420 S

Introduction

The IP telephones in the optiPoint 410/optiPoint 410 S and optiPoint 420/optiPoint 420 S families allow users to conduct telephone calls in a simple, familiar way over a data network.

Operation

Convenient and interactive operation is ensured by the three dialog keys and the display (not available for optiPoint 410 entry and optiPoint 410 entry S). Furthermore, the key lamp principle visualizes the activated functions.

The difference between the optiPoint 410/optiPoint 410 S and optiPoint 420/optiPoint 420 S families lies in the design of the function key panels:

- optiPoint 410/optiPoint 410 S families: the function keys have panels with labeling strips on which the function or call number currently saved can be entered.
- optiPoint 420/optiPoint 420 S families: the function keys are self-labeling keys. Self-labeling means that each key is assigned a display (1 line with 12 characters) in which the function or call number currently saved is shown.

Key modules and adapters

The add-on device optiPoint self-labeling key module allows you to increase the number of function keys available for the telephone types standard and advance. The add-on devices optiPoint key module and optiPoint BLF can also be used with the optiPoint 410/optiPoint 410 S and optiPoint 420/optiPoint 420 S families.

The optiPoint 410 display module is used as an add-on device for telephone types standard and advance. Its graphical LCD display (320 x 240 dots), the touchscreen and the navigation keys mean that many functions can be used intuitively and therefore more effectively.

The use of different optiPoint 500 adapters allows flexibility for the expansion of the telephone workstation (not for telephone types entry, economy, and economy plus).

Differences between the optiPoint 410/optiPoint 420 and optiPoint 410 S/optiPoint 420 S families:

- optiPoint 410/optiPoint 420 families: All HiPath 3000/5000 features that are offered interactively on the display, in the service menu, and on function keys are available (except for Relocate).
- optiPoint 410 S/optiPoint 420 S families: The corresponding telephones support SIP (Session Initiation Protocol). SIP is an ASCII-based signal used to set up sessions in an IP network.

Features and restrictions for Internet telephony stations

Important: The term "Internet telephony" as used in this document refers to making telephone calls via IP-supported networks (Voice over IP) and signaling via SIP.

The following features for Internet telephony stations are actively supported:

- CLIP (displays the calling party's station number on the called party's station)
- CLIP (suppresses the calling party's station number on the called party's station)
- COLP (displays the called party's station number on the calling party's station)
- COLR (suppresses the called party's station number on the calling party's station)
- Consultation hold
- Hold
- Toggle
- Transfer (transfer after messaging)
- DISA (Direct Inward System Access): No features may be activated for the SIP telephone
- Inband DTMF

Although Internet telephony stations may not activate the following features, they may be passively involved:

- Call forwarding (forwarding to an Internet telephony station is supported)
- Conference (Internet telephony stations may be passively involved)
- Park (Internet telephony stations may be parked; from the perspective of the Internet telephony station, this is similar to "Call hold")
- Live Call Recording (Internet telephony stations may be passively involved)
- Whisper (Internet telephony stations may be passively involved)
- Automatic COS changeover (the Internet telephony station can be implemented in automatic COS changeover)
- Internal traffic restriction (ITR) groups (Internet telephony stations may be implemented in ITR groups)

The following restrictions apply to Internet telephony stations:

– Internet telephony stations are configured in HiPath 3000/5000 V8 as DSS1 (functional telephone) and therefore cannot be supervised by the system (no monitoring). Internet telephony stations cannot use applications that require monitoring (for example, HiPath ComAssistant).

– Internet telephony stations cannot be integrated into call pickup groups, hunt groups, team, top or MULAP groups.

– Internet telephony stations cannot activate or use system features that can be operated with codes.

– Music is played when an Internet telephony station is on hold. Music is not played and a ring tone is not applied for the Internet telephony station when unscreened transfer is performed between the Internet telephony station and another station.

– The display on the Internet telephony station is not refreshed if an Internet telephony station is unparked by a different party to the one who parked it.

– SIP devices are not supported by the Deployment Tool (DLS Interface, DLI) in HiPath Xpressions Compact boards (HiPath 3000).

– In some situations, you cannot use terminal-specific features in HiPath 3000/5000 V8 This includes features offered via the device's menu interface. The features available with the basic system HiPath 3000/5000 V8 have general release status.

10.2.1 optiPoint 410 and optiPoint 410 S Telephones

10.2.1.1 optiPoint 410 entry, optiPoint 410 entry S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 3rd party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 8 function keys with LEDs
- 2 volume adjustment keys (plus/minus) and pitch
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules), no display

Standard key assignment (default) for optiPoint 410 entry, optiPoint 410 entry S



optiPoint 410 entry
Consultation hold
Redial
Message
Callback
Speed dialing
Microphone on/off
Loudspeaker
Disconnect

optiPoint 410 entry S
Programmable
Programmable
Programmable
Programmable
Programmable
Programmable
Cancel
Level

Fig. 10-23 optiPoint 410 entry, 410 entry S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.1.2 optiPoint 410 economy, optiPoint 410 economy S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 3rd party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 12 function keys with LEDs
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules)

Standard key assignment (default) for optiPoint 410 economy, optiPoint 410 economy S



optiPoint 410 economy	
Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

optiPoint 410 economy S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
	Programmable
	Programmable
	Cancel
	Level

Fig. 10-24 optiPoint 410 economy, 410 economy S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.1.3 optiPoint 410 economy plus, optiPoint 410 economy plus S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys with LEDs
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules)

Standard key assignment (default) for optiPoint 410 economy plus, optiPoint 410 economy plus S



optiPoint 410 economy plus	
Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

optiPoint 410 economy plus S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
	Programmable
	Programmable
	Cancel
	Level

Fig. 10-25 optiPoint 410 economy plus, 410 economy plus S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.1.4 optiPoint 410 standard, optiPoint 410 standard S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys with LEDs
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 2 option bays
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 410 standard, optiPoint 410 standard S



optiPoint 410 standard	
Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

optiPoint 410 standard S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
	Programmable
	Programmable
	Cancel
	Level

Fig. 10-26 optiPoint 410 standard, 410 standard S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.1.5 optiPoint 410 advance, optiPoint 410 advance S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 1 integrated USB 1.1 interface
- 19 function keys with LEDs
- Graphic display (swivel) with 4 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 410 advance, optiPoint 410 advance S



optiPoint 410 advance	
Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

optiPoint 410 advance S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Cancel
	Level

Fig. 10-27 optiPoint 410 advance, 410 advance S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.2 optiPoint 420 and optiPoint 420 S Telephones

The IP telephones of the optiPoint 420 and optiPoint 420 S family have self-labeling keys. Self-labeling means that each key is assigned a display (one line with 12 characters) in which the function or call number currently saved is shown.

10.2.2.1 optiPoint 420 economy, optiPoint 420 economy S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 12 function keys with LEDs and self-labeling keys
- Graphic display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules)

Standard key assignment (default) for optiPoint 420 economy, optiPoint 420 economy S



optiPoint 420 economy	
Service	Programmable
Redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Disconnect

optiPoint 420 economy S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
Programmable	Programmable
	Cancel
	Level

Fig. 10-28 optiPoint 420 economy, 420 economy S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.2.2 optiPoint 420 economy plus, optiPoint 420 economy plus S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys with LEDs and self-labeling keys
- Graphic display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules)

Standard key assignment (default) for optiPoint 420 economy plus, optiPoint 420 economy plus S



optiPoint 420 economy plus	
Service	Programmable
Redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Disconnect

optiPoint 420 economy plus S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
Programmable	Programmable
	Cancel
	Level

Fig. 10-29 optiPoint 420 economy plus, economy plus S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.2.3 optiPoint 420 standard, optiPoint 420 standard S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 12 function keys with LEDs and self-labeling keys
- Graphic display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 2 option bays
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 420 standard, optiPoint 420 standard S



optiPoint 420 standard	
Service	Programmable
Redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Disconnect

optiPoint 420 standard S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
Programmable	Programmable
	Cancel
	Level

Fig. 10-30 optiPoint 420 standard, 420 standard S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.2.4 optiPoint 420 advance, optiPoint 420 advance S

Main features

- Protocols
  - H.323, HFA/V3 + V4, CorNet IP, SIP
  - HTTP, DHCP, SNMP, FTP
  - H.235 (security)
  - QoS to DIFFSERV and IEEE 802.1 p/Q
- Voice compression G.711, G.722, G.723 and G.729 A/B
- Power over LAN (in accordance with Cisco and standard pre802.3af)
- CTI (for example, via TAPI 1st Party)
- 1 Ethernet (10/100BaseT) interface (self-configuring) for LAN connection
- 1 Ethernet (10/100BaseT) interface (self-configuring) for the PC connection
- 1 integrated USB 1.1 interface
- 18 function keys with LEDs and self-labeling keys
- Graphic display (swivel) with 4 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- Port for headset (121 TR 9-5)
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Modularity:
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 420 advance, optiPoint 420 advance S



optiPoint 420 advance	
Service	Programmable
Redial	Programmable
Mailbox	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

optiPoint 420 advance S	
Loudspeaker	Programmable
Redial	Programmable
Caller list	Programmable
Programmable	Programmable
Programmable	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Cancel
	Level

Fig. 10-31 optiPoint 420 advance, 420 advance S - Standard Key Assignment

Refer to Section 10.2.3 for information on connection and startup.

10.2.3 Connection and Startup

optiPoint 410, optiPoint 420

HiPath 3000 together with HiPath Xpressions Compact supports the central administration of the IP terminals connected to the system. For this purpose a Deployment Tool (DLS Interface DLI) has been implemented on the HiPath Xpressions Compact boards. The DHCP and FTP servers integrated in DLI support the following:

- the central configuration of parameters for all IP terminals connected enabling plug&play operation
- the central software update of all IP terminals connected

For information about the prerequisites for using the DLI function, see Section 10.3.

The DLI function can only be used for standalone systems.
The Deployment and Licensing service is available for networked HiPath 3000 systems with or without HiPath 5000 RSM. The Deployment and Licensing service can also be used for systems that do not satisfy the prerequisites for using the DLI function. For information on how to use this tool, see the Deployment Service Administrator Manual.

For information on terminal administration, refer to the optiPoint 410/420 Administrator Manual.

optiPoint 410 S, optiPoint 420 S

For information on how to connect and start up terminals, refer to the optiPoint 410 S/420 S Administrator Manual:

The software can be upgraded over:

- the Deployment and Licensing service
  Information on the procedure can be found in the Deployment Service Administration Manual.
- the WBM access at the relevant optiPoint IP telephone.
  The optiPoint 410 S/420 S Administrator Manual contains information on this procedure.

Download

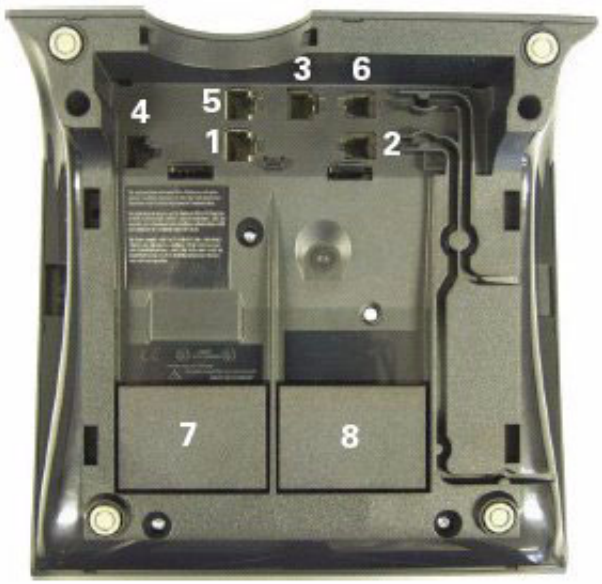
The manuals and tools mentioned can be downloaded here:
http://www.enterprise-communications.siemens.com/global/Products.aspx (... -> Downloads).

10.2.3.1 Ports on the Bottom of the Telephone

optiPoint 410 entry,
optiPoint 410 entry S



optiPoint 410, 420 standard,
optiPoint 410, 420 standard S



optiPoint 410, 420 advance,
optiPoint 410, 420 advance S



Fig. 10-32 optiPoint 410, 420, 410 S, 420 S - Connection Options

Table 10-4 optiPoint 410/420, optiPoint 410 S/420 S - Description of Ports

No.	Port
1	Ethernet (10/100BaseT) interface (self-configuring) for the LAN
2	Handset
3	Local power supply (optional)[1]
4	Key module
5	Ethernet (10/100BaseT) interface (self-configuring) for the PC
6	Headset (121 TR 9-5)
7	Adapter 1
8	Adapter 2
9	USB interface

1 No local power supply is required if power is provided via the Ethernet cable (Power over LAN).

10.2.4 Key Modules for optiPoint 410/410 S and 420/420 S

Installing the key modules

NOTE: To avoid damage to property, the line cord must be disconnected before connecting the key module to the telephone.

The user usually installs the add-on devices. The installation instructions are on the “Electronic Operating Instructions” CD.

Number of key modules

Up to two add-on devices may be mounted on an optiPoint 410/optiPoint 410 S or optiPoint 420/optiPoint 420 S terminal (not optiPoint 410 entry, optiPoint 410 entry S, optiPoint 410 economy, optiPoint 410 economy S, optiPoint 410 economy plus, optiPoint 410 economy plus S, optiPoint 420 economy, optiPoint 420 economy S, optiPoint 420 economy plus and optiPoint 420 economy plus S).

10.2.4.1 optiPoint self labeling key module

The optiPoint self labeling key module is an add-on device that should be mounted on the side of the telephone; it provides an additional 13 keys, LEDs, and displays for all purposes. Self-labeling key means that each key is assigned a display (one line with 12 characters) in which the function or call number currently saved is shown.

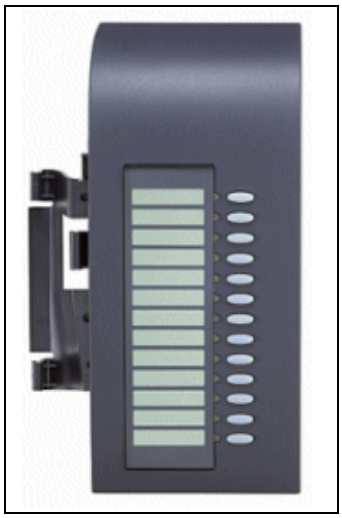


Figure 10-33 optiPoint self labeling key module

Information on double assignment can be found in Section 10.6.

The bottom key of the first key module installed on the telephone (optiPoint self-labeling key module or optiPoint key module) is automatically defined as “Shift key” (default). This is the case if no Shift key was already programmed.

10.2.4.2 optiPoint 410 display module

This is an add-on device with a graphic swivel display (240 x 320 pixels) with touchscreen functionality, background illumination, and navigation keys.



Fig. 10-34 optiPoint 410 display module

Main features

- Graphical user interface
- Local personal telephone directory
- Access to company-wide telephone directory via LDAP
- WAP browser
- Voice-controlled dialing
- Call list containing all incoming and outgoing calls
- Speed-dialing list
- Online help

Connection

The optiPoint 410 display module must always be installed as the first add-on device, in other words, connected directly to the telephone.

The connection to the telephone is made over an interface cable with the following connectors: RJ11 input (MW6), RJ45 output (MW8). Power is supplied by the connected telephone.

10.2.4.3 Possible Configurations for the Key Modules

The following table shows the possible add-on device configurations for telephones from the optiPoint 410/optiPoint 410 S and optiPoint 420/optiPoint 420 S families. Add-on devices cannot be used on telephones that are not listed here.

Table 10-5 Add-On Device Configurations for optiPoint 410/410 S and optiPoint 420/420 S

optiPoint 410/optiPoint 410 S telephone optiPoint 420/optiPoint 420 S telephone	First key module	Second key module
optiPoint 410 standard optiPoint 410 standard S optiPoint 410 advance optiPoint 410 advance S optiPoint 420 standard optiPoint 420 standard S optiPoint 420 advance optiPoint 420 advance S	optiPoint key module	–
	optiPoint key module	optiPoint key module
	optiPoint key module	optiPoint BLF
	optiPoint 410 display module	–
	optiPoint 410 display module	optiPoint key module
	optiPoint 410 display module	optiPoint BLF
	optiPoint 410 display module	optiPoint self labeling key module
	optiPoint BLF	–
	optiPoint BLF	optiPoint BLF[1]
	optiPoint self labeling key module	–
	optiPoint self labeling key module	optiPoint self labeling key module

1 Configuration with two optiPoint BLFs only with HiPath 3800

10.2.5 Use of optiPoint 500 Adapters

The following optiPoint 500 adapters are available for use on telephones from the optiPoint 410/optiPoint 410 S and optiPoint 420/optiPoint 420 S families (not optiPoint 410 entry, optiPoint 410 entry S, optiPoint 410 economy, optiPoint 410 economy S, optiPoint 410 economy plus, optiPoint 410 economy plus S, optiPoint 420 economy, optiPoint 420 economy S, optiPoint 420 economy plus or optiPoint 420 economy plus S):

- optiPoint acoustic adapter
  Note: Floating contacts are not supported when using the adapter on optiPoint 410/optiPoint 410 S and optiPoint 420/optiPoint 420 S.
- optiPoint recorder adapter

10.3 Central Administration of IP Workpoints via the System

From V6.0 HiPath 3000 together with HiPath Xpressions Compact supports the central administration of IP workpoints connected to the system. For this purpose a Deployment Tool (DLS Interface DLI) has been implemented on the HiPath Xpressions Compact boards listed below. The DHCP and FTP servers integrated in DLI support the following:

- the central configuration of parameters for all IP workpoints connected enabling plug&play operation.
- the central software update of all IP workpoints connected.

Prerequisites

- HiPath 3000 V6.0 or later
  The following systems support the DLI function:
  - HiPath 3800, with the HiPath Xpressions Compact board IVMNL and the HG 1500 board STMI2
  - HiPath 3550, with the HiPath Xpressions Compact board IVMS8N or IVMP4 and the HG 1500 board HXGS3
  - HiPath 3500, with the HiPath Xpressions Compact board IVMS8NR or IVMP4N and the HG 1500 board HXGR3

  
  The DLI function can only be used for standalone systems.
  The Deployment and Licensing service is available for networked HiPath 3000 systems with or without HiPath 5000 RSM. For information on how to use this tool, see the Deployment Service Administrator Manual.
- HiPath Xpressions Compact, V2.5 and later
- HG 1500 V3.0 or later
- IP workpoints
  Central administration can be performed for the following IP workpoints over the DLI function:
  - OpenStage 20 (HFA), from V1 R0.1.41
  - OpenStage 40 (HFA), V1 R0.1.41 or later
  - OpenStage 60 (HFA), V1 R0.1.41 or later
  - OpenStage 80 (HFA), V1 R0.1.41 or later
  - OpenScape Personal Edition
  - optiPoint 410 entry V5.0 and later

– optiPoint 410 economy V5.0 and later
– optiPoint 410 economy plus V5.0 and later
– optiPoint 410 standard V5.0 and later
– optiPoint 410 advance V5.0 and later
– optiPoint 420 economy V5.0 and later
– optiPoint 420 economy plus V5.0 and later
– optiPoint 420 standard V5.0 and later
– optiPoint 420 advance V5.0 and later

Refer to the Release Notes and Sales Release for information on the latest software versions.

10.3.1 Plug&Play Startup of IP Workpoints

Procedure

1. When you connect an IP workpoint, it receives both it's own IP address as well as that of the DLI by contacting the DHCP server implemented on the HiPath Xpressions Compact board.
2. The IP workpoint registers with the Deployment service (DLI) within HiPath Xpressions Compact.
3. The Deployment Service checks whether it is necessary to configure the default values for the IP workpoint (for example, if this is the first startup).

   Note: For IP workpoint configuration, a template in XML format is defined for each IP workpoint type and stored in the HiPath Xpressions Compact file system. There is exactly one template per supported IP workpoint type, regardless of the software version.
   The first time that an IP workpoint is started, the Deployment Service checks whether there is a suitable template for this type. If a template exists, the IP workpoint is supported and the configuration data from the template and the plug&play data (such as, the gatekeeper address) are supplied to the IP workpoint.
   If this is an IP workpoint type for which no template is available, a general template is provided.

   Each additional logon with the Deployment service results in a plug&play-only configuration (supply of gatekeeping address, etc.). In this way, the attributes assigned by template and changed locally on the IP workpoint are not overwritten by the Deployment service with each new logon.
4. The Deployment Service sends configuration data from the matching template together with the plug&play data to the IP workpoint.

5. The IP workpoint logs on to the gateway and is operational.

HiPath Xpressions Compact does not save local changes to IP workpoint parameters (for example, those made via the telephone keypad or WBM access on the IP workpoint).
If an IP workpoint is replaced because of a defect, the local changes must be entered on the replacement device.

Plug&play configuration of SIP-based workpoints is not possible.

10.3.2 Software Upgrade of IP Workpoints via the System

Notes

Each of the IP workpoint types supported requires different software (image file).

The image files are usually generated with `vxWorks.app`. You do not have to rename the image files because the files are assigned a new name when saved on the hard disk on the HiPath Xpressions Compact board.

The HiPath Xpressions Compact board's hard disk has enough space for a number of black-and-white images at once. Only IVMP4 and IVMP4N boards generate an error message when there is not enough space for image files (currently around 200 MB is available).

Procedure

1. The SW images from the new software version are available and are loaded onto the hard disk on the HiPath Xpressions Compact board. A separate DLI-WBM is available for this. The DLI WBM is accessed via
https://*<IP address of the HiPath Xpressions Compact board>*/dli.

2. The HiPath Xpressions Compact's internal Deployment service checks whether the software image is available in a valid format. If this is not the case, an appropriate error message is generated for the user by the DLI-WBM.

   Note: A software upgrade is only possible within a main version (example: update from V5.1.0 to V5.3.4).
   The HiPath Xpressions Compact's internal Deployment service does not support main-version upgrades or migrations (software type changes).

3. The HiPath Xpressions Compact's internal Deployment service prompts all registered IP workpoints that are to be equipped with the new software to start software deployment.

4. The IP workpoints in question download the software image from the HiPath Xpressions Compact's internal FTP server and start a reboot.

5. After booting, the IP workpoints reregister with the HiPath Xpressions Compact's internal Deployment service. Based on the registration data, the Deployment service recognizes whether the new software was successfully installed; it then outputs the appropriate message via the DLI-WBM.

You can use Web-based Management to display information on all registered IP workpoints and their software deployment status.

Software cannot be upgraded for SIP-based workpoints.

10.4 optiPoint 600 office

The optiPoint 600 office phone is a high-end product to complete the optiPoint 500 family.

From HiPath 3000/5000 V7, the optiPoint 600 office can only be connected via the $U_{P0/E}$ port. It is no longer possible to connect it via the IP port.

Main features

- 19 function keys with LEDs
- Graphic LCD display (swivel) with 8 lines, each with 24 characters, touchscreen. Background lighting with approximately 5 s ghosting.
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Interfaces and slots:
  - 1 integrated USB 1.1 interface
  - 1 option bay
  - 1 interface for up to 2 add-on devices
  - 1 headset port (121 TR9-5)
- Suitable for wall mounting
- Software download via PPP

Default key assignment for optiPoint 600 office



optiPoint 600 office	
Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Fig. 10-35 optiPoint 600 office - Default Key Assignment

Connection and configuration

Connection of optiPoint 600 office over the $U_{P0/E}$ interface: Refer to Page 10-89 for more information.

10.5 optiPoint 500

optiPoint 500 telephones handle the digital communication of voice and data (voice communication only for optiPoint 500 entry and optiPoint 500 economy). The three dialog keys and the display guarantee convenient and interactive operation. Furthermore, the key lamp principle visualizes the activated functions.

With the exception of optiPoint 500 entry and optiPoint 500 economy, the optiPoint 500 telephones have a USB 1.1 interface. This allows for PC-supported telephoning and Internet access over the USB interface of a PC.

The optiPoint key module and optiPoint BLF add-on devices increase the number of function keys available.

The different optiPoint 500 adapters allow flexible expansion of the telephone workstation. Additional devices (such as personal computers, fax equipment, telephones, headsets) can be connected quickly because it is easy to build them on to the bottom of the telephones (not optiPoint 500 entry and optiPoint 500 economy) and because the adapters are “plug&play”.

You can find information not contained in this chapter in the optiPoint 500 Service Manual.

10.5.1 optiPoint 500 Telephones

10.5.1.1 optiPoint 500 entry

Main features

- 8 function keys with LEDs (can be modified with HiPath 3000/5000 Manager E; for information on key programming, see Section 10.6)
- Open listening
- 2 volume adjustment keys (plus/minus) and pitch
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules), no display

Standard key assignment (default) for optiPoint 500 entry



Consultation hold
Redial
Message
Callback
Speed dialing
Microphone on/off
Loudspeaker
Disconnect

Fig. 10-36 optiPoint 500 entry - Standard Key Assignment (Default)

Refer to Section 10.5.1.6 for connection requirements.

10.5.1.2 optiPoint 500 economy (not for U.S.)

Main features

- 12 function keys with LEDs (4 can be modified with HiPath 3000/5000 Manager E, 8 freely programmable; for information on key programming, see Section 10.6)
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Suitable for wall mounting
- No modularity (no connecting capability for adapters or key modules)

Standard key assignment (default) for optiPoint 500 economy



Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Fig. 10-37 optiPoint 500 economy (not for U.S.) Standard Key Layout

Refer to Section 10.5.1.6 for connection requirements.

10.5.1.3 optiPoint 500 basic

Main features

- 12 function keys with LEDs (4 can be modified with HiPath 3000/5000 Manager E, 8 freely programmable; for information on key programming, see Section 10.6)
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Open listening
- 2 volume adjustment keys (plus/minus), pitch and display contrast
- Interfaces and slots:
  - 1 USB 1.1 interface
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 500 basic



Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Fig. 10-38 optiPoint 500 basic - Standard Key Assignment (Default)

Refer to Section 10.5.1.6 for connection requirements.

10.5.1.4 optiPoint 500 standard, optiPoint 500 standard SL (for U.S. only)

Note: optiPoint 500 standard and optiPoint 500 standard SL (for U.S. only) function exactly the same on HiPath 3000 systems.

Main features

- 12 function keys with LEDs (4 can be modified with HiPath 3000/5000 Manager E, 8 freely programmable; for information on key programming, see Section 10.6)
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Interfaces and slots:
  - 1 integrated USB 1.1 interface
  - 1 option bay
  - 1 interface for up to 2 add-on devices
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 500 standard



Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Disconnect

Fig. 10-39 optiPoint 500 standard - Standard Key Assignment (Default)

Refer to Section 10.5.1.6 for connection requirements.

10.5.1.5 optiPoint 500 advance

Main features

- 19 function keys with LEDs (4 can be modified with HiPath 3000/5000 Manager E, 15 freely programmable; for information on key programming, see Section 10.6)
- Alphanumeric LCD display (swivel) with 2 lines, 24 characters each. Background lighting that stays lit for approximately 5 s.
- 3 dialog keys for interactive user prompts: “Yes”, “Back”, and “Next”
- Full-duplex speakerphone mode with echo suppression for room adaptation
- 2 volume adjustment keys (plus/minus), pitch, speaker quality and display contrast
- Interfaces and slots:
  - 1 integrated USB 1.1 interface
  - 2 option bays
  - 1 interface for up to 2 add-on devices
  - 1 headset port (121 TR9-5)
- Suitable for wall mounting

Standard key assignment (default) for optiPoint 500 advance



Service	Programmable
Redial	Programmable
Microphone on/off	Programmable
Loudspeaker	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable
	Programmable

Fig. 10-40 optiPoint 500 advance - Standard Key Assignment (Default)

Refer to Section 10.5.1.6 for connection requirements.

10.5.1.6 Connection Requirements for HiPath 3000

Hardware requirements

System	HiPath 3800	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300
Hardware require-ments	free $U_{P0/E}$ port on SLMO2/8	free $U_{P0/E}$ port on CBCC CBRC SLU8 SLU8R SLMO24	free $U_{P0/E}$ port on CBCC CBRC SLU8 SLU8R

Connecting as a client telephone

The device can also be connected to an existing optiPoint 500 telephone (except for optiPoint 500 entry and optiPoint 500 economy) as a client telephone (using an optiPoint phone adapter).

10.5.1.7 Connection

Procedure: Connecting an optiPoint 500 Telephone

Step	Activity
1.	Locate a free interface on the main distribution frame or internal distributor for connecting the telephone.
2.	Connect the cable from the main distribution frame or internal distributor to the wall outlet.

The maximum range for a standalone or host telephone without additional local power supply is approximately 1000 m (3280 feet) (for J-Y (ST) 2x2x0.6, ∅ 0.6 mm). Perform the terminal test in Section 12.2.11 to determine whether a local power supply is needed for additional power (for example, in host-client configurations or for larger ranges).

3.	Label the keys. You have the following options: • by hand (in writing); label sheets come with each telephone. • using a PC: – with the “Key Labeling Tool” (requires MS Word©) which is contained on the “Electronic Operating Instructions” CD. – with the “Online Key Labeling Tool” which can be viewed at: http://www.enterprise-communications.siemens.com/global/Products.aspx (... -> Downloads).
4.	Prepare the telephone for connection: • Connect the handset cord to the telephone (marked with symbol) and to the handset. • Do you plan to connect an add-on device? Refer to Abschnitt 10.5.2 auf Seite 10-92 for more information. • Do you plan to connect an optiPoint adapter? Refer to Abschnitt 10.5.3 auf Seite 10-94 for more information.
5.	Connect the line cord (marked on the telephone by a symbol). optiPoint 500 telephones are shipped with a 6 m (20 ft.) line cord and an MW6 (RJ11) plug for connection to a modular telephone jack.

The first time the telephone is switched on,

- all LEDs light up briefly
- all LEDs on the add-on devices (AODs), if connected, light up briefly (AOD LEDs do not necessarily flash at the same time as the LEDs on the telephone)
- all pixels on the display activate briefly.

These indications show that the telephone is starting up and performing a self-test. Downloading has finished and the telephone is ready for operation when you see the date and time on the display.

10.5.1.8 Ports on the Bottom of the Telephone

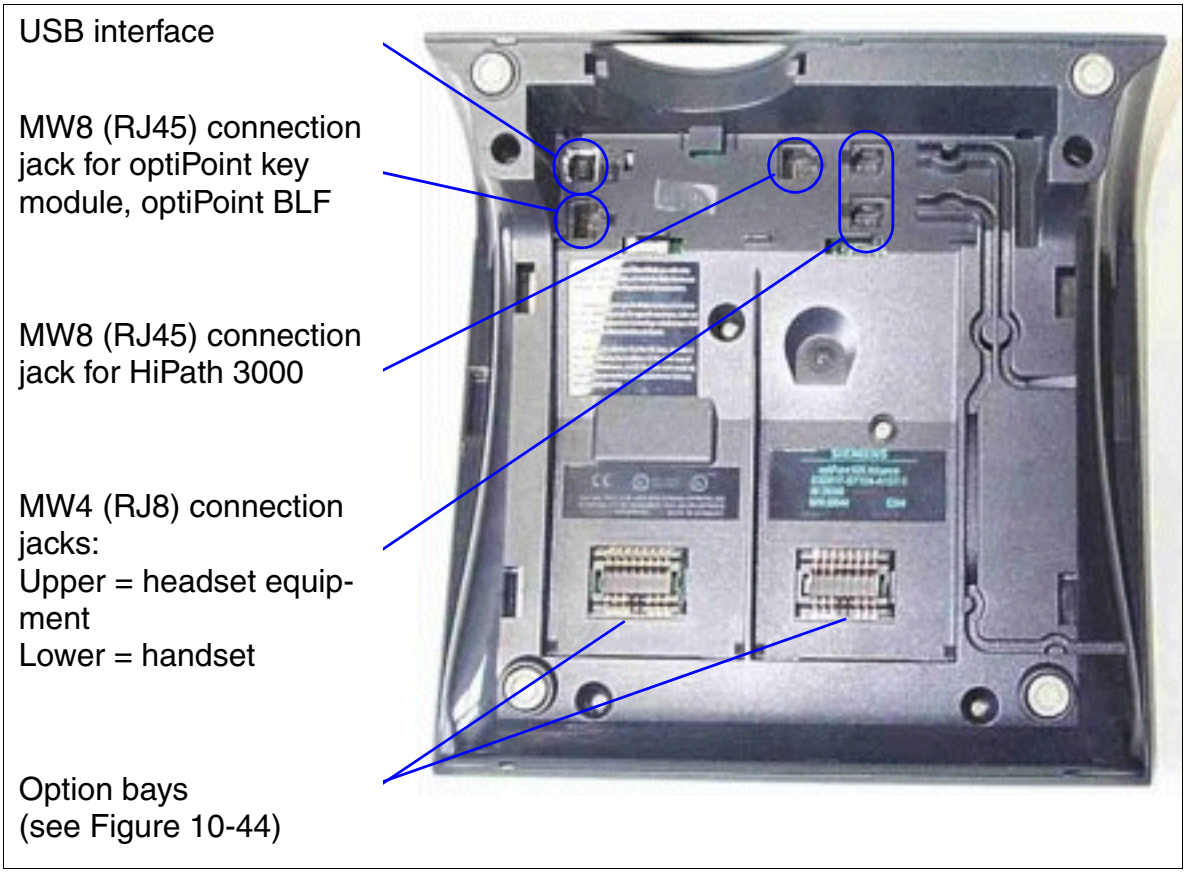


Fig. 10-41 optiPoint 500 Connection Options

10.5.1.9 USB 1.1 Interface

With the exception of optiPoint 500 entry and optiPoint 500 economy, the optiPoint 500 telephones have a USB 1.1 interface. This forms the basis for:

- PC-supported telephoning (TAPI)
- Data transmission over CAPI (for example, direct Internet access, fax capability, e-mail, etc.). If the CAPI software is installed, PCs have direct Internet access over the USB interface without any additional adapter. There is a charge for this software.

TAPI and CAPI can be used simultaneously (for example, to receive a large e-mail or download data while calls are being set up over a CTI application).

10.5.2 optiPoint 500 Add-On Devices

The optiPoint key module and optiPoint BLF add-on devices increase the number of function keys available.

The user usually installs the add-on devices. The installation instructions are on the “Electronic Operating Instructions” CD.

> **Caution**
> Always disconnect the line cord before connecting add-on devices to the telephone.

Refer to the optiPoint BLF Feature Description for model-specific data for the optiPoint key module and the HiPath 3000/5000.

The following sections contain information on the possible key module configurations:

- Section 10.5.2.3 for terminals in the optiPoint 500 family
- Section 10.2.4.3 for terminals in the optiPoint 410 and optiPoint 420 family

10.5.2.1 optiPoint key module

The optiPoint key module is an add-on device that should be mounted on the side of the telephone; it provides an additional 16 keys, LEDs and labeling areas for all purposes.

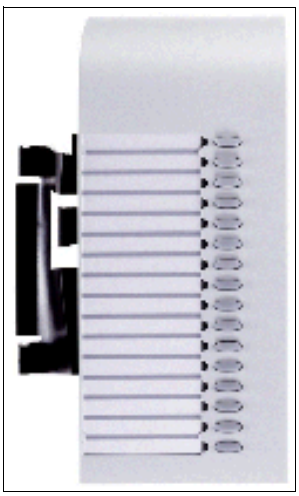


Fig. 10-42 optiPoint key module

Information on double assignment can be found in Section 10.6.

10.5.2.2 optiPoint BLF

This is an add-on device that provides 90 additional keys, LEDs and labeling areas for all purposes.

The device is connected to the telephone or to an optiPoint key module over an interface cable with the following connectors: RJ11 input (MW6), RJ45 output (MW8).

Power is supplied by a local PSU (see Section 10.8.1.1) that can power up to two optiPoint BLFs. The power supply unit must be plugged directly into the designated optiPoint BLF port.

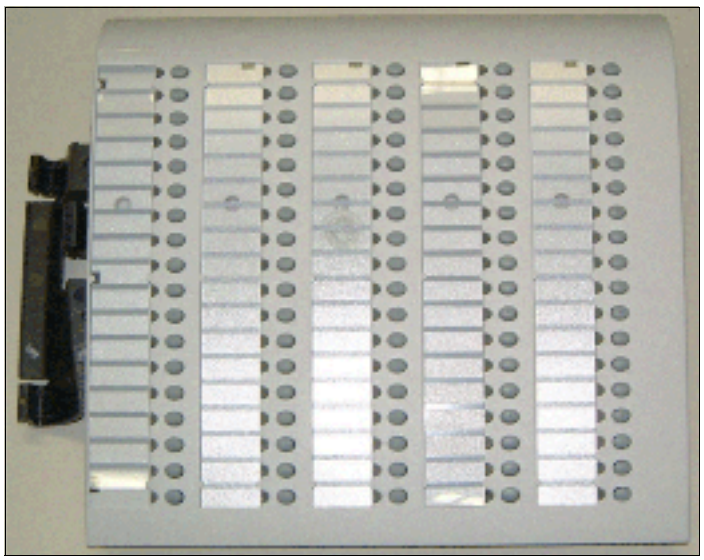


Fig. 10-43 optiPoint BLF

10.5.2.3 Possible Configurations for the Key Modules

The following table shows the possible configurations for key modules on telephones from the optiPoint 500 family (not optiPoint 500 entry and optiPoint 500 economy).

Table 10-6 Key module configurations on an optiPoint 500 telephone

optiPoint 500 telephone	First key module	Second key module
optiPoint 500 basic	optiPoint key module	–
optiPoint 500 standard, optiPoint 500 standard SL (for U.S. only)	optiPoint key module	optiPoint key module
	optiPoint key module	optiPoint BLF
	optiPoint BLF	–
optiPoint 500 advance	optiPoint BLF	optiPoint BLF[1]

1 Configuration with two optiPoint BLFs only with HiPath 3800

10.5.3 optiPoint 500 Adapters

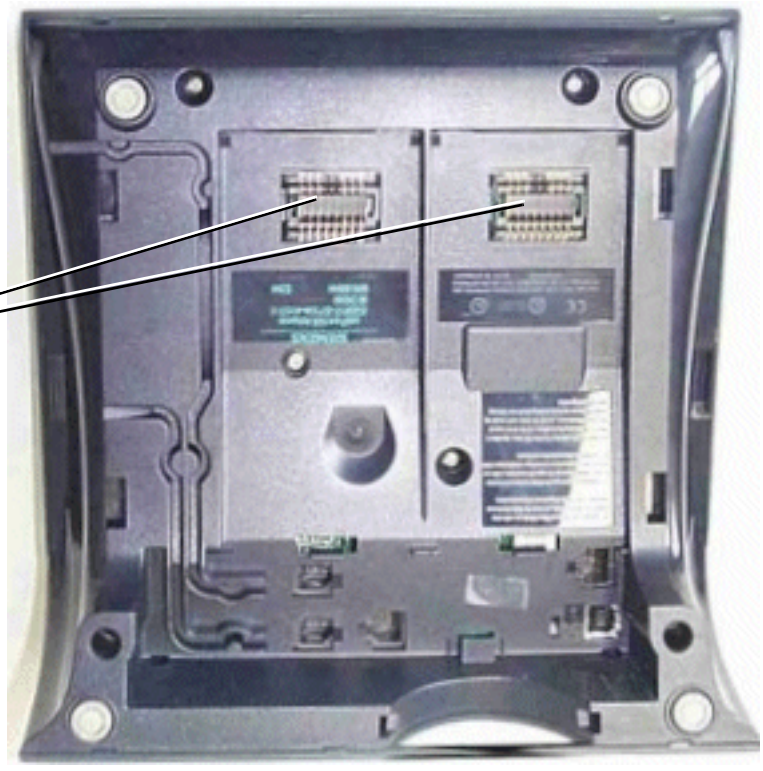
The different optiPoint 500 adapters (not optiPoint 500 entry and optiPoint 500 economy) allow flexible expansion of the telephone workstation by providing additional device connections (such as personal computers, fax equipment, telephones, headsets).

The adapters, which are connected on the bottom of the telephone, are "plug&play". When a new telephone adapter configuration is plugged in, it generates a reset; a setup message notifies the system of the new configuration.

The user usually installs the adapter. The installation instructions are on the “Electronic Operating Instructions” CD.

> **Caution**
> Always disconnect the line cord before connecting adapters to the telephone or removing them from the telephone.

Option bays



Option bays:
- 2 x for optiPoint 500 advance (shown here)
- 1 x for optiPoint 500 basic and optiPoint 500 standard

Fig. 10-44 optiPoint 500 Option Bays

10.5.3.1 optiPoint analog adapter

The optiPoint analog adapter allows an analog device (such as, telephone (DTMF only), group 3 fax, modem, cordless telephone) to be connected to an optiPoint 500 telephone.

The analog device connected can send and receive calls on the interface to the system regardless of the optiPoint telephone's connection status, as long as a B channel is available.

The adapter must always have a local power supply for operating the connected analog device.



MW6 (RJ11) socket assignments:

Pin	Signal
1	free
2	free
3	T (Tip)
4	R (Ring)
5	free
6	free

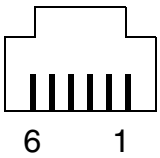


Fig. 10-45 optiPoint analog adapter

T/R interface properties

- Supply current: 30 mA
- Busy signal when both B channels are busy
- Ring sequence: 2.2
- Supports only DTMF with Flash
- No ground signaling allowed
- Does not support: VoiceMail server with T/R interface, message waiting lamp, dictating equipment, speaker, announcement device (such as start/stop).

10.5.3.2 optiPoint ISDN adapter

The optiPoint ISDN adapter provides the basic ISDN access for S_0 devices (max. 2), such as, an S_0 PC card, group 4 fax equipment or video communication devices (such as, videoset or videokit).

S_0 telephones must have their own power supply for connection.



MW8 (RJ45) socket assignments:

Pin	Signal
1	free
2	free
3	SR1
4	SX1
5	SX2
6	SR2
7	free
8	free

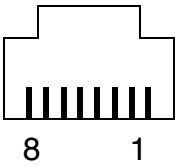


Fig. 10-46 optiPoint ISDN adapter

S_0 interface properties

- Supports point-to-point and passive bus connections
- Wired for short passive bus configurations
- Cable lengths
  - Maximum 100 m (328 feet) with a cable impedance of 75 ohms
  - Maximum 200 m (656 feet) with a cable impedance of 150 ohms (complies with CCITT recommendation I.430).
- The NT terminating resistors are integrated into the ISDN adapter.

10.5.3.3 optiPoint phone adapter

The optiPoint phone adapter is used for connecting a second optiPoint 500 telephone (client telephone) with its own power supply.

The system treats the client telephone as an independent telephone with a separate phone number and its own B channel. The client telephone can send and receive calls regardless of the connection status of the host telephone.

The maximum range between the host and client telephones is approximately 100 m (328 feet) (for J-Y (ST) 2x2x0.6, ∅ 0.6 mm).



MW6 (RJ11) socket assignments:

Pin	Signal
1	free
2	AUX – (a)
3	$U_{P0/E}$ –
4	$U_{P0/E}$ +
5	AUX + (b)
6	free

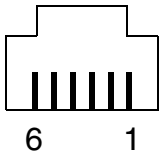


Fig. 10-47 optiPoint phone adapter

Example of a Host-Client Configuration

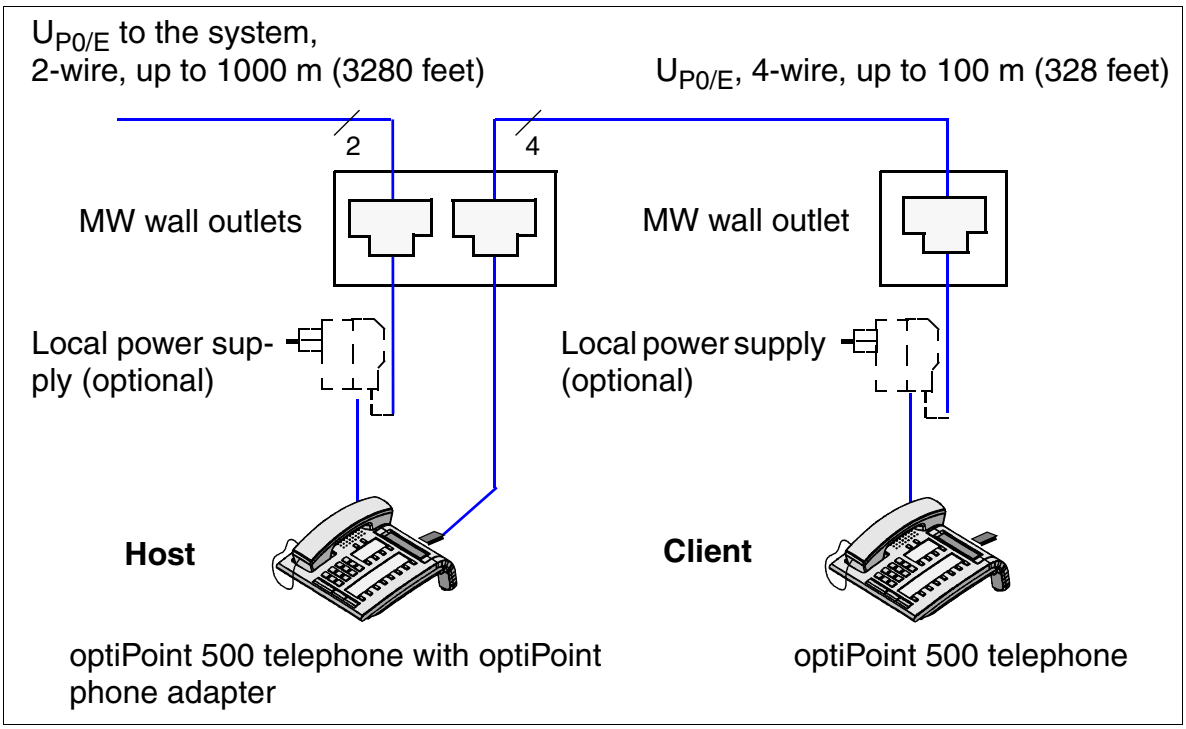


Fig. 10-48 Example a Host-Client Configuration

10.5.3.4 optiPoint acoustic adapter

The optiPoint acoustic adapter is used for connecting

- a headset (121 TR 9-5) (see Section 10.8.2)
- an active loudspeaker box and a desk microphone via the Y cable
- busy display/door opener and secondary bell/light paging, etc. (each with its own power supply) via floating contacts (not supported when using the adapter on optiPoint 410 and optiPoint 420).



Assignment of the three connection jacks:

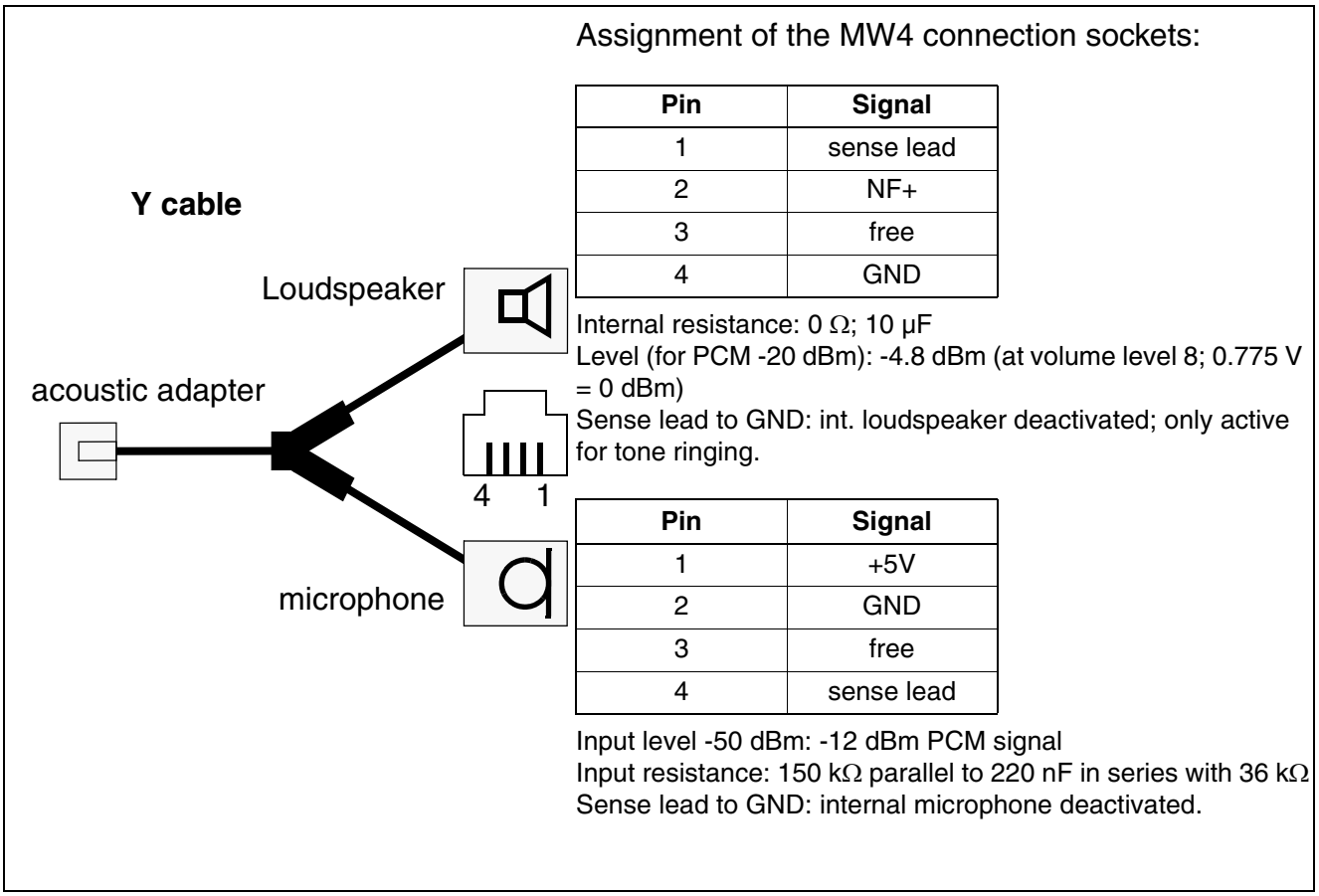
1	Connecting a headset with the following electrical values (121 TR 9-5): • Microphone (electret interface): – max. power: 400 µA, – supply voltage: 5 V ± 10% – series resistor: 5 kΩ ± 10% • Acoustic transformer: – Impedance: 150 Ω ± 10% – EBD: 13 dB ± 2.5 dB
2	Connecting a loudspeaker and microphone using Y cable (see Figure 10-50)
3	Floating contacts (see Table 10-7), load capacity of max. 5 W at 24 Vac or 60 Vdc

Fig. 10-49 optiPoint acoustic adapter

Notes on the optiPoint acoustic adapter

- Section 10.5.4 contains details on a possible additional external power supply.
- The internal components of the optiPoint terminal are deactivated in speakerphone mode if an external microphone and an external loudspeaker are used (sense lead).
- optiPoint 500 basic does not support the connection of an external microphone to the optiPoint acoustic adapter.
- The speakerphone mode selection is independent of whether the internal or an external speakerphone is used. External speakerphones have precedence over internal speakerphones with the exception of manual intercom and signaling procedures.
- The internal microphone, the transmitter inset and any microphone connected to the optiPoint acoustic adapter are muted in the “Mute” audio state.

- Ring, alarm and key tones are transferred to the internal loudspeaker and not to an external loudspeaker connected to the optiPoint acoustic adapter.
- The volume keys on the optiPoint terminal are used to adjust the volume level of the internal loudspeaker and any connected external loudspeaker. The volume of the external loudspeaker can also be adjusted using the external amplifier.



Assignment of the MW4 connection sockets:

Pin	Signal
1	sense lead
2	NF+
3	free
4	GND

Internal resistance: 0 Ω; 10 µF
Level (for PCM -20 dBm): -4.8 dBm (at volume level 8; 0.775 V = 0 dBm)
Sense lead to GND: int. loudspeaker deactivated; only active for tone ringing.

Pin	Signal
1	+5V
2	GND
3	free
4	sense lead

Input level -50 dBm: -12 dBm PCM signal
Input resistance: 150 kΩ parallel to 220 nF in series with 36 kΩ
Sense lead to GND: internal microphone deactivated.

Fig. 10-50 Y Cable for optiPoint acoustic adapter

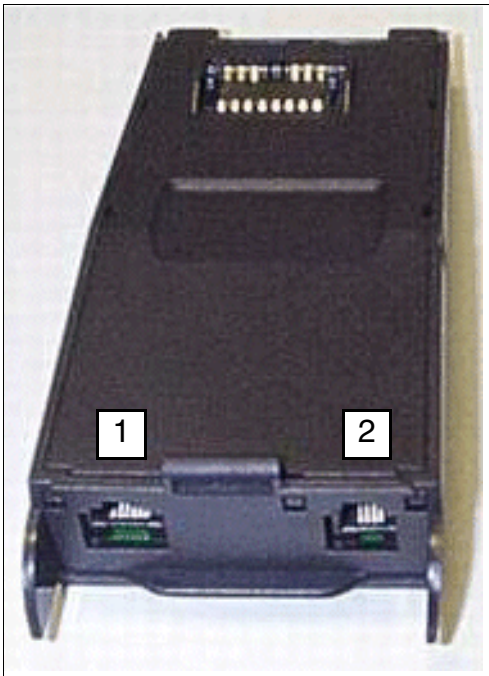
Table 10-7 Floating contacts on the optiPoint acoustic adapter

Pin	Assign-ment	Notes
1	free	–
2	"Busy" contact	Signals active telephone states: • handset lifted • Loudspeaker activated or headset active These states can be displayed, for example, on external signaling equipment (LED, relay, etc.) The signaling equipment must have its own power supply. The contact can be loaded with up to 5 W at 24 Vac or 60 Vdc.
3		
4	"Call" contact	Signals the call receipt state. This can be used, for example, to control a secondary bell. The contact can be loaded with up to 5 W at 24 Vac or 60 Vdc.
5		
6	free	–

10.5.3.5 optiPoint recorder adapter

The optiPoint recorder adapter allows an external recorder or a second headset to be connected.

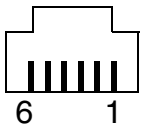
Warning: The called party must be informed that the call is being recorded.



Assignment of both connection jacks:

1 MW6 port for recorder

Pin	Signal
1	free
2	NF
3	NF
4	NF
5	NF
6	free
Contacts 2+3 and 4+5 are bridged internally.	



Recorders to be connected must meet the following electrical requirements:
Input impedance: >10 kΩ
Frequency progression: 300 to 3000 Hz ± 3 dB
Beep tone level: -26 dBm to -18 dBm at a 600 Ω load
Max. input level: 650 mVeff from a 600 Ω source

2 MW4 port for second headset

Pin	Signal
1	Tx–
2	Rx
3	Rx
4	Tx+

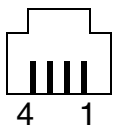


Fig. 10-51 optiPoint recorder adapter

10.5.3.6 Possible optiPoint Adapter Configurations

Adapter categories

Each $U_{P0/E}$ port in the system provides two B channels. This means that you can connect two telephones, each with a separate phone number, to one $U_{P0/E}$ port.

Category 1 optiPoint 500 adapters
The following adapters each require a B channel and, therefore, can only be used once on a host terminal (host terminal requires the second B channel of the $U_{P0/E}$ port).

- optiPoint analog adapter
- optiPoint ISDN adapter
- optiPoint phone adapter

If one of these adapters is used in the optiPoint 500 advance, only a category 2 adapter can be operated in the second slot.

Category 2 optiPoint 500 adapters
The following adapters can be used on the host and client telephones. This is also true if a category 1 optiPoint 500 adapter is already connected.

- optiPoint acoustic adapter
- optiPoint recorder adapter

Configuration restrictions

The voltage feed test can be used to check whether a local power supply is also necessary for an adapter configuration. To avoid any doubts, the test should always be implemented when installing large configurations.

Number of usable adapters and key modules

HiPath 3000/5000 shows the maximum number of adapters and key modules that can be connected to Section 10.5.5. The limits also include the client telephones connected over optiPoint phone adapters and the analog telephones connected over optiPoint analog adapters.

10.5.4 optiPoint 500 key modules and adapters power supply

Power is generally supplied to optiPoint 500 telephones by the system via the $U_{P0/E}$ interfaces. When certain optiPoint 500 key modules and adapters are used, the power supply from the system is not adequate.

Table 10-8 indicates which optiPoint 500 key modules require an additional external power supply. In this case, the local power supply units described in Section 10.8.1.1 are used.

Table 10-8 Additional External Power Supply for optiPoint 500 Key Modules and Adapters

optiPoint 500 key modules optiPoint 500 Adapters	Is an additional external power supply required?	Plug-in power supply unit connection
optiPoint key module	generally not required[1]	series-connected[2]
optiPoint BLF	required	connected directly[3]
optiPoint analog adapter	required	series-connected[2]
optiPoint ISDN adapter	generally not required[1]	series-connected[2]
optiPoint phone adapter	generally not required[1]	series-connected[2]
optiPoint acoustic adapter	required[4]	series-connected[2]
optiPoint recorder adapter	generally not required[1]	series-connected[2]

1 It is assumed that only one key module or adapter is implemented on each optiPoint 500 telephone. An additional external power supply may be required if several key modules and adapters are implemented on an optiPoint 500 telephone or the maximum $U_{P0/E}$ interface range is reached by the optiPoint 500 telephone. The telephone test described in Section 12.2.11 will establish whether or not additional power is required from a local power supply.

2 The local power supply is series-connected to the optiPoint 500 telephone: the "digital" RJ6 jack on the local power supply must be connected to the optiPoint 500 telephone. The other RJ6 jack must be connected to the $U_{P0/E}$ interface on the system.

3 The local power supply is connected directly to the optiPoint BLF: one of the two RJ6 jacks on the local power supply unit must be connected with the center jack (indicated by the symbol of a power supply unit) on the optiPoint BLF. A local power supply can supply a maximum of two optiPoint BLFs.

4 An additional external power supply is required if the floating contacts on the optiPoint acoustic adapters are being used.

10.5.5 Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Add-On Devices and Adapters

Table 10-9 System-Specific Maximum Configuration for $U_{P0/E}$ Workpoint Clients, Key Modules and Adapters

Workpoint Clients, Add-On Devices, Adapters	SYSTEM				
	HiPath 3800[1]	**HiPath 3550**	**HiPath 3500**	**HiPath 3350**	**HiPath 3300**
optiPoint 500 telephones					
• Number per system	384	72[2]	48[3]	24[4]	24[5]
• Number per box (the value in brackets applies to operation using a PSUI)	192	–	–	–	–
optiPoint acoustic adapters					
Number per system	No restriction				
optiPoint analog adapters					
Number per system	116	24[6]	24[6]	8[7]	8[7]
optiPoint recorder adapters					
Number per system	No restriction				
optiPoint ISDN adapters					
Number per system	116	48[6]	48[6]	8[7]	8[7]
optiPoint phone adapters					
Number per system	116	48[6]	48[6]	24[7]	24[7]
optiPoint key modules					
Number per system	250	100	100	30	30
optiPoint BLF:					
Number per system	12	6	6	–	–

1 System load is greatly dependent on factors such as system configuration and traffic. Static rules on configuration inspection are therefore not suitable. As a guide, configurations that include UCD/ACD, more than one SLC16N, groups with more than 10 stations or OpenScape Office connections should always be inspected using the project planning tool (https://enterprise-businessarea.siemens-enterprise.com/productinfo/document/c9yH1MXx3k8_/HiPath%203000%20V8%20Planning%20Guide%20Performance%20Calculation%20Tool.xls).

2 8x$U_{P0/E}$ at the central board + 5xSLU8 + 1xSLMO24.

3 8x$U_{P0/E}$ at the central board + 5xSLU8R.

4 8x$U_{P0/E}$ at the central board + 2xSLU8.

5 8x$U_{P0/E}$ at the central board + 2xSLU8R.

6 If the total number of $U_{P0/E}$ stations, analog stations and additional stations connected using an adapter is greater than 72, a Powerbox PB3000 must be used as an external power supply unit.

7 If the total number of $U_{P0/E}$ stations and additional stations connected using an adapter is greater than 24, a UPSC-D/UPSC-DR must be used.

10.6 Key Programming

The programmable function keys on certain telephones and key modules in the optiPoint 410, optiPoint 420, optiPoint 500, and the OpenStage range support double assignment (see the sections on the specific telephones in this chapter). Please note the following differences between the functions depending on the HiPath 3000 version:

- Up to and including V6.0 SMR-05:
  Double assignment is possible if only phone numbers without LED support are saved on the first level. It is also possible to program call numbers without LED support on the second level. These can be internal station numbers, DID call numbers and call numbers from a HiPath network.
- V6.0 SMR-06 and later:
  One of the two following options can be configured using HiPath 3000/5000 Manager E (in the Settings menu under System parameters > Flags):
  - The "Extended Key Functionality" flag is not activated (default setting).
    This will produce the same behavior as in versions up to and including V6.0 SMR-05.
  - The "Extended Key Functionality" flag is activated.
    Once you have defined a key of your choice as the "Shift key", only phone numbers without LED support can be saved at the second key level which is now available. You can program any key functions on the first key level. LED signaling is associated with the first key level only.

When the Shift function is pressed, the LED associated with the Shift key lights up. This signals that the phone numbers on the second key level are available. When you switch key levels, the key labels on telephones with self-labeling keys also change.

The Shift function is deactivated when you press a phone number or if you press the Shift key again.

The optiPoint BLF function keys cannot have double assignments.

10.7 optiLog 4me

optiLog 4me is a digital, single-channel speech recording device designed for operation with the HiPath 3000/5000. It can record up to 2900 hours of telephone calls.



Fig. 10-52 optiLog 4me

You can set the optiLog 4me to the following modes in both digital and analog telephones:

- Start Recorder
  Recording begins when you press the Start key.
- Trader Recorder
  Records and stores all calls.
- Malicious Call Recorder
  Stores calls in their entirety when you press any button during the call.
- Third Party Monitoring (not currently available with HiPath 3000/5000)
  optiLog 4me should be installed at the central station of the system. Recording starts when you press the Monitor key on the telephone.

Furthermore, you can use the recorder to record conference calls using an external microphone.

The optiLog 4me can be connected between the optiPoint 500 telephone and the handset. The privacy module is supplied complete with a local power supply.

For additional information on this, please refer to the installation and administration instructions included with the adapter.

10.8 optiPoint Accessories

The following data is valid for the telephone families optiPoint 410, optiPoint 410 S, optiPoint 420, optiPoint 420 S, optiPoint 500, and for the optiPoint 600 office telephone. Restrictions are indicated in the relevant places.

10.8.1 External AC Adapters

You may need an external AC adapter if you are using large configurations or if you need to extend the range.

10.8.1.1 Local Power Supply for optiPoint 500, optiPoint 600 office

You can connect a local power supply to the line cords of a host or client telephone using two RJ11 jacks and the connection cable supplied (see Figure 10-53).

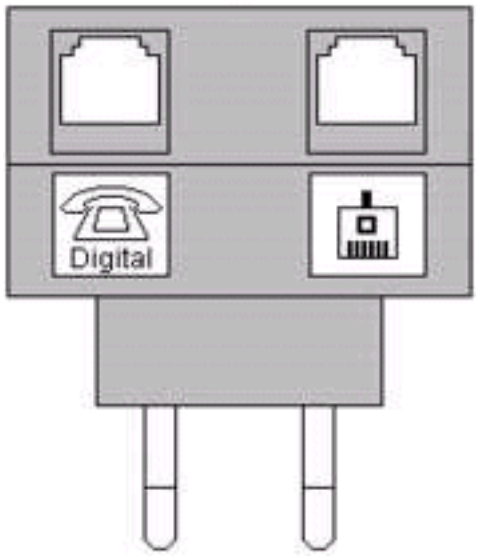
Variants

- Local power supply, Euro: AUL:06D1284 (C39280-Z4-C71 = number entered on unit)
- Local power supply, UK: AUL:06D1287 (C39280-Z4-C72 = number entered on unit)
- Local power supply, 110 V USA: AUL:51A4827 (C39280-Z4-C73 = number entered on unit)

Technical data for local power supply AUL:06D1284 (Euro)

- Line voltage: 220 (230) VAC
- AC line frequency: 47 ... 53 Hz
- Output voltage: max. 50 VDC, min. 30 VDC
- Output current: Max. 250 mA

Table 10-10 Pin Assignment for Local Power Supply AUL:06D1284 (Euro)

Pin	Assignment	
1	Not used	
2	–	
3	a-wire (tip)	
4	b-wire (ring)	
5	+	
6	Not used	

Example: External AC Adapter Connection

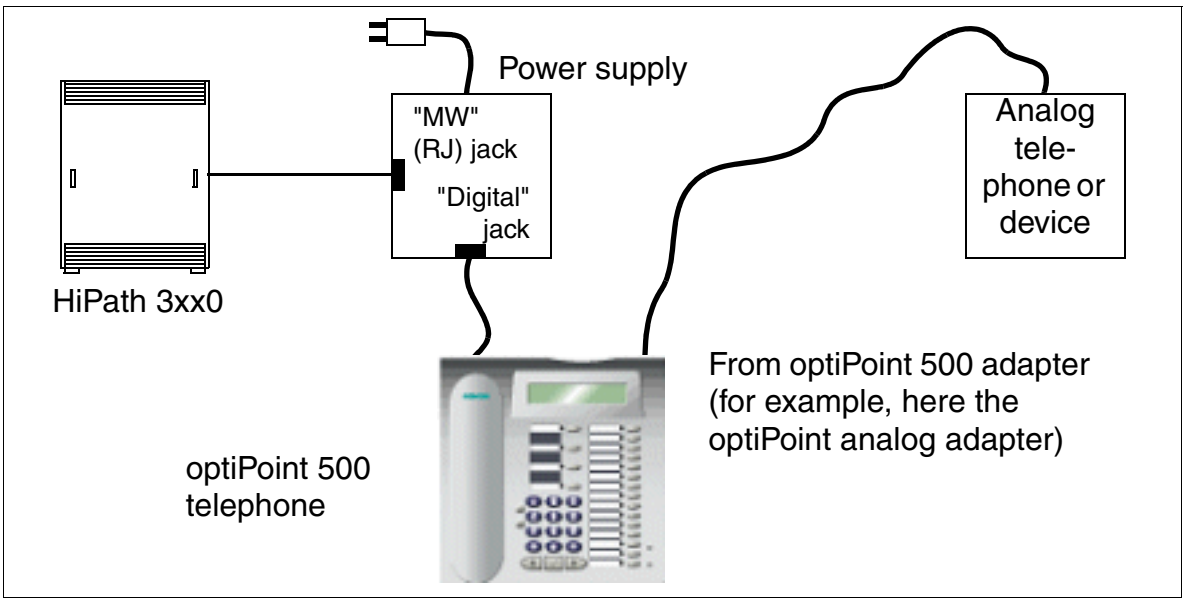
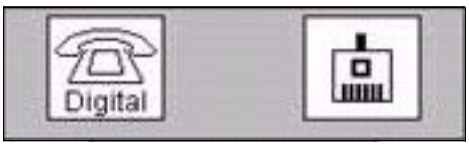


Fig. 10-53 Example: External AC Adapter Connection

10.8.1.2 Power supply unit for optiPoint 410/410 S and 420/420 S

The AC adapter features two MW6 connectors. Power is supplied to a telephone via the left board marked "Digital".



Variants

- AC adapter, Euro: C39280-Z4-C510
- AC adapter, UK: C39280-Z4-C512
- AC adapter, 110 V USA: C39280-Z4-C511

Technical specifications

Technical specifications	AC adapter, Euro: C39280-Z4-C510	AC adapter, UK: C39280-Z4-C512	AC adapter, 110 V USA: C39280-Z4-C511
Line voltage	230 Vac	230 Vac	120 VAC
Line frequency	50 Hz	50 Hz	60 Hz
Output voltage	max. 43 Vdc, min. 30 Vdc	max. 43 Vdc, min. 30 Vdc	max. 43 Vdc, min. 30 Vdc
Output current	480 mA	480 mA	480 mA

10.8.2 Headsets

A headset replaces the telephone handset, which means that the user's hands are free when telephoning. Cordless headsets (121 TR 9-5) may also be used.

Note: A headset key can be configured for the optiPoint. This allows the user to take calls and to switch between the handset and the headset.



Fig. 10-54 Example: Corded and Cordless Headsets

Connection options

optiPoint telephones not included in the table below do not support headset connection.

Table 10-11 Connection Options for Corded and Cordless Headsets

Telephone	Connection Options for Corded and Cordless Headsets	
	Direct	**Using an optiPoint acoustic adapter[1]**
optiPoint 500 basic		X
optiPoint 500 standard, optiPoint 500 standard SL (for U.S. only)		X
optiPoint 500 advance	X	X
optiPoint 600 office	X	X
optiPoint 410 economy plus, optiPoint 410 economy plus S	X	
optiPoint 410 standard, optiPoint 410 standard S	X	X
optiPoint 410 advance, optiPoint 410 advance S	X	X
optiPoint 420 economy plus, optiPoint 420 economy plus S	X	
optiPoint 420 standard, optiPoint 420 standard S	X	X
optiPoint 420 advance, optiPoint 420 advance S	X	X

1 Accepting and ending calls using the headset keys is only supported if the connection is established using an optiPoint acoustic adapter.

Information on connecting the headset is provided in the relevant installation instructions.

10.9 OpenScape Personal Edition

Overview

OpenScape Personal Edition is an IP softphone for installation on laptops and desktop PCs. It is released without server components. The product is the successor to OpenScape optiClient 130/130 S.

OpenScape Personal Edition is available in HFA and SIP versions.

The product has a modular software structure, meaning that functionality can be increased in increments. The user interface has the same look and feel as the Windows® Office 2007 interface.

Features

- Softphone
- Call control
- HFA or SIP
- CTI
- Groupware and directory access
- Contact management
- Call journal
- Video (in SIP version)
- Desktop client for Windows-based clients

Differences between the HFA and SIP versions

The HFA version can work with HiPath 4000. The SIP variant works with HiPath 3000 and OpenScape Voice and also supports video function.

The HFA version supports all features of the HFA protocol. The SIP version supports all released SIP functions (see sales information).

Prerequisites for the PC

- Operating systems
  - Windows XP (SP 2 or later)
  - Windows Vista (32-bit)

- RAM space

  You will need:

  – At least 1 GB RAM for Windows XP

  – At least 1.5 GB RAM for Windows Vista

  – 256 MB RAM for OpenScape Personal Edition

  A total of 2 GB RAM is required.
- Processor with a clock frequency of at least 1 GHz
- At least 200 MB free space on the hard disk
- CD-ROM drive
- Ethernet network card with IEEE 802.1p/q support for optimum Quality of Service (QoS)
- USB support for connecting a handset or headset

Available languages

- German
- English
- Chinese (simplified), only in the corresponding operating system

Video cameras

A commercial USB camera is suitable for the video function. The system was tested with Logitech cameras.

A minimum of 1.3 megapixels resolution is required.

10.10 HiPath AP 1120

The terminal adapter HiPath AP 1120 connects up to two analog telephones and/or fax machines with a corporate network or a network provided by a carrier. HiPath 3000/5000 supports the HiPath AP 1120 variants H.323 and SIP.

The device is capable of dynamically recognizing the most common IP telephony codecs and fax protocols, including T.38.

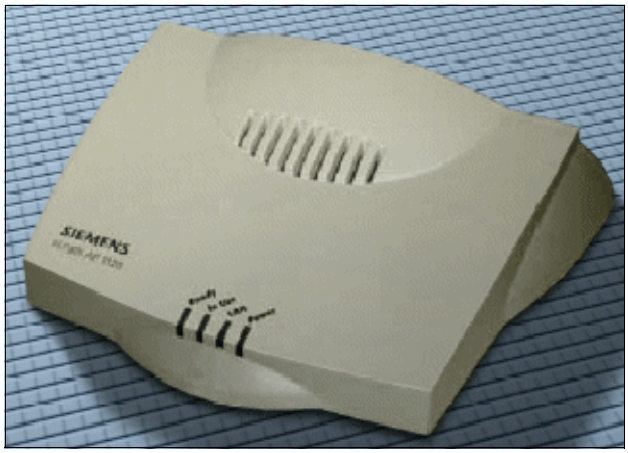


Fig. 10-55 HiPath AP 1120

Connections

- Ethernet connections:
  - 1 x RJ45: 10/100 BaseT Ethernet access
  - 1 x RJ45: 10/100 BaseT Ethernet access, power supply over MDI, IEEE 802.3af (Power over LAN)
- Analog connections:
  - 2 x RJ11: analog telephone, fax
- Power supply:
  - External 24 Vdc/12 W local power supply
    No local power supply is required if power is provided via Ethernet access (Power over LAN).

Connection and configuration

Information on connecting and configuring the HiPath AP 1120 terminal adapter can be found in the Installation Manual (Configuration Tools and Documentation) and the Administration Manual, see:
http://www.enterprise-communications.siemens.com/global/Products.aspx (... -> Downloads).

10.11 optiPoint WL2 professional/optiPoint WL2 professional S

optiPoint WL2 professional is the telephone for simplified company-wide access to data and resources via WLAN.

WLANs are transparent in IP traffic and thus the ideal environment for IP multimedia applications. Adding realtime IP communication, for example, in the form of voice, is the next logical step, as it uses investment in convergent LANs and the expands the range of a company's IP telephony and multimedia communication systems.

Product image



Figure 10-56 optiPoint WL2 professional

Workpoints used

HiPath 3000/5000 provides wireless LAN services via a WLAN access point connected to the DMZ interface. The following WLAN workpoints are implemented:

- optiPoint WL2 professional
  enables the use of all HiPath 3000/5000 features (except Relocate) that are offered on the display, in the service menu, and on function keys.
- optiPoint WL2 professional S
  supports the SIP (Session Initiation Protocol). The SIP protocol is an ASCII-based signal protocol that is used to set up sessions in an IP network.

Properties

Wireless LAN Voice-over-IP telephone with color graphical display.

The optiPoint WL2 professional can be used with HiPath 3000/5000 V5.0 or later.
The optiPoint WL2 professional S is the solution for SIP systems and can be used with HiPath 3000/5000 V6.0 or later.

- **Interfaces:** WLAN, USB
- **Standards:** WLAN, 802.11b (11 Mbps), 802.11g (full support of 54 Mbps), CorNet-IP, SIP

Configuration

- Wireless connection with a WLAN access point as the link to a LAN switch
- IP connection to the HG 1500 gateway in the HiPath 3000 system; CorNet-IP registration
- Basic configuration via DHCP
- Enhanced configuration via the telephone website (single telephone or using the HiPath Deployment Service

Features

Telephone

- Telephone with color graphic display
  (6 lines, 128 x128 pixel resolution, 4096 colors, 3.1cm x 3.1cm)
- Call animation and caller display (CLIP)/caller ID for incoming calls
- Illuminated keypad
- Two softkeys for dynamic access to features
- Intuitive user prompting
- Illuminated MWI key
- Speakerphone key
- Status display shows the following in standby or idle modes: date, time, battery level, RF signal strength, connected access point
- Status display shows the following during a call: battery level, RF signal strength, call duration, handset lifted, CLIP/caller ID
- Display for missed calls
- Loudspeaker function
- Displays all received calls
- Dialing via number input, SIP-URI (professional S) and IP address (direct IP call)

- Multi-line functionality
- Configurable speed-dial keys
- Call preparation (enter the phone number without occupying the line) with correction option
- Redial the last 10 different dialed numbers
- One-touch keypad blocking and ringtone muting with icon display
- Common user interface with Siemensdesktop telephones via the optiGuide user interface (professional S)
- Access to HiPath features (dependent on connected HiPath system) for call features such as callback, conferencing, consultation hold, etc.
- Local SIP features (professional S): Hold, mute, transfer, three-party conference, MWI, DND etc.
- SIP features with server support: Group pickup, priority alerting, distinctive ringing, keyset, shared call appearance, bridge line appearance, etc.

Local internal phonebook

- Comprehensive local internal phone/address book
- CLIP is replaced by the internal phonebook entry in the telephone or on the HiPath system

Audio

- 6 polyphonic ringtones (with programmable volume)
- 16 ringtones, including 12 managed by the HiPath system and 4 managed by the user
- Ringtones can be downloaded
- Volume control with 8 levels
- Ringtones dependent on CLIP/caller ID
- VIP calls

Added-value applications and features

- Caller announcements (CLIP/caller ID)
- Voice dialing
- Polyphonic ringtones (downloadable)
- Access to LDAP directories
- Headset connection via a Slim Lumberg connector

- Silent alert
- Prepared for broadband voice transmission (optional), G.722)
- CTI interface
- Upgrades and configurations can be performed OTA ("Over The Air") via the HiPath Deployment Service, an advanced management application
- HiPath application support

Codecs

- G.711 (a-law and µ-law)
- G.729ab (G.729a with VAD (Voice Activity Detection))
- G.723
- G.722 (optional)
- Advanced Echo Cancellation (AEC)

QoS

- ToS
- DiffServ
- 802.1q
- 802.11e (WME subset)

Accessories

- Desktop charger
- Desktop charger with the option of charging a second battery
- USB data cable
- Wide range of headsets available
- Various carriers available
- Power adapter (suitable for the appropriate geographic region)

Additional features

- Web browser-based administration
- Multilingual user interface

- Date and time synchronization via NTP server or HiPath system
- Range: Indoors: up to 30 m (dependent on the environment)
  Outdoors: up to 300 m (dependent on the environment)
- Power supply (Li-Ion, 3.7 V, battery)
- Operation times: Talk time up to 4 hours; stand-by up to 80 hours
- Weight: approx. 100 g
- Dimensions:
  Telephone: 132 x 52 x 22 mm (LxWxH)
  Charger: 70 x 73 x 35 mm
- Color: Light Cashmere Silver

Wireless Features

- 802.11g (fallback to 802.11b)
- Frequency range: 2.4 – 2.497 GHz
- Number of dialable channels: 13 (ETSI) or 11 (North America)
- Configurable transmit power: approx. +20 dBm EIRP
- Site survey tool integrated in the telephone
- Bit rates: 54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps
- SSID

Security Features

- WEP (64, 128-bit)
- WPA
- Cisco infrastructure support via CCX
- Telephone can be PIN-protected
- VPN client
- Authentication (login/password)
- 802.11i (optional, if standard decided upon)

Authentication

- EAP-TLS
- LEAP

Protocols/network features

- DHCP client
- FTP client
- VLAN support
- SNMP trap agent
- VoIP (SIP, RTP, RTCP, TLS)
- DNS
- HTTP and HTTPS server
- PPTP for VPN support
- UPNP (control point and telephone)
- IP addressing: fixed, DHCP, PPPoE

PC software

- PC tool for exchanging phonebook data between Microsoft Outlook and the local internal phonebook on the WLAN telephone
- Ringtone download from PC to telephone

10.12 Attendant Console Versions

10.12.1 OpenStage Attendant

Switching services

Switching services can be executed in HiPath 3000/5000 by a specially configured OpenStage telephone. This OpenStage Attendant is also an intercept position. It is the destination for all incoming non-DID calls and calls which the call-allocation algorithms are unable to route to users (intercept calls). The attendant routes these calls to the correct destination.

Telephones

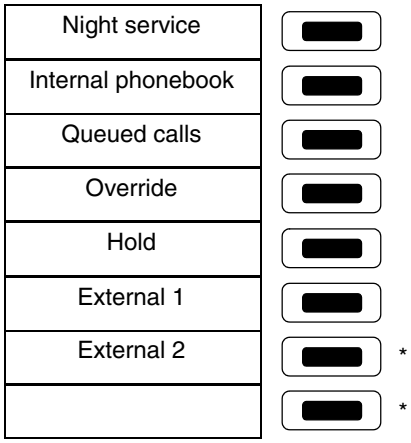
The following telephones can be configured as OpenStage Attendant:

- OpenStage 30
- OpenStage 40
- OpenStage 60
- OpenStage 80

Key layout

On OpenStage 30/40/60/80 telephones configured as attendant consoles, the programmable function keys are assigned as follows:

OpenStage Attendant



*) not for OpenStage 40

10.12.2 optiPoint Attendant

A specially equipped optiPoint telephone can perform switching services for HiPath 3000/5000. This optiPoint Attendant simultaneously serves as the intercept position. It is the destination for all incoming non-DID calls and calls which the call-allocation algorithms are unable to route to users (intercept calls). The attendant routes these calls to the correct destination.

Configuration as optiPoint Attendant is possible for the following terminals: optiPoint 500 economy/basic/standard/advance, optiPoint 410 economy/economy plus/standard/advance, optiPoint 420 economy/economy plus/standard/advance, and optiPoint 600 office.

Standard key assignment (default) for optiPoint Attendant



Service	Night service
Redial	Internal phonebook
Microphone on/off	Queued calls
Loudspeaker	Override
	Hold
	External 1
	External 2
	Disconnect

Fig. 10-57 optiPoint 500 standard: Standard Key LayoutoptiPoint Attendant

For more information, please refer to the optiPoint Attendant operating instructions.

10.12.3 optiClient Attendant V8

Definition

optiClient Attendant is a PC-based attendant console and can be connected to HiPath 3000/ HiPath 2000/HiPath OpenOffice EE systems. Depending on the model, up to six optiClient Attendants can be implemented at each node.

optiClient Attendant can also be implemented as a central attendant console in a network consisting of HiPath 3000/HiPath 2000/HiPath OpenOffice EE systems.

optiClient Attendant V8 replaces the existing optiClient Attendant V7.0 in all connection variants (USB and LAN).
The sale of existing and new optiClient Attendant V7.0 systems will be discontinued.

optiClient Attendant V8 only operates in conjunction with HiPath 3000 V8, HiPath 3000/5000 V7, HiPath 2000 and higher and HiPath OpenOffice EE and higher and is not downwards-compatible.
optiClient Attendant V7.0 is not compatible with HiPath 3000 V8, HiPath 3000/5000 V7, HiPath 2000 V2 and higher, and HiPath OpenOffice EE and higher (no upgrade possible).

Technical changes in comparison to version 7.0:

- optiClient Attendant V8 always needs a telephone for operation (even in the IP connection version). This telephone should be separately marketed (connection via Soft-OLA no longer applicable).
- Headsets are consequently no longer connected to the PC but to the telephone.
- Telephone connectivity is always guaranteed even if the optiClient Attendant PC fails or is switched off.

Connection variants

- Connection via IP to:
  optiPoint 410, 420; OpenStage TDM telephones [not connected to CorNet-IP (HFA)]
- Connection via USB interface to:
  optiPoint 500, OpenStage 40 T

optiClient Attendant V8 features

- Ongoing, waiting or parked calls are displayed with type, name, and phone number
- Acoustic message signaling with volume control
- Display of the switching state of source and target
- Answering of pending calls
- VIP call flagging for preferred call acceptance
- Selection of telephone directories:
  - Outlook Contacts
  - Lotus Notes
  - Internal Attendant telephone directory, based on Microsoft Access
  - Open LDAP
- Advanced integration with MS Outlook, featuring direct e-mail transmission using the phonebook entry
- Call statistics for incoming calls with sort function according to various criteria
- Convenient caller list with an almost unlimited number of entries, sorted according to date and time
- Additional functions, such as, hold keys, override, callback, conference, paging, speaker announcements, alarm signaling, view call charges, redial (10 last-dialed destinations)
- No calls are lost because options are provided for intercepting unanswered DID calls and DID calls to busy stations
- Windows online help
- Convenient configuration of individual features
- Service tools for diagnosis and protocols
- Simple installation routine
- User interface currently available in German, English, Dutch, Portuguese, Italian, French, and Spanish.
- Connection of a blind attendant console, optional.
- optiClient Attendant may operate as the central attendant console in HiPath networks.
- Import of CSV files into the integrated internal phonebook
- Busy lamp fields offer the following features:

- Up to 300 fields per busy lamp field
- Up to two busy lamp fields possible
- Configuration of busy lamp fields to suit individual user requirements
- BLF zoom with automatic font adjustment
- Speed dialing via busy lamp field
- Color display of station status: idle, calling, busy internal, busy external
- Call forwarding may be switched on or off for each station
- Do Not Disturb may be switched on or off for each station
- Displays "forwarded" and "do not disturb" using symbols
- Name definition for BLFs
- Definition of titles for groups of BLF stations
- Access to public calendar (Exchange)
- Copy/cut and paste on the BLF

optiClient Attendant compatibility

	HiPath 3000 V8 HiPath 2000 V2/ HiPath OpenOffice EE	**HiPath 3000/5000 V7 HiPath 2000 V2/ HiPath OpenOffice EE**	**HiPath 3000/5000 V6.0 HiPath 2000 V1.0**	**HiPath 3000/5000 V5.0**
optiClient Attendant V8	Yes	Yes	No, not ready for startup	No, not ready for startup
optiClient Attendant V7.0	No, not ready for startup	No, not ready for startup	Yes	Yes

PC system requirements

- Pentium IV
- 256 MB RAM space
- Operating systems WIN2000, XP, 2003 Server (Windows Vista Business, see notes in the Sales Information)
- Microsoft-compatible mouse
- CD-ROM or DVD drive

- For operation via TCP/IP connection:
  - Functional operating system with network and sound card configured
  - optiPoint 410/420 telephone (OpenStage telephones: see notes in the Sales Information)
- For operation via USB:
  - optiPoint 500 with USB interface (OpenStage telephones: see notes in the Sales Information),
    USB cable (part number: S30267-Z360-A30-1),
    USB driver (included in the CallBridge TU software),
    and a free USB port at the PC.

Overview of Microsoft operating systems supported for each connection variant

Connection variant	Windows 2000	Windows XP	Windows Vista Business
USB interface	X	X	[1]
TCP/IP	X	X	[1]

1 see notes in the Sales Information

Licensing

A license is required for optiClient Attendant V8. The product is licensed centrally via HiPath License Management.

When commissioned for the first time, optiClient Attendant V8 can be operated license-free for a maximum of 30 days at HiPath 3000 V8, HiPath 3000/5000 V7, HiPath 2000 V2 and higher, and HiPath OpenOffice EE and higher as part of the grace period offered by these systems.

Model-specific data

Topic	HiPath 3000	HiPath 3000/5000	HiPath 2000/ HiPath OpenOffice EE
Feature available in	**x**	**x**	**x**
Hardware requirements			
Software requirements	V8	V7	from V2 or later
Maximum number of connectable optiClient Attendant	6	6	1

optiClient Attendant as central attendant console

optiClient Attendant can be used as a central attendant console in an IP network (max. 6 optiClient Attendant per network). To enable network-wide BLF functionality, all attendant consoles must be connected to one of the network's HiPath 3000 nodes and registered. This functionality is independent of the optiClient Attendant connection type (USB or TCP/IP). For the network-wide Busy Lamp Field function all decentralized systems send their station states (e.g. free or busy) to the central system, to which the optiClient Attendants are connected. Signaling takes place in the CorNet-IP protocol (CorNet-NQ protocol tunneled in H.323 via annex M1).

In an IP network, up to 100 stations per node can be defined that send their status information to the central attendant console for display on the busy lamp field. The stations of the central system in the network (to which the optiClient Attendants are connected) can all be displayed on the busy lamp field of the central attendant console.

10.13 Handsets for HiPath Cordless Office

This section lists all the mobile telephones authorized for use with HiPath Cordless Office, including a brief description. For more information, please see the user manual for the relevant mobile telephone and the HiPath Cordless Office service manual.

10.13.1 Gigaset SL3 professional

Gigaset SL3 professional is a DECT-standard mobile telephone and suitable for HPS (HiPath Positioning System).

Product image



Figure 10-58 Gigaset SL3 professional

Technical specifications

- Mobile telephone operation times:
  - Standby time (without display illumination): approx. 200 hours
  - Talk time: approx. 10 hours
  - Charging time: approx. 3 hours
- Dimensions (H × W × D in mm)
  - Mobile telephone: 114 × 46 × 22
  - Charging unit: 67 x 67 x 21
- Weight of the mobile telephone incl. battery: approx. 110 g
- Operating temperature of the mobile telephone: +5 °C to +45 °C (41 °F to 113 °F)

10.13.2 Gigaset S4 professional

Gigaset SL4 professional is a DECT-standard mobile telephone and suitable for HPS.

Product image



Figure 10-59 Gigaset S4 professional

Technical specifications

- Mobile telephone operation times
  - Standby time (without display illumination): approx. 165 hours
  - Talk time: approx. 12 hours
  - Charging time: approx. 7,5 hours
- Dimensions (H × W × D in mm)
  - Mobile telephone: 146 x 49 x 26
  - Charging unit: 39 x 87 x 83
- Weight of the mobile telephone incl. battery: approx. 125 g
- Operating temperature of the mobile telephone: +5 °C to +45 °C (41 °F to 113 °F)

10.13.3 Gigaset M2 professional

Gigaset M2 professional is a very robust mobile telephone based on the digital DECT/GAP standard. It is suitable for use in environments requiring telephones to be break- and shock-proof and dust- and spray-resistant.

Product image



Figure 10-60 Gigaset M2 professional

Special features

- IP rating IP 65 (casing protection):
  - Protected against splashes and low-pressure jets of water
  - Dustproof
- Shock-proof and robust
- Silicon-free surface
- Sturdy carry clip
- Immunity from electromagnetic radiation in accordance with EN 50 082-2
- Acoustics optimized for industrial environment with 5 volume levels
- Memory card for device-specific and individual entries
- Emergency key (individual programmable key)

Technical specifications

- Operation times:
  - Standby time (without display illumination): approx. 200 hours
  - Talk time: approx. 10 hours
  - Charging time: approx. 6 hours
- Dimensions (H × W × D in mm):
  - Mobile telephone: 167 × 56 × 35
- Weight of the mobile telephone incl. battery: approx. 176 g
- Operating temperature of the mobile telephone: –10 °C to +55 °C (14 °F to 131 °F)

10.13.4 Logging Mobile Telephones on to the System

Introduction

Sixteen mobile telephones are released for use by entering the HiPath cordless system number (DECT identification, eight hexadecimal places) and inserting the SLC16N in HiPath 3550, after which they can be logged on (mobile telephone codes, or PINs, are assigned. Other mobile telephones must be released before they can be used.



For initial installation of the HiPath Cordless Office, the HiPath cordless system number must be ordered together with the SLC16N board. Replacement boards are always delivered without a HiPath cordless system number.

Before logging on a mobile phone, you must open the login window from a system telephone (Manager T) by entering the code and password. A maximum of 10 login windows can be open at a time.
Then type the station numbers of the mobile telephones you want to log on.

10.13.4.1 Opening the HiPath 3000 Login Window

Input	Activity	Display
*94 2 19970707	Open the login window	Number:
124	Type the station number of the handset you want to log on (such as, 124)	Number:
125	Type the station number of the second handset you want to log on (such as, 125)	Number:
: :	: :	: :

The login window remains open for ten minutes per station. The handset must log on during this period (refer to Page 10-134).

10.13.4.2 Logging On the Mobile Telephone

Example: log the mobile telephone (station number “125”) on to the DECT telephone system 2 using mobile telephone PIN “11112345”.

Step	Entry or Key	Handset Display
1.	Switch on the mobile telephone by holding down the hook key for at least 1 second. You hear a confirmation tone.	The first time you log on, the message “Register?” appears on the handset display. The second time you log on, "Base 1" or a similar message flashes.
2.	Make the following entries within one minute. Press the menu key.	
3.	Select a station[1] (for example: Base 2) and confirm.	**Base 2**
4.	Open the add-on menu.	
5.	Select “Register” and confirm your choice.	The following prompt appears: “Please enter PIN:”
6.	Enter the eight-digit PIN (mobile telephone code) “11112345” and confirm.	“11112345”
7.	Once you have logged on properly, "Base 2" or a similar message appears and the bell symbol " " flashes.	**Base 2**

1 Base = DECT telephone system

After logging on and releasing a handset, always turn on the out-of-range warning signal. For more information, please refer to the operating instructions.

10.13.4.3 Checking the Login Status of the Mobile Telephones

The current login status of mobile telephones can be checked using HiPath 3000/5000 Manager E in the system view (“Cordless ...” dialog in the “Settings” menu) and the station view.

10.13.4.4 Replacing, Locking, and Logging Off a Mobile Telephone

If you need to replace a handset for servicing, you must change the mobile telephone code (PIN) of the old handset before logging on the replacement telephone.



When you replace a mobile telephone, the station must be assigned a new mobile telephone code (PIN) in the HiPath 3000 system. This automatically logs off the mobile telephone.
This also prevents a person who knows the old PIN to log on an invalid mobile telephone.

10.14 Analog Telephones for HiPath 3000

You can connect dial pulsing (DP) and DTMF telephones (such as group 3 fax machines and modems, answering machines, or entrance telephones) to the analog ports in the HiPath 3000.

Boards for connecting analog telephones

System	HiPath 3800	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300
Hardware require-ments	Free analog port on SLMA8	Free analog port on CBCC CBRC 4/8/16SLA 8SLAR SLA8N/16N/24N SLAD4/8 SLAD8R SLAD16	Free analog port on CBCC CBRC 4/8SLA 8SLAR SLAD4/8 SLAD8R SLAD16

Connecting equipment using an optiPoint analog adapter



An analog telephone can also be connected with an optiPoint analog adapter to an existing telephone from the optiPoint 500 range (except for optiPoint 500 entry and optiPoint 500 economy).

10.15 ISDN Terminals for HiPath 3000

An S_0 bus in the HiPath 3000 system family can support up to eight ISDN terminals (maximum of eight terminal equipment identifiers (TEI). Each terminal can be dialed selectively under its multiple subscriber number or station number.

It is possible to have a maximum of four Gigaset CX340isdn cordless systems for each S_0 bus. Because of the call switching functions, at least two mobile phones must be registered at each Gigaset CX340isdn. Thus, at least two terminal equipment identifiers (TEI) will be required for each Gigaset CX340isdn.

The features that can be activated depend on the type of S_0 terminal used. Different ISDN features are supported depending on the terminal used. Analog station users can activate system features by means of code procedures. The telephones support only those system features which can be activated in the idle state.

The dialing behavior of ISDN terminals corresponds to that of DP terminals. The substitute codes “75” and “76” can be used for the characters “*” and “#” which cannot be used in the ISDN protocol.

Boards for connecting ISDN terminals

System	HiPath 3800	HiPath 3550 HiPath 3500	HiPath 3350 HiPath 3300
Hardware requirements	Free S_0 port on STMD3	Free S_0 port on CBCC CBRC STLS2/4 STLS4R STLSX2/4 STLSX4R	Free S_0 port on CBCC CBRC STLS2/4 STLS4R STLSX2/4 STLSX4R

Connecting with an optiPoint ISDN adapter

It is also possible to connect an ISDN device to an existing optiPoint 500 telephone using an optiPoint ISDN adapter (except for optiPoint 500 entry and optiPoint 500 economy).

11 HiPath Cordless Office

Overview

This chapter contains basic information about the operation of HiPath Cordless Office. For more detailed information, please refer to the HiPath Cordless Office service manual.

Chapter contents

This chapter covers the following topics:

Topic
Introduction, page 11-2
System Configuration, page 11-3
Technical Data for Base Stations, page 11-4
Power-Related Capacity Limits, page 11-6
Multi-SLC and System-Wide Networking, page 11-9
Planning Notes for Networked HiPath 3000 Systems Featuring Network-Wide Roaming, page 11-11

11.1 Introduction

For HiPath 3000 V1.2 and later, HiPath Cordless Office can be used on all systems of this product line.

Direct connection

The BS3/1 (S30807-H5482-X) and BS4 (S30807-U5491-X) base stations can be connected directly to the $U_{P0/E}$ interfaces on the central control boards in the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300. The connection must be made via one $U_{P0/E}$ interface each. A mix of base stations of types BS3/1 and BS4 is supported.

A BS3/S (X30807-X5482-X100) single-cell base station can be used to ensure the operation of a maximum of one base station at the $U_{P0/E}$ interfaces on central control boards in the HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300. In this case, it is not possible to expand with additional base stations.

However, base stations cannot be simultaneously connected to the SLC16/SLC16N board and the CBCC within one HiPath 3550 system.



The base stations BS3/1 (S30807-H5482-X), BS3/3 (S30807-H5485-X), and BS3/S (X30807-X5482-X100) are being phased out and may no longer be ordered. You must use the successor product BS4 (S30807-U5491-X) instead of the types named.
You can still operate the base stations listed in HiPath 3000. Base stations BS3/1, BS3/3, and BS4 can also be used in mixed mode.

Connecting cordless boards

Base stations can be connected to the $U_{P0/E}$ interfaces of the following cordless boards:

- SLC16N in HiPath 3550.
- SLCN in HiPath 3800



The SLC16 board (S30810-Q2922-X) is no longer supported in HiPath 3000/5000 V6.0 or later.

The base stations BS3/1 (S30807-H5482-X), BS3/3 (S30807-H5485-X), and BS4 (S30807-U5491-X) may be used in mixed mode on the above cordless boards.

You can install up to four SLCN boards in HiPath 3800. All four boards provide full cordless functionality (roaming and seamless connection handover) because the radio fields on the cordless boards are synchronized within a single system (see Section 11.5).

The HiPath 3000 product line does not currently support the network-wide handover feature.

11.2 System Configuration

The following table indicates the maximum possible system configuration parameters for . It also shows when

- CMA or CMS is necessary
- analog trunk access is possible.

Tabelle 11-1 HiPath Cordless Office - System Configuration for HiPath 3000 V8

System	max. Number		Clock modules	Maximum number of base stations BS with connection via 1x$U_{P0/E}$				Simultaneous calls per BS				max. Number MTs	Analog trunk access of the system
	SLC16N	SLCN		BS3/1	BS3/S	BS3/3	BS4	BS3/1	BS3/S	BS3/3	BS4		
HiPath 3350 HiPath 3300	–	–	CMS	–	1	–	1	–	1/2	–	1/2	8	No
	–	–	CMA	1	–	–	1	1/4	–	–	1/4	8	Yes
	–	–	CMA	3	–	–	3	1/4	–	–	1/4	16	Yes
HiPath 3550 HiPath 3500	–	–	CMS	–	1	–	–	–	1/2	–	–	8	No
	–	–	CMA	1	–	–	1	1/4	–	–	1/4	8	Yes
	–	–	CMA	7	–	–	7	1/4	–	–	1/4	32	Yes
HiPath 3550	1	–	CMS	16	–	16	16	1/4	–	3/12	3/12	64 (with 1 SLC16N)	Yes
HiPath 3800	–	4	CMS	64	–	64	64	1/4	–	3/12	3/12	250 (with 4 SLCN) [1]	Yes

Explanations:

- BS3/1 (S30807-H5482-X): is a base station that supports a maximum of 4 calls.
- BS3/3 (S30807-H5485-X): is a base station that supports a maximum of 12 calls when connected using three $U_{P0/E}$ interfaces.
- BS3/S (X30807-X5482-X100): The BS3/S single-cell base station guarantees the operation of a maximum of one base station on the $U_{P0/E}$ interfaces of the central board. It is not possible to operate additional base stations.
- BS4 (S30807-U5491-X): is a base station that supports a maximum of 12 calls when connected using three $U_{P0/E}$ interfaces. In the case of a direct connection, it is only permitted to make the connection via one $U_{P0/E}$ interface. The B channels in the base station BS4 require a license (see Chapter 8).

1 Up to 128 handsets are possible at an SLCN.

11.3 Technical Data for Base Stations

Table 11-2 Technical Data for Various Base Stations

Parameter	BS3/1 and BS3/S	BS3/3	BS4	Outdoor cover
Power supply voltage range	42 to 54 V	42 to 54 V	42 to 54 V	–
Power consumption	max. 1.7 W	max. 3.2 W	max. 3.0 W	–
Housing dimensions (W x D x H in mm)	181 x 139 x 69	202 x 172 x 43	200 x 176 x 49	296 x 256 x 90
Weight	approx. 0.3 kg	approx. 0.5 kg	approx. 0.5 kg	approx. 1.0 kg
Temperature range	for indoor use: - 5 to + 50 °C			for outdoor use: - 20 to + 45 °C
Relative humidity	–	–	–	up to 95%

BS3/1 base station



Figure 11-1 BS3/1 S30807-H5482-X Base Station

Outdoor cover

A base station must be installed in a weatherproof outdoor cover to guarantee radio coverage outdoors, for example on factory premises. The outdoor cover is suitable for mounting on walls of buildings, roofs, and masts.

The outdoor cover S30122-X7469-X is used for BS3/1 (BS3/S), BS3/3, and BS4. A heater is not required.

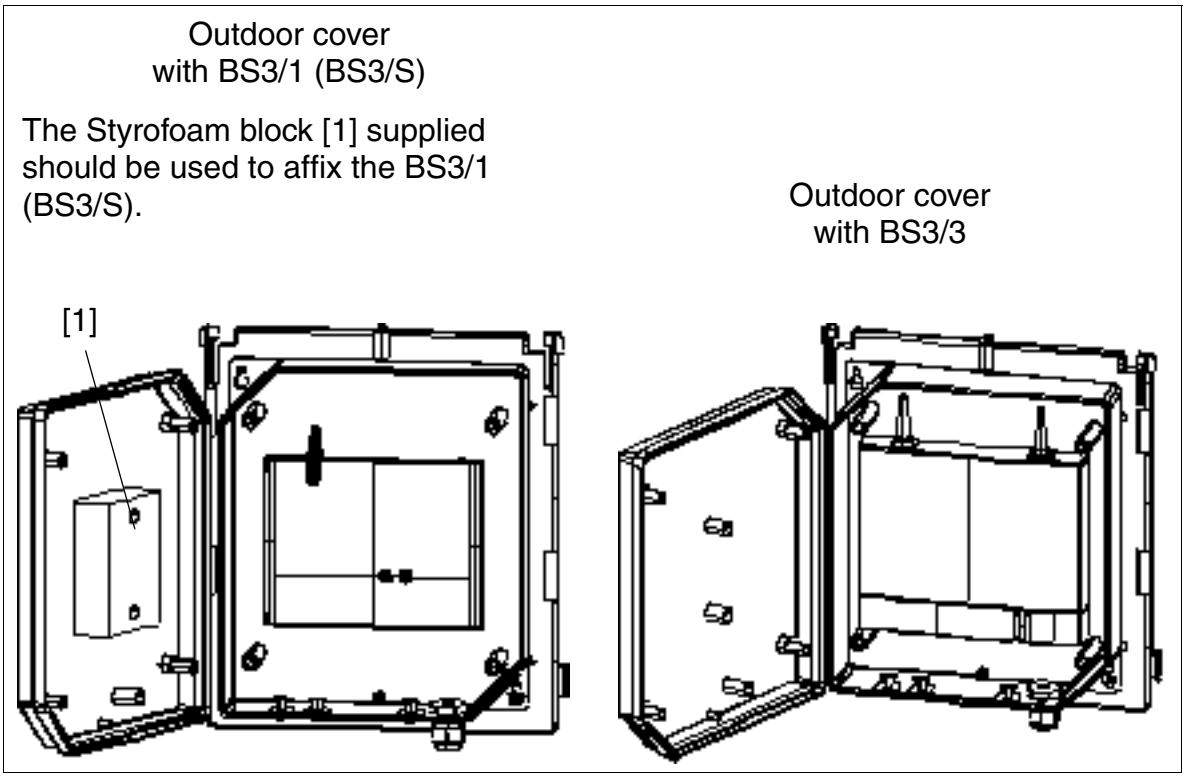


Figure 11-2 BS3/1 (BS3/S) and BS3/3 in the Outdoor Cover S30122-X7469-X

For information on the various outdoor cover mounting options, refer to the HiPath Cordless Office Service Manual.

11.4 Power-Related Capacity Limits

The number of base stations, their distance from the system, and the overall telephone configuration determine whether or not the output from the internal system power supply units is sufficient or whether an additional supply is necessary.

- HiPath 3800
  If the correct number of LUNA2 modules was calculated, the system's internal power supply unit provides sufficient power to supply the system configuration specified in Table 11-1.
  For information on how to calculate the number of LUNA2 modules required, see Page 3-59.

- HiPath 3550 and HiPath 3500
  The following tables show which telephone configurations do not need an additional power supply:

  – Table 11-3, depending on the number of BS3/1 and BS4 base stations connected to the central CBCC/CBRC control board.

  – Table 11-4, depending on the number of BS3/1 base stations connected to SLC16N and the number of BS4 base stations connected to SLC16N.

  – Table 11-5, depending on the number of BS3/3 base stations connected to SLC16N and the number of BS4 base stations connected to SLC16N.

  If extra telephone configurations are added to these, an additional power supply is needed (Powerbox PB3000).

Table 11-3 HiPath 3550, HiPath 3500 - Maximum Number of Corded Telephones Depending on the Number of BS3/1 and BS4 Base Stations Connected to CBCC or CBRC

Number of BS3/1s and BS4s connected via $1xU_{P0/E}$ to CBCC or CBRC	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiPoint 500					
1	66	61	57	53	48	44
2	63	59	54	50	46	41
3	60	56	52	47	43	39
4	58	53	49	45	40	36
5	55	51	47	42	38	33
6	53	48	44	40	35	31
7	50	46	41	37	33	28

Table 11-4 HiPath 3550- Maximum Number of Corded Telephones Depending on the Number of BS3/1 Base Stations Connected to SLC16N and BS4 Base Stations Connected to SLC16N

Number of BS3/1s and BS4s connected via $1xU_{P0/E}$ to SLC16N	**Maximum number of corded telephones**					
	analog telephones					
	0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
	optiPoint 500					
1	66	61	57	53	48	44
2	63	59	54	50	46	41
3	60	56	52	47	43	39
4	58	53	49	45	40	36
5	55	51	47	42	38	33
6	53	48	44	40	35	31
7	50	46	41	37	33	28
8	47	43	39	34	30	26
9	45	40	36	32	27	23
10	42	38	33	29	25	20
11	40	35	31	27	22	18
12	37	33	28	24	20	15
13	34	30	26	21	17	13
14	32	27	23	19	14	10
15	29	25	20	16	12	7
16	27	22	18	13	9	5

Table 11-5 HiPath 3550 - Maximum Number of Corded Telephones Depending on the Number of BS3/3s Connected to SLC16N and BS4s Connected to SLC16N

Number of BS3/3s and BS4s connected via $2xU_{P0/E}$ to SLC16N	**Maximum number of corded telephones**					
	Analog telephones					
	0	1-10	11-20	21-30	31-40	41-50
	optiPoint 500					
1	64	60	56	51	47	42
2	60	56	52	47	43	39
3	57	52	48	43	39	35
4	53	48	44	40	35	31
5	49	44	40	36	31	27
6	45	40	36	32	27	23
7	41	37	32	28	23	19
8	37	33	28	24	20	15



When using an additional power supply (such as Powerbox PB3000), HiPath 3550 and HiPath 3500 can be expanded up to the maximum possible capacity limit specified in Table 2-6.

Supplying power to base stations

The internal power supply unit in the respective system is the main power source for the base stations. For more information on the various power supply options, please refer to Page 3-156.

11.5 Multi-SLC and System-Wide Networking

You can install up to four SLCN boards in HiPath 3800. For the total cordless station mobility (roaming and seamless connection handover) within a system, the radio fields of these cordless boards are synchronized.

The system views each mobile telephone (mobile station) as a corded telephone. During administration, a fixed port on the system's "home cordless board" is assigned to the MT; this is used for addressing the MT.

As soon as an MT moves into the area of a different radio switching location ("current-location cordless board"), an extension connection is switched using a DSS1 connection initiated by the cordless board. The home and current-location cordless boards exchange a networking protocol (User-to-User Signaling UUS) over this extension connection to support full mobility (see Figure 11-3).

This function can be used not only within one system, but also among systems (among nodes) because the CorNet NQ used for networking supports the UUS protocol (note: for the system-wide extension connections, you may have to take additional B channels into consideration for the permanent connection paths (CorNet NQ, see Section 11.6). That means full mobility across the radio fields of the different cordless systems. All handset features (callback, team functions, voicemail, etc.) remain intact. The network-wide handover feature is only exception here as it is not currently supported.

Required B channels

Table 11-6 Required B channels for Multi-SLC and System-Wide Networking

Mobile telephone (MT) has set up a connection	Required B channels	Required B channels for the home cordless board	Required B channels for the current-location cordless board
In the home cordless board range	1	1	–
In the current-location Cordless board range	3	2	1
Handover from home to home cordless board	1	1	–
Handover from home to current-location cordless board	3	2	1
Handover from current-location to current-location cordless board	5 (temporary)	3	2 (1 for each cordless board)

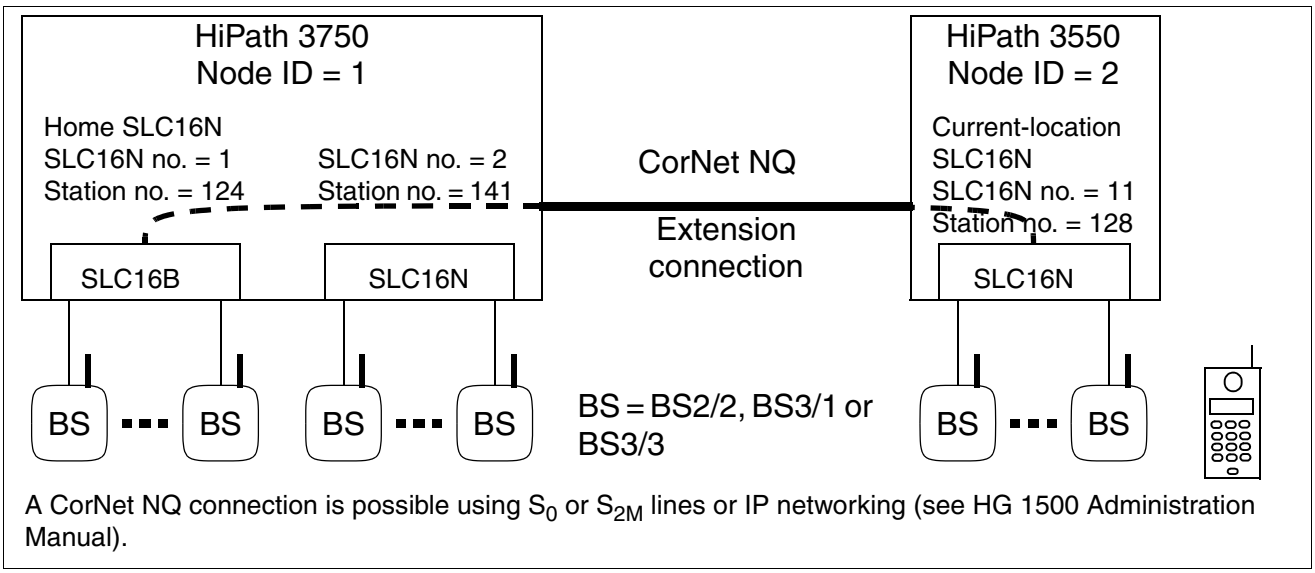


Figure 11-3 Example of a Cordless Extension Connection in Networked Systems

Networked HiPath 3000 systems feature

- max. 64 networked systems
- accessible using a shared station number (roaming among the systems/nodes)
- call interruption when changing between systems/nodes

11.6 Planning Notes for Networked HiPath 3000 Systems Featuring Network-Wide Roaming

The demand for additional B channels for fixed connection paths (CorNet-NQ) must be taken into account for the system-wide extension connections described in Section 11.5.

The demand for additional B channels for fixed connection paths (CorNet NQ) must be taken into account for the system-wide extension connections described in Section 11.5.

If the “Network-wide roaming” feature is used, please ensure that there is no overlapping in the radio areas of individual systems with identical DECT IDs. Handsets treat networked systems with identical DECT IDs as a single system.

If the radio areas of systems with identical DECT IDs overlap, mobile telephones inadvertently try to perform network wide handover, which results in communication breakdown.

If networking is required for systems in which the individual radio fields overlap (for example, to increase capacity limits or through decentralized installation), different DECT IDs must be configured in the individual systems. Network-wide roaming does not apply in this case.

The following describes three different scenarios for networked HiPath 3000 systems.

Scenario 1: Incorrect DECT Configuration of Networked HiPath 3000 Systems

Identical DECT IDs and overlapping radio areas result in incorrect handover causing a breakdown in communication.

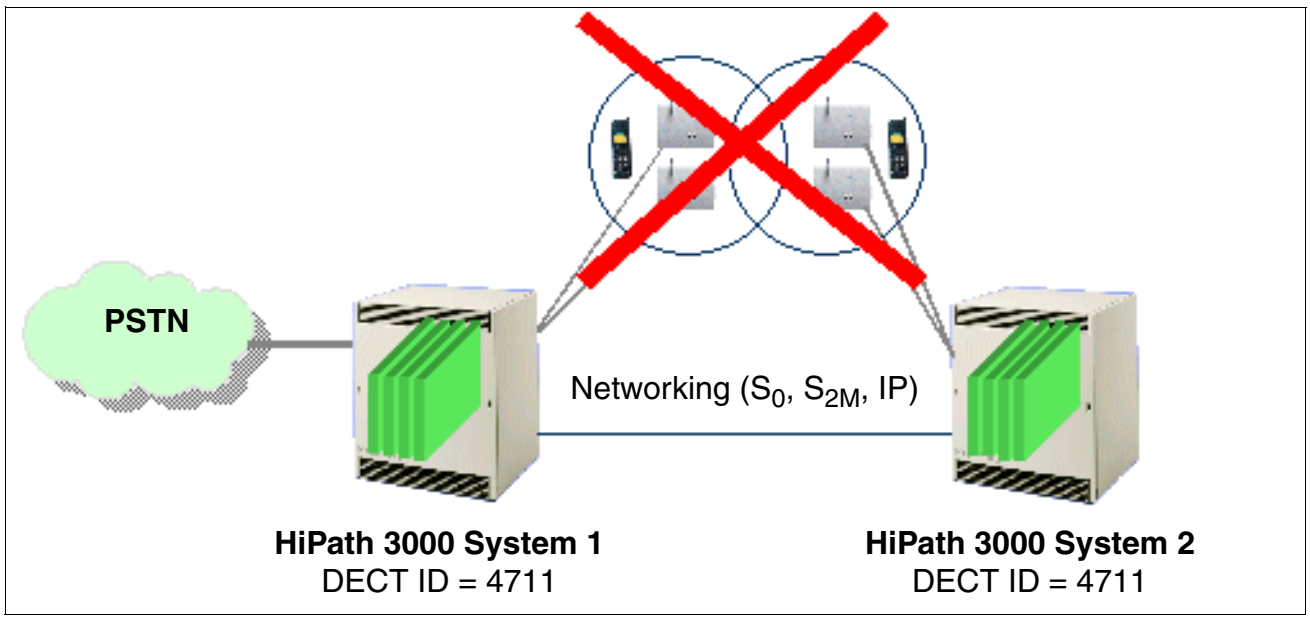


Figure 11-4 Incorrect DECT Configuration of Networked HiPath 3000 Systems

Scenario 2: Correct DECT Configuration when Networking HiPath 3000 Systems

No incorrect handover due to identical DECT IDs despite overlapping radio areas. Disadvantage: network-wide roaming not possible.

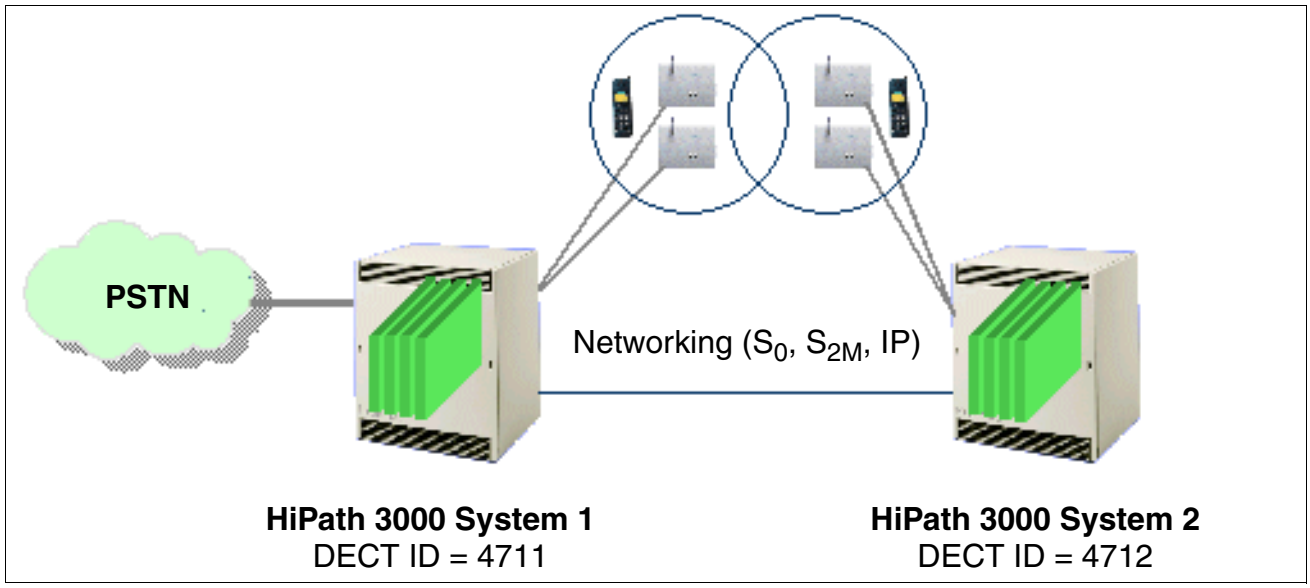


Figure 11-5 Correct DECT Configuration when Networking HiPath 3000 Systems

Scenario 3: Correct DECT Configuration when Networking HiPath 3000 Systems

No incorrect handover despite identical DECT IDs as the radio areas do not overlap. Network-wide roaming possible.

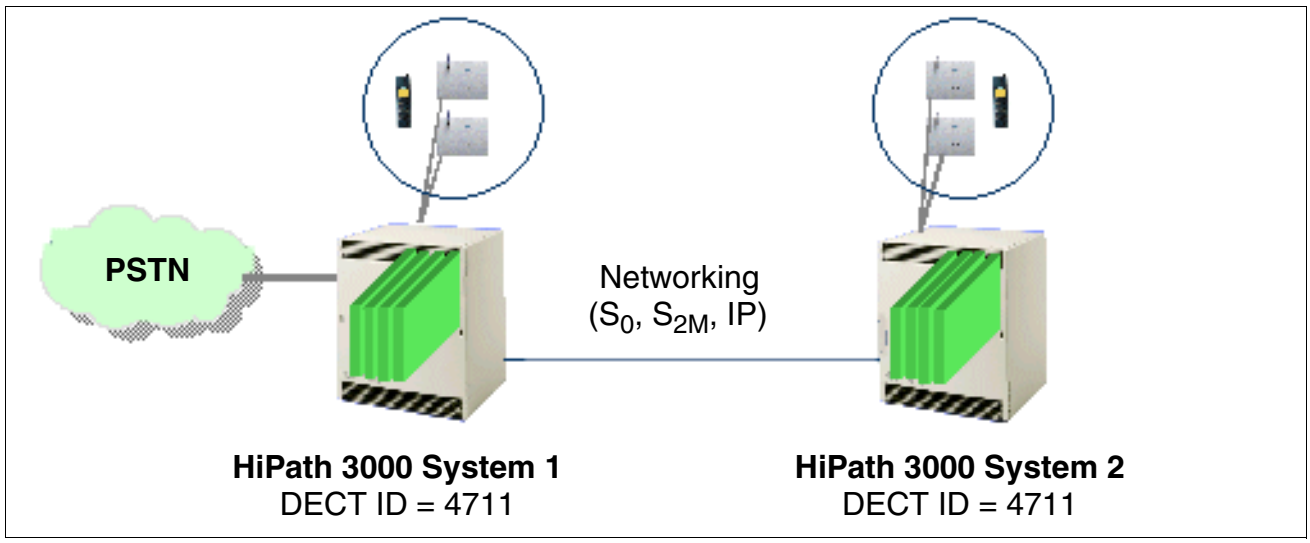


Figure 11-6 Correct DECT Configuration when Networking HiPath 3000 Systems

12 Service

Introduction

This chapter contains information on the options available to service technicians and customers for

- performing service and maintenance work.
- recognizing and correcting errors.

Such work can be performed on site or using remote service.

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• Effects of Hardware Changes on Customer Data, page 12-8
• Relocate/Transfer Application Processor Software (APS), page 12-11
• Determine Ccurrent System Software Version, page 12-16
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12.1 Service and Maintenance Tasks

12.1.1 Backing Up the Customer Database (CDB Backup)

A distinction is made here between

- backup of customer data **without** HiPath Software Manager and
- backup of customer data **with** HiPath Software Manager.

12.1.1.1 Customer Data Backup Without HiPath Software Manager

Definition

CDB backup refers to saving the customer database (CDB) to the multimedia card MMC (HiPath 3000) or copying the cyclic RAM data and saving it in two PDS (Permanent Data Service) files (HiPath 5000).

Note: The RUN LED flashes repeatedly for a short period to signal that a CDB backup, which takes about 30 seconds, is in progress on the MMC.

12.1.1.1.1 Automatic Customer Data Backup

HiPath 3000

A two-stage concept guarantees automatic customer data backup.

A complete CDB backup version can be found on the MMC at any time. Deltas for this backup are stored in an SRAM area (with battery backup) in the central control board. If the SRAM area is full, the customer data is automatically backed up. This means that the entire CDB, including SRAM content, is copied from the SDRAM in the central control board to the MMC. The current CDB is simultaneously stored on the MMC along with the “old” CDB, which is not deleted until the current CDB is completely stored on the MMC.

In case of a power outage, the SDRAM content that has no battery backup is completely lost. However, by re-accessing the CDB backup on the MMC, the system’s database can be restored to the state it was in prior to the power outage.

Regardless of the volume of changes to the database, HiPath 3000 always automatically performs a complete CDB backup at midnight, system-time.

HiPath 5000

On the communication server, RAM data is copied automatically every three minutes and stored in the file `hicom.pds`. This file contains the complete data description of the HiPath 5000 with emulated HG 1500 boards. This includes:

- customer data
- trace
- error history
- call charge data
- status data

The directory in which the two PDS files are to be stored must be defined when the HiPath 5000 software is installed (setup). The two PDS files are created when the HiPath 5000 is started for the first time.



The PDS files must not be modified, as reading of the files using conventional tools and interpretation of the content is not possible without specialist knowledge.
In the event of an error, the PDS files can be made available to the responsible Service Support contact for diagnostic purposes. The `*.trc` and `*.dmp` files stored in the `diag` subdirectory of the installation directory should also be supplied.

12.1.1.1.2 Manual Customer Data Backup with HiPath 3000

You can perform a manual CDB backup using HiPath 3000/5000 Manager E (in online mode) or Manager T.

However, be aware that it is not possible to deliberately abort a manual backup that is initiated using Manager T. Once the CDB backup process starts, it should be ended because the back-up continues to run in the background.

You can also manually initiate a CDB restore, including the call detail data, from the MMC.

Procedure: Manual CDB backup, system restore using Manager T

Step	Activity
Manual customer data backup on the MMC	
1.	Manager T: Start system administration
2.	Menu 28 -> Edit CDB
3.	Menu 28-2 -> Back up CDB data
4.	Menu 28-2-1 -> CDB on MMC
Loading the saved customer data from the MMC into the system	
1.	Manager T: Start system administration
2.	Menu 28 -> Edit CDB
3.	Menu 28-2 -> Back up CDB data
4.	Menu 28-2-2 -> CDB from MMC **Caution:** When performing this action, the system performs a hard restart.

12.1.1.2 Customer Data Backup with HiPath Software Manager

Definition

The HiPath Software Manager supports, among other things, the backup of customer databases (Backup Manager) from all HiPath 3000/5000 systems in t114he same customer network (see also Section 12.1.7, “Backing Up System Components (Backup Manager)”).

The CDB backups are stored in a directory which must be defined in advance. The data backup can either be started manually immediately or performed at a predefined time. A cyclic backup, which saves the customer data at a set time every day, is also possible.

Refer to the help provided with the HiPath Software Manager for information on backing up customer data with this tool.

12.1.1.3 CDB Treatment When Replacing Central HiPath 3000 Hardware



A new license file is always required if a central control board that requires a license has to be replaced. As a result of the replacement, the MAC address changes and the license becomes invalid.
For information on this procedure, please see Section 8.3.7.

When replacing a central control board due to a hardware defect, for example, the following options are available for handling the CDB:

- **Procedure: After replacing the board, load the “current” CDB to the system**

Step	Activity
1.	Copy the current CDB and save it on the MMC.
2.	Disconnect the system from the power supply.
3.	Remove the MMC.
4.	Replace the central control board.
5.	Insert the MMC.
6.	Restart the system by plugging in the power plug.
7.	The CDB previously stored on the MMC is loaded to the system RAM. The customer system is now configured: • The CMI mobile telephones are logged on. • The V.24 baud rate is set up. • The ACD login port is configured. • All telephone options, such as volume and display, are determined per station.

- **Procedure: After replacing the board, load the “old” CDB from the customer disk to the system**

Step	Activity
1.	Back up current CDB with HiPath 3000/5000 Manager E.
2.	Disconnect the system from the power supply.
3.	Remove the MMC.
4.	Replace the central control board.
5.	Insert the MMC.
6.	Restart the system by plugging in the power plug.
7.	Reload.
8.	If an “older” CDB update is imported, reload the CDB into the system without the Delta mode. The “hardware and CDR switch” remain inactive.
9.	Reset. The customer system is now configured. All you have to do now is • log on the CMI mobile telephones again, • reset the V.24 baud rate, • re-configure the ACD login port, • redefine all telephone configurations, such as volume and display, per station.

12.1.2 Effects of Hardware Changes on Customer Data

Any changes to the hardware must be made before creating a copy of the customer database using HiPath 3000/5000 Manager E. You must ensure that the hardware configuration on the MMC of HiPath 3000 is always current.

Hardware changes include:

- removing or inserting boards (HiPath 3000 only).
- removing or inserting telephones.
- removing or inserting add-on devices or adapters.

12.1.2.1 Inserting and Removing HiPath 3000 Boards

> **Caution**
> When using HiPath 3550, HiPath 3350, HiPath 3500, and HiPath 3300, disconnect the system from the power supply before removing or inserting boards.
> Only HiPath 3800 peripheral boards can be removed or inserted during operation.

Startup rules for inserting and removing boards

Table 12-1 Startup Rules for Inserting and Removing Boards

If	Then
Inserting new board in free slot	The board is integrated into the system according to the rules for initial startup (see Chapter 4, “Installing HiPath 3000”). • System with default numbering plan The station numbers from the new board are appended (consecutively and in ascending order) to the numbers already assigned. • System with modified numbering plan The station numbers on the new board can be in any order. Using HiPath 3000/5000 Manager E or Manager T, you can assign a specific station to a port. If the number is already assigned to a different object, you can switch both numbers.
Replacing board with same or under equipped board type	Board is activated. The same station range is used.

Table 12-1 Startup Rules for Inserting and Removing Boards

If	Then
Replacing board with over-equipped board of same type	Board is activated. The old station range is activated and the ports associated with the new board are inserted at the end. The ports are split if there is no contiguous station range available. In the case of subscriber line modules, you can use HiPath 3000/ 5000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.
Replacing with a different board type	The system does not automatically activate the board. After removing the old board, you can delete it from the database using HiPath 3000/5000 Manager E or Manager T. After you have inserted the new board, the system activates it as if it had been inserted into a free slot. However, the CDB area used by the old board is left as a gap. In the case of subscriber line modules, you can use HiPath 3000/ 5000 Manager E to retain the old station data by copying it to the new board, or you can delete it and reset the default state. Copying is not possible for trunk boards.



If you initiate a system reload on a system updated as described above, the system must be reset after the updated CDB has been installed. The reset synchronizes the port placement sequence in the system with that of the CDB.

Procedure: Exchanging boards

Step	Activity
1.	Disconnect system from power supply.
2.	Remove the board(s).
3.	Restart the system by plugging in the power plug.
4.	Delete board slot using user interface (29-4).
5.	Disconnect system from power supply.
6.	Insert new board(s).
7.	Restart the system by plugging in the power plug.
8.	Load customer data from the system. Adapt customer data to new hardware configuration. Insert new board(s), (stations, for example).
9.	Load new customer data into the system.

12.1.2.2 Exchanging Workpoint Clients

You can add or remove workpoint clients while the system is in operation. The data in the removed workpoint clients is retained.

In case of different telephone models, meaning ones that have a different number of programmable keys, the keypad layout of the previous model is retained. Add-on devices that are not plugged in retain their technical features. With the HiPath 3000/5000 Manager E, you can delete the add-on devices that are not plugged in and remove the keys that are no longer available.

12.1.3 Relocate/Transfer Application Processor Software (APS)

APS replacement/transfer is not possible with HiPath 5000. You must perform a complete software upgrade.

For system software updates, a distinction is made between

- HiPath 3000 systems **without** HiPath Software Manager and
- HiPath 3000 systems **with** HiPath Software Manager.

For networked HiPath 3000 systems with HiPath 5000 RSM, an APS update can only be performed with HiPath Software Manager.

12.1.3.1 APS Replacement/Transfer for HiPath 3000 Systems Without HiPath Software Manager

Two memory areas are reserved for the application processor software on the MMC. To be able to store two complete APS and to keep the transfer time as low as possible, part of an APS is stored in a compressed format. The APS is decompressed after it has been transferred from the MMC to the SDRAM area of the central control board.

12.1.3.1.1 Transferring an APS of HiPath 3000 by Replacing the MMC

APS replacement is only possible within a version and if a logical, compatible CDB is available.

Procedure

Step	Activity
1.	Create a backup of the current CDB and save on a customer disk for security reasons.
2.	Remove MMC with “old” APS. The flashing Run LED (0.1 s on/0.1 s off) indicates that the MMC is missing. The system remains active for call processing.
3.	Install new MMC with “new” APS. The system creates an automatic CDB backup and thus saves the current customer database (CDB) to the new MMC.
4.	An automatic reset is then performed (hard restart for entire system with the current CDB).

Step	Activity
5.	Use the “APS stamp” to verify that the new APS has been activated. Use HiPath 3000/5000 Manager E or Manager T (menu item 29-1-2) to make the necessary query.

12.1.3.1.2 APS Transfer

Options

The APS Transfer feature is available with the HiPath 3000/5000 Manager E. It facilitates

- the **on-site replacement of the APS** by means of a direct connection via the V.24 interface or preferably via the integrated analog/digital modem or via LAN.
- an **APS transfer via remote service** from a central service center using the integrated analog or digital modem or via LAN.

Function

This feature transfers the new APS in its entirety and stores it in the available area of the MMC. After the transfer, the checksum is analyzed. The system subsequently reports whether or not:

- an error was found.
  If so, you have to delete the transferred APS.
- the APS transfer was successful.
  You can then activate the APS immediately or at a later time.

Resetting the system initiates the changeover from the old APS to the new APS. If problems occur during this process, the old APS is reactivated. Once the changeover is successful, the old APS is deleted from the MMC.

In case of power outage, the SDRAM content that has no battery backup and the active APS are completely lost. By re-accessing the current APS on the MMC, the system can be restored to the state it was in prior to the power outage.

Procedure

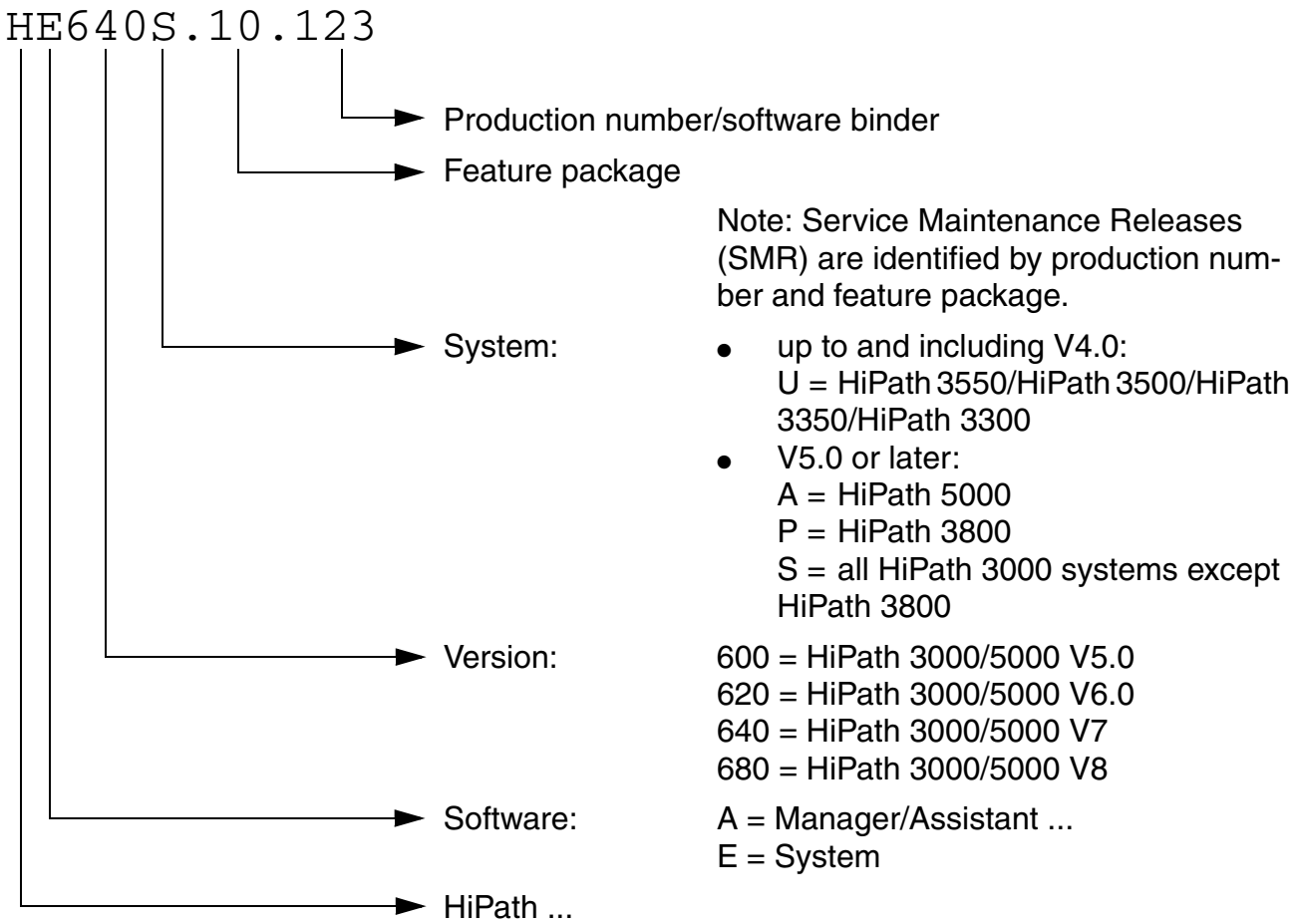
Step	Activity
1.	Save the existing customer data (for example: as “customer1.kds”).
2.	Select “Open CDB” from the HiPath 3000/5000 Manager E file menu and highlight “APS files (*.fst)”. Open the fst file using the new system software.
3.	Double-click the “Transfer” icon: Select the appropriate access and enter the PIN code.
4.	Highlight “APS Transfer”. A new window appears in the top right of the screen. You can use this window to select whether • to change directly to the APS after the transfer is completed. • to change to the APS at a pre-determined time. **Note:** If the “APS Transfer” field has a gray background, then the fst file was not opened correctly.
5.	Start the APS transfer. Transfer time for connection via digital modem (ISDN) or LAN is approximately 20 to 30 minutes. Connections via the IMODN analog modem or direct connections (V.24 interface) require longer transfer times.
6.	Once the APS transfer is completed, the HiPath 3000/5000 Manager E reports that the “APS transfer was successful”. Once the set transfer time has been reached, the system resets and the new version is used for startup.
7.	Use the “APS stamp” to verify that the new APS has been activated. Use HiPath 3000/5000 Manager E or Manager T (menu item 29-1-2) to make the necessary query.

Notes on the APS transfer sequence

- If the transfer connection is interrupted (due to a line interruption, for example), the entire APS transfer must be manually restarted via HiPath 3000/5000 Manager E. The complete APS transfer is performed again.
- Since the software is written to the MMC in compressed format during APS transfer, it must be unpacked after the transfer is complete (this takes about 5 minutes).
- After the APS transfer, the checksum is analyzed. If errors are found in the checksum, delete the transferred APS. You then have to repeat the complete APS transfer.
- Once the APS has been successfully transferred, the message “APS transfer was successful” appears. You can then finish the session.
- The system software uses a special system reset (none of the other resets initiate a changeover) to change over to the new APS.
  You cannot use the telephone while the system resets and boots up.

- After a successful changeover to the new APS, an entry in the error memory is also made and the old APS on the MMC is deactivated. This does not impede switching traffic. The deactivated area is now available for a new APS transfer. The positive or negative entry in the error memory is sent to the service center.

APS stamp: explanation using example



Software modifications for the correction of faults and the provision of a small number of new features are called software updates or service maintenance releases (SMR). A CDB conversion is not necessary.
Software upgrades are used for more extensive enhancements to the scope of services. An upgrade may also include modifications to hardware as well as error corrections. A software upgrade changes the name of the version, for example, from V1.0 to V2.0. A CDB conversion may be necessary.

12.1.3.2 APS Transfer for HiPath 3000 Systems With HiPath Software Manager

Definition

The HiPath Software Manager supports, among other things, updates of the system software (Upgrade Manager) of all HiPath 3000 systems in the same customer network. An update of the software of installed HG 1500 boards (HG 1500 V3.0 SMR-3 or later) can also be performed.

The following options are available under the menu item “Upgrade”:

- upgrade all HG 1500 boards and HiPath 3000 systems
- upgrade HG 1500 boards (HG 1500 V3.0 SMR-3 or later)
- upgrade all HiPath 3000 systems
  Note: The file format “*.fli” must be selected for APS transfer using HiPath Software Manager.

The software (APS and/or HG 1500) is updated in two steps. First, the new software is loaded to a system memory known as the “shadow area”. This occurs in the background independently of the system status.

In the second step, the new software version must be made available, in other words, the switch from the current software version to the new software version must take place. The current software is replaced by the software in the shadow area and thus deleted. The changeover can either be started immediately once the software has been loaded or performed at a predefined time.



Caution
It is important to make sure that the changeover time for a HG 1500 board does not coincide with the changeover time for the corresponding HiPath 3000, as this can render the HG 1500 board unfit for operation. The default setting of the HiPath Software Manager therefore incorporates a safety margin of 10 minutes between the changeovers.

Information about updating the system software and the HG 1500 software using HiPath Software Manager can be obtained from the help provided with this tool.

Note: If HiPath Software Manager is not available, the HG 1500 software update must be performed with HiPath 3000 Manager I (up to and including HG 1500 V2.0) or Web-based Management WBM (HG 1500 V3.0 or later).

For APS transfer using HiPath Software Manager, the HiPath 3000/5000 TFTP server must be installed on a server in the customer LAN. All HiPath 3000 systems must be able to access this HiPath 3000/5000 TFTP server over IP. Other TFTP servers cannot be used for HiPath Software Manager.

12.1.4 Determine Ccurrent System Software Version

The current version of the software can be determined using:

- HiPath 3000/5000 Manager E (*System status: System-wide – System – Software Version*)
  The current version of the software for the communication system is displayed.
- The first system client (not OpenScape Personal Edition) (29-1-2 software part number)
  The current version of the software for the communication system is displayed.

Siemens Enterprise Communications GmbH & Co. KG introduced the new "Release Management" software in October 2006.
Connected with this software are the following uniform versioning and terminology for all products and solutions:

Vx Ry.Z.n

- Vx = major release. Corresponds with the release of a new product version.
- Ry = minor release on the basis of a major release with a minor improvement in functionality.
- z = fix release on the basis of a minor release. Generally only contains the correction of bugs.
- n
  - = 0 in major releases, minor releases, and fix releases (generally available software editions).
  - = max. four-digit number for hotfixes for targeted use in case of a high-priority error (software editions on the basis of a fix release with limited availability).

Examples:

- V7 R3 .1.0 = fix release 1 for minor release 3 of major release (version) 7.
- V7 R3.5.1037 = hotfix on the basis of fix releases 5 for minor release 3 of major release (version) 7.

Software changes for the provision of new features to a smaller extent is called a minor release (MR). A CDB conversion is not necessary.
Major releases (raising of the version number) are used for more extensive enhancements to the scope of services. An upgrade may also include modifications to hardware as well as error corrections. A major release (raising of the version number) results in a change in the name of the version, for example, from V6.0 to V7. A CDB conversion may also be necessary.

12.1.5 Upgrading HiPath 3000

For information on upgrade procedures, please see Section 9.2, “Upgrading HiPath 3000”.

12.1.6 Determining System Information and Installed Software Components (HiPath Inventory Manager)

Definition

HiPath Inventory Manager is a service for detecting the installed software components and system information in a HiPath 3000/5000 network. System information is only determined upon initial start-up of the service.

The relevant information can be displayed in table format by clicking one of the following buttons:

- Master Setup
  Information including version and installation date of the master setup.
- HiPath 3000
  Hardware and software information regarding the HiPath 3000 systems in the network and the installed HG 1500 boards.
- HiPath Applications
  Information regarding the following software components:
  - MS Windows components (MS Internet Explorer, DNS server, DHCP server)
  - Media Streaming
  - TAPI
  - CCMC, CCMS, CMD, CSP, CSPL
  - Administration
  - HiPath 5000 Server
  - GetAccount
  - HiPath 3000/5000 Manager E
  - Common Software
- Operating System
  Information regarding the current operating system.

All information can be updated at any time via the “Update data” button.

The system information is automatically determined when the HiPath Inventory Manager service is started for the first time. A cyclic update can be performed every ≥ 1 days. The system information can be queried manually at any time. This should always be done before an update/upgrade, for example.

Further details on how to determine the system information using HiPath Inventory Manager can be obtained from the help provided with this tool.

12.1.7 Backing Up System Components (Backup Manager)

Definition

The HiPath Software Manager allows the following system components and databases of a HiPath 3000/5000 network to be backed up:

- Full backup (= default setting)
  This option creates a data backup for all HiPath 3000 systems and HG 1500 boards in the HiPath 3000/5000 network as well as databases (Feature Server, SQL Server).
- HG 1500 backup
  This menu item displays all HG 1500 boards in the HiPath 3000/5000 network in an overview. It is possible to back up the data of one or all of the displayed HG 1500 board(s) (HG 1500 V3.0 SMR-3 or later).
- HiPath 3000 backup
  With this menu item, all HiPath 3000 systems in the HiPath 3000/5000 network are displayed in an overview. It is possible to back up the data of a specific system or of all displayed HiPath 3000 systems.
- Database backup
  With this menu item, all databases (Feature Server, SQL Server) are displayed in an overview. It is possible to back up the data of one or of all database(s).

Refer to the help provided with the HiPath Software Manager for information on backup with this tool.

Setting options

It is possible to specify individually when a backup is to take place and where the backed up data can be stored.

- Time of data backup
  The data backup can either be started manually immediately or performed at a predefined time. By default, a full backup is performed cyclically, with the data being saved daily at a specific time.
- Backup path
  The path for the directory in which the backup files are to be stored can be specified.
- Backup to a local drive
  There is no need to specify a special user account for this type of backup.
- Backup to a network drive
  A user account (user name, password) with write permission for the network drive must be specified for this type of backup.
  If the backup source (for example HiPath 5000) is located on a separate PC, this user account must have read permission for the shared drive.

The backup path and the type of backup are preset for the HiPath Software Manager during setup.

Restoring data

The HiPath Software Manager allows damaged databases to be restored with the database backup.

The other system components are restored using HiPath 3000/5000 Manager E (for HiPath 3000) and HiPath 3000 Manager I (for HG 1500 up to and including V2.0) or Web-based management WBM (for HG 1500 V3.0 or later).

12.1.8 HiPath User Management

HiPath User Management will be implemented in Small Remote Site scenarios in HiPath 3000/5000 V5.0 and later. These are networks in which HiPath 4000 functions as a central system. HiPath 3000 systems are used in smaller branch locations (Small Remote Sites, SRS).

IP stations can be “relocated” from one branch (HiPath 3000) to another (HiPath 3000) or from the central office (HiPath 4000) to a branch (HiPath 3000) and vice versa via HiPath User Management.

Small Remote Site Concept

In normal mode, all IP workpoint clients (system clients) are registered with the central system HiPath 4000. In an emergency (failure of the central HiPath 4000 system or the CorNet IP network), the IP workpoint clients in the branch react and automatically register with their branch HiPath 3000 via the SRS concept. These workpoint clients are then available to users with all features of HiPath 3000.

The IP workpoint clients (system clients) reregister with the central HiPath 4000 system when normal mode is resumed.

The Small Remote Site concept requires that the branch systems and central system are connected with each other via an IP network. System clients (IP workpoint clients) such as OpenStage CorNet-IP (HFA) or OpenScape Personal Edition are supported.

For further information on the Small Remote Site concept, refer to the HiPath 3000/5000 V8 Feature Description.

HiPath 3000 Element Manager

The link between HiPath User Management and the HiPath 3000 systems involved is the HiPath 3000 Element Manager. For the central HiPath 4000 system, access is accomplished via Element Manager in HiPath 4000 Manager.

Element Manager allows the central administration of a Small Remote Site scenario via HiPath User Management.

After installing HiPath 3000 Element Manager, configure the HiPath 3000 systems to be administered via HiPath User Management. You can do this via the HiPath 3000 Element Manager web-based configuration interface. You can add or remove individual systems in the node configuration menu. Once you have added a system (node), any information on its configured IP workpoint clients (system clients) is retrieved immediately via SNMP.

The basic configuration of HiPath 3000 for an SRS scenario is carried out via HiPath 3000/5000 Manager E (Settings menu: Set up station (emergency mode)). User Management recognizes the configured system clients and identifies them internally as HiPath 3000 SRS telephones.

The next procedure depends on customer specifications:

- The IP workpoint clients in the Small Remote Sites (branches) should use the same call numbers in normal mode (registered with HiPath 4000) and in emergency mode (registered with HiPath 3000).

  In this case, the call numbers are assigned via HiPath User Management.
  When configuring the IP workpoint clients (system clients) via HiPath 3000/5000 Manager E their call numbers should be deleted. Otherwise it is not possible to assign call numbers via HiPath User Management without taking further steps.

- The IP workpoint clients in the Small Remote Sites (branches) should use different call numbers in normal mode (registered with HiPath 4000) and in emergency mode (registered with HiPath 3000).

  In this case, the call numbers are assigned via HiPath 3000/5000 Manager E when configuring the IP workpoint clients (system clients).
  An IP workpoint client configured in this way can then be assigned a HiPath 4000 call number for normal mode via HiPath User Management.

The following configuration data for an IP workpoint client is modified via HiPath User Management:

- Internal call number
- DID number
- Directory name
- CFSS destination
- Access groups



Refer to the HiPath User Management service and administrator documentation for information on the installation and configuration procedures for HiPath 3000/5000 and HiPath 3000 Element Manager.

12.2 Guided Maintenance

12.2.1 Assessing Displays on the HG 1500 Front Panel

The HG 1500 board has a front panel that displays the status of the V24 and the two LAN interfaces, the assignment of the individual resources (H323, D.38, PPP, and VCAPI) as well as the assignment of the DSP channels.

For more information, see the HG 1500 administrator documentation.

12.2.2 Recording HiPath 3000 Board Status

12.2.2.1 Central Control Boards

RUN LED

A RUN LED that displays the system's operating capacity is located on the central control board.

Table 12-2 RUN LED - LED Status Meaning

RUN LED	Meaning
Off	No power
On	Reset switch pressed briefly
Off	Reset switch held down for more than 5 seconds (LED is extinguished to acknowledge that a reload has begun)
On	System boot
Off for 0.1 s	Load operation: APS in SDRAM, loadware, and card data
Flashing 0.5 s on/0.5 s off	Normal operating state (zero load)[1]
Flashing 0.1 s on/0.1 s off	MMC removed or defective

1 The flashing rhythm depends on the load. The higher the system load the slower the flashing rhythm.

Options available?

You can call up the following options using the HiPath 3000/5000 Manager E:

- CMA
- CMS

- LIM
- IMODN
- MPPI, UAM (only with HiPath 3550, HiPath 3350) or UAMR (only with HiPath 3500, HiPath 3300)
  The availability of one of these Announcement and Music Modules is displayed as “Option 5”.
  The ALUM4 module cannot be displayed.

12.2.2.2 Power Supplies

Tabelle 12-3 Power Supply Status Displays

Board	Status display
HiPath 3800	
LUNA2	The LED displays the operating status (on or off).
Powerbox PB3000	The LED displays the operating status (on or off).
HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300	
PSUP	The LED displays the 5-V output voltage.
UPSC-D, UPSC-DR	• A green LED displays the 5-V output voltage. • A yellow LED displays the additional power of –48-V output voltage provided by an external power supply unit (Powerbox PB3000).
Powerbox PB3000	The LED displays the operating status (on or off).

12.2.2.3 Peripheral Boards

Viewing peripheral board status

You can use HiPath 3000/5000 Manager E or Manager T to view the status of all peripheral boards. Display is limited to the following statuses per board:

- Board not inserted
- Board defective (not loaded)
- Board disabled
- Board enabled (active)
- Board busy (at least one station or line from this board is disconnected, is being called, or is busy).

For ISDN boards, the status of the reference clock is displayed:

- No reference clock
- Reference clock for clock generator is created.

When viewing the board status using the HiPath 3000/5000 Manager E, all peripheral boards integrated into the system are presented in a table. The status display is updated every 3 seconds.

With Manager T, you can only view the status of one board at a time. You can also update the status display by pressing a key.

You cannot perform additional activities with the HiPath 3000/5000 Manager E and Manager T while viewing the status of a board.

Table 12-4 HiPath 3000/5000 Manager E - Example of Status Display of Peripheral Boards

Slot	Board	not inserted	Defective	Blocked	Free	Res.	Clock source
1	STLS2			X		X	X
2	SLU8		X				
3	SLA4			X	X		
4	TLA8		X				
5							
6							
7	TS2			X	X		
8	16SLA	X					
9							
10	SLMO24				X		

Locking out and releasing boards and ports

Using the HiPath 3000/5000 Manager E and Manager T, you can lock out a complete station or trunk module. The lockout prevents renewed seizure after the current connection has finished. Release or lockout settings are also retained after a reset.

The first SLMO/SLU board can be blocked. This action does not block the first two ports. You can block specific ports with the “Block selection” option.

Ports of an IVM or HG 1500 board cannot be locked.

When attempting to lock out the last active trunk, you are subsequently notified that remote service through the service center is no longer possible.

12.2.3 Recording HiPath 3000 Trunk Status

HiPath 3000 records the current status of each individual trunk in a table. If the status changes, the new status along with the time stamp is entered. You can use HiPath 3000/5000 Manager E to view the trunk status, in which case the following information is provided.

Data	Contents
Date	Date of the event (as stored in system)
Time	Time of the event (as stored in system)
Trunk number	Number of the trunk
Slot/Port	Slot and port number
Status	• Trunk status: – Inactive – Incoming call – Outgoing call – Trunk-to-trunk connection – Trunk disabled (using lockout switch or HiPath 3000/5000 Manager E) – Trunk failure • Number of the connected station

12.2.4 Recording Station Status

HiPath 3000 records the current status of each individual station in a table. You can use HiPath 3000/5000 Manager E to view the station status, in which case the following information is provided.

Data	Contents
Station name	Name of the selected station
Slot, port	Example: 7-1
Telephone model	Example: optiPoint 500 advance
Telephone status	Active or inactive
DID number	External number of the selected station
Language	Menu language of selected station
Connection status	• Inactive: The telephone is idle. • Busy: The telephone is off the hook, but not yet dialed. • Waiting: The telephone call is in the queue. • Connected: The telephone is connected to a second telephone with a trunk or a hunt group member. • Holding: The telephone is on hold. • Error: The connection cannot be established due to an error (for example, invalid telephone number). • Call: The telephone is called.
Connected to	The number of the connected station or trunk
Forwarding status	• Off: No call forwarding activated. • Internal: Call forwarding activated only for internal calls. • External: Call forwarding activated only for external calls. • All: Call forwarding activated for all calls.
Destination	Number of call forwarding destination

Data	Contents
Activated features	Status of activated features (on or off): • Do Not Disturb • Call forwarding (device status) • Answer text • Room monitor • Lock Code • Suppress calling ID • Call connection • Disable incoming ringing • Out of Hunt group/Group ringing • Call waiting tone • Direct Answering • Call waiting terminating • Ring transfer (only for MULAP) • Call forwarding MULAP (only for MULAP)
Stations included	List of the stations included

12.2.5 Recording the Status of the HiPath 3000 V.24 Interfaces

You can use HiPath 3000/5000 Manager E to view the current status of the V.24 interfaces, in which case the following information is provided.

- Status of the trunks (1 = active trunk, 0 = inactive trunk)
  The individual trunks are assigned as follows:
  DTR = HiPath 3000
  DSR = Telephone
  RTS = HiPath 3000
  CTS = Telephone

  This means, for example, that incorrectly connected or damaged cables can be determined (for more information on this, refer to the HiPath 3000/5000 Manager E Help).

- V.24 Monitoring
  The number of sent/received bytes within a selected time period can be recorded and then displayed/saved using a text editor (default = MS WordPad®).

The failure and restart of a V.24 interface generates an entry in the eventlog and releases a remote error signal (V.24 failure = “Check printer” error message, V.24 restart = Withdrawal of error message).

12.2.6 Trace Options for HiPath 3000

Special user rights are required for activating the Trace setting in the Maintenance menu, that are exclusively reserved by the user group Development.

12.2.6.1 Tracing ISDN Activities

This feature allows the user to trace ISDN telephones (subscriber ports) and ISDN trunks (trunk ports) in real time. ISDN activities are routed to HiPath 3000/5000 Manager E and saved in a trace file. Only the ISDN sequences are displayed on the monitor, not the content of the ISDN messages.

The feature is activated in HiPath 3000/5000 Manager E by selecting the “Call Monitoring” tab under Maintenance. The Start button starts Call Monitoring, whereupon the data of all available ports in the system is read out.

If the trace session is over, you can start the **ISDN Message Decoder** (ISDN Tracer) and use it to convert the trace file into a readable format (English only). You can also read out the trace data using remote service.

The ISDN Message Decoder is a 32-bit application which converts ISDN layer-3 messages and information elements into a readable format. Since you cannot find out from the trace file whether it deals with an information element from a Euro ISDN or a QSig configuration, you have to select the protocol. You may select the following settings from the main menu:

- Raw (default setting)
- Euro ISDN
- QSig V1
- CorNet NQ

With the “Raw” setting, the Hex values are only decoded, not interpreted. With the other two settings, the Hex values are decoded and interpreted for each feature (CC, AOC, etc.).

12.2.6.2 Tracing Call-Specific Activities

You can trace all activities that were initiated by a call for telephones, trunks, etc. These include consultation calls, conference calls, and hunt groups, for example.

12.2.7 Trace Options and Evaluations in Connection with SRTP

The Secure Realtime Transport Protocol (SRTP) is the secure version of the RTP protocol. It is used in IP telephony for transferring encrypted voice traffic.

Data can be encrypted from:

- gateway to gateway
- gateway to workpoint client
- workpoint client to workpoint client

This results in two scenarios:

- Encrypted signaling from gateway to gateway: CorNet NQ is encrypted.

  Firstly, the connection is set up via H.323. The CorNet NQ container is then sent in encrypted form via the IP network.

  Traces can be performed as usual, but do not include data in the CorNet NQ container (for example, signaling messages, station number information).

- Encrypted payload from workpoint client to workpoint client and from gateway to workpoint client: CorNet TS is encrypted.

  The connection setup via CorNet TC is already partially encrypted. The CorNet TS data records contained in this setup are completely encrypted. This means that voice data (including DTMF tones) is transmitted in encrypted form. In the case of data connections, the data is encrypted for transmission. If RFC2833 is activated (this must be activated if security is activated), information about key actions (user input indication) on the workpoint client is also encrypted and transmitted.

  The rest of the CorNet TC message is not encrypted. Messages that do not contain CorNet TS data records are not encrypted either.

  During a trace, the RTP data flow can be read out as usual. Voice quality cannot be evaluated due to payload encryption.

12.2.8 Monitoring IP Data Packages with rpcap and Wireshark (Ethereal)

12.2.8.1 Overview

Tracing via the HIP interface

The HIP interface (interface between HiPath 3000 and HG 1500) cannot be traced directly. However, external connections to the HIP interface via the LAN interfaces (LAN1: emac0 or LAN2: emac1) can be traced. When the rpcap service is launched, a server port of the HG 1500 opens. This enables direct access to TCP/IP packets by an IP trace tool such as e.g. Wireshark (Ethereal).

Wireshark is a program for analyzing network communication connections. It records data packets from HG 1500 and displays them clearly in a table.

rpcap (Remote Packet Capture)

The rpcap protocol permits programs such as Wireshark to run on the destination system as a server, recording data packets and transmitting them to a client. The client processes, analyzes and archives the data packets.

12.2.8.2 Performing Monitoring

To monitor the HG 1500 data packets, the rpcap service in the HG 1500 WBM and the IP trace tool Wireshark on administrator PC must be configured and started.

1. Configure and start the rpcap service of the HG 1500

In the HG 1500 WBM, proceed as follows:

1. Start WBM.
2. Log on as a developer.
3. Go to **Maintenance** -> **Platform Diagnosis** -> **rpcap daemon** to open the "Start rpcap daemon" window.
4. Make the following entries in the "IP address (numeric or literal):" field:
   - IP address of the HG 1500 (numeric or literal)
   - HG 1500 port
5. Click **Apply** to start the rpcap daemon. A HG 1500 server port is opened.

2. Configure Wireshark and start monitoring

In Wireshark, proceed as follows:

1. Start the program.
2. Via **Capture** -> **Options**, open the "Wireshark: Capture Options" window.
3. In the "Interface:" selection and input field, enter the following:

   `rpcap://<IP address of the HG1500>/emac0`

   or:

   `rpcap://<IP address of the HG1500>/emac1`

   Only the HG 1500 data packets are monitored.
4. In the "Capture Filter:" selection and input field, enter the following:

   `not host <IP address of the administrator PC>`

   The data packets of the administrator PC are excluded.
5. Set additional settings as appropriate, see www.wireshark.org.
6. Click **Start** to begin recording data packets. The data stream that comes from HG 1500 is displayed.

3. Stopping monitoring

To stop monitoring, you must proceed in the following sequence in order to prevent HG 1500 from crashing:

1. Stop Wireshark via **Capture** -> **Stop**.
2. Stop the HG 1500 rpcap daemon:
   1. In the WBM via **Maintenance** -> **Platform Diagnosis** -> **rpcap daemon**, open the "Stop rpcap daemon" window. Under "Client identification for access control", the HG 1500 IP address entered above is shown in the "IP address (numeric or literal):" field.
   2. Click **Apply** to stop the rpcap daemon. The HG 1500 server port is closed. Access, for example via Wireshark is no longer possible.

12.2.9 HiPath Manager PCM Trace Monitor for HiPath 5000

12.2.9.1 HiPath Manager PCM Trace Monitor Applications

Communication between the different HiPath 5000 applications is organized using various buffer tables and messages. You can monitor the individual entries in the different buffer tables, exchanged immediate messages, program and communication messages for the relevant component in a separate trace window, in other words, a separate window is opened for each component (application).

The trace windows can be viewed using the Trace Monitor and swapped out for further processing.



This documentation does not cover interpretation of the trace window contents by the Trace Monitor. Trace files are used for problem analysis and are interpreted by Service Support during servicing.
The description below can be used to determine the work steps required for Trace Monitor navigation and control and for swapping out the trace contents to a file.

Trace messages can be displayed for the following HiPath 5000 applications:

- Feature Server
  Two trace files are available:
  - `\winnt\system32\carlogfile.txt`
    provides details on which HG 1500 boards have logged on to the network and when.
  - `\winnt\system32\rgtracefile.txt`
    provides details on when the individual HG 1500 boards were assigned a station number.
- Presence Manager
  Two trace files are available:
  - `\winnt\system32\dssdiagnosefile.txt`
  - `\winnt\system32\dsslogfile.txt`
- HiPath Manager PCM Administration
  Administration of the configuration parameters for component control by the user, for general parameters, for call charge evaluation and analysis.
- HiPath GetAccount
  Internal component that is responsible for evaluating and saving call charges and for immediate printing.

12.2.9.2 Starting and Exiting the Trace Monitor

The `HiPath Manager PCM` program group was created when installing the HiPath Manager PCM server. Administration and the trace monitor were integrated here.

To start the Trace Monitor, select `Start - Programs - HiPath - HiPath Manager PCM Trace Monitor for HiPath Applications`.

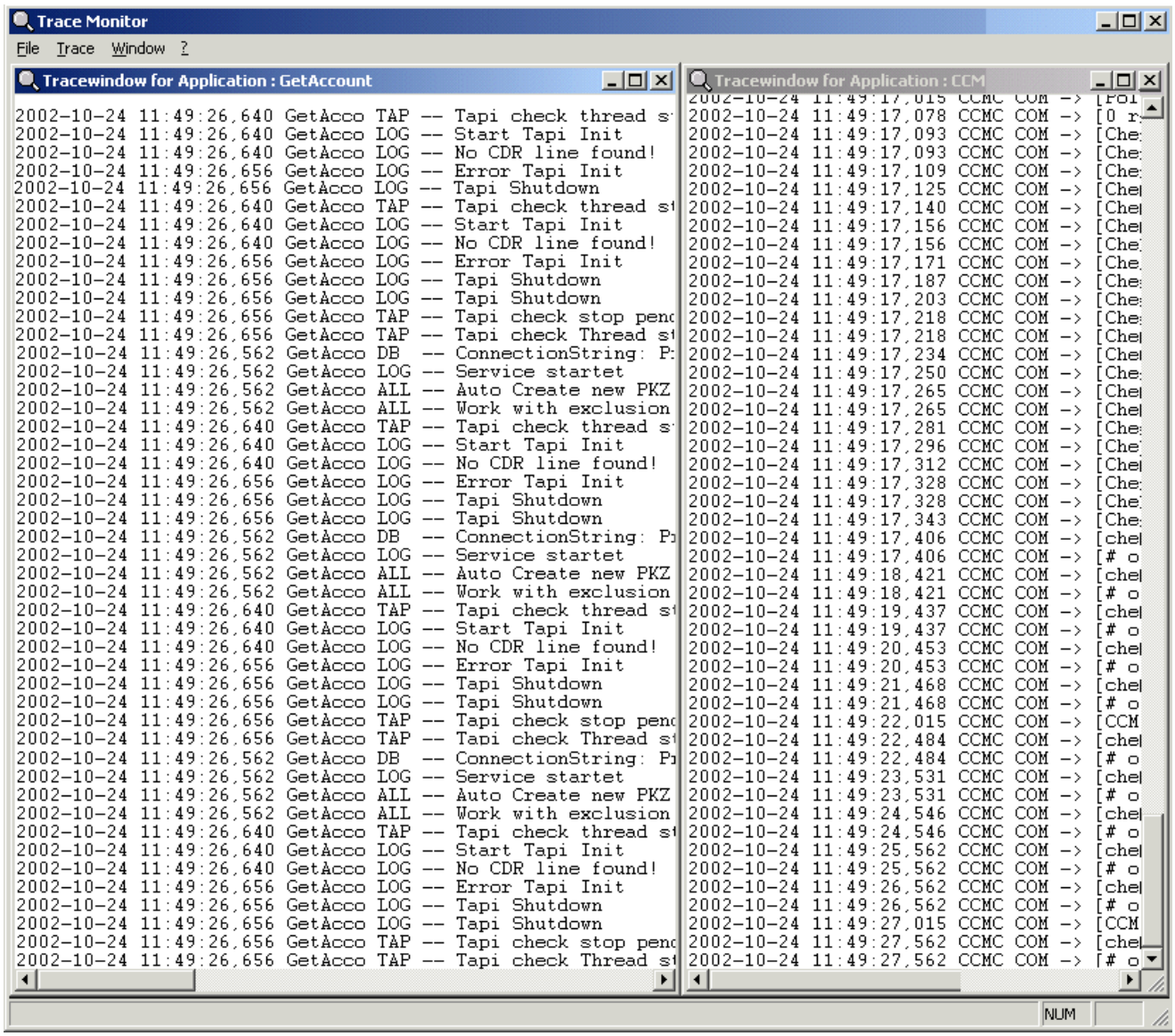


Figure 12-1 Trace Monitor

The Trace Monitor can be closed with **Exit** in the File menu, with the key combination Alt + F4 or with the Trace Monitor system menu.

12.2.9.3 The Screen Layout of the Trace Monitor

When you start the Trace Monitor, an application window with the following layout appears:

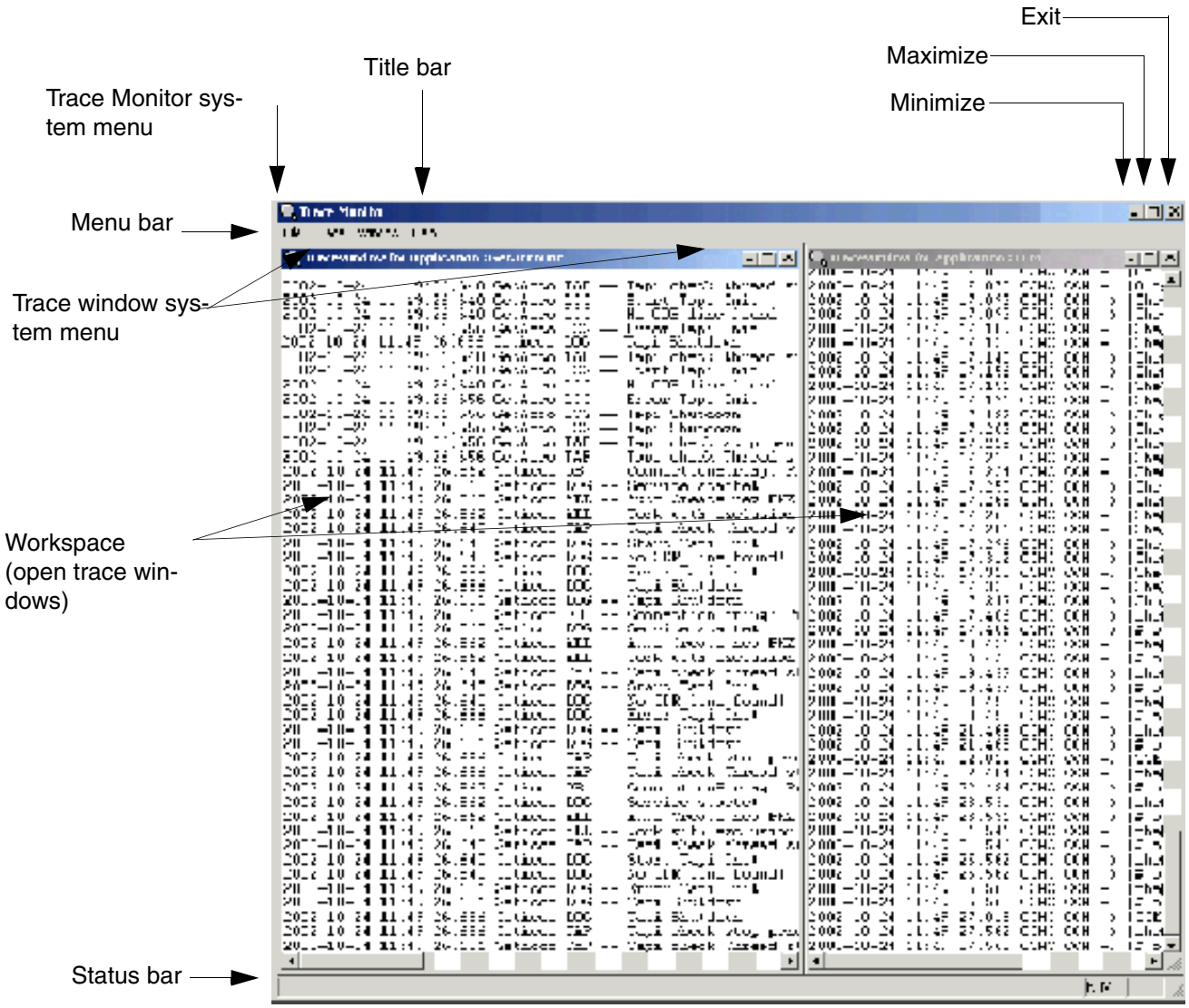


Figure 12-2 The Screen Layout of the Trace Monitor

The Trace Monitor menu bar lists the available menus/menu items.

Table 12-5 Trace Monitor Menu Functions

Menu name	Menu item	Function
File	Print Setup	Setup of the printer for the output of trace messages to the printer.
	Exit	Closes the Trace Monitor
Trace	Use Hex font	The output of special trace messages with non-displaying characters is displayed in a hex font (option active) or in ANSI font (option not active). Default messages are always displayed in ANSI format.
	Colored Text	Toggles between color (option active) and black-and-white display (option not active) for trace messages.
	Add Date/Timestamp	Inserts a timestamp in each new trace message when the option is active.
	Show Window for new Application	If this option is active, one of the applications that writes trace messages is immediately displayed in a separate trace window when it is activated. If the option is not active, trace windows for active applications can be opened or closed manually by selecting the entry Trace - <Name of Application>.
Window	Cascade	Displays the trace windows in a cascade.
	Tile Vertically	Displays the trace windows side by side.
	Tile Horizontally	Displays the trace windows one above the other.
	Arrange Icons	Arranges the trace windows reduced to an icon.
?	About...	Activates Trace Monitor program information.

12.2.9.4 General Functions

Opening and closing a trace window

The following options are available for opening and closing trace windows:

- **Automatic**
  Select the option Show New Logon Immediately (checkmark visible next to menu item) in the Trace menu to activate the automatic opening/closure of trace windows when the relevant application is started/exited. To disable this option, select the entry again. The checkmark is removed.

- **Manual**
  If this option is not set, you can open and close the trace windows for the active applications manually. The Trace menu should be activated for this purpose. The first entries displayed are the available trace windows. Open trace windows are checkmarked.

  – To open a closed window you must activate the entry. The checkmark is set and the trace window is opened.

  – To close an open window you must reactivate the entry. The checkmark disappears and the trace window is closed.

Print trace window content

You also have an option that allows you to output the current status of a trace window to the configured Trace Monitor printer for documentation purposes. For this, select the **Print Messages** entry via the System menu or, alternatively, the Context menu (right click in the Trace window) of the relevant Trace window. The current contents of the trace window are then sent to the configured printer.

Deleting the contents of the trace window

To delete the contents of a trace window, select the **Delete Messages** entry via the system menu or, alternatively, the Context menu (right click in the Trace window) of the relevant Trace window. The contents are deleted and the window is empty.

Freezing the contents of a trace window

To stop messages scrolling, you can freeze the current status of the trace window display. For this, select the **Stop Window Scrolling** entry via the system menu or, alternatively, the Context menu (right-click in the Trace window) of the relevant Trace window. The contents of the trace window are frozen. New trace messages are loaded to the buffer, but are no longer displayed.

To disable this option, select the menu item **Stop Window Scrolling** again. The option is removed and recent messages are displayed.

Arranging trace windows

The active Trace Monitor trace windows can be arranged as follows:

- Cascade
  Using the key combination  +  or via the **Cascade** entry in the menu window.

- Tile Horizontally
  Using the key combination ⇧ + F6 or via the **Tile Horizontally** entry in the menu window.
- Tile Vertically
  Using the key combination ⇧ + F4 or via the **Tile Vertically** entry in the menu window.

If the Trace windows are minimized as symbols, these can be arranged using the status bar. For this, select the **Arrange Icons** entry in the menu window.

12.2.9.5 Exporting Trace Windows

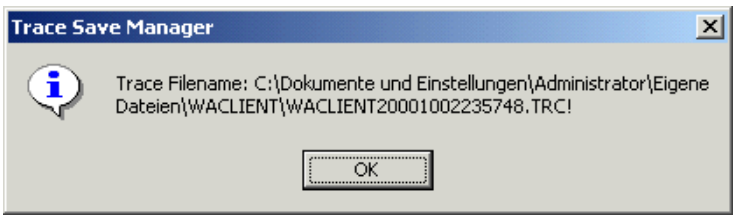
Each trace window has a capacity of 1,000 (for the Server PC under Windows 95/98) or 5,000 entries (for the Server PC under Windows NT or Windows 2000). When this capacity is reached, the oldest entry is deleted from the trace window for each new entry.

To document a current situation from a trace window, you can save the current status of a trace window to a swap file.

Procedure

1. The **Write Messages to File** entry should be selected via the system menu or, alternatively, the context menu (right-click in the Trace window) of the relevant Trace window.

   A message box containing the path and file name of the swap file for the trace window appears:



2. Confirm the message with **OK**.

The default **destination directory** for swap files is the Windows 2000 shell user directory:

```
C:\Documents and Settings
    \[Windows User]
      \My Documents
        \[Application ID]
          \[Trace File Name]
```

The following naming conventions apply to swap files:

```
<Application ID><Time>.trc
```

The time is stored in YYYYMMDDhhmm format.

Example of a file name for a swapped-out trace file

Windows User: Meier
Application: GetAccount
Exported on: 06.09.2004
at: 16:57:

```
C:\Documents and Settings
    \Meier
      \My Documents
        \WACLIENT          \WACLIENT200409061657.trc
```

12.2.10 Eventlog for HiPath 3000

HiPath 3000 features an eventlog where accrued errors are classified according to error class and error number with the date/time of the original error. You can use HiPath 3000/5000 Manager E to read out the eventlog.

Section 12.2.16 contains information on the possible entries.

12.2.11 Testing Telephones

After startup and country adaptation, you can activate the terminal test on any optiPoint 600 office (in $U_{P0/E}$ mode), OpenStage, optiPoint 410 and optiPoint 420 telephone using a code or the service menu.

It is not possible to perform the terminal test on optiPoint 410 S and optiPoint 420 S telephones.

This test checks the display (your number is displayed), LEDs, and ring tones. The tests ends automatically after a period of time. The test allows you to perform a visual and acoustic check of the components to ensure that they are functioning properly.

Test procedure on the system telephone

Table 12-6 Terminal Test

Step	Entry	Description
1.	*940	Code for terminal test
2.	–	For approximately five seconds, all LEDs blink quickly (except for the Service menu LED), all display pixels are activated, and you can hear a tone.



If the test does not react as described, an additional power supply (plug-in power supply unit) for the relevant system telephone may be necessary.

The phone number, date and time are normally shown in the display. If a different text appears (“Gateway not found”, for example), this means that there is an error.
Correct the error by following the administration instructions for the relevant telephone.

12.2.12 Event Viewer for HiPath 5000 (Eventlog)

Introduction

The Event Viewer (Eventlog) is one of the tools supplied with NT-based operating systems (Microsoft Windows NT, Microsoft Windows 2000, Microsoft Windows XP, etc.). The Event Viewer administers logs that record information on programs, security, and system events on the computer. You can use it to display and administer eventlogs, to gather information on hardware and software problems, and to monitor security events.

You can use this standard tool to obtain status information for the HiPath 5000 server and any application server present.

All events associated with the server(s) and its (their) applications are saved. The events provide a quick and, above all, time-specific overview of all relevant actions (status, information, warning, error, etc.).

The tool itself handles the event entries. You can specify the length of the event file, the validity of events in days, the reaction when the maximum size has been reached, and the display filter, for example.

You can save the resulting event file (log file) under any name.

Starting the Event Viewer

Start the Event Viewer from the Windows Start menu: `Start/Programs/Administrative Tools/Event Viewer`

The Event Viewer associated with other application servers present can be opened via the HiPath 5000 server. To do this, select the relevant server in the network browser under `Operation/Connect to another computer/Other computer`.

Configuring the Event Viewer

The Event Viewer has at least three areas:

- System log: information on all operating system components
- Security log: information on changes to the security system and possible system violations
- Application log: application events

You can configure these areas independently of one another by marking the area and selecting `Operation/Properties`:

- The maximum log size (in KB) and the reaction if this value is exceeded are defined under “General”. 1.44 MB (= capacity of a floppy disk) is the recommended log size. “Overwrite events where necessary” is the recommended setting.
- You can select an event source under “Filter” for example, to display only the entries for the HiPath 5000 server. You can further restrict the output under Category and Event ID.

Evaluating events

Double-click an entry in an Event Viewer area to obtain more precise information on an event. Use the two arrow buttons to spring from one event to the next.

The HiPath 5000 Server entries in Table 12-8 are currently supported.

Saving the event file (log file)

If problems occur within the customer network, you can save an Event Viewer area as an event log (log file) and then forward this file to the relevant Service Support personnel for further diagnosis.

Always save an eventlog (log file) in evt file format (file extension `*.evt`). The Event Viewer can only read and configure the file if it is in this format.

12.2.13 HiPath Fault Management

HiPath 3000 and HiPath 5000 systems have a separate SNMP agent that allows access to various system data that is stored in its MIB or Management Information database. The MIB provides basic system information, status information, event-related data, and information on installed hardware (slots) and configured connections (ports).

HiPath Fault Management can read information from the HiPath 3000 and HiPath 5000 system MIB via SNMP requests. This allows the system to permanently monitor the status of the network components and to include changes of status in the network administrator information.

A graphic map of the network displays the topology and the current status of the network components.

For detailed information, refer to the product-specific documentation for HiPath Fault Management.

SNMP functions

Simple Network Management Protocol (SNMP) represents a convenient platform within the TCP/IP protocol family for management tasks in the HiPath 3000 and HiPath 5000 software. SNMP is used more or less as a management agent on HiPath 3000 and HiPath 5000 and handles central monitoring and administration of LAN network components, including the HiPath 3000 and HiPath 5000. It is possible to:

- address the HiPath 3000 and HiPath 5000 over the TCP/IP protocol family.
- access data from external management applications such as HiPath Fault Management.
- implement remote maintenance jobs (such as online port status, disabling and enabling ports, and determining free ports).
- transmit service-related Class B errors.
- visualize the operating status of a HiPath 3000 and HiPath 5000.

12.2.14 Licensing Analysis



This documentation does not cover interpretation of the analysis data. Trace files, log files, etc. are used for problem analysis and are interpreted by Service Support during servicing.

12.2.14.1 Analysis Using Customer License Manager (CLM)

The CLM installation directory (for example, `C:\Program Files\licensing\license manager`) contains the `Trace` directory among other things. Each time the TomCat Web server is started, a new subdirectory is created to which the trace output is then written. Trace output can be viewed using MS Internet Explorer.

You can define the size of the trace files as well as the degree of detail of a trace in a configuration file (in the example `C:\Program Files\licensing\license manager\Apache Tomcat\ClmSettings.xml`):

`<TraceFilesQuantity>3</TraceFilesQuantity>`
This value (for example 3) indicates how many trace files are used cyclically.

`<TraceFileEntries>1000</TraceFileEntries>`
This value (for example 1000) defines the maximum number of trace entries per trace file.

`<TraceLevel>4</TraceLevel>`
This value (1 – 8) defines the degree of detail: 1 = Low (important events only), 4 = Standard (including external interfaces), 8 = All.

12.2.14.2 Analysis Using Customer License Agent (CLA)

The CLA offers two analysis options:

Log files

The Customer License Agent (CLA) manages a configuration log and error log. Both logs are viewed using the CLM. This provides a good overview of an error situation that helps to narrow down an error to a specific area, for example.

Trace files

The CLA records detailed information about its internal processes in a text file that is stored in the `bin` subdirectory of its installation directory. The degree of detail (off, low, standard, all) and the size (in MB) of this recorded information can be defined using the Customer License Manager (CLM).

Extensive reconstruction of an error is generally made possible by setting 100 MB for the size and a “standard” degree of detail.

12.2.15 Analysis Using HiPath Software Manager and HiPath Inventory Manager



This documentation does not cover interpretation of the analysis data. Trace files, log files, etc. are used for problem analysis and are interpreted by Service Support during servicing.

Trace files

The installation directory of the Common Web Service (default = `C:\Program Files\siemens\hipath\commonweb`) contains, among other things, the `Trace` directory, in which the trace files for the Web applications HiPath Software Manager and HiPath Inventory Manager are stored.

This directory name is saved in a registry key during installation. If this key cannot be accessed, the trace files are stored in the temporary system directory (as the Common Web Service is started as a system service). Under MS Windows 2000, this directory normally has the name `C:\WINNT\temp`, while under MS Windows 2003 it is called `C:\WINDOWS\temp`.

Each time a Web application is started by the Common Web Service (TomCat Web server), a separate subdirectory is created. This subdirectory contains the trace files in XML format. The subdirectory name follows the convention `date_<DATE>_time_<TIME>`.

In order to enable service support to perform diagnosis, the complete `Trace` directory must be made available. Adaptations for more detailed traces can be made in consultation with service support using the CFG files in the `config` directory. These adaptations refer to the degree of detail (level) of the trace file and application options for the components of all Web applications.

Inventory diagnosis data

When the HiPath Inventory Manager is operated with the “verbose mode” flag set (on the settings page), the following XML files are saved in the temporary directory of the system (see above):

- `swmreport.xml` – contains the information generated during an update of the system information by the HiPath Software Manager.
- `invdataos.xml` – contains the data for the operating system for the last update.
- `invdatasnmp.xml` – contains the data for the HiPath 3000/5000 network from the last update.
- `invdataapps.xml` – contains the data for the applications from the last update.
- `invdatamaster.xml` – contains the data for the master setup from the last update.

12.2.16 HiPath 3000 Error Messages (Entries in the Eventlog for HiPath 3000)

Classification

Accrued errors are classified according to error class and error number. The three different error classes are described below:

- **Error Class A** = Customer-related error
  HiPath 3000/5000 Manager E fails to issue a signal/message. Class A errors are indicated on the optiPoint Attendant display. They can be corrected by the customer without service support.

  The following error messages are implemented at present:

  – “Printer Alarm” (caused by paper out, for example)

  – “Fan Failure” (caused by failure of the fan with HiPath 3500 or HiPath 3300)

  – “Revisor Alarm” (caused by overflow of the log part of the MMC, for example).

  – “Too Many Key Modules” (caused by attaching more than the maximum possible number of optiPoint key modules specified in Table 10-9)

- **Error Class B** = Service-related errors
  Class B errors can be read out via the HiPath 3000/5000 Manager E Event Log, which can be automatically forwarded to a service center.
  Errors of this class are, for example, failure of the boards, individual ports, or trunks. You can generally correct these errors by replacing the hardware, re-configuring the customer database, or by working together with the carrier. Table 12-7 lists all Class B errors.

- **Error Class C** = Development-related errors
  HiPath 3000/5000 Manager E fails to issue a signal/message.
  Class C errors require diagnosis and problem analysis by specialists.

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
Error Class 01 - General Messages				
01-003	!System Restart	Hard restart (reset) of entire system with current CDB.	None	
01-010	!SNMP System Restart	Hard restart of entire system via SNMP.	None	
01-014	local DB changes	“On site” changes to the database.	None	
01-015	remote DB changes	“Remote” changes to the database.	None	
01-016	!SNMP APSXF result	APS transfer acknowledgement message via SNMP.	None	
01-017	!SNMP authentication fail	Unauthorized access attempt.	Check firewall settings in HiPath 3000/5000 Manager E (*Network – Firewall*).	
01-018	!SNMP 80 % high watermark of logfile	Changes logged internally in the system: 80% of write capacity used.	Read out data using HiPath 3000/5000 Manager E (*Transfer – Security – Protocol*).	
01-019	!Sensor Alarm	Temperature in HiPath 3500/HiPath 3300 19-inch housing is too high.	Check the fan and air supply in the 19-inch housing. Note the ambient temperature.	
01-020	!CDR buffer limit reached	Overflow in the CDR buffer (CDR information).	Check that the interfaces (V.24, LAN), ports and the connection are functioning or read out call data.	
01-021	!Authentication Failure	Unauthorized access attempt.	Check firewall settings in HiPath 3000/5000 Manager E (*Network – Firewall*).	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
01-022	!Flash deleted	Flash area deleted.	None	APS transfer possible again.
01-023	!Process stopped	Process stopped.	Perform hard restart (reset).	
01-024	!unauthorized application	Attempted access via an unauthorized application.	Check firewall settings in HiPath 3000/5000 Manager E (*Network – Firewall*).	
01-025	!manual switchback from HiPath Manager			
Error Class 02 - License Management Messages				
02-002	!START Grace Period	HiPath License Management: Start of grace period.	None	The remaining license validity period is shown on the display.
02-003	!START Reg. Lic File	HiPath License Management: Start of regular licensing.	None	
Error Class 09 - Hardware Module Messages				
09-000	!microprocessor fault on, common	Microprocessor error.	Check power at the power supply unit. If this error persists, replace the central control board.	
09-001	!microprocessor fault off, common	The microprocessor error has been corrected.	None	
09-002	!loadware memory fault on, common	Error in loadware memory.	Replace the board if necessary.	
09-003	!loadware memory fault off, common	Error in loadware memory has been corrected.	None	
09-029	!line interruption (error on)	Line interruption	Check the line and terminal.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
09-030	!short circuit (error on)	Short circuit on the board specified.	Check the line, terminal, and port.	
09-031	!under voltage (error on)	Under voltage.	Check the power and line at the terminal's power supply unit.	
09-032	!thermal overload (error on)	The specified board is overheated.	Check the fan and air supply in the 19-inch housing. Note the ambient temperature.	
09-036	!slip detected on (STMD)	A bit slip has occurred on an ISDN line.	Check the S_0 line. If necessary, reload the board or perform a hard restart. If the error persists, set up an ISDN trace.	The problem may be caused by asynchronous internal and external clock rates. Data loss possible/connection may be terminated.
09-037	!slip detected off (STMD)	The bit slip on the ISDN line has been corrected.	None	
09-038	!alarm indication signal error on (TMS2M)	Alarm display: An S_{2M} error has occurred. Physical line/board problem (too many CRC/SLIP errors).	Check the S_{2M} line and board. Replace the board if necessary. If the error persists, set up an ISDN trace.	
09-039	!alarm indication signal error off(TMS2M)	Alarm display: The S_{2M} error has been corrected.	None	
09-042	!no signal error on (TMS2M/STMD)	Alarm display: An S_{2M} error has occurred. No physical connection available.	Check the S_{2M} line and board. If necessary, reload the board or perform a hard restart. If the error persists, set up an ISDN trace.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
09-043	!no signal error off (TMS2M/STMD)	Alarm display: The S_{2M} error has been corrected.	None	
09-044	!receive remote alarm error on (TMS2M)	Alarm display: An S_{2M} error has occurred. Physical problem with the communication partner (too many CRC/SLIP errors).	Check the board and partner system or arrange for a technician to do so.	
09-045	!receive remote alarm error off (TMS2M)	Alarm display: The S_{2M} error has been corrected.	None	
09-048	!bitslip error on (TMS2M)	A bit slip has occurred on an ISDN line.	Check the S_{2M} line. If necessary, reload the board or perform a hard restart. If the error persists, set up an ISDN trace.	The problem may be caused by asynchronous internal and external clock rates. Data loss possible/connection may be terminated.
09-049	!bitslip error off (TMS2M)	The bit slip on the ISDN line has been corrected.	None	
09-050	!loss of synchronisation error on (TMS2M)	A synchronization error has occurred.	Check the S_{2M} line. If necessary, reload the board or perform a hard restart. If the error persists, set up an ISDN trace.	The problem may be caused by asynchronous internal and external clock rates. Data loss possible/connection may be terminated.

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
09-051	!loss of synchro-nisation error off (TMS2M)	The synchroniza-tion error has been corrected.	None	
09-058	!Self test error on (SLMO)	Error while self-testing the speci-fied SLMO board.	If necessary, replace the board or change the slot.	
09-059	!Self test error off (SLMO)	Error while self-testing the speci-fied SLMO board has been correct-ed.	None	
09-061	!Overcurrent on power controller on (SLMO)	Overcurrent on the specified SLMO board.	Check the power and line on the terminal and power sup-ply unit. Replace hardware if neces-sary.	
09-062	!Overcurrent on power controller off (SLMO	Overcurrent on the specified SLMO board has been corrected.	None	
09-065	!Out of buffers for card error on	Insufficient pool capacity on the specified SLMO board.	Check lines and terminals. Set up a default trace. • High traffic load: –> Dis-tribute load to several boards. • Board is faulty: -> Re-place board.	
09-066	!Out of buffers for card error off	Insufficient pool capacity on the specified SLMO board has been corrected.	None	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
Error Class 11 – General Messages				
11-058	!Too many L1 errors	Too many layer 1 errors.	Check the lines, terminal, and port. A short circuit may have occurred.	
Error Class 12 – Processor Exceptions				
12-000	Initial Stack Ptr	Reset: Initial Stack Pointer	Create a trace. Create a stack dump. Save a snapshot.	
12-001	Initial Prg. Counter	Reset: Initial Program Counter	Create a trace. Create a stack dump. Save a snapshot.	
12-002	bus_error	Interrupt Bus Error	Create a trace. Create a stack dump. Save a snapshot. In the case of HiPath 3550 or HiPath 3500, this problem may be caused by a software error –> Upgrade required.	
12-003	address_error	Interrupt Address Error	Create a trace. Create a stack dump. Save a snapshot.	
12-004	illegal_instruction	Interrupt Illegal Instruction	Create a trace. Create a stack dump. Save a snapshot.	
12-005	zero_division	Interrupt Zero Division	Create a trace. Create a stack dump. Save a snapshot.	
12-006	Invalid opcode	Invalid Opcode Exception	Create a trace. Create a stack dump. Save a snapshot.	
12-007	TRAP V Instructions	TRAPcc, TRAP V Instructions	Create a trace. Create a stack dump. Save a snapshot.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
12-008	Privilege Violation	Privilege Violation	Create a trace. Create a stack dump. Save a snapshot.	
12-009	Trace	Trace	Create a trace. Create a stack dump. Save a snapshot.	
12-010	Line 1010 Emulator	Line 1010 Emulator	Create a trace. Create a stack dump. Save a snapshot.	
12-011	Line 1111 Emulator	Line 1111 Emulator	Create a trace. Create a stack dump. Save a snapshot.	
12-012	Hardware Breakpoint	Hardware Breakpoint	Create a trace. Create a stack dump. Save a snapshot.	
12-013	Reserved Coproc. Violation	Reserved Coprocessor Violation	Create a trace. Create a stack dump. Save a snapshot.	
12-014	Format Error Uninit. Inter.	Format Error Uninitialized Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-015	Format Error Uninit. Inter.	Format Error Uninitialized Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-017	critical input interrupt	HiPath 3800, Offset 0x0100, Critical Input Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-018	machine check interrupt	HiPath 3800, Offset 0x0200, Machine Check Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-019	data storage interrupt	HiPath 3800, Offset 0x0300, Data Storage Interrupt	Create a trace. Create a stack dump. Save a snapshot.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
12-020	instr. storage interrupt	HiPath 3800, Offset 0x0400, Instruction Storage Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-021	alignment interrupt	HiPath 3800, Offset 0x0600, Alignment Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-022	program interrupt	HiPath 3800, Offset 0x0700, Program Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-023	system call interrupt	HiPath 3800, Offset 0x0C00, System Call Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-025	watchdog timer interrupt	HiPath 3800, Offset 0x1020, Watchdog Timer Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-026	Data TLB interrupt	HiPath 3800, Offset 0x1100, Data TLB Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-027	Instruction TLB interrupt	HiPath 3800, Offset 0x1200, Instruction TLB Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
12-028	debug interrupt	HiPath 3800, Offset 0x2000, Debug Interrupt	Create a trace. Create a stack dump. Save a snapshot.	
Error Class 15 – Messages Concerning APS Transfer and Saving on Flash				
15-000	!Req to switch over APSXF	Request for APS transfer.	None	
15-001	!APS switched over KDS ok	APS transfer was successful.	None	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
15-002	!APS switched over def. KDS	APS transfer was not successful. Default CDB loaded.	Check CDB version.	
15-003	!CRC checksum error	Error in CRC checksum.	Check APS version. Retransfer APS. If the error persists, replace the MMC module.	
15-004	!APS switched back def. KDS	APS transfer was not successful. Default CDB loaded.	Load stored CDB into the system. Check APS version. Provide snapshot and stack dump for analysis. Restart APS transfer or perform a speed upgrade. If the error persists, replace the MMC module.	An error occurred while starting up the new APS. The system has switched back to the old APS. As a result, the CDB was set to “Default”.
15-005	!APS switched back old KDS	APS transfer was not successful. Old CDB loaded.	Load stored CDB onto the system. Check APS version. Provide snapshot and stack dump for analysis. Restart APS transfer or perform a speed upgrade. If the error persists, replace the MMC module.	An error occurred while starting up the new APS. The system has switched back to the old APS.
15-006	!APS Transfer disconnected	APS transfer interrupted.	Check the transmission link and interface. Restart APS transfer.	
15-007	!Country-text transfered	Country-specific texts successfully transferred.	None	
15-008	!Error by deleting MMC	Shadow APS cannot be deleted.	Check APS version. Restart APS transfer. If the error persists, replace the MMC module.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
15-009	!Blck_lenght err apsxf/ctxt	Block length error during country-specific text transfer.	Check the transmission link and interface. Retransfer APS.	
15-010	!Rest_length err apsxf/ctxt	Remaining length error during country-specific text transfer.	Check the transmission link and interface. Retransfer APS.	
15-011	!Speed-Upgrade	Speed upgrade was successful.	None	Software was updated. Previous CDB is still used.
15-012	!APSXF aborded	APS transfer was manually stopped.	None	
Error Class 16 – Operating System Messages				
16-001	GET-POOL xx, xx from=xx addr=xxxxxxxx	Error in system pool administration.	Set up a trace using information from BLS (Back Level Support). Create a stack dump. Save a snapshot.	
16-002	RELPL xxxxxxxxx len=xxxx, from=xx	Error in system pool administration.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
16-004	!Error in Cosmos-Send	COSMOS send error (software message transmission).	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
16-005	!Error in Cosmos-Timer	COSMOS timer error (software timer administration).	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
16-006	!Error in Cosmos-Receive	COSMOS receive error (software message receipt).	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
16-007	COSMOS ID=xx opcode=0xnnnn ercode=0xnnnn	COSMOS error during restart	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
16-009	RESTARTED: watchdog	Overload or continuous loops during software operation. System watchdog restarted the system.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	The system was un able to reach idle status within approximately ten minutes.
16-010	RESTARTED: manual Reset	Hard restart (reset) was manually triggered.	None	
16-011	RESTARTED: manual Reload	Manual reload.	None	The CDB is reset to default status.
16-012	RESTARTED: Power down	No power	Check line voltage. Check power supply.	
16-013	!KDS bakkup not performed	Customer data was not backed up to MMC.	Check the MMC module and replace if necessary.	
16-014	RESTARTED: unknown rest. HW-ind. mismatched	Hardware reports an unknown reset reason.	Check environmental influences (for example, grounding). Central control board problem: -> Replace board.	
16-015	!general error logging	Error while writing the log file to the MMC module.	Check the MMC module and replace if necessary.	
16-017	!CTXT take over failed	Country-specific texts cannot be applied.	Retransfer country-specific texts and change the language again.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
16-020	!CSTA: length out of range	CSTA interface: Required length exceeds the permitted range. Incorrect internal parameters.	Use the CSTA browser (application emulation) to check the CSTA interface. Set up a CSTA trace and a default system trace. Check whether or not the application has been released.	
16-021	!CSTA: Alloc() error	CSTA interface: Allocation fails.	Use the CSTA browser (application emulation) to check the CSTA interface. Set up a default trace with CSTA.	
16-023	APS x fetched from MMC	Startup acknowledgement after speed upgrade.	None	
16-024	!idle arrived after restart	System has reached idle status after restart.	None	
16-030	!exceed. of CSTA mon. pts	Number of CSTA monitor points exceeded.	Check the number of subscribers, lines, and ACD groups configured.	
Error Class 18 – Messages Concerning Database Handling and License Management				
18-012	HLM:Start grace period	HiPath License Management: Grace period started.	If necessary, load license from the CLS and relicense the system.	The remaining license validity period is shown on the display.
18-016	HLM:Feat-ID: xxx expiration started	HiPath License Management: The specified feature is still valid for up to 30 days.	If the customer still requires this feature, a new license file must be ordered and loaded to the system.	The remaining license validity period is shown on the display.

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
18-017	HLM:Feat-ID: xxx expired	HiPath License Management: The validity period of the specified feature has expired.	If the customer still requires this feature, a new license file must be ordered and loaded to the system.	
18-018	HLM: set license to default	HiPath License Management: All licenses have been deleted.	Load license from the CLS and relicense the system.	This error only occurs in combination with the following error messages: 1. HLM: Invalid license data. 2. HLM: MAC ID mismatch. 3. HLM: Lic failure period stopped default lic. 4. HLM: Grace period stopped, default license. All licenses are deleted in each of these cases.
18-019	HLM: Invalid license data	HiPath License Management: The license file is invalid or has been manipulated.	Check licensing. Load the original license file from the CLS and relicense the system.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
18-020	HLM:Lic failure period started	HiPath License Management: The system is no longer connected to HiPath 5000 RSM.	Check and reestablish the connection to HiPath 5000 RSM.	The system was licensed in a network and is now no longer connected to HiPath 5000 RSM. You have 30 days to reestablish the connection. All system licenses will be deleted after this period.
18-021	HLM:Lic failure period stopped license ok	HiPath License Management: The connection between the system and HiPath 5000 RSM is reestablished.	None	
18-022	HLM: Lic failure period stopped default lic	HiPath License Management: The connection between the system and HiPath 5000 RSM was not reestablished within 30 days. All licenses were deleted.	Check and reestablish the connection to HiPath 5000 RSM. Load license from the CLS and relicense the system.	
Error Class 19 – Network Services Messages				
19-002	!SNTP-Server not responding	No connection to the SNTP server.	Check the application and the connection.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
Error Class 20 – Call Processing Messages				
20-002	!RS232: DSR not Ready	The RS232/V.24 interface is out of order.	Check the interface, the line, and the application.	
20-011	!RS232: DSR ready	The RS232/V.24 interface is now operational.	None	
20-013	!not connected ways	The maximum number of connection paths permitted has been exceeded.	Use the project planning tool to test the system configuration. Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
20-017	!int. charg buf ovflw	Internal call data memory overflow.	Read out call data. If the error persists, check the call data application interface.	
20-029	!Forced trunk disconnection	Manual line release (for U.S. only).	None	
20-032	!CDR Mem. alloc. failed	Advanced call data memory cannot be created.	• System with MMC module: MMC module is faulty. Replace the MMC. • HiPath 2000/ HiPath OpenOffice EE: File system in flash is full or faulty.	
20-033	!CDR Cache alloc. failed	Read cache for reading out CDR data cannot be created.	Perform a hard restart (normally occurs automatically).	This is caused by insufficient system memory capacity.

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
20-034	!CDR Data write failed	Error while writing CDR data to the advanced call data memory.	MMC module: If necessary, read out call data via TFTP. The internal administration structure is also corrected, if this is required.	
20-035	!CDR Adm. write failed	Error while writing the administration structure to the advanced call data memory.	MMC module: If necessary, read out call data via TFTP. After this, replace the MMC module.	
20-036	!CDR Data read failed	Error while reading CDR data from the advanced call data memory.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
20-037	!CDR Adm. read failed	Error while reading administration structure from the advanced call data memory.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
20-038	!CDR Data detected	An advanced call data memory was found during system startup.	None	
20-039	!CDR Data overflow	The advanced call data memory is full.	Read out call data.	
20-040	!CDR Mem. allocated	The advanced call data memory was successfully created.	None	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
20-041	!CDR Mem. released	The advanced call data memory was temporarily released.	None	This message is issued after the call data memory has been completely read out. It must be followed by the “CDR Mem. allocated” message.
20-042	!MMC-size	Output of MMC module size	None	During system startup, the size of the MMC module is read out and hexadecimally output in bytes 1 and 2 of the info bytes. Value "00 10" describes the 16-MB MMC, value "00 40" describes the 64-MB MMC. Not applicable for HiPath 2000/HiPath OpenOffice EE.

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
20-043	!CDR-MMC MMC full	Memory on the MMC module or in the HiPath 2000/ HiPath OpenOffice EE file system is insufficient for creating the advanced call data memory.		
Error Class 21 – Device Handler Messages				
21-000	!no dial tone detected	No dial tone detected.	Use headset to check dial tone. Replace port or terminal if necessary.	
21-001	!dial tone detected	Dial tone detected.	None	
21-007	!Referenztakt ON	ISDN clock found.	None	
21-008	!Referenztakt OFF	ISDN clock lost.	Check that the clock is available on the S_0/S_{2M} line. If necessary, use HiPath 3000/5000 Manager E to correct the clock's allowed/denied numbers list (*Trunk – Clock parameters*). If necessary, perform a hard restart (reset).	
21-011	!Fan Alarm ON	Fan error.	Check the fan and air supply in the 19-inch housing. Note the ambient temperature.	
21-012	!Fan Alarm OFF	The fan error has been corrected.	None	
21-013	!no ack from temp. sensor	No response from temperature sensor.		
21-014	!overload at codereceiver	Not enough DTMF receivers.	Use a larger system.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
21-015	!overload at code-transmit.	Not enough DTMF transmitters.	Use a larger system.	
21-019	!Shorten Msg not succesfull	Internal error: An overlong ISDN message could not be shortened by deleting Facility IEs.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
21-028	!Power Alarm on	Emergency battery operation due to power outage.	Check line voltage. Note battery capacity.	
21-029	!Power Alarm off	Power supply restored.	None	
Error Class 23 – Messages from the Device Handler Network				
23-060	!system hold, no buffer available	System hold, no more free buffer available.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
23-061	!Check config rules for TMDID	For U.S. only: TMDID boards incorrectly configured.	Check TMDID board configuration using information from Page 4-47 and correct if necessary.	
Error Class 26 – Board Administration Messages				
26-000	!unknown card type	Unknown board.	System does not support the board type. Replace the board with a valid board type or remove it from the system.	The board may be too old or too new for the system.
26-001	!card out of service	The specified board is out of order.	None	
26-002	!More than allowed amount of cards	The maximum number permitted for a certain board type is exceeded.	Reduce the number of boards of this board type. Note the maximum configuration.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
26-003	!other card type than old card type	Incompatible board type. The slot is already pre-assigned with a different board type.	Replace the board or use Manager T to delete the pre-assigned board type so that the new board is recognized.	
26-004	!card in service	The specified board is operational.	None	
26-007	!Reload after load-LW-Code error	The specified board has been reloaded due to a startup error.	If this error persists, replace the board.	The board is reloaded due to a load error (length, checksum error) or a missing or delayed acknowledgement during startup.
Error Class 28 – Recovery Messages				
28-000	!not possible to send a message	Error while transmitting message via COSMOS (insufficient resources).	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
28-004	!SLC-Trace finished	SLC LW trace transferred to trace memory.	Trace memory can now be read out.	
28-006	--- tttttttt -> hh:mm:ss --- DD.MM.YY ---	Time stamp set in event log B memory.	None	A time stamp (current time and date) is entered when the event log B memory is copied. This facilitates analysis.

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
28-008	--- APS: Hexxxxx.xx.xxx:x x xxx ----	Current APS version entered in event log B memory.	None	The current APS version is entered when the event log B memory is copied. This facilitates analysis.
Error Class 29 – Messages Concerning Board Communication				
29-000	!error from COSMOS	COSMOS error.	Set up a trace using information from BLS. Create a stack dump. Save a snapshot.	
29-010	!receive buffer not free	Receive buffer is not free.	Set up a trace using information from BLS.	The board receive buffer cannot receive messages from the system (performance problems).
29-014	!illegal pointer	Invalid pointer.	Set up IOP trace.	
29-024	!polling time out	The specified board has malfunctioned.	If this error persists, check the board and the slot.	
29-025	!card ist present-LW has resetted itself	Loadware of specified board restarted.	If this error persists, check the board and the slot.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
29-035	!ELIC deadlock no Interrupt from ELIC	ELIC clock supply malfunction.	Check clock supply. Check central control board.	Possible causes: • Faulty clock supply • Environmental influences • Faulty control board
Error Class 30 – Board Software Messages				
30-006	!XCSEPBC: PBC error	PBC or ELIC error on the specified board.	Replace the board.	
30-016	!HEATER ON - HXG3	Temperature in HiPath 3550/HiPath 3350 wall housing is too high.	Check the fan kit and the air supply in the wall housing. Note the ambient temperature.	
30-017	!HEATER OFF - HXG3	Temperature in HiPath 3550/HiPath 3350 wall housing is normal.	None	
30-061	!short circuit on Upoe Port SLMC on	Short circuit in base station line.	Check lines. Replace base stations.	
30-062	!short circuit on Upoe Port SLMC off	Short circuit in base station line has been corrected.	None	
Error Class 32 – Messages Concerning IVM (HiPath Xpressions Compact) and EVM (Entry Voice Mail)				
32-000	!Configuration link up			
32-001	!Configuration link down			

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
32-008	!TIMEOUT during server-msg			
32-010	!IVM: Exception (unexpected error)	IVM: An unexpected error has occurred.	Set up an IVM trace.	
32-011	!IVM: SW-error	IVM: A software error has occurred.	Set up an IVM trace. Upgrade IVM if necessary.	
32-013	!IVM: HD assignment of memory space 80%	IVM: 80% of hard disk used.	Search IVM statistics for mailboxes with too many undeleted messages.	
32-014	!IVM: HD full	IVM: Hard disk is full.	Search IVM statistics for mailboxes with too many undeleted messages.	
32-015	!IVM: Mailbox not available	IVM: Mailbox is not available.	Check whether the subscriber in question is available in the event log. Set up IVM system mailbox if necessary.	
32-016	!IVM: SW_Upgrade not possible	IVM: Software upgrade is not possible.	Reload the board if necessary. Upgrade software again.	
32-017	!IVM: Reload occured	IVM: Reload performed.	None	
32-018	!IVM: Restore faulty	IVM: Faulty restore.	Perform restore again.	
32-019	!IVM: HD assignment of memory space <70 %	IVM: Hard disk load less than 70%.	None	
32-020	!IVM: Unauthorized call attempt	IVM: Unauthorized call attempt.	If the attempt is unintentional, deactivate the station number length. If the attempt is intentional, create an IVM trace to determine the subscriber who made the attempt.	

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
32-030	VMM Cmd-resp timeout	EVM: Command response timeout.	Reload the board. If the error persists, replace the board.	
32-032	memory level of 80%	EVM: 80% of memory used.	Check EVM mailboxes for too many undeleted messag-es.	
32-033	Presence evt from EVM	EVM: Presence Event from EVM.		
32-041	VMM msg limit reached	EVM: Message limit reached.	Check EVM mailboxes for too many undeleted messag-es.	
32-042	no language available	EVM: No language file available.	Check available languages on the EVM. Load a language if neces-sary.	
32-044	VMM buffer over-flow	EVM: VMM buffer overflow.		
32-046	EVM error during DM	EVM: EVM error during Data Mode.		
32-049	DH_EVM->reset EVM	EVM: System - DH_EVM -> reset EVM.		
32-052	AM com during DM	EVM: AM Com-mand during Data Mode.		
32-053	Memory Full	EVM: Memory Full.		
32-055	No Pill File select-ed	EVM: No Pill File Selected.	Check available languages on the EVM. Load a language if neces-sary.	
32-058	Philips API ER-ROR	EVM: Philips API ERROR.		
32-059	I2C failure detect-ed	EVM: I2C failure detected.		

Table 12-7 HiPath 3000 Class B Error Messages

No.	HiPath 3000/ 5000 Manager E: Event Log Entry	Meaning	Required Measures	Note
Error Class 40 – Messages Concerning MMC Module Access				
40-000	!MMC not plugged or defective	MMC module cannot be accessed during startup.	• MMC module is not connected: –> Connect the MMC. • MMC module is faulty: -> Replace the MMC.	

12.2.17 HiPath 5000 Error Messages (Event Viewer Entries for HiPath 5000)

Table 12-8 lists the possible entries for HiPath 5000 in the Event Viewer.

The **Source** column designates the origin of the possible entries:

- HiPath AllServe = Feature Server events
- GetAccount = GetAccount events

The various components of these sources are identified by means of the abbreviations in the **Category** column. Section 6.2 contains information about the most important components of the Feature Server.

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1000	X	Not defined	Unidentified logical TFTP error in HiPath 3000/5000			adm	HiPath AllServe
1010	X	Socket error	General socket error	Save event file for error analysis	Shut down and restart server. If error is still present, restart the PC.	adm	HiPath AllServe
1011	X	Udp/tftp: unknown service	Logical socket error, unable to install Winsock Library	Save event file for error analysis	Unrecoverable error. Restart server and report error to appropriate service support.	adm	HiPath AllServe
1013	X	WSA socket error	General socket error	Save event file for error analysis	Unrecoverable error. Restart server and report error to appropriate service support.	adm/ car	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1014	X	File open error	Logical TFTP error; HiPath 3000/5000 displays a message indicating that frame page cannot be opened		Wait 5 minutes then repeat action.	adm	HiPath AllServe
1015	X	Error while setsockopt.	Server problem: IP socket could not be initialized	Save event file for error analysis	Shut down and restart server. If error is still present, restart the PC.	adm	HiPath AllServe
1016	X	Error while recvfrom.	HiPath 3000/5000 no longer replies when files are received	Save event file for error analysis	Connection error, HiPath 3000/5000 HIP problems. Check if ping is working: If ping is working: wait 5 mins and restart server. If ping is not working properly, check if the "Ping unsuccessful" error message appears in the Event Viewer.	adm	HiPath AllServe
1017	X	Error while sending to <IP-Adr>	Logical error when sending data to HiPath 3000/5000	Save event file for error analysis	Unrecoverable error. Restart server and report error to appropriate service support.	adm	HiPath AllServe
1018	X	Transfer timed out	No acknowledgement received/sent	Save event file for error analysis	Possible connection interruption or HiPath 3000/5000 HIP problems.	adm	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1019	X	Discarded packets	TFTP protocol error: data transfer no longer possible, transfer cancelled.	Save event file for error analysis	Unrecoverable error. Check if ping is working: If ping is working: wait 5 mins and restart server. If ping is not working properly, check if the "Ping unsuccessful" error message appears in the Event Viewer.	adm	HiPath AllServe
1020		Receive successful	CDB page frame successful (read)		Information	adm	HiPath AllServe
1021		Send successful	CDB page frame successful (write); Event Properties contains the corresponding page frame ID		Information	fct/ adm	HiPath AllServe
1022		Connect successful	Positive ack. from FCT; connection with HiPath 3000/5000 successful; Event Properties contains the corresponding HIP address		Information	fct/ adm	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1023	X	Socket not connected	Connection difficulties - HiPath 3000/5000 server. TCP connection not available	Save event file for error analysis	Check LAN, initiate HiPath 3000/5000 ping. Restart server if necessary. Check HiPath 3000/5000 HIP.	fct	HiPath AllServe
1024		CDB transfer successful (read)	All frame pages successfully read from HiPath 3000/5000 nodes by the server		Information	vsrv	HiPath AllServe
1025		CDB transfer successful (write)	All frame pages successfully written from the server to all HiPath 3000/5000 nodes		Information	vsrv	HiPath AllServe
1027		CallAddressTable and NodeIpTable transfer successful	Successful transfer of call address table and node IP table to the system by the server		Information	car	HiPath AllServe
1028	X	Venus database closed	Venus database closed		Information	vsrv	HiPath AllServe
1029	X	Venus Database started	Venus database started		Information	vsrv	HiPath AllServe
1030		Data saved to disk	Saving the Venus database to the server hard drive		Information	vsrv	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1031		Ping not possible	HiPath 3000/ 5000 HIP no longer available	Save event file for error analysis	Check HiPath 3000/ 5000. Check HG 1500. Check LAN. Initiate HiPath 3000/5000 ping, if necessary	adm/ fct/ vsrv/ sync	HiPath AllServe
1032	X	CDB transfer to (<IP-Adr>) failed (write)	Writing data to HiPath 3000/ 5000 with specified IP address failed	Save event file for error analysis	Check HiPath 3000/ 5000. Check HG 1500. Check LAN. Initiate HiPath 3000/5000 ping, if necessary. Load HiPath 3000/ 5000 Manager E data to the server again. This initiates data transfer from the server to HiPath 3000/5000.	vsrv	HiPath AllServe
1033		Data sync tile	Modification to database in HiPath 3000/5000 reported to the server; HiPath 3000/5000 data loaded and saved on the server			adm	HiPath AllServe
1034		Disconnection of object recovered (%1)				sync	

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1036	X	CDB transfer from (<IP-Adr>) failed (read)	Data reading from HiPath 3000/5000 (with specified IP address in the server) failed	Save event file for error analysis	Check HiPath 3000/5000. Check HG 1500. Check LAN. Initiate HiPath 3000/5000 ping, if necessary. Activate HiPath 3000/5000 data loading via HiPath 3000/5000 Manager E.	vsrv	HiPath AllServe
1037		Interface error (_hr= 0xzzzzzzzz)	If 0xzzzzzzz = 0x80070057, this is just internal information for Development, otherwise error	Save event file for error analysis	If an error message appears, RgTraceFile.txt and Carlog File must be saved.	reg	HiPath AllServe
1038		User interface active on <IP-Adr>	The user interface is active during a sync. Trials are not cancelled and are cyclically repeated until successful.		Information	sync	HiPath AllServe
1039		User: “<username>” on PC: “<pc_name>”: read CDB data from server	HiPath 3000/5000 Manager E information about user actions, user reads data from the server.		Information	vsrvadmin	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1039		User: “<username>” on PC: “<pc_name>”: write CDB data to server. Mode (delta)	HiPath 3000/ 5000 Manager E information about user actions, user writes data to the server and to the systems.		Information	vsr-vad-min	HiPath AllServe
1040		Node IP ADD <IP-Adr>			Error		HiPath AllServe
1041		No resources in system %1	API cannot open FCT, as there is another API session active (e.g. user interface).			fct	HiPath AllServe
1042		Regs message <IP-Adr>				vsrv	HiPath AllServe
1043		Car update node IP table entry <IP-Adr>	Database generates the node IP table per CDB for the car server		Information	vsrv	HiPath AllServe
1045	X	Feature Server: Service Started. Version HVxxxB.yy.nnn.	The "Feature Server" service was started.		Information	vd-bast	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
1045	X	Feature Server: Service stopped.	The "Feature Server" service was stopped.		Information	vd-bast	HiPath AllServe
1046		Update CallAddressTable (No. = %1) and NodeIpTable (No. = %2)	CAR assigned a new call address and node IP table by the database (event 1027 follows).		Information	car	HiPath AllServe
1047		Registration request from <IP-Adr>	The REG server received a registration request from HG 1500.		Information	reg	HiPath AllServe
10000		Wrong request ID	Wrong UDP packet sequence, asynchronism.		Check LAN	fct	HiPath AllServe
10001		Unknown packet	Unknown HiPath 3000/5000 IP packet.		Information	fct	HiPath AllServe
10002	X	Socket receive	TCP socket error.	Save event file for error analysis	Possible interrupted connection.	fct	HiPath AllServe

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Error 0x%x in Func \“SaveGeb\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving an outgoing call data record.				GetAccount
515	X	Error 0x%x in Func \xd2 SaveKommend\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving an incoming data record.				GetAccount
515	X	Error 0x%x in Func \“SaveNewPrice\”. Description: %s”,e.Error(), (char*)(e.Description())	Error when saving a recalculated call data record.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Error init HKLM registry Stop service GetAccount	Error when reading start parameters from the HK local machine registry.				GetAccount
515	X	Error init registry HKCU Stop service GetAccount	Error when reading start parameters from the HK Current user registry.				GetAccount
515	X	Error when starting immediate printout. Stop service GetAccount	Error when starting immediate printout thread.				GetAccount
515	X	Error 0x%x in Func \"InsertSofortDruck\". Description: %s",e.Error(), (char*)(e.Description())	Error when saving a record for immediate printout.				GetAccount
515	X	No CDR line found	TSP does not provide any CDR lines.				GetAccount
515	X	Error TAPI Init	Error when initializing the TAPI interface.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	TapiFunc: %s ID: %d Error: %s", szTapiFunc, lLineID, szErrorMess	Error when calling a TAPI function for a particular line.				GetAccount
515	X	TapiFunc: %s Error: %s", szTapiFunc, szErrorMess	Error when calling a TAPI function.				GetAccount
515	X	Box not found in database cntBox = 0 SwitchID: %d, nVNodeID: %d	Node data has not yet been read.				GetAccount
515	X	CDR Service in PBX: %d could not be started	The CDR service in the switch could not be started.				GetAccount
515	X	Error sending command 'starting CDR Service' to PBX: %d	Error when sending the start CDR service command.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
514	X	CDR Service in PBX: %d by TSP already started	TSP has already started the CDR service.				GetAccount
515	X	Error starting CDR service on PBX: %d dwParam2: 0x%x	Undefined error when starting the CDR service.				GetAccount
515	X	Error sending command 'stop CDR Service'	Error when sending the command to stop the CDR service.				GetAccount
515	X	Error stopping CDR Service: Illegal Access	Error when stopping the CDR service. Access denied. Someone else already started the service.				GetAccount
515	X	Error stopping CDR Service: ErrorCode: 0x%x", dwParam2	Undefined error when stopping the CDR service.				GetAccount
513	X	TAPI Reinit	TAPI was reinitialized.				GetAccount

Table 12-8 Event Viewer Entries for the HiPath 5000 Server

Event	Default trap	Error text	Meaning	User reaction		Category	Source
515	X	Start service error: Database connect error	Error when opening the database connection.				PCM
515	X	Start service error: Misc. database error	Error when reading out the values saved in the database.				PCM

12.3 Correcting Errors

12.3.1 Automatic Error Correction

One of the below recovery actions is assigned to each error in the error memory. These recovery actions are programmed to automatically correct errors that occur.

- Hard restart
- Reload board
- Reload CDB backup
- Port lockout
- Power failure transfer (loop start)
- None

A watchdog activates continuous loops.

If no recovery measure is assigned or if the one that is assigned fails, a service technician has to correct the error manually.

12.3.2 Manual Error Correction Without HiPath 3000/5000 Manager E

Manually activating a restart (reset)/reload

Pressing the reset button on the central control board of HiPath 3000

- initiates a **Reset** (hard restart of the entire system with the current CDB) if the button is pressed for less than 5 seconds. The RUN LED lights up when the Reset button is pressed.
- initiates a **Reload** if the button is pressed longer than 5 seconds. The Run LED disappears after approximately five seconds as verification that the reload has been initiated. The entire content of the customer database is replaced by its default version. All country and customer-specific settings are lost.



If you initiated a system reload, the system must be reset after the CDB has been installed. This ensures that all signaling gateways (= HG 1500 gatekeeper) are reset.

Locking out and releasing boards and ports

You can lock out and release ports using the lockout switch located on the board. The lockout prevents renewed seizure after the current connection has finished. It creates

- a port lockout in an outgoing direction on analog trunk boards.
- a port lockout in outgoing and incoming directions on trunk boards.
- a lockout of the entire board for subscriber line modules.

12.3.3 Manual Error Correction With HiPath 3000/5000 Manager E

Initiating Restart (Reset)

This initiates an immediate hard restart of the entire system with the current CDB.

Initiating Reload Card

This the single board (loading Loadware) to reload.

Locking out and releasing boards and ports

HiPath 3000/5000 Manager E enables you to lock out an entire subscriber line module or line circuit module and individual ports. The lockout prevents renewed seizure after the current connection has finished. Release or lockout settings are also retained after a reset.

However, you cannot lock out the first SLMO/SLU board because administration through Manager T runs on its first two ports.

When attempting to lock out the last active trunk, you are subsequently notified that remote service through the service center is no longer possible.

You cannot use HiPath 3000/5000 Manager E to release boards and ports locked out with the lockout switch.

ALUM

You cannot initiate a power failure transfer to analog telephones using HiPath 3000/5000 Manager E.

12.4 Remote Service

Definition

Remote service is described as communication between the service center and HiPath 3000 and HiPath 5000 using the public telecommunications network to fulfill service tasks. These tasks are

- remote system administration,
- remote administration of Plus products via the system,
- remote correction of system software (APS transfer),
- automatic signaling of error messages.

Remote service facilitates the administration and maintenance of various communication systems from a central location.

The connection to HiPath 3000 can be set up via the integrated digital modem (B channel), the integrated analog modem (IMODN) or the HG 1500.

Special software programs, such as pcANYWHERE, facilitate connections to HiPath 5000. If the customer agrees, Remote Access Service RAS can also be used, provided this service is active on the HiPath 5000 server.

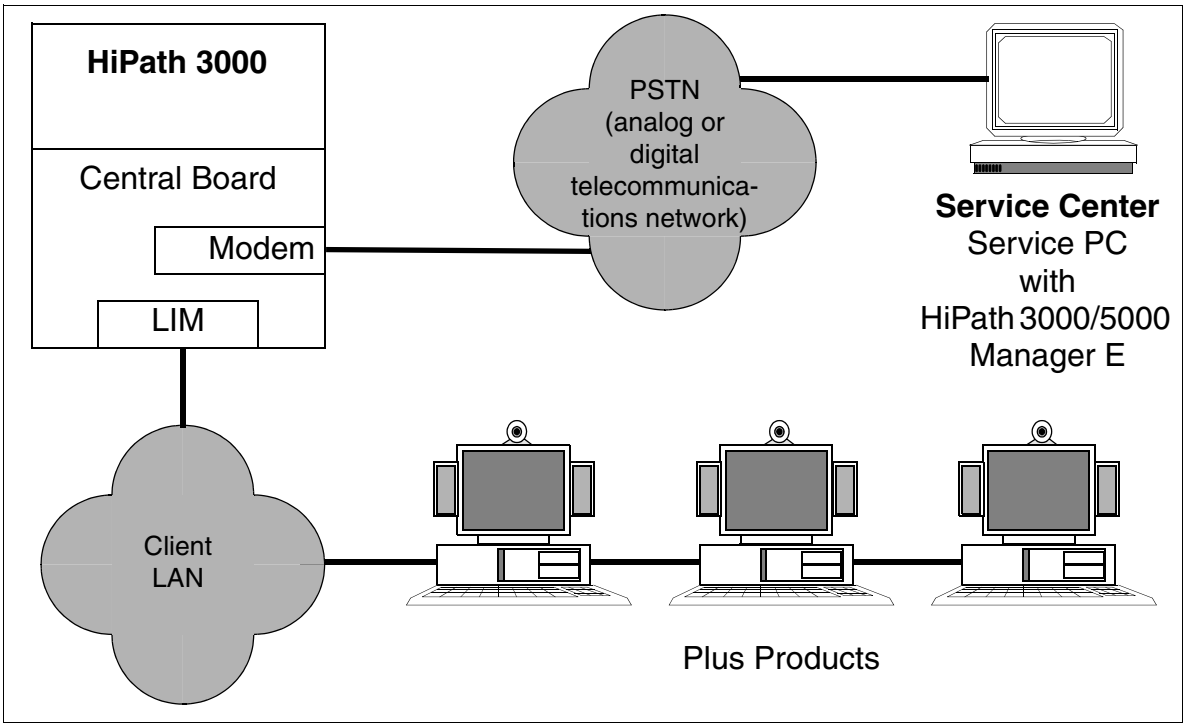


Figure 12-3 Example of Remote Service with HiPath 3000

12.4.1 HiPath 3000 Connection Options

- **HG 1500**
  All systems can be accessed remotely with a LAN-LAN link via the HGHiPath 30001500 board. For information on configuration, refer to the HG1500 Administration Manual.

- **Integrated analog modem IMODN**
  This modem enables remote access to all systems in the HiPath 3000 product line. Access is achieved using any trunks, tie trunks, and all subscriber lines. IMODN is designed as a plug-in card.

  > **Caution**
  > Be sure to disconnect the system from the power supply before removing or inserting integrated analog modems (IMODN).

  The IMODN is treated as a pseudo port. It receives a number in the system that can be reached internally through direct internal dialing (DID). You can cancel the DID number manually to prevent external access.

- **Integrated digital modem (B Channel)**
  An integrated B channel modem is available with all systems in the HiPath 3000 product line. This type of modem facilitates remote access using both digital trunks, tie trunks, as well as S_0 subscriber lines. Data transmission is supported according to Protocol X.75.

  The digital modem is treated as a pseudo port. It receives a number in the system that can be reached internally and through direct internal dialing. You can cancel the DID number manually to prevent external access.

Baud rate settings
For information about setting the baud rate for different connection types between HiPath 3000 and HiPath 3000/5000 Manager E, consult the Help for HiPath 3000/5000 Manager E.

Access to the analog/digital modem
The customer must enable the access to both modems by entering a six-digit PIN code. If the service center is to make a connection to the HiPath 3000 over a modem, it may be necessary to enter this individual code. It depends on which trunk type is used for the modem access. The following applies to the system default:

- Access over ISDN trunk = enable procedure: customer must enter PIN code.
- Access over another trunk = login without code: PIN code is not necessary.

If necessary, the system administration (only by using Manager T) can reset the PIN code back to the default value.

12.4.2 HiPath 5000 Connection Options

In general, the connection to HiPath 5000 is established via special software programs, such as pcANYWHERE. Please refer to the relevant product documentation for information on possible applications.

If the customer agrees, Remote Access Service RAS can also be used, provided this service is active on the HiPath 5000 server. Information on configuring the Remote Access Service (RAS) can be obtained from the HG 1500 Administration Manual.

12.4.3 Remote System Administration

12.4.3.1 Remote Administration of HiPath 3000 with HiPath 3000/5000 Manager E

To establish a remote connection between HiPath 3000 and the service center (HiPath 3000/5000 Manager E), the following options are available:

- Callback
- Service call via code
- Automatic error signaling

Any one of these options establishes a connection using the integrated digital modem (B channel) or the integrated analog modem (IMODN).

Callback

HiPath 3000 can manage up to six different callback indices (callback passwords and their relevant callback numbers), in which case the first callback connection is also the destination of the automatic error signaling. For each callback connection, you can select either the digital modem (B channel) or the analog modem (IMODN).

If you have chosen your settings and selected the connection setup option “Callback activated”, the HiPath 3000/5000 Manager E can dial in to the system. HiPath 3000 registers the callback destination and saves the callback index. After 10 s, the HiPath 3000 initiates the actual callback with the number which is linked using the callback index. As soon as the connection is established, you can use HiPath 3000/5000 Manager E to manage the system.

If no connection is established, HiPath 3000 will make a total of 20 attempts in intervals of 10 s after which the callback attempt ends and has to be started up again with HiPath 3000/5000 Manager E.

Service call via code

You can use any telephone to initiate a HiPath 3000 service call to the service center by selecting the connection setup option “Service call via code” and activating the feature “Remote access immediately after installation”. In contrast to the usual callback procedure, this callback (service call) is not activated by HiPath 3000/5000 Manager E itself, but by any telephone you choose. Callback initialization is skipped.

The service call destinations are the six callback indices that also apply to callback. You are not required to enter the relevant passwords.

The service center wait time for one service call is limited to 15 minutes, though you can end it manually at any time.

Procedure: Activate the feature “Remote access immediately after installation”.

Step	Entry	Description
1.	*994	Enter code for “Remote access immediately after installation”
2.	X	Select callback index (0 ... 6 possible)
3.	XXXXXXX	Select a suffix number if necessary (up to 11 digits) The suffix is used for selecting the remote PC in the service center.
4.	✓ or #	Press “OK” or the “#” button.

Automatic error signaling

Class B errors can be automatically transferred to a service center. For more information on this, see Section 12.4.5.

12.4.3.2 DTMF Remote Administration of HiPath 3000

This feature facilitates remote system administration by transmitting DTMF signals. The user interface (menu prompt) is the same as that of the Manager T for system administration on site.

DTMF remote administration can be performed using either analog or digital trunks.

12.4.4 Remote Correction of System Software (APS)

The service center performs the APS transfer (see Section 12.1.3).

12.4.5 Remote Error Signaling

Class B errors can be automatically transferred to a service center. For this, the “Error-Signaling” flag must be activated and a number entered under the callback index 1.

To register an error message, the HiPath 3000/5000 Manager E that is dialed at the service center must be in Receive mode. If an error message is received, the HiPath 3000/5000 Manager E automatically creates a file in which the error is entered. If another error occurs, it is entered in the same file behind the previous entry.

The error report consists of one header and the error information that is transmitted in binary form. The header contains a unique identifier that recognizes the customer system that sent the error reports.



Caution
In case of a power outage, the not battery-buffered SDRAM content of the MMC is completely lost. Any individual settings made for the time parameter “error signaling interval” are also reset to the default value 15 minutes.
When the system is restarted, the automatic recovery action “reload CDB backup” starts and the customer-individual settings are reloaded. Because this process lasts longer than 15 minutes, the first error message is always signaled at the end of the 15-minutes default interval. All other errors are then signaled again with the individually set interval.
Example: The error signaling interval of a HiPath 3550 with activated error signaling was set to 90 s. After a power outage, the 90 s interval reverts to the default value of 15 minutes. The first error message “no voltage” is signaled 15 minutes after restarting operation of the system. After conclusion of the recovery action “reload CDB backup”, the original 90 s setting of the error signaling interval is reactivated. All other errors are signaled after 90 s.

12.4.6 Controlled Release of a Remote Connection

With version 1.2 and later, you can initiate the controlled release of a remote connection (with analog or digital modem) between the HiPath 3000 and HiPath 3000/5000 Manager E as follows:

- Disconnect according to action (Default setting)
  After completing an action (e.g. CDB backup or APS transfer), the remote connection is automatically disconnected.
- Disconnect according to release time
  After completing an action (CDB backup or APS transfer, for example) and the adjustable release time sequence (60 ... 9999 s), the remote connection is disconnected.
- “Hang up” button
  By pressing this button, you can disconnect the remote connection manually.

Use HiPath 3000/5000 Manager E to select any one of these options.

12.4.7 Remote Administration and Access Using PPP

You can establish a connection between the system/Plus product and the service center using either the integrated digital modem (B channel) or the integrated analog modem (IMODN). Data is exchanged in both cases using Point-to-Point-Protocols (PPP).

For further information see “Features via LAN” in the HiPath 3000/5000 Feature Description.

12.4.7.1 Remote System Administration

You can also operate HiPath 3000/5000 Manager E in conjunction with the relevant infrastructure (RDT network, router) using PPP.

For further information, see “Remote Administration of HiPath 3000 via PPP” in the HiPath 3000/5000 Feature Description.

12.4.7.2 Remote Administration of Plus Products

You can manage Plus products from a central location using HiPath 3000. However, HiPath 3000 only provides the means of transmission. The Plus product is actually administered using special software programs like pcANYWHERE.

For further information, see “Remote Administration of Plus Products via PPP” in the HiPath 3000/5000 Feature Description.

12.4.7.3 Remote Error Signaling Using SNMP

Plus products and the HiPath 3000 can transmit error messages (SNMP traps) to the service center.

For further information, see “SNMP Functionality” in the HiPath 3000/5000 Feature Description.

12.5 Security Features

12.5.1 Access Security

12.5.1.1 User-Specific Logon for WBM

To ensure that authorized users have access to the HiPath 3000/5000 and to prevent unauthorized access, users must be identified by a user name and authorized by a password. This applies to all local and remote administration and maintenance procedures using Web-Based Management (WBM).

The user group determines which data is administered. The following two user groups are permanently defined for administration via WBM:

- Customer
- Administrator

Each user group is assigned a fixed user name and password. You need a valid user name and password to access a user group. Only the data authorized for the relevant user group can be read and administrated.

The following table provides a breakdown of the two user groups and their rights for each of the setup wizards.

Table 12-9 WBM User Groups with Associated Rights

Wizard	Customer	Administrator
Initial Installation (for basic system setup)		X
New Components: (for configuring new components)		
• LAN telephones (for configuring additional IP workpoints)		X
• WLAN telephones (for configuring additional WLAN workpoints)		X
• Analog telephones (for configuring additional analog workpoints - group 3 fax devices, for example)		X
• Not for U.S.: S0 interfaces (for configuring additional ISDN connections and ISDN workpoints)		X
• Licensing (for licensing system expansions)		X

Table 12-9 WBM User Groups with Associated Rights

Wizard	Customer	Administrator
Change Feature: (for modifying current system setup data)		
• LAN/WLAN telephones (for modifying configured workpoints)		X
• Analog telephones (for modifying configured analog workpoints)		X
• Not for U.S.: S0 interfaces (for modifying configured ISDN connections and ISDN workpoints)		X
• For U.S. only: T1 board (for configuring and modifying the T1 board operating mode)		X
• Trunk seizure (for modifying the code and prioritization for trunk seizure)		X
• Answer machine (for configuring and modifying the integrated voice mailboxes)		X
• Call forwarding no answer/call pickup (for configuring and modifying call forwarding destinations and call pickup for incoming calls)	X	X
• Call groups (for configuring and modifying call groups (incoming calls are signaled to all members of a call group))	X	X
• Key programming (for configuring and modifying key programming on the workpoints)	X	X
• Internal phonebook (for configuring and modifying entries in the central phonebook)	X	X
• DHCP (for modifying to the DHCP server)		X
• Firewall (for configuring and modifying the integrated Internet firewall)		X
• DSL (for modifying Internet access)		X
• Internet telephony (for configuring and modifying Internet telephony access)		X
• VPN (for configuring and modifying virtual private networks)		X
• Online help (for configuring and modifying the installation directories in the online help)		X

Table 12-9 WBM User Groups with Associated Rights

Wizard	Customer	Administrator
Remote Access (for activating and deactivating remote access for remote system administration)		X
Software Update (for checking if software updates are required)		X
Status: (for querying the current system status)		
• Network interfaces (for querying the current status of network interfaces)	X	X
• Dial-up networking (PSTN) (for querying information about existing dial-up connections (PSTN partners))	X	X
• Stations (for querying the data of all configured stations)	X	X
• Events (for querying the last 50 events (trace messages))	X	X
Expert Mode (for configuring and modifying advanced features, such as, the networking of several HiPath 3000/5000 systems)		X

12.5.1.2 Password Protection against Brute Force Attacks

Brute force attacks are attempts made by a computer program to crack the password of another program or tool, by trying all possible combinations of letters and numbers.

To protect against unauthorized access, remote access logon to WBM is monitored. Users are permitted five attempts over five minutes to enter the correct password. If this time expires or the password is entered incorrectly five times, remote access is blocked.

The system's event log records the password input attempts.

12.5.1.3 Logon With User Name and Password

Security

To ensure that authorized users have access to the HiPath 3000 and to prevent unauthorized access, users must be identified by a user name and authorized by a password. This applies to all local and remote administration and maintenance procedures using HiPath 3000/5000 Manager E, Manager T, HiPath 3000/5000 Manager C, Assistant TC, and AMHOST.

After the first system startup and during country initialization, you can select between the following security options:

- variable password (default)
- fixed password concept

Example of first-time login with Manager T

Step	Entry	Description
1.	*95	Start system administration
2.	31994	Default user name
3.	31994	Default password



Alphanumeric characters cannot be entered at all workpoints. Therefore, when changing the user name or password with Manager T/Assistant TC, you may enter additional characters as long as you never use an appropriate workpoint. Alphanumeric characters can only be entered at the following workpoints: OpenStage 40/60/80, optiPoint 600 office (in $U_{P0/E}$ mode), optiPoint 410 advance and optiPoint 420 advance.

Step	Entry	Description
4.	XXXXX	You are prompted to enter a new password (max. 15 digits)

Step	Entry	Description
5.	XXXXX	You are prompted to confirm the password entered in step 4.
6.	29 - 5	Country initialization
7.	X	You are prompted to select the password type: 1 = Variable password 2 = Fixed password
8.	XX	You are prompted to enter the country code (see Page A-26). The system then boots up with the country-specific default information.

Notes:
- On step 4 and step 5: If a new password is issued, both steps are omitted when calling the system again.
- On step 6: No country adjustment is necessary for Germany because the system starts up with German codes.
- On step 7: When selecting the fixed password, the default password (31994) overwrites the new password entered under step 4.

Variable password concept

Up to 16 users can be assigned their own user ID with individual name, password, and a user group consisting of six pre-determined user groups (in Table 12-10). Only the data authorized for the relevant user group can be read and administrated.

During initial login, the system requests the identity of the user and demands a new password (max. 15 characters from the optiPoint 500 character set). This then overwrites the default user name (31994) and default password (31994). This first user is then automatically assigned to the user group “System Maintenance”. The system informs the user that no user is configured in the system and that the user has been assigned with “System Maintenance” authorization. Using HiPath 3000/5000 Manager E or Manager T, additional users and their passwords can be configured in the user administration.

If a user forgets a password, it has to be deleted and re-configured by a different authorized user. If all authorized users forget their passwords, the system must be regenerated.

Fixed password concept

When using a fixed password, only fixed user groups with unchangeable default user names and default passwords are used. Also, new users cannot be configured in the user administration.

Changing password types

Only with Manager T can you change from a variable password to a fixed password type and vice versa. To do this, you have to re-initialize the country settings. This switches the entire content of the customer database (including user names and passwords) to a default state.

If you perform country initialization in a system with a variable password, the previously created user names and passwords remain intact as long as you do not subsequently change the password type.

If a CDB is read from a system in which the default user names and passwords were changed, this CDB cannot be loaded into a HiPath 3000 system that was changed to a fixed password type. Before reading this CDB, you have to set up a user (user name and password) in the system that matches a user group with a fixed password. Once this user has been set up, the CDB can be read from the HiPath 3000. With this user name and ID, you can now load the CDB into the system switched to the fixed password type.

12.5.1.4 Pre-Determined User Groups and Their Access Rights

User groups with a variable password

The following table shows the six pre-determined user groups and their access rights.

Table 12-10 Variable password concept: Pre-Determined User Groups and Their Access Rights

No.	User groups / User rights	User admin.	Audit	System maint. (Service)	Customer admin. (Cust.)	Charge accounting	Develop-ment
1.	• Setting up/deleting users • Assigning users to user groups	X		X[1]			
2.	• Assessing and archiving backup-related log files • Reader rights to system data (error memory, for example), not including confidential customer information		X	X[2]			
3.	• Access rights to all system data (not including development access rights) as long as no users are assigned to other user groups.			X			
4.	• Access rights to confidential customer information • Executing customer actions (printing out certain lists, for example)			X[3]	X		
5.	• Access rights to non-confidential customer information			X	X		
6.	• Access rights to parameters and call detail recording actions (not including interface parameters for the output device)			X[3, 4]	X[4]	X	
7.	• Access rights of the “System Maintenance” user group • Setting up and reading certain parameters to which no other user group has access.						X

1 As long as no user is assigned to the “User Administration” user group.
2 As long as no user is assigned to the “Audit” user group.
3 As long as no user is assigned to the “Customer administration” user group.
4 As long as no user is assigned to the “Accounting” user group.

User groups with a fixed password

The following table shows fixed (unchangeable) user groups and their rights.

Table 12-11 Fixed Password: Fixed User Groups and Their Access Rights

No.	User groups User rights	System maint. (Service) Name/Password= 31994/31994	Customer admin. (Cust.) Name/Password: – Manager TC=*95/(Password not necessary) – Manager C=office/office	Development
1.	• Assessing and archiving backup-related log files • Reader rights to system data (error memory, for example), not including confidential customer information	X		X
2.	• Access rights to all system data (not including development access rights)	X		X
3.	• Access rights to confidential customer information • Executing customer actions (printing out certain lists, for example)	X	X	X
4.	• Access rights to non-confidential customer information	X	X	X
5.	• Access rights to parameters and call detail recording actions (not including interface parameters for the output device)		X	
6.	• Setting up and reading certain parameters to which no other user group has access.			X

12.5.1.5 System Access Options

The user's access rights, meaning the data that the user may read or manage, always depend on the user group to which the user is assigned.

Service tools

- Manager T and Assistant TC systems
  Log on by entering your user name and password (regardless of code lock)
  The system can only be accessed using the first two $U_{P0/E}$ connections from the first SLMO/SLU board in the system.
- HiPath 3000/5000 Manager E and HiPath 3000/5000 Manager C (local)
  Log on by entering your user name and password
- HiPath 3000/5000 Manager E (remote), direct connection
  Log on by entering your user name and password
  The system can be accessed directly using the integrated digital modem (B channel) or the integrated analog modem. However, the user is required to establish a 5 digit access code beforehand.
- HiPath 3000/5000 Manager E (remote), callback connection
  Log on by entering your user name and password
  The system can be accessed using the integrated digital modem (B channel) or the integrated analog modem. However, you have to set up a callback index beforehand.
- HiPath Software Manager
  Log on by entering your user name and password

AMHOST

The AMHOST (Administration and Maintenance via HOST) feature allows Plus products to read certain system information and to change it, if necessary. To enable Plus products to access the system, you have to set up a user without a user group in the HiPath 3000 default user administration. Enter "AMHOST" as the user name and "77777" as the default user password.

You can only change this password if the system is configured using a variable password. In this case, delete the "AMHOST" user and re-configure the system with the same user name and a new password.

12.5.1.6 Customer Data Security

When saving a customer database on the hard disk, a user table (part of the user administration) with user name and encrypted passwords are also saved. This guarantees access security when the customer database is opened offline later on.

When opening the customer database offline, you are requested to enter your user name and password. The data that you enter is compared to the data in the user table. In this case, the user group verified during this process also determines the access rights.

When loading an offline customer database into HiPath 3000, the user table that goes with it should not be loaded into the system. Otherwise, the system-specific user administration would be distorted.



When you generate a default customer database offline, a default user table is also set up. If you generate a customer database like this, you can only load it into a default system.

12.5.2 Automatic Logging of Administration Procedures

Definition

All accesses to customer-related data in the HiPath 3000 are automatically logged in an area of the MMC (LOG area) reserved for this purpose. The information recorded includes who the user is, the data manipulated by the user, and the time. An authorized user (member of the “Revision” user group) can transfer the system data to a PC and assess it.

12.5.2.1 Logging

A log entry contains the following information:

- Date and time
- User name and user group
- Type of activity (format identification) and activity (command entry)

12.5.2.1.1 Format Identification and Command Entry

The following format information is logged:

- Manager T (1)
  All activities are logged, regardless of system access. The respective code with the most important parameters is recorded as the command entry (station/number, for example).
- Assistant TC (2)
  Same as Manager T (1)
- Session Information (3)
  The system access is logged, regardless of whether it is logged using Manager T, HiPath 3000/5000 Manager E, or other systems. Possible command entries are:
  A0-1 = Login procedure
  A0-2 = Logout procedure
  A0-3 = Unauthorized login attempt
- HiPath 3000/5000 Manager E Database (4)
  Access to the database is logged using HiPath 3000/5000 Manager E. Possible command entries are:
  A1-1 = Database read
  A1-2 = Regeneration of CDB (Load CDB into the system)
  A1-3 = Write database

- Program Systems (5)
  APS transfers and system boots (first bootup, for example) are recorded. Possible command entries are:
  – A2-1 = APSXF started
  – A2-2 = APSXF ended
  – A2-3 = APS boot (APS stamp also included)

- HiPath 3000/5000 Manager E Maintenance (6)
  Maintenance activities which can be assigned with the following command entries are logged:
  – B1-1 = Read error memory
  – B1-2 = Delete error memory
  – B2-1 = Out of service
  – B3-1 = Read Direct Memory Access
  – B3-2 = Write Direct Memory Access
  – B4-1 = Delete base station status overload
  – B4-2 = Delete base station restart
  – B5-1 = Digital loopback change
  – B6-1 = Trunk rolling change
  – B7-1 = Read trunk status
  – B8-1 = Delete trunk error counter

- Simulated or pseudo Manager T format (7)
  The HiPath 3000/5000 Manager E records the offline changes of a CDB as a “simulated” Manager T command. For data areas subject to change by HiPath 3000/5000 Manager E, pseudo areas are generated. When loading an offline CDB into the system, the following simulated commands are logged as command entries:
  C1 = Pseudo area “System parameter”
  – C1-1 System fags/CMI
  – C1-2 System intercept/AC
  – C1-3 Tones and calls
  – C1-4 Direction flag special (Variable direction#)
  – C1-5 System settings
  – C1-6 Host Link Interface
  – C1-7 Relocate activation
  C2 = Pseudo area “System timer”
  – C2-1 System timer
  C3 = Pseudo area “S_0 configuration”
  – C3-1 Station bus
  – C3-2 Line supervision
  – C3-3 Mode
  C4 = Pseudo area “Lines”
  – C4-1 Loop start parameter (Variable Slot/Line#)
  C5 = Pseudo area “Digit analysis”
  – C5-1 Internal number (Variable Stn#, Grp#)

– C5-2 Service codes
C6 = Pseudo area “Daylight saving time”
– C6-1 Daylight saving time
C7 = Pseudo area “Routes”
– C7-1 Routing flags (Variable Trk Grp#)
C8 = Pseudo area “Door setup”
– C8-1 Door setup (Variable door#)
C9 = Pseudo area “UCD flags”
– C9-1 UCD flags
C10 = Pseudo area “Delete system counter”
– C10-1 Delete system counter

- HiPath 3000/5000 Manager E online (8)
  Archives from the log file and the user administration are logged. Possible command entries are:
  – D1-1 = Archive
  – D2-1 = New user
  – D2-2 = Delete user
  – D3-1 = Change password



Logging External Accesses (Solutions, Applications)
Plus products used with “AMHOST” can only make limited changes. Because these changes “automatically” run simultaneously (Check In and Check Out for hotel solutions, for example), these are not logged. Only the session information (user name is “amhost”) with the command entries “Login procedure” and “Logout procedure” are logged.

12.5.2.2 Issuing and Saving Log Data

Data is automatically logged in an area (LOG area) on the MMC reserved for this purpose (HiPath 3000) or in a special directory (HiPath 5000). It cannot be switched off.

If approximately 80 % of the MMC log area capacity is exceeded, a Class A error is issued. This error is dealt with like all Class A errors and is displayed on the optiPoint Attendant as “Revisor Alarm.”

The log should now be read out and archived, meaning it should be saved in an archive file (file extension = arc). If an archive is not created, the oldest datablock is overwritten if there is a danger of overflow.

You can only issue log entries using HiPath 3000/5000 Manager E. You cannot retrieve the log entries from the system until you have logged on as a user with “Revisor” rights.

Archive

If you request an archive (storage), the system checks whether or not there is already an archive file (file extension = arc). If it is a file with log data from a previous archive, the file must match the current customer. In case of a positive result, the system log entries are retrieved and attached to the existing data in the archive file. At the same time, the data in the system is deleted.
If malfunctions occur during this procedure (for example, line interruption), the entire procedure ends and the archive has to be restarted.

If no archive is requested, the revisor can retrieve, view, and print the log entries. However, log entries remain in the system.

You do not have to log on to the system to use the HiPath 3000/5000 Manager E to check archive files on the PC monitor. In this case, a password is not required.

Multimedia card

When replacing the multimedia card, the following applies:

- If the memory area for logging data is empty, logging restarts.
- If the memory area for logging data is not empty, logging continues.

Example of a log printout

The following assumption applies as an example: The first system boot up has taken place. Customer-specific programming was completed.

1050	00-11-25 15:57:10	rev(R)	(6)D1-1	Archive
1051	00-11-25 15:58:22	rev(R)	(3)A0-2	Logout procedure
1052	00-11-26 09:20:15	serv(S)	(3)A0-1	Login procedure
1053	00-11-26 09:21:35	serv(S)	(4)A1-1	Database read
1054	00-11-26 09:21:52	serv(S)	(7)14-12-*(20)	Station name
1055	00-11-26 09:22:45	serv(S)	(4)A1-3	Write database
1056	00-11-26 09:23:25	serv(S)	(3)A0-2	Logout procedure
1057	00-11-26 10:10:15	pnkm(A)	(3)A0-1	Login procedure
1058	00-11-26 10:11:15	pnkm(A)	(2)14-12-”30”	Station name
1059	00-11-26 10:11:35	pnkm(A)	(2)14-12-”31”	Station name
1060	00-11-26 10:12:15	pnkm(A)	(3)A0-2	Logout procedure
1061	00-11-27 11:20:30	rev(R)	(3)A0-1	Login procedure

The sample printout (without consideration of headers and footers) refers to the following information concerning administration procedures:

- The Revisor (“rev” user in “R” (Revision) user group) has generated an initial archive.
- The Service (“serv” user in “S” (system maintenance) user group) has read out the system database, changed 20 station names, and rewritten them to the system.
- The Customer (“pnkm” user in “A” (Administration) user group) has changed two additional station names.
- The Revisor has retrieved the most recent log entries and printed them out.

13 IP Fundamentals

Chapter contents

This chapter covers the following topics:

Topic
IP Network Requirements, page 13-2
• General Introduction, page 13-2
• H.323 Protocol, page 13-2
• Standards Supported, page 13-3
• QoS - Quality of Service, page 13-4
Network Analysis, page 13-6



This section provides introductory information only and does not replace IP training.

13.1 IP Network Requirements



For special requirements regarding bandwidth, delay, QoS, etc. for a HiPath 3000/5000 V8 customer IP network, please refer to the requirement specifications in the HiPath 3000/5000 solution contract.

13.1.1 General Introduction

A number of protocols play a role in data communication (X.25, Frame Relay, ATM and TCP/IP). The IP (Internet Protocol) switching layer is the Internet's key protocol and permits interoperability with other networks and protocols, for example, Ethernet, X.25, Frame Relay and ATM. IP is consequently often used as a synonym for the technology as a whole. The protocols TCP, UDP and RTP are used by the various applications and requirements in the Internet, such as "File Transfer (FTP)", "e-mail (SMTP)" and "WWW".

RTP (Real Time Protocol) is used for voice transmission. The term "Voice over IP (VoIP)" indicates that the IP protocol is used to transport voice information.

There are nowadays various protocols that result from the efforts of diverse standardization bodies and standardization drives.

13.1.2 H.323 Protocol

H.323 encompasses the following subjects:

- Signaling (H.245, etc.)
- Video transmission
- Voice transmission/voice compression, for example
  - G.723.1 (5.3/6.3 Kbps)
  - G.729A (8 Kbps)
- Data applications (Application Sharing, T.120)

It is clear that this standard offers much more than just what is needed for voice transmission via data networks. H.323 was developed for multimedia applications.

13.1.3 Standards Supported

HiPath 3000/5000 V8 supports the standards listed in the following table.

Table 13-1 Standards Supported

Standard		Transmission rate[1]	Notes
G.711	ITU standard for voice codecs	64 Kbps	ISDN voice quality
G.722	High-quality voice co-dec	48, 56 or 64 Kbps	Better voice quality than G.711
G.723.1	ITU standard for voice codecs	5.3 or 6.3 Kbps	Adequate voice quality
G.729	Group of ITU stan-dards for voice codecs	8 Kbps	Less delay and better voice quality than G.723.1
G.729A	ITU standard for voice codecs, based on G.729	8 Kbps	Less delay and better voice quality than G.723.1
G.729AB	ITU standard for voice codecs, based on G.729A	8 Kbps	Less delay and better voice quality than G.723.1
T.38	ITU standard for fax transmission (Realtime FAX)	14 Kbps	Governs communication from group 3 fax devices over IP networks

1 The bandwidth actually required in the LAN, for example, may be considerably higher. Here are some relevant factors:
– Data Link Layer used: Ethernet (with or without VLAN), PPP, Frame Relay ...
– Protocols with/without compression: RTP, UDP, IP
– Security: VPN tunnel ...
– Redundancy: For example T.38
– Packaging: the number of samples that are transported per package.

“Clear Channel” transmission mode is characterized by the fact that signals are transmitted digitally and the connection is bit-transparent. There is no compression. The transmission rate is 64 Kbps.

13.1.4 QoS - Quality of Service

Introduction

Data transmission in IP networks can encounter:

- Time problems due to large e-mail attachments and web surfing
- Network bottlenecks as a result of multiple requests for the same web page
- Reduced voice quality due to:
  - Delay (decline in voice quality due to delay)
  - Variable delays (decline in voice quality due to jitter)
  - Packet loss (decline in voice quality due to packet loss)

Quality of Service includes various methods which guarantee certain transmission properties in packet-orientated networks (IP).

It is thus important, for example, to ensure a minimum bandwidth for Voice over IP for the entire duration of the transfer operation. When several equal-access applications are operating via IP, the available transmission link bandwidth (for example, an ISDN B channel, 64K bps) is shared between these applications. Consequently, packet loss may occur during a voice connection, causing poor voice quality.

HiPath 3000/5000 QoS

In HiPath 3000/5000 networks, different types of traffic are transported via a single IP infrastructure. It is the aim of Quality of Service to fulfill the data traffic and voice traffic requirements.

To prevent voice traffic from being suppressed by data traffic, the former must be given high priority. In addition, it must be specified that high-priority traffic is transmitted before traffic with lower priority. This is specified on layers 2 and 3:

- The three bits in the 802.1p field, which is part of the 802.1Q tag, are used on layer 2.
- On layer 3, the six bits in the DiffServ Code Point (DSCP) field are used in the IP headers' Type of Service (ToS) byte.

It is also essential that sufficient bandwidth is available within the QoS class in use (Codepoint/ IEEE802.1p User Priority). The following table lists the QoS values used for DiffServ and the User Priority IEEE802.1p field.

Table 13-2 Possible QoS Settings

Traffic type	DiffServ Code Point	802.1p field (Priority 0 (= lowest) – 7 (= highest)	Traffic class
Voice payload (RTP/RTCP)	AF12 (001100)	6	Guaranteed service
Data payload (fax gateway)	AF11 (001010)	6	Guaranteed service
Signaling (H.225, H.245 and real-time application signaling)	AF21 (010010)	5	Controlled Load
All other traffic types	DE (000000)	0	Best effort

Information on the QoS procedures used for HG 1500 can be found in the HG 1500 Administration Manual.

13.2 Network Analysis

Network analysis must be performed before installation of the relevant systems and applications to guarantee smooth operation in the customer network.
Network analysis determines the conditions under which the customer's network is suitable for HiPath 3000/5000. The result report is an integral component of the requirement specifications in the HiPath 3000/5000 solution contract.

The Network Analysis service module is used to check whether the customer's communication network is suitable for business-over-IP solutions from
Siemens Enterprise Communications GmbH & Co. KG (HiPath 3000, HiPath 4000, HiPath 5000 etc.). The assessment is carried out on the basis of parameters preset by the products. The customer receives a final report in which the network structure and operating parameters (percentage utilization, delay, jitter) are documented.

Information can be found on the HiPath Network Analysis home page:
https://netinfo.icn.siemens.de/es/products/prod_netzwerk_analyse_v2/product/home_page

Customer benefits and cost-effectiveness

- Preparation of the network for future applications (VoIP)
- Determination of current traffic volume and percentage utilization, baselining
- Decision-making assistance for the introduction of VoIP solutions

Network analysis performance specification

- Examination of the suitability of customer networks for
  Siemens Enterprise Communications GmbH & Co. KG Voice-over-IP solutions
- Recording of relevant parameters over a predefined test time
- Assessment on the basis of product specifications
- Interpretation of test results with suggestions of further measures
- Final report with recommendations

Configuration notes

For use when planning Siemens Enterprise Communications GmbH & Co. KG Voice-over-IP solutions

For use only in SNMP-based IP data networks (routers, IP switches, hubs)

A System Programming Codes (Expert Mode Codes)

A.1 Introduction

The workpoints with the two lowest internal station numbers (for example, 11 and 12 or 100 and 101) can be used to administer HiPath 3000 systems.

Programming is conducted in expert mode. This allows you to program features and settings by inputting defined digit strings.

You must acknowledge error messages. When the system reports an error as a result of entering a previously used code, a code appears in the second line of the display. You can use this code to go directly to the desired menu segment.

A.2 Accessing System Administration

Users can access system administration by entering a user name (ID) and password (authentication). Depending on the active password concept (refer to Section 12.5.1.3 for more details), the procedure is as follows:

Table A-1 Starting System Administration (Service)

Step	Entry	Description
1.	*95	Start system administration
2.	XXXXX	Enter user name: • Fixed password concept: User name = 31994 • Variable password concept: Individual user name
3.	XXXXX	Enter password: • Fixed password concept: Password = 31994 • Variable password concept: Individual password

Page 12-96 contains an example of initial system administration via Manager T after the system is booted.

Table A-2 Expert Mode Code Groups

Code Group	Function
System maintenance expert mode (previously Manager T)	
11	Call detail recording
12	Speed dialing system
13	Account codes
14	Set up station
15	CO call privileges
16	Incoming calls
17	Networking
18	Traffic restriction
19	Displays
20	ISDN parameters
21	Analog CO interface
22	System settings
23	Code
24	Door relay
25	Announcement/Music
26	Relays
27	Sensors (HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300 only)
28	Edit CDB
29	System details
30	Remote service
31	Call distribution
32	Paging
33	Attendant
34	DISA
35	Least Cost Routing (LCR)
36	HiPath Cordless Office
37	Security
51 – 63	Customer administration (previously Assistant TC)

Table A-3 Expert Mode Codes

Code				Function
11				**Call detail recording**
11	1			CDR/station (call detail recording at station)
11	1	1		View CDR/station; enter station number
11	1	2		Print CDRS
11	2			CDR per trunk (call detail recording per trunk)
11	2	1		View CDR per trunk; select slot/trunk
11	2	2		Print CDRT
11	3			CDR central (call detail recording central)
11	3	1		Output format: 0 = compressed, 1 = long
11	3	2		Station number format, suppress digits: 0 = no, 1 = yes
11	3	3		Incoming calls: 0 = no, 1 = yes
11	3	4		Call duration 0 = no, 1 = yes
11	3	5		Output MSN: 0 = no, 1 = yes
11	3	6		Call charge display: 1 = Amount, 2 = Pulses
11	3	7		Outgoing without connection: 0 = no, 1 = yes
11	4			Call charge factor Enter 0 % to 10000 %
11	5			ISDN factor Enter 0 % to 10000 %
11	6			Currency, alphanumeric entry of max. 3 characters (not for U.S.)
11	7			Call log: 0 = no, 1 = yes
11	8			CDRA (call detail recording, attendant), pay phone, station.
11	9			Computing accuracy, decimal digits (0 to 3)
12				**Speed dialing system**
12	1			Speed dial numbers, external station numbers 000 to 999 (HiPath 3550/HiPath 3500); 000 to 299 (HiPath 3350, HiPath 3300)
12	2			Speed dial names (alphanumeric entries of up to 16 characters), only if speed-dialing numbers have been entered[1]

Table A-3 Expert Mode Codes

Code				Function
13				**Account Code (ACCT)**
13	1			Code entries, list 0 to 999
13	2			Checking procedure 0 = Not checked, 1 = Acc. code list, 2 = Number of digits
13	3			Entry procedure 0 = Optional, 1 = Mandatory
13	4			Code length (1 to 11)
14				**Set up station**
14	10			Copy station data
14	11			Station type
14	11	0		Standard
14	11	1		Fax
14	11	2		PhoneMail (5 digits)
14	11	3		Loudspeaker
14	11	4		Answer Machine
14	11	5		External MOH
14	11	6		P.O.T MW LED
14	11	7		PhoneMail (6 digits)
14	11	8		Door station with pulsed loop
14	11	9		Memo
14	11	10		Modem
14	12			Station names (alphanumeric), up to 16 character[1]
14	13			Override: 0 = denied, 1 = allowed
14	14			Associated Dialing: 0 = denied, 1 = allowed
14	15			DISA: 0 = denied, 1 = allowed
14	16			Call waiting rejection: 0 = off, 1 = on
14	17			Headset 0 = off, 1 = on
14	18			Call pickup group: HiPath 3550/HiPath 3500: Groups 1 to 16, max. 32 stations HiPath 3350/HiPath 3300: Groups 1 to 8, max. 8 stations
14	19			Reset station PIN: 0 = Reset to 00000
14	20			Override do not disturb 0 = no, 1 = yes

Table A-3 Expert Mode Codes

Code				Function
14	21			Missed Calls List: 0 = no, 1 = yes
14	22			MCID: 0 = denied, 1 = allowed
14	23			Call FWD, external: 0 = denied, 1 = allowed
14	25			Data compression 0 = no, 1 = yes
14	26			Select language: 11 = German 12 = US English 13 = French 14 = Spanish 15 = English 16 = Italian 17 = Dutch 18 = Portuguese 19 = Finnish 20 = Czech 21 = Danish 22 = Swedish 23 = Norwegian 24 = Turkish 25 = Telekom, German 26 = Polish 27 = Hungarian 28 = Russian 29 = Greek 30 = Slovenian 31 = Serbo-Croatian 32 = Estonian 33 = Latvian 34 = Lithuanian 35 = Chinese 36 = Slovakian 37 = Catalonian 38 = German (2) 39 = English (2) 40 = Romanian 41 = Bulgarian 42 = Macedonian 43 = Serbian (cyr.) 44 = Serbian (lat.)

Table A-3 Expert Mode Codes

Code				Function
14	27			Do not Disturb: 0 = off, 1 = on
14	28			Telephone lock intercept: 0 = no, 1 = yes
14	29			Dialing method: 1 = DTMF, 2 = DP
14	30			optiPoint BLF (busy lamp field or BLF), Display: No BLF, one BLF, two BLFs
14	31			Ringback protection per station
14	32			Setup station in internal phonebook: 0 = no, 1 = yes
14	33			Edit tel. number 0 = no, 1 = yes
14	34			Monitoring: 0 = not authorized, 1 = authorized
14	35			Keypad dial: 0 = not authorized, 1 = authorized
14	36			Forwarding CFSS
14	37			Speaker calling
14	38			Bar speaker calling
15				**CO call privileges**
15	1			Direct trunk access day; specify reference station Enter new data: 0 = No trunk access except by system speed-dialing 1 = Incoming only 2-7 = Allowed list, Allowed list 1-6 8-13 = Denied list, Denied list 1-6 14 = Full access
15	2			Direct trunk access night; specify reference station Enter new data: 0 = No trunk access except by system speed-dialing 1 = Incoming only 2-7 = Allowed list, Allowed list 1-6 8-13 = Denied list, Denied list 1-6 14 = Full access
15	3			Allowed lists
15	3	1		Allowed list 1, 100 entries
15	3	2		Allowed 2, 10 entries
15	3	3		Allowed 3, 10 entries
15	3	4		Allowed 4, 10 entries
15	3	5		Allowed 5, 10 entries

Table A-3 Expert Mode Codes

Code				Function
15	3	6		Allowed 6, 10 entries
15	4			Denied lists
15	4	1		Denied list 1, 50 entries
15	4	2		Denied 2, 10 entries
15	4	3		Denied 3, 10 entries
15	4	4		Denied 4, 10 entries
15	4	5		Denied 5, 10 entries
15	4	6		Denied 6, 10 entries
15	5			Number of authorized stations (for verification purposes only)
15	6			Telephone lock 0 = No trunk access except by system speed-dialing 1 = Incoming only 2 - 7 = Allowed lists 1-6 (AL 1 to AL 6) 8 - 13 = Denied lists 1-6 (DL 1 to DL 6) 14 = Full access (full)
15	7			Toll restriction, 0 = Digit-by-digit, 1= En-bloc sending
15	8			Switched trunk authorization
15	9			Toll restriction, private
16				**Incoming calls**
16	10			Internal station numbers
16	10	1		Station
16	10	1	1	Boards
16	10	1	2	Change station number
16	10	1	3	Find station number
16	10	2		Groups
16	11			DID numbers; (internal) station number is displayed; enter (new) station number
16	12			Intercept position, day; enter new destination, group or Stn. no., max. 6 digits
16	13			Intercept position, night; enter new destination, group or Stn. no., max. 6 digits
16	14			Intercept criteria

Table A-3 Expert Mode Codes

Code				Function
16	14	1		on RNA: 0 = no, 1 = yes
16	14	2		on Busy
16	14	2	1	Intercept 0 = no, 1 = yes
16	14	2	2	Call waiting on busy: 0 = no, 1 = yes
16	14	3		on Invalid, intercept: 0 = no, 1 = yes
16	14	4		on Incomplete, intercept: 0 = no, 1 = yes
16	14	5		on Automatic recall, intercept: 0 = no, 1 = yes
16	15			Hunt/group call
16	15	1		Called station no.; select group and assign destination
16	15	2		Ring type; select group and type: 1 = Circular hunt group 2 = Linear hunt group 3 = Group call 4 = Group call, no answer 5 = Basic MULAP 6 = Executive MULAP 7 = Group call, call waiting
16	15	3		Group name, select group and enter name (alphanumeric)[1]
16	15	4		Select host (master)/executive, group, and station (only stations that are not the host (master) telephone in another group)
16	16			Call allocation, day; select slot/trunk and assign station no.
16	17			Call allocation, night; select slot/trunk and assign station no.
16	18			Call forwarding

Table A-3 Expert Mode Codes

Code				Function
16	18	1		Select call destination list and destination index (1 – 4). Call destination lists: • up to and including V1.2 = 70 • V3.0 or later = – 376 for HiPath 3550, HiPath 3500 – 70 for all other systems Select destination (1 – 4), possible entries: • targeted call number of a station or a group • * = identical to called station • #9 = system search of all stations except for the executive extensions • #201 – #260 = uniform call distribution group 01 to group 60 • #301 – #316 = announcement device 01 to 16 • an external destination, in other words call numbers in satellites and in the central office
16	18	2		Internal calls; select station/group: • up to and including V1.2 = 70 • V3.0 or later = – 1 – 376 for HiPath 3550, HiPath 3500 – 1 – 70 for all other systems
16	18	3		External calls, day; select station/group: • up to and including V1.2 = 1 – 70 • V3.0 or later = – 1 – 376 for HiPath 3550, HiPath 3500 – 1 – 70 for all other systems
16	18	4		External calls, night; select station/group: • up to and including V1.2 = 1 – 70 • V3.0 or later = – 1 – 376 for HiPath 3550, HiPath 3500 – 1 – 70 for all other systems
16	18	5		Number of rings (1 to 15) for station/group
16	18	6		Night bell, location for station/group
16	18	7		Night bell, mode: 1 = Immediate connect, 2 = After timeout
16	18	8		Call forwarding (CF) on busy, 0 = Do not forward call, 1 = Forward call
16	19			Ring cadence: 0 = Ring type 1, 1 = Ring type 2, 2 = Ring type 3
16	20			DTMF DID: 0 = denied, 1 = allowed
16	21			Ringback protection (Brazil): 0 = off, 1 = on

Table A-3 Expert Mode Codes

Code				Function
17				**Networking**
17	11			Simplified dialing: 0 = Off, 1 = On
17	12			Assign trunk group; select slot/trunk and assign trunk group Route 1-8 (HiPath 3350, HiPath 3300) Route 1 - 16 (HiPath 3550/HiPath 3500)
17	13			Overflow route; select route and assign overflow route
17	14			Trunk type CO/CS; select trunk type: 0 = CO, 1 = CS
17	15			Route name, select route and enter name (alphanumeric)[1]
17	16			Route seizure; Route selection: 0=cyclic, 1= linear
17	17			Rerouting (optimized B channel utilization)
17	17	1		Route optimize active: 0 = No, 1 = If route is known, 2 = Always
17	17	2		Change route: 0 = denied, 1 = allowed
17	18			Central intercept
17	19			Call data routing
17	19	1		Destination system
17	20			Digit repetition; select trunk group: 0 = off, 1 = on
17	21			Path optimization: 0 = no, 1 = yes
17	22			QSig: Voice mail
17	22	1		Callback access number
17	22	2		Callback access name
17	23			QSig: Busy signaling
17	23	1		Stations: 0 = no, 1 = yes
17	23	2		Station number, destination system
17	23	3		System number, destination system
17	24			Station number type: 1 = Internal, 2 = DID, 3 = Internal/DID
18				**Traffic restriction**
18	1			Configure exec./sec. groups; select group, enter: 1 = Exec. 1. 2 = Exec. 2. 3 = Sec. 1. 4 = Sec. 2 HiPath 3550/HiPath 3500: Group 1-10 HiPath 3350/HiPath 3300: Group 1-4
18	2			Hotline

Table A-3 Expert Mode Codes

Code				Function
18	2	1		Hotline destinations HiPath 3550/HiPath 3500 Destination 1-6 HiPath 3350/HiPath 3300: Destination 1
18	2	2		Hotline station number
18	2	2	1	Hotline Mode: 0 = Off, 1 = Hotline, 2 = Off-hook alarm after timeout
18	2	2	2	Hotline assignment HiPath 3550/HiPath 3500 1-6 HiPath 3350/HiPath 3300 1
18	2	3		Hotline timeout, 1-99 x s
18	3			ITR groups (internal traffic restriction groups)
18	3	1		Group assignment
18	3	1	1	Station
18	3	1	2	Lines, select slot/line
18	3	1	3	Speed-dialing number assignment
18	3	1	3-1	Minimum speed-dialing group, Select group, 0 to 999
18	3	1	3-2	Maximum speed-dialing group, Select group, 0 to 999
18	3	2		Connection groups
18	3	2	1	Matrix, Select Group: 0 = no, 1 = yes
19				**Displays**
19	11			Text messages: select message no. 0 to 9 and enter a text containing up to 24 [1] characters (alphanumeric)
19	12			Advisory messages: select message no. 0 to 9 and enter a text containing up to 24 [1] characters (alphanumeric)
19	13			Enter 4-digit time in the format HHMM (hour minute)
19	14			Enter 6-digit date in the format DDMMYY (day month year)
19	15			Call duration: 0 = off, 1 = on
19	16			Name, Call numbers: 0 = Calling ID only, 1 = Name, 2 = Name and calling ID
19	17			Automatic recall 1 = Caller, 2 = Transferred destination

Table A-3 Expert Mode Codes

Code				Function
19	18			Transfer before answer: 1 = Transferred by, 2 = Transferred to
20				**ISDN parameters**
20	1			Call number suppression 0 = off, 1 = on
20	2			System station number - incoming
20	2	1		Station number; select trunk group
20	2	2		National number; select trunk group
20	2	3		International number; select trunk group
20	2	4		Type, outgoing; select trunk group: 0 = Unknown, 1 = Station, 2 = National, 3 = International, 4 = Internal
20	2	5		National prefix (U.S. = 1)
20	2	6		International prefix (U.S. = 011)
20	3			Reference clock
20	3	1		Allowed nos. list; select position (slot and port)
20	3	2		Denied nos. list; select position (slot and port)
20	4			EU parameters (not for U.S.)
20	4	1		S_0 port configuration; select slot/port and determine connection type (not for U.S.): 1 = Automatic 2 = Euro CO PP 3 = Euro CO PMP 4 = Euro bus 5 = CorNet 1 6 = CorNet 2 7 = ECMA-QSIG 8 = ISO-QSIG
20	4	2		S2M port configuration; select slot/port and determine connection type (not for U.S.): 1 = Euro CO PP 2 = CorNet 1 3 = CorNet 2 4 = ECMA-QSIG 5 = ISO-QSIG
20	4	3		S_0 bus MSN (for verification purposes only)
20	4	4		Call forwarding PMP
20	4	4	1	Multiple subscriber numbers, select index, 1 to 10

Table A-3 Expert Mode Codes

Code				Function
20	4	4	2	MSN trunks, select index, 1 to 10
20	5			US parameters (for U.S. only)
20	5	1		BRI parameter
20	5	1	1	CO/protocol: 1 = AT&T/NI 1 2 = AT&T/Custom 3 = Siemens/NI 1 4 = NT/NI 1
20	5	1	2	SPID admin, select station, select slot/port
20	5	1	3	CAID admin, stn., select CAID
20	5	1	4	PDID admin, stn., select PDID
20	5	1	5	FIN - for message waiting
20	5	1	6	CACH EKTS, select slot/port: 0 = off, 1 = on
20	5	2		PRI parameters
20	5	2	11	Protocol type: 11 = AT&T/Custom 12 = AT&T/NI2 13 = AT&T/NI2 OSA 14 = AT&T/4ESS 15 = Siemens/Custom 16 = Siemens/Custom OSA 17 = Siemens/NI2 18 = Siemens/NI2 OSA 19 = MCI/DEX600 20 = MCI/DMS250 21 = BELL/DMS100 22 = BELL DMS100 TNS 23 = Nortel/DMS100 24 = Nortel DMS100 TNS 25 = SPRINT/DMS250 26 = Westinghouse 27 = FTS/DMS250 28 = FTS/5ESS 29 = GENERIC/NI2 30 = GENERIC/NI2 OSA 31 = QSIG 32 = IDA-P

Table A-3 Expert Mode Codes

Code				Function
20	5	2	12	Frame/line/encod, select slot 0 = ESF/B8ZS/Normal 1 = SF/ZCS/Inverted
20	5	2	13	Inwats parameter
20	5	2	13-1	Direction
20	5	2	13-2	DNIS
20	5	2	13-3	Entrance telephone ring destination

Table A-3 Expert Mode Codes

Code				Function
20	5	2	14	Calling service, select trunk group 11 = NONE 12 = AT&TSDN-GSDN 13 = AT&TSDDN 14 = MCI-VN-VS 15 = SPRINT-VPN 16 = WICN-PV 17 = MEG800-TFM 18 = MCI 800 19 = ULTRA-800 20 = WICN-INWATS 21 = MEG 22 = MCI-PRISIM-WATS 23 = SPR-ULTRA-WATS 24 = WICN-OUTWATS 25 = ACCU-SDS 26 = LDS-WC-TSAA 27 = INTER-800 28 = MULTIQUEST 29 = MCI-900 30 = SDS56 31 = SDS64C 32 = SDS64R 33 = DMS100-PV 34 = DMS100-INWATS 35 = DMS100-OUTWATS 36 = DMS100-FX 37 = 5ESS-INWATS 38 = WATS-MSB 39 = DMS100-TIE 40 = NI2-INWATS 41 = NI2-OUTWATS 42 = NI2-FX 43 = NI2-TIE 44 = NI2-HOTEL 45 = NI2-SCOCS 46 = CALL-BY-CALL 1 47 = CALL-BY-CALL 2 48 = CALL-BY-CALL 3 49 = CALL-BY-CALL 4 50 = WATS-BANDED

Table A-3 Expert Mode Codes

Code				Function
20	5	2	15	CBC pool: 11 = AT&TSDN-GSDN 12 = AT&TSDDN 13 = MCI-VN-VS 14 = SPRINT-VPN 15 = WICN-PV 16 = MEG800-TFM 17 = MCI 800 18 = ULTRA-800 19 = WICN-INWATS 20 = MEG 21 = MCI-PRISIM-WATS 22 = SPR-ULTRA-WATS 23 = WICN-OUTWATS 24 = ACCU-SDS 25 = LDS-WC-TSAA 26 = INTER-800 27 = MULTIQUEST 28 = MCI-900 29 = SDS56 30 = SDS64C 31 = SDS64R 32 = DMS100-PV 33 = DMS100-INWATS 34 = DMS100-OUTWATS 35 = DMS100-FX 36 = 5ESS-INWATS 37 = WATS-MSB 38 = DMS100-TIE 39 = NI2-INWATS 40 = NI2-OUTWATS 41 = NI2-FX 42 = NI2-TIE 43 = NI2-HOTEL 44 = NI2-SCOCS
20	5	2	16	CBC access code
20	5	3		S0 bus MSN, select slot/port
20	5	4		QSig: S0 parameter
20	6			QSIG parameter

Table A-3 Expert Mode Codes

Code				Function
20	6	1		System number
20	6	2		Group number
20	7			Keypad dial: 0 = denied, 1 = allowed
20	8			System station number - outgoing
20	8	1		Port number
20	8	2		National number
20	8	3		International number
20	8	4		Suppress station number
21				**Analog CO interface**
21	1			Dialing method; select slot/trunk: 0 = Automatic, 1 = DTMF, 2 = Dial pulses 3 = MFC-R2, 4 = MFC-R2 with OAD
21	2			Delayed dialing; select trunk group: 0 = No pause, 1 = 1 s, 2 = 3 s, 3 = 6 s, 4 = 9 s
21	3			Trunk call pause; select trunk group: 1 = 6 s, 2 = 13 s
21	4			Line Length; select slot and trunk: 0 = Short 1 = Long
21	5			Charge data module, select slot/trunk: 0 = off, 1 = on
21	6			Silent reversal: 0 = no, 1 = yes
21	7			Port status: 0 = on, 1 = Off (SW), 2 = Off (HW), 3 = Off (HW, SW)
21	8			Allocated without extension
22				**System settings**
22	11			Music on Hold (MOH): 0= Off, 1 = No ring tone, 2 = Ring tone, 3 = Announcement device 1
22	12			Internal Phonebook: 0 = No, 1 = Internal, 2 = LDAP, 3 = All
22	13			V.24 (RS-232) configuration
22	13	1		Select CB baud rate: 1 = 9600 baud, 2 = 2400 baud, 3 = 19200 baud
22	13	2		Port assignment
22	13	2	1	CSTA/CDRC (call detail recording central), output: 0 = none, 1 = V.24 port, 2 = UPN port, 3 = PC-VPL, 4 = LAN

Table A-3 Expert Mode Codes

Code				Function
22	13	2	2	Port for CDRS (call detail recording at station), output: 0 = none, 1 = V.24 port, 2 = UPN port
22	13	2	3	Port for CDRT (call detail recording per trunk), output: 0 = none, 1 = V.24 port, 2 = UPN port
22	13	2	4	Port for CDB printout
22	13	2	5	Port for CDR printout
22	13	2	6	Port for CDRA (call detail recording, attendant); if a pay phone is configured, also see code 11 8), output: 0 = none, 1 = V.24 port, 2 = UPN port
22	14			Call FWD, external
22	14	1		Connect call: 0 = On answer, 1 = Immediately.
22	14	2		Call forwarding: 0 = deactivate, 1 = activate
22	15			Caller list mode: 1 = Only external, 2 = External and Internal, 3 = External ring/call
22	16			Application
22	16	1		Call distribution: 0 = no, 1 = yes
22	17			Tones
22	17	1		Conference, Warning tone: 0 = off, 1 = on
22	17	2		Call pickup, Warning tone: 0 = off, 1 = on
22	18			Transfer key (Retrieve): 1 = Press once, 2 = Press twice
22	19			Class of service
22	19	1		Night answer, Pos. 1-5; enter station
22	19	2		Central telephone lock
22	20			DTMF automatic: 0= no, 1 = yes
22	21			Key click: 0=Off, 1= Volume 1 ... 4 = Volume 4
22	22			DTMF - Pulse/Pause: 1 = 70/70 msec, 2 = 80/80 msec, 3 = 80/250 msec, 4 = 200/200 msec
22	23			Phone lock destination
22	24			Stn. relocate: 0 = denied, 1 = allowed
22	25			Trunk reservation: 0 = off, 1 = on
22	26			Speaking volume: 0 = default, 1 = high
22	27			CO features (Transfer/Conference/Drop): 0 = disabled, 1 = enabled
22	28			Feature Identification Number (FIN) for Transfer (for U.S. only)

Table A-3 Expert Mode Codes

Code				Function
22	29			Feature Identification Number (FIN) for Conference (for U.S. only)
22	30			Feature Identification Number (FIN) for Drop (for U.S. only)
22	31			MSN default: 0 = off, 1 = on
22	32			DTMF hidden: 0 = off, 1 = on
22	33			Announcement with connection: 0 = denied, 1 = allowed
22	34			MFC-R2 parameters
22	34	1		Ringback protection
22	34	2		DID digits
22	35			Common hold
22	35	1		By hanging up
22	35	2		Without hanging up
22	36			Switch line, DSS: 0 = no, 1 = yes (Status 1 = U.S., Status 0 = Rest of World (ROW)
22	37			Advisory call 0 = off, 1 = on
22	38			Trace stop facility
22	38	1		Stop trace
22	38	1	01	Assistant: 0 = inactive, 1 = active
22	38	1	09	HW: 0 = inactive, 1 = active
22	38	1	12	Processor: 0 = inactive, 1 = active
22	38	1	15	APSXF: 0 = inactive, 1 = active
22	38	1	16	General: 0 = inactive, 1 = active (error 19 cannot be set to inactive)
22	38	1	20	CP: 0 = inactive, 1 = active
22	38	1	21	DH: 0 = inactive, 1 = active
22	38	1	23	Network: 0 = inactive, 1 = active
22	38	1	26	Presence 0 = inactive, 1 = active
22	38	1	28	Recovery: 0 = inactive, 1 = active
22	38	1	29	IO Process: 0 = inactive, 1 = active
22	38	1	30	LW: 0 = inactive, 1 = active (0 to n)
22	38	1	11	LW date: 0 = inactive, 1 = active (41 to n)
22	38	2		Reset 1 = Delete all, 2 = System default

Table A-3 Expert Mode Codes

Code				Function
22	39			IP access
22	39	1		IP interface, mode: 0 = Inactive 1 = HIP Forwarding 2 = LIM 3 = SLIP Routing
22	39	2		IP address, data (7 ... 15): x.x.x.x (x = 0 ... 255) Use either "*" or "." as a separator.
22	39	3		Subnet mask
22	39	4		Gateway IP address
22	40			Open numbering
22	40	1		Active/inactive
22	40	2		Voice mail node number
22	40	3		Node number
22	41			UCD permanently available: 0 = inactive, 1 = active
23				**Code**
23	1			Substitute code *, code 75
23	2			Substitute code #, code 76
23	3			Trunk access code; select slot and trunk and enter new code
23	4			Route code; Select route followed by position 1-10 for code and enter new code Route 1-8 (HiPath 3350HiPath 3300,) Direction 1-16 (HiPath 3550/HiPath 3500)
23	5			Attendant code
23	5	1		Attendant code DID
23	5	2		Attendant code internal
23	6			Second trunk access code
23	7			Reset telephone lock code
23	8			Hotel terminal

Table A-3 Expert Mode Codes

Code				Function
24				**Door relay**
24	1			Entrance phone; select door, max. 6 digits, door 1-4
24	2			Destination; select door, max. 6 digits, door 1-4
24	3			Door opener; select door: 0 = not available, 1 = available, 2 = available with DTMF, doors 1-4
24	4			Call forwarding, door, external; select door: 0 = do not run, 1 = run
24	5			Door opener, DTMF, select station: 0 = denied, 1 = allowed
25				**Announcement/Music**
25	1			Announcement devices
25	1	1		In system (select announcement device 1 ... 16)
25	1	2		Via server (select announcement device 1 ... 16)
25	2			Type of ann., select ann. device: 1 = Ann. type, 2 = Music on hold, 3 = Internal music
25	3			Announcement prior to answer; select slot and trunk
25	4			External MOH (Only enter analog line module stations.)
26				**Relays**
26	1			Type; select relay 1 to 4 and assign function: 11 = Manual on and off 12 = Off after timeout 13 = Door opener 14 = Speaker amplifier (starting contact for amplifier) 15 = Busy display 16 = Music on hold 17 = Call charge pulse 18 = Second bell 19 = Station active 20 = Announcement
26	2			Switching time Select relay 1 through 4 and enter up to 3 digits (0 to 255)
26	3			Assigned station Select relay 1 through 4 and enter stations or groups (up to 5 digits)
26	4			Relay name; select relay 1 to 4, enter a name containing up 16 [1] characters (alphanumeric)

Table A-3 Expert Mode Codes

Code				Function
27				**Sensors (HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300 only)**
27	1			Type: 0 = Alarm, 1 = Call distribution
27	2			Destination station no.; select sensor 1 - 4 External station with seizure code (trunk/direction) Internal station with station prefix (if programmed)
27	3			Station no. for announ.; select sensor 1 - 4 and enter station or group number (max. 6 digits)
27	4			Infobox control data; select sensor 1 - 4 and enter control characters 0 - 9, *, #, max. 24 digits
27	5			Call duration; select sensor 1 through 4 and enter 1 to 255
27	6			Call pause; select sensor 1 through 4 and enter 0 to 255
27	7			Number of rings; select sensor 1 through 4 and enter 1 to 255
27	8			Block time; select sensor 1 through 4 and enter 0 to 255
27	9			Sensor text; select sensor 1 to 4, enter text containing up 16 [1] characters (alphanumeric)
28				**Edit CDB**
28	1			Print CDB data
28	2			Save CDB data
28	2	1		CDB to MMC
28	2	2		CDB from MMC
29				**System details**
29	1			System
29	1	1		System type (for verification purposes only)
29	1	2		SWversion (for verification purposes only)
29	2			Status display
29	2	1		Call forwarding, external, 0 = Off, 1 = On (for verification purposes only)
29	2	2		Night service, 0 = Off, 1 = On (for verification purposes only)
29	2	3		Trunk, 0 = Inactive, 1 = Active (for verification purposes only)
29	2	4		Ping, 1 = IP address, 2 = Start
29	2	5		MAC address
29	3			Options (HiPath 3550, HiPath 3350, HiPath 3500 and HiPath 3300 only)

Table A-3 Expert Mode Codes

Code				Function
29	3	1		Type per option (for review only) 1 = Relays 2 = Call detail recording 3 = Fax/DID 4 = ANI 5 = Announcement (Beyer)
29	3	2		Software version for each option (1 to 16) (for verification purposes only)
29	3	3		Reset options
29	4			Boards
29	4	1		Board type, select slot: 11 = TMS2 12 = TMST1 - digital 13 = TIEL 14 = TMDID 15 = TML8W 16 = TMOM 17 = TMGL8 18 = TLA2 19 = TLA4 20 = TLA8 21 = TS2 22 = TMGL2 23 = TMGL4 24 = TMQ2 25 = TMQ4 26 = TST1 - digital 27 = STMD 28 = STLS2 29 = STLS4 30 = SLA16 31 = SLMO8 32 = SLMO24 33 = SLMC8 (CMI V1) 34 = 4SLA / SLAD4 35 = 8SLA / SLAD8 34 = 4SLA 35 = 8SLA XX = DIUT2

Table A-3 Expert Mode Codes

Code				Function
29	4	1		Board type, select slot: 36 = 16SLA 37 = SLU8 38 = ILAN 39 = SLC16 (CMI V2.2M) 42 = SLMO8K 43 = SLMO24K 44 = SLA8N 45 = SLA16N 46 = SLA24N 47 = TMAMF 48 = CR8 49 = SLU4 (Octopus E 10) 50 = SLU2 (Octopus E 10) 52 = HXGS (HiPath 3550, HiPath 3350, HiPath 3500, HiPath 3300) 53 = IVMS8 54 = IVML8 55 = IVML24 56 = SLAS16 57 = TMCAS 58 = SLUC8 ($U_{P0/E}$ interfaces on CBCC, CBRC, CBCP) 59 = SLUC4 ($U_{P0/E}$ interfaces on SBSCO) 60 = SLUC2 ($U_{P0/E}$ interfaces on SBSCS) 61 = SLAS4N 62 = SLAS8N 63 = IVMP8 64 = 65 = HXGS3 66 = SLC16N 67 = STMD2 68 = STLS2N 69 = STLS4N 70 = SLMO2

Table A-3 Expert Mode Codes

Code				Function
29	4	1		Board type, select slot: 71 = TMEW2 72 = DIUN2 73 = SLMA8 74 = SLMA3 75 = SLMA2 76 = SLMO8_HP4K 77 = STMD3 78 = SLCN 79 = STMI2 80 = IVMN8 81 = IVMNL 82 = TM2LP 83 = TMDID_HP4K 84 = TMC16 85 = DIU2U 86 = EVM2 87 = TS2 88 = STMD3 (feeding)
29	4	2	xx	Reset board (for board no., see 29-4-1)
29	4	3	0-9	Board status
29	4	4		Disable/enable board
29	5			Country initialization
29	5	1		Variable password
29	5	1	00 to 99	SeeSelect country code
29	5	2		Fixed password

Table A-3 Expert Mode Codes

Code				Function
29	5	2	00 to 99	Select country code 11 = Germany 12 = Netherlands 13 = France 14 = Finland 15 = United Kingdom 16 = Italy 17 = Spain 18 = Portugal 19 = Switzerland 20 = Austria 21 = International 22 = Ireland 23 = Belgium 24 = Brazil 25 = South Africa 26 = China 28 = India 29 = Czech Republic 30 = Denmark 31 = Australia 32 = Argentina 33 = Philippines 35 = Brazil 2 36 = Singapore 37 = Hungary 38 = Malaysia 40 = Indonesia 41 = Russia 42 = Thailand 46 = Poland 47 = Greece 49 = Sweden 50 = Norway 51 = Turkey 52 = U.S. 53 = Pakistan 54 = Hong Kong 55 = New Zealand 56 = Taiwan 57 = Korea
29	6			Virtual subscribers

Table A-3 Expert Mode Codes

Code				Function
29	6	1		Configure stations
29	6	2		Display stations
30				**Remote service**
30	1			DTMF access: 0 = No access, 1 = Access as host (primary), 2 = Access as client (secondary), 3 = Host and client (primary and secondary)
30	2			ISDN trunk access: 0 = Enable procedure, 1 = Logon (DID) without PIN, 2 = Logon (DID) with PIN, 3 = Callback
30	3			Other access: 0 = Enable procedure, 1 = Logon without code, 2 = Logon (DID) with code, 3 = Callback
30	4			Reset password
30	5			Integrated modem
30	5	1		Station number, remote service, max. 6 digits
30	5	2		DID number, remote service
30	5	3		CAID admin (for U.S. only)
30	6			Digital modem
30	6	1		Station number, remote service, max. 6 digits
30	6	2		DID number, remote service
30	6	3		CAID admin (for U.S. only)
30	7			Callback connection
30	7	1		Destination; select position (1-6)
30	7	2		Password; select position (1-6)
30	7	3		X.75 protocol: 0 = no, 1 = yes
30	8			Automatic CDB printout: 0 = no, 1 = yes
30	9			USBS D channel access
30	9	1		Station number, remote service
30	9	2		DID number, remote service
31				**Call distribution**
31	1			Group assignment; select group ID
31	2			Group parameters
31	2	1		Announcement device; select group HiPath 3550/HiPath 3350/HiPath 3500/HiPath 3300: Announcement device 1-4

Table A-3 Expert Mode Codes

Code				Function
31	2	2		Wait times; select group, time: 1-9 x 30s
31	2	3		Call cycles
31	2	3	1	Primary cycles; select group
31	2	3	2	Secondary cycles; select group
31	2	4		AICC connection; select group 0 = off, 1 = on
31	2	5		Max. waiting calls; select group
31	3			Wrap-up time: 0 = no wrap-up time, 1-20 = wrap-up x 30s
31	4			Call priority external; select slot/trunk
31	5			Call priority internal
32				**Paging**
32	1			PSE port (slot and trunk)
32	3			Protocol: 1 = ESPA 4.4.5, 2 = ESPA 4.4.3
32	4			Operating mode
32	4	1		Mode urgent
32	4	2		Mode normal
32	4	3		Mode text
32	5			Display
32	5	1		Number
32	5	1	1	Number of digits
32	5	1	2	Display, filler: 0=none, 1=left, 2=right
32	5	1	3	Filler
32	5	2		Text
32	5	2	1	Number of digits
32	5	2	2	Display, filler: 0=none, 1=left, 2=right
32	5	2	3	Filler
32	6			PSE data transfer; select sequence: 1 = Operating mode, 2 = Call no., 3 = Text
32	7			PSE dial assignment; select station (not for U.S.)
32	8			PSE dial numbers; select index

Table A-3 Expert Mode Codes

Code				Function
33				**Attendant**
33	1			Queued calls
33	3			Speed extending: 0 = denied, 1 = allowed
33	4			Extend undialed lines : 0 = denied, 1 = allowed
34				**DISA**
34	1			Day/night. select slot / line: 0 = None, 1 = Only night, 2 = Only day, 3 = Day and night
34	2			DID number
34	3			Security mode: 0 = by time, 1 = by #
34	4			CAID admin (for U.S. only)
35				**Least Cost Routing (LCR)**
35	1			LCR on or off: 0 = off, 1 = on
35	2			Digit transmission: 0 = Digit-by-digit, 1= En-bloc sending
35	3			Dial rule
35	3	1		Name; select line
35	3	2		Format; select line
35	3	3		Type, select line: 0 = undefined, 1 = Main network supplier, 2 = 1-level, 3 = 2-level, 4 = CN, 5 = DICS, 6 = PRI
35	4			Authorization code; select index (1-16)
35	5			Schedule
35	5	1		Time limit; select day index (1 = Monday to 7 = Sunday) and time format (hhmm)
35	5	2		Timezone; select day index (1 = Monday to 7 = Sunday) and time period 1-8
35	6			Class of service (1 to 15); select station
35	7			Route tables
35	7	1		Route; select table/line
35	7	2		Assign dial rule; select table/line
35	7	3		Min. authorization; select table/line
35	7	4		Assign timezone; select table/line
35	7	5		Warning, select table/line: 1 = none, 2 = display, 3 = tone, 4 = display and tone

Table A-3 Expert Mode Codes

Code				Function
35	8			Dial plan
35	8	1		Dialed digits; select line
35	8	2		Assign route table; select line
35	8	3		Account codes: 0 = no, 1 = yes
35	8	4		Toll restriction, private: 0 = no, 1 = yes
35	8	5		Toll restriction: 0 = no, 1 = yes
35	8	6		Emergency number
36				**HiPath Cordless Office**
36	1			Log on CMI unit; select device: 1 = inactive
36	2			CMI code; select device
36	3			CMI number; select device, changes not possible
36	4			Reset cordless code
36	5			DECT identification, data: 1. E/ARC 2. EIC 3. FPN 4. FPS
37				**Security**
37	1			Change password

Table A-3 Expert Mode Codes

Code				Function
				Customer administration (previously Assistant TC)
52				Time, hour/minute
53				Date, ddmmyy
55				**Station names**
56				**Text messages**
57				**Advisory messages**
58				Select language
59				**Group names**
61				Hotline
61	1			Hotline destinations
61	2			Hotline station
61	2	1		Hotline mode, 0 = Off, 1 = Hotline, 2 = Code blue
61	2	2		Hotline assignment
61	3			Hotline timeout
62				Codes, remote service
63				Codes, Cordless
The "bolded" messages only appear on workpoints that support alphanumeric character entry.[1]				

1 Alphanumeric characters can only be entered at the following workpoints: optiPoint 600 office (in $U_{P0/E}$ mode), optiPoint 410 advance, optiPoint 420 advance and OpenStage 40/60/80.

B Codes for Activating/Deactivating Features

This appendix describes the options for activating and deactivating features depending on the different workpoint clients (WpC).

Table B-1 contains all the activation/deactivation procedures for analog workpoint clients, TDM workpoint clients without a display and CMI mobile phones. The table only contains the access codes for TDM workpoint clients with a display, CMI feature mobile phones and IP workpoint clients. The procedures for S_0 workpoint clients either correspond to procedures for analog workpoint clients or are handled via the relevant ISDN protocol with the terminal-specific user interface.
The table also contains information about the effect of the telephone lock and the status-specific locking of features.

Table B-2 contains a description of the various types of workpoint clients.

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for								Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition				
	Code + Procedure	Code	Code	Key		Menu		Code		via Telephone lock	Status locking on	
				Fixed	Programmable	Dialog	Service					
Activate relay	*90+Relay no.	7590...	*90...	–	V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Deactivate relay	#90+Relay no.	7690...	#90...	–	V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Accept call waiting	*55	7555	*55	–	V	BR, WA, RG, GS, BS	U	Mouse click, Drag& Drop	AN, DIG, ENT, S0, CMI, IP-SC, IPH3	–	–	Also possible via the DSS, GESP, LTG or MUSAP key
Bar call waiting (automatic)	#490	76490	#490	–	V, T	RH	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	

Abbreviations:
- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for								Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition		via Telephone lock	Status locking on	
				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code				
Allow call waiting (automatic)	*490	75490	*490	–	V, T	RH	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Silent call waiting (camp-on) on	–	–	*87	–	V, T	RH	U1	Local feature	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Silent call waiting (camp-on) off	–	–	#87	–	V, T	RH	U1	Local feature	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Logon mode (for handset)	*942+Code +Stn. no.	–	*942	–	–	–	H	–	DIG, CMI	X		
Query caller list	–	–	#82...	–	V	RH, BR	U	Local feature menu	DIG, IPSC, IPSI	X		Only if enabled
Missed calls - save number/ save call number	–	–	*82	–	–	RG, GS	–	Local active menu	DIG, IPSC	X	RK, BR, WA	Only if enabled
Do not disturb on	*97	7597	*97	–	V, T	RH	U	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Do not disturb off	#97	7697	#97	–	V, T	RH	U	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Call forwarding on, internal or external	*1+Type+Stn. no.	751... or Call forwarding (local S_0 WpC functionality)	*1...	–	V, U, T	RH	U	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Later selection of the forwarding type: 1 = All calls, 2 = Ex. calls only, 3 = Int. calls only

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for								Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition				
				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Call forwarding off	#1	761	#1	–	V, T	RH	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Call forwarding in EDSS1 trunk on (not for tenant service)	–	–	*64...	–	V, U, T	RH	U1	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Only for S_0 trunk connection and authorized stations. Later selection of the forwarding type: 1 = immediate, 2 = unanswered calls, 3 = on busy. All call forwarding types can be activated independently of each other.
Call forwarding in EDSS1 trunk off (not for tenant service)	–	–	#64...	–	V, T	RH	U1	–	AN, DIG, ENT, S0, CMI, IPSC	X		
CFSS (Call forwarding station out of service)	–	–	*9411	–	V, U, T	–	U1	–	IPSC	X	RK, BS	CFSS (call forwarding station out of service) has higher priority than normal call forwarding.
CFSS (Call forwarding station out of service)	–	–	#9411	–	V, T	–	U1	–	IPSC	X		
Call forwarding on for each MULAP	*501+MULAP+Type+Stn. no.	75501	*501	–	V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC			Only for MULAP members
Call forwarding off for each MULAP	#501+MULAP	76501	#501		V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC			Only for MULAP members
UCD (uniform call distribution), logon	*401+ID	–	*401..	–	V, U, T	–	U2	Feature key	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for UCD group members

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for								Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition		via Telephone lock	Status locking on	
	Code + Procedure	Code	Code	Key: Fixed	Key: Programmable	Menu: Dialog	Menu: Service	Code				
UCD (uniform call distribution), logoff	#401	–	#401	–	V, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
UCD, available	*402	–	*402	–	V, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
UCD, unavailable	#402	–	#402	–	V, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
UCD, rework on	*403	–	*403	–	V, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
Call distribution, rework off	#403	–	#403	–	V, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
Call distribution, night destination on	*404 +* or Stn. no.	–	*404 ...	–	V, U, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
Call distribution, night destination off	#404	–	#404	–	V, T	–	U2	–	AN, DIG, ENT, CMI, IPSC	X	RK, BS	Only for logged on stations
Call distribution, queue	–	–	*405	–	V	–	U2	–	DIG, IPSC	X	RK, BS	Only for logged on stations
Call acceptance	–	–	–	–	V	–	–	Mouse click, Drag& Drop	ALL	X	RH, BR, WA, BS, RG	Can only be activated using key
Advisory message on	–	–	*69...	–	V, U, T	RH	U1	Local feature menu	DIG, CMI. IPSC	X	RK, BS	
Advisory message off	–	–	#69...	–	V, T	RH	U1	Local feature menu	DIG, CMI. IPSC	X	RK, BS	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Associated dialing	*67+Stn.+Stn. no.	7567...	*67...	–	U	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X		Only for authorized stations
Associated services	*83+Stn.+ Services procedure...	7583	*83...	–	U	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Only for authorized stations
Override	*62	–	*62	–	V	RG	U1	–	AN, DIG, ENT, CMI, IPSC	–	–	Only for authorized stations
Room monitor on	*88	7588	*88	–	V	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	WA, RG, GS, RK, BS	Not possible for workpoint clients without a speakerphone when handset is on-hook
Room monitor off	–	–	–	–	–	–	–	–	AN, DIG, ENT, S0, CMI, IPSC	–		Room monitor off by hanging up or pressing the loudspeaker or release key
Telephone lock on, individual	*66+Code	7566...	*66...	–	U, T	RH	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	–	RK, BS	
Telephone lock off, individual	#66+Code	7666...	#66...	–	U, T	RH, BR	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	–	RK, BS	
Change telephone lock access code	*93+Old code+2 x New code	7593...	*93...	–	–	–	H	Local feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Reset services/features for own workpoint client	#0	760	#0	–	–	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	x	RK, BS	See feature description: Reset activated features

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Speaker call	*80+Stn. no.	7580	*80	–	V, U	–	H	Menu	AN, DIG, ENT, S0, CMI, IPSC	–	RK, BS. WA, RG	Speaker calls to a group: Paging only possible if “Speaker call” has been enabled for the called party. The called party’s microphone is activated if “Direct Answering” has been enabled for this party (not for paging).
Hands free answerback on	–	–	*96	–	V, T	RH	U1	–	DIG, CMI, IPSC	X	–	Only for WpC with speakerphone
Hands free answerback off	–	–	#96	–	V, T	RH	U1	–	DIG, CMI, IPSC	X	–	Only for WpC with speakerphone
DISA (Direct Inward System Access)	–	–	–	–	–	–	–	–	–	–	–	Activation only possible from external location for authorized stations/lines. HiPath 5000 does not support the DISA feature.
Internal DISA	*47+DISA stn. no.+DISA STN.+service +Suffix dialing	–	*47...	–	V, U	RH	U1	–	AN, DIG, ENT, IPSC	X	WA, RG, RK, BS	Within a HiPath 5000 network only. Features cannot be activated from analog (DP) or S_0 WpC.
Discreet calling on	*945+Stn. no.	75945	*945..	–	U	–	–	–	DIG, S0, IPSC	X	WA, RG, BS, RK, GS	Only for authorized stations, No AN as a destination terminal

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Discreet calling off	#945+Stn. no.		*945..	–	U	–	–	–	AN, DIG, S0, IPSC	X	WA, RG, BS, RK, GS	Only for authorized stations
Relocate: Save configuration	*9419 (only TDM WpC without display)	–	*9419	–	–	–	–	Possible via central database	DIG, ENT	X	WA, RG, RK, BS, GS	Not for the first two station ports
Relocate: Reactivation, load configuration	#9419 (only TDM WpC without display)	–	#9419	–	–	–	–	–	DIG, ENT	X	WA, RG, RK, BS, GS	Not for the first two station ports
Phone test	*940	–	*940	–	–	–	U1	–	DIG, ENT, IPSC	–	WA, RG, RK, BS, GS	
MCID	*84	MCID (local S_0 WpC functionality)	*84	–	V	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	–	–	
Flex call	*508+Stn. no.	75508	*508	–	V	–	H	–	AN, DIG, ENT, S0, CMI, IPSC		–	
Release trunk (Emergency Trunk Access)	*43+Trunk code	7543...	*43..	–	U	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Only for attendant

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	Code + Procedure	Code	Code	Key: Fixed	Key: Programmable	Menu: Dialog	Menu: Service	Code				
View call charges (see charge display)												
Call detail recording, attendant (CDRA)	–	–	–	–	V	–	–	–	DIG	x	RK, BS	Only if appropriate authorization is assigned
Call recording on	*493 TDM WpC without display: programmed key	–	–	–	V, T	CMI feature handset only.	–	Feature menu	AN, DIG, ENT, CMI, IPSC	X	RH, BR, WA, RG, BS, RK	Only for authorized stations
Call recording off	#493 TDM WpC without display: programmed key	–	–	–	V, T	CMI feature handset only.	–	Feature menu	AN, DIG, ENT, CMI, IPSC	X	RH, BR, WA, RG, BS, RK	Only for authorized stations
Selective line seizure	See numbering plan	See numbering plan	See numbering plan	–	V	–	–	See numbering plan	AN, DIG, ENT, S0, CMI, IPSC	X	–	Only with trunk key for prime line Telephone lock for outgoing lines only
Group call	See numbering plan	See numbering plan	See numbering plan	–	V	–	–	See numbering plan	AN, DIG, ENT, S0, CMI, IPSC	–	–	Group calls can be programmed on DSS key
Group call, join	*85	7585	*85	–	V, T	RH	U1	Feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	All group calls, join = *85*

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Group call, leave	#85	7685	#85	–	V, T	RH	U1	Feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	All group calls, leave = #85#
Hold key	–	–	–	–	V	–	–	Mouse click, Key	DIG, ENT	–	–	
Hardware settings	+/– ...(local procedure for CMI)	–	+/–...	X	–	–	–	Local Key	ALL	–	RK	From idle state: Call parameters, speaker mode (if available) From talk state: Volume
Hotel terminal	*491+Stn. no.	75491	*491	–	–	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	WA, RK, BS, RG	Activate LED
Hotline	–	–	–	–	–	–	–	–	AN, DIG, ENT, S0, CMI, IPSC	–	–	Hotline destination is defined for each individual station in the CDR.
Send message (message waiting)	*68+(Stn. no.)+Text no.	7568...	*68	–	V, U	RH, RG	U1	Local feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Without dialing call number in ringing state

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Cancel/answer/display message (message waiting)	#68	7668	#68	–	–	RH	U1	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Suffix dialing not permitted for DIG, S0. Suffix dialing for AN, ENT, CMI: 0 = delete all sent and received messages, 1 = delete all sent messages, 2 = delete all received messages, 3 = call sender.
Fax waiting message/answering machine	Only TDM workpoint clients with corresponding key	–	–	–	V	–	H	–	DIG, ENT	–	–	Feature deleted by pressing the key
Keypad dial	–	–	*503	–	–	GS	–	Can be displayed	DIG, CMI, IPSC	–	–	
Conference (up to 5 stations)	*3	753	*3	–	V	GS	U1	Local active menu	AN, DIG, ENT, S0, CMI, IPSC	–	–	Initiation from call
End conference (up to 5 stations)	#3	763	#3	–	V	GS	U1	Local active menu	AN, DIG, ENT, S0, CMI, IPSC	–	RH, BR, WA, RG, BS, RK	Status as prior to conference call. Dialog menu provides further options for ending conference.
Call charge display for own station (GET)	–	–	*65	–	V	–	H	–	DIG, IPSC	X	–	Deletion only by system administrator

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Save / change speed dialing system/individual	*92+ISD no.+Stn. no.	7592	*92...	–	–	–	H	Local ETD feature	AN, DIG, ENT, S0, CMI, IP-SC, IPSI	X	RK, BS	ISD 0 ... 9 Mobile phones also have an additional local procedure
Using system speed-dial number	*7+ISD no.	757...	*7...	–	V, U	–	H	Local ETD feature	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	000 ... 999 Mobile phones also have an additional local procedure
Using station speed-dial number	*7+ISD no.	757...	*7...	–	V, U	–	H	Private ETD feature	AN, DIG, ENT, S0, CMI, IP-SC, IPSI		RK, BS	ISD 0 ... 9
Trunk queuing, automatic	–	–	–	–	V		–	–	AN, DIG, ENT, S0, CMI, IPSC	X	RH, BR, RG, RK, GS	Automatically after timeout if enabled in the CDR
Trunk queuing, manual	–	–	–	–	V	BS	–	–	AN, DIG, ENT, S0, CMI, IPSC	X	RH, BR, RG, RK, GS	Activation by pressing a key if enabled in the CDR
Toggle	*2	752	*2	–	V	GS	U1	Mouse click, Key	AN, DIG, ENT, S0, CMI, IP-SC, IPSI	–	–	Also available using the DSS, GESP, LTG and MUSAP key.
DTMF transmission	*53	7553	*53	–	U	–	H	Menu, key	AN, DIG, ENT, S0, CMI, IPSC	–	RH, BR, WA, RG, RK, BS	

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				Key		Menu			via Telephone lock	Status locking on	
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code			
Microphone off (mute on)	*52 (if microphone available)	–	*52	X, T	V, T	GS	U1	Local active menu	AN, DIG, ENT, CMI, IPSC	–	–	Unavailable for workpoint clients without a speakerphone if handset is on-hook
Microphone on (mute off)	#52 (if microphone available)	–	#52	X, T	V, T	BR, WA, RG, GS, BS	U1	Local active menu	AN, DIG, ENT, CMI, IPSC	–	–	
Mobility/replace call numbers	–	–	*9419	–	U	–	U1	Possible using central database	IPSC			Only for mobile phone numbers Not for the first two station ports.
Night answer on	*44+ * or Stn. no.	75...	*44...	–	V, U, T	RH	U1	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	Standard night service with *.
Night answer off	#44+ * or Stn. no.	7644	#44	–	V, T	RH	U1	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Repertory key/ DSS	–	–	–	–	V	–	–	Speed dialing key	DIG	X	–	Key can be assigned an internal or external call number. Telephone locking for external repertory key only.
Paging, see speaker call to a group												
Park on	*56+Park slot	7556	*56..	–	U, T	–	H	Key, Menu	AN, DIG, ENT, S0, CMI, IPSC	–	RH, BR	

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Retrieve call	#56+Park slot	7656	#56...	–	U, T	–	H	Key, Menu	AN, DIG, ENT, S0, CMI, IPSC	–	WA, EG, GS, RK, BS	
Paging system (PSE comfort), paging	*45+Stn. no.	7545...	*45..	–		–		–	AN, DIG, ENT, S0, CMI, IPSC	–	–	
Paging system (PSE comfort), meet me	#45+Stn. no.	7645...	#45..	–	–	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	–	–	
Account code	*60+ACCT	7560...	*60...	–	U	–	H	–/mandatory ACCT possible	AN, DIG, ENT, S0, CMI, IPSC	X	WA, RG, RK, BS	ACCT can also be entered without service code following ext. line seizure.
Route seizure	See numbering plan	See numbering plan	See numbering plan	–	V	–	–	See numbering plan	AN, DIG, ENT, S0, CMI, IPSC	X	–	Telephone lock only permitted for seizure of outgoing lines.
Set callback	*58	CCBS (local S_0 WpC functionality)	*58	–	V, T	RG	U1	Local active menu	AN, DIG, ENT, S0, CMI, IPSC	–	RH, BR, WA, GS, RK, BS	
View or delete callback requests	#58	CCBS (local S_0 WpC functionality)	#58...	–	U, T	RH	U1	Local feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RH, BR, WA, GS, RK, BS	

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	Code + Procedure	Code	Code	Key: Fixed	Key: Programmable	Menu: Dialog	Menu: Service	Code				
Initiate callback (exclusive hold on)	DP: Dial CMI, DTMF: Flash TDM WpC without display: Consultation hold key	HOLD (local S_0 WpC functionality)	–	–	–	GS	–	Drag& Drop, menu	AN, DIG, ENT, S0, CMI, IP-SC, IPSI	–	–	
Call number suppression on, temp.	*86	CLIR (local S_0 WpC functionality)	*86	–	V, T	RH	U1	Feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Call number suppression off, temp.	#86	CLIP (local S_0 WpC functionality)	#86	–	V, T	RH	U1	Feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Station number, assign for MUSAP	*41+DID no.	7541...	*41...	–	V	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	–	This must be followed by seizure of external line.
Ring transfer on	*502+MULAP	75502	*502	–	V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X		Only for member of the executive MULAP groups
Ring transfer off	#502+MULAP	76502	#502	–	V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X		Only for member of the executive MULAP groups
Ringing group on	*81+Stn. no.	7581...	*81...	–	U, V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Ringing group off - all members removed	#81	7681	#81	–	U, V, T	RH	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	

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				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Ringer cutoff on	–	–	*98	–	V, T	RH	U1	Local feature	DIG, IPSC	X	RK, BS	A short advisory tone is activated. The optical signals are retained.
Ringer cutoff off	–	–	#98	–	V, T	RH	U1	Local feature	DIG, IPSC	X	RK, BS	
Hunt group, join	*85	7585	*85	–	V, T	RH	U1	Feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	All hunt groups, join = *85*
Hunt group, leave	#85	7685	#85	–	V, T	RH	U1	Feature menu	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	All hunt groups, leave = #85#
Service menu	–	–	–	X, T	–	–	–	–	DIG, IPSC	–	BS	Service key as for stopping and starting procedure
Remote service call	*994+Index+Suffix dialing	75944	*994	–	–	–	U1	–	AN, DIG, ENT, S0, CMI, IPSC	–	–	
Silent monitoring	*944+Stn. no.		*944..	–	–	–	–	–	AN, DIG, ENT, CMI	X	WA, RG, BS, RK	Only for authorized stations
Trunk flash on analog trunk	*51	–	*51	–	V	–	H	–	AN, DIG, ENT, CMI, IPSC	X	–	
Silent ringing, see ringer cutoff												
Language selection	–	–	*48					At login	IPSC		–	
Substitution code for '*'	75	75	75	–	–	–	–	–	ALL	–	–	

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for								Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition				
				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Substitution code for '#'	76	76	76	–	–	–	–	–	ALL	–	–	
System administration	–	–	*95...	–	–	–	H	–	DIG, IPSC	See notes	WA, RG, RK, BS	Only for authorized stations via access code. User data is protected via telephone lock feature.
System administration, remote DTMF administration and maintenance, enable (service system)	–	–	*991...	–	–	–	–	–	DIG, IPSC	–	WA, RG, RK, BS	
System administration, remote DTMF administration and maintenance, enable (customer system)	–	–	*992...	–	–	–	–	–	DIG, IPSC	–	WA, RG, RK, BS	Only for authorized stations via access code.
Enable system administration via HOST (also remote)	–	–	*993 ...	–	–	–	–	–	DIG, IPSC	–	WA, RG, RK, BS	Only for authorized stations via access code.
Key programming	–	–	*91...	–	–	–	H	Local	DIG, IPSC	X	RK, GS	
Toll fraud monitoring	–	–	–	–	–	–	–	–	DIG	X	–	Only for attendant, if enabled

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

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	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition				
				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
Internal phonebook	–	–	–	–	V	RH, BR, GS	–	Private (local directory on PC) + LDAP interface	DIG, IPSC	–		
Telephone Data Service (TDS)	*42	7542	*42	–	U,V	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	–	RK, BS	
Activate timed reminder	*46+time	7546...	*46..	–	U, V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	–	
Deactivate timed reminder	#46+time	7646...	#46..	–	U, V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X		
Freeze trace	*509	–	*509	–	V	–	–	–	AN, DIG, ENT, S0, CMI, IPSC	–	–	
Disconnect key	–	–	–	–	V	–	–	Local active menu, key	ALL	–	–	
Enable door opener via DTMF	*89+Stn. no.+Code	7589	*89...	–	U, V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	–	
Disable door opener, DTMF	#89+Stn. no.+Code	7689	#89...	–	U, V, T	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X	–	
Door opener via adapter cabinet	*61+Stn. no.	7561	*61...	–	U, V	GS	H	–	AN, DIG, ENT, S0, CMI, IPSC	–	–	Only if entrance telephone is configured

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

Table B-1 Codes for Activating/Deactivating Features

Feature	Operating procedure for								Supported workpoint clients (see abbreviations in Table B-2)	Locking of feature		Note
	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition		via Telephone lock	Status locking on	
	Code + Procedure	Code	Code	Key		Menu		Code				
				Fixed	Programmable	Dialog	Service					
Transfer (screened/unscreened)	–	ECT (local S_0 WpC functionality)	–	–	–	RG, GS	–	Drag& Drop, Menu Key	AN, DIG, ENT, S0, CMI, IPSC, IPSI	–	–	IPSI only support Transfer after messaging.
Call pickup, directed	*59+Stn. no.	7559...	*59...	–	U	–	H	Using status-supported speed dialing keys	AN, DIG, ENT, S0, CMI, IPSC	–	WA, RG, RK, BS	
Call pickup in pickup group	*57	7557	*57	–	V	RH, BR, GS	U	–	AN, DIG, ENT, S0, CMI, IPSC	–	WA, RG, RK, BS	
Pickup	DTMF: Flash TDM WpC without display: Consultation hold key	–	–	–	–	GS	–		AN, DIG, ENT, S0, CMI, IPSC	–	–	
Call forwarding after time on	*495	75495	*495	–	V, T	RH	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Call forwarding after time off	#495	76495	#495	–	V, T	RH	U1	Feature key	AN, DIG, ENT, S0, CMI, IPSC	X	RK, BS	
Extending undialed lines	–	–	–	–	–	WA	–	–	DIG	–	–	Only for authorized stations

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
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Table B-1 Codes for Activating/Deactivating Features

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	TDM workpoint clients without display, CMI mobile phones, analog workpoint clients[1]	S_0 workpoint clients	TDM workpoint clients with display, CMI feature mobile phones, IP workpoint clients					OpenScape Personal Edition				
				Key		Menu						
	Code + Procedure	Code	Code	Fixed	Programmable	Dialog	Service	Code		via Telephone lock	Status locking on	
AC call (see numbering plan)	9 (ROW) 0 (USA)	9 (ROW) 0 (USA)	9 (ROW) 0 (USA)	–	–	–	–	9 (ROW) 0 (USA)	ALL	–	–	
Number redial	Redial key	–	–	X	–	–	–	Local feature	AN, DIG, ENT, S0, CMI, IP-SC, IPSI	X	–	Cannot be programmed under DSS.
Retrieval of external call placed on common hold	*63+Trunk code	7563..	*63..	–	V	–	H	Local feature menu	AN, DIG, ENT, S0, CMI, IPSC	–	–	Retrieval also possible with trunk key
Central telephone lock	*943+Stn. no.+ * or #	75943..	*943..	–	U	–	H	–	AN, DIG, ENT, S0, CMI, IPSC	X		Only for authorized stations
Return to held call (exclusive hold off)	*0 or CMI, DTMF: Flash TDM WpC without display: Consultation hold key	Retrieve	*0	–	–	BR, WA, RG, GS, BS	U1	Mouse click, key	AN, DIG, ENT, S0, CMI, IP-SC, IPSI			

Abbreviations:

- Call states: RH = idle, BR = ready, WA = digit input, BS = busy, RK = incoming call, RG = outgoing call, GS = call
- Key programming: V = key can be programmed with complete feature, U = key can be programmed to start procedure, T = key with toggle functionality
- Menu level: H = Main menu, U1 = 1st submenu, U2 = 2nd submenu

1 The codes are valid for DTMF telephones. Substitution codes 75 and 76 must be entered instead of "*" and "#" for DP telephones.

Description of the different workpoint client groups from Table B-1

Tabelle B-2 Description of the different workpoint client groups

Workpoint client group	Description/examples	Abbreviation
All workpoint clients	All workpoint clients listed below	ALL
TDM workpoint clients without display	● OpenStage 10 T ● optiPoint 500 entry	ENT
TDM workpoint clients with display	● OpenStage 15 T, 20 T, 30 T, 40 T, 60 T, 80 T ● optiPoint 500 economy (not for USA), basic, standard, advance ● optiPoint 600 office (in $U_{P0/E}$ mode)	DIG
analog workpoint clients	DP and DTMF terminals	AN
S0 workpoint clients	ISDN terminals	S0
IP workpoint clients	● System clients: – OpenScape Personal Edition – OpenStage 15 – OpenStage 20 E, 20, 20 G – OpenStage 40, 40 G – OpenStage 60, 60 G – OpenStage 80, 80 G – optiPoint 410 entry (without display), economy, economy plus, standard, advance – optiPoint 420 economy, economy plus, standard, advance	IPSC
	● H.323 clients: – MS Windows NetMeeting	IPH3
	● SIP clients: – optiPoint 410 entry S, economy S, economy plus S, standard S, advance S – optiPoint 420 economy S, economy plus S, standard S, advance S	IPSI
CMI feature mobile phones	● Gigaset SL3 professional ● Gigaset S4 professional ● Gigaset M2 professional	CMI

C IP Protocols and Port Numbers Used with HiPath 3000/5000 V7 and Higher

The following tables provide information about the components of HiPath 3000/5000 V7 and later that are needed for firewall configuration. Firewalls protect customer-internal intranets against outside attacks.



The following tables contain extracts from

- Product-Specific Data Sheet for HiPath Network Analysis: HiPath 5000 V7
- Product-Specific Data Sheet for HiPath Network Analysis: HG 1500 V7

The tables are only available in English.

2 Services and Ports

2.1 Voice Traffic and Signaling

2.1.1 HiPath 5000

HiPath 5000 uses for communication on the network the following services and ports:

Important: Except the UDP-Ports for the Voice payload the port numbers listed cannot be changed in the product.

Explanation:

A-Prot. Application-Layer-Protocol

M-Prot. Middleware-Layer-Protocol

T-Prot. Transport-Layer-Protocol

D-Ports Default-Ports are the port numbers or the port range which comes in effect after turning power on the first time – without administration.

A-Ports Admin-Ports are the alternative port numbers or the port range in which the ports can be altered by administration.

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
Centralised Administration - Functions provided by the system for DBFS access								
	FCT Interface to DBFS	server	FCT API	---	TCP	7100	1 - 65535	Def: FCT Adm: Default can be modified within this range
	REG Client Registration of HG1500 at DBFS	client	REG	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	SYNC Interface to DBFS	server	SYNC	---	TCP	7024	1 - 65535	Def: SYNC Adm: Default can be modified within this range
Centralised Ressource Management - Mangement of networkwide Ressources (conference, MOH)								
	IPNC MediaGatewaycontrol	server	MCP	---	TCP	12051	1 - 65535	Def: IPNC Adm: Default can be modified within this range
	RM client Resource manager for networkwide use of MOH and Conference	client	RM API	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	RM server Resource manager for networkwide use of MOH and Conference	server	RM API	---	TCP	9000	1 - 65535	Def: RM Adm: Default can be modified within this range
CSTA - CSTA access								
	CSTA Access	server	CSTA API	---	TCP	7001	1 - 65535	Def: CSTA Adm: Default can be modified within this range
Customer License Agent (CLA)								
	CLA Discovery CLA multicast listener for CLA detection by CLM	server	CLADP	---	UDP	23232		Def: UDP CLA detection Port on multicast address 224.0.23.23

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	CLA-Service CLA service port for CLC / CLM	server	XML	---	TCP - SSL	61740		Def: Port will be discovered by CLM through multicast procedure. CLC uses port by configuration.
Customer License Client (CLC)								
	CLA Connectivity (CLC) Used for data transfer between CLC / CLM	client	HLP	---	TCP - SSL	61740		Def: Port will be discovered by CLM through multicast procedure. CLC uses port by configuration.
Customer License Manager (CLM) Web basierte Applikation zur Verwaltung von HiPath Lizenzen in der Kundeninfrastruktur								
	CLA Connectivity (CLM) Used for data transfer between CLA / CLM	client	XML	---	TCP - SSL	61740		Def: Port will be discovered by CLM through multicast procedure. CLC uses port by configuration.
	CLM Shutdown port Tomcat shut down port provided by CLM setup	server	TSP	---	TCP	8820		Def: Shutdown port (Tomcat) of License Manager
	CLS Connectivity (CLM) Interface to Central License Server (CLS)	client	SOAP	HTTPS	TCP	0 - 65535		Def: Port selected by the TCP/IP-implementation of the underlying operating system
	HTTP based Management Access (CLM) Web based Interface of Customer License Manager	server	HTTP	---	TCP	8819	1025 - 65535	Def: HTTP port of License Manager Adm: Default can be modified within this range during Setup or later (CLM)
	HTTPS based Management Access (CLM) Secured Web based Interface of Customer License Manager	server	HTTPS	---	TCP	8818	1025 - 65535	Def: HTTPS port of License Manager Adm: Default can be modified within this range during Setup or later (CLM)
DBFS - Feature Server for centralized administration								
	CAR Server (DBFS) CAR componennt for centralized administration	server	CAR	---	TCP	12063	1 - 65535	Def: CAR Server Adm: Default can be modified within this range
	REG Server Registration of HG1500 with DBFS	server	REG	---	TCP	12061	1 - 65535	Def: REG Adm: Default can be modified within this range
	VSYNC client (DBFS) Client for database synchronisation betwwen DBFS and H2/3/5k	client	SYNC	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
H.323 Networking								
	CAR client Call address resolution client	client	CAR	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-Alive Client Alivechecks (configurable)	client	CAR Alive	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-alive server Alive checks (configurable)	server	CAR Alive	---	TCP	12062	1 - 65535	Def: CAR Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
	RAS client RAS client for registration at external gatekeeper	client	H.323 (H.225-RAS)	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
	RM client Resource manager for networkwide use of MOH and Conference	client	RM API	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
H.323 Subscriber								

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	H.225 RAS RAS server for H.323 endpoints	server	H.323 (H.225-RAS)	---	UDP	1719	1 - 65535	Def: H.225/RAS Adm: Default can be modified within this range
	H.245 Media Signaling active H.245 channel signalling for H.323 endpoints	client	H.323 (H.245)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.245 Media Signaling passive H.245 channel signalling for H.323 endpoints	server	H.323 (H.245)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling	server	H.323 (H.225-Q.931)	---	TCP	4711	1 - 65535	Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
HFA subscriber								
	Cornet TC	server	Cornet-TC	---	TCP	4060	1 - 65535	Def: CorNet-TC Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
MS-SQL Server								
	MS-SQL_Server-TCP MS-SQL Server	server	MS-SQL	---	TCP	1433		
	MS-SQL_Server-UDP Microsof SQL Server	server	MS-SQL	---	UDP	1434		
SIP networking								
	CAR client Call address resolution client	client	CAR	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-Alive Client Alivechecks (configurable)	client	CAR Alive	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-alive server Alive checks (configurable)	server	CAR Alive	---	TCP	12062	1 - 65535	Def: CAR Adm: Default can be modified within this range
	SIP Call Signalling active (symmetric UDP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	UDP	5060		Def: SIP
	SIP Call Signalling active (TCP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	SIP Call Signalling passive Call Signalling for SIP endpoints and SIP based trunking	server	SIP	---	TCP_UDP	5060	1 - 65535	Def: SIP Adm: Default can be modified within this range
SIP subscriber								
	SIP Call Signalling active (symmetric UDP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	UDP	5060		Def: SIP

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	SIP Call Signalling active (TCP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	SIP Call Signalling passive Call Signalling for SIP endpoints and SIP based trunking	server	SIP	---	TCP_UDP	5060	1 - 65535	Def: SIP Adm: Default can be modified within this range

2.1.2 IP- Clients

2.1.2.1 optiClient 130 V5.1 R5

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
HFA Client								
	Cornet TC	server	Cornet-TC	---	TCP	4060	1 - 65535	Def: CorNet-TC Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720		Def: H.225/Q.931
	H.323 Media Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung für Sprachkanäle (Mediachannels)	server	H.323 (H.245)	---	TCP	12000 - 12100		Def: H.245 portnumber is negotiated via H.225
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
LDAP Connectivity (client sided) client sided connectivity to a LDAP Service								
	LDAP Access Directory access via LDAP	client	LDAP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
DLC Connectivity (DLS client sided) client sided connectivity to Deployment Licence Service								
	DLS contact me request (optiClient sided) workpoint sided DLS contact me service	server	HTTP	---	TCP	8082		Def: HTTP optiClients
	DLS Detection (DHCP) DLS detection via DHCP	client	DHCP	---	UDP	68		Def: DHCP Client Port
	DLS Detection (DNS) DLS detection via DNS	client	DNS	---	UDP		1024 - 65535	Def: Unspecified Default Port(range) values Adm: PortLow/PortHigh can be modified within this range ()
	DLS Workpoint Interface (optiClient sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	18443		Def: DLS: Communication interface workpoints – DLS
HFA Client (HiPath 3000) HFA client at HiPath 3000								

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	Cornet TC (HG1500) Cornet TC	server	Cornet-TC	---	TCP	4060	1 - 65535	Def: CorNet-TC Adm: Default can be modified within this range
	H.323 Call Signaling (HG1500) active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720		Def: H.225/Q.931
	H.323 Media Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung f?r Sprachkan?le (Mediachannels)	server	H.323 (H.245)	---	TCP	12000 - 12100		Def: H.245 portnumber is negotiated via H.225
	RTP Payload Transport (HG1500) active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport (HG1500) passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
HLM Connectivity (client sided) client sided HiPath Licence Management								
	CLA Connectivity (CLC) Used for data transfer between CLC / CLM	client	HLP	---	TCP - SSL	61740		Def: Port will be discovered by CLM through multicast procedure. CLC uses port by configuration.
LDAP Connectivity (client sided) client sided connectivity to a LDAP Service								
	LDAP Access Directory access via LDAP	client	LDAP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)

2.1.2.2 optiPoint 410/420 SIP V5 R0

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
OAM (oP410 SIP) Administration of optiPoint SIP devices								
	DHCP-Client (op410) Server of "Dynamic Host Configuration Protocol"	client	DHCP	---	UDP	68		Def: DHCP Client Port
	DHCP-Server (oP410) Server of "Dynamic Host Configuration Protocol"	server	DHCP	---	UDP	67		Def: DHCP Server Port
	DLS Workpoint Interface (client sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	18443	0 - 65535	Def: DLS: Communication interface workpoints – DLS
	DNS DNS relay	server	DNS	---	TCP_UDP	53		Def: DNS
	FTP_Server_Control (oP410) FTP-Server	server	FTP	---	TCP	21		Def: FTP-Server Control Port
	HTTPS_Server (Phones) Secure Embedded Web Server	server	HTTP	---	TCP	443	0 - 65535	Def: HTTPS
	HTTP_Server (Phones) Web Interface	server	TFTP	---	TCP	8085	0 - 65535	Def: HTTP optiPoints, HG1500
	IP-Config (Phones) IP Configuration Services	server	*proprietary*	---	UDP	5100		
	SNMP (SET/GET) (Phones) SNMP SET/GET-Functionality	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
	SNMP Trap (oP410) SNMP Trap function	client	SNMP	---	UDP	161 162		Def: SNMP Trap (oP410)
	SNTP (oP410) Simple Network Time Protocol	server	SNTP	---	UDP	123		Def: SNTP
	SNTP heartbeat (oP410) Simple Network Time Protocol	server	SNTP	---	UDP	580		
QoS Data Collection Unit (QCU) phones Send QoS reports								
	QCU client 12010 Client application which sends QDC data to the QCU	client	SNMP	---	UDP	12010	0 - 65535	Def: QCU receiving Port
SIP payload transport (op410 SIP) Session Inition Protocol (SIP) payload								
	SIP Payload Transport (oP410) active Voice over IP: Transmission of Payload	client	RTP_RTCP	---	UDP	5004 - 5027	0 - 65534	Def: Port 5004 .. 5006 for normal usage. For every line-key you have to add two channels. The maximum of line keys are 10 -->. For this the maximum range of 5004 .. 5027 is valid Adm: even port number only
	SIP Payload Transport (oP410) passive Voice over IP: Transmission of Payload	server	RTP_RTCP	---	UDP	5004 - 5027	0 - 65534	Def: Port 5004 .. 5006 for normal usage. For every line-key you have to add two channels. The maximum of line keys are 10 -->. For this the maximum range of 5004 .. 5027 is valid Adm: even port number only
SIP Signalling (op410 SIP) Session Inition Protocol (SIP) signaling								
	SIP Signaling (WL2-Phone) SIP over TLS	client	SIP	---	TCP - TLS	5061		Def: SIP

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	SIP signaling TCP (oP410) SIP signalling in the case of using TCP (configurable inside the phone)	client	SIP	---	TCP	5060		Def: SIP
	SIP signaling UDP (oP410) SIP signalling in the case of using UDP (configurable inside the phone)	client	SIP	---	UDP	5060		Def: SIP
	SIP-TLS (OP410) SIP over TLS	client	SIP	---	TCP - TLS	5061	1 - 65535	Def: SIP Adm: Configuration the port value to zero will result in the default port value being used
User Applications (oP410 SIP) bundle of user functions								
	JAVA (optiPoints) JAVA applications in phones	client	HTTP	---	TCP	9200	0 - 65535	Def: Java default port in optiPoint phones
	LDAP Access (optiPoint phones) Directory access via LDAP	client	LDAP	---	TCP	389	0 - 65535	Def: LDAP
	WAP client (TCP) for WAP access to WAP services (server)	client	WAP	---	TCP	9200	0 - 65535	Def: WAP connectionless session service (IANA)

2.1.2.3 optiPoint 410/420 V5 R3

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
H.323 (oP410) General term for H.323 functions								
	H.323 Call Signaling (oP410) active Voice over IP	client	H.323 (H.225-Q.931)	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	H.323 Call Signaling (oP410) passive Voice over IP	server	H.323 (H.225-Q.931)	---	TCP	1720	0 - 65535	Def: H.225/Q.931
	H.323 Payload Transport (oP4x0 at H2k/H3k) active Voice over IP	client	RTP_RTCP	---	UDP	5004 - 5013	0 - 65534	Def: RTP portnumber is negotiated via H.245. Max 5 connections: RTP starts at <adr> port2/max - 1 down to <adr> port 1/min , RTCP at <adr> port2/max down to <adr> port 1/min+1 Adm: even port number only
	H.323 Payload Transport (oP4x0 at H2k/H3k) passive Voice over IP	server	RTP_RTCP	---	UDP	5004 - 5013	0 - 65534	Def: RTP portnumber is negotiated via H.245. Max 5 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: even port number only
	H.323 Payload Transport (oP4x0 at H4k) active Voice over IP	client	RTP_RTCP	---	UDP	5008 - 5013	0 - 65534	Def: Attention: The phone is prepared to handle up to 5 port couples in total. If the base port is set to 5004 inside the phone, the port range then is 5004 ... 5013. But, in H4k scenarios, only the upper three couples (starting from the top) are used: 5012/5013, 5010/5011 and 5008/5009 . Adm: even port number only
	H.323 Payload Transport (oP4x0 at H4k) passive Voice over IP	server	RTP_RTCP	---	UDP	5008 - 5013	0 - 65534	Def: Attention: The phone is prepared to handle up to 5 port couples in total. If the base port is set to 5004 inside the phone, the port range then is 5004 ... 5013. But, in H4k scenarios, only the upper three couples (starting from the top) are used: 5012/5013, 5010/5011 and 5008/5009 . Adm: even port number only
HFA (oP410) Hicom Feature Access								
	CorNet TC Logon (oP600) CorNet TC Logon Port	client	*proprietary*	---	TCP	4060		Def: CorNet-TC
OAM (oP410 HFA) Administration of optiPoint HFA devices								
	DLS Workpoint Interface (client sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	18443	0 - 65535	Def: DLS: Communication interface workpoints – DLS
	FTP_Server_Control (oP410) FTP-Server	server	FTP	---	TCP	21		Def: FTP-Server Control Port
	HTTPS_Server (Phones) Secure Embedded Web Server	server	HTTP	---	TCP	443	0 - 65535	Def: HTTPS
	HTTP_Server (Phones) Web Interface	server	TFTP	---	TCP	8085	0 - 65535	Def: HTTP optiPoints, HG1500
	IP-Config (Phones) IP Configuration Services	server	*proprietary*	---	UDP	5100		
	SNMP (SET/GET) (Phones) SNMP SET/GET-Functionality	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
	SNMP Trap (oP410) SNMP Trap function	client	SNMP	---	UDP	161 162		Def: SNMP Trap (oP410)

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
QoS Data Collection Unit (QCU) phones Send QoS reports,								
	QCU client 12010 Client application which sends QDC data to the QCU	client	SNMP	---	UDP	12010	0 - 65535	Def: QCU receiving Port
User Applications (oP410 HFA) bundle of user functions of HFA phone oP410								
	CTI Service (TCP) CTI Service in oP410	client	Cornet TS	---	TCP	5105		Def: CTI Service oP410
	JAVA (optiPoints) JAVA applications in phones	client	HTTP	---	TCP	9200	0 - 65535	Def: Java default port in optiPoint phones
	LDAP Access (optiPoint phones) Directory access via LDAP	client	LDAP	---	TCP	389	0 - 65535	Def: LDAP
	WAP client (TCP) for WAP access to WAP services (server)	client	WAP	---	TCP	9200	0 - 65535	Def: WAP connectionless session service (IANA)

2.1.2.4 optiPoint WL2 professional V1.0 HFA Variant

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
H.323 (WL2) General term for H.323 functions								
	H.323 Call Signaling (WL2) active Voice over IP	client	H.323 (H.225-Q.931)	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	H.323 Call Signaling (WL2) passive Voice over IP	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
	H.323 Payload Transport (WL2) active Voice over IP	client	RTP_RTCP	---	UDP	5004 - 5011		Def: RTP portnumber : RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1).
	H.323 Payload Transport (WL2) passive Voice over IP	server	RTP_RTCP	---	UDP	5004 - 5013		Def: RTP portnumber is negotiated via H.245. Max 5 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1).
HFA (WL2) Hicom Feature Access								
	CorNet TC Logon (WL2) CorNet TC Logon Port	client	*proprietary*	---	TCP	4060		Def: CorNet-TC
LDAP WL2 LDAP access for phones								
	LDAP Access (WL2) Directory access via LDAP	client	LDAP	---	TCP	389	0 - 65535	Def: LDAP
OAM (WL2) Administration of optiPoint HFA devices								
	DHCP-Client (WL2) Server of "Dynamic Host Configuration Protocol"	client	DHCP	---	UDP	68		Def: DHCP Client Port
	DHCP-Server (WL2) Server of "Dynamic Host Configuration Protocol"	server	DHCP	---	UDP	67		Def: DHCP Server Port
	DLS Workpoint Interface (WL2) (client sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	1024 - 65535	0 - 65535	Def: Ephemeral Ports (IANA)
	HTTPS Server (WL2) Secure Embedded Web Server	server	HTTP	---	TCP	443		Def: HTTPS
	HTTP Server (WL2) Web Interface	server	TFTP	---	TCP	8085		Def: HTTP optiPoints, HG1500
	IP-Config (WL2) Service Agent Reque	server	*proprietary*	---	UDP	5100		
	SNMP (SET/GET) (WL2) SNMP SET/GET-Functionality	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
	SNMP (Traps) (WL2) active SNMP Traps	client	SNMP	---	UDP	162		Def: SNMP (Traps)
	Telnet (WL2) Telnet-Server	server	Telnet	---	TCP	23		Def: Telnet
QoS Data Collection Unit (QCU) phones Send QoS reports,								
	QCU client 12010 Client application which sends QDC data to the QCU	client	SNMP	---	UDP	12010	0 - 65535	Def: QCU receiving Port

2.2 Administration and Diagnosis

The following services are needed for administration and diagnosis in addition to those listed in chapter Voice Traffic and Signaling

OAM (H5k) Adminstration and Maintenance HiPath 5000							
ADM (H2/3/5k) Interface to DBFS	server	ADM API	---	TCP	7000	1 - 65535	Def: ADM Adm: Default can be modified within this range
HTTP client (HG1500) used for multi gateway administratrion feature (MGAF)	client	HTTP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
HTTP Server (HG1500) HTTP Server for WBM access	server	HTTP	---	TCP	8085		Def: HTTP optiPoints, HG1500
HTTPS client used for multi gateway administration feature (MGAF)	client	HTTPS	---	TCP - SSL	1024 - 65535		Def: Ephemeral Ports (IANA)
HTTPS Server (HG1500) Secure Web Server	server	HTTPS	---	TCP - SSL	443		Def: HTTPS
LDAP Client LDAP client used for centraliced directory service	client	LDAP	---	TCP_UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
SNMP (SET/GET) (H2/3/5k/HG1500) SNMP Set/Get	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
SNMP (Traps) (H2/3/5/HG1500) SNMP Erromessages	client	SNMP	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
SNMP (Traps) (HG1500) Receiving of SNMP-Traps	server	SNMP	---	UDP	162		Def: SNMP (Traps)
SNTP Client (H2/3/5k/BizIP) Simple Network Time Protocol	client	SNTP	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
TFTP Client (H2/3/5k) APS-Transfer/ KDS-Sicherung mit TFTP	client	TFTP	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
TFTP Server (H2/3/5k,BizIP) TFTP Server for CDR	server	TFTP	---	UDP	69		Def: TFTP
SW_Manager (H5k) HiPath Software Manager							
SW-Man Secured Web Access from a Client Browser HTTPS Interface of SW-Manager	server	HTTPS	---	TCP	8443	0 - 65535	Def: HTTPS port of SW-Manager, DB Feature Server Adm: Default can be modified within this range via server.xml file in Tomcat's "conf" directory
SW-Man Tomcat Shutdown Used to shutdown Tomcat	server	*proprietary*	---	UDP	8279	0 - 65535	Def: Shutdown port of SW-Manager Adm: Default can be modified within this range via server.xml file in Tomcat's "conf" directory
SW-Man Web Access from a Client Browser HTTP Interface of SW-Manager	server	HTTP	---	TCP	8280	0 - 65535	Def: HTTP port of SW-Manager Adm: Default can be modified within this range via server.xml file in Tomcat's "conf" directory
X-Trace (H2/3/5k) Access for X-Tracer							
Online Trace (H2/3/5k) Online Trace Port (X-Tracer)	server	XTP	---	TCP	21965		Def: X-Tracer
X-Trace (HG1500) Access for X-Tracer							
Online Trace (HG1500) Acces to X-Trace	server	XTP		TCP	2048		Def: XTrace

2 Services and Ports

2.1 Voice Traffic and Signaling

2.1.1 HG1500

HiPath HG 1500 uses for communication on the network the following services and ports:

Important: Except the UDP-Ports for the Voice payload the port numbers listed cannot be changed in the product.

Explanation:

A-Prot. Application-Layer-Protocol

M-Prot. Middleware-Layer-Protocol

T-Prot. Transport-Layer-Protocol

D-Ports Default-Ports are the port numbers or the port range which comes in effect after turning power on the first time – without administration.

A-Ports Admin-Ports are the alternative port numbers or the port range in which the ports can be altered by administration.

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
Accounting Server (HG1500) IP-Accounting								
	Accounting Server IP-Accounting	server	ACP	---	TCP	13042		Def: Accounting
Decomposed Media Gateway - Signalling for decomposed media gateway in HiPath3000								
	IPNC MediaGatewaycontrol	server	MCP	---	TCP	12051	1 - 65535	Def: IPNC Adm: Default can be modified within this range
	MPH MediaPayloadHandler	server	MCP	---	TCP	12052	1 - 65535	Def: MPH Adm: Default can be modified within this range
DSL-Diagnose Server - DSL-Statusanzeige								
	DSL-Diagnose Server DSL-Statusanzeige	server	DSL-D	---	UDP	12200	1 - 65535	Adm: Default can be modified within this range
H.323 Networking								
	CAR client Call address resolution client	client	CAR	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-Alive Client Alivechecks (configurable)	client	CAR Alive	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-alive server Alive checks (configurable)	server	CAR Alive	---	TCP	12062	1 - 65535	Def: CAR Adm: Default can be modified within this range
	CAR_Alive w. Ping Ping based check alive mechanism	peer	ICMP-Echo	---	ICMP			Def: Unspecified Default Port(range) values
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	H.323 Call Signaling passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
	RAS client RAS client for registration at external gatekeeper	client	H.323 (H.225-RAS)	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
	RM client Resource manager for networkwide use of MOH and Conference	client	RM API	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	RM server Resource manager for networkwide use of MOH and Conference	server	RM API	---	TCP	9000	1 - 65535	Def: RM Adm: Default can be modified within this range
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
H.323 Subscriber								
	H.225 RAS RAS server for H.323 endpoints	server	H.323 (H.225-RAS)	---	UDP	1719	1 - 65535	Def: H.225/RAS Adm: Default can be modified within this range
	H.245 Media Signaling active H.245 channel signalling for H.323 endpoints	client	H.323 (H.245)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.245 Media Signaling passive H.245 channel signalling for H.323 endpoints	server	H.323 (H.245)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signalind	server	H.323 (H.225-Q.931)	---	TCP	4711	1 - 65535	Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
HFA subscriber								
	Cornet TC	server	Cornet-TC	---	TCP	4060	1 - 65535	Def: CorNet-TC Adm: Default can be modified within this range

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	H.323 Call Signaling active VoIP payloadtransport	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling passive Voice over IP: payloadtransport	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
	RTP Payload Transport active VoIP payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
SIP networking								
	CAR client Call address resolution client	client	CAR	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-Alive Client Alivechecks (configurable)	client	CAR Alive	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	CAR-alive server Alive checks (configurable)	server	CAR Alive	---	TCP	12062	1 - 65535	Def: CAR Adm: Default can be modified within this range
	CAR_Alive w. Ping Ping based check alive mechanism	peer	ICMP-Echo	---	ICMP			Def: Unspecified Default Port(range) values
	RM client Resource manager for networkwide use of MOH and Conference	client	RM API	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	RM server Resource manager for networkwide use of MOH and Conference	server	RM API	---	TCP	9000	1 - 65535	Def: RM Adm: Default can be modified within this range
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	SIP Call Signalling active (symmetric UDP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	UDP	5060		Def: SIP
	SIP Call Signalling active (TCP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	SIP Call Signalling passive Call Signalling for SIP endpoints and SIP based trunking	server	SIP	---	TCP_UDP	5060	1 - 65535	Def: SIP Adm: Default can be modified within this range

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
SIP Service Provider Trunk								
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	SIP Call Signalling active (symmetric UDP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	UDP	5060		Def: SIP
	SIP Call Signalling active (TCP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	SIP Call Signalling passive Call Signalling for SIP endpoints and SIP based trunking	server	SIP	---	TCP_UDP	5060	1 - 65535	Def: SIP Adm: Default can be modified within this range
	STUN (client) STUN client used for SIP Provider access	client	STUN	---	UDP	1 - 65535		Def: STUN client, Port depends on the client for which STUN request is sent
SIP subscriber								
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	SIP Call Signalling active (symmetric UDP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	UDP	5060		Def: SIP
	SIP Call Signalling active (TCP) Call Signalling for SIP endpoints and SIP based trunking	client	SIP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	SIP Call Signalling passive Call Signalling for SIP endpoints and SIP based trunking	server	SIP	---	TCP_UDP	5060	1 - 65535	Def: SIP Adm: Default can be modified within this range
VCAPI - Virtual Common (ISDN) Application Programming Interface								
	VCAPI VCAPI Server	server	VCAPI	---	TCP	12001		Def: VCAPI
VPN-IPSEC VPN tunnel								

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	VPN-ESP (client) IPSEC protocol for encrypted payload transport	client	IPSEC	---	ESP	0		Def: NoPort assigned for this protocol
	VPN-ESP (server) IPSEC protocol for encrypted payload transport	server	IPSEC	---	ESP	0		Def: NoPort assigned for this protocol
	VPN-ISAKMP (client) Internet Security Association and Key Management Protcol for IPSEC	client	ISAKMP	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
	VPN-ISAKMP (server) Internet Security Association and Key Management Protcol for IPSEC	server	ISAKMP	---	UDP	500		Def: ISAKMP
	VPN-NAT-T (client) NAT treversal, IPSEC protocol for encrypted payload transport	client	NAT-T	---	UDP	1024 - 65535		Def: Ephemeral Ports (IANA)
	VPN-NAT-T (server) NAT treversal, IPSEC protocol for encrypted payload transport	server	NAT-T	---	UDP	4500		Def: NAT-T

2.1.2 IP- Clients

2.1.2.1 optiClient 130 V5.1 R5

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
HFA Client								
	Cornet TC	server	Cornet-TC	---	TCP	4060	1 - 65535	Def: CorNet-TC Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720		Def: H.225/Q.931
	H.323 Media Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung für Sprachkanäle (Mediachannels)	server	H.323 (H.245)	---	TCP	12000 - 12100		Def: H.245 portnumber is negotiated via H.225
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
LDAP Connectivity (client sided) client sided connectivity to a LDAP Service								
	LDAP Access Directory access via LDAP	client	LDAP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
DLC Connectivity (DLS client sided) client sided connectivity to Deployment Licence Service								
	DLS contact me request (optiClient sided) workpoint sided DLS contact me service	server	HTTP	---	TCP	8082		Def: HTTP optiClients
	DLS Detection (DHCP) DLS detection via DHCP	client	DHCP	---	UDP	68		Def: DHCP Client Port
	DLS Detection (DNS) DLS detection via DNS	client	DNS	---	UDP		1024 - 65535	Def: Unspecified Default Port(range) values Adm: PortLow/PortHigh can be modified within this range ()
	DLS Workpoint Interface (optiClient sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	18443		Def: DLS: Communication interface workpoints – DLS
HFA Client								

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	Cornet TC	server	Cornet-TC	---	TCP	4060	1 - 65535	Def: CorNet-TC Adm: Default can be modified within this range
	H.323 Call Signaling active VoIP Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	12250 - 12950	1 - 65535	Def: H.323 Adm: Default can be modified within this range
	H.323 Call Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720		Def: H.225/Q.931
	H.323 Media Signaling (MDW_MSA) Voice over IP: Verbindungssteuerung f?r Sprachkan?le (Mediachannels)	server	H.323 (H.245)	---	TCP	12000 - 12100		Def: H.245 portnumber is negotiated via H.225
	RTP Payload Transport active VoIP Payloadtransport	client	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
	RTP Payload Transport passive VoIP payloadtransport	server	RTP_RTCP	---	UDP	29100 - 29159	1 - 65535	Def: RTP portnumber is negotiated via H.245. Max 30 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: Default can be modified within this range
HLM Connectivity (client sided) client sided HiPath Licence Management								
	CLA Connectivity (CLC) Used for data transfer between CLC / CLM	client	HLP	---	TCP - SSL	61740		Def: Port will be discovered by CLM through multicast procedure. CLC uses port by configuration.
LDAP Connectivity (client sided) client sided connectivity to a LDAP Service								
	LDAP Access Directory access via LDAP	client	LDAP	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)

2.1.2.2 optiPoint 410/420 SIP V5R0

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
OAM (oP410 SIP) Administration of optiPoint SIP devices								
	DHCP-Client (op410) Server of "Dynamic Host Configuration Protocol"	client	DHCP	---	UDP	68		Def: DHCP Client Port
	DHCP-Server (oP410) Server of "Dynamic Host Configuration Protocol"	server	DHCP	---	UDP	67		Def: DHCP Server Port
	DLS Workpoint Interface (client sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	18443	0 - 65535	Def: DLS: Communication interface workpoints – DLS
	DNS DNS relay	server	DNS	---	TCP_UDP	53		Def: DNS
	FTP_Server_Control (oP410) FTP-Server	server	FTP	---	TCP	21		Def: FTP-Server Control Port
	HTTPS_Server (Phones) Secure Embedded Web Server	server	HTTP	---	TCP	443	0 - 65535	Def: HTTPS
	HTTP_Server (Phones) Web Interface	server	TFTP	---	TCP	8085	0 - 65535	Def: HTTP optiPoints, HG1500
	IP-Config (Phones) IP Configuration Services	server	*proprietary*	---	UDP	5100		
	SNMP (SET/GET) (Phones) SNMP SET/GET-Functionality	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
	SNMP Trap (oP410) SNMP Trap function	client	SNMP	---	UDP	161 162		Def: SNMP Trap (oP410)
	SNTP (oP410) Simple Network Time Protocol	server	SNTP	---	UDP	123		Def: SNTP
	SNTP heartbeat (oP410) Simple Network Time Protocol	server	SNTP	---	UDP	580		
QoS Data Collection Unit (QCU) phones Send QoS reports								
	QCU client 12010 Client application which sends QDC data to the QCU	client	SNMP	---	UDP	12010	0 - 65535	Def: QCU receiving Port
SIP payload transport (op410 SIP) Session Inition Protocol (SIP) payload								
	SIP Payload Transport (oP410) active Voice over IP: Transmission of Payload	client	RTP_RTCP	---	UDP	5004 - 5027	0 - 65534	Def: Port 5004 .. 5006 for normal usage. For every line-key you have to add two channels. The maximum of line keys are 10 -->. For this the maximum range of 5004 .. 5027 is valid Adm: even port number only

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	SIP Payload Transport (oP410) passive Voice over IP: Transmission of Payload	server	RTP_RTCP	---	UDP	5004 - 5027	0 - 65534	Def: Port 5004 .. 5006 for normal usage. For every line-key you have to add two channels. The maximum of line keys are 10 -->. For this the maximum range of 5004 .. 5027 is valid Adm: even port number only
SIP Signalling (op410 SIP) Session Inition Protocol (SIP) signaling								
	SIP Signaling (WL2-Phone) SIP over TLS	client	SIP	---	TCP - TLS	5061		Def: SIP
	SIP signaling TCP (oP410) SIP signalling in the case of using TCP (configurable inside the phone)	client	SIP	---	TCP	5060		Def: SIP
	SIP signaling UDP (oP410) SIP signalling in the case of using UDP (configurable inside the phone)	client	SIP	---	UDP	5060		Def: SIP
	SIP-TLS (OP410) SIP over TLS	client	SIP	---	TCP - TLS	5061	1 - 65535	Def: SIP Adm: Configuration the port value to zero will result in the default port value being used
User Applications (oP410 SIP) bundle of user functions								
	JAVA (optiPoints) JAVA applications in phones	client	HTTP	---	TCP	9200	0 - 65535	Def: Java default port in optiPoint phones
	LDAP Access (optiPoint phones) Directory access via LDAP	client	LDAP	---	TCP	389	0 - 65535	Def: LDAP
	WAP client (TCP) for WAP access to WAP services (server)	client	WAP	---	TCP	9200	0 - 65535	Def: WAP connectionless session service (IANA)

2.1.2.3 optiPoint 410/420 V5 R3

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
H.323 (oP410) General term for H.323 functions								
	H.323 Call Signaling (oP410) active Voice over IP: Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	H.323 Call Signaling (oP410) passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	0 - 65535	Def: H.225/Q.931
	H.323 Payload Transport (oP4x0 at H2k/H3k) active Voice over IP: Uebertragung der Sprachpakete	client	RTP_RTCP	---	UDP	5004 - 5013	0 - 65534	Def: RTP portnumber is negotiated via H.245. Max 5 connections: RTP starts at <adr> port2/max - 1 down to <adr> port 1/min , RTCP at <adr> port2/max down to <adr> port 1/min+1 Adm: even port number only
	H.323 Payload Transport (oP4x0 at H2k/H3k) passive Voice over IP: Uebertragung der Sprachpakete	server	RTP_RTCP	---	UDP	5004 - 5013	0 - 65534	Def: RTP portnumber is negotiated via H.245. Max 5 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1). Adm: even port number only
	H.323 Payload Transport (oP4x0 at H4k) active Voice over IP: Uebertragung der Sprachpakete	client	RTP_RTCP	---	UDP	5008 - 5013	0 - 65534	Def: Attention: The phone is prepared to handle up to 5 port couples in total. If the base port is set to 5004 inside the phone, the port range then is 5004 ... 5013. But, in H4k scenarios, only the upper three couples (starting from the top) are used: 5012/5013, 5010/5011 and 5008/5009 . Adm: even port number only
	H.323 Payload Transport (oP4x0 at H4k) passive Voice over IP: Uebertragung der Sprachpakete	server	RTP_RTCP	---	UDP	5008 - 5013	0 - 65534	Def: Attention: The phone is prepared to handle up to 5 port couples in total. If the base port is set to 5004 inside the phone, the port range then is 5004 ... 5013. But, in H4k scenarios, only the upper three couples (starting from the top) are used: 5012/5013, 5010/5011 and 5008/5009 . Adm: even port number only
HFA (oP410) Hicom Feature Access								
	CorNet TC Logon (oP600) CorNet TC Logon Port	client	*proprietary*	---	TCP	4060		Def: CorNet-TC
OAM (oP410 HFA) Administration of optiPoint HFA devices								
	DLS Workpoint Interface (client sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	18443	0 - 65535	Def: DLS: Communication interface workpoints – DLS
	FTP_Server_Control (oP410) FTP-Server	server	FTP	---	TCP	21		Def: FTP-Server Control Port
	HTTPS_Server (Phones) Secure Embedded Web Server	server	HTTP	---	TCP	443	0 - 65535	Def: HTTPS
	HTTP_Server (Phones) Web Interface	server	TFTP	---	TCP	8085	0 - 65535	Def: HTTP optiPoints, HG1500
	IP-Config (Phones) IP Configuration Services	server	*proprietary*	---	UDP	5100		

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
	SNMP (SET/GET) (Phones) SNMP SET/GET-Functionality	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
	SNMP Trap (oP410) SNMP Trap function	client	SNMP	---	UDP	161 162		Def: SNMP Trap (oP410)
QoS Data Collection Unit (QCU) phones Send QoS reports,								
	QCU client 12010 Client application which sends QDC data to the QCU	client	SNMP	---	UDP	12010	0 - 65535	Def: QCU receiving Port
User Applications (oP410 HFA) bundle of user functions of HFA phone oP410								
	CTI Service (TCP) CTI Service in oP410	client	Cornet TS	---	TCP	5105		Def: CTI Service oP410
	JAVA (optiPoints) JAVA applications in phones	client	HTTP	---	TCP	9200	0 - 65535	Def: Java default port in optiPoint phones
	LDAP Access (optiPoint phones) Directory access via LDAP	client	LDAP	---	TCP	389	0 - 65535	Def: LDAP
	WAP client (TCP) for WAP access to WAP services (server)	client	WAP	---	TCP	9200	0 - 65535	Def: WAP connectionless session service (IANA)

2.1.2.4 optiPoint WL2 professional V1.0 HFA Variant

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
H.323 (WL2) General term for H.323 functions								
	H.323 Call Signaling (WL2) active Voice over IP: Verbindungssteuerung	client	H.323 (H.225-Q.931)	---	TCP	1024 - 65535		Def: Ephemeral Ports (IANA)
	H.323 Call Signaling (WL2) passive Voice over IP: Verbindungssteuerung	server	H.323 (H.225-Q.931)	---	TCP	1720	1 - 65535	Def: H.225/Q.931 Adm: Default can be modified within this range
	H.323 Payload Transport (WL2) active Voice over IP: Uebertragung der Sprachpakete	client	RTP_RTCP	---	UDP	5004 - 5011		Def: RTP portnumber : RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1).
	H.323 Payload Transport (WL2) passive Voice over IP: Uebertragung der Sprachpakete	server	RTP_RTCP	---	UDP	5004 - 5013		Def: RTP portnumber is negotiated via H.245. Max 5 connections: RTP starts at <adr>, RTCP at <adr>+1 (=RTP+1).
HFA (WL2) Hicom Feature Access								
	CorNet TC Logon (WL2) CorNet TC Logon Port	client	*proprietary*	---	TCP	4060		Def: CorNet-TC
LDAP WL2 LDAP access for phones								
	LDAP Access (WL2) Directory access via LDAP	client	LDAP	---	TCP	389	0 - 65535	Def: LDAP
OAM (WL2) Administration of optiPoint HFA devices								
	DHCP-Client (WL2) Server of "Dynamic Host Configuration Protocol"	client	DHCP	---	UDP	68		Def: DHCP Client Port
	DHCP-Server (WL2) Server of "Dynamic Host Configuration Protocol"	server	DHCP	---	UDP	67		Def: DHCP Server Port
	DLS Workpoint Interface (WL2) (client sided) workpoint sided DLS Communication interface workpoints	client	WPIP	HTTPS	TCP	1024 - 65535	0 - 65535	Def: Ephemeral Ports (IANA)
	HTTPS_Server (WL2) Secure Embedded Web Server	server	HTTP	---	TCP	443		Def: HTTPS
	HTTP_Server (WL2) Web Interface	server	TFTP	---	TCP	8085		Def: HTTP optiPoints, HG1500
	IP-Config (WL2) Service Agent Reque	server	*proprietary*	---	UDP	5100		
	SNMP (SET/GET) (WL2) SNMP SET/GET-Functionality	server	SNMP	---	UDP	161		Def: SNMP (Set/Get)
	SNMP (Traps) (WL2) active Senden SNMP-Fehlermeldungen	client	SNMP	---	UDP	162		Def: SNMP (Traps)
	Telnet (WL2) Telnet-Server	server	Telnet	---	TCP	23		Def: Telnet

Application	Function	Type	A-Prot.	M-Prot.	T-Prot.	D-Ports	A-Ports	Remarks
QoS Data Collection Unit (QCU) phones Send QoS reports,								
	QCU client 12010 Client application which sends QDC data to the QCU	client	SNMP	---	UDP	12010	0 - 65535	Def: QCU receiving Port

2.2 Administration and Diagnosis

The following services are needed for administration and diagnosis in addition to those listed in chapter Voice Traffic and Signaling

OAM (HG1500) Administration and Maintenance						
DNS client DNS Client	client	DNS	---	TCP_UDP	1024 - 65535	Def: Ephemeral Ports (IANA)
DynDNS client DynDNS Client	client	DynDNS	---	UDP	1024 - 65535	Def: Ephemeral Ports (IANA)
Expert Access (HG1500) Debug Agent access	server	*proprietary*	---	UDP	17185	Def: VxWorks DebugAgent
HTTP client (HG1500) used for multi gateway administratrion feature (MGAF)	client	HTTP	---	TCP	1024 - 65535	Def: Ephemeral Ports (IANA)
HTTP Server (HG1500) HTTP Server for WBM access	server	HTTP	---	TCP	8085	Def: HTTP optiPoints, HG1500
HTTPS client used for multi gateway administration feature (MGAF)	client	HTTPS	---	TCP - SSL	1024 - 65535	Def: Ephemeral Ports (IANA)
HTTPS Server (HG1500) Secure Web Server	server	HTTPS	---	TCP - SSL	443	Def: HTTPS
QCU Report (Client) Client application which sends QDC reports to QCU Server	client	SNMP	---	UDP	1024 - 65535	Def: Ephemeral Ports (IANA)
SNMP (SET/GET) (H2/3/5k/HG1500) SNMP Set/Get	server	SNMP	---	UDP	161	Def: SNMP (Set/Get)
SNMP (Traps) (H2/3/5/HG1500) SNMP Error Messages	client	SNMP	---	UDP	1024 - 65535	Def: Ephemeral Ports (IANA)
SNMP (Traps) (HG1500) Receiving of SNMP-Traps	server	SNMP	---	UDP	162	Def: SNMP (Traps)
SNTP Server (H2/5k/HG1500,BizIP) Simple Network Time Protocol	server	SNTP	---	UDP	123	Def: SNTP
Telnet (HG1500) CLI	server	Telnet	---	TCP	23	Def: Telnet
Service Center (HG1500) Diagnosis access for development only						
ServiceCenter (HG1500) Interface for diagnosis (developmentlevel)	server	SCP	---	TCP	5098	1 - 65535 Def: SC-LDH Adm: Default can be modified within this range
X-Trace (HG1500) Access for X-Tracer						
Online Trace (HG1500) Acces to X-Trace	server	XTP	---	TCP	2048	Def: XTrace

D Identifying System Power Requirements

The following values are for orientation only, and can vary depending on the traffic flow.

This supplement specifies the power requirement of the boards and components of the HiPath 3000 systems. In addition, information is provided on the power requirement of the different workpoint clients, key modules and adapters.

With this information,

- the individual system power requirement can be identified.
- every system configuration can be checked to see whether the nominal output of the power supply unit is sufficient or whether an additional power supply may be needed.

Topic
HiPath 3800 Board Power Requirement, page D-2
HiPath 3550 Board Power Requirement, page D-4
HiPath 3350 Board Power Requirement, page D-6
HiPath 3500 Board Power Requirement, page D-8
HiPath 3300 Board Power Requirement, page D-9
Workpoint Client, Add-On Device, and Adapter Power Requirements, page D-10
Checking Whether the Output of a Power Supply Unit is Sufficient, page D-13
Identifying the Primary System Power Requirement, page D-16

To ensure that a system's dynamic capacity limit is not exceeded, the configuration can be tested using the project planning tool:
http://intranet.mch4.siemens.de/syseng/perfeng/tools/hpt/index.htm

D.1 HiPath 3800 Board Power Requirement

Table D-1 Nominal Output of the HiPath 3800 Power Supply Unit

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	–48 V
LUNA2	S30122-K7686-A1 S30122-K7686-M1	140[1]	
Powerbox PB3000 with LUNA2	S30177-U773-X with S30122-K7686-M1	–	110

1 The total max. nominal output at the 5-V and at the –48-V output is 140 W. The 5-V nominal output can vary between 30 and 60 W and the –48-V nominal output can vary between 80 and 110 W. In other words, if 30 W are withdrawn at the 5-V output, a maximum of 110 W is available at the –48-V output.



You must check whether the total power requirement of the boards used and the workpoint clients connected to a system cabinet exceeds the maximum possible LUNA2 output. Section D.7 contains a sample calculation.

Tabelle D-2 Board Power Requirement HiPath 3800

Board or Component	Part number	Net Power Requirement in W	
		5 V	–48 V
CBSAP	S30810-Q2314-X	10.0	–
DBSAP	S30807-Q6722-X	1.5	–
DIU2U	S30810-Q2216-X	5.1	–
DIUN2	S30810-Q2196-X	5.0	–
DIUT2	S30810-Q2226-X100	3.5	–
IVMN8	S30122-H7688-X100	10.0	–
IVMNL	S30122-H7688-X	10.0	–
PBXXX	S30810-Q6401-X	15.0	–
REALS	S30807-Q6629-X	1.5	–
RGMOD	S30124-X5109-X	–	14.4
SLCN	S30810-Q2193-X300	5.0	–
SLMA	S30810-Q2191-C300	1.6	12.0
SLMA2	S30810-Q2246-X	2.1	13.3
SLMA8	S30810-Q2191-C100	0.6	4.0

Tabelle D-2 Board Power Requirement HiPath 3800

Board or Component	Part number	Net Power Requirement in W	
		5 V	–48 V
SLMO2	S30810-Q2168-X10	1.0	1.2
SLMO8	S30810-Q2168-X100	0.4	0.4
STMD3	S30810-Q2217-X10	4.0	–
STMI2	S30810-Q2316-X100	16.3	–
TM2LP	S30810-Q2159-Xxxx	1.8	–
TMC16	S30810-Q2485-X	1.3	–
TMCAS-2	S30810-Q2946-X	4.5	–
TMDID	S30810-Q2452-X	2.3	6.6
TMEW2	S30810-Q2292-X100	1.3	3.1

D.2 HiPath 3550 Board Power Requirement

Table D-3 Nominal Output of the HiPath 3550 Power Supply Units

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	–48 V
UPSC-D	S30122-K5660-A300 S30122-K5660-M300	40.0	53.0
Powerbox PB3000 with LUNA2	S30177-U773-X with S30122-K7686-M1	–	110

You must check whether the total power requirement of the boards used and the workpoint clients connected exceeds the maximum possible output of the UPSC-D with or without Powerbox PB3000. Section D.7 contains a sample calculation.

Table D-4 Board Power RequirementHiPath 3550

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBCC (including subboards)	S30810-Q2935-A301	7.0	0.5
GEE12	S30817-Q951-Axxx	0.5	–
GEE16	S30817-Q951-Axxx	0.5	–
GEE50	S30817-Q951-Axxx	0.5	–
HXGS3 (including ventilator kit)	S30810-Q2943-X	10.0	2.8
HXGS3 (excluding ventilator kit)	S30810-Q2943-X	10.0	–
IVMS8	S30122-Q7379-X	2.6	0.3
PDM1	S30807-Q5692-X100	–	5.0
SLA8N	S30810-Q2929-X200	0.2	0.5
SLA16N	S30810-Q2929-X100	3.0	3.0
SLA24N	S30810-Q2929-X	4.5	4.5
SLAD4	S30810-H2956-X100	2.0	1.0
SLAD8	S30810-H2956-X200	2.0	1.0

Table D-4 Board Power RequirementHiPath 3550

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
SLAD16	S30810-Q2957-X	2,5	1,5[1]
SLC16N	S30810-Q2193-X100	5.0	–
SLMO24	S30810-Q2901-X	1.5	–
SLU8	S30817-Q922-A301	0.8	–
STLS2	S30817-Q924-B313	0.6	–
STLS4	S30817-Q924-A313	1.0	–
STRB	S30817-Q932-A	0.5	–
TCAS-2	S30810-Q2945-X	4.5	–
TLA2	S30817-Q923-Bxxx	0.1	–
TLA4	S30817-Q923-Axxx	0.2	–
TLA8	S30817-Q926-Axxx	0.4	–
TMAMF	S30810-Q2587-A400	1.8[2]	16.9[2]
TMCAS	S30810-Q2938-X		
TMGL4	S30810-Q2918-X	4.7[2]	0.1[2]
TMQ4	S30810-Q2917-X	3.8	–
TST1	S30810-Q2919-X	0.8	–
TS2	S30810-Q2913-X300	0.9	–
V24/1	S30807-Q6916-X100	0.3	–
4SLA	S30810-Q2923-X200	0.7	0.7
8SLA	S30810-Q2923-X100	1.3	1.3
16SLA	S30810-Q2923-X	2.5	2.5

1 For each active station (off hook), the net resource requirement increases by approx. 1.6 W (dependant on the phone's cable length and DC resistance).
2 Identified at a traffic flow of 0.8 Erlang

D.3 HiPath 3350 Board Power Requirement

Table D-5 Nominal Output of the HiPath 3350 Power Supply Units

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	–48 V
PSUP	S30122-K5658-M	15.0	19.2
UPSC-D	S30122-K5660-A300 S30122-K5660-M300	20.0[1]	53.0
Powerbox PB3000 with LUNA2	S30177-U773-X with S30122-K7686-M1	–	110

1 Nominal output = 40 W. Due to build-up of heat, not more than 20 W may be withdrawn.



You must check whether the total power requirement of the boards used and the workpoint clients connected exceeds the maximum possible output of the PSUP or the UPSC-D with or without Powerbox PB3000. Section D.7 contains a sample calculation.

Table D-6 HiPath 3350 Board Power Requirement

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
BS3/1	S30807-H5482-X	–	2,0
BS3/3	S30807-H5485-X	–	3,0
CBCC (including sub-boards)	S30810-Q2935-A301	7,0	0,5
GEE12	S30817-Q951-Axxx	0,5	–
GEE16	S30817-Q951-Axxx	0,5	–
GEE50	S30817-Q951-Axxx	0,5	–
HXGS3 (in old systems including ventilator kit)	S30810-Q2943-X, S30810-Q2943-X1	10,0	2,8
IVMP8	S30122-Q7379-X100	2,6	0,3
PDM1	S30807-Q5692-X100	–	5,0
SLAD4	S30810-H2956-X100	2,0	1,0
SLAD8	S30810-H2956-X200	2,0	1,0
SLAD16	S30810-Q2957-X	2,5	1,5[1]

Table D-6 HiPath 3350 Board Power Requirement

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
SLU8	S30817-Q922-A301	0,8	–
STLS2	S30817-Q924-B313	0,6	–
STLS4	S30817-Q924-A313	1,0	–
STRB	S30817-Q932-A	0,5	–
TLA2	S30817-Q923-Bxxx	0,1	–
TLA4	S30817-Q923-Axxx	0,2	–
TLA8	S30817-Q926-Axxx	0,4	–
TMGL4	S30810-Q2918-X	4,7[2]	0,1[2]
TMQ4	S30810-Q2917-X	3,8	–
V24/1	S30807-Q6916-X100	0,3	–
4SLA	S30810-Q2923-X200	0,7	0,7
8SLA	S30810-Q2923-X100	1,3	1,3
16SLA	S30810-Q2923-X	2,5	2,5

1 For each active station (off hook), the net resource requirement increases by approx. 1.6 W (dependant on the phone's cable length and DC resistance).
2 Identified at a traffic flow of 0.8 Erlang

D.4 HiPath 3500 Board Power Requirement

Table D-7 Nominal Output of the HiPath 3500 Power Supply Units

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	–48 V
UPSC-DR	S30122-K7373-A900 S30122-K7373-M900	40.0	53.0
Powerbox PB3000 with LUNA2	S30177-U773-X with S30122-K7686-M1	–	110

You must check whether the total power requirement of the boards used and the workpoint clients connected exceeds the maximum possible output of the UPSC-DR with or without Powerbox PB3000. Section D.7 contains a sample calculation.

Table D-8 Board Power RequirementHiPath 3500

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
BS3/1	S30807-H5482-X	–	2.0
BS3/3	S30807-H5485-X	–	3.0
CBRC (including subboards)	S30810-Q2935-Z301	7.0	0.5
HXGR3	S30810-K2943-Z	10.0	–
IVMS8R	S30122-K7379-Z	2.6	0.3
Fan for HiPath 3500	–	–	1.4
PDM1	S30807-Q5692-X100	–	5.0
SLAD8R	S30810-K2956-X300	2.0	1.0
SLU8R	S30817-K922-Z301	0.8	–
STLS4R	S30817-K924-Z313	1.0	–
STRBR	S30817-Q932-Z	0.5	–
TCASR-2	S30810-K2945-X	4.5	–
TLA4R	S30817-Q923-Zxxx	0.2	–
TMGL4R	S30810-K2918-Z	5.7[1]	0.1[1]
TST1	S30810-K2919-Z	0.8	–
TS2R	S30810-K2913-Z300	0.9	–
8SLAR	S30810-K2925-Z	1.3	1.3

1 Identified at a traffic flow of 0.8 Erlang

D.5 HiPath 3300 Board Power Requirement

Table D-9 Nominal Output of the HiPath 3300 Power Supply Units

Power Supply Unit	Part Number	Max. Nominal Output in W	
		5 V	–48 V
UPSC-DR	S30122-K7373-A900 S30122-K7373-M900	20.0[1]	53.0
Powerbox PB3000 with LUNA2	S30177-U773-X with S30122-K7686-M1	–	110

1 Nominal output = 40 W. Due to build-up of heat, not more than 20 W may be withdrawn.



You must check whether the total power requirement of the boards used and the workpoint clients connected exceeds the maximum possible output of the UPSC-DR with or without Powerbox PB3000. A sample calculation is shown in Section D.7.

Table D-10 Board Power RequirementHiPath 3300

Board or Component	Part Number	Net Power Requirement in W	
		5 V	–48 V
BS3/1	S30807-H5482-X	–	2.0
B S3/3	S30807-H5485-X	–	3.0
CBRC (including subboards)	S30810-Q2935-Z301	7.0	0.5
HXGR3	S30810-K2943-Z	10.0	–
IVMP8R	S30122-K7379-Z100	2.6	0.3
Fan for HiPath 3300	–	–	1.4
PDM1	S30807-Q5692-X100	–	5.0
SLAD8R	S30810-K2956-X300	2.0	1.0
SLU8R	S30817-K922-Z301	0.8	–
STLS4R	S30817-K924-Z313	1.0	–
STRBR	S30817-Q932-Z	0.5	–
TLA4R	S30817-Q923-Zxxx	0.2	–
TMGL4R	S30810-K2918-Z	5.7[1]	0.1[1]
8SLAR	S30810-K2925-Z	1.3	1.3

1 Identified at a traffic flow of 0.8 Erlang

D.6 Workpoint Client, Add-On Device, and Adapter Power Requirements

An average power requirement is specified, which is identified at a traffic flow of 0.15 Erlang.

Table D-11 Workpoint Client, Add-On Device, and Adapter Power Requirements

Workpoint Client		Net Power Requirement in W (from –48 V input)
OpenStage (CorNet-IP connection variant)	OpenStage 20	0.0[1]
	OpenStage 40	
	OpenStage 60	
	OpenStage 80	
OpenStage (TDM connection variant)	OpenStage 10	0.85 W
	OpenStage 20	
	OpenStage 40	1.1 W
	OpenStage 60	0.0[2]
	OpenStage 80	
OpenStage Key Module		0.0[2]
OpenStage BLF		0.0[2]
OpenStage PhoneAdapter		0.0[2]

Table D-11 Workpoint Client, Add-On Device, and Adapter Power Requirements

Workpoint Client		Net Power Requirement in W (from –48 V input)
optiPoint 410 optiPoint 420	optiPoint 410 entry, optiPoint 410 entry S	0.0[1]
	optiPoint 410 economy, optiPoint 410 economy S	
	optiPoint 410 standard, optiPoint 410 standard S	
	optiPoint 410 advance, optiPoint 410 advance S	
	optiPoint 420 economy, optiPoint 420 economy S	
	optiPoint 420 economy plus, optiPoint 420 economy plus S	
	optiPoint 420 standard, optiPoint 420 standard S	
	optiPoint 420 advance, optiPoint 420 advance S	
	optiPoint self labeling key module	
	optiPoint 410 display module	
optiPoint 500	optiPoint 500 entry	0.3
	optiPoint 500 economy (not for U.S.)	0.7
	optiPoint 500 basic	0.7
	optiPoint 500 standard, optiPoint 500 standard SL (for U.S. only)	0.7
	optiPoint 500 advance	0.72
	optiPoint key module	0.05
	optiPoint BLF	0.0[2]
	optiPoint analog adapter	0.00[3]
	optiPoint ISDN adapter	0.7
	optiPoint phone adapter	0.18
	optiPoint acoustic adapter	0.25
	optiPoint recorder adapter	0.3

Table D-11 Workpoint Client, Add-On Device, and Adapter Power Requirements

Workpoint Client	Net Power Requirement in W (from –48 V input)
optiPoint 600 office	0.0[1]
Analog telephone (40 mA for short trunk) in active status	0.3

1 Power over Ethernet or power supply via a local plug-in unit.
2 Power is provided by a local power supply.
3 A local power supply provides power to the connected analog telephone.

D.7 Checking Whether the Output of a Power Supply Unit is Sufficient

Apart from the secondary power requirements, the power output must also be checked to ensure that the maximum possible output of the system's power supply unit is sufficient. For this, the power requirement on the 5-V output format and on the –48-V output format must be examined separately.

> **Caution**
> To guarantee smooth system operation, the nominal output of the power supply unit at the 5-V output and at the –48-V output must be greater than the respective secondary power requirement.

Procedure

Proceed as follows to identify the secondary power requirement of a system:

1. Determine secondary power requirement at the 5-V output

   5 V power requirement of the boards/components used

   = secondary power requirement at the 5-V output

2. Determine secondary power requirement at the –48-V output

   –48-V power requirement of the boards/components used

   \+ power requirement of connected workpoint clients (analog and digital telephones), key modules and adapters

   = secondary power requirement at the –48-V output

Using the specified values, check whether the total power requirement exceeds the maximum possible output of the power supply unit at the 5-V output or at the –48-V output. If this is the case, you have the following options:

- HiPath 3800
  The number of LUNA2 power supply units can be increased.
- HiPath 3550 with UPSC-D
  The maximum nominal output of the –48-V output can be increased from 53 W to 110 W by using the external power supply Powerbox PB3000 with LUNA2.
- HiPath 3350 with UPSC-D
  The maximum nominal output of the –48-V output can be increased from 53 W to 110 W by using the external power supply Powerbox PB3000 with LUNA2.

- HiPath 3500 with UPSC-DR
  The maximum nominal output of the –48-V output can be increased from 53 W to 110 W by using the external power supply Powerbox PB3000 with LUNA2.
- HiPath 3300 with UPSC-DR
  The maximum nominal output of the –48-V output can be increased from 53 W to 110 W by using the external power supply Powerbox PB3000 with LUNA2.

Sample calculation for aHiPath 3550

1. Determine secondary power requirement at the 5-V output

power requirements of the boards/ components used =	7.00 W	1 x CBCC
	10.00 W	1 x HXGS3 (including ventilator kit)
	0.90 W	1 x TS2
	2.40 W	3 x SLU8
	1.30 W	1 x 8SLA
	5.00 W	1 x SLC16N
	0.00 W	12 x BS3/1
= secondary power requirement at the 5-V output =	26.60 W	

The maximum nominal output of UPSC-D at the 5-V output amounts to 40 W and is enough to cover the specified power requirement.

2. Determine secondary power requirement at the –48-V output

	power requirements of the boards/ components used =	0.50 W	1 x CBCC
		2.80 W	1 x HXGS3 (including ventilator kit)
		0.00 W	1 x TS2
		0.00 W	3 x SLU8
		1.30 W	1 x 8SLA
		0.00 W	1 x SLC16N
		24.00 W	12 x BS3/1
+	power requirement of connected workpoint clients, key modules and adapters =	4.32 W	6 x optiPoint 500 advance
		8.40 W	12 x optiPoint 500 basic
		2.40 W	8 x optiPoint 500 entry
		0.00 W	2 x Hicom Attendant BLF
		0.00 W	2 x optiPoint BLF
		0.40 W	8 x optiPoint key module
		0.50 W	2 x optiPoint acoustic adapter
		1.80 W	6 x analog telephones
=	secondary power requirement at the –48-V output =	47.83 W	

The maximum nominal output of UPSC-D at the –48-V output amounts to 53 W and is enough to cover the specified power requirement.

D.8 Identifying the Primary System Power Requirement

Procedure

Proceed as follows to identify the primary power requirement of a system:

1. Determine overall secondary power requirement

   power requirements of the boards/components used

   \+ power requirement of connected workpoint clients (analog and digital telephones), key modules and adapters

   ---

   = overall secondary power requirement

2. Identifying primary power requirement

   overall secondary power requirement

   \+ requirements of power supply units (LUNA2 = 9 W, PSUP/UPSC-D/UPSC-DR = 12 W respectively)

   \+ requirements of Powerbox PB3000 with LUNA2 (9 W)

   = the result should be multiplied by the factor 1.3 to allow for the degree of efficiency of the power supply.

Sample calculation for aHiPath 3550

1. Determine overall secondary power requirement

	power requirements of the boards/ components used =	7.50 W	1 x CBCC
		12.80 W	1 x HXGS3 (including ventilator kit)
		0.90 W	1 x TS2
		2.40 W	3 x SLU8
		2.60 W	1 x 8SLA
		5.00 W	1 x SLC16N
		24.00 W	12 x BS3/1
+	power requirement of connected workpoint clients, key modules and adapters =	4.32 W	6 x optiPoint 500 advance
		8.40 W	12 x optiPoint 500 basic
		2.40 W	8 x optiPoint 500 entry
		0.00 W	2 x Hicom Attendant BLF
		0.00 W	2 x optiPoint BLF
		0.40 W	8 x optiPoint key module
		0.50 W	2 x optiPoint acoustic adapter
		1.80 W	6 x analog workpoint clients
=	overall secondary power requirement =	74.43 W	

2. Identifying primary power requirement

	overall secondary power requirement =	74.43 W	
+	UPSC-D requirement =	12.00 W	
	Allow for the degree of efficiency of the power supply unit:	86.43 W	x 1.3 = 112.4 W

The primary power requirement of HiPath 3550 with the expansion mentioned amounts to approximately 112.4 W.

E Notes for Editing the File snmpd.cnf

E.1 Introduction

The SNMP parameters required for HiPath 5000 are defined when installing the FM Reporting Client (SNMP Master Agent). This refers to the trap destinations and the names of the HiPath Fault Management desktop communities.

The FM Reporting Client does not have its own user interface. The SNMP parameters defined during installation may only be changed by uninstalling and then reinstalling the FM Reporting Client.

Users with sufficient knowledge of SNMP can change trap destinations and community names by editing the file snmpd.cnf. The file can be found in the installation directory of the FM Reporting Client.



The following notes on editing the file `snmpd.cnf` are intended exclusively for users with sufficient knowledge of SNMP.
Note: The syntax of entries in the FM Reporting Client configuration file (SNMP master agent) is appended to the element description in the SNMP-TARGET-MIB (RFC 3413 – Chapter 4, cf. http://www.zvon.org).

E.2 Trap Destination

Procedure for sending a trap

1. Testing of the `snmpNotifyEntry` entries.
2. A trap is sent for all with `snmpNotifyTag == snmpTargetAddrTagList`.
   a) Only one `snmpNotifyEntry` should exist.
   b) The `snmpNotifyTag` of this entry should be used in all `snmpTargetAddrEntries`.
3. In addition, there must be an entry with `snmpTargetAddrParams == snmpTargetParamsName`.

`snmpNotifyEntry` `<snmpNotifyName> <snmpNotifyTag> <snmpNotifyType> <snmpNotifyStorageType>`

- **`snmpNotifyName`**
  Any unambiguous identifier for the entry.
  String with 1-32 characters.

- **snmpNotifyTag**
  Designation that must correspond with the `snmpTargetAddrTagList` (`snmpTagetAddrEntry`), so that a trap can be sent.
  The value is always "hipath".
- **snmpNotifyType**
  Type of traps that are to be sent (trap, about).
  For HiPath 5000 always “trap”.
- **snmpNotifyStorageType**
  Always “nonVolatile” (persistent storage necessary).

snmpTargetAddrEntry `<snmpTargetAddrName> <snmpTargetAddrTDomain> <snmpTargetAddrTAddress> <snmpTargetAddrTimeout> <snmpTargetAddrRetryCount> <snmpTargetAddrTagList> <snmpTargetAddrParams> <snmpTargetAddrStorageType> <snmpTargetAddrTMask> <snmpTargetAddrMMS>`

- **snmpTargetAddrName**
  Any unambiguous identifier for the entry.
  String with 1-32 characters.
- **snmpTargetAddrTDomain**
  Transport type for the entry.
  String: `snmpUDPDomain` or `snmpIPXDomain`.
- **snmpTargetAddrTAddress**
  Destination address for traps.
  The format depends on the entry `snmpTargetAddrTDomain`.
  For `snmpUDPDomain`: IP address + port (for example 192.132.123.98:162), whereby 0 may also be entered as a port. In this case the default port will be used.
- **snmpTargetAddrTimeout**
  Timeout: Default is 1500. For HiPath 5000, 100 is used.
- **snmpTargetAddrRetryCount**
  Retry count: Default is 3.
- **snmpTargetAddrTagList**
  Designation that must correspond with a `snmpNotifyTag` (`snmpNotifyEntry`) so that a trap can be sent to the given address.
  The value is always "hipath".
- **snmpTargetAddrParams**
  Designation that refers to an entry in a `snmpTargetParamsEntry` (`snmpTargetParamsName`).
  The value is always "v1Params".
- **snmpTargetAddrStorageType**
  Always “nonVolatile” (persistent storage necessary).

- **snmpTargetAddrTMask**
  Transport mask is always 255.255.255.255:0.

- **snmpTargetAddrMMS**
  Maximum message size is always 2048 (bytes).

snmpTargetParamsEntry <snmpTargetParamsName> <snmpTargetParamsMPModel> <snmpTargetParamsSecurityModel> <snmpTargetParamsSecurityName> <snmpTargetParamsSecurityLevel> <snmpTargetParamsStorageType>

- **snmpTargetParamsName**
  Any unambiguous identifier for the entry.
  String with 1-32 characters.
  The value is always "v1Params".

- **snmpTargetParamsMPModel**
  Message processing model: 0 (SNMPv1), 1 (SNMPv2c), 2 (SNMPv2u, SNMPv2*), 3 (SNMPv3).
  1 for "v1Params".

- **snmpTargetParamsSecurityModel**
  Security Model: snmpv1, snmpv2c, snmpv2s, ...
  snmpv1 for "v1Params".

- **snmpTargetParamsSecurityName**
  Security name within the configuration file.
  The value is always “public”.

- **snmpTargetParamsSecurityLevel**
  Security level is always “noAuthNoPriv”.

- **snmpTargetParamsStorageType**
  Always “nonVolatile” (persistent storage necessary).

E.3 Community (Read/Write)

snmpCommunityEntry <snmpCommunityIndex> <snmpCommunityName> <snmpCommunitySecurityName> <snmpCommunityContextEngineID> <snmpCommunityContextName> <snmpCommunityTransportTag> <snmpCommunityStorageType>

- **snmpCommunityIndex**
  Any unambiguous identifier for the entry.
  String with 1-32 characters.
- **snmpCommunityName**
  The incoming snmpv1 community (read or write community).
- **snmpCommunitySecurityName**
  This identifier represents the entry within the entire configuration file (for example in the snmpTargetParamsSecurityName).
  Always “public” (read community and trap destinations) or “private” (write community).
- **snmpCommunityContextEngineID**
  The value is always “localSnmpID”.
- **snmpCommunityContextName**
  Is always empty.
- **snmpCommunityTransportTag**
  Is always empty.
- **snmpCommunityStorageType**
  Always “nonVolatile” (persistent storage necessary).

E.4 Consequences for the File snmpd.cnf

The following entries can be found in the configuration file delivered with the installation.

```
snmpNotifyEntry  icn1 hipath trap nonVolatile
snmpTargetParamsEntry  v1Params 0 snmpv1 public noAuthNoPriv nonVolatile
snmpTargetParamsEntry  v2Params 1 snmpv2c public noAuthNoPriv nonVolatile
vacmAccessEntry  Anyone - snmpv1 noAuthNoPriv prefix CfgProt - CfgProt \
    nonVolatile
vacmAccessEntry  Anyone - snmpv2c noAuthNoPriv prefix CfgProt - CfgProt \
    nonVolatile
vacmAccessEntry  SetAnyone - snmpv1 noAuthNoPriv prefix CfgProt CfgProt \
    CfgProt nonVolatile
vacmAccessEntry  SetAnyone - snmpv2c noAuthNoPriv prefix CfgProt CfgProt \
    CfgProt nonVolatile
vacmSecurityToGroupEntry  snmpv1 public Anyone nonVolatile
vacmSecurityToGroupEntry  snmpv1 private SetAnyone nonVolatile
vacmSecurityToGroupEntry  snmpv2c public Anyone nonVolatile
vacmViewTreeFamilyEntry  All internet - included nonVolatile
vacmViewTreeFamilyEntry  CfgProt internet - included nonVolatile
vacmViewTreeFamilyEntry  CfgProt vacmSecurityToGroupTable - excluded \
    nonVolatile
vacmViewTreeFamilyEntry  CfgProt vacmAccessTable - excluded nonVolatile
vacmViewTreeFamilyEntry  CfgProt snmpCommunityTable - excluded nonVolatile
vacmViewTreeFamilyEntry  CfgProt usmUserTable - excluded nonVolatile
vacmViewTreeFamilyEntry  CfgProt vacmViewTreeFamilyTable - excluded \
    nonVolatile
```

This means that any entries to be made must always be in the following format:

1. **Communities**
   (Definition: There is exactly one read and exactly one write community.)

   a) **Read Community**
   `snmpCommunityEntry t001 <community-string> public localSnmpID -- nonVolatile`

   a) **Write Community**
   `snmpCommunityEntry t002 <community-string> public localSnmpID -- nonVolatile`

2. **Trap Destinations**
   `snmpTargetAddrEntry <lfd.-Nr.> snmpUDPDomain <IP-Adresse>:<Port> 100 3 hipath v1Params nonVolatile 255.255.255.255:0 2048`

F Components of the Linux Server of OpenScape office HX

Contents

The Linux server of OpenScape Office HX uses the components described in the following sections:

- Abschnitt F.1, “Postgres (Postmaster)”
- Abschnitt F.2, “File and Print Server”
- Abschnitt F.3, “Media Extension Bridge (MEB)”
- Abschnitt F.4, “CSTA Service Provider (CSP)”
- Abschnitt F.5, “OpenScapeOffice (OSO)”
- Abschnitt F.6, “Administration Portal”
- Abschnitt F.7, “Backup and Restore Engine”

F.1 Postgres (Postmaster)

Tabelle F-1 Application layer protocol: Postgres database

IF function	Protocol	Server Port	Internal/External	Description	Conf.
Postgres	TCP	5432	Internal/External	Database server	No

F.2 File and Print Server

Tabelle F-2 Application layer protocol: File and print server

IF function	Protocol	Server Port	Internal/External	Description	Conf.
smbd	TCP	139	External	Samba service - SAMBA (file) share	No
smbd	TCP	445	External	Samba service - SAMBA (file) share	
cupsd	UDP	631	External	Common Unix Printing System server	No
cupsd	TCP	631	External	Common Unix Printing System server	No

F.3 Media Extension Bridge (MEB)

Tabelle F-3 Application layer protocol: proprietary

IF function	Protocol	Server Port	Internal/External	Description	Conf.
MEB H.225	TCP	1720	External	Call signaling for H.323 bundling	Yes
MEB T.38	UDP	[1]			
External	T.38 payload data (fax)	(Yes)			
MEB RTP / RTCP	UDP	[1]			
External	RTP payload data	(Yes)			
MEB H.245	UDP	12000-12100	Internal/External	Data control channel	Yes

1 Calculation of the port area: Beginning with 29100 (base port) the MEB receives the first 270 ports for RTP/RTCP and T.38. Generally ports 29100 - 29189 are used for the first MEB. However, generally reserved are: 29100 - 29369.

F.4 CSTA Service Provider (CSP)

Tabelle F-4 Application layer protocol: proprietary

IF function	Protocol	Server Port	Internal/External	Description	Conf.
CSP	TCP	8800	External	IP port for all applications that want to connected to the CSP.	Yes

F.5 OpenScapeOffice (OSO)

Tabelle F-5 Application layer protocol: proprietary

IF function	Protocol	Server Port	Internal/External	Description	Conf.
VSL debug	TCP	8770	External	Diagnosis option for developers, will be removed from the final version.	

Tabelle F-5 Application layer protocol: proprietary

IF function	Protocol	Server Port	Internal/External	Description	Conf.
VSL multisite	TCP	8778	External	Is used for multiple connections, e.g. to connect several VSL servers.	Yes
VSL user portal	TCP/UDP	8779	External	Is used for client connections. UDP is used for hunt calls to automatically determine the server (also suitable for group calls).	No
VSL MyReports (http)	TCP	8101	External	Report preview. This port is defined in the Tomcat configuration file server.xml.	
VSL MyReports server	TCP	22	External	myRS connection to the server by using the SFTP.	

F.6 Administration Portal

Tabelle F-6 Application layer protocol: proprietary

IF function	Protocol	Server Port	Internal/External	Description	Conf.
AdminPortal (HTTPS)	TCP	443	External	Administration portal	No
AdminPortal (HTTP)	TCP	8100	External	Access to internal resources (URL lock page).	No
AdminPortal (HTTP)	TCP	8101	External	Administration portal for access to the PHP servlet.	No
Tomcat shutdown	TCP	8005	Internal	Deactivate administration portal.	No

F.7 Backup and Restore Engine

Tabelle F-7 Application layer protocol: proprietary

IF function	Protocol	Server Port	Internal/External	Description	Conf.
B&R engine	TCP	6666	Local	Interface of the Backup&Restore engine to JSP in the administration portal.	No

G Country Versions

G.1 Country Versions with Own Country Code

This table lists countries where HiPath 3000 Manager has a special country code under "Country Version":

No.	Country Version	Country Code	In Use
1.	Argentina	ARG	ARG
2.	Australia	AUS	AUS
3.	Belgium	BEL	BEL
4.	Brazil	BRA	BRA
5.	China	CHN	CHN
6.	Denmark	DAN	DAN
7.	Germany	BRD	BRD
8.	Finland	FIN	FIN
9.	France	FKR	FKR
10.	Greece	GRI	GRI
11.	Great Britain	GBR	GBR
12.	Hong Kong	HGK	HGK
13.	India	IND	IND
14.	Indonesia	IDS	IDS
15.	Ireland	IRL	IRL
16.	Italy	ITL	ITL
17.	Canada	KAN	USA
18.	Korea	KOR	IND
19.	Luxembourg	LUX	BRD
20.	Malaysia	MAL	MAL
21.	New Zealand	NSL	NSL
22.	The Netherlands	NDL	NDL
23.	Norway	NOR	NOR
24.	Austria	OES	OES
25.	Pakistan	PAK	PAK

Table 13-3 Countries with Special Country Code

No.	Country Version	Country Code	In Use
26.	The Philippines	PHI	PHI
27.	Poland	POL	POL
28.	Portugal	POR	POR
29.	Russia	RUS	RUS
30.	Sweden	SWD	SWD
31.	Switzerland	SWZ	SWZ
32.	Singapore	SIN	SIN
33.	Slovakia	SRE	CRE
34.	Spain	SPA	SPA
35.	South Africa	RSA	RSA
36.	Taiwan	TAI	TAI
37.	Thailand	THA	THA
38.	Czech Republic	CRE	CRE
39.	Turkey	TRK	TRK
40.	Ukraine	UKR	RUS
41.	Hungary	UNG	UNG
42.	USA	USA	USA
43.	Belarus	WEI	RUS

Table 13-3 Countries with Special Country Code

G.2 Countries with Country Code "IM"

This table lists the countries that should be set with the country code "international" or "IM" under "Country Version" in HiPath 3000 Manager:

No.	Country Version	Country Code
1.	Egypt	EG
2.	Algeria	DZ
3.	Azerbaijan	AZ
4.	Bangladesh	BD
5.	Bolivia	BO
6.	Bosnia-Herzegovina	BA
7.	Botswana	BW
8.	Bulgaria	BG
9.	Chile	CL
10.	Costa Rica	CR
11.	Ecuador	EC
12.	El Salvador	SV
13.	Ivory Coast	CI
14.	Estonia	EE
15.	Guatemala	GT
16.	Honduras	HN
17.	Iceland	IS
18.	Israel	IL
19.	Jordan	JO
20.	Kazakhstan	KZ
21.	Kenya	KE
22.	Kyrgyzstan	KG
23.	Colombia	CO
24.	Croatia	HR
25.	Kuwait	KW
26.	Lebanon	LB
27.	Madagascar	MG

Table 13-4 IM Countries

No.	Country Version	Country Code
28.	Malta	MT
29.	Morocco	MA
30.	Mauritius	MU
31.	Macedonia	MK
32.	Mexico	MX
33.	Namibia	NA
34.	Nicaragua	NI
35.	Nigeria	NG
36.	Oman	OM
37.	Panama	PA
38.	Paraguay	PY
39.	Peru	PE
40.	Romania	RO
41.	Zambia	ZM
42.	Saudi Arabia	SA
43.	Senegal	SN
44.	Serbia/Montenegro	YU
45.	Zimbabwe	ZW
46.	Slovenia	SI
47.	Sri Lanka	LK
48.	Tadzhikistan	TJ
49.	Tanzania	TZ
50.	Tunisia	TN
51.	Turkmenistan	TM
52.	Uruguay	UY
53.	Uzbekistan	UZ
54.	Venezuela	VE
55.	United Arab Emirates	AE
56.	Vietnam	VN

Table 13-4 IM Countries

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Abbreviations

This list contains the abbreviations used in this manual.

A

ADPCM	Adaptive Difference Pulse Code Modulation
AES	Advanced Encryption Standard
ALUM	Trunk failure transfer
AMHOST	Administration and Maintenance via HOST
ANI	Automatic Number Identification
ANI4R	Automatic Number Identification Rack
APS	System Program System

B

BHCA	Busy Hour Call Attempts
BSG	Upright battery housing
BSG	Key module

C

CABLU	Cabling Unit
CAS	Channel Associated Signaling
CBCC	Central Board with Coldfire Com
CBCP	Central Board with Coldfire Point
CBCPR	Central Board with Coldfire Pro
CBRC	Central Board Rack Com
CBSAP	Central Board Synergy Access Platform
CCBS	Completion of Calls to Busy Subscribers
CDB	Customer Database
CLA	Customer License Agent
CLC	Customer License Client
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CLM	Customer License Manager
(CLS)	Central License Server

CMA	ADPCM clock module
CMS	Clock Module Small
cPCI	Compact Programmable Communication Interface
CPFSK	Continuous Phase Frequency Shift Keying
CR	Code Receiver
CUC	Connection Unit Com
CUCR	Connection Unit Com Rack
CUP	Connection Unit Point
CUPR	Connection Unit Point Rack
D	
TW	Twin Wire
DECT	Digital Enhanced Cordless Telecommunications
RDT	Remote Data Transfer
DiffServ	Differentiated Services
DIU2U	Digital Interface Unit 2 Universal
DIUN2	Digital Interface Unit ISDN
DMC	Direct Media Connection
DSP	Digital Signal Processor
E	
EC1	First expansion cabinet
EC2	Second expansion cabinet
EBP	Slot (board)
ECG	Euro-ISDN–CAS-Gateway
ECGM	Euro-ISDN-CAS-Gateway Maintenance
ECT	Explicit Call Transfer
ESD	Electrostatically Sensitive Devices
Erl	Erlangs
eSHB	Electronic Service Manual
EVM	Entry Voice Mail
F	
FSK	Frequency Shift Keying

G

GAP	Generic Access Profile
BC	Basic cabinet
GEE	Call Metering Receiving Equipment
GPCF	Grace Period Configuration File

H

HA	Handset
LS	Loop start
HOPE	Hicom Office PhoneMail Entry
HPCO	HiPath ProCenter Office
HXGM	HiPath Xpress Gateway Medium
HXGR	HiPath Xpress Gateway Rack
HXGS	HiPath Xpress Gateway Small

I

IMODN	Integrated Modem Card New
IP	Internet Protocol
IVML	Integrated Voice Mail Large
IVMNL	Integrated Voice Mail New Large
IVMP	Integrated Voice Mail Point
IVMPR	Integrated Voice Mail Point Rack
IVMS	Integrated Voice Mail Small
IVMSR	Integrated Voice Mail Small Rack

K

CDB	Customer database

L

LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode
LIM	LAN Interface Module
LIMS	LAN Interface Module for SAPP
LM	Feature

M	
MCID	Malicious Call Identification
MDFU	Main Distribution Frame Universal
MDFU-E	Main Distribution Frame Universal, Enhanced
MMC	Multimedia card
MSN	Multiple Subscriber Number
MW	Mini-Western
N	
NT	Network Termination
O	
OPAL	Option Adapter Long
OPALR	Option Adapter Long Rack
P	
PCM	Personal Call Manager
PCM	Pulse Code Modulation
PDM1	PMC DSP modules
PDS	Permanent Data Service
PFT	Power Failure Transfer
PSE	Paging system
PSUP	Power Supply Unit Point
Q	
QoS	Quality of Service
R	
REAL	Relay and Trunk Failure Transfer
REALS	Relay and ALUM (power failure transfer) for SAPP
RJ	Registered Jack
RLF	Real License File
RSA	Resilience Service Application
RSM	Real-Time Services Manager

S

SELV	Safety Extra-Low Voltage Circuit
SIP	Session Initiation Protocol
SLA	Subscriber Line Analog
SLAR	Subscriber Line Analog Rack
SLAD	Subscriber Line Analog with DuSLIC
SLADR	Subscriber Line Analog with DuSLIC Rack
SLC	Subscriber Line Cordless
SLCN	Subscriber Line Cordless New
SLMA	Subscriber Line Module Analog
SLMO	Subscriber Line Module Cost Optimized UP0/E
SLU	Subscriber Line UP0/E
SLUR	Subscriber Line UP0/E Rack
SMR	Service Maintenance Release
SNG	Local power supply
SNMP	Simple Network Management Protocol
SP	Service Provider
SRTP	Secure Realtime Transport Protocol
STLS	Subscriber Trunk Line S0
STLSR	Subscriber And Trunk Line S0 Rack
STLSX	Subscriber Trunk Line S0 with ISAC-SX
STLSXR	Subscriber Trunk Line S0 with ISAC-SX Rack
STMD	Subscriber And Trunk Module Digital S0
STRB	Control Relay Module
STRBR	Control Relay Module Rack

T

TAPI	Telephony Application Programming Interface
ET	Door opener
TIEL	Tie Line Ear & Mouth
TLA	Trunk Line Analog
TLAR	Trunk Line Analog Rack
TM2LP	Trunk Module Loop Procedure

TMAMF	Trunk Module Analog for Multifrequency Code Signalling
TMC	Trunk Modules Central office
TMCAS	Trunk Module Channel Associated Signaling
TMDID	Direct Inward Dialing
TMEW	Trunk Modules for E&M World
TMGL4	Trunk Module Ground Start/Loop Start
TMGL4R	Trunk Module Ground Start/Loop Start Rack
TML8W	Trunk Module Loop Start World
TMOM	Trunk Module Outgoing Multipurpose
TMS2	Trunk Module S2M
TMST1	Trunk Modules S1/T1
TS2	Trunk Module S2M
TS2R	Trunk Module S2M Rack
U	
UAE	Universal socket
UPSC-D	Uninterruptible Power Supply Com-DECT
UPSC-DR	Uninterruptible Power Supply Com-DECT Rack
UPSM	Uninterruptible Power Supply Modular
UPSMres	Uninterruptible Power Supply Modular Reset Signal
SP	Surge protector
USB	Universal Serial Bus
V	
VPN	Virtual Private Network
W	
WAP	Wireless Application Protocol
WpC	Workpoint Client

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