Aastra Business Communication Solution

AASTRA

Aastra 470 as of R2.0
System Manual

Platforms supported:
Aastra 470

This document contains information on the expansion stages, system capacity, installation, configuration, running and maintenance of this Aastra communication systems as well as their technical data.

It is intended for planners, installers and system managers of Aastra 400 communication systems.

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1 Product and Safety Information

Here you will find information relating to safety, data protection and legal matters besides product and documentation information. Please read through the product and safety information carefully.

1. 1 Product information

Purpose and function

Aastra 400 is an open, modular and comprehensive communication solution for the business sector with several communication servers of different performance and expansion capacity, an extensive telephone portfolio and a multitude of expansions.

The expansion possibilities for the Aastra 470 communication server include an applications server for unified communications and multimedia services, an FMC Controller for integrating mobile phones, an open interface for application developers and a multitude of expansion cards and modules.

The business communication solution with all its elements was designed to cover the full spectrum of communication requirements of businesses and organizations in a user and maintenance-friendly way. The individual products and parts are coordinated and cannot be used for other purposes or replaced by outside products or parts (except to connect up other authorized networks, applications and phones to the interfaces certified for that purpose).

User groups

The phones, softphones and PC applications of the Aastra 400 communication solution are particularly user friendly in design and can be used by all end users without any specific product training.

The phones and PC applications for professional applications such as PC operator consoles or call centre applications require training of the personnel.

Specialist knowledge of IT and telephony is assumed for the planning, installation, configuration, commissioning and maintenance. Regular attendance at product training courses is strongly recommended.

User information

Aastra 400 products are supplied complete with safety and product information, quick user's guides and user's guides.

These and all other user documents such as system manuals are available for download from the Aastra 400 DocFinder as individual documents or as a documentation set. Some user documents are accessible only via a partner login.

It is your responsibility as a specialist retailer to keep up to date with the scope of functions, the proper use and the operation of the Aastra 400 communication solution and to inform and instruct your customers about all the user-related aspects of the installed system:

- Please make sure you have all the user documents required to install, configure and commission a Aastra 400 communication system and to operate it efficiently and correctly.
- Make sure that the versions of the user documents comply with the software level of the Aastra 400 products used and that you have the latest editions.
- Always read the user documents first before you install, configure and put a Aastra 400 communication solution into operation.
- Ensure that all end users have access to the user's guides.

Downloading documents from the internet
Aastra 400 DocFinder: www.aastra.com/DocFinder
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Conformity

Aastra Telecom Schweiz AG hereby declares that

- the Aastra 400 products conform to the basic requirements and other relevant stipulations of Directive 1999/5/EC.
- all our products are manufactured in conformity with RoHS and WEEE (2002/95/EC and 2002/96/EC).

The product-specific declarations of conformity can be found on the Aastra 400 DocFinder.

Trade names

Aastra® is a registered trademark of Aastra Technologies Limited.

All other trademarks, product names and logos are trademarks or registered trademarks of their respective proprietors.

Usage of third party software

Aastra 400 products comprise, or are partially based on, third-party software products. The licence information for these third-party products is listed in the user's guide of the Aastra 400 product in question (see also 7. 7).

Exclusion of Liability

All parts and components of the Aastra 400 communication solution are manufactured in accordance with ISO 9001 quality guidelines. The relevant user information has been compiled with the utmost care. The functions of the Aastra 400 products have been tested and approved after comprehensive conformity tests. Nonetheless errors cannot be entirely excluded. The manufacturers shall not be liable for any direct or indirect damage that may be caused by incorrect handling, improper use, or any other faulty behaviour. Potential areas of particular risk are signalled in the appropriate sections of the user information. Liability for loss of profit is excluded in any case.

Environment

Aastra 400 products are delivered in recycled, chlorine-free corrugated cardboard packaging. The parts are also wrapped inside a protective fleece made of polyethylene foam fleece or polyethylene film for added protection during shipping. The packaging is to be disposed of in accordance with the guidelines stipulated under current legislation.

Aastra 400 products contain plastics based on a pure ABS, sheet steel with an aluminium-zinc or zinc finish, and epoxy resin-based PCBs. These materials are to be disposed of in accordance with the guidelines stipulated under current legislation.

Aastra 400 products are disassembled exclusively using detachable screwed connections.

1. 2 Safety information

Reference to hazards

Hazard warnings are affixed whenever there is a risk that improper handling may put people at risk or cause damage to the Aastra 400 product. Please take note of these warnings and follow them at all times. Please also take note in particular of hazard warnings contained in the user information.

Operating safety

Aastra 400 communication servers are operated on 230 VAC mains power. Communication servers and all their components (e .g. telephones) will not operate when mains power fails. Interruptions in the power supply will cause the entire system to restart. A UPS system has to be connected up-circuit to ensure an uninterruptible power supply. Up to a specific performance limit a Aastra 470 communication server can also be operated redundantly using an auxiliary power supply. For more information please refer to your communication server's system manual.

When the communication server is started for the first time, all the configuration data is reset. You are advised to backup your configuration data on a regular basis as well as before and after any changes.

Installation and operating instructions

Before you begin with the installation of the Aastra 400 communication server:

- Check that the delivery is complete and undamaged. Notify your supplier immediately of any defects; do not install or put into operation any components that may be defective.
- Check that you have all the relevant user documents at your disposal.
- During the installation follow the installation instructions for your Aastra 400 product and observe to the letter the safety warnings they contain.

Any servicing, expansion or repair work is to be carried out only by technical personnel with the appropriate qualifications.

1. 3 Data Protection

Protection of user data

During operation the communication system records and stores user data (e.g. call data, contacts, voice messages, etc.). Protect this data from unauthorised access by using restrictive access control:

- For remote management use SRM (Secure IP Remote Management) or set up the IP network in such a way that from the outside only authorised persons have access to the IP addresses of the Aastra 400 products.
- Restrict the number of user accounts to the minimum necessary and assign to the user accounts only those authorisation profiles that are actually required.

- Instruct system assistants to open the remote maintenance access to the communication server only for the amount of time needed for access.
- Instruct users with access rights to change their passwords on a regular basis and keep them under lock and key.

Protection against listening in and recording

The Aastra 400 communication solution comprises features which allow calls to be monitored and recorded without the call parties noticing. Inform your customers that these features can only be used in compliance with national data protection provisions.

Unencrypted phone calls made in the IP network can be recorded and played back by anyone with the right resources:

- Use encrypted voice transmission (Secure VoIP) whenever possible.
- For WAN links used for transmitting calls from IP or SIP phones, use as a matter of preference either the customer's own dedicated leased lines or with VPN encrypted connection paths.

1. 4 About this System Manual

This System Manual contains information on the expansion stages, system capacity, installation, configuration, running and maintenance of Aastra communication systems as well as their technical data. The system functions and features, the DECT planning and the possibilities for networking several systems into a private network (PISN) or an Aastra Intelligent Net (AIN) are not part of this Manual; they are described in separate documents.

The System Manual is available only in electronic form as a document in Acrobat Reader format, and can be printed out. Navigation in PDF format is based on the bookmarks, table of contents, cross references and index. All these navigation aids are linked, i.e. a mouse click takes you directly to the corresponding places in the Manual. We have also ensured that the page numbering in the PDF navigation corresponds to the page numbering of the Manual, making it much easier to jump to a particular page.

Referenced menu entries and parameters appearing on terminal displays or in AIMS AMS (Aastra Management Suite) are *highlighted* in italics and in colour for a clearer orientation.

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General Considerations

Special symbols for additional information and document references.

Note
Failure to observe information identified in this way can lead to equipment faults or malfunctions or affect the performance of the system.

Tip
Additional information on the handling or alternative operation of equipment.

See also
Reference to other chapters within the document or to other documents.

Aastra Intelligent Net:
Particularities that have to be observed in an AIN.

Safety Considerations

Special hazard alert messages with pictograms are used to signal areas of particular risk to people or equipment.

Hazard
Failure to observe information identified in this way can put people and hardware at risk through electrical shock or short-circuits respectively.

Warning
Failure to observe information identified in this way can cause a defect to a module.

Warning
Failure to observe information identified in this way can lead to damage caused by electrostatic discharge.

1. 5 About Aastra

Aastra Technologies Limited is one of the world's leading manufacturers of communication systems. When developing products and solutions the prime objective is always to optimise the communication processes of small, medium and large companies and cut costs as a result.

Aspects of modern office communications such as mobility, future viability, security and availability are as much an integral part of the development work as user friendliness and product design. The offer covers the entire range of VoIP and SIP solutions, including communication servers, gateways, system phones and process-oriented software solutions.

With its pioneering innovations Aastra consistently promotes the convergence of voice and data communications in its solutions. Aastra's clientele includes acknowledged telephone and data network operators in North America, Europe and Africa as well as Internet Service Providers and distributors of renown.

Aastra Technologies Limited, (TSX: "AAH"), is a leading company at the forefront of the enterprise communication market. Headquartered in Concord, Ontario, Canada, Aastra develops and delivers innovative communication products and applications for businesses. Aastra's operations are truly global with more than 50 million installed lines around the world and a direct and indirect presence in more than 100 countries. The large portfolio offers multi-functional Call Manages for small and medium-sized companies as well as highly scalable Call Managers for big companies. Integrated mobility solutions, call centre solutions and a broad range of telephones round off the portfolio. With a strong focus on open standards, Aastra enables enterprises to communicate and collaborate more efficiently.

For additional information on Aastra, visit our website.

2 System Overview

This chapter provides a brief overview of the Aastra 470 communication server with its positioning within the Aastra 400 series and the networking possibilities. It also features the system phones, the applications and the application interfaces.

2. 1 Introduction

Aastra 400 is a family of IP-based communications servers for professional use in companies and organizations operating as small and medium-sized businesses in all industries. The family consists of three systems with different expansion capacities. The systems can be expanded using cards, modules and licences, and adapted to the specific requirements of companies.

The family covers the growing demand for solutions in the area of unified communications, multimedia and enhanced mobile services. It is an open system that supports global standards and is therefore easily integrated into any existing infrastructure.

With its wide range of networking capabilities the system is particularly well suited for companies that operate in several locations. Coverage can even be extended to the smallest branch offices at low cost.

Aastra 400 communication systems handle “Voice over IP” technology with all its benefits. What’s more, the systems operate just as easily with traditional digital or analogue phones and public networks.

With the integrated Media Gateways any hybrid forms of an IP-based and digital or analogue communication environment are also possible. This enables customers to make the switch from traditional telephony to IP-based multimedia communication either in just one step or, gradually, in several stages.

2. 2 Communication server

Aastra 470 is the most powerful communication server in the Aastra 400 family. It is designed for installation in a 19” rack, but can also be set up on a flat surface.

With the exception of the power supply and earthing, all the connections and control elements are accessible from the front. The communications server does not have to be removed from the rack when expanding the system with interface cards, modules or an application card. Fig. 1 shows an Aastra 470 with a fitted application card and a number of interface cards.

Fig. 1 Aastra 470 with application card and a number of interface cards

The Aastra 470 communications server ships with a plug-in processor card (call Manager card) with colour display, 4 analogue terminal interfaces and 3 Gbit-LAN connections. A second CPU card (applications card) can be fitted as an option. It contains the pre-installed applications server for unified communications and multimedia services.

2. 2. 1 Positioning

Applications range from small businesses or branches to large companies at one or more locations. Up to 36 users can be operated on the Aastra 470 communication server without licensing. And with an expansion licence up to 400 users are possible.

The graphic below shows the Aastra 400 communication servers with their expansion capacity for IP system phones.

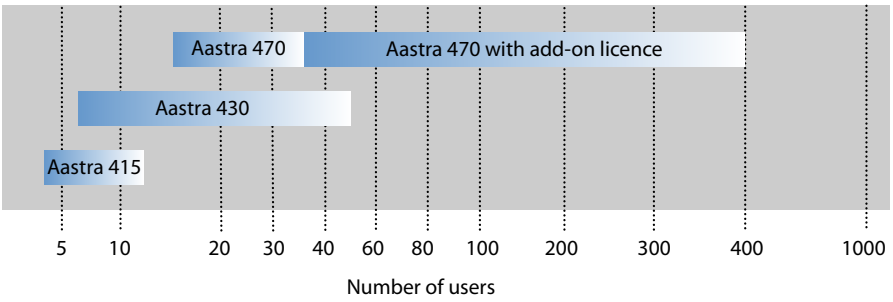


Fig. 2 Aastra 400 communication servers and their expansion capacity for IP system phones

2. 3 Networking Possibilities

Aastra 400 communication servers at different company locations, even beyond national borders, can be linked together to form an enterprise-wide private communication network with a common numbering plan. The following networking types are possible:

Aastra Intelligent Net (AIN)

In an AINseveral communication servers of the Aastra 400 series can be connected up to form a homogeneous communication system. The single systems are connected with one another via the IP network, thereby forming the nodes of the overall AIN system One node acts as the Master and controls the other (satellite) nodes. All the features are then available at all the nodes.

No call charges are incurred as the internal voice traffic between locations is routed via the system's own data network. All the AIN nodes are configured and set up centrally via the Master.

If a node is isolated from the rest of the AIN by an interruption in the IP connection, it restarts with an emergency configuration after a set amount of time. The connections are then routed to the public network via local links, for example with ISDN or SIP connections, until contact with the AIN is restored.

SIP networking

Networking based on the open global SIP protocol is the universal way of connecting several systems with one another via the private data network or the internet. Aastra 400 communication platforms can be used to network up to 100 other Aastra systems or SIP-compatible third-party systems. All the main telephony features such as call number and name display, enquiry call, hold, brokering, call transfer and conference circuits are supported. The transmission of DTMF signals and the T.38 protocol for Fax over IP between the nodes is also possible.

Virtual and leased-line networking via BRI/PRI interfaces

With this type of With this type of connection the nodes are connected via basic rate interfaces (BRI) or primary rate interfaces (PRI).

With virtual networking all the nodes are connected via the public ISDN network. This type of networking is particularly well suited for geographically dispersed locations which have such a low volume of calls between locations that leased lines or setting up a private data network are not worthwhile. The range of services available in a virtual network depends on the range of services offered by the network provider. The DSS1 ISDN protocol is the main protocol used.

With leased line networking the nodes are connected via dedicated or leased lines. One advantage of leased line networking are the fixed costs, regardless of the number of call connections. The most common protocol used is QSIG/PSS1, which supports several more features than the DSS1 protocol.

Virtual and leased-line networking can also be used in combination. Aastra systems are well as third-party systems can be used.

2. 4 Aastra system phones and clients

Aastra system phones stand out by virtue of their high level of user convenience and their attractive design. The broad range of products ensures there is a suitable model for every use.

Tab. 1 Digital system phones of the Aastra 5300 family

Product	Principal common features	Additional model-specific features
 Aastra 5361  Aastra 5370  Aastra 5380	• Intuitive and user-friendly menu prompting with Foxkey and central navigation key • All the system features can be used • Automatic update of the phone software • Connection via DSI interface • Two phones can be connected per DSI interface • Powered via DSI bus or power supply • Wall mounting possible	Aastra 5370/Aastra 5380: • Expansion key modules can be connected • Headset socket with DHSG standard Aastra 5380: • Backlit display • Optional Bluetooth module • Can be used as operator console when combined with expansion key module
Note: The digital system phones of the Office family (Office 10, Office 25, Office 35, Office 45 and Office 45pro) are supported as before (not all system features can be used).		

Tab. 2 Digital system phones of the Dialog 4200 family

Product	Principal common features	Additional model-specific features
 Dialog 4220  Dialog 4222  Dialog 4223	• Configurable number and function keys with LED • System features can be used via function codes • Hearing aid compatible • Connection via DSI interface • One phone can be connected per DSI interface • Powered via DSI bus or via optionally power supply • Wall mounting possible	Dialog 4222, Dialog 4223: • Graphics-compatible display • System features operated using menu prompting • Expansion key module(s) can be connected • Headset socket • Hands-free feature • Configurable team keys Dialog 4223: • 4 softkeys

Tab. 3 IP system phones (hardphones) of the Aastra 5300ip family

Product	Principal common features	Additional model-specific features
 Aastra 5361ip  Aastra 5370ip  Aastra 5380ip	• Intuitive and user-friendly menu prompting with Foxkey and central navigation key • All the system features can be used • Excellent voice quality due to Aastra Hi-Q™ wideband audio technology • Automatic update of the phone software • Connection via Ethernet • Powered via Ethernet (POE) or power supply • Wall mounting possible • Web configuration interface	Aastra 5370ip/Aastra 5380ip: • Expansion key modules can be connected • Headset socket with DHSG standard • Integrated switch for connecting a PC Aastra 5380: • Backlit display • Optional Bluetooth module • Can be used as operator console when combined with expansion key module
Note: The Aastra 5360ip IP system phone is supported as before.		

Tab. 4 IP system phones (softphones) and clients

Product	Main features
 Aastra 2380ip	• Autonomous, powerful, IP-based PC system phone with intuitive user interface • Can be used with headset or handset via PC audio interface, USB or Bluetooth • Graphical user interface with mouse and keyboard operation • Displayable expansion keypad for team keys, functions and phone numbers • Displayable keypad • Ring tones expandable using .mp3, .mid and .wav files • Call contacts directly from Outlook • All the system features can be used
 Aastra 1560 Aastra 1560ip	• OIP client application for a professional PC operator console • Can be used purely as an IP softphone (Aastra 1560ip) or together with a system phone (Aastra 1560) • Graphical user interface with mouse and keyboard operation • Can be used in an AIN as a network-wide PC operator console • Call management with internal and external queues • Presence indicator, presence profiles, phone book and journal • Operator groups and agent control • Line keys and calendar functions • Possibility of synchronisation with a Microsoft Exchange server • All the system features can be used
 OfficeSuite	• OIP client application for PC-based call management • Used in conjunction with a system phone • Graphical user interface with mouse and keyboard operation • Configuration of the coupled system phone • Call manager with extensive functions and options • Presence indicator of other users • Configurable presence profiles • Phone book with address books and personal contacts • Journal with call lists, text messages and notes • Workgroups (agent control) • Possibility of synchronisation with a Microsoft Exchange server • Possibility of displaying various additional windows • All the system features can be used
 Aastra Mobile Client (AMC)	• FMC client for mobile phones (runs on various operating systems) • Integrates the mobile phone into the Aastra communication system • User is always reachable under the same call number (One Number concept) • Various telephone functions can be menu-operated both in the idle state and during a call • Other system features can be used via function codes • With AMC Controller handover is possible between internal WLAN and mobile radio network
Note: The Office 1560/1560IP operator application is supported as before.	

Tab. 5 Cordless system phones of the Aastra 600d family

Product	Principal common features	Additional model-specific features
 Aastra 610d  Aastra 620d  Aastra 630d	• Intuitive and user-friendly menu prompting with Foxkey and central navigation key • All the system features can be used • Automatic update of the phone software • Backlit display and keyboard • Headset socket • Automatic handover and roaming • Can be operated on both the DSI radio units SB-4+, SB-8, SB-8ANT and the SIP-DECT radio units RFP L32 IP, RFP L34 IP and RFP L42 WLAN	Aastra 620d/Aastra 630d: • Colour display • Three freely configurable keys • Vibra call • Bluetooth interface • USB Interface • Power battery (optional) Aastra 630d: • Complies with industry standard (IP65) • With emergency button and sensor alarms, suitable for personal protection
Note: The Office 135/135pro and Office 160pro/Safeguard/ATEX) cordless system phones are supported as before (not all system features can be used).		

Tab. 6 SIP Multimedia Terminal Aastra BluStar™ 8000i[1)]

Product	Main features
 Aastra 8000i	• Intelligent multimedia terminal with intuitive operation • Video conferencing solution, collaboration tool and application platform in one. • XML browser compatible • Bluetooth interface • Can be connected to a laptop • HD video camera with 30 frames per second • Three loudspeakers for voice transmission in HD audio quality • Four microphones to eliminate unwanted background noise • 13 inch colour touch-screen display • Biometric fingerprint reader • Desktop sharing • SIP-based

1) The release for Aastra BluStar™ 8000i, Aastra 6735i and Aastra 6737i is independent from R1.2 and will be made later.

Tab. 7 SIP phones of the Aastra 6730i[1)] series

Product	Principal common features	Additional model-specific features
 Aastra 6730i  Aastra 6731i  Aastra 6735i  Aastra 6737i  Aastra 6739i	• User-friendly registration, configuration and operation of system features through Aastra 400 integration. • XML browser compatible • Automatic update of the terminal software • Web-user interface • Excellent voice quality due to Aastra Hi-Q™ wideband audio technology • Full-duplex hands-free operation (speakerphone) • Wall mounting possible • Power over Ethernet (except Aastra 6730i)	Aastra 6731i: • Integrated 10/100 Mbit Ethernet switch for connecting a PC Aastra 6735i, Aastra 6737i, and Aastra 6739i: • Integrated Gbit Ethernet switch for connecting a PC • Backlit display • Expansion key modules can be connected • Headset socket (DHSG standard) Aastra 6739i: • Bluetooth interface • USB Interface General: • Additional model-specific features include the resolution, the display type and size, and the number of configurable or fixed function keys.

Tab. 8 SIP phones of the Aastra 6750i series

Product	Principal common features	Additional model-specific features
 Aastra 6753i  Aastra 6755i  Aastra 6757i	• User-friendly registration, configuration and operation of system features through Aastra 400 integration. • XML browser compatible • Automatic update of the terminal software • Web-user interface • Excellent voice quality due to Aastra Hi-Q™ wideband audio technology • Full-duplex hands-free operation (speakerphone) • Wall mounting possible • Integrated 10/100 Mbit Ethernet switch for connecting a PC • Power over Ethernet	Model-specific features include the resolution, the display type and size, and the number of configurable or fixed function keys.

Tab. 9 Analogue Aastra phones

Product	Principal common features	Additional model-specific features
 Aastra 1910  Aastra 1930	• Destination dialling keys • Frequency dialling or pulse dialling • System features can be used via function codes • Wall mounting possible • Connection for data modem • Hearing aid compatible • Message list	Aastra 1930: • Three-line display • 135 phone book contacts • Number/name display for incoming calls • Automatic call answering • Headset socket

2. 5 Various phones and terminals

Thanks to the use of international standards other clients, terminals and phones, Aastra and third-party, can be connected and operated on the communication server:

- SIP-based phones
  With the integrated SIP protocol SIP-based phones (softphones, hardphones) - or via an SIP access point also WLAN and DECT phones - can be connected to the communication server. Besides the basic telephony functions, features such as call transfer, conference calls or CLIP/CLIR are also supported. Function codes can also be used to operate various system functions.
- Cordless phones
  The sturdy 9d DECT phones from the Ascom Wireless Solutions product portfolio can be logged on to the communication server as system phones. User-friendly messaging and alarm systems can thus be implemented in combination with the IMS (Integrated Message Server). Other DECT phones can also be operated in GAP mode.
- Mobile phones
  Mobile phones can also be integrated into the communication system. They can then be reached under an internal call number, and their status is monitored and displayed. Internal/external calls can be made via the integrated mobile phone; system functions can also be executed using function codes. With the Aastra Mobile Client application all the main telephony functions are available with menu prompting (see "Aastra applications", page 24).
- Analogue terminals
  All terminals (phones, fax, modem, etc.) approved by the network operator can

be connected on the analogue terminal interfaces. The communication system supports pulse and frequency dialling modes.

- ISDN terminals
  ISDN terminals that comply with the Euro ISDN standard can be connected to the BRI-S terminal interfaces. The communication system provides a series of ISDN features at the S bus.

2. 6 Applications and application interfaces

A distinction is made among applications between Aastra-specific applications and certified applications supplied by third parties.

The Aastra applications Open Interfaces Platform (OIP) and Telephony Web Portal (TWP) run either on the integrated applications server (CPU2) or on a customer server. Certified third-party applications are always installed on a customer server. The applications on the customer server communicate with the communication server via standardised interfaces (see "Application interfaces", page 26).

Auxiliary applications for planning and the configuration and park management are available as a separate software application or web application.

2. 6. 1 Aastra applications

Tab. 10 Aastra applications OIP and TWP

Application	Main features
 Open Interfaces Platform (OIP)	• Application interface for deep integration of applications by Aastra or other manufacturers (see "Application interfaces", page 26) • Simple operation and administration using OIP Toolbox • Integrates the Aastra 1560/1560ip / Office 1560/1560IP and OfficeSuite applications • Presence-controlled communication coupled with Outlook diary entries • Integration of contact databases and directories (Outlook, Exchange, Active Directory, LDAP directories, phone book CD) • Integration of building automation equipment and alarm systems • Call centre functions with flexible routing algorithms, skill-based agent groups and emergency routing • Unified messaging with notification whenever new voice messages are received via email (incl. message attachment) • Partner program for integrating and certifying applications by other manufacturers • Pre-installed on the applications card (CPU2) of the Aastra 470 communication server

Application	Main features
 Aastra Telephony Web Portal (TWP)	• Unified & collaborative communication application with extensive multimedia services • Call management functions, e-mail, text messaging, chat • Video conference circuits and desktop sharing • Video and audio recordings • Statistics functions • Team functions such as presence key and abbreviated dialling • Directory integration • Pre-installed on the applications card (CPU2) of the Aastra 470 communication server

Tab. 11 Planning and configuration applications

Application	Main features
Aastra Plan	• Web-based planning application for Aastra communication platforms • Uses project data to calculate the necessary communication server complete with terminals, interface cards, modules and licences • Country-specific adaptations possible for accessories • Stored price lists and configurable quote compilation • No installation necessary
WebAdmin	• Web-based configuration tool for the online configuration of single systems • Access control with predefined authorization profiles • Special accesses for hospitality solutions • Integrated online help and configuration assistant • Integrated in the communication server software package • No installation necessary
Aastra Hospitality Manager	• Integrated web-based application used to operate functions in the hospitality sector • List view and floor-by-floor view of the rooms • Functions such as check-in, check-out, notification, wake-up call, retrieval of call charges, maintenance list, etc.
Aastra Management Suite (AMS)	• Software package for the configuration and monitoring of a single system or an entire network (AIN) • Contains auxiliary applications such as Smart Software Update, System Search and Aastra WAV Converter • Access control with user accounts and configurable authorization profiles • Online and offline configuration possible • For installation on your own PC
Secure IP Remote Management (SRM)	• Server-based solution for secure IP remote management • No router and firewall configuration or VPN connection setup required • Allows configuration via AMS or WebAdmin once the connection has been set up • No installation necessary

2. 6. 2 Application interfaces

The most important interface for own and third-party applications is the interface of the Open Interfaces Platform (OIP). This open interface allows the applications to be deeply integrated with telephony. Third-party applications can also be integrated on systems of the Aastra 400 series via different interfaces without OIP.

2. 6. 2. 1 Open Interfaces Platform

The Open Interfaces Platform (OIP) is a software component that is connected to one of the supported communication systems as middleware and allows the integration of data sources and applications. The applications themselves are connected directly to the OIP interface (CORBA) or the OIP TAPI service provider.

The applications access many powerful functions of the communication system and of OIP itself.

These added-value services significantly broaden the use of the communication systems and provide a seamless convergence of computer and telephony applications for the user. With the clearly structured interface the application manufacturer is able to gain easy access to the communication system and at the same time benefit from the integrated functionality of OIP.

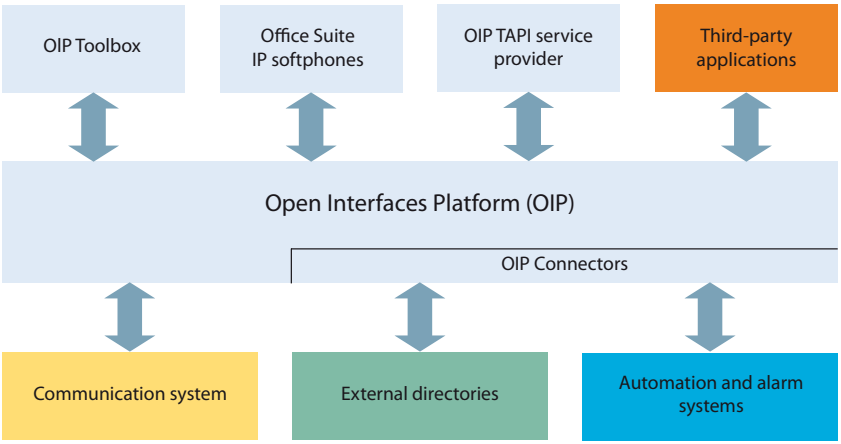


Fig. 3 OIP as middleware between communication system, external data sources and applications

Features

With OIP the applications are provided with many other features besides telephony functions. The operation and administration of the OIP and its applications is made simple and user-friendly by the OIP Toolbox.

OIP applications

OIP applications are specific user applications such as softphone applications which run on the OIP server. The OIP Toolbox is a collection of integrated OIP applications.

OIP services

The OIP services are the core components of the Open Interfaces Platform and are in charge of controlling the system. They provide interface functions, which the system is being controlled (e g. Call Control or configuration).

OIP as telephony server

OIP can be used as a telephony server to provide CTI functionalities on telephony clients. The Microsoft telephony server is now no longer required. Added security is also provided with the different rights assignment.

OIP on several communication servers

An OIP server can also be used as in an Aastra Intelligent Net. To do so, it will be linked to the Master. It is then possible for instance to obtain network-wide call logging for all the communication servers, to display call charge information on the system phones or to display status on the presence indicator field of a PC operator console for all the users connected.

Connection of external data sources

OIP supports the connection of external directories and it is also possible to set up adaptable alarming and messaging systems.

2. 6. 2. 2 Message and alarm systems

Aastra 400 supports several message formats and message protocols for implementing messaging, monitoring and alarm systems.

Internal messaging system for system phones

The internal messaging system for system terminals allows users to exchange predefined or user-defined text messages between system phones. Text messages can also be sent to individual users or message groups.

The internal messaging system does not have an interface with which it can be addressed directly. However it can also be operated via OIP.

External messaging, monitoring and alarm systems

The powerful ATAS/ATASpro protocol is available via the communication server's Ethernet interface for applications in the security and alarming sector. This protocol can be used to implement customised alarm applications. An alarm appears on the display of system phones, complete with the freely definable user functions that apply only to that alarm. In addition the duration of the tone as well as its volume and melody can be freely defined by the user for each alarm.

The cordless DECT phone Aastra 630d is specially designed for applications in the security and alarming sector. Besides a special alarm button it also features a man-down alarm, a no-movement alarm and an escape alarm. Sensors inside the phone constantly check the handset's position and motion. An alarm is triggered if the phone remains in a virtually horizontal position or motionless for some time or if the handset is shaken violently.

2. 6. 2. 3 CTI - Computer Telephony Integration

The Computer Telephony Integration (CTI) integrates telephony services in the company process. Besides conventional telephony features Open Interfaces Platform (OIP) offers many other convenient functions, which supports the employees with their daily work, for instance:

- Dialling by name for outgoing calls and CLIP display for incoming calls offers an added value by the integration of external directories and databases.
- Notification of Microsoft Outlook appointments on the system phones
- Presence-controlled communications with Busy Indicator
- Automatic Call Distribution
- Access to system configuration, what a maximum integration of different systems ensures

And of course the communication system supports also First and Third-Party CTI interfaces for commercial CTI applications based on the Microsoft TAPI 2.1 standard.

First-party CTI

A first-party CTI is the direct physical connection between a phone terminal and a telephony Client (workstation PC). Telephony functions and telephone states are controlled and monitored on the telephony Client. A first-party CTI solution is ideal for a small number of CTI workstations and is easily implemented.

Connection via Ethernet

Aastra 400 supports First-Party CTI on all system phones via the Ethernet interface. For this purpose the First-Party TAPI Service Provider (AIF-TSP) is required.

Application example

- Dialling from a database (phone book CD, etc.)
- Caller identification (CLIP)
- Creating a call journal

Third-party CTI

Third-party CTI is an user-friendly multi-station solution. In contrast to first-party CTI, third-party CTI controls and monitors several system phones (including cordless phones) via the central telephony server, which is connected with the communication server. In addition phones on ISDN and analogue interfaces can also be monitored. PC and phone allocation is handled by the telephony server.

Connection via Ethernet with OIP

The CTI Third party connection is effected via Ethernet using the Open Interfaces Platform (OIP). To this end the OIP is installed on the telephony server.

Application example

- Busy lamp field
- Group functionality
- Networked CTI solution
- Automatic Call Distribution (ACD)

2. 6. 2. 4 ISDN interface

Aastra 400 supports the ISDN protocols ETSI, DSS1 and QSIG. Besides the possibility of networking various systems into a PISN (Private Integrated Services Network) via the ISDN interface, these protocols also provide various functions that can be used for connecting external applications (e. g. IVR systems, fax server, voice mail systems, unified messaging systems, DECT radio systems).

2. 6. 2. 5 Configuration

The Aastra 400 communication servers are configured using the AMS application, which can communicate with the communication servers via different interfaces (Ethernet, ISDN). A proprietary protocol is used for this purpose. With the Open Interfaces Platform the configuration interface is accessible for application manufacturers. The web-based configuration tool WebAdmin is also available for single systems.

2. 6. 2. 6 System monitoring

The system status is monitored using the SEM (System Event Manager) application, which is included in AMS. The application gathers and outputs the system messages and alarms. The system messages and alarms are also accessible via the Open Interfaces Platform.

2. 6. 2. 7 Call logging

The Call Logging Manager includes data acquisition for incoming traffic (ICL), outgoing traffic (OCL) and the counting of the acquired call charges according to a variety of criteria. The data can be retrieved via different interfaces and subsequently processed.

2. 6. 2. 8 Accommodation/Hotel[1)]

The Aastra 400 communication server offers you several possibilities for implementing an accommodation and hotel solution, with different configuration tools, operation applications and interfaces. The configuration is carried out using either the AMS Configuration Manager or WebAdmin. The Aastra 5380/5380ip reception phone or the web-based Aastra Hospitality Manager application is available to operate the functions. A connection to a Property Management System (PMS) via the communication server's Ethernet interface is also possible. The commercially available FIAS protocol is provided for this purpose.

2. 6. 2. 9 Voice over IP

Aastra 400 provides gateways for implementing Voice over IP. Besides the possibility of networking systems via IP, IP system phones and SIP phones can also be operated on Aastra 400 via the Ethernet interface.

1) Older configurations created with the AMS Hotel Manager with associated hotel functions and operated using the System Assistant on the Office 45/45pro are still supported.

2. 7 Connection options

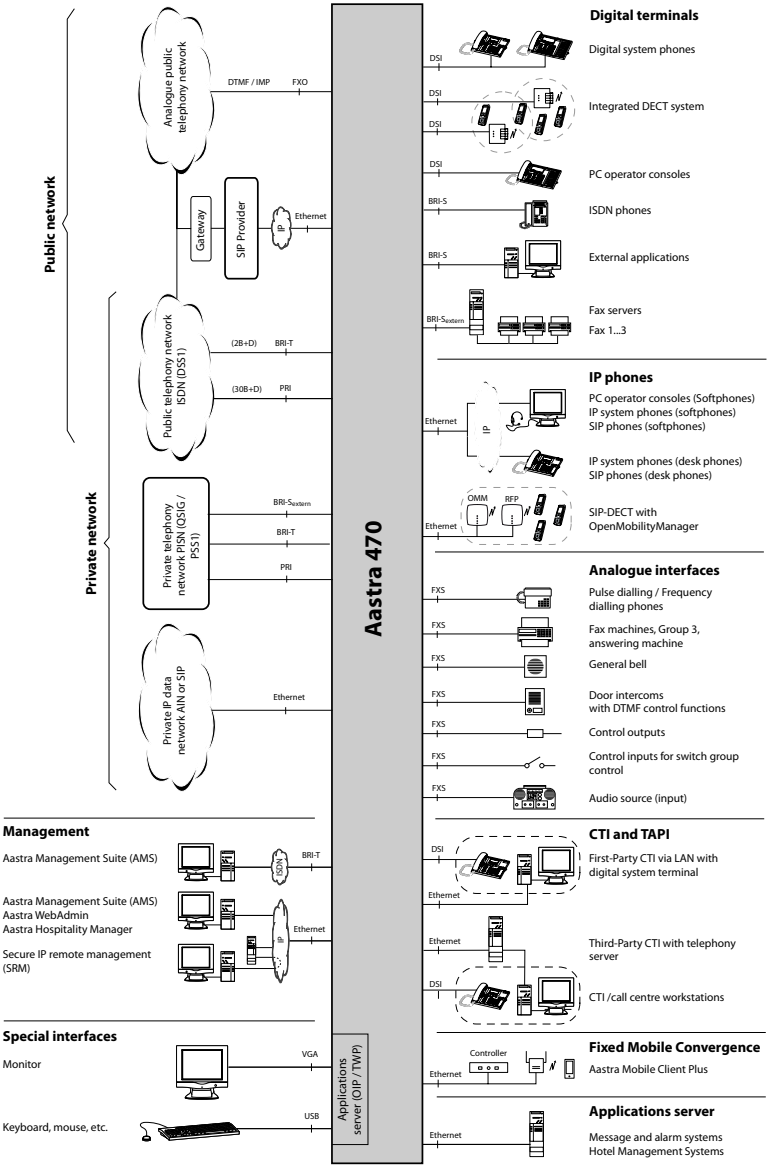


Fig. 4 Overview of interfaces with possible terminal equipment

3 Expansion Stages and System Capacity

The basic systems can be expanded using interface cards, system modules, an applications card and licences. The expansion possibilities available and the maximum system capacities need to be known so the communications system can be ideally adapted to customer requirements. With the project data the optimum hardware configuration is easily determined using the project planning application Aastra Plan.

3. 1 Overview

Expansion possibilities for the Aastra 470 basic systems at a glance. The interface cards are fitted from the front into one of a total of 7 slots. System modules are fitted either to the call manager card or to interface cards. System modules are also used on other platforms: The DSP modules with Aastra 415/430 and the IP media modules with Aastra 5000.

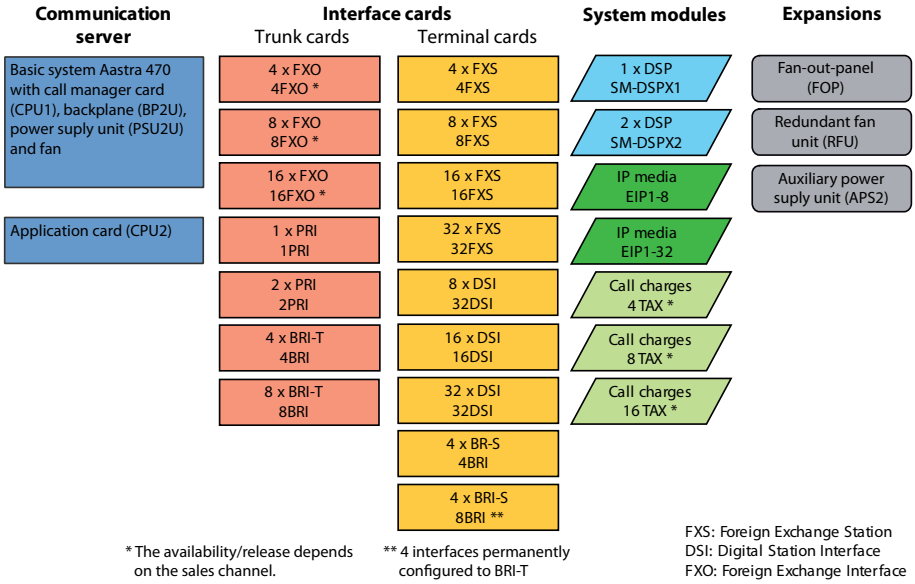


Fig. 5 Overview of the expansion possibilities

The basic system Aastra 470 can be expanded not just with interface cards and system modules but also with an applications card (CPU2). The applications card is supplied with preinstalled operating system, unified communications and multimedia applications.

The front-side RJ45 sockets of interface cards with 16 or more interfaces are partly or all four-fold assigned. With the FOP fan-out-panel they can be split again to individual sockets.

The Aastra 470 basic system has an integrated fan. The operating reliability of the communication server can be increased by fitting an optional redundant fan unit.

It is powered by an internal power supply unit (PSU2U). An external auxiliary power supply unit (APS2) is required for expansions involving a large number of power-consuming terminals. The auxiliary power supply unit also serves to increase the operating reliability. If the internal power supply unit fails, the external auxiliary power supply unit takes over the power supply.

3. 2 Basic system

The Aastra 470 basic system consists of the following components:

- Metal housing (2 height units) suitable for installation in a 19" rack or for desktop installation.
- CPU1 call manager card, fitted with a Flash card, a RAM module and an EIM card.
- 7 expansion slots with dummy covers fitted
- BP2U backplane fitted to electrically connect processor cards and interface cards.
- Fitted PSU2U power supply unit
- Fitted fan
- Power cord
- Rack assembly material

Fig. 6 Aastra 470 basic system

For electrical and thermal reasons the dummy covers must always be fitted. They are removed only to expand the basic system with interface cards or an application card.

For a clearer overview the figure below shows the open communications server from above with an additional fan fitted. The housing cover is in two parts. The upper, rear cover is removed for the purpose of fitting an additional fan (see "Fitting an additional fan", page 82 for the procedure).

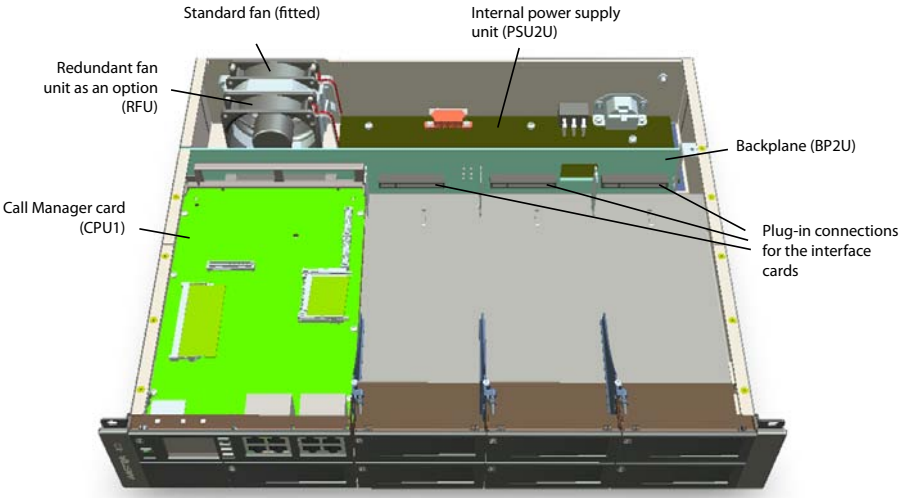


Fig. 7 Aastra 470 basic system fitted with a redundant fan unit

3. 2. 1 Interfaces, display and control elements

The interfaces accessible from the outside are located on the front and rear side of the basic system. The housing cover only needs to be opened when fitting an additional fan (see "Fitting an additional fan", page 82).

Basic system (without call manager card)

The figure below shows the positions of basic system interfaces without call manager card.

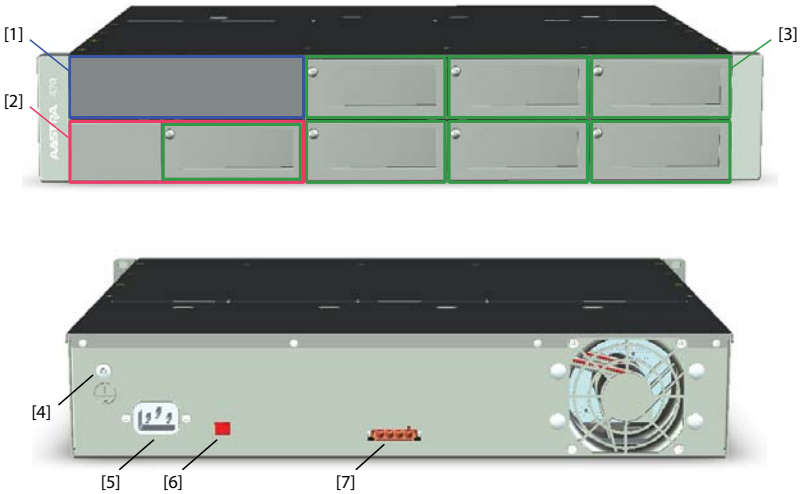


Fig. 8 Position of the interfaces on the basic system

Tab. 12 Interfaces of the basic system

Interfaces	Number of entries	Position	Remarks
Slot for Call Manager card CPU1	1	[1]	Device ships already equipped
Slot for application card CPU2	1	[2]	Can be fitted as an option
Slots for interface cards	7[1)]	[3]	Can be fitted as an option
Interface for redundant fan unit	1		Connectors inside the housing
Earth connection	1	[4]	
Mains socket for 115/230 V power supply input	1	[5]	
115/230 V voltage converter	1	[6]	
Socket for auxiliary power supply unit APS2	1	[7]	

[1)] 1 fewer slot if CPU2 application card is fitted

Call Manager card CPU1

The call manager card is the core the basic system and already fitted on delivery. Besides a powerful processor it also comprises a RAM module, a Flash memory card with the call manager software and an EIM card, on which the licences among others are stored.

The call manager card comprises two powerful DSP chips, one of which can be assigned selectable functions. Two DSP modules can also be fitted as an option to further boost the DSP resources (see also "DSP Resources", page 41).

An IP media module can be fitted as an option to increase the number of VoIP channels (see also "IP media modules", page 48).

Three individually configurable Gbit Ethernet interfaces are available on the front panel of the call manager card. The status of the interfaces is visible directly on the interfaces themselves thanks to the LEDs (see also "Ethernet interfaces", page 136).

Analogue voice and data terminals are connected via FXS interfaces. The call manager card comprises four of these configurable multifunctional interfaces (see also "FXS terminal interfaces", page 125).

The most striking display element on the call manager card is the backlit 1.8" colour display with the four navigation keys as control elements. It is used to display event messages or to execute maintenance functions. If the colour display is not available (e. g. during call manager system setup) the call manager status is indicated using the multi-coloured status LED on the On/Off button (see also "Display and control panel", page 200).

The figure below shows the positions of the interfaces and of the display and control elements on the call manager card.

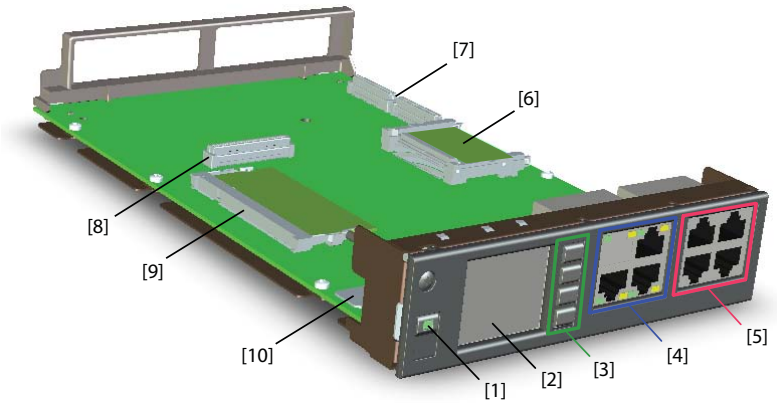


Fig. 9 Interfaces, display and control elements of the call manager card CPU1

Tab. 13 Interfaces, display and control elements of the call manager card CPU1

Interfaces, display and control elements	Number of entries	Position	Remarks
On/Off button with integrated status LED	1	[1]	
Colour display	1	[2]	
Navigation keys	4	[3]	
Ethernet interfaces 1Gbit/s (LAN)	3	[4]	RJ45 sockets
FXS terminal interfaces[1)]	4	[5]	RJ45 sockets
Slot for Flash card	1	[6]	Device ships already equipped
Slot for DSP modules	2	[7]	Can be fitted as an option, stackable
Slot for IP Media module	1	[8]	Can be fitted as an option
Slot for RAM module	1	[9]	Device ships already equipped
Slot for EIM card	1	[10]	Device ships already equipped

1) Multifunctional analogue interfaces

3. 2. 2 Power supplies

Internal power supply unit PSU2U

The Aastra 470 communication server is powered as standard directly with a mains cable. The voltage converter needs to be set to the correct position to match the mains power (230 VAC or 115 VAC) (see also "Powering the communication server", page 87). The internal power supply unit PSU2U powers all the system components and a limited number of connected terminals.

External auxiliary power supply APS2

The external auxiliary power supply APS2 is used for the following purposes:

- Increasing the supply power available. This is required only for systems which are to operate a large number of terminals without their own power supply.
- As a redundancy for the internal power supply unit PSU2U. If either the internal or the external power supply unit fails, the system switches over to the intact power supply, without interruption.

The external auxiliary power supply APS2 is also powered by the 115/230 V mains.

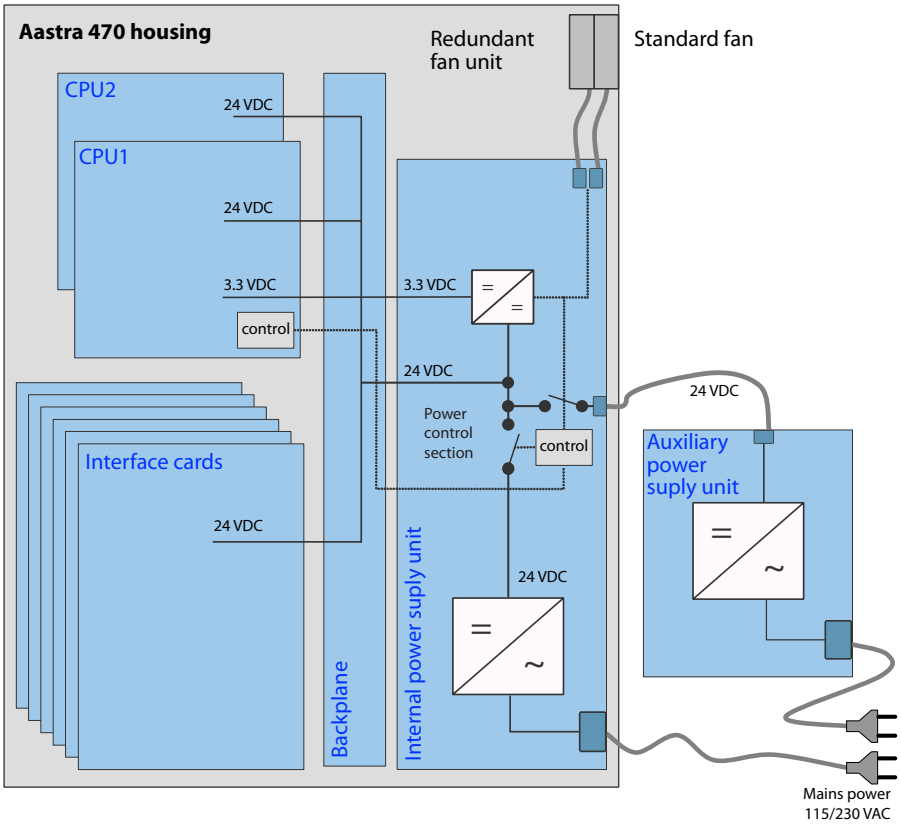


Fig. 10 Overview of the Aastra 470 power supply concept

Notes

- It is also possible to operate the communication server with the external power supply unit APS2 only In this case redundancy operation is of course no longer possible.
- To ensure that its operation is maintained even in the event of a mains outage, an external uninterruptible power supply (UPS) must be used.

See also:

For the available power outputs using the various types of power supply and for connecting the power supplies, see "Powering the communication server", page 87.

3. 2. 3 Ethernet concept

Aastra 470 provides three GBit Ethernet interfaces, which are routed to the front panel of the call manager card. They are used to connect to the customer's data network (LAN) and e. g. the IP connection with an SIP provider. The socket marked "WAN" currently has no function and remains covered.

Likewise the Ethernet interface on the front panel of the applications card is not used as the applications server is accessed via the WebAdmin configuration tool.

As the following schematic diagram shows, all the cards are internally connected with one another via Ethernet.

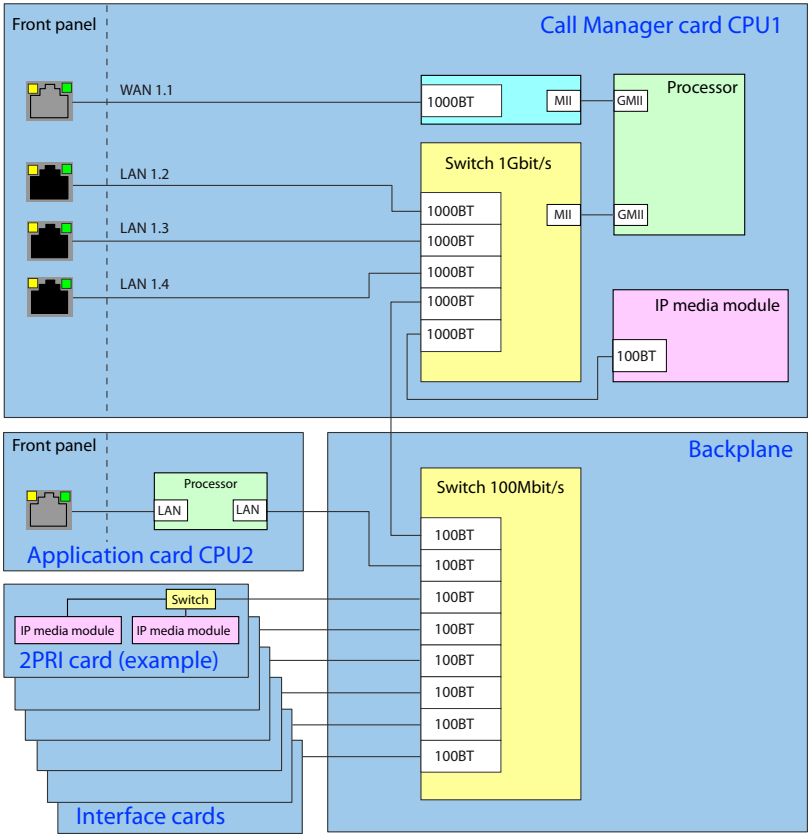


Fig. 11 Overview of the Aastra 470 Ethernet concept

3. 2. 4 DSP Resources

DSP resources are used for complex signal processing functions. (DSP stands for Digital Signal Processor). They provide functions for conference circuits, DTMF sender and receiver, compression of voice data, etc. Two DSP chips are permanently fitted to the call manager card.

A DSP chip on the call manager card is allocated to fixed functions, which can be used without licences (see Tab. 14).

The functions of the second DSP chip can be selected to suit requirements. The functions are partly subject to licence (see Tab. 18).

The basic resources of the communications server can be expanded by fitting DSP modules (see "DSP module", page 42) and IP media modules (see "IP media modules", page 48). The functions of the DSP chips on the DSP modules can also be configured.

Fixed DSP functions on the call manager card

The table below provides an overview of fixed DSP functions on the call manager card. Except for the Enterprise Voice Mail channels no licences or additional hardware are required to be able to use the functions.

Tab. 14 System modules on the call manager card

Max. number of simultaneous ...	Number of entries
Circuits for the functions three-party conference and six-party conference	10
Circuits for the features intrusion and silent intrusion	10
Circuits for the Call Waiting function	6
DTMF sender	9
DTMF receiver	16
Dialling tone receiver	2
Busy tone receiver	5
FSK receiver for CLIP detection on analogue network interfaces	2
Audio channels for basic voice mail (G.711)[1)]	2
Audio channels for Enterprise voice mail (G.711)[2)]	8

1) Can be used without licence subject to the following restrictions: Voice memory capacity approx. 20 minutes, no e-mail notification in the event of new voice messages. With a licence, the basic voice mail can be expanded with the Auto Attendant function.

2) Licences required

System modules on the call manager card

A DSP chip on the call manager card provides selectable functions. A description of the individual functions can be found as of page 43.

The functions are specified in the *DSP configuration* using the AMS Configuration Manager. In Tab. 18 all the possible combinations are listed, with the maximum number of voice channels. For this the DSP chip on the Call Manager card has to be loaded with different firmware. Additional functions require the use of one or more DSP modules. Some of these functions are subject to a licence.

3. 3 Expansion with cards and modules

An Aastra 470 basic system can be individually expanded using interface cards, system modules and an application card. The number and position of the available slots are described in the chapter "Interfaces, display and control elements", page 36.

3. 3. 1 System modules and system cards

With system modules a distinction is made between modules expandable as an option (DSP modules, IP media modules, Call charge modules) and mandatory modules (RAM module). The system cards (Flash card, EIM card) are always required. This chapter describes only the system modules that can be expanded as an option. They expand the resources of the communications server, which means the system can be expanded step by step in line with requirements.

3. 3. 1. 1 DSP module

Processor-intensive system functions require DSP resources. The communication server's DSP capacity increases through the use of DSP modules.

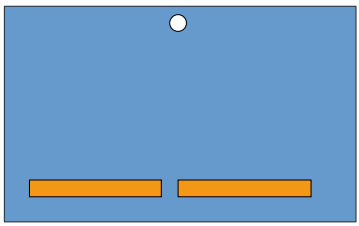


Fig. 12 Design of the DSP module

DSP modules are stacked on the call manager card and do not take up any slots for interface cards (see "Fitting DSP modules", page 93). The different types of modules can be used as a mix.

Tab. 15 DSP modules

Type	Number of DSP chips per module	Max. number of modules per system
SM-DSPX1	1	2
SM-DSPX2	2	
SM-DSP1[1)]	1	
SM-DSP2[1)]	2	

1) Although no longer available, the module is still supported.

Compared with DSP modules, modules with the designation DSPX are fitted with more powerful DSP chips. They are used to transmit VoIP data among others using the SRTP protocol (Secure VoIP).

Allocatable functions

One or more functions can be allocated to the individual DSP chips on the DSP modules. For this the DSP chips have to be loaded with different firmware. The DSP resources can be used for DECT telephony, Voice-over-IP, Voice Mail, hands-free operation, integrated mobile phones or fax transmissions. This means that for each DSP chip a specific number of voice channels is available for the corresponding functions. Some of these functions are subject to a licence (see also "Licences", page 59).

- *DECT*
  Operation of a DECT system on DSI interfaces with cordless terminals. In the case of connections between DECT and non-DECT endpoints the voice data has to be converted. This process requires DSP capacity. DECT channels can be used without a licence.
- *VoIP*
  Connections between IP and non-IP endpoints are made via an IP media gateway. This is carry out by the integrated standard media switch that switches VoIP channels for call connections in the IP network. The Standard Media Switch uses DSP resources for the real-time processing of the call data. VoIP channels are always required between IP and non-IP endpoints, e. g. for internal connections between an SIP/IP phone and a digital system phone or e. g. for an external user who is routed to the internal Voice Mail System via an SIP network interface. In an AIN VoIP channels are also used for call connections between the nodes (see Fig. 13 for an overview). The number of configurable VoIP channels depends on

both the type of DSP chip (see "Configuration of DSP chips", page 47) and the configured mode (see "Standard Media Switch modes of operation", page 46).

Note
the IP media gateway function can also be provided with IP media modules. The necessary DSP resources are located on the IP media modules themselves. Standard media switch and IP media switch are independent of each other and can be used as a mix (see "IP media modules", page 48).

- *FoIP*
  Reliable real-time fax transmissions via an IP network using the T.38 fax protocol (ITU-T). FoIP channels can be used without a licence.
- *Audio*
  These voice channels are used to play back and record audio data. Each voice channel is also assigned a DTMF receiver to allow user inputs during playback. This requires licences and DSP resources. The voice channels can be used for voice mail, Auto Attendant or call recording. The allocation is configurable (see "Reserving audio channels", page 46). The number of configurable voice channels depends on the type of DSP chip (see "Configuration of DSP chips", page 47).

  Note
  With the Aastra 470 communications server G.711 voice channels are always used for voice mail, Auto Attendant and call recording. The *Voice mail mode* parameter cannot therefore be altered for this system.
- *GSM*
  Enhanced functionality is achieved for integrated mobile phones by providing special DTMF receivers during the call connection. Suffix dialling functions (such as enquiry calls or setting up a conference with function codes) can be carried out as a result. The number of GSM channels – and therefore the number of DTMF receivers – depends on the number of users with integrated mobile phones who want to use this functionality simultaneously. One *Mobile Phone Extension* licence is required for each integrated mobile phone.
- *FXO*
  The basic resources (fixed DSP functions on the call manager card) cover 16 FXO interfaces. For system configurations with more than 16 FXO interfaces this setting provides additional dialling tone and busy tone receivers.
  Note: The values of the user-definable FXO channels corresponds to the number of FXO interfaces, not the number of additional dialling tone and busy tone receivers.

Use of VoIP channels

VoIP channels are always required between IP and non-IP endpoints. They are freely available, i. e. they are always used wherever they happen to be needed. The figure below provides an overview of the cases where VoIP channels are needed and how many.

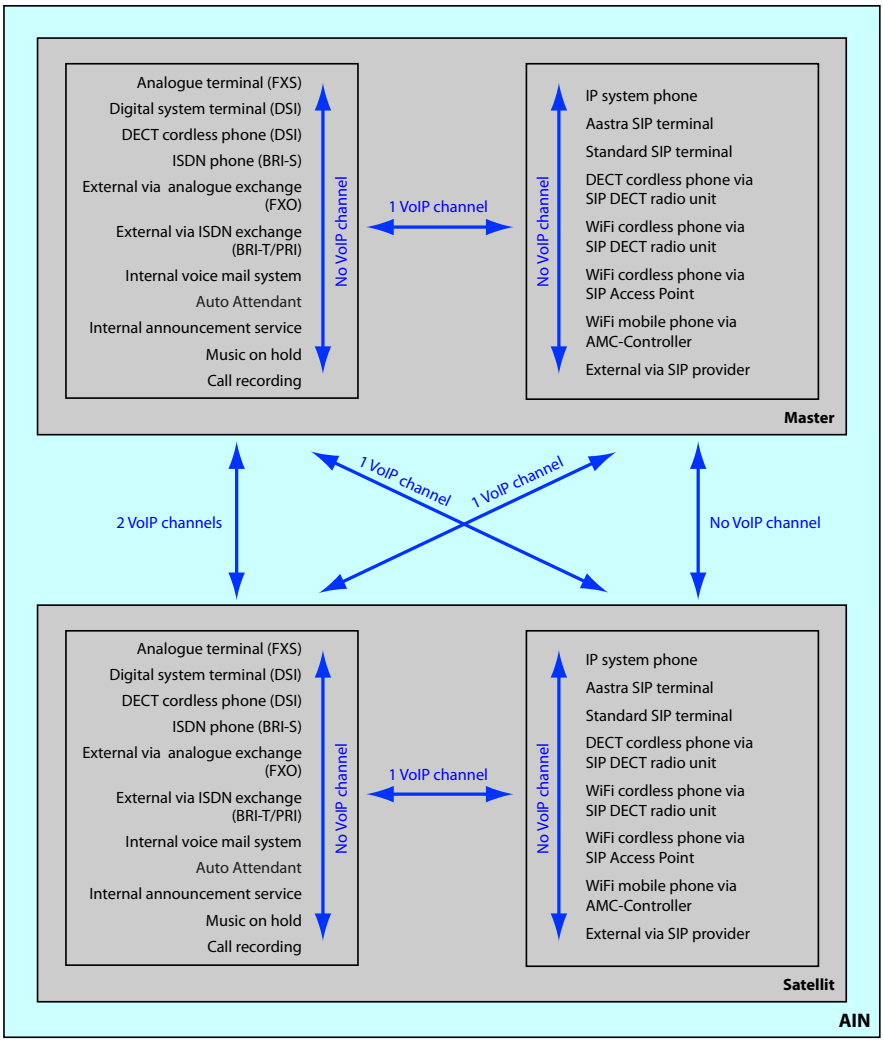


Fig. 13 Overview of the use of VoIP channels

Standard Media Switch modes of operation

The standard media switch mode of operation is set in the AMS Configuration Manager using the *VoIP mode* parameter. The configured mode is always valid for the entire node.

Tab. 16 Standard Media Switch modes of operation

VoIP mode	Explanation	Licences
No VoIP	No VoIP channels can be configured.	
G.711	Although more voice channels are available per DSP in mode *G.711* than in hybrid mode, the volume of voice data is greater and requires a greater bandwidth.	Two VoIP channels per system can be used without a licence. One *VoIP Channels for Standard Media Switch* licence is required for each additional VoIP channel.
G.711/G.729	The VoIP hybrid mode *G.711/G.729* handles both G.711 and G.729 for coding voice data.	One *VoIP Channels for Standard Media Switch* licence is required for each VoIP channel.
Secure G.711	Same as *G.711* but with a more secure data transmission using the SRTP protocol.	One *VoIP Channels for Standard Media Switch* licence is required for each VoIP channel. The *Secure VoIP* licence valid right across the system is also required.
Secure G.711/G.729	Same as *G.711/G.729* but with a more secure data transmission using the SRTP protocol.	One *VoIP Channels for Standard Media Switch* licence is required for each VoIP channel. The *Secure VoIP* licence valid right across the system is also required.

Reserving audio channels

The allocation of audio channels between voice mail, Auto Attendant and call recording is set under *Reservation audio channels* in the AMS Configuration Manager. An audio channel for Auto Attendant is always used in cases where an incoming call results in greetings being played back from mailboxes which have been assigned an Auto Attendant profile. In all other cases one audio channel is used for voice mail in connection with the voice mail system. Audio channels for call recording are used exclusively for the manual or automatic recording of phone calls.

Tab. 17 Reserving audio channels

Parameter	Explanation
Available audio channels	Maximum available audio channels on this node. This value depends on the DSP configuration under CM_2.1.3.
Reserved for voice mail	Number of audio channels on this node that can be used exclusively for voice mail.
Reserved for Auto Attendant:	Number of audio channels on this node that can be used exclusively for Auto Attendant.
Reserved for call recording	Number of audio channels on this node that can be used exclusively for call recording.
Not reserved/sharable	Number of audio channels on this node that can be used for voice mail, Auto Attendant or call recording, depending on where they happen to be required.

No voice channels are reserved after a first start and they can be used for voice mail, Auto Attendant or call recording.

Configuration of DSP chips

The assignable functions for each DSP chip are specified in the AMS Configuration Manager in the *DSP configuration*. The DSP modules provide additional functions as indicated in the following table. All the possible combinations are listed, with the maximum number of voice channels.

Tab. 18 Max. number of voice channels per DSP chip on CPU1, SM-DSPX1 or SM-DSPX2

DECT	*VoIP*[1)]	*FoIP*	*Audio*[1)]	*GSM*[1)]	*FXO*	Remarks
10						
8			12			
8				5		
4			32	5		
4			24	10		
4			12	20		
2	4			10		
	5...8					Depends on the parameter *VoIP mode:* • *G.711*: 8 channels • *Secure G.711*: 7 channels • *G.711/G.729*: 6 channels • *Secure G.711/G.729*: 5 channels
	4		18	10		Only for *VoIP mode* = *G.711* or *G.711/G.729*
	3	3				
			46			
					64	

1) Licence(s) required (see also "Licences", page 59).

Tab. 19 Max. number of voice channels per DSP chip on SM-DSP1[1)] or SM-DSP2[1)]

DECT	*Audio*[1)]	*GSM*[1)]	Remarks
10			
8		10	
6	18	10	
	46		

1) Licence(s) required (see also "Licences", page 59).

1) Although no longer available, the module is still supported.

Notes

- With the exception of the IP media modules the configured *VoIP mode* applies to all the DSP chips of a node. If the *VoIP mode* is set to *G.711*, two G.711 VoIP channels per system can be used without a licence. The G.711 VoIP channels of the configurable DSP chip on processor card CPU1 can be combined with G.711 VoIP channels of DSP modules.
- If audio channels are configured and licensed, the two basic audio channels that can be used without a licence are redundant (see Tab. 14).
- Audio channels and FoIP channels can only be configured on one DSP chip per node.
- The system has to be restarted for the configuration changes of the DSP to take effect.
- After a first start all the DSP chips are configured on *DECT*.

3. 3. 1. 2 IP media modules

IP media modules can be used for systems with high call switching requirements in the IP network. Depending on the module type a different number of VoIP and FoIP channels are available, provided by the IP media modules as required (see Tab. 21).

Note

The use of the IP media switch does not depend on the mode of operation of the standard media switch and the configuration of the DSP chips that are used by the standard media switch.

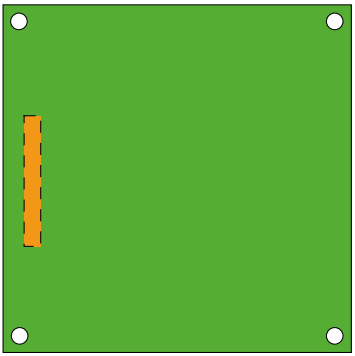


Fig. 14 Design of the IP media modules

IP media modules can be fitted both to the processor card CPU1 (see Fig. 9) and to the 1PRI and 2PRI trunk cards (see Fig. 16). The modules are **not** stackable.

Tab. 20 IP media module

Type	Number of modules per CPU1 processor card	Number of modules per 1PRI trunk card	Number of modules per 2PRI trunk card	Max. number of modules per system
EIP1-8	1	1	2	5
EIP1-32				

The number of VoIP channels per IP media module depends on both the type of module and the use of voice channels:

Tab. 21 Max. number of voice channels per IP media module

Type	G.711 only, Secure G.711	G.711/G.729, Secure G.711/G.729	FoIP (T.38)
EIP1-8	32	8	8
EIP1-32	64	28	28

3. 3. 1. 3 Call charge modules

Optional call charge modules are available for detecting charge pulses on analogue network interfaces.

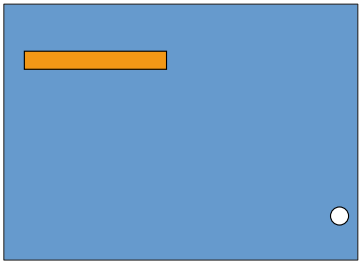


Fig. 15 Design of call charge modules

Call charge modules are fitted to FXO cards. The call charge modules available match the number of ports on the FXO cards. Only 1 call charge module can be fitted to each FXO card.

Tab. 22 Call charge modules

Type	Number of modules per 4FXO trunk card	Number of modules per 8FXO trunk card	Number of modules per 16FXO trunk card
4TAX[1)]	1	–	–
8TAX[1)]	–	1	–
16TAX[1)]	–	–	1

[1)] The availability of the call charge modules depends on the sales channel.

3. 3. 2 Interface cards

Interface cards are fitted from the front into one of a total of 7 expansion slots (see "Fitting interface cards", page 91). Interface cards can be assigned to two categories:

- Trunk cards
  These cards provide interfaces for connection to public dial-up networks or for networking systems to create a private telephony network.
- Terminal cards
  These cards provide interfaces for connecting digital and analogue voice and data terminals.

On some BRI cards a part of the interfaces are configurable (BRI-S/T). This means that these cards cannot be clearly assigned to any particular category. They are listed both among the trunk cards and the terminal cards.

Up to 2 IP media modules can be fitted on PRI cards.

Each FXO card can be fitted with one call charge module.

The number of RJ45 sockets on the front depends on the type of interface card. On cards with 16 or more interfaces part or all of the RJ45 sockets are multiply assigned. They are fed to the fan-out-panel (FOP) using patch cables and then split to individually assigned RJ45 sockets (see "Fan-out panel FOP", page 133).

The splits can also be made elsewhere, e. g. using system cables available separately (see "Prefabricated system cable 4 x RJ45", page 98).

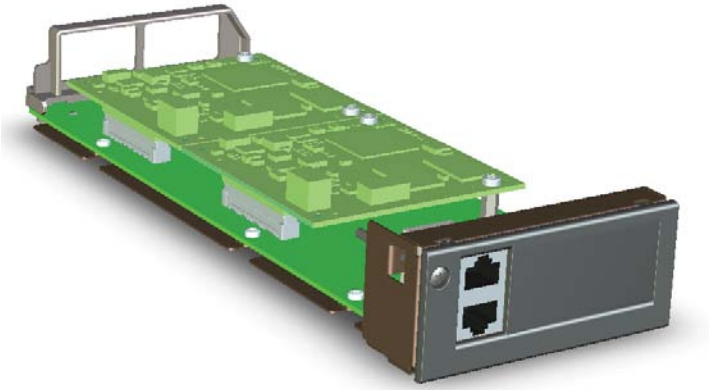


Fig. 16 Example of an interface card (2PRI with 2 IP media modules fitted)

3. 3. 2. 1 Trunk cards

The trunk cards contain interfaces for connection to the analogue public network (PSTN), the digital public network (ISDN) or for networking systems to create a private telephony network (PISN). The trunk cards can be used and operated on any slots for interface cards.

The trunk cards contain either FXO interfaces (FXO: Foreign Exchange Office), PRI interfaces (PRI: Primary Rate Interface) or BRI interfaces (BRI: Basic Rate Interface).

BRI cards contain both network interfaces (BRI-T) and terminal interfaces (BRI-S). On the BRI cards 4 interfaces can be individually configured to BRI-S or BRI-T.

Tab. 23 Trunk cards

Type	Network interfaces per card	Max. number of cards per system	Remarks
1PRI	1 × PRI	7[1)]	• Can be fitted with 1 IP media module • Contains 30 B channels • 10 B channels can be used licence-free
2PRI	2 × PRI	7[1)]	• Can be fitted with 2 IP media modules • Contains 2 × 30B channels • 2 ×10 B channels can be used licence-free
4BRI	4 × BRI-T	7[1)]	• All interfaces configurable to BRI-S
8BRI	8 × BRI-T	7[1)]	• Four fixed BRI-T interfaces • 4 BRI-T interfaces configurable to BRI-S
4FXO[2)]	4 × FXO	7[1)]	• 1 call charge module can be fitted for 4 ports
8FXO[2)]	8 × FXO	7[1)]	• 1 call charge module can be fitted for 8 ports
16FXO[2)]	16 × FXO	4	• 1 call charge module can be fitted for 16 ports

1) 1 fewer card if CPU2 application card is fitted

2) The availability of the FXO trunk cards depends on the sales channel.

3. 3. 2. 2 Terminal cards

Terminal cards are used for connecting digital and analogue voice and data terminals such as:

FXS cards are an exception. Their analogue interfaces are multifunctional. In addition they provide interfaces for controlling external devices and switching over internal switch groups. Depending on the terminal or function, the interfaces are configured individually and switched over internally accordingly (see "Multifunctional FXS interfaces", page 128).

DSI cards are used for connecting digital system terminals such as phones and radio units. 2 terminals can be connected to each DSI interface.

Terminals to ETSI standard are connected via BRI cards. The cards contain both terminal interfaces (BRI-S) and network interfaces (BRI-T). On the BRI cards 4 interfaces can be individually configured to BRI-S or BRI-T.

Tab. 24 Terminal cards

Type	Terminal interfaces per card	Max. number of cards per system	Remarks
4FXS	4 × FXS	7[1)]	• Interfaces individually configurable • 2 interfaces on each card (X.1 und X.2) are designed for long lines.
8FXS	8 × FXS	7[1)]	• Interfaces individually configurable • 2 interfaces on each card (X.1 und X.2) are designed for long lines.
16FXS	16 × FXS	7[1)]	• Interfaces individually configurable • 2 interfaces on each card (X.1 und X.2) are designed for long lines. **Note:** To prevent the system from overheating, no more than 50 FXS ports should be active simultaneously on each system.
32FXS	32 × FXS	7[1)]	• Interfaces individually configurable • 2 interfaces on each card (X.1 und X.2) are designed for long lines. **Note:** To prevent the system from overheating, no more than 30% of the FXS ports should be active simultaneously per 32FXS card and no more than 50 FXS ports per system.
8DSI	8 × DSI	7[1)]	
16DSI	16 × DSI	7[1)]	
32DSI	32 × DSI	7[1)]	
4BRI	4 × BRI-S	7[1)]	• All interfaces configurable to BRI-T
8BRI	4 × BRI-S	7[1)]	• Four fixed BRI-T interfaces • 4 BRI-S interfaces configurable to BRI-T

[1)] 1 fewer card if CPU2 application card is fitted

3. 3. 3 Application card CPU2

The application card CPU2 comprises a standard PC with hard disk. The applications card is connected with the call manager call via Ethernet and the backplane, which means that the Ethernet interface on the front panel is not required.

The Windows Server 2008 embedded operating system and the Aastra applications Open Interfaces Platform (OIP) and Telephony Web Portal (TWP) are preinstalled on the application card's standard PC.

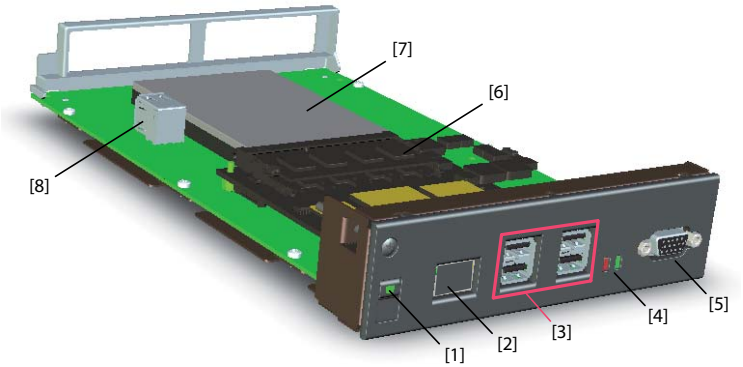


Fig. 17 Interfaces, display and control elements of the applications card CPU2

Tab. 25 Interfaces, display and control elements of the applications card CPU2

Interfaces, display and control elements	Number of entries	Position	Remarks
On/Off button with integrated status LED	1	[1]	
Ethernet internet 100Mbit/s	1	[2]	No provision for use at present
USB interfaces 2.0	4	[3]	For connecting the keyboard, mouse, etc.
Status LEDs	2	[4]	For indicating HDD access and USB supply overload
VGA video interface	1	[5]	For connecting the monitor
COM Express module with Intel Dual Core standard PC, 4GB RAM	1	[6]	Expandable RAM
250GB hard disk	1	[7]	
USB interfaces 2.0 for "software dongles"	2	[8]	One of the interfaces is taken up by the TWP application

The meaning of the status LEDs is explained in the chapter "Status LEDs on the applications server", page 204.

The maximum permissible current input at the USB interfaces varies:

Tab. 26 Max. admissible current input at USB interfaces

Front-side USB interfaces	Internal USB interfaces	Max. current input [mA]
top left / bottom left	bottom	100
top right / bottom right	top	500

Access to the applications server is normally via the WebAdmin configuration tool, which means the front-side interfaces of the applications card are not needed.

Note

For licensing reasons the front-side connections are to be used for maintenance purposes only. Installing user-specific applications is prohibited.

3. 4 System capacity

System capacities are defined on the one hand by the existing hardware with its expansion possibilities and on the other by the limits set in the software. The software limits can be partly expandable by licences.

Note:
The values in the following three tables relate to a communication server with an Aastra 470 Expansion expansion licence. Without this licence the system is limited to the first 36 users in the numbering plan, which means many values in the table are not valid.

3. 4. 1 System capacity

The number of slots, interface cards and system modules per communication server have already been mentioned in the previous chapters and are not listed separately in this chapter.

Tab. 27 General system capacity

Max. number...	Aastra 470	AIN with Aastra 470 as Master
Nodes in a transparent network (AIN)	–	41
Nodes with SIP networking	100	–
User	400[1)]	600
Terminals per user[2)]	16	16
Simultaneous connections		
• Without IP and without DECT (internal / external)	184	250
• IP – not IP (internal / external)	184	250
• IP – IP (interne)	250	250
• IP – IP via SIP access channels (external)	240	240
• DECT – not DECT (internal / external)	50	250
• DECT – DECT (internal)	50	250
Voice channels VoIP G.711 / G.729 (Standard Media Switch)[3)]	24 / 24	per node
Voice channels VoIP G.711 / G.729 (IP media switch)[4)]	250 / 140	250 / 250
Voice channels (call recording)	8	per node
Voice channels (Enterprise voice mail)	16	per node
Voice channels (sum of Enterprise voice mail and call recording)	16	per node
Voice channels (Auto Attendant)	46	per node
Voice channels (Enterprise Voicemail, Auto Attendant and call recording total)	46	per node
Voice channels FoIP, T.38 (standard media switch)	3	per node
Voice channels FoIP, T.38 (IP media switch)	140	per node
Trunk groups	290	290

Max. number...	Aastra 470	AIN with Aastra 470 as Master
Trunk groups in route	8	8
Network interfaces per trunk group	64	64
Routes	210	210
B Channel Groups	290	290
SIP Provider	10	10
SIP user account	500	500
Direct Dialling Plans	10	10
Total DDI numbers	4000	4000
Call Distribution Elements	4000	4000
User groups	99	99
Members per user group with global call distribution	16	16
Members per user group without global call distribution	400	600
Abbreviated dialling numbers + PISN users	4000	4000
Line keys per key telephone	39	39
Busy lamp fields for SIP system phones	50	50
Switch Groups	50	50
Positions per switch group	3	3
Hotline destinations	20	20
Emergency number destinations	50	50
Emergency numbers	10	10
Allocations of external call numbers to internal call numbers	1000	1500
External digit barring	16	16
Internal digit barring	16	16
Predefined text messages	16	16
Announcement / message groups	16	16
User per announcement / message group	16	16
Data service tables	32	32
User accounts for User Access Control	25	25
Authorization profiles for user accounts	25	25
Log entries per user account	20	20
First-party CTI users via LAN	32	32
Third-party CTI interfaces	1	1
Third-Party CTI Interface (Basic, Standard)	400	600
Groups, Agents (Call Centre)	150	150
Mailboxes with Basic or Enterprise voice mail system	400	600
Greetings per mailbox	3	3
Profiles per mailbox for Auto Attendant	3	3
Call data memory internal (number of records)	1000	1000
Phonebook entries	12000	12000
Call list entries	16000	16000
Busy lamp field buttons on Aastra SIP phones in total	1000	1000

Max. number...	Aastra 470	AIN with Aastra 470 as Master
Busy lamp field buttons per Aastra SIP phone	50	50
Same users on busy lamp field buttons on Aastra SIP phones	25	25
Freely configurable keys	5000	5000
Expansion key modules on DSI terminals	400	400
Expansion key modules on IP system phones	400	400
Expansion key modules Aastra M670i, Aastra M675i	400	400
Alpha keyboard (AKB)	400	400

1) Without expansion licence limited to 36 users

2) only 1 operator console each, DECT cordless phone, Aastra 2380ip

3) In the Secure VoIP modes the maximum values cannot be achieved with the selection i the DSP settings: *Secure G.711* VoIP mode: 3 × 7 = 21 channels, VoIP mode *Secure G.711/G.729*: 4 × 5 = 20 channels

4) Applies also to Secure VoIP modes

Tab. 28 System capacity of the CPU2 application card

Max. number...	CPU2 in Aastra 470
Supervised users in TWP	130
TWP clients (Caller + Alerter + Browser)	50
Audio conference users	10
Video conference users	10
OfficeSuite users	200[1)]
Aastra 1560/Office 1560 users	5
Constant load (calls per hour)	1000

1) Of which max. 50 call centre agents

3. 4. 2 Terminals

Tab. 29 Maximum number of terminals per system and interface

Interface	Terminal type	Terminal	per Aastra 470	per AIN with Aastra 470 as Master	per interface
Miscellaneous	Terminals (including virtual terminals and integrated mobile phones)		600	600	
	Terminals (excluding virtual terminals and integrated mobile phones)		400	600	
DSI-AD2	Terminals on DSI-AD2 interfaces (total)		400	600	
	Digital system phones	Aastra 5360 Aastra 5361 Aastra 5370 Aastra 5380 Office 10 Office 25 Office 35 Office 45	400	600	2
	Operator consoles / operator applications	Aastra 5380 Aastra 1560 Office 45 Office 1560	32	32	2
	Cordless System	SB-4+ radio unit	224	255	1
	Cordless System	SB-8 / SB-8ANT radio units	112	255	[1]
DSI-DASL	Digital system phones	Dialog 4220 Dialog 4222 Dialog 4223	224	600	1
DECT	Cordless phones	Aastra 610d Aastra 620d Aastra 630d Office 135 Office 160 GAP terminals	400	600	
LAN	Terminals on LAN interfaces (total)		400	600	
	IP terminals	Aastra 2380ip Aastra 5360ip Aastra 5361ip Aastra 5370ip Aastra 5380ip	400	600	
	IP operator consoles / IP operator applications	Aastra 5380ip Aastra 1560ip Office 1560IP	32	32	

Interface	Terminal type	Terminal	per Aastra 470	per AIN with Aastra 470 as Master	per interface
	AastraSIP terminals	Aastra 6730i Aastra 6731i Aastra 6735i[2)] Aastra 6737i[2)] Aastra 6753i Aastra 6755i Aastra 6757i Aastra 6739i Aastra 8000i[2)]	400	400	
	Standard SIP terminals		400	400	
-	Virtual terminals		400	600	
	Integrated mobile phones (with or without AMC)		255	255	
	Integrated mobile phones with AMCC30/AMCC125		30/125	30/125	
BRI-S	Terminals on DSI-S interfaces (total)		224	512	8[3)]
	Terminals as per ETSI standard • ISDN terminals • ISDN PC cards • ISDN LAN routers • ISDN Terminal Adapters		224	512	
FXS	Terminals on FXS interfaces (total)		228	600	1
	Analogue, nationally approved terminals • Pulse dialling (PUL) • Frequency dialling (DTMF) • Radio units for cordless phones • Door intercoms with DTMF control functions • Group 3 fax machines[4)] • Answering machines • Modems		228	600	
	External audio equipment with line output		1	1 per node	
	External equipment can be switched via control outputs		228	600	
	External switches for controlling internal switch groups via control inputs		228	600	
	General Bell		1	1 per node	

1) Operation on 2 DSI interfaces in each case

2) The release for this product is independent from R1.2 and will be made later.

3) Maximum of 2 simultaneous call connections.

4) Transmission with the T.38 protocol is recommended for Fax over IP. The corresponding DSP resources need to be allocated.

3. 4. 3 Terminal and network interfaces

Tab. 30 Terminal and network interfaces

Max. number...	Aastra 470	AIN with Aastra 470 as Master
Ethernet interfaces	3	per node
Terminal interfaces, total (DSI, FXS, BRI-S)	228	600
DSI terminal interfaces	224	600
Analogue terminal interfaces FXS	228	600
BRI-S terminal interfaces	28	64
Network interfaces, total (BRI-T, PRI, BRI-Sexternal)	56	74
Analogue network interfaces FXO	64	64
Basic rate interfaces BRI-T	56	64
Basic rate interfaces BRI-Sexternal	28	64
Primary rate interfaces PRI[1)]	14	32
SIP access	10	10
SIP access channels	240[2)]	240[2)]

1) 30 B channels per PRI network interface, of which 10 B channels each can be used without licence.

2) Licences required

3. 4. 4 Licences

Use of the call manager software requires a licence. Additional licences are required in order to use a number of enhanced functions and protocols, to enable voice channels or to operate certain terminals. The Aastra Plan application automatically plans the necessary licences, which are then enabled on the communication server using a licence code.

The licence code (LIC) contains all the enabled licences. When you purchase a new licence from your authorized dealer, you obtain a new licence code in return.

You enter it under CM_1.2_*Licence code* in AMS and save it in the communication server.

Note:
Licence codes cannot be transferred to another communication server.

Available licences:

- *Software Subscription*
  Updating to a new software release requires a licence. The Software Subscription licence entitles you to upgrade the communication server to a new software level for a specific period. It is the prerequisite for being able to purchase

an update licence (*Software Release* licence) for a particular software version. Without a valid *Software Release* licence you can update the communication server to a new software level, but after four hours of operating time it will switch over to the restricted operating mode 8see "Restricted operating mode", page 70). The communication server will switch back to normal operation as soon as you enter a licence code that comprises the *Software Release* licence. It is not necessary to restart the communication server.

Note:
The purchase of a new communication server also includes the *Software Subscription* licence. The licence has to be activated with the aid of the EID via the Aastra 400 activation portal on the extranet (partner login required). The licence code issued as a result contains the appropriate *Software Release* licence (and any other licences you may have acquired).

Aastra Intelligent Net
In an AIN a valid *Software Release* licence is required at all the nodes in order to update to a new software release for the communication server.

- *Aastra 470 Expansion*
  This licence cancels out the restriction to the first 36 users in the numbering plan of the Aastra 470 communication server. The maximum system capacities can be found in Tab. 27, Tab. 29 and Tab. 30.

  Aastra Intelligent Net
  In an AIN with an Aastra 470 as Master and more than 36 users, an Aastra 470 Expansion licence is required only for the Master. The Aastra 470 satellites do not need a licence, even if they have more than 36 users (except of course for offline operations lasting more than 2 hours).

- *QSIG Networking Channels*
  These licences are used to implement a private leased-line network with QSIG by enabling a specific number of simultaneously outgoing QSIG channels. Two licence levels are available (see Tab. 31).

- *CTI First Party via LAN*
  This basic licence enables the CTI basic functions via Ethernet interface (e.g. for using a PC dial help) for a specific number of users (see "System capacity", page 54). It cannot be combined with CTI third-party licences.

- *ATAS Interface / ATASpro Interface*
  With ATAS licences external alarm and messaging sources can be connected via

the Ethernet interface. The licences also offer additional possibilities compared with ATPCx (e.g. displaying the Fox menu on system phones and triggering an alarm with the Redkey).
The ATASpro Interface licence can also be used to determine the position of users of Aastra DECT cordless phones, which can be visualized with the appropriate applications.

Note:
If you use the Open Interfaces Platform, OIP takes the licences from the communication server. So always acquire these licences for the communication server so you can use ATAS even without OIP.

- *Advanced Messaging*
  Enables the SMPP protocol to be used for integrating an SMS server and 9d cordless phones to be logged on as system phones (Ascom Wireless Solutions products). User-friendly messaging systems can then be implemented.
- *SMPP*
  This licence allows the use of the SMPP protocol. It is visible only in AMS (not on the licence server). The licence cannot be purchased individually but is part of the *Advanced Messaging* licence.
- *Basic Aastra Intelligent Net*
  This licence allows an Aastra Intelligent Net to be set up and operated with one Master and one satellite.
- *Aastra Intelligent Net Satellites*
  An upgrade licence for each additional satellite is required to integrate more than one satellite in an Aastra Intelligent Net. An existing basic AIN licence has to be in place already.
- *Aastra SIP Terminals*
  To operate Aastra SIP terminals of the Aastra 6700i series, for Aastra Blustar™ 8000i Media Phone, for cordless terminals logged on via Aastra SIP DECT or Aastra SIP WLAN base stations, and for SIP users for the TWP application (Telephony Web Portal), one licence is required per terminal or user. The licences are needed when registering the terminals or the user on the system. Use is not possible if *SIP Terminals* licences are missing.
- *Aastra Video Terminals*
  In addition to the *Aastra SIP Terminals* licence you need to purchase also an *Aastra Video Terminals* licence in order to use the video functionality of an Aastra Blustar™ 8000i Media Phone. Use is not possible if *Video Terminals* licences are missing.

- *SIP Terminals*
  One licence is required per terminal to operate standard SIP terminals. The licences are needed when registering the terminals on the system and can be used even if *Aastra SIP Terminals* icences are missing.
- *Video Terminals*
  To be able to use the video functionality of a standard SIP video terminal you need to acquire a Video Terminals licence in addition to a *SIP Terminals* licence. The licences can also be used if the *Aastra Video Terminals* licences are missing.
- *SIP Access Channels*
  The connection of the system to a SIP service provider or the networking of the systems via SIP requires one licence per channel.

Aastra Intelligent Net
In an AIN all the SIP licences are always acquired for the Master. The number of licences determines the maximum number of simultaneously active voice channels, regardless of the nodes on which they are currently being used. Requirement: The DSP resources on each node must be available and allocated accordingly.

- *VoIP Channels for Standard Media Switch*
  This licence enables the conversion of voice channels for VoIP - non VoIP connections and is used for IP terminals, SIP terminals, SIP access channels or to operate an Aastra Intelligent Net. High voice data compression is possible with the standard VoIP channels (G.729). One voice channel is activated with each licence.

Note:
Theoretically there are no VoIP channel licences in a pure VoIP environment (only IP/SIP phones on the system and connection to the public network via an SIP provider). However, as soon as voice mail functions, the announcement service or music on hold is used, VoIP channel licences are required as the use of these functions entails a conversion of the voice data.

Aastra Intelligent Net
In an AIN the licence can also be used for the connections between the nodes. Two VoIP channel licences are required for each node connection. The licences are always acquired for the Master. The number of licences determines the maximum number of simultaneously active conversions, regardless of the nodes on which they are currently being used. Requirement: The DSP resources on each node must be available and allocated accordingly.

- *Mobile Phone Extension*
  With this licence it is possible to integrate mobile phones into the communication system. One licence has to be purchased for each mobile phone.

  Note:
  The *AMC User* licence is also required on the mobile phone to enable the easy integration of mobile phones with Aastra Mobile Client. This licence can be purchased on the AMC licensing portal.

- *AMC Extension*
  With this licence mobile phones can be integrated into the communication system together with an Aastra Mobile Client Controller. The AMC Controller allows mobile users to move back and forth between the internal WLAN coverage and the mobile radio network without the call being interrupted.

  Note:
  This integration also requires *AMC User* and *AMC Plus Pack* licences on the mobile phone. These licences can be purchased on the AMC licensing portal.

- *Aastra 5300ip Phones*
  One licence per terminal is required to operate the IP system phones Aastra 5360ip, Aastra 5361ip, Aastra 5370ip and Aastra 5380ip. The licences are needed to register the terminals on the system. If the required licences are missing, the relevant event message is output on the system.

- *Aastra 2380ip Softphones*
  One licence per terminal is required to operate the IP softphones Aastra 2380ip. The licences are needed to register the terminals on the system.

- *Aastra Dialog 4200 Phones*
  One licence per phone is required to operate Dialog 4220, Dialog 4222 and Dialog 4223 digital phones. The licences are needed to register the phones on the system.

- *Analogue Modem*
  This licence allows remote maintenance of an Aastra 415/430 using an analogue modem. For this the *Modem* function must be allocated to the mainboard DSP. Transmitting event messages via an analogue modem is also possible.

  Aastra Intelligent Net
  In an AIN the licence is always acquired on the Master. The licence allows the remote maintenance of the AIN via any Aastra 415/430 node.
  Note: The Master can also be an Aastra 470.

- *B-Channels on PRI Cards*
  In addition to the 10 B channels that can be used without a licence on each PRI interface card, one extra B channel is enabled per licence. A maximum of 30 B channels are possible per PRI interface. Unlike the B channels that can be used without a licence and which are restricted to the relevant PRI interface card, the licensed B channels can be used on any PRI interface card.

Aastra Intelligent Net
In an AIN the licence is always acquired on the Master. For each licence an additional B channel is available on a PRI interface card of any node, depending on where the B channel is currently being used.

- *TWP Connection*
  This licence is used to connect to the Telephony Web Portal (TWP). While it is visible in AMS and on the licence server, it cannot be deleted; instead it is automatically enabled whenever user-based TWP licences are available.
- *Enterprise Voice Mail*
  If the functionality of the basic voice mail system is insufficient, the voice mail system can be expanded. This licence provides two audio channels for recording or playing back audio data for voice mail. Auto Attendant or call recording. The licence also increases voice memory capacity and enables email notification whenever new voice messages are received.

Notes
- Additional audio channels require additional *Audio Record & Play Channels* licences. A licence is required to use the *Auto Attendant* function.
- In a VoIP environment VoIP channel licences are also required for converting the voice data when using the internal voice mail system.

- *Audio Record & Play Channels*
  This licence enables an additional audio channel for recording or playing back audio data for voice mail, Auto Attendant or call recording. This licence can only be used in conjunction with the *Enterprise Voice Mail* licence.

Aastra Intelligent Net
In an AIN the Enterprise Voice Mail and Audio Record & Play Channels licences are all acquired for the Master. The number of Audio Record & Play Channels licences determines the maximum number of simultaneously active audio channels, regardless of the nodes on which they are currently being used. Requirement: The DSP resources on each node must be available and allocated accordingly.

- *Auto Attendant*
  This licence enables the use of the Auto Attendant function and is independent of the Enterprise Voice Maillicence. It means it can also be used in conjunction with basic voice mail.

  Note
  In a VoIP environment VoIP channel licences are also required for converting the voice data when using the Auto Attendant.

- *Silent Intrusion*
  This licence is needed for the *Silent intrusion* feature, which is similar to the *Intrusion* feature. The difference is that the user intruded upon receives neither a visual nor an acoustic signal of the intrusion. The feature is used mainly in call centres. One licence is required per system.

- *Secure VoIP*
  This licence allows encrypted VoIP connections with the aid of SRTP (Secure Real-Time Transport Protocol) and TLS (Transport Layer Security).

- *CSTA Sessions*
  This licence allows third-party applications to monitor/check a terminal on the communication server using the CSTA protocol. If a terminal is monitored or checked by several applications or instances, one licence is required for each monitoring/check.

- *Hospitality Manager*
  This licence allows you to use the Aastra Hospitality Manager. The Aastra Hospitality Manager is a web-based application for receptionists in the hospitality sector. One licence is required per system.

- *Hospitality PMS Interface* and *Hospitality PMS Rooms*
  The *Hospitality PMS Interface* licence is used to connect the communication server to a hotel management system using the FIAS protocol. In addition one *Hospitality PMS Rooms* licence is required per room.

Tab. 31 Overview of licences

Licence	Licensed attributes	Without licence	With licence	Licences for networking
Software Subscription	Allows the communication server to be upgraded to a new software level.	unavailable	Enabled for a specific period of time from the date of purchase	per node
Software Release	Allows a particular software release to be operated	restricted[1)]	unrestricted	per node
Aastra 470 Expansion	Number of users on the communication server	36	Limited only by the system capacity	In the AIN, only on the Master; otherwise per node.
QSIG Networking Channels	QSIG channels	0	per licence 4 or n QSIG channels (n limited by the system capacity)	per node
CTI First Party via LAN	First-party CTI clients with basic functions on Ethernet interface	0	enabled for a specific number of users (see "System capacity", page 54)	per node
ATAS Interface	Use of the ATAS interface	unavailable	enabled	per node
ATASpro Interface	Use of the ATASpro interface	unavailable	enabled	per node
Advanced Messaging	SMPP protocol for integration of an SMS server and registration of 9d cordless phones as system phones. (Includes licence SMPP)	unavailable	enabled	per node
SMPP[2)]	SMPP protocol	unavailable	enabled	per node
Basic Aastra Intelligent Net	Operation of an AIN	unavailable	AIN with master and one satellite	Only on the Master
Aastra Intelligent Net Satellites[3)]	Additional satellite in an AIN	0	1 additional satellite per licence	Only on the Master
Aastra SIP Terminals	Number of registered Aastra SIP terminals in AMS	0	1, 20 or 50 additional Aastra SIP terminals per licence	In the AIN, only on the Master; otherwise per node.
Aastra Video Terminals	Use of the video functionality of an Aastra SIP terminal	0	Additional licence for *Aastra SIP Terminals*. 1, 20 or 50 additional Aastra SIP terminals with video functionality per licence.	In the AIN, only on the Master; otherwise per node.

Licence	Licensed attributes	Without licence	With licence	Licences for networking
SIP Terminals	Number of registered standard SIP terminals in AMS	0	1 additional standard SIP terminal per licence	In the AIN, only on the Master; otherwise per node.
Video Terminals	Use of the video functionality of a standard SIP terminal	0	Additional licence for *SIP Terminals*. 1 additional standard SIP terminal with video functionality per licence.	In the AIN, only on the Master; otherwise per node.
SIP Access Channels	Simultaneously usable channels to an SIP service provider	0	Per licence 1 additional SIP access channel	In the AIN, only on the Master; otherwise per node.
VoIP Channels for Standard Media Switch	Conversion of voice channels for VoIP - non VoIP connections	0	Per licence 1 additional VoIP channel	In the AIN, only on the Master; otherwise per node.
Mobile Phone Extensions	Number of mobile phones opened in AMS	0	1 additional mobile phone per licence	In the AIN, only on the Master; otherwise per node.
AMC Extensions	Number of mobile phones opened in AMS with Aastra Mobile Client	0	1 additional mobile phone per licence and the possibility of activating an Aastra Mobile Client	In the AIN, only on the Master; otherwise per node.
Aastra Dialog 4200 Phones	Number of registered Dialog 4220, Dialog 4222 and Dialog 4223 digital phones	0	One additional phone per licence	In the AIN, only on the Master; otherwise per node.
Aastra 5300ip Phones	Number of registered Aastra 5360ip, Aastra 5361ip, Aastra 5370ip and Aastra 5380ip IP system phones	0	1, 20 or 50 additional IP system phones per licence	In the AIN, only on the Master; otherwise per node.
Aastra 2380ip Softphones	Number of registered Aastra 2380ip IP softphones	0	per licence 1 additional IP softphone	In the AIN, only on the Master; otherwise per node.
Analogue Modem	Use of the modem functionality on an Aastra 415/430.	unavailable	enabled	In the AIN, only on the Master; otherwise per node.

Licence	Licensed attributes	Without licence	With licence	Licences for networking
B-Channels on PRI Cards	B channels that can be used simultaneously on the PRI interface card of an Aastra 415, Aastra 430 or Aastra 470.	10	Per licence 1 additional B- channel	In the AIN, only on the Master; otherwise per node.
TWP Connection	Connection to Telephony Web Portal (TWP)	unavailable	enabled	Licence is enabled when user-based TWP licences are available
Enterprise Voice Mail	Voice compression, expanded voice memory capacity, and e-mail notification whenever new voice messages are received.	unavailable	Enabled (including 2 audio channels for voice mail, Auto Attendant or call recording)	In the AIN, only on the Master; otherwise per node.
Audio Record & Play Channels	Voice channels for recording or playing back audio data.	unavailable	per licence 1 additional audio channel for voice mail, Auto Attendant or call recording	In the AIN, only on the Master; otherwise per node.
Auto Attendant	Use of the Auto Attendant function	unavailable	enabled	In the AIN, only on the Master; otherwise per node.
Silent Intrusion	Use of the Silent intrusion feature	unavailable	enabled	In the AIN, only on the Master; otherwise per node.
Secure VoIP	Encrypted VoIP connections using SRTP and TLS.	unavailable	enabled	In the AIN, only on the Master; otherwise per node.
CSTA Sessions	Number of monitored terminals via the CSTA protocol.	0	per licence 1, 20 or 50 CSTA sessions	In the AIN, only on the Master; otherwise per node.

Licence	Licensed attributes	Without licence	With licence	Licences for networking
Hospitality Manager	Use of the Aastra Hospitality Manager	unavailable	enabled	In the AIN, only on the Master; otherwise per node.
Hospitality PMS Interface	Use of the PMS interface and therefore of the FIAS protocol.	unavailable	enabled	In the AIN, only on the Master; otherwise per node.
Hospitality PMS Rooms	Number of rooms when using the PMS interface.	0	per licence 1, 20 or 50 rooms	In the AIN, only on the Master; otherwise per node.

1) 4 hours after the new software has been uploaded, the communication server switches over to a restricted operating mode (see "Restricted operating mode", page 70).

2) This licence cannot be purchased separately; it is part of other licences

3) Upgrade to *Basic Aastra Intelligent Net* licence

All the licences are offered in separate licence packages. Depending on the sales channels the packages may differ from the licences in Tab. 31. The systems ship out unlicensed. Back-licensing is not provided for. However, resetting to the factory setting is possible.

Temporary offline licences

If the connection to the Master is interrupted in an AIN, the satellites restart in offline mode. The licences acquired on the Master are no longer visible to the satellites in offline mode. To ensure autonomous VoIP and QSIG traffic temporarily, the following licences are enabled in the satellites concerned for the duration of offline operation or for a maximum of two hours (the licences are not visible in AMS):

- *Aastra 470 Expansion*
- *Enterprise Voice Mail*
- *QSIG Networking Channels*, unlimited
- *Aastra SIP Terminals*, unlimited
- *Aastra Video Terminals*, unlimited
- *SIP Terminals*, unlimited
- *Video Terminals*, unlimited
- *SIP Access Channels*, unlimited
- *VoIP Channels for Standard Media Switch*, unlimited
- *Mobile Phone Extension*, unlimited

- *Aastra Dialog 4200 Phones*, unlimited
- *Aastra 5300ip Phones*, unlimited
- *Aastra 2380ip Softphones*, unlimited
- *CSTA Sessions*, unlimited

To ensure a longer-lasting offline operation the necessary licences must also be purchased for the satellites.

Restricted operating mode

Without a valid *Software Release* licence the communication server switches over to a restricted operating mode 4 hours after each restart. The restriction concerns the following aspects:

Restricted operating features:

- No call information for incoming calls and during the call connection.
- Dialling by name is deactivated.
- Calling up functions using the menu or function keys is disabled (enquiry calls are not possible either).
- Team keys are disabled.
- Function codes are disabled (exception for remote maintenance on/off).
- Dialling from the PC and other CTI functions are not supported.

Restricted services and routing functions:

- Calls are not routed to integrated mobile phones.
- Call centre functions are out of service (no routing to ACD).
- Voice mail functions are out of service (no routing to voice mail).
- The announcement service is out of operation.

Restrictions in an Aastra Intelligent Net
In an AIN, the satellites carry out a restart every four hours.

Trial licences

Trial licences are available for some functions. This means that functions or features that require a licence can be used and tested, licence-free, for a period of 60 days. The trial licences are automatically enabled the first time a particular function is used and then listed in AMS in the licence overview, complete with the date on which they expire. This process can only be carried out for each function or feature. Thereafter a licence must be purchased.

Trial licences are available for the following functions:

- *QSIG Networking Channels*, unlimited
- *CTI First Party via LAN*
- *ATAS Interface*
- *ATASpro Interface*
- *SIP Access Channels*, unlimited
- *Aastra SIP Terminals*, unlimited
- *Aastra Video Terminals*, unlimited
- *SIP Terminals*, unlimited
- *Video Terminals*, unlimited
- *VoIP Channels for Standard Media Switch*, unlimited
- *Mobile Phone Extension*, unlimited
- *Aastra Dialog 4200 Phones*
- *Aastra 5300ip Phones*, unlimited
- *Aastra 2380ip Softphones*, unlimited
- *Enterprise Voice Mail*
- *Auto Attendant*
- *CSTA Sessions*, unlimited
- *Hospitality Manager*
- *Hospitality PMS Rooms*, unlimited

OIP licences

OIP licences are managed by OIP itself. A detailed description of the OIP licences can be found in the System Manual Open Interfaces Platform.

3. 4. 5 Power supply capacity

The maximum number of terminals connected to the system can be limited by the supply power available for terminals. It is also important to take note of the maximum load per terminal interface.

3. 4. 5. 1 Supply power available for terminals

The internal power supply unit (PSU2U) is rated for the power requirements of a typical system expansion. An external auxiliary power supply unit (APS2) is used for purposes of redundancy or if a large number of terminals are operated without their own power supply. It can either handle the power supply on its own or be used in combination with the internal power supply unit (see also the overview "Powering the communication server", page 87).

Tab. 32 Available power output for various types of power supply

	Internal power supply unit only	External auxiliary power supply unit only	Internal power supply unit + external auxiliary power supply unit
Available power output (P total)	120 Watt	240 Watt	360 Watt

To calculate the power output available for the connected terminals (P terminals) you need to deduct the power consumption of the basic system, the interface cards, the DSP modules, the IP media modules, the CPU2 applications card and the redundant fan unit (P hw) from the power specifications in Tab. 32 (P total) .

Tab. 33 Power requirements of hardware components Aastra 470

Designation	Output P [W]
Basic system with CPU1 call manager card	10
Interface card 1PRI	1.5
Interface card 2PRI	2
Interface card 4BRI	1
Interface card 8BRI	1
Interface card 4FXO	1
Interface card 8FXO	1.5
Interface card 16FXO	2.5
Interface card 4FXS	1.5
Interface card 8FXS	2
Interface card 16FXS	3
Interface card 32FXS	4.5
Interface card 8DSI	2
Interface card 16DSI	3

Designation	Output P [W]
Interface card 32DSI	4
DSP module SM-DSPX1, SM-DSP1	0.75
DSP module SM-DSPX2, SM-DSP2	1.5
IP Media module EIP1-8	2
IP Media module EIP1-32	2.5
4TAX, 8TAX, 16TAX call charge module	0.1
Application card CPU2	21 [1)]
Redundant fan unit RFU	3.5

1) Up to 9 W more if the front-side USB interfaces are connected.

The basic system and the interface cards generate their own local power supply with an 80% efficiency. The calculated value must therefore be multiplied by a factor of 0.8 at the end. The calculation formula is therefore as follows:

$$P_{terminals} = (P_{total} - P_{hw}) \times 0.8$$

The total power requirements of all connected terminals must not exceed the value P terminals.

The number of permissible terminals per system depends on the power requirements of the individual terminals. Tab. 34 provides details of the average power requirements of the terminals.

Note

The actually required power supply depends strongly on the call traffic, the wire diameter and the line length to the connected terminals. The values in the following table are average values under the following assumption:

- Phones traffic volume: Call Connection 38%, Ringing 2%
- SB-4+ radio unit: Active call connection on 2 channels
- SB-8 radio unit: Active call connection on 4 channels
- Background lighting Aastra 5380: 30% active
- LEDs on terminals and expansion key modules: 20% active.
- Wire diameter: 0.5 mm
- Line length: 200 m

The table below shows the average power requirements of the terminals for a line length of approx. 200 m and a wire diameter of 0.5 mm.

Tab. 34 Average power requirements of terminals

Terminals	Connection	Output P [mW]
Aastra 5360 [1]	DSI-AD2 interface	280
Aastra 5361	DSI-AD2 interface	680
Aastra 5370	DSI-AD2 interface	680
Aastra 5380	DSI-AD2 interface	820
Aastra 5370, Aastra 5380 with power supply unit	DSI-AD2 interface	0
Expansion key module Aastra M530	Aastra 5370	110
Expansion key module Aastra M530	Aastra 5380	120
Expansion key module Aastra M535	Aastra 5370, Aastra 5380	0 [2]
Dialog 4220	DSI-DASL interface	390
Dialog 4222	DSI-DASL interface	640
Dialog 4223	DSI-DASL interface	660
EKP expansion key module	Dialog 4222, Dialog 4223	45
Radio unit without power supply unitSB-4+	DSI-AD2 interface	1500 [3]
Radio unit without power supply unitSB-8	2 DSI-AD2 interfaces	1350 [4]
Radio unit with power supply unit SB-4+/SB-8	1 or 2 DSI-AD2 interfaces	< 100
Office 10 [1]	DSI-AD2 interface	340
Office 25 [1]	DSI-AD2 interface	380
Office 35 [1]	DSI-AD2 interface	280 [5]
Office 45/45pro [1]	DSI-AD2 interface	660 [5]
Office 45pro with power supply unit [1]	DSI-AD2 interface	< 10
Expansion key module (EKP) [1]	Office 35, Office 45	80
Alphanumerical keyboard (AKB) [1]	Office 35, Office 45	20
ISDN terminal	BRI-S interface	approx. 500 [6]
Analogue terminals	FXS interface	approx. 500

1) Although no longer available, the phone is still supported.

2) An Aastra M535 always requires a power supply unit

3) The value applies to radio units with hardware version "-2". The value for hardware version "-1" is 300 mW lower.

4) The value applies to each interface and to radio units with hardware version "-2". The value per interface for radio units with hardware version "-1" is 150 mW lower.

5) The value applies to phones with hardware version "-2". The value for phones with hardware version "-1" is 60 mW lower.

6) The value depends greatly on the terminal type.

Tip

With the planning application Aastra Plan the power supply available for terminals is checked automatically.

Overload shutdown

If 80% of the available power output is exceeded, the event message *Terminal power supply overload* is generated.

If 100% of the available power output is exceeded, the event message *Terminal power supply shutdown* is generated. The power supply is then shut down step by step, starting with the expansion slots with the highest numbers and, within the cards, with the ports with the highest numbers. The terminal ports (FXS, DSI, BRI-S) are shut down in group of 4 ports. The exchange ports (PRI, BRI-T, FXO) are never shut down.

Once the power required drops below 100% as a result of the shutdowns, the disconnected ports are reconnected after approx. 10 seconds. If the limit of 100% is again exceeded, the overload shutdown is triggered once again.

The overload shutdown works in principle for all three types of power supply (see Tab. 32). However it triggers particularly in cases where only the internal power supply unit is available and a large number of terminals are operated without their own power supply.

If an overload occurs, either reduce the required supply power (e.g. by powering DECT radio units and or system phones locally) or use the external auxiliary power suply unit for terminals.

3. 4. 5. 2 Power supply per interface

DSI interface card

The maximal available power supply on the DSI ports per interface is limited. In certain cases (e. g. 32 connected SB-4+ radio units with HW version " - 2" at a 32DSI interface during simultaneously high traffic load) this value can be exceeded and the the overload shutdown is triggered. To provide remedy individual terminals must either be powered locally or spread out on several DSI interface cards.

Tab. 35 Maximal power supply per interface card

Maximal power supply per interface card	Output P [W]
DSI interface card	41.5

3. 4. 5. 3 Power supply per terminal interface

The power supply per terminal interface is determined by the interface type. The interface load depends on the following variables:

- Terminals used incl. auxiliary devices
- Bus configuration
- Line length and conductor cross-section

For information on the calculations refer to "Terminal interfaces", page 113.

4 Installation

This Chapter tells you the ways in which Aastra 470 can be installed and the conditions to be observed. It also includes the mounting into a 19" rack, the correct way to connect the earthing, and the power supply. Other topics in this chapter include how to fit system modules and interface cards. Finally the Chapter also describes the network- and terminal-side connection of the interfaces and the installation, powering and connection of system terminals.

4. 1 System components

The figure below shows the components of the Aastra 470 communication server complete with mounting options.

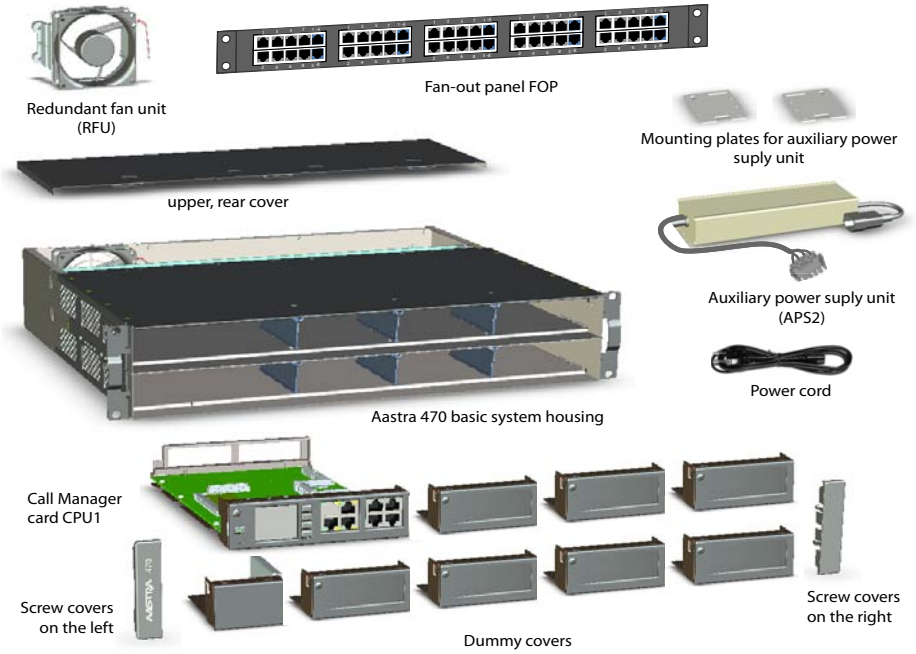


Fig. 18 System components with mounting options

4. 2 Fitting the communication server

The Aastra 470 communication server is designed for installation in a 19" rack (2 height units). The communication server can also simply be placed on a flat surface. Wall-mounting is not allowed.

4. 2. 1 Equipment supplied

The equipment supplied with the Aastra 470 includes:

- Aastra 470 communications server with integrated Call Manager card
- Fastening kit for rack mounting
- 2 covers for the rack screws
- 4 rubber feet for desktop installation
- Power cord
- Product information

4. 2. 2 Location requirement

The following location requirements must be observed when positioning the communication server.

Hazard
Failure to observe the location requirements can cause the communication server to overheat, damaging electrical components and/or the surrounding area.
An event message is generated if the heat dissipation is insufficient. Appropriate measures must then be taken immediately to improve heat dissipation, e. g. providing the required clearances or lowering the ambient temperature.

Tab. 36 Aastra 470 Location requirements

Heat radiation	• Do not position in direct sunlight, near radiators or near other heating sources
EMC	• Do not position in strong electromagnetic fields of radiation (e.g. near x-ray equipment, welding equipment or similar).
Heat dissipation	• With desktop and rack mounting the ventilation holes (left) and the fan outlet (rear) must not be obstructed. • All the communication server's housing openings must always be closed during operation to ensure a controlled flow of air (see Fig. 19).
Environment	• Room temperature 5...45 °C • Relative humidity 30…80%, non-condensing

4. 2. 3 Safety regulations

Be sure to observe the following safety regulations before carrying out work inside a communication server:

Hazard:
Once the communication server is connected to the mains, there are hazardous voltages inside the housing. Always observe the following points before removing the housing cover:

- Disconnect the communication server from the power supply.
- Wait at least one minute so the charged capacitors have time to discharge.

Warning
Components, interface cards or system modules can be damaged by electrical voltage.
Always disconnect the communication server from the power supply before removing the housing cover.

Warning
Components can be damaged by electrostatic discharge when touched. Always touch the earthed metal case of the communication server before carrying out work inside the housing. This also applies to interface cards and system modules that are no longer packed inside the ESD protective wrapping.

4. 2. 4 Flow of hot air

The Aastra 470 communications server ships with a fan already pre-installed. The housing is designed so the air flow is first guided at two levels over the processor cards and the interface cards, then passes through cutouts in the backplane, absorbs the heat from the power supply unit, and exits the housing through the fan aperture.

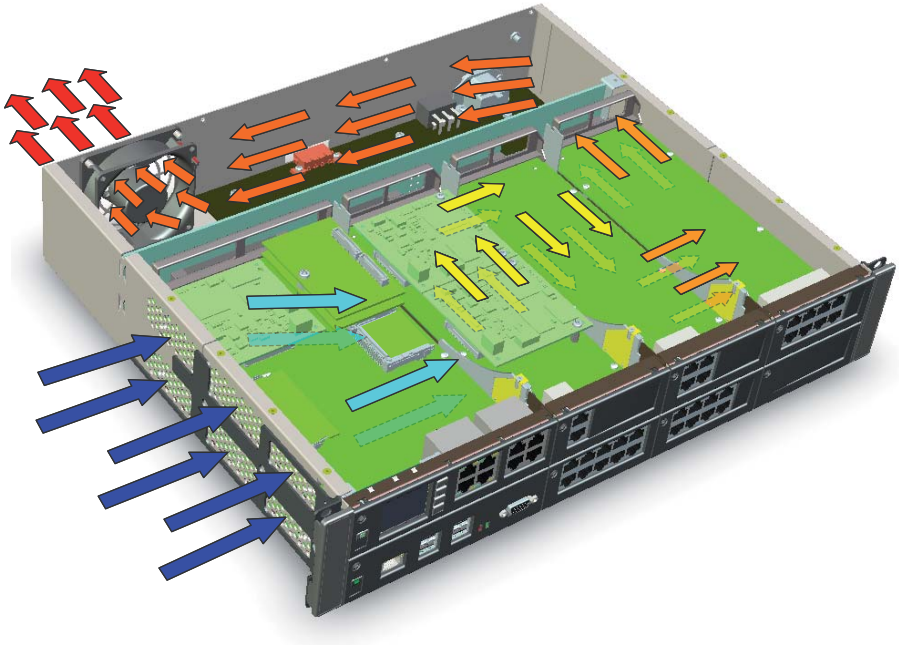


Fig. 19 Flow of hot air

The fan speed depends on the ambient temperature, the number of cards and modules, and the communication server load, and continually adapts to the current temperature inside the housing.

Note
Make sure all the housing openings on the communications server are always closed and secured by screws during operation to ensure a controlled flow of air. This applies in particular to the interface cards and processor cards, but also to the dummy covers and housing covers.

4. 2. 5 Desktop installation

For desktop installation simply place the Aastra 470 communication server on a flat, level surface. Several communication servers can be stacked directly on top of one another.

For the desktop installation of the mehreren communication server proceed as follows:

1. Affix the 4 rubber feet supplied to each of the corners of the communications server's housing base.
2. If necessary install the redundant fan unit (see "Fitting an additional fan", page 82)
3. Connect the earthing (see "Connecting the earthing wire", page 85).
4. Always observe the location requirements set out in Tab. 36.

4. 2. 6 Rack-mounting

The rack mounting of the Aastra 470 communication server allows it to be installed horizontally in a 19" rack. Be sure to observe the following:

- The communication server takes up the space of 2 height units (units) inside the 19" rack. (1 height unit corresponds to 44.45 mm).
- Several communication servers can be stacked directly on top of one another. To do so, make sure the rubber feet are removed first.
- With interface cards with more than 8 ports it is advisable to route the cabling via an fan-out-panel (FOP) (1 height unit).

4. 2. 6. 1 Rack-mounting procedure

Materials required:

- Fastening kit for rack mounting
- Screwdriver

To rack-mount a communication server proceed as follows:

1. Pull off the screw covers on the left and right of the front panel.
2. Secure the cage nuts in the appropriate positions in the rack's fastening rails.
3. If necessary install the redundant fan unit (see "Fitting an additional fan", page 82).
4. Connect the earthing (see "Connecting the earthing wire", page 85).
5. Secure the communications server to the rack's fastening rails using the M6 screws and the cage nuts.
6. Fit the screw covers on the left and right of the front panel.
7. Connect the earthing (see "Connecting the earthing wire", page 85).
8. Always observe the location requirements set out in Tab. 36.

4. 2. 6. 2 Fitting an additional fan

An additional fan can be fitted in front of the standard fan already integrated. Both fans always rotate at the same time and at the same speed, depending on the temperature inside the communications server. The redundant fan unit increases the system's operating reliability. If one fan fails, the second fan dissipates the heat. A fan failure generates an event message, allowing the defective fan (or both fans) to be replaced.

Note
Fans have a limited service life. So if a fan fails become of age (> approx. 5 years) it is advisable to replace both fans as a precautionary measure.

Materials required:

- Aastra 470 additional fan premounted on fastening frame
- Set of screws for additional fan
- Screwdriver

To install the additional fan proceed as follows:

1. Disconnect the communication server from the power supply.

Warning
Be sure to observe the "Safety regulations", page 79.

2. Remove the upper rear housing cover.
3. Remove the 4 rubber covers from the holes in the back panel of the communications server provided for mounting the additional fan.
4. Use the 4 enclosed screws to fit the fastening frame complete with additional fan to the back panel of the communications server (see Fig. 20).
5. Plug the fan connector into the connector marked "FAN 2" on the internal power supply unit.
6. Fit the upper rear housing cover.
7. Reconnect the communication server to the power supply.

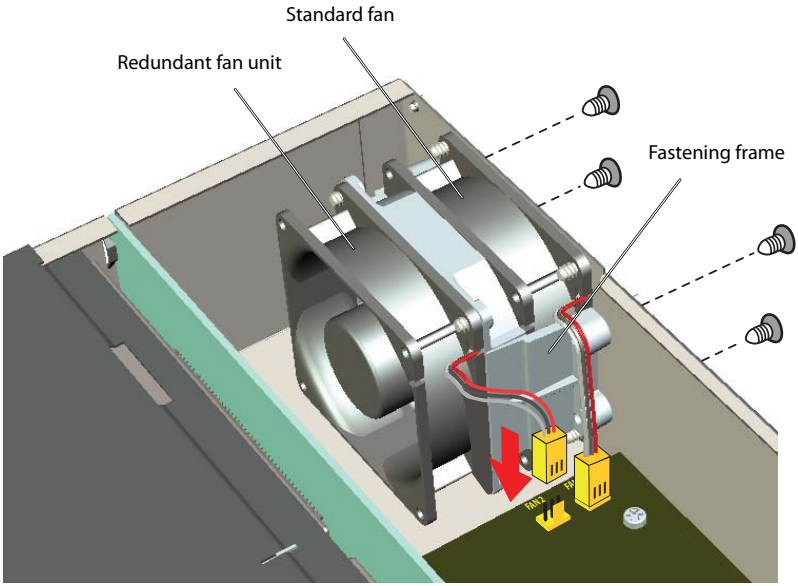


Fig. 20 Fitting the additional fan in Aastra 470

4. 3 Earthing and protecting the communication server

The protective earth and equipotential bonding are important integral parts of the safety concept: Standard EN 60950 relevant to safety matters stipulates protective earthing.

Warning
High leakage currents can occur as a result of connecting to the communication network.
Establish an earth connection before connecting to the communications network.
Disconnect the communication server from the communications network before carrying out maintenance work.

Warning
Transient overvoltage can occur on the mains and on the communications network.
Protect each line installation leading from the building by using one surge voltage protector per core at the isolating point (main) distribution frame or entry point into the building.

Operation on an IT current distribution system:
The communication server can be operated on an IT power distribution system as per EN/IEC 60950 with voltages of up to 230 VAC.

4. 3. 1 Connecting the earthing wire

The communication server's earthing connection is located on the rear panel of the communications server next to the mains power socket. The earthing wire is secured using a screw and a spring washer.

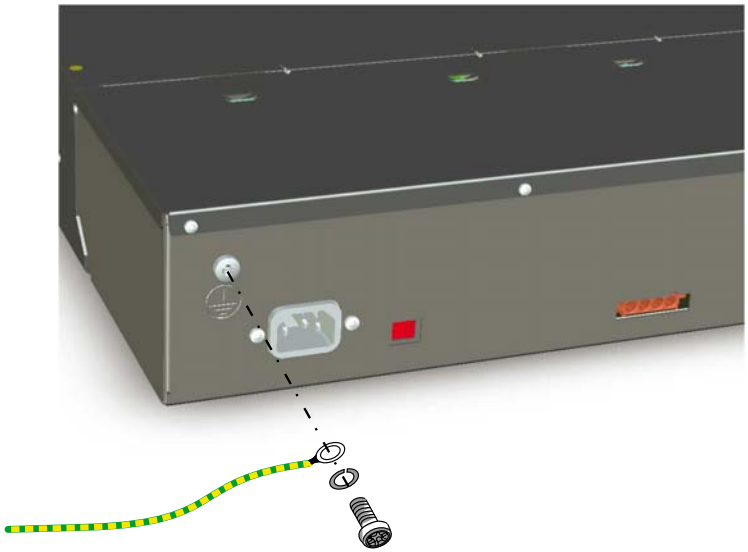


Fig. 21 Earthing connection

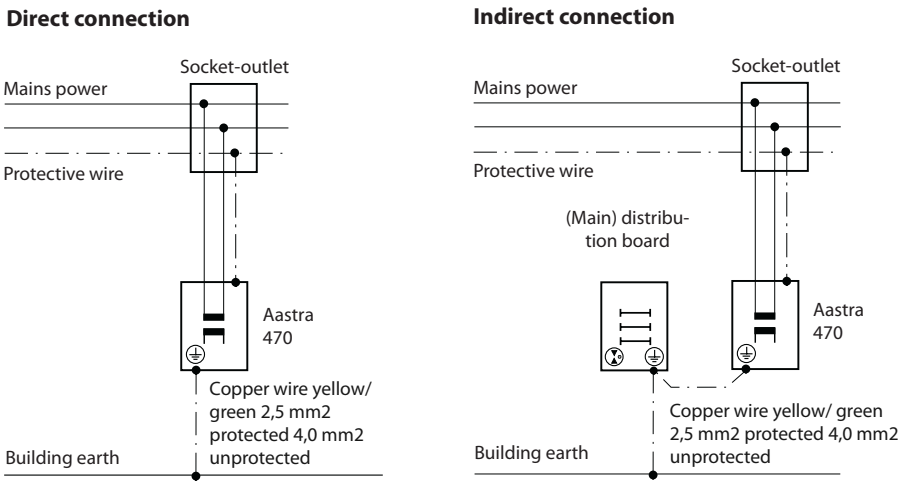


Fig. 22 Earthing of the communication server in the case of an direct cabling and indirect cabling

Note
In the case of an indirection connection make sure that the communication server's earthing wire does not form any earth loops with the earthed cable screenings of the installation cables leading up to the (main) distribution frame. The cables should be kept as short as possible and laid out in parallel.

4. 3. 2 Connecting the cable screening

When using shielded installation cables also use shielded RJ45 connectors. In this way the shielding of the installation cables is automatically connected with the housing of the communication server and therefore with the building earth.

Note
Connect the cable screens to one another at the splitting point only. Observe the tree structure principle to prevent earth loops.

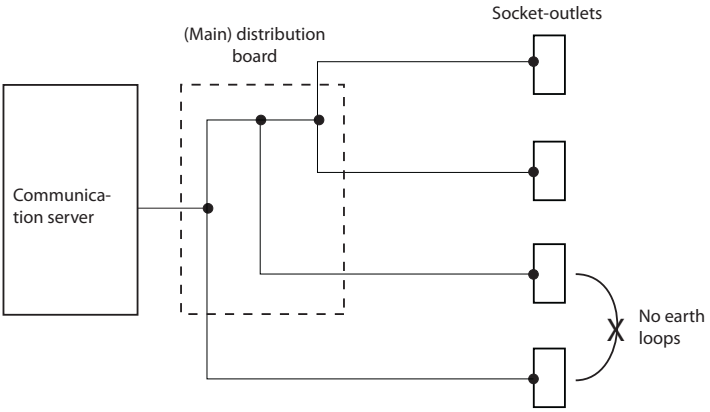


Fig. 23 Tree structure principle

4. 4 Powering the communication server

The communications server is powered as standard with 230 VAC or 115 VAC directly from the mains. The internal power supply unit (PSU2U) is rated for the power requirements of a typical system expansion. The external auxiliary power supply unit APS2 can be used to increase the power supply available or to increase operating reliability (redundancy in the event of a failure on the part of one of the two power supplies). The communication server can also be operated with the external auxiliary power supply unit only. To ensure that its operation is maintained even in the event of a mains outage, an external uninterruptible power supply (UPS) must be used.

Hazard:
Hazard due to heat generation in the event of short-circuits.
The mains power supply connection must be protected with 16 A maximum.

The overview table below lists the four different types of power supply with the available power outputs:

Tab. 37 Power supply types for the communication server

Power supply type	Available power output	Redundancy operation possible	Remarks
Internal power supply unit only	120 Watt	No	Suitable for a typical system configuration
Internal power supply unit + external auxiliary power supply unit	120 Watt	Yes	Suitable for a typical system configuration with power supply redundancy
External auxiliary power supply unit only	240 Watt	No	Minor heat generation inside the Aastra 470 housing
Internal power supply unit + external auxiliary power supply unit	360 Watt	No	Suitable for maximum power requirements

4. 4. 1 Internal power supply unit

The communication server is powered via the supplied mains power cord.

The following points are to be observed:

- The mains connector acts as a disconnecting device and must be positioned so that it is easily accessible.
- The voltage converter must be set to the voltage of the connected mains power (see Fig. 24).

Warning
PCBs may be damaged or become defective if the communication server is operated on 230 V mains power and the voltage converter is set to 115 V.

4. 4. 2 External auxiliary power supply unit

The use of the external auxiliary power supply unit APS2 is necessary to increase the operating reliability (redundancy operation) or if the internal power supply unit is no longer sufficient based on the power requirement calculations or any event messages generated (power supply overload). It is also connected directly to the 230 VAC or 115 VAC mains. However, unlike the internal power supply unit it does not have a voltage converter. The voltage automatically adapts to the mains voltage.

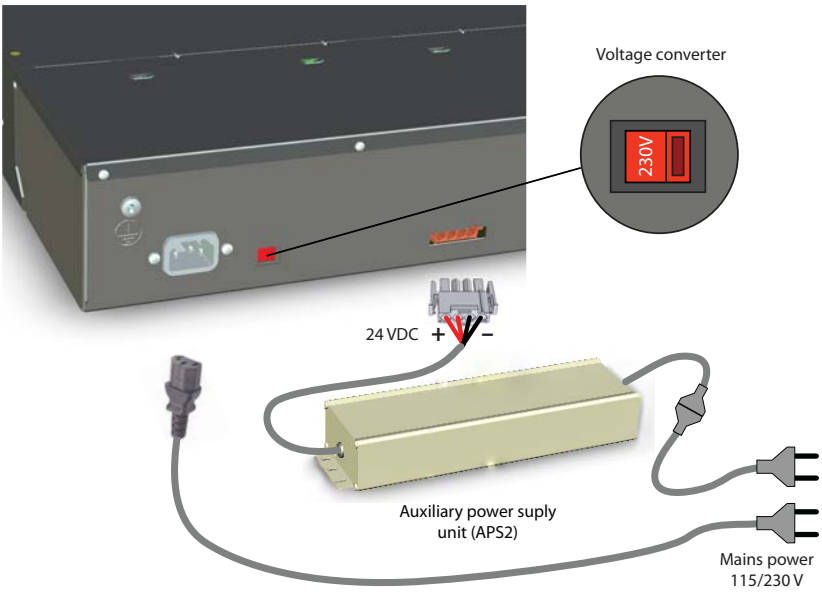


Fig. 24 Power supply to the communication server

Note
For an external power supply use the optional auxiliary power supply unit APS2 exclusively.

Mounting the auxiliary power supply APS2

The auxiliary power supply APS2 is supplied with a fastening kit that includes two fastening plates and 6 screws. If a fan-out-panel (FOP) is already fitted, the auxiliary power supply can be installed behind the connection panel.

The following diagram shows the fan-out-panel from below with the auxiliary power supply fitted.

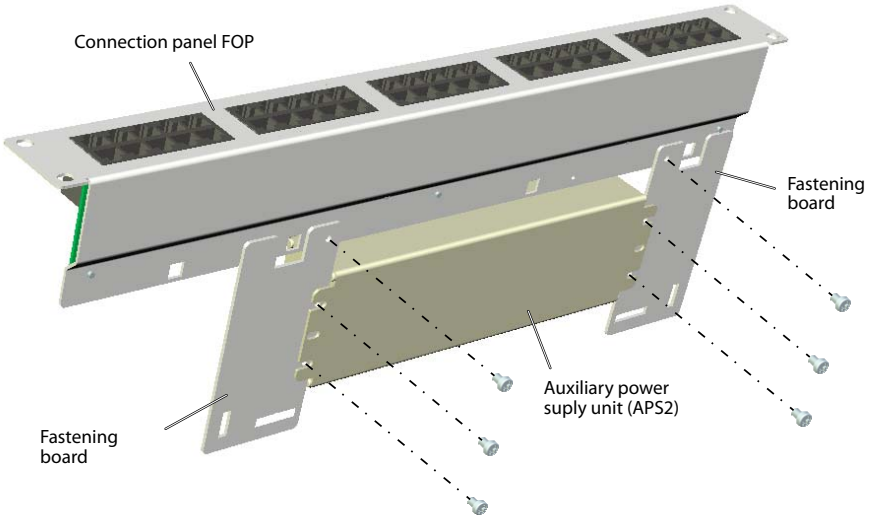


Fig. 25 Fan-out-panel with auxiliary power supply fitted (viewed from below)

4. 4. 3 Uninterruptible power supply (UPS)

The use of an external uninterruptible power supply (UPS) guarantees operation even in the event of a mains outage.

The UPS battery capacity is rated according to the communication server's primary power requirements and the required bridging time. The table below shows the maximum power requirements of the communication server in its maximum configuration and maximum traffic volume for different types of power supply.

Tab. 38 Maximum power requirements of the communication server

Communication server	Maximum power requirements
Internal power supply unit only	210 VA
External auxiliary power supply unit only	400 VA
Internal power supply unit + external auxiliary power supply unit	610 VA

The battery capacity required [Ah] can be calculated using the battery voltage and the maximum bridging time. It is important to note that the battery must never be allowed to become completely discharged and that in typical conditions only approx. 60% of the maximum power requirements is needed.

Note
The uninterrupted operation of the communication server is ensured if the UPS takes over the power supply within 20 ms of the mains outage.

See also
For more technical details see "Technical Data", page 238.

4. 5 Equipping the Basic System

For individual expansion the Aastra 470 basic system can be fitted with interface cards, system modules and an application card. An overview can be found in the Chapter "Expansion Stages and System Capacity", page 33.

4. 5. 1 Fitting interface cards

Interface cards are fitted to slots 2 to 8. Slot 1 is reserved for the Call Manager card. If an application card is fitted, slot 2 for interface cards is no longer available either.

Fig. 26 Number of the Aastra 470 slots

To fit an interface card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Shut down the call manager via the control panel (see "On/Off key", page 200).
2. Unscrew the screw on the dummy cover and remove the cover by pulling the screw.
   Note: The narrow dummy cover in slot 2 is only removed when an application card is fitted.
3. Carefully slide the interface card into the slot shaft and gently press the card as far as it goes into the connection on the backplane.
4. Use the screw to secure the card in its slot.
5. Restart the call manager by pressing the On/Off button on the call manager card.

4. 5. 2 Fitting application card CPU2

The application card is wider than an interface card and can only be fitted to slot 2 (see Fig. 26).

To fit an application card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Unscrew the screw on the larger dummy cover in slot 2 and remove the cover by pulling the screw.
2. Remove the plastic cover of the narrow dummy cover in slot 2. To do so insert a screwdriver at an angle from below to release the snap-in mechanism on the plastic cover.
3. Unscrew the screw on the narrow dummy cover and remove the cover by pulling the screw.
4. Carefully slide the application card into the shaft of slot 2 and gently press the card as far as it goes into the connection on the backplane.
5. Use the screw to secure the card in its slot.
6. Connect the cables of any assigned interfaces on the front panel of the applications card.
7. Start up the applications server by pressing the On/Off button on the applications card.

4. 5. 3 Equipping the call manager card CPU1

The Call Manager card is part of any communications server and is required for a fully functional system. It is already fitted ex-works and only needs to be removed in the event of repairs (see "Operation and Maintenance", ab page 176) or when expanding the system with modules. The Call Manager card only fits into slot 1 (see Fig. 26).

4. 5. 4 Fitting system modules

With system modules a distinction is made between modules expandable as an option (DSP modules, IP media modules, Call charge modules) and mandatory modules (RAM module). The system cards (Flash card, EIM card) are always required.

This chapter only describes the procedure for fitting system modules that are expandable as an option (DSP module, IP Media module, call charges module). The RAM module only need to be replaced in the event of repairs or maintenance work (see "Operation and Maintenance", ab page 176).

4. 5. 5 Fitting DSP modules

DSP modules are fitted to the Call Manager card. A maximum of 2 DSP modules can be stacked.

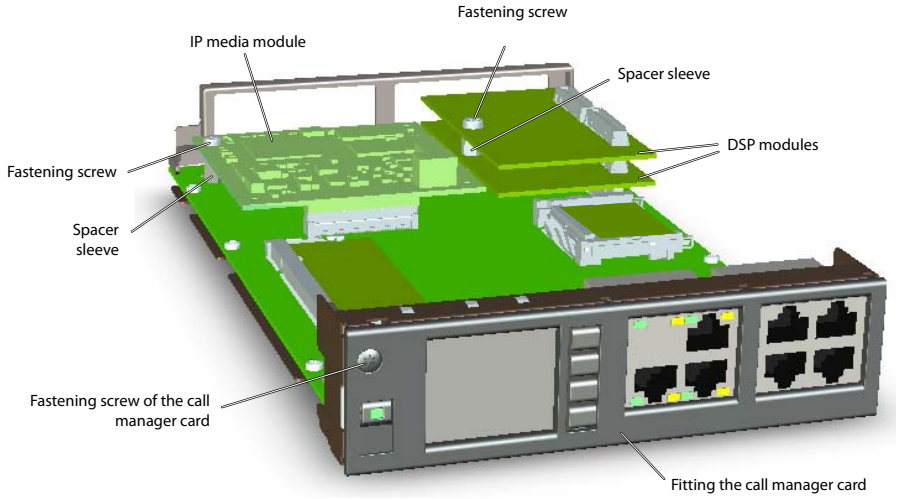


Fig. 27 System modules on the Call Manager card

To fit a DSP module, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Shut down the call manager via the control panel (see "On/Off key", page 200).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Remove the fastening screw on the module slot for DSP modules.
4. The spacer sleeve for the lower module is already premounted on the processor card. For the upper DSP module screw the spacer sleeve supplied with the module into place.

5. Place the module on slot (or onto a module already fitted in that slot) and press down evenly on both connectors as far as the stop.
6. Secure the module with the fastening screw.
7. Carefully slide the Call Manager card into the shaft of slot 1 and gently press the card as far as it goes into the connection on the backplane.
8. Secure the Call Manager card back into its slot with the screw.
9. Restart the call manager by pressing the On/Off button on the call manager card.

4. 5. 6 Fitting IP Media modules

IP Media modules are fitted either to the Call Manager card or to PRI trunk cards. IP Media modules are **not** stackable.

To fit an IP Media module to a Call Manager card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Shut down the call manager via the control panel (see "On/Off key", page 200).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Remove the 2 fastening screws on the 2 premounted spacer sleeves on the IP Media module.
4. Place the module in the slot and press it down evenly into the slot as far as the stop.
5. Fit the module on to the call manager card from below using the 2 fastening screws.
6. Carefully slide the Call Manager card into the shaft of slot 1 and gently press the card as far as it goes into the connection on the backplane.
7. Secure the Call Manager card back into its slot with the screw.
8. Restart the call manager by pressing the On/Off button on the call manager card.

Proceed accordingly to fit one or two IP Media modules to a PRI trunk card.

4. 5. 7 Fitting call charge modules

Call charge modules are fitted to FXO trunk cards. Only 1 call charge module can be fitted to each FXO card.

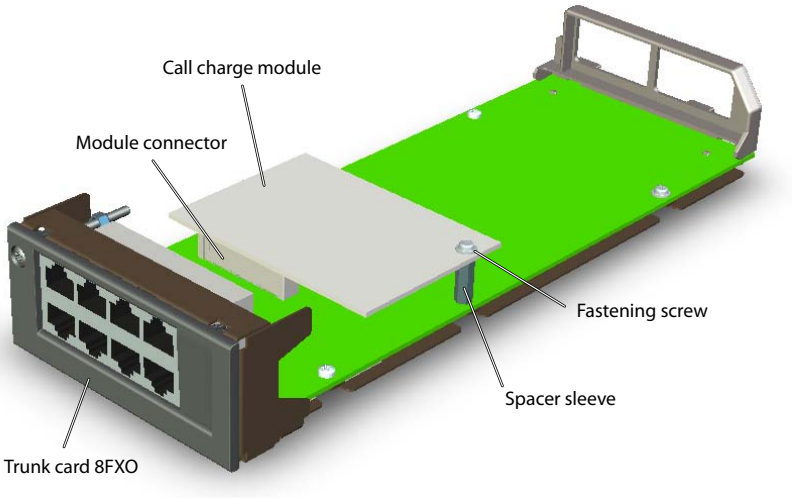


Fig. 28 Call charge module on 8FXO trunk card

To fit a call charge module, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Shut down the call manager via the control panel (see "On/Off key", page 200).
2. Unscrew the screw on the FXO card and remove the card by pulling the fastening screw.
3. Remove the fastening screw for the call charge module on the FXO card and in its place screw the spacer sleeve into position (see Fig. 28).
4. Place the module in the slot and press it down evenly into the slot as far as the stop.
5. Secure the module with the fastening screw on the spacer sleeve.
6. Carefully slide the FXO card into the slot shaft and gently press the card as far as it goes into the connection on the backplane.
7. Use the screw to secure the FXO card back into its slot.
8. Restart the call manager by pressing the On/Off button on the call manager card.

4. 5. 8 Component mounting rules

The component mounting rules mentioned in the previous chapters are listed here in an overview:

- The Call Manager card can only be fitted to slot 1.
- The application card can only be fitted to slot 2.
- Interface cards can be fitted to card slots 2 to 8.
  Exception: If an application card is fitted, slot 2 is no longer available for interface cards.
  Tip: Leave slot 2 empty so that it can later be equipped with an applications card, if required. This will save you a good deal of configuration work later on.
- For optimum heat dissipation interface cards should always be fitted to the basic system in the same sequence as the slot numbering (from left to right, see Fig. 26). The empty slots are therefore always those with the highest numbers (with the exception possibly of slot 2).
- Two DSP modules can be stacked and are always fitted to the Call Manager card.
- IP Media modules are fitted to the Call Manager card or to PRI trunk cards and cannot be stacked.
- The interfaces are enabled sequentially when the communication server is started up. The following rules apply:
  – The number of interfaces actually enabled is determined in each case by the system capacity (see "System capacity", page 54). If a limit value is reached, all the interface cards or all the interfaces of the last card may not be enabled.
  – The interfaces are enabled in accordance with their designation, starting with the lower designations. This means that the terminal interfaces on the processor card are always enabled before those on the interface cards.

4. 6 Connecting the communication server

There are two possibilities for connection to the telephone network and the terminal-side cabling:

- Direct connection
- Indirect cabling via (main) distribution frame and any universal building cable installation (UBC) (see also Fig. 32 and Fig. 33).

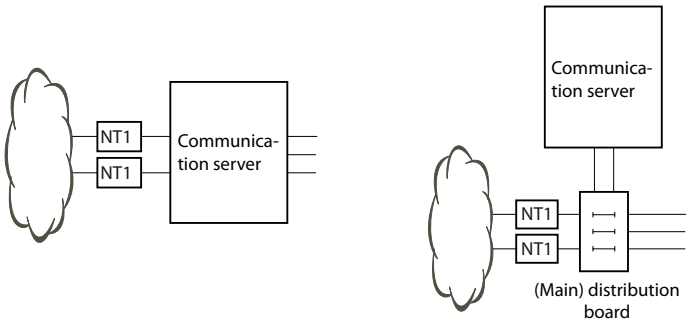


Fig. 29 Direct cabling (left) and indirect cabling (right)

On the front panel all the connections are made using RJ45 connectors.

4. 6. 1 Direct connection

Standard commercial cables are used to connect directly to the telephone network. Details can be found in the Chapter "Network Interfaces", page 103.

On terminal cards with 16 or more interfaces some or all of the RJ45 sockets are multiply assigned. They can be split into individual RJ45 sockets using patch cables and the fan-out-panel (see "Fan-out panel FOP", page 133).

4. 6. 2 Indirect cabling

There are two possibilities for connecting the communication server indirectly to the telephone network and terminal-side cabling:

- Connection via main distribution board
- Connection to a universal building cable installation (UBC)

4. 6. 2. 1 Connection via main distribution board

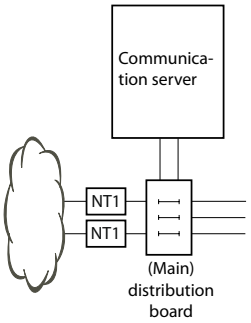


Fig. 30 Connection via main distribution board

The interface sockets on the front panel and on the fan-out-panel (FOP) where applicable are connected with the (main) distribution frame or the patch panels using either patch cables or prefabricated system cables (see "Equipment Overview", page 237).

Prefabricated system cable 4 x RJ45

With terminal cards with 16 or more interfaces some or all of the RJ45 sockets are assigned four-fold on the front panel of the Aastra 470. With this cable they can be connected without the use of a fan-out-panel (FOP). The cable is 6 m long and at one extremity has four RJ45 connectors on which all the pins are wired.

Tab. 39 Schematic diagram of prefabricated system cable 4 × RJ45 × 8 pin

Stranded element	Core colour	Cable designation	RJ45	Port
			Pin	Two-wire connection
1	white	1	4	x.1a
	blue		5	x.1b
	turquoise		3	x.2a
	violet		6	x.2b
2	white		1	x.3a
	orange		2	x.3b
	turquoise		7	x.4a
	violet		8	x.4b

Stranded element	Core colour	Cable designation	RJ45	Port
			Pin	Two-wire connection
3	white	2	4	x.1a
	green		5	x.1b
	turquoise		3	x.2a
	violet		6	x.2b
4	white		1	x.3a
	brown		2	x.3b
	turquoise		7	x.4a
	violet		8	x.4b
5	white	3	4	x.1a
	grey		5	x.1b
	turquoise		3	x.2a
	violet		6	x.2b
6	red		1	x.3a
	blue		2	x.3b
	turquoise		7	x.4a
	violet		8	x.4b
7	red	4	4	x.1a
	orange		5	x.1b
	turquoise		3	x.2a
	violet		6	x.2b
8	red		1	x.3a
	green		2	x.3b
	turquoise		7	x.4a
	violet		8	x.4b

Prefabricated system cable 12 x RJ45

The cable is 6 m long and, at one extremity, has 12 RJ45 connectors for the interfaces on the front panel. Two of them have 4 cores; the others, 2 cores. This means the cable is suitable for connecting the following interfaces:

- 2 network interfaces BRI-T or 2 terminal interfaces BRI-S or a combination thereof.
- 10 terminal interfaces (DSI, FXS) or a combination thereof.

Note:
This cable cannot be used to connect Ethernet interfaces (see also "Connection of PRI primary rate interface", page 107 and "Connection of Ethernet interfaces", page 137).

Tip
Use standard commercial connecting cables not just for the PRI and Ethernet interfaces but also for connecting the BRI-T interfaces.

Tab. 40 Schematic diagram of prefabricated system cable 12 × RJ45

Stranded element	Core colour	Cable designation	RJ45	Signal	
			Pin	Connection four-wire	Two-wire connection
1	white	1	4	f	a
	blue		5	e	b
	turquoise		6	d	–
	violet		3	c	–
2	white	2	4	f	a
	orange		5	e	b
	turquoise		6	d	–
	violet		3	c	–
3	white	3	4	–	a
	green		5	–	b
	turquoise	4	4	–	a
	violet		5	–	b
4	white	5	4	–	a
	brown		5	–	b
	turquoise	6.	4	–	a
	violet		5	–	b
5	white	7	4	–	a
	grey		5	–	b
	turquoise	8	4	–	a
	violet		5	–	b
6	red	9.	4	–	a
	blue		5	–	b
	turquoise	10	4	–	a
	violet		5	–	b
7	red	11	4	–	a
	orange		5	–	b
	turquoise	12	4	–	a
	violet		5	–	b

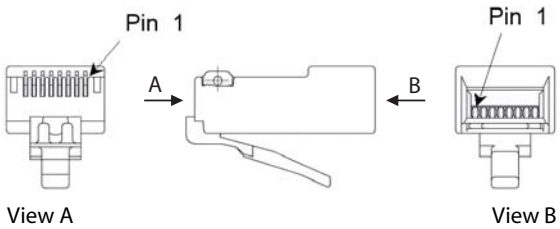


Fig. 31 Pin numbering, RJ45 connector

4. 6. 2. 2 Connection to a universal building cable installation (UBC)

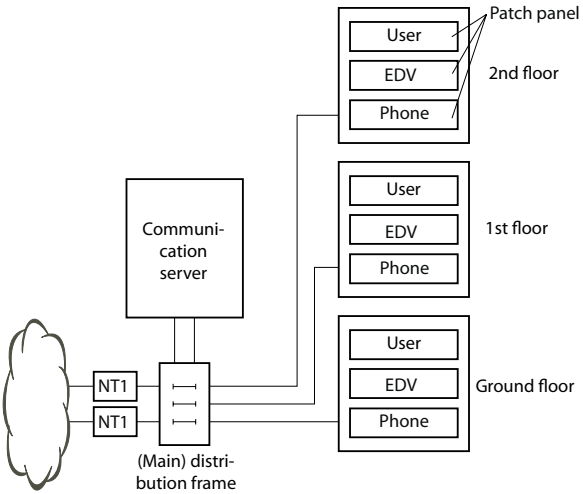


Fig. 32 Connecting to a UBC via a (main) distribution board (example)

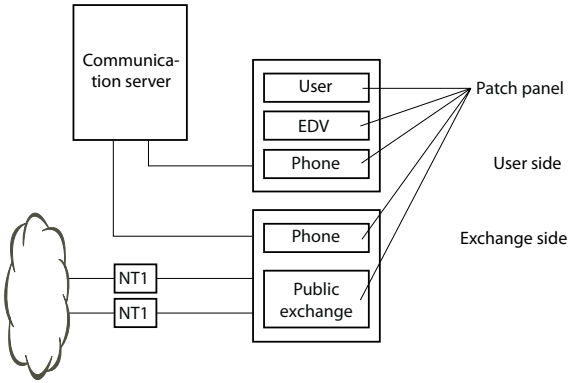


Fig. 33 Connecting to a UBC via wiring centre (example)

4. 7 Cabling interfaces

All the interfaces are routed to the front panel and are therefore accessible without opening the communication server.

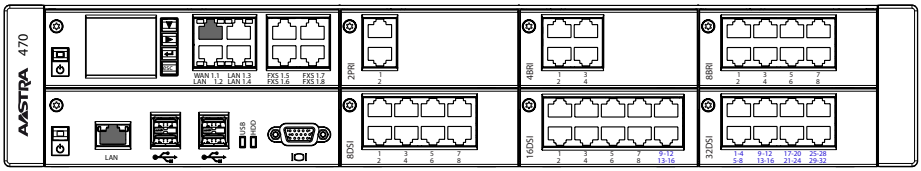


Fig. 34 Interfaces on the front panel with port designation (example)

4. 7. 1 Port addressing

A port address is always of the type x.y. x is the number of the card slot, and y, the port number.

The slot numbering starts with 1 and ends with 8 (see "Number of the Aastra 470 slots", page 91).

With BRI-S interface and DSI interface addresses, the terminal selection digit (TSD) is displayed in AMS in addition to the slot and port numbers.

Tab. 41 Examples of interface addressing

Slot	Port address
Call Manager card; FXS interface x.5	1.5
Interface card on slot 4; interface x.3	4.3
Terminal with TSD 2 on interface card in slot 6; interface x.4	6.4-2

4. 7. 2 Network Interfaces

Equipping the system with interface cards provides the necessary network interfaces. With the exception of the Ethernet interface, which also represents a network interface via SIP access, there are no network interfaces on the Aastra 470 communication server.

4. 7. 2. 1 Basic rate interface BRI-T

Fitting BRI interface cards means that BRI network interfaces are available on the RJ45-sockets on the front panel of the cards. The possible RJ45 sockets are highlighted in colour in the figure below.

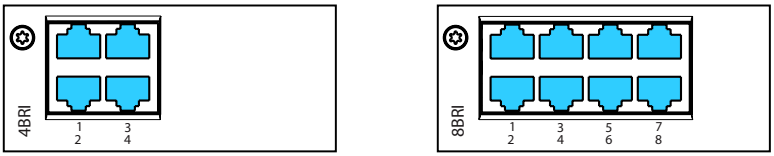


Fig. 35 Connection possibilities for BRI network interfaces

Notes

- The interfaces of sockets 1 to 4 can be switched to BRI-S. The interfaces of sockets 5 to 8 are permanently configured to BRI-T.
- Circuit type as per EN/IEC 60950: SELV

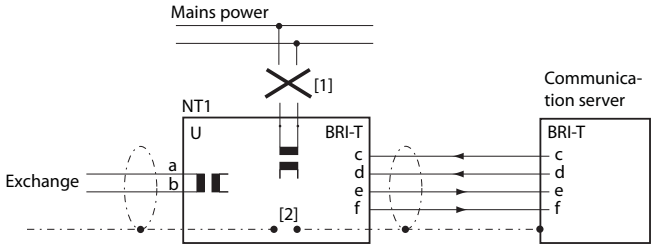
The connection from the front panel to the NT1 (Network Termination) is via standard commercial straight patch cables with 8-pin RJ45 connectors on both sides. With the appropriate tools you can also create your own cables.

Cable Requirements

Tab. 42 Cable requirements for basic rate interface BRI-T

Core pairs × cores	1 × 4 or 2 × 2
Stranded	yes
Wire diameter, core	0.4…0.6 mm
Screening	recommended
Characteristic impedance	< 125 Ω (100 kHz), < 115 Ω (1 MHz)
Wave attenuation	< 6 dB/km (100 kHz), < 26 dB/km (1 MHz)
Near / crosstalk attenuation	> 54 dB/100 m (1 kHz to 1 MHz)

BRI basic rate interface network-side



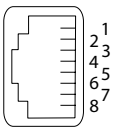
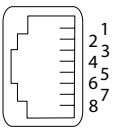
[1] Do not connect power supply NT1

[2] Do not fit the jumper

Fig. 36 Basic access on NT1

The assignment of the RJ45 connector is identical on the NT-side and on the side of the communication server.

Tab. 43 Wiring of the BRI basic rate interface network-side

NT1			Cable cores Straight patch cable	Communication server		
Socket	Pin	BRI-T signal		BRI-T signal	Pin	Socket
	1	–		–	1	
	2	–		–	2	
	3	c	←	c	3	
	4	f	→	f	4	
	5	e	→	e	5	
	6	d	←	d	6	
	7	–		–	7	
	8	–		–	8	

Basic access in the private leased-line network

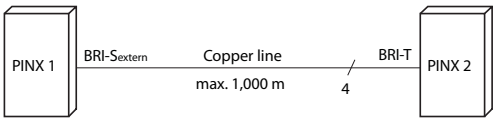


Fig. 37 BRI-S basic rate interface external, networked with copper line

Tab. 44 Connection of BRI-S basic rate interface external, networked with copper line

PINX 1 signal BRI-S basic rate interface external	Cable cores	PINX 2 signal Basic rate interface BRI-T
c	←	c
f	→	f
e	→	e
d	←	d

Bus configuration

BRI-S external is subject to the conditions that apply to terminal interface BRI-S (see "BRI-S terminal interfaces", page 121).

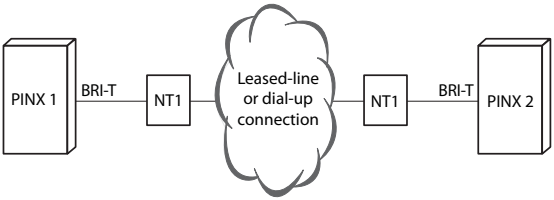


Fig. 38 Basic rate interface BRI-T, networked with leased-line or dial-up connection

Tab. 45 Cabling for basic rate interface BRI-T, networked with leased-line or dial-up connection

PINX 1 signal, basic rate interface BRI-T	Cable cores	NT1	Network	NT1	Cable cores	PINX 2 signal, basic rate interface BRI-T
c	→	c		c	←	c
f	←	f		f	→	f
e	←	e		e	→	e
d	→	d		d	←	d

See also
Chapter "Connections with basic accesses" in the PISN/QSIG Networking System Manual.

4. 7. 2. 2 Primary rate interface PRI

Fitting the corresponding interface cards means that PRI network interfaces are available on the RJ45-sockets on the front panel of the cards. The possible RJ45 sockets are highlighted in colour in the figure below.

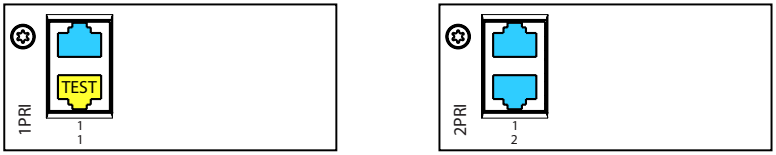


Fig. 39 Connection possibilities for PRI network interfaces

With card 1PRI the PRI interface is routed in parallel to both RJ45 sockets for test purposes.

Notes

- In normal operation both sockets must not be connected on the 1PRI card; otherwise faults may occur.
- Circuit type as per EN/IEC 60950: SELV

Cable requirements

The connection to NT1 (Network Termination) is implemented using commercially available screened cables with 8-pin RJ45 connectors at both ends, e.g. S-FTP 4P, PVC, Cat. 5e.

Tab. 46 Cable requirements for the primary rate interface)

Core pairs × cores Stranded Wire diameter, core Screening	2 × 2 (for short distances also 1 × 4) yes 0.4...0.6 mm yes (Cat. 5)
Characteristic impedance Wave attenuation Near / crosstalk attenuation	< 125 Ω (100 kHz), < 115 Ω (1 MHz) < 6 dB/km (100 kHz), < 26 dB/km (1 MHz) > 54 dB/100 m (1 kHz to 1 MHz)

PRI primary rate interface, network-side

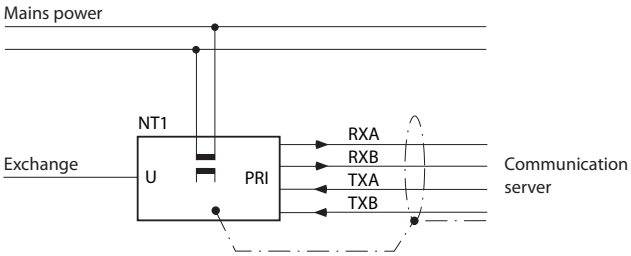
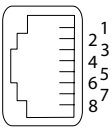
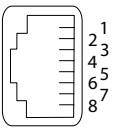


Fig. 40 PRI primary rate interface on NT1

Tab. 47 Connection of PRI primary rate interface

NT1			Cable cores Straight patch cable	Communication server		
Socket	Pin	PRI signal[1)]		PRI signal	Pin	Socket
	1	TxA	→	RxA	1	
	2	TxB	→	RxB	2	
	3	–		–	3	
	4	RxA	←	TxA	4	
	5	RxB	←	TxB	5	
	6	–		–	6	
	7	–		–	7	
	8	–		–	8	

1) Other designations are also possible on the NT1 such as: "S2m ab" instead of "TxA/TxB" and "S2m an" instead of "RxA/RxB".

Primary rate access in the private leased-line network

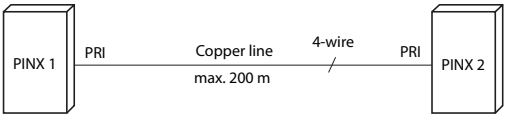
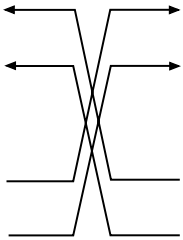


Fig. 41 Primary rate access, networked with copper line

Tab. 48 Cabling for primary rate access PRI, networked with copper line

RJ45 Pin	PRI PINX 1 signal	Cable cores Crossed patch cable	PRI PINX 2 signal	RJ45 Pin
1	RxA		RxA	1
2	RxB		RxB	2
3	—		—	3
4	TxA		TxA	4
5	TxB		TxB	5
6	—		—	6
7	—		—	7
8	—		—	8

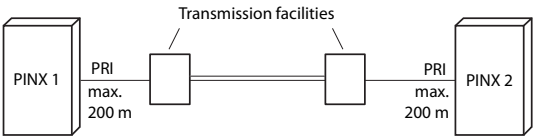


Fig. 42 Primary rate interface, networked with transmission equipment

Tab. 49 Cabling for primary rate access PRI, networked with transmission equipment

RJ45 Pin	PRI PINX 1 signal	Cable cores, straight patch cable	Transmission equipment signal		Transmission equipment signal	Cable cores Straight patch cable	PRI PINX 2 signal	RJ45 Pin
1	RxA	←	RxA		RxA	→	RxA	1
2	RxB	←	RxB		RxB	→	RxB	2
3	—						—	3
4	TxA	→	TxA		TxA	←	TxA	4
5	TxB	→	TxB		TxB	←	TxB	5
6	—						—	6
7	—						—	7
8	—						—	8

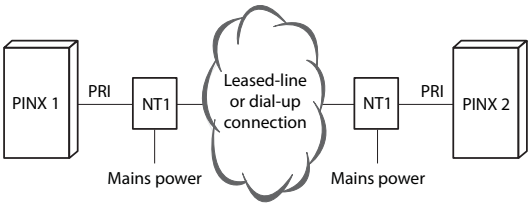


Fig. 43 Primary rate access PRI, networked with leased-line or dial-up connection

Tab. 50 Cabling for primary rate access PRI, networked with leased-line or dial-up connection

RJ45 Pin	PRI PINX 1 signal	Cable cores, straight patch cable	PRI signal NT1	Network	PRI signal NT1	Cable cores Straight patch cable	PRI PINX 2 signal	RJ45 Pin
1	RxA	←	RxA		RxA	→	RxA	1
2	RxB	←	RxB		RxB	→	RxB	2
3	—						—	3
4	TxA	→	TxA		TxA	←	TxA	4
5	TxB	→	TxB		TxB	←	TxB	5
6	—						—	6
7	—						—	7
8	—						—	8

See also:
System Manual “PISN / QSIG Networking”

4. 7. 2. 3 FXO network interfaces

Fitting the corresponding interface cards means that FXO network interfaces are available on the RJ45-sockets on the front panel of the cards. The possible RJ45 sockets are highlighted in colour in the figure below.

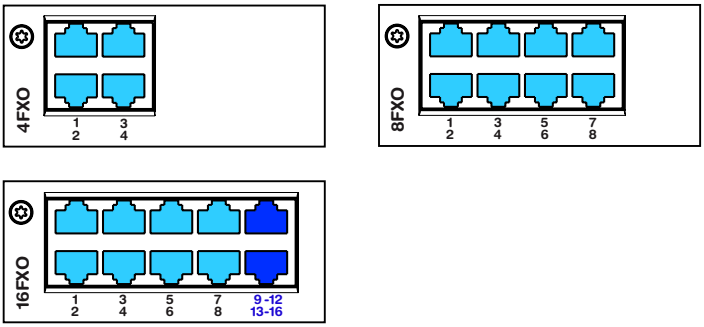


Fig. 44 Connection possibilities for FXO network interfaces

On cards with 16 interfaces RJ45 sockets 9 to 16 are multiply assigned. The signals can be split again to individual RJ45 sockets using patch cables and the fan-out

panel FOP (see "Fan-out panel FOP", page 133) or with 8-fold assigned connecting cables (see e. g. "Prefabricated system cable 4 x RJ45", page 98).

Tip
Multiply assigned RJ45 sockets are colour-coded in blue.

One call charge module can be fitted to each FXO card if required (see "Fitting call charge modules", page 95).

In a direct connection the RJ45 connector is connected directly to the trunk cable using a crimp clip.

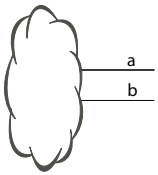
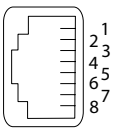
With an indirection connection you need to observe the cable requirements.

Notes
- Inadmissibly high temperatures can occur on the FXO card when connecting to local exchanges generating a very high loop current (up to 90 mA). If so, the PCB temperature monitoring deactivates the FXO ports in groups of 4 ports. If the temperature then drops, the FXO ports are automatically reactivated group by group. This behaviour can occur particularly when the ambient temperature is higher than normal and/or with a system with maximum configuration. Normally local exchanges produce a loop current of approx. 25 mA, which does not cause any restrictions.
- Circuit type as per EN/IEC 60950: TNV-3

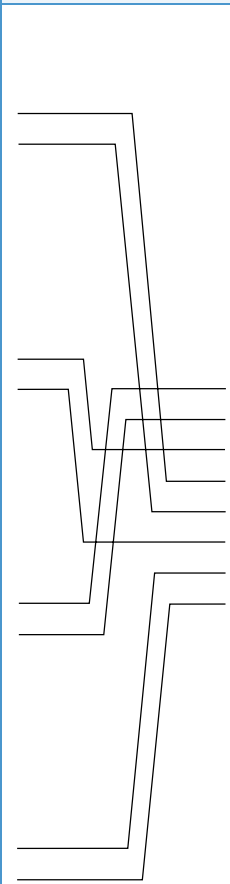
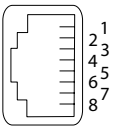
Connection

Assignment of the RJ45 sockets on the front panel:

Tab. 51 Connection FXO network interface

Public analogue network	Communication server		
	FXO signal	Pin	Socket
	–	1	
	–	2	
	–	3	
	a	4	
	b	5	
	–	6	
	–	7	
	–	8	

Tab. 52 Connection of four-fold assigned FXO network interface

Public analogue network		Splitting with fan-out panel FOP or 8-fold assigned connecting cables	Communication server		
	FXO signal		FXO signal	Pin	Socket
a b	– – – 1a 1b – – –				
a b	– – – 2a 2b – – –		3a 3b 2a 1a 1b 2b 4a 4b	1 2 3 4 5 6 7 8	
a b	– – – 3a 3b – – –				
a b	– – – 4a 4b – – –				

Cable Requirements

Tab. 53 Cable requirements for FXO network interface

Core pairs × cores	1 × 2
Stranded	not required
Wire diameter, core	0.4 … 0.8 mm
Screening	not required
Resistance	max. 2 × 250 Ω

4. 7. 3 Terminal interfaces

4. 7. 3. 1 Terminal interfaces DSI

Fitting the corresponding interface cards means that DSI terminal interfaces are available on the RJ45-sockets on the front panel of the cards. The possible RJ45 sockets are highlighted in colour in the figure below.

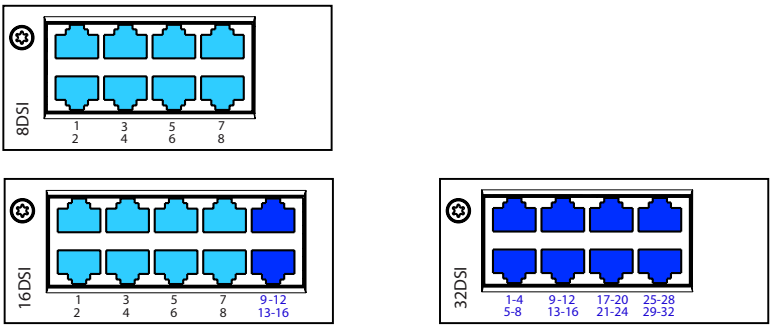


Fig. 45 Connection possibilities for DSI terminal interfaces

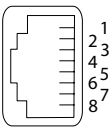
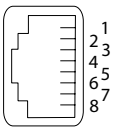
On terminal cards with 16 or more interfaces some or all of the RJ45 sockets are multiply assigned. The signals can be split again to individual RJ45 sockets using patch cables and the fan-out panel FOP (see "Fan-out panel FOP", page 133) or with 8-fold assigned connecting cables (see e. g. Prefabricated system cable 4 x RJ45).

Tip
Multiply assigned RJ45 sockets are colour-coded in blue.

Note
Circuit type as per EN/IEC 60950: SELV

Connection

Tab. 54 Connection of individually assigned DSI terminal interface

Communication server			Cable cores	Connection socket		
Socket	Pin	DSI signal		DSI signal	Pin	Socket
	1	–		–	1	
	2	–		–	2	
	3	–		–	3	
	4	a		a	4	
	5	b		b	5	
	6	–		–	6	
	7	–		–	7	
	8	–		–	8	

Tab. 55 Connection of four-fold assigned DSI terminal interface

Communication server			Splitting with fan-out panel FOP or 8-fold assigned connecting cables	Connection socket		
Socket	Pin	DSI signal		DSI signal	Pin	Socket
				–	1	
				–	2	
				–	3	
				1a	4	
				1b	5	
				–	6	
				–	7	
				–	8	
				–	1	
				–	2	
				–	3	
				2a	4	
				2b	5	
				–	6	
				–	7	
				–	8	
				–	1	
				–	2	
				–	3	
				3a	4	
				3b	5	
				–	6	
				–	7	
				–	8	
				–	1	
				–	2	
				–	3	
				4a	4	
				4b	5	
				–	6	
				–	7	
				–	8	
	1	3a				
	2	3b				
	3	2a				
	4	1a				
	5	1b				
	6	2b				
	7	4a				
	8	4b				

DSI bus configuration

For each DSI interface card, the *interface type* (protocol) on the DSI bus can be selected under CM_2.1.1 in AMS:

- *DSI-AD2*:
  For system phones of the Aastra 5300[1)] series and for SB-4+ and SB-8 DECT radio units.
- *DSI-DASL*: For system phones of the Dialog 4200 series.

Depending on the line length 1 or 2 phones can be connected on each DSI-AD2 interface. The following requirements apply with regard to the bus length to ensure that the maximum permissible signal delay is not exceeded:

Tab. 56 DSI-AD2 bus length and number of phones

Number of phones	Total length of DSI-AD2 bus	Distance between the 1st and 2nd connection point (excl. connection cable)
1	A: max. 1200 m	–
2	B: max. 1200 m	C: max. 10 m

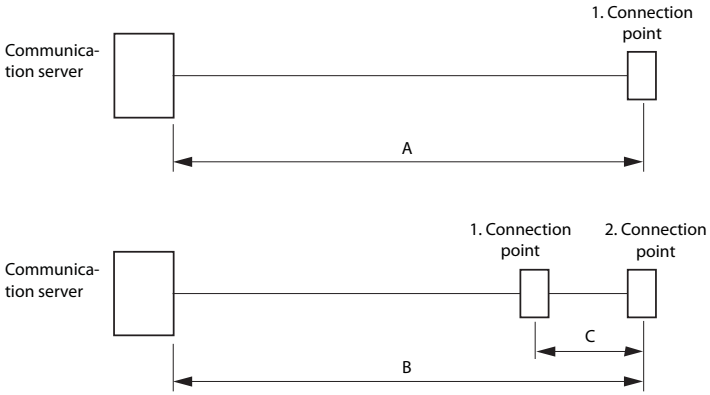


Fig. 46 DSI-AD2 bus

Notes

- The total length of the cables from the communication server to the system phone must not be less than 10 m.
- Only one system phone and only one phone of the Dialog 4200 series can be operated on each DSI-DASL interface. The maximum line length for a 0.5 mm wire diameter is set at 1000 m.

1) Office 10, Office 25, Office 35, Office 45/45pro are supported as before

Restrictions

The maximum length of an DSI-AD2 bus is further restricted by:

- the maximum power requirements of the connected system phones and their supplementary equipment. In this context the SB-4+ and SB-8 DECT radio units are also considered as system phones.
- the line resistance (depending on the line length and wire diameter)

Tab. 57 Maximal power requirements of the system phones on the DSI bus

System phone [1]	Connection	Max. power input [mW]
Aastra 5360 [2]	DSI-AD2 interface	900
Aastra 5361	DSI-AD2 interface	1220 [3]
Aastra 5370	DSI-AD2 interface	1220 [3]
Aastra 5380	DSI-AD2 interface	1340 [3]
Aastra 5370, Aastra 5380 with power supply unit	DSI-AD2 interface	0
Expansion key module Aastra M530	Aastra 5370	300
Expansion key module Aastra M530	Aastra 5380	500
Expansion key module Aastra M535	Aastra 5370, Aastra 5380	0 [4]
Dialog 4220	DSI-DASL interface	500
Dialog 4222	DSI-DASL interface	660
Dialog 4223	DSI-DASL interface	680
EKP expansion key module	Dialog 4222, Dialog 4223	190
DECT radio unit without power supply unit SB-4+	DSI-AD2 interface	1700 [5]
DECT radio unit without power supply unit SB-8	2 DSI-AD2 interfaces	1550 [6]
DECT radio unit with power supply unit SB-4+/SB-8	1 or 2 DSI-AD2 interfaces	< 100
Office 10 [2]	DSI-AD2 interface	900
Office 25 [2]	DSI-AD2 interface	900
Office 35 [2]	DSI-AD2 interface	630 [7]
Office 45 [2]	DSI-AD2 interface	1110 [7]
Office 45pro with power supply unit [2]	DSI-AD2 interface	< 10
Expansion key module (EKP) [2]	Office 35	150
Expansion key module (EKP) [2]	Office 45	210
Alpha keyboard [2]	Office 35, Office 45	30

[1] Assumptions:
System phones: In hands-free mode, loudspeaker on maximum volume, all LEDs lit
Aastra 5380: Backlighting with maximum brightness
Expansion key modules: All LEDs lit
Radio units: Active call connection on all channels

[2] Although no longer available, the phone is still supported.

[3] The value can increase to approx. 600 mW if the power available at the DSI-AD2 bus allows it.

[4] An Aastra M535 always requires a power supply unit

5) The value applies to radio units with hardware version "-2". The value for hardware version "-1" is 300 mW lower.

6) The value applies to each interface and to radio units with hardware version "-2". The value per interface for radio units with hardware version "-1" is 150 mW lower.

7) The value applies to phones with hardware version "-2". The value for phones with hardware version "-1" is 60 mW lower.

The two diagrams below show the power available on the DSI-AD2 bus in relation to the line length and the wire diameter. The table can then be used to determine the number and type of system phones that can be connected to the DSI-AD2 bus under the given conditions. The power available can be calculated by measuring the loop resistance where the wire diameter is known.

Due to the different hardware versions of the radio units, the power available on the DSI-AD2 bus is not the same in every case:

Power available A:

- Applies to all the system phones of the Aastra 5300 series and the Office series.
- Applies to the SB-4+/SB-8 DECT radio units with hardware version "-1".

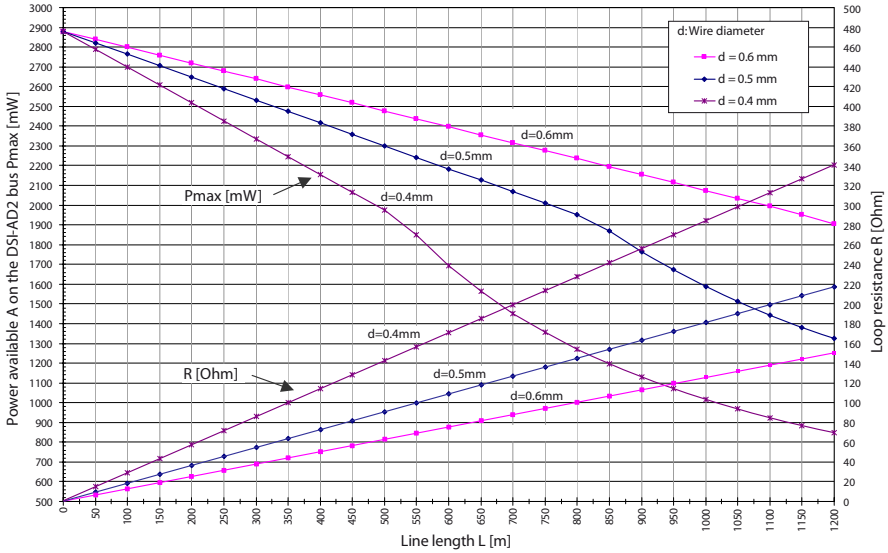


Fig. 47 Power available A on the DSI-AD2 bus

Power available B:

Applies to the SB-4+/SB-8 DECT radio units with hardware version "-2" and system phones of the Dialog 4200 series.

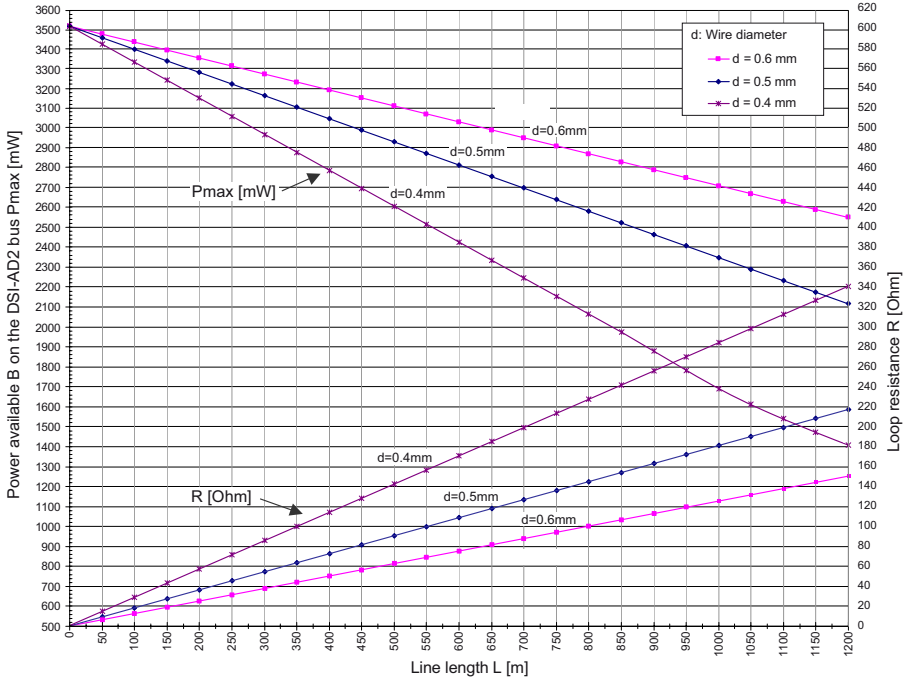


Fig. 48 Power available B on the DSI-AD2 bus

Notes

- If another system phone is operated on the DSI-AD2 bus in addition to an Aastra 5361, Aastra 5370 or Aastra 5380, at least one phone must be powered by a local power supply unit.
- An Aastra 5370 or Aastra 5380 with an Aastra M535 expansion key module always requires a power supply unit.
- An Aastra 5380 with 3 Aastra M530 expansion key modules always requires a power supply unit. With 2 expansion key modules the use of power supply unit depends on the line length and the line cross-section.

Automatic detection of critical power supply situations

Only Aastra 5360, and phones of the Office series:

When a system phone (or a second such phone) is connected to the DSI bus, the maximum power input is automatically determined; all the system phones (incl. expansion key module and alphanumerical keyboard) connected to the interface are taken into account. The maximum power available is also determined based on the calculated line length (assumption: Diameter = 0.5 mm). If the calculated power available is below the maximum possible power input of the connected system phones, the message "*Power supply critical xy* " is generated on the phones connected last (accuracy approx. 150 m).

System phones Aastra 5361, Aastra 5370 and Aastra 5380 only:
During startup, these system phones carry out a detailed measurement of the available power. A warning is shown on the display if the result is inadequate: *Line power too weak: External power supply required!*

Notes

- Depending on the power available based on the line length on the DSI-AD2 bus the ringing and hands-free volume decreases accordingly.
- The backlighting of the Aastra 5380 display is brighter if the phone is powered by a power supply unit.

Rating examples

Example 1:

Aastra 5370
Maximal power requirements as per Tab. 57: 1220 mW

Fig. 47 indicates:

- Maximum line length for a wire diameter of 0.4 mm: 840 m
- Maximum line length for a wire diameter of 0.5 mm: 1200 m
- Maximum line length for a wire diameter of 0,6 mm: 1200 m

Example 2:

An Aastra 5380 with 2 Aastra M530 expansion key modules
Power requirements as per Tab. 57: 1340 + 300 + 300 = 1940 mW.

Fig. 47 indicates:

- Maximum line length for a wire diameter of 0.4 mm: 520 m

- Maximum line length for a wire diameter of 0.5 mm: 820 m
- Maximum line length for a wire diameter of 0,6 mm: 1170 m

Example 3:

Evaluation of an existing line installation
Line diameter: 0.5 mm
Loop resistance: 120 Ω

Fig. 47 indicates:

- Line length: 660 m
- Power available: 2120 mW

Cable Requirements

Tab. 58 Requirements for an DSI bus cable

Core pairs × cores	1 × 2 or 1 × 4
Stranded	yes[1)]
Wire diameter, core	0.4…0.6 mm
Screening	recommended
Characteristic impedance	< 130 Ω (1 MHz)

1) Note: max. 25 m can be crossed unstranded.
(CH: Applies also to cable type G51)

Installation rules

- If an Aastra DECT radio unit is used, do not connect any other system phone to the same DSI bus.
- If *Interface type* is configured to *DSI-DASL*, only connect one system phone or one phone of the Dialog 4200 series to the DSI bus.
- Do not use any terminating resistors at the bus extremity.
- Avoid using different cable cross-sections on the same bus
- Use the supplied cables for connecting the system phones
- Cabling of AD2 terminals is restricted to pairs of a separate dedicated cable(s).[1)].

1) Applies in Australia only

Terminals

The following system terminals can be operated on the DSI-AD2 bus:

- System phones of the Aastra 5300[1)] series
- Aastra DECT Radio units

The system phones on an DSI-AD2 bus are addressed via a single-digit terminal selection digit (TSD).

Example:
The address of a system phone with TSD 2 on DSI interface 3.5 is 3.5-2.

Only system phones of the Dialog 4200 series can be operated on a DSI-DASL bus.

4. 7. 3. 2 BRI-S terminal interfaces

Fitting the corresponding interface cards means that BRI-S terminal interfaces are available on the RJ45-sockets on the front panel of the cards. The possible RJ45 sockets are highlighted in colour in the figure below.

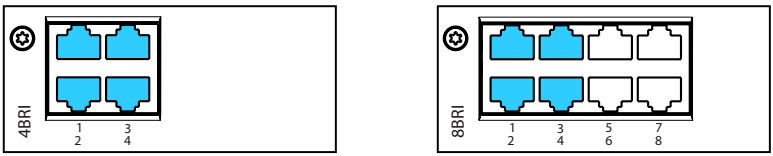


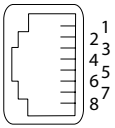
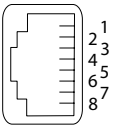
Fig. 49 Connection possibilities for BRI-S terminal interfaces

Note
With the 8BRI card, only the interfaces of sockets 1 to 4 are available for BRI-S terminal interfaces. The interfaces of sockets 5 to 8 are permanently configured to BRI-T.

[1)] Office 10, Office 25, Office 35, Office 45/45pro are supported as before

Connection

Tab. 59 Connection of BRI-S terminal interfaces

Communication server			Cable cores	Connection socket		
Socket	Pin	BRI-S signal		BRI-S signal	Pin	Socket
	1	–		–	1	
	2	–		–	2	
	3	c	←	c	3	
	4	f	→	f	4	
	5	e	→	e	5	
	6	d	←	d	6	
	7	–		–	7	
	8	–		–	8	

S bus configuration

The S bus is a four-wire, serial ISDN bus based on the DSS1 protocol (ETSI standard). It starts in each case at an BRI-S interface of the communication server. Four bus configurations are possible, depending on the line length and the number of terminals:

Tab. 60 S bus configurations depending on line length and the number of terminals.

S bus	Short	Short, V-shaped	Long	Point-to-point
Length (max.) Server ↔ terminal Terminal 1 ↔ Terminal 4	 150 m –	 2 × 150 m –	 500 m 20 m	 1'000 m –
Number of terminals (max.)	8	8	4	1

Note

The maximum number of terminals per S bus depends on the power requirements of the terminals (see "Restrictions", page 123).

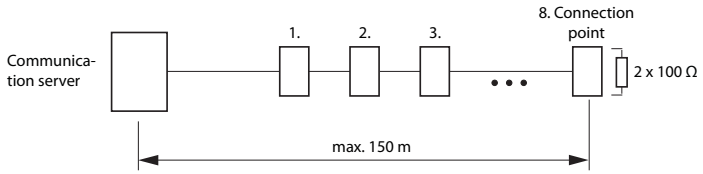


Fig. 50 S bus, short

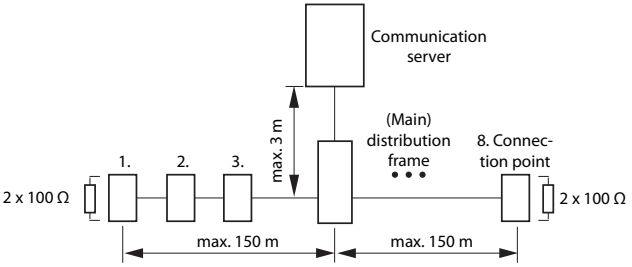


Fig. 51 S bus, short, V-shaped

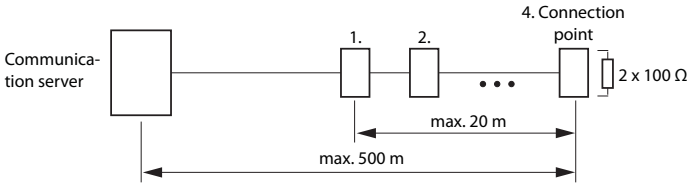


Fig. 52 S bus, long

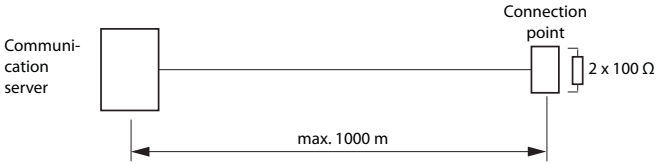


Fig. 53 S bus, point-to-point

Greater distances (up to 8 km) can be achieved using a standard commercial S bus extension.

Restrictions

The maximum number of terminals per S bus is further restricted by the power requirements of the terminals and their supplementary equipment:

Tab. 61 Power balance on the S bus

	Power available [W]
S bus short	5 [1)]
S bus, long	3.5 [1)]

1) These values are based on a wire diameter of 0.5 mm.

The number of terminals is the sum of the power requirements of the individual terminals and the power available on the S bus.

Connection sockets

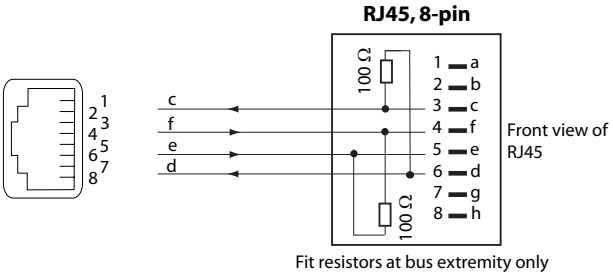


Fig. 54 RJ45 connection, single socket

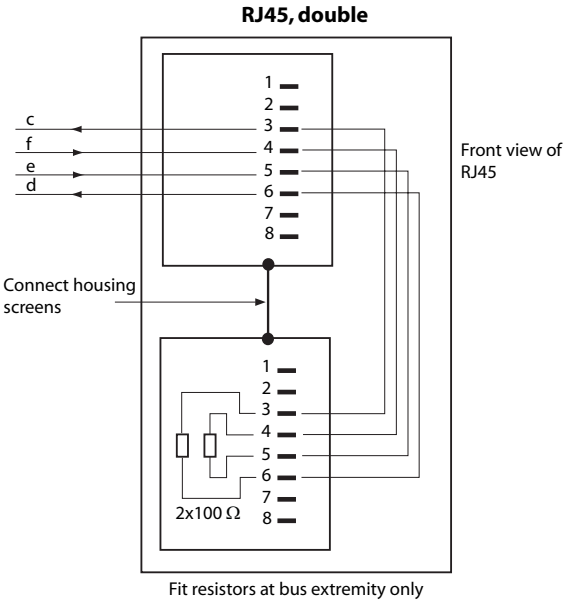


Fig. 55 RJ45 connection, double socket

Installation rules

Always terminate the bus extremity with 2 × 100 Ω (0.25 W, 5%)!

Note
Circuit type as per EN/IEC 60950: SELV

Cable Requirements

Tab. 62 Requirements for an S bus cable

Core pairs × cores Stranded Wire diameter, core Screening	1 × 4 or 2 × 2 yes 0.4…0.6 mm recommended
Ohmic resistance Characteristic impedance Wave attenuation Near / crosstalk attenuation	< 98 Ω/km (conductor), < 196 Ω/km (loop) < 125 Ω (100 kHz), < 115 Ω (1 MHz) < 6 dB/km (100 kHz), < 26 dB/km (1 MHz) > 54 dB/100 m (1 kHz to 1 MHz)

Terminals

The ETSI protocol must be set in the interface configuration.

Up to 8 terminals of different types can be connected to one S bus.

- Standard ISDN terminals
- ISDN Terminal Adapter
- PC with ISDN card
- Group 4 fax machines[1)], etc.

Two call connections are possible simultaneously for each S bus.

4. 7. 3. 3 FXS terminal interfaces

The Call Manager card CPU1 already contains 4 FXS terminal interfaces, which are routed through to the front panel of the card and labelled accordingly. The number of available FXS terminal interfaces can be increased by fitting interface cards. The RJ45 connector assignment is identical. The possible RJ45 sockets are highlighted in colour in the figure below.

1) Not possible within an AIN

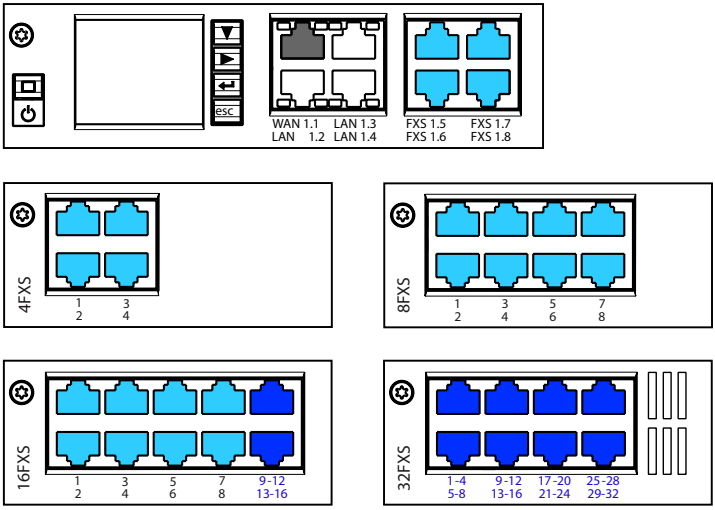


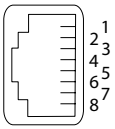
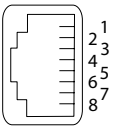
Fig. 56 Connection possibilities for FXS terminal interfaces

On terminal cards with 16 or more interfaces some or all of the RJ45 sockets are multiply assigned. The signals can be split again to individual RJ45 sockets using patch cables and the fan-out panel FOP (see "Fan-out panel FOP", page 133) or with 8-fold assigned connecting cables (see e. g. "Prefabricated system cable 4 x RJ45", page 98).

Tip
Multiply assigned RJ45 sockets are colour-coded in blue.

Connection

Tab. 63 Connection of individually assigned FXS terminal interface

Communication server			Cable cores	Connection socket		
Socket	Pin	Analogue signal		Analogue signal	Pin	Socket
	1	–		–	1	
	2	–		–	2	
	3	–		–	3	
	4	a		a	4	
	5	b		b	5	
	6	–		–	6	
	7	–		–	7	
	8	–		–	8	

Tab. 64 Connection of four-fold assigned FXS terminal interface

Communication server			Splitting with fan-out panel FOP or 8-fold assigned connecting cables	Connection socket		
Socket	Pin	Analogue signal		Analogue signal	Pin	Socket
				–	1	
				–	2	
				–	3	
				1a	4	
				1b	5	
				–	6	
				–	7	
				–	8	
				–	1	
				–	2	
				–	3	
				2a	4	
				2b	5	
				–	6	
				–	7	
				–	8	
	1	3a		–	1	
	2	3b		–	2	
	3	2a		–	3	
	4	1a		3a	4	
	5	1b		3b	5	
	6	2b		–	6	
	7	4a		–	7	
	8	4b		–	8	
				–	1	
				–	2	
				–	3	
				4a	4	
				4b	5	
				–	6	
				–	7	
				–	8	

Multifunctional FXS interfaces

The analogue interfaces of the FX cards are multifunctional. Depending on the terminal or function they are configured individually in the *Interface configuration* using AMS and switched over internally accordingly.

Tab. 65 Mode of the FXS interfaces

FXS mode	Connection
Phone/fax	Analogue DTMF and pulse dialling terminals such as phones, fax, modem, answering machines, etc.
Two-wire door	Analogue two-wire door intercom
External audio source	Audio interface for connecting playback equipment with line output.
Control output	Ports for switching external equipment.
Control input	Ports for switching internal switch groups.
General Bell	Commercial auxiliary bells

After a first start all the FXS interfaces are configured on *Phone/fax*.

Warning
Terminals connected to FXS interfaces can be damaged if the configuration of the FXS interface mode is unsuitable.

Note
Circuit type as per EN/IEC 60950: TNV-2

FXS mode: Phone/fax

In this mode the following analogue terminals can be connected:

- Analogue phones with DTMF or pulse dialling (earth key is not supported)
- Radio units for cordless phones
- Group 3 fax machines[1)]
- Answering machines
- Modem

[1)] Transmission with the T.38 protocol is recommended for Fax over IP. The corresponding DSP resources need to be allocated.

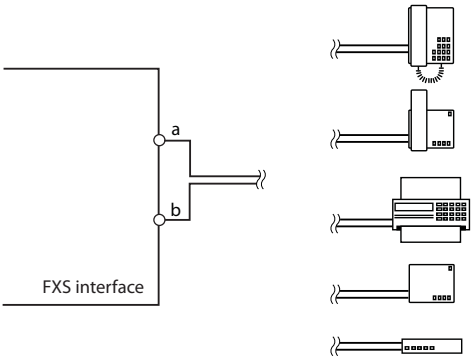


Fig. 57 Connection for FXS mode: Phone/fax

Ports 1.5 and 1.6 on the call manager card and in each case the first two ports of FXS cards (X.1 and X.2) are designed for long lines. The no-load voltage at these ports is 51 VDC. All the other ports have a no-load voltage of 30 VDC. The loop current is limited to 25 mA on all ports.

Tab. 66 Cable requirements for FXS mode: Phone/fax

	Ports for long lines	Normal ports
Core pairs × cores	1 × 2	1 × 2
Stranded	only for lengths > 200 m	only for lengths > 200 m
Wire diameter, core	0.4 … 0.8 mm	0.4 … 0.8 mm
FXS resistance	max. 2 × 625 Ω	max. 2 × 250 Ω
Line length for a wire diameter of 0.6 mm	max. 10 km	max. 4 km
Screening	not required	not required

FXS mode: Two-wire door

In this mode two-wire door intercoms with DTMF control functions can be connected. The no-load voltage in this mode is 24 VDC. The loop current is limited to 25 mA.

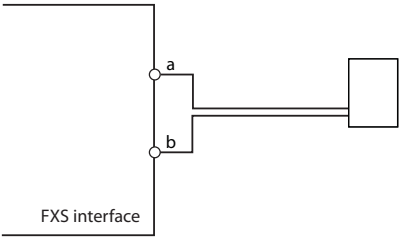


Fig. 58 Connection for FXS mode: Two-wire door

Tab. 67 Cable requirements for FXS mode: Two-wire door

Core pairs × cores	1 × 2
Stranded	only for lengths > 200 m
Wire diameter, core	0.4 … 0.8 mm
FXS resistance	max. 2 × 200 Ω
Line length for a wire diameter of 0.6 mm	max. 3 km
Screening	not required

FXS mode: External audio source

One FXS interface per communication server can be configured for the connection of audio equipment. In this mode the FXS interface becomes an audio input that can be used for the following purposes:

- to play music or an announcement to connections with callers on hold ("Music on hold" function).
- to play music or an announcement for the announcement service (announcement prior to answering), voice mail greetings or for "Music on hold" and then to store it as a wave file.

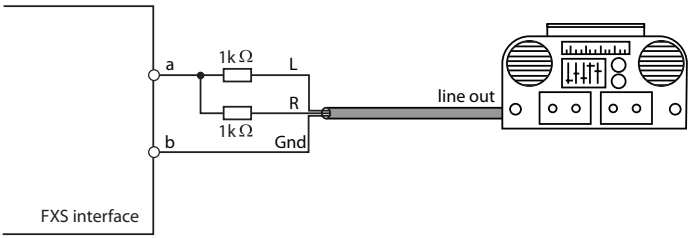


Fig. 59 Connection for FXS mode: External audio source

Any playback equipment (tape recorder, CD player, etc.) with a line output can be used as the audio source. It is advisable to merge the left/right audio signal via 2 resistors (see Fig. 59).

Warning
The default value of all FXS interfaces is configured to *Phone/fax* . Audio equipment may be damaged by the DC or AC voltage imposed.
Make sure that the mode of the FXS interface is configured to External audio source before connecting audio equipment.

Note:
The customer is responsible for all copyright matters relating to any music playback.

Tab. 68 Technical data for FXS mode: External audio source

Input impedance	approx. 15 kΩ
Input level	configurable in AMS
Input circuit	asymmetrical
Output resistance audio source	< 1 kΩ
Installation cable	NF cable screened (required for low levels)

FXS mode: Control output

If an FXS interface is configured as a control output, the signal can be used to control external devices or equipment (e. g. heating system, alarm system or outdoor lighting system).

The no-load voltage is 24 VDC; the current is limited to 25 mA. A connected relay must be of the type 24 VDC and must not draw more than 300 mW in power.

There are no special requirements for the cables.

Warning
Control outputs must have a floating connection.

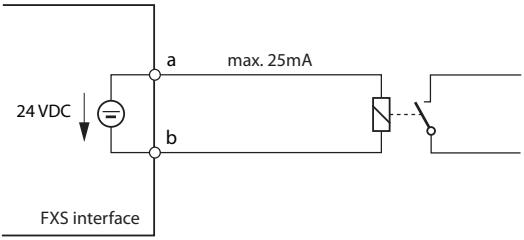


Fig. 60 Connection for FXS mode: Control output

FXS mode: Control input

If FXS interfaces are configured as control inputs, one or more of the switch groups 1...20 can be switched between position 1, 2 and 3. An external switch or a relay is connected for this purpose. An LED can be connected to the circuit to indicate the switch state. The no-load voltage is 24 VDC; the current is limited to 25mA.

The permissible switch and loop resistances are as follows:

- Active state (On): < 1 kΩ
- Passive state (Off): > 4 kΩ

There are no special requirements for the cables.

Warning
Control inputs must have a floating connection.

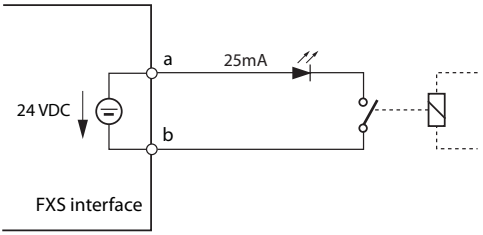


Fig. 61 Connection for FXS mode: Control input

In the switch group configuration in AMS the ports are assigned to the control inputs of a switch group. To be able to control all 3 switch positions of a switch group, you need 2 control inputs which switch the switch position of the switch group depending on the status.

Tab. 69 Switch group control via the control inputs

FXS control input 1	*FXS control input 2*	Switch positions of the switch group
Off	Off	Position 1
On	Off	Position 2
Random	On	Position 3

Other conditions:

- The same control inputs can control one or more switch groups.
- The same switch group can only be switched by the 2 assigned control inputs.
- Control of the switch groups using the control inputs takes priority over control using function codes.

FXS mode: General Bell

One FXS interface per communication server can be configured for the connection of a general bell. It is possible to use commercial auxiliary bells designed for connection in parallel to analogue terminals as a general bell. However the impedance of the connected general bell (or total impedance in the case of several devices connected in parallel) must not fall below 1 kΩ. The ringing voltage is 48 VAC. An 48 V AC relay must be interposed if connecting a large number of auxiliary bells.

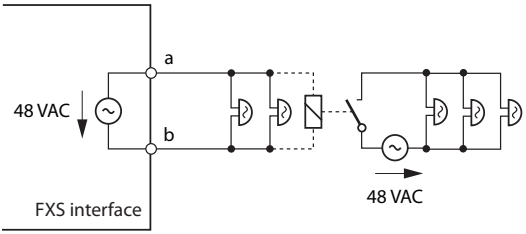


Fig. 62 Connection for FXS mode: General Bell

See also
"General bell on FXS interface" in the "System Functions and Features" System Manual.

4. 7. 4 Fan-out panel FOP

All interface cards with 16 or more interfaces have four-fold assigned RJ45 sockets. With the fan-out panel FOP a total of 10 four-fold assigned RJ45 sockets can be split to individual RJ45 sockets.

The fan-out panel (FOP) takes up the space of one height unit in a rack and can be fitted directly above or below the communication server.

Fan-out panels can also be offset, e. g. as floor distributors.

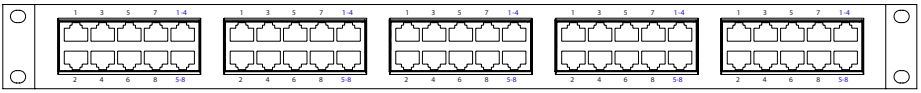


Fig. 63 Fan-out panel FOP

The diagram below shows the connection of an interface card 16DSI with terminals. This card has 2 four-fold assigned RJ45 sockets. The 8 individually assigned RJ45 sockets are connected directly while the 2 four-fold assigned sockets are looped via the front panel of the fan-out-panel connector (FOP) strip using 2 patch cables.

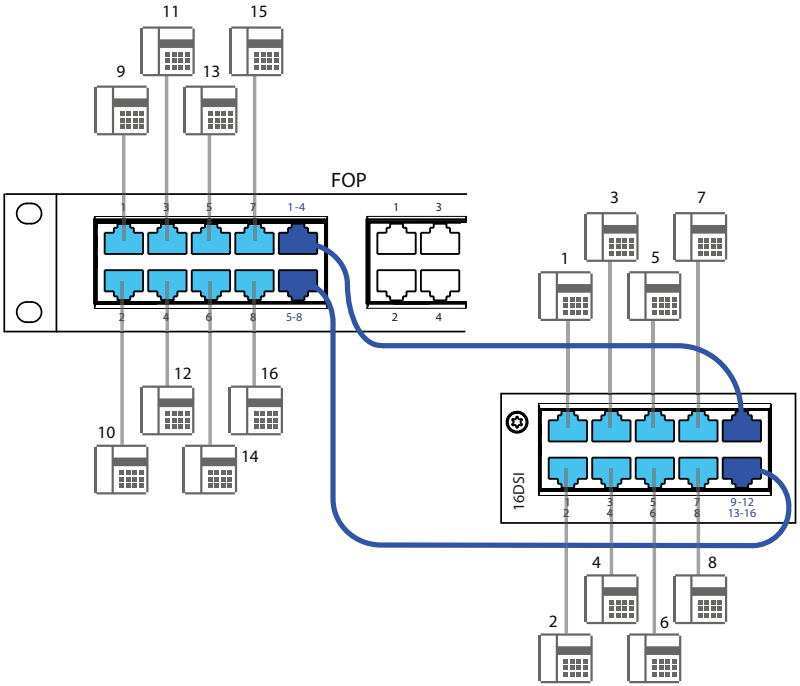


Fig. 64 Connection of four-fold assigned sockets via FOP connector strip

The blue patch cables are available separately in lengths of 1 and 2 m (see "Equipment Overview", page 237).

The internal wiring of the fan-out panel is shown in the table below. The wiring is shown for sockets 1 - 4. Sockets 5 - 8 are wired accordingly.

Tab. 70 Wiring of sockets 1–4 in the fan-out panel FOP

Fan-out panel FOP			Internal wiring	Fan-out panel FOP		
Socket	Pin	Signal		Signal	Pin	Socket
				–	1	1
				–	2	
				–	3	
				1a	4	
				1b	5	
				–	6	
				–	7	
				–	8	
				–	1	2
				–	2	
				–	3	
				2a	4	
				2b	5	
				–	6	
				–	7	
				–	8	
1–4	1	3a		–	1	3
	2	3b		–	2	
	3	2a		–	3	
	4	1a		3a	4	
	5	1b		3b	5	
	6	2b		–	6	
	7	4a		–	7	
	8	4b		–	8	
				–	1	4
				–	2	
				–	3	
				4a	4	
				4b	5	
				–	6	
				–	7	
				–	8	

Warning

If analogue trunk lines (FXO interfaces) are to be routed via the fan-out panel FOP, for safety reasons the fan-out panel must be connected to the protective earth (see Fig. 65).

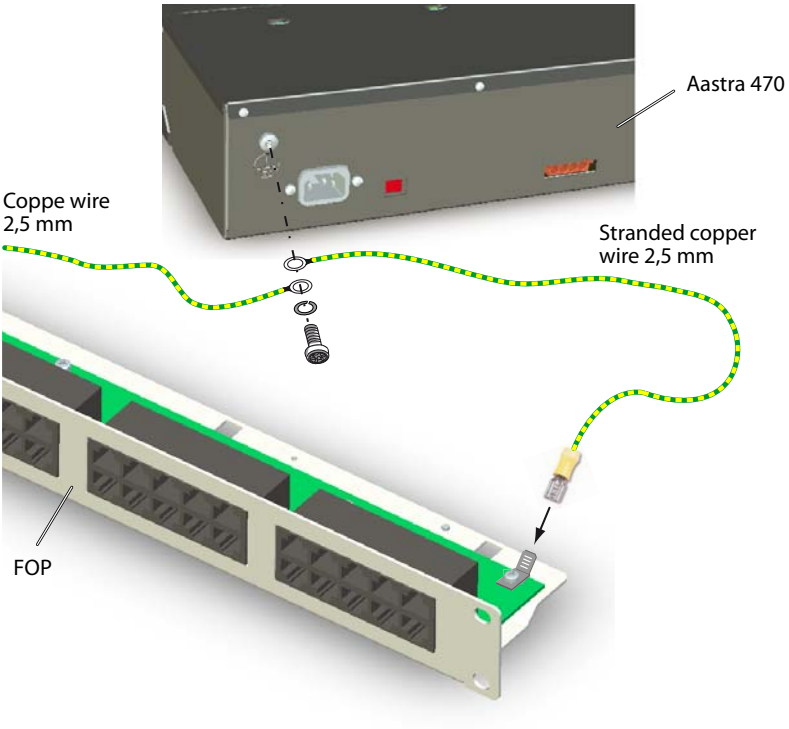


Fig. 65 Connection of the FOP fan-out-panel to the protective earth

4. 7. 5 Ethernet interfaces

The communication server Aastra 470 has a Gbit Ethernet switch on the call manager card. Three LAN interfaces are routed to the front panel of the call manager card and labelled accordingly. The RJ45 sockets are highlighted in colour in the figure below.

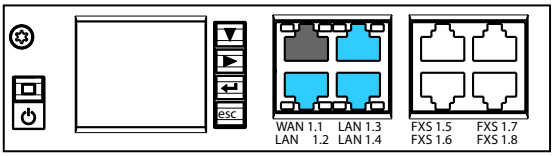
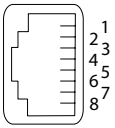


Fig. 66 Connection possibilities for Ethernet interfaces

Note
Circuit type as per EN/IEC 60950: SELV

Connection

Tab. 71 Connection of Ethernet interfaces

RJ45 socket	Pin	Signal
	1	TX D1+
	2	TX D1–
	3	RX D2+
	4	BI D3+
	5	BI D3–
	6	RX D2–
	7	BI D4+
	8	BI D4–

Settings

The IP address can either be taken from a DHCP server in the IP network or configured statically. If a DNS server is used, the communication server can also be addressed via its host name.

Tab. 72 Default values, IP address

Parameter	Parameter value
IP address	192.168.104.13
Subnet mask	255.255.255.0
Gateway	0.0.0.0
DHCP	*Yes*
Host name	*<Model name>-<MAC address>*[1)] Example: Aastra430-00085d803100

1) This entry is hidden and does not appear in the parameter's input field

First-start response

The IP addressing after a first start depends on whether a static IP addressing is already stored on the EIM card from a previous configuration. A static IP addressing (IP address, subnet mask, gateway) entered manually is stored on the EIM card and remains available after a first start. This means that the communication server remains accessible via Ethernet interface in the same way as before the first start.

If no IP addressing is entered on the EIM card (e. g. after initial delivery), the communication server is started with DHCP after a first start. The communication server tries to log on with the DHCP server and to enter its host name on the DNS server. If logon is successful the communication server is accessible via the host name. If the

logon to the DHCP server fails, the communication server deactivates DHCP temporarily and can be accessed via the static default value address. The communication server is then accessible with a direct connection via the IP address.

Note:
DHCP is deactivated only temporarily and is reactivated after a subsequent restart.

Cable types

The Ethernet switch on the communications server features Auto MDI/MDIX. With the automatic detection straight or crossover LAN cables can be used for all connection types.

Configuration

On theAMS Configuration Manager the Ethernet interfaces routed to the front panel can be configured individually. The following settings are possible:

Tab. 73 Configuration possibilities for Ethernet interfaces

Parameter	Parameter value
Speed/mode	<*Automatic*, *1G/full-duplex*, *100M/full-duplex*, *100M/half-duplex*, *10M/full-duplex*, *10M/half-duplex*>
MDI	<*Auto MDI/MDIX*, *MDI (straight)*, *MDIX (crossed*>

Status LED

The status of the Ethernet interfaces is indicated by the green and yellow LEDs directly on the interface in question.

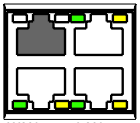


Fig. 67 Status LED on the Ethernet interfaces

Tab. 74 Status LED on the Ethernet interfaces

Green LED	Yellow LED	Rate	State
On	On	10 Mbit/s	Port has a connection with the network
flashing	flashing	10 Mbit/s	Port is receiving or sending data
On	Off	100 Mbit/s	Port has a connection with the network
flashing	Off	100 Mbit/s	Port is receiving or sending data
Off	On	1 Gbit/s	Port has a connection with the network
Off	flashing	1 Gbit/s	Port is receiving or sending data

Cable requirements

Use commercial Cat. 5 cable, or choose a cable type with the following characteristics:

Tab. 75 Requirements for an Ethernet cable

Core pairs × cores	4 × 2
Stranded	yes
Wire diameter, core	0.4...0.6 mm
Screening	yes
Category	Cat. 5 minimum

4. 8 Installing, powering and connecting terminals

4. 8. 1 Digital system phones

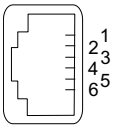
4. 8. 1. 1 General information

Accesses

The connections on the underside of the system phones are identified by the symbols. The meaning of the symbols is described in the corresponding operating instructions.

DSI terminal interface

Tab. 76 DSI interface on the phone

RJ45 socket	Pin	Signal
	1	—
	2	—
	3	b
	4	a
	5	—
	6	—

Note:
The total length of the cables from the communication server to the system phone must not be less than 10 m.

Terminal selection

Two system phones can be connected to a DSI interface (DSI-AD2 only). The system can only differentiate the two system phones by the position of the address switch on the phone. The following settings are possible (TSD = Terminal Selection Digit):

- TSD1
- TSD2

Note:
In the following cases *Not Configured* is displayed along with the node number, the slot number and the port number. In this state the system phone is not ready for operation:

- A terminal has been created at the connected port, but the address selection switch is incorrectly set.
- No terminal has yet been created at the connected port.

User allocation

In the configuration each terminal is assigned to a user or a free seating pool. If a terminal has been created at the connected port and the address selection switch is correctly selected but no user or free seating pool is allocated to the terminal, the system phone display reads *No Number* and indicates the terminal ID. In this state the system phone is not ready for operation.

Terminal type

The terminal type is specified along with the configuration of the system. when the lines are also assigned to the line keys.

Note:
If the terminal type configured is incorrect, the system phone display shows the warning *Wrong phone type*. On the Office 10 the LED flashes slowly. In this situation, although the system phone can be used for basic telephone operations, none of the added features will be available. The terminal type must be entered via the AMS Configuration Manager or on the terminal via login to the system configuration.

Carrying out a logon on the system phone:

– Office 10: Press the Foxkey twice.

– All other system phones: Long keypress (long click) on a function key. *Set new phone type* appears next. Confirm with Foxkey *Yes*.

4. 8. 1. 2 Aastra 5360/5361/5370/5380

These IP system phones can be both desktop-mounted and wall-mounted.

Mounting the phone

The following points are described in detail in the User's Guides for Aastra 5360/ 5361/5370/5380:

- Set-up as a desk phone (choice of two different set-up angles)
- Wall mounting
- Connecting one or more Aastra M530 or Aastra M535 expansion key modules.
- Connection of a headset to DHSG standard.

Note:
To prevent any damage to the phone, always disconnect the phone from the power supply first before connecting a headset to DHSG standard.

Mounting the Bluetooth module

The Aastra 5380 can also be equipped with a Bluetooth module as an option. To install (see Fig. 68), proceed as follows:

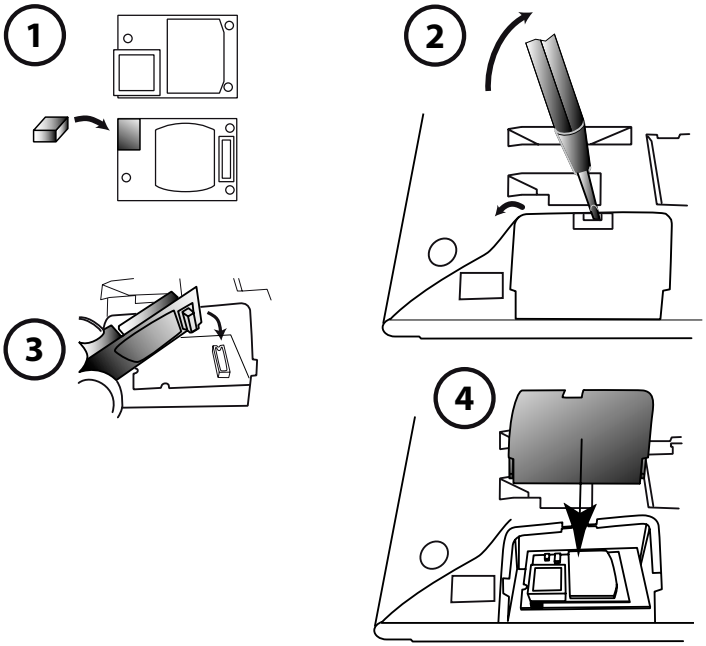


Fig. 68 Assembly of the Bluetooth module

Warning
The system's reliability can be adversely affected by electrostatic discharges caused by touching electronic components and elements, and subsequent damage can result. Always observe the ESD guidelines.

1. Fit foam spacers on the connector side of the Bluetooth module (for the position of the foam spacer see ①). The spacer ensures that the Bluetooth module sits securely.
2. Carefully remove the cover for the Bluetooth module on the underside of the phone using a suitable screwdriver (see ②).
3. Connect the Bluetooth module. Make sure it is securely fitted (see ③).
4. Fit the cover for the Bluetooth module back into place and press home until it snaps into place (see ④).

Powering the phone

The Aastra 5360, Aastra 5361 Aastra 5370 and Aastra 5380 system phones are normally powered via the DSI bus. However there are several reasons that require powering with a plug-in power supply:

- Long line
- 2 phones on the same bus
- 1 or more expansion key modules on the phone
- Terminal power supply of the communication server is overloaded

Only use the corresponding plug-in power supply unit with FCC connector available as an option. It is connected either to the phone itself or, when using one or more expansion key modules, on the last expansion key module.

See also
The power available on the DSI bus depending on the line length and the wire diameter, and the power input of the system phones are described in the chapter "Terminal interfaces DSI", page 113.

Connecting the phone

1. Setting the DSI bus address on the system phone's underside:
   - TSD1 = address switch on position 1
   - TSD2 = address switch on position 2
2. Plug the connector into the socket-outlet.
3. If the system is configured, test the operation of the system phone.
4. Label the phone as indicated in the operating instructions.

4. 8. 1. 3 Office 25, Office 35, and Office 45/45pro

These system phones are desktop models. A wall-mounted bracket is available as an option for Office 25 and Office 35.

Mounting the desktop model

Connect the handset cord and the phone cord to the phone as indicated in the operating instructions.

Installing the wall-mounted bracket (optional)

The wall assembly set consists of a baseplate, a wall plate and fastening screws (see Fig. 69).

1. Secure the wall plate to the wall using the three longer screws. Feed the cord through the middle opening on the wall plate (see ①).
2. Remove the 4 plastic feet on the underside of the phone (see ②).
3. Secure the baseplate of the wall assembly set to the underside of the terminal using the 2 shorter screws (see ③).
4. Suspend the baseplate with the phone onto the wall plate from above (see ④) and tilt downwards until it snaps into place (see ⑤).
5. Plug the phone cord into the phone (see ⑥).

Powering the phone

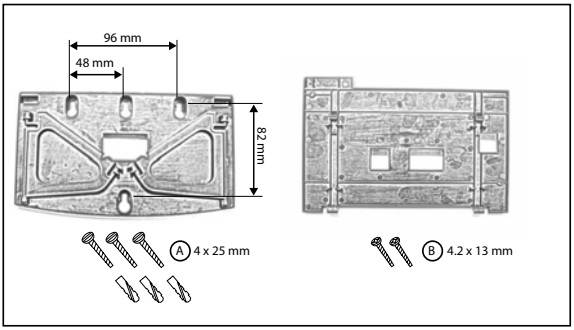
The system phones Office 25, Office 35, and Office 45 are powered via the DSI line. The system phones Office 45pro need to be powered externally with a plug-in power supply. Only use the corresponding plug-in power supply unit with FCC connector.

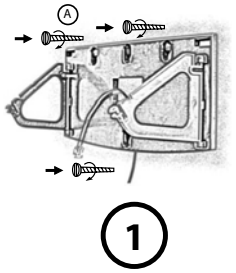
Connecting the phone

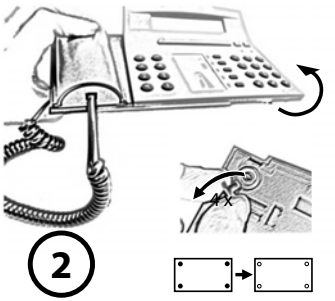
1. Set the DSIbus address under the system phone's designation label.
   - TSD1 = Address switch not pressed (disengaged)
   - TSD2 = Address switch pressed (engaged)
2. Plug the connector into the socket-outlet.
3. If the system is configured, test the operation of the system phone.
4. Label the phone as indicated in the operating instructions.

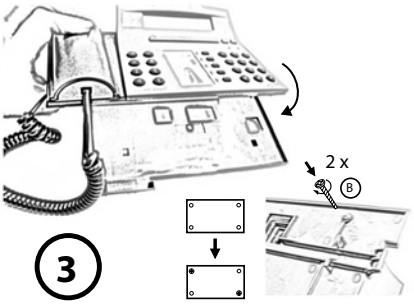
Connecting the expansion key module or the alphanumerical keyboard

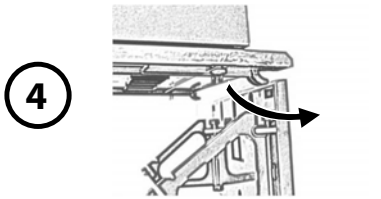
The connection of the expansion key modules and the alphanumerical keyboard to Office 35 and Office 45 is described in the relevant operating instructions.

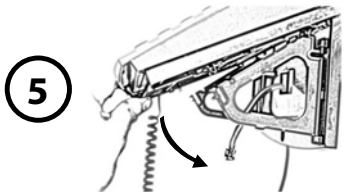


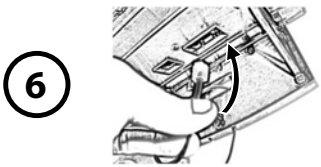












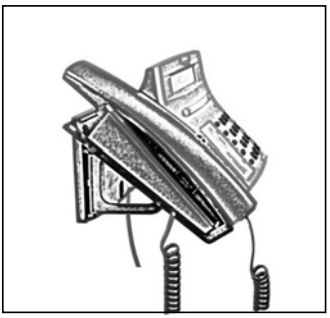


Fig. 69 Wall mounting of Office 25 and Office 35

4. 8. 1. 4 Office 10

The terminal is a desktop model. A wall-mounted bracket is available as an option.

Mounting the desktop model

1. Feed the connecting cable through the strain relief on the handset rest.
2. Position the handset rest as required and put the handset in place.

Installing the wall-mounted bracket (optional)

1. Feed the connecting cable through the strain relief on the wall-mounted bracket.
2. Screw the wall-mounted bracket onto the wall using the screws supplied and hook the handset into position.

Powering the phone

The terminal is powered via the DSI line.

Connecting the phone

1. Set the DSI bus address (Fig. 70).
2. Plug the connector into the socket-outlet.
3. If the system is configured, test the operation of the terminal.
4. Label terminal.

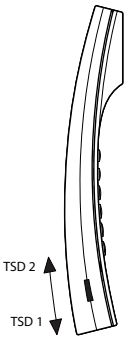


Fig. 70 Set the DSI bus address

Note:
Make sure the TSD (address switch) is pushed in as far as the stop or the switchover will not function correctly.

4. 8. 2 DECT radio units and cordless phones

The locations determined for the cordless phones, charging bays and radio units during the planning phase need to be checked against the following criteria:

- Influence on radio operation
- Ambient conditions

Influences on radio operation

Radio operation is affected by the following influences:

- Outside interference (EMC)
- Obstacles in the surrounding area affect the radio characteristic

To achieve optimum conditions for radio operation, observe the following points:

- Optimum radio operation depends on the radio unit → cordless phone line of sight.
- Walls act as an obstacle to the propagation of radio waves. Losses depend on the wall thickness, construction material and reinforcement used.
- Do not place radio units and cordless phones in the immediate vicinity of TV sets, radios, CD players or power installations (for reasons of EMC, e.g. distribution boxes, rising power lines).
- Do not place radio units and cordless phones near X-ray installations (EMC).
- Do not place radio units and cordless phones near metal partitions.
- Observe the minimum distance requirements between adjacent radio units (see Fig. 72).
- Minimum distance between cordless phones for fault-free operation: 0.2 m. (The charging bays of the Office 135 can be linked using connecting strips. However, operating several phones on interconnected charging bays can lead to malfunctions.)
- Minimum distance between charging bays with cordless phones on-hook for fault-free operation: 0.2 m.

Ambient conditions

- When installing: Ensure convection (space for ventilation).
- Avoid excessive dust.
- Avoid exposure to chemicals.

- Avoid direct sunlight.
- See also technical data in Tab. 131.

Note:
If these requirements cannot be met (e.g. outdoor installation), use the appropriate protective housing.

4. 8. 2. 1 Installing the radio units

Do **not** remove the cover of the radio unit. (Warranty protection will lapse if the cover is removed)

Fit the mounting bracket (see Fig. 71 dimensional drawing for wall mounting). Observe the minimum distances (see Fig. 72).

Position the DSI socket(s) near the radio unit.
Each radio unit requires one DSI bus (two optional on the SB-8): Do not connect any other terminals.

The radio units can be powered from the communication server up to the maximum line length of 1200 m specified for operation (wire diameter 0.5 mm). The plug-in power supply unit for is the same as the one for the Office 135 charging bay.

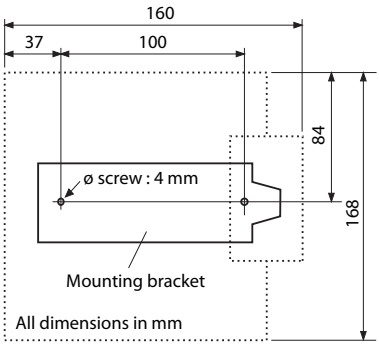
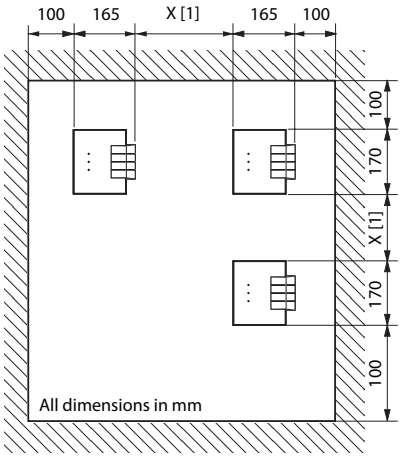


Fig. 71 Dimensional drawing for wall-mounting the mounting bracket



[1] X = 200: Minimum distance if the radio units are connected to the same communication server (synchronous)
X = 2000:Minimum distance if the radio units are not connected to the same communication server (not synchronous)
Make sure the minimum distances are observed

Fig. 72 Installation distances

Connecting the radio unit

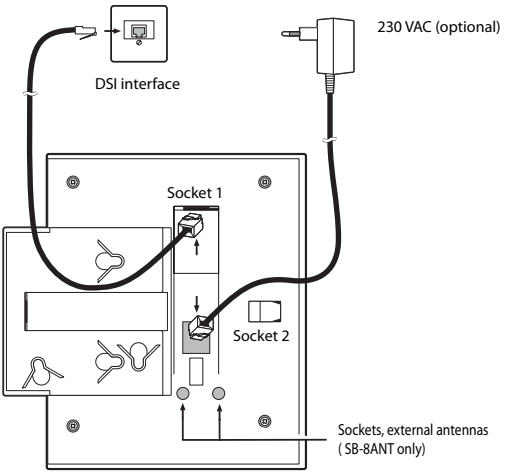
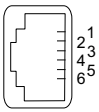


Fig. 73 Underside of the radio units with connection points

Tab. 77 Connections on the Aastra DECT radio units

RJ12 sockets	Pin	Socket 1: DSI interface		Socket 2: Power supply
		SB-4+	SB-8 / SB-8ANT	SB-4+ / SB-8 / SB-8ANT
	1	Local power supply –	Local power supply –	Local power supply –
	2	—	b2	—
	3	b1	b1	—
	4	a1	a1	—
	5	—	a2	—
	6	Local power supply +	Local power supply +	Local power supply +

If an SB-8 / SB-8ANT is operated on two DSI interfaces, it is recommended always to use two neighbouring ports.

Aastra Intelligent Net:
As the DECT systems of the individual nodes in an AIN do not run synchronously, the two DSI interfaces of an SB-8 / SB-8ANT must always be connected to the same node.

Tab. 78 Operating state display on Aastra DECT radio units

LED flashing (two LEDs on the SB-8)	Information
green	Operating state
red / green	Startup procedure running
orange	Transmission of DECT sequences
red	Fault
not flashing and not lit	LED switched off or radio unit defective or not in operation

For further display variants, see "Operating state of the Aastra DECT radio units", page 226

4. 8. 3 IP system phones

The installation, powering and connection of the IP system phones Aastra 5360ip, Aastra 5361ip, Aastra 5370ip, Aastra 5380ip and Aastra 2380ip are described in the System Manual "Aastra Intelligent Net (AIN) and IP system phones".

4. 8. 4 OIP applications

The operating requirements and installation instructions for the OIP applications Aastra 1560/1560ip, Office 1560/1560IP, OfficeSuite and Office eDial are described in the System Manual "Open Interfaces Platform".

4. 8. 5 Aastra SIP and standard SIP phones

The registration of SIP system phones of the Aastra 6700i series, other Aastra SIP terminals and SIP terminals by other manufacturers as internal users is described in the "SIP and SIP terminals" System Manual.

4. 8. 6 Mobile phones

The integration of mobile phones in the Aastra 400 communication system is described in the System Manual "System Functions and Features".

5 Configuration

This chapter introduces the configuration tool Aastra Management Suite (AMS) with its managers and auxiliary applications. With the modular Aastra Management Suite, the installer is able to configure and service the communication server and its ancillary equipment centrally, online or offline. In addition, the access types are presented and user access control is discussed. Other topics in this chapter include remote access, data exchange between PC and communication server, and configuration steps.

5. 1 AMS Configuration Tool

The Aastra Management Suite (AMS) is a software package used for the configuration and monitoring of a single system or an entire network. The configuration can be prepared offline and locally or remotely loaded to the configuration server. Remote access means that changes and expansions can be carried out independently of time and location, and is used for the remote maintenance of the system.

Note:
AMS is backwards compatible, i. e. configuration servers with an older software release can also be configured with a more recent AMS version.

See also:
The Application Notes and Frequently Asked Questions (FAQs) in connection with AMS can be downloaded from https://pbxweb.aastra.com

5. 1. 1 AMSShell

The AMS shell is used to administer the communication servers, replicate the nodes of an Aastra Intelligent Net (AIN) and set the access parameters. The numbering plan of a private leased-line network can also be specified here across all the nodes.

Other useful functions available include *Backup* and *Restore*, *Upload* and *Download* and audio data management.

See also:
How to operate AMS and the individual functions are described in detail in AMS help.

AMS comprises several functional software modules. These are the AMS Managers and auxiliary applications. Most are operated centrally from the AMS Shell.

5. 1. 2 AMS manager

The table below shows the main properties and functions of the individual AMS Managers:

Tab. 79 Overview of AMS managers

Symbol	Manager	Function
	Configuration Manager (CM)	• Configure system and customer data offline • Configure system and customer data online (via local access, dial-up access or LAN) • Adapt system or customer data flexibly and quickly
	Fault & Maintenance Manager (FM)	• Configure remote alarming • Display, evaluate and analyse event messages
	Account Manager (AM)	• Configuration of OCL and ICL data • Configuration of the OCL and ICL output interface • Recording of ICC data per user, network interface or cost centre (totalizer only) • Configuration and allocation of the surcharge calculator to the ICC counters • Data import from LCR tables • LCR management
	Hotel Manager (HM)	• Check-in and check-out • Configure room telephones • Acquisition and printout of call charges • Room management (room available, occupied) • Wake-up calls for guests
	Information Manager (IM)	Information Manager (IM) supports the customers with helpful offline documentation.
	Upload Manager (UM)	The Upload Manager (UM) is used to update the software of a system from the PC.
	System Event Manager (SEM)	• Comprehensive centralized monitoring of event messages • Installation on several PCs possible • Particularly well suited for monitoring networked systems • Receives and processes messages via ISDN or TCP / IP

The AMS- Managers are called up via the *Manager* or using an icon on the toolbar (Exception: SEM is called up via the Windows Start menu or by means of the icon in the Windows taskbar).

The following table shows which Managers are password protected and which are available offline or online.

Tab. 80 Availability of AMS Managers

Manager	Before *Log in*	After *Log in*	After *Log in* and *Connect (offline)*	After *Log in* and *Connect (online)*
Configuration Manager (CM)			✓	✓
Fault & Maintenance Manager (FM)			✓	✓
Account Manager (AM)			✓	✓
Hotel Manager (HM)			✓	✓
Information Manager (IM)	✓	✓	✓	✓
Upload Manager (UM)		✓	✓	✓

5. 1. 3 Auxiliary applications

System Search

The auxiliary application System Search is started via *Tools* / *System Search* or by using the  icon in the menu bar. System Search is a help tool for detecting communication servers of the Aastra 400 series in the IP network. System Search finds all individual communication servers connected to the IP network, provided they are in the same subnetwork as the PC with AMS and have at least SW version I7.

See also:
Additional information about System Search can be found in AMS help.

Smart Software Update

The auxiliary application Smart Software Update can be started via the Windows Start menu or by means of the  icon in the Windows taskbar.

If the Internet connection is active, by pressing a button this application automatically downloads the most current SW package (Software for communication server, system phones, DECT radio units, WebAdmin etc) for the required communication server and sales channels from the download server.

If the communication server is in the first-start state (from the factory or first-start executed) and you establish a connection with AMS to the communication server, the SW version of the communication server is automatically compared to the last version downloaded from the download server. If the communication server software is older, an update is suggested.

Aastra WAV Converter

If the integrated voice mail system is operated in expanded mode, all the audio data must be available in compressed G.729 format. To be able to continue using existing, uncompressed voice messages and greetings in G.711 format, you need to

compress the message and greetings first. The Aastra WAV Converter  is provided for this very purpose in the AMS shell under *Tools* / *Managing audio data*.

Aastra Hospitality Manager

The Aastra Hospitality Manager is a web-based application for receptionists in the hospitality sector. It provides a clear, at-a-glance list view or floor-by-floor view of the rooms and features functions such as check-in, check-out, notification, wake-up call, retrieval of call charges, maintenance list, etc. It is integrated in WebAdmin and subject to a licence.

WebAdmin

This web-based configuration tool is available for the online configuration of Aastra 400 series communication servers. It provides a simple, user-friendly interface and an online help, and with its different authorization levels it is aimed at different user groups:

Authorization level *Administrator*:
The Administrator has access to all the views and functions of the configuration tool. It can configure the system's main parameters and show a general configuration assistant and a special hospitality configuration assistant.

System Assistant authorization level:
The System Assistant only sees selected views of the configuration tool and the scope of functions is limited.

Authorization level *Hospitality-Administrator*:
The Hospitality Administrator features all the views required to set up the Aastra Hospitality Manager and the reception menu of the Aastra 5380/5380ip and specify its default settings. A link can also be used to start the Aastra Hospitality Manager (see "Aastra Hospitality Manager", page 155).

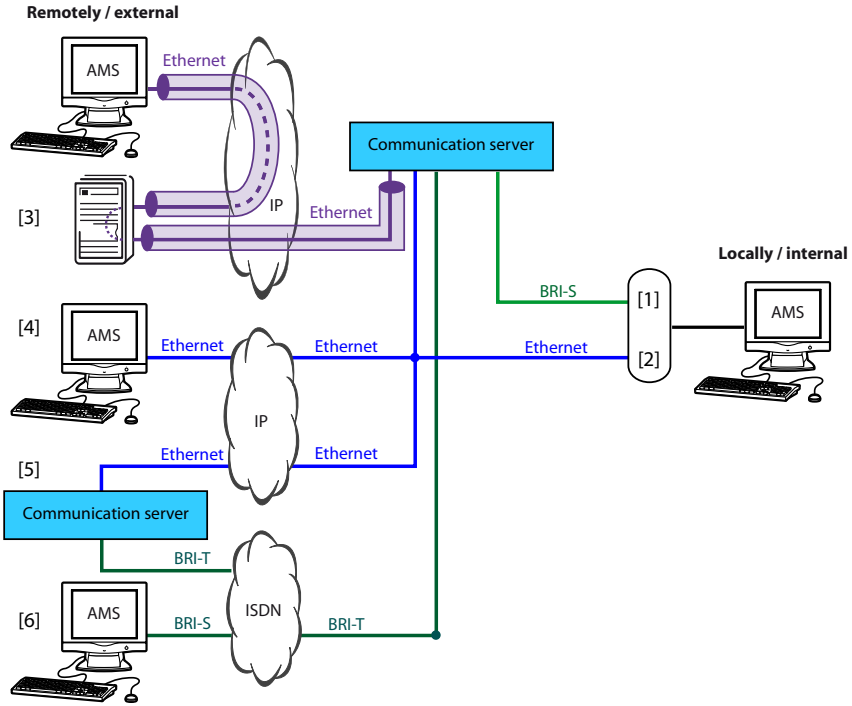
Authorization level *Receptionist*:
This access starts the Aastra Hospitality Manager directly (see "Aastra Hospitality Manager", page 155).

The WebAdmin is included in the file system of each communication server of the Aastra 400 family and does not have to be installed separately.

Note:
With the web-based administration two users are able to access the same communication server simultaneously - and no fewer than five users at the Receptionist authorization level. Of these one user can access with AMS. This can cause confusion if a configuration is being carried out in the same places.

5. 2 Access types

There are the following possibilities to access the communication server with AMS:



[1] Internal dial-up access via an BRI-S terminal interface
[2] Internal access via the LAN or directly
[3] External access via SRM (secure IP remote management)
[4] External access via IP network
[5] External dial-up access via dial-in node (only in AIN)
[6] External dial-up access via ISDN connection via a BRI-T network interface

Fig. 74 Overview of the access types

See also:
Detailed information can be found in the AMS Help.

5. 3 User Access Control

Access to the configuration is password-protected. Any user wanting to log in to a communication server is prompted for his user name and password (access data).

5. 3. 1 User accounts and authorization profiles

A user's authorizations are regulated by authorization profiles, which are assigned to the user accounts.

5. 3. 1. 1 Default user account

The default user account (*admin*) and several default authorization profiles are created when a new communication server is opened or after a first start. The default user account is linked with the authorization profile *Administrator*. This authorization profile is assigned the administration rights for the *User access control* for *Audio services* and for AMS at the *Installer* authorization level.

The required user accounts and authorization profiles can be set up using the default user account.

A second default user account *SystemUserInterface* is also predefined. It is used to control access via the control panel for the colour display on the front panel and can neither be modified nor deleted (see "Display and control panel", page 200).

5. 3. 1. 2 Predefined authorization profiles

There are 6 predefined authorization profiles:

- *Administrator*
- *Systemmanager*
- *Attendant*
- *OIP*
- *1st party CTI user via LAN*
- *Support*
- *SystemUserInterface*

The authorization profiles are assigned administration rights and interface user rights. The allocation of existing authorization profiles can be transferred to other authorization profiles using "Copy & Paste".

Tab. 81 Predefined authorizations of the authorization profiles

Features	Administrator	System-manager	Attendant	OIP	1st party CTI user via LAN	Support	SystemUserInterface
Administration rights							
• User Access Control	✓	–	–	–	–	–	–
• Audio services	✓	✓	✓	–	–	✓	–
• AMS authorization level	Installer	System Manager	Attendant	No access	No access	Installer	No access
• WebAdmin authorization level	No access	No access	No access	No access	No access	No access	No access
Interface access							
• OIP	✓	–	–	✓	–	–	–
• Office 45	✓	✓	✓	–	–	–	–
• FTP	✓	–	–	–	–	✓	–
• Monitor	✓	–	–	–	–	✓	–
• First party CTI	✓	–	–	–	✓	–	–
• Third-party CTI	✓	–	–	–	–	–	–
• ATAS	✓	–	–	–	–	–	–
• Remote maintenance using dial-up access	✓	–	–	–	–	✓	–
• System Search	✓	–	–	–	–	–	–
• LDAP service	–	–	–	–	–	–	–

5. 3. 1. 3 Administration rights

The various administration rights enable the following configuration possibilities:

- *User Access Control*
  - Creating new user accounts and authorization profiles
  - Deleting user accounts and authorization profiles
  - Assigning authorization profiles to user accounts
  - Editing the authorizations of authorization profiles
  - Changing the passwords of all user accounts
  - Blocking user accounts
- *Audio services*
  Allows you to record and delete global greetings (voice mail) and welcome announcements (announcement service), and to record and delete audio data for the Music on hold function.
- *AMS-Authorization level*
  Determines the authorization level for handling, accessing and editing the configuration data via AMS, and the software upload authorizations.

Tab. 82 Authorizations for carrying out AMS functions

Features	Installer	System Manager	Attendant
• *Upload (AMS -> communication server)*	✓	–	–
• *Download (communication server -> AMS)*	✓	✓	✓
• *Backup (AMS -> File)*	✓	✓	✓
• *Restore (File -> AMS)*	✓	–	–
• *Data export*	✓	✓	✓
• *Data import*	✓	–	–
• *Apply basic satellite configuration from AIN*	✓	–	–
• *AINApply - basic configuration from satellites*	✓	–	–
• *Set/change sales channel*	✓	–	–
• *Initialization*	✓	–	–
• *Restart*	✓	–	–
• Status change remote maintenance	✓	✓	✓
• Software upload	✓	–	–

5. 3. 1. 4 Interface access

The following interfaces can be enabled or disabled:

- *OIP*
  Allows the OIP server to access the communication server. This authorization is not intended for individual persons.
- *Office 45*
  Allows unlimited access to the configuration data via Office 45 (System Assistant).
- *FTP*
  Allows access to the FTP server of the communication server. Needs to be enabled for software upload.
- *Monitor*
  Allows monitors to access the communication server for fault diagnosis.
- *First party CTI*
  Allows first-party applications to communicate with the communication server via the IP network by means of the CTI interface. This authorization is not intended for individual persons.
- *Third-party CTI*
  Allows third-party applications to communicate with the PBX via the IP network by means of the CTI interface. This authorization is not intended for individual persons.

- *ATAS*
  Allows third-party applications to communicate with the communication server via the IP network by means of the ATAS interface. This authorization is not intended for individual persons.
- *Remote maintenance using dial-up access*
  Allows in principle access to the system by dialling a service number. *Remote maintenance* itself, in the *Maintenance* main menu of the Configuration Manager (CM_7.1), must be enabled.
- *System Search*
  Allows IP parameters displayed in System Search to be modified directly.
- *LDAP service*
  Allows LDAP clients to access the integrated LDAP server. The LDAP clients can then access the system phone book.

5. 3. 2 Passwords

To ensure that the communication server can only be configured with AMS by authorized personnel, access to both the communication server configuration and the communication server itself is protected by passwords. AMS and communication server password management can be synchronised.

Note:
AMS keeps a list of user accounts and their assigned authorization profiles. When AMS is started, a check is carried out to see whether the user's OS name (operating system name) is on the list of user accounts. If so, the user is authorized to configure offline without entering his password (auto login). If the communication server password is identical to the user's password, he can even access the communication server without password and configure online.

5. 3. 2. 1 Default password

To access the default user account (*Default User Account*) enter the following:

Tab. 83 Default password

User name	admin
Password	33aastra

It is advisable to change the password immediately to prevent unauthorized access to the user access control.

The default password for the communication server and AMS is identical.

Note:
It is not possible to configure the communication server with a default password. During the initial commissioning or after initialization you are prompted to change the default password during the connection set-up with the communication server. This ensures that unauthorized personnel cannot manipulate the communication server data from a remote location once access for remote maintenance has been enabled.

See also:
The control panel on the front panel is PIN-protected (see "PIN control panel", page 200).

5. 3. 2. 2 Password syntax

The following rules apply to password selection and spelling:

- A password must consist of a minimum of 8 and a maximum of 10 alphanumerical characters.
- Unlike the user names, the passwords are case sensitive.
- The following special characters can be used: ?, /, <, >, -, +, *, #, =,. and space.
- German umlauts (e. g. ä, ö, ü) and other diacritical characters (e.g. é, à, â) are not permitted.
- The standard passwords 1ascotel, 2ascotel, 3ascotel and 4ascotel are not permitted.
- The password must not be the same as the user name.

5. 3. 2. 3 Change password

Any user who has been assigned an authorisation profile in which the *User Access Control* administration right is configured to *Yes* is authorised to modify the passwords of all user accounts. It is therefore advisable to assign this administration right restrictively.

Users whose password has been changed are prompted to enter their newly assigned password the next time they log in. The same applies to users whose accounts have been newly created.

Users without the administration right *User access control* can only change their own password.

5. 3. 2. 4 Incorrect password

After 15 failed login attempts using incorrect passwords the corresponding user account is blocked; it can then only be reactivated by a user with the *User Access Control* administration right. He then replaces the old password with a new one. The next time he logs in, the corresponding user is prompted to change the password and enter the new one he has been assigned.

5. 3. 2. 5 Lost password

If another user has also been defined with the *User Access Control* administration right configured to *Yes*, he can simply overwrite with a new password the password lost by another user. The next time he logs in, the corresponding user is prompted to change the password and enter the new one he has been assigned. If the passwords of all Administrators are lost and if password-free access using an operating system name (auto login) is no longer possible either, it is possible to access locally without a password (see "Password-free access", page 162)

5. 3. 3 Access using the System Assistant on the Office 45

The System Assistant on the Office 45 has access to the menus with *Attendant* level. The user account under which he logs in must be assigned an authorization profile in which the *Office 45* interface access is enabled. The profile also needs to be assigned the AMS authorization level *Attendant* if the remote access status is to be changed.

5. 3. 4 Password-free access

The control panel on the front panel can activate a function that enables via AMS password-free, local access with administration right *User access control*. Local access is then possible using a LAN cable. This is useful for example if all the passwords have been lost.

There is no password-free access for remote maintenance.

Password-free access with the System Assistant on the Office 45 is also possible, but without the possibility of changing the status of the remote access.

5. 3. 5 Automatic exit from the configuration

Access to the system configuration will be interrupted if during the set disconnect time (AMS Shell menu: *View* / *Options* under *Online Connection*) you do not make any changes to a parameter value or do not make use of the navigation system.

5. 3. 6 Access log

An access log is drawn up for each user account so that the history of accesses to the configuration can be tracked. Denied access attempts using erroneous or incorrectly type passwords are also logged.

The logs can be read by any user.

Retrieving the log data

The system monitors all the accesses and failed access attempts and saves them in the file system of the communication server. These lists can be retrieved locally or remotely.

CLIP verification

If the setting *CLIP required* is set to *Yes* in the configuration, remote retrieval is possible only if the retrieving party logs in using a CLIP. The CLIP number is also recorded by the access log.

Entering the processes in the log

Each access attempt generates an entry in the corresponding list.
In the case of a remote maintenance access an entry will not be generated if remote maintenance is barred or if *CLIP required* is set to *Yes* in the configuration and no CLIP is received.

5. 4 Enabling remote access

With remote access the user is authenticated using his user name and password. The user account must also be assigned an authorization profile in which the interface access *Remote maintenance via dial-up access* is enabled.

5. 4. 1 Access enabled by local users

Remote access can be enabled in three ways:

- Using function codes (see page 164)
- With the AMS Configuration Manager
- Via the System Assistance on the Office 45

It can be revoked again automatically or manually.

All enabling types have equal authorization status. This means that remote access can be enabled using a function code for example, and then barred again using the *Remote maintenance* setting in AMS or with the System Assistant on the Office 45.

When remote maintenance is activated, the event message *Remote maintenance on* is sent to the local printer and to all the terminals registered in message group 16.

Remote access can be enabled or barred using the function codes both from the idle state and the talk state, e. g. after an enquiry.

The authorization to activate / deactivate remote access using function codes can be allocated in the user configuration (*Remote maintenance = Yes*).

After a first start of the communication server, the authorizations of all users are restricted.

Note:
It is advisable not to keep the remote access authorization permanently activated. This ensures that the communication server data cannot be manipulated from a remote location by unauthorized persons.

5. 4. 2 Function code for remote access

Tab. 84 Function codes for remote access authorization

Enable / bar a one-off remote access	*754 / #754
Enable / bar a permanent remote access	*753 / #753

When remote access is enabled using function code *754, access will automatically be barred again once the remote configuration process has been completed. It is possible to bar access manually using #754 before a remote configuration process has been initiated.

Remote access can be enabled permanently using the function code *753. To bar access, the authorized user must enter the function code #753 manually.

The enabling or barring of remote access authorization using the function code is signalled in each case by an acknowledgement tone.

Remote access authorization can also be enabled or barred in the AMS Configuration Manager or with the System Assistant function on the Office 45, if the relevant authorization has been given.

Note:
In a QSIG network it is important to make sure that the authorization to change the remote access is also denied to unauthorized PISN users. Otherwise a PISN user would be able to use an abbreviated dialling number defined for the destination PINX and containing the appropriate function code to change the remote access authorization to the destination PINX.

Aastra Intelligent Net:
In an AIN the remote access of all the nodes depends on the setting in the Master. If remote access is enabled in the Master, both the AIN configuration and the offline configuration of the satellites are enabled.

Remote access via an external dial-up connection to the AIN is also protected and has to be explicitly enabled via the control panel on the front panel. This is irrespective of whether dial-up access is via a satellite or directly to the Master.

5. 4. 3 Function keys for remote access authorization

On system phones (with the exception of Office 10) the function code for enabling remote access authorization can be stored under a function key, providing the user has the appropriate authorization.

The relevant LED lights up if remote access is enabled once or permanently.

The relevant LED goes off as soon as remote access is denied again, either automatically or manually, using the function code or the configuration menu or the AMS Configuration Manager.

Tab. 85 Menu example of a one-off remote access on the Office 45

F12:		REMOTE MAINT.	ONCE ONLY
OK	BACK		? v

Tab. 86 Menu example of repeated remote access on the Office 45

F12:		REMOTE MAINT.	ON
OK	BACK		? v

5. 5 Data exchange between communication server and PC

The system and user data is stored in the file system of the communication server and on the PC's hard disk. Both databases are serviced by the AMS Managers. To keep the databases at the same level, you need to exchange data between the databases.

The figure below illustrates the interplay between the PC and the two databases:

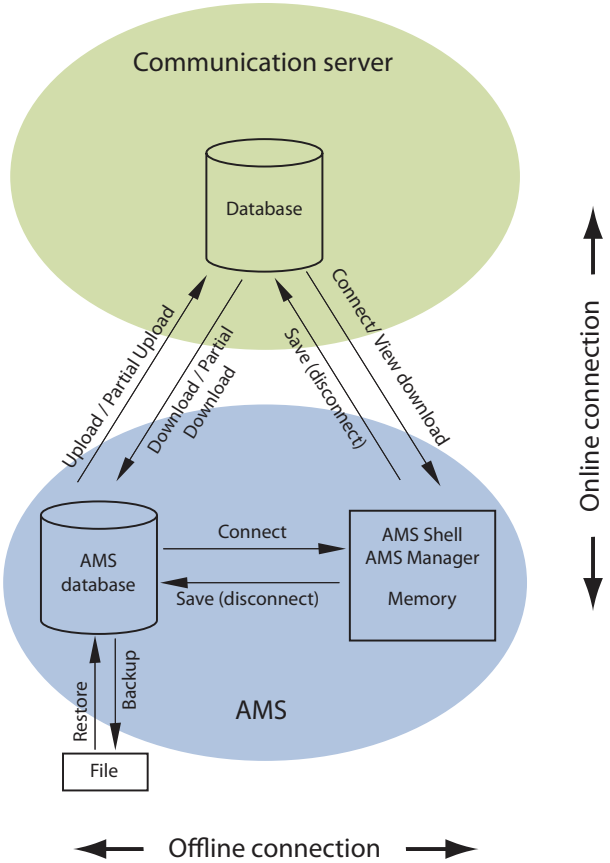


Fig. 75 Functions involved in exchange data between the communication server and AMS

To edit or complement system and user data, load the data either directly from the communication server file system or from the PC's hard disk (AMS database) into the main memory.

5. 5. 1 Working offline (AMS database)

With the AMS database you can only work in offline mode. The following functions are available:

Connect (offline)

All the configuration data from the selected communication server is loaded from the AMS database into the PC's main memory and made available for processing. When you modify the parameters in an AMS Manager, a check mark is placed alongside the corresponding location on the menu tree.

Note:
The changes and the check marks are retained even if a Manager is closed without saving.

Disconnect (offline)

The AMS database is closed. If configuration data was modified, AMS will ask whether you want to save the changes in the AMS database.

Save

After editing, the modified configuration data is written from the PC's main memory into the AMS database and the check marks on the modified parameters are deleted. Saving always stores the configuration data from all the AMS Managers.

Backup (AMS -> File)

This menu function on the AMS Shell stores configuration data of the selected communication server from the AMS database to a backup file specified by the user. If the current communication server configuration data is to be saved, it must first be loaded into the AMS database using Download (communication server -> AMS).

Backup AMS database

This menu function on the AMS Shell stores the configuration data of all the communication servers from the AMS database to a backup file specified by the user.

Note:
Make sure the configuration data from the AMS database is up to date.

Restore (File -> AMS)

This menu function on the AMS Shell restores configuration data from a backup file to the AMS database of the selected communication server. The configuration data can then be transferred to the communication server file system using the Upload function.

Restore AMS database

This menu function on the AMS Shell restores configuration data from a backup file to the AMS database of all the open communication servers.

Note:
All the configuration data in the current AMS database will be overwritten!

5. 5. 2 Working online (communication server database)

Configuration data in the communication server database can only be accessed in the online mode. The following functions are available:

Connect (Online)

The communication server is connected with the AMS Shell and automatically loads the configuration data of the communication server into the PC's main memory.

Disconnect (Online)

Closes all the AMS Managers and disconnects the online connection between the PC and the communication server. If configuration data has been changed, but not yet stored in the communication server with *Save*, AMS displays a prompt asking whether the configuration should be saved. AMS will then ask you whether you want to update the local AMS database.

Save

The modified configuration data is stored in the communication server file system and the check marks alongside the modified parameters are cleared. Saving always stores the data from all the AMS Managers.

Download (communication server -> AMS)

During the download via the AMS Shell the configuration data is downloaded from the file system of the communication server to the AMS database.

During the download the system is automatically prebarred and then released once the operation is completed. Existing connections are retained. The progress of the download operation is indicated by a progress indicator bar in a window. A download can be carried out when the system is operating under full-load conditions.

Download view

This function loads configuration data from the current window in a AMS Manager from the file system of the communication server to the PC's main memory. This partial download is available in the online mode of individual Managers (e.g. Configuration Manager, Fault & Maintenance Manager). New or modified hardware can be registered in AMS in this way.

Upload (AMS -> communication server)

During the upload via the AMS Shell configuration data from the AMS database is written to the file system of the communication server.

During a configuration data upload the system is automatically prebarred and then again released once the operation is completed. The progress of the upload operation is indicated by a progress indicator bar in a window.

The status of CFUs, user group members, switch groups, control outputs, personal call routing and free seating sessions can also be uploaded if required.

An upload is carried out in the following cases:

- Putting a new system into operation.
- Restoring a system if the configuration has been lost.
- Replicating a special configuration, e.g. copying customer data to a different system.

Note:
Some configuration changes only take effect after a restart. Once the upload is completed, the communication server is restarted.

Partial Upload

The Partial Upload function is used to load the following configuration data individually from the AMS database to the communication server file system.

- Abbreviated dialling numbers
- PISN user data
- Terminal data (individual or block by block)
- LCR (Least Cost Routing) data

With a partial upload, configuration data that changes frequently can be uploaded more quickly into the communication server file system.

Note:
A partial upload is only followed by a restart and disconnection of existing phone connections if system data is loaded up onto a communication server. In this case AMS generates an appropriate message.

Auto backup

The Auto Backup function creates a backup of the configuration data at regular intervals and saves the backup files on the communication server's file management system. The distribution service is used to automatically copy the backups to an FTP server or to send them by e-mail. All the settings for the Auto Backup function can be found under *Auto backup* in the Configuration Manager. The backup files on the communication system's file management system can be downloaded or deleted from the AMS Shell. It is also possible to upload a backup file to the communication server's file management system.

See also:
The relevant procedure is described in detail in the AMS Help.

Managing audio data

This menu is used to administer the audio data for the voice mail system, the announcement service and the "Music on hold" feature. You have the following possibilities:

- Download all audio data or only the personal voice messages and greetings for saving in a backup
- Upload all audio data or only the personal voice messages and greetings from a backup.

- Upload audio guide languages, global greetings, welcome announcements for the announcement service or files for Music on hold from a backup or other sources
- Download, compress and upload existing voice messages and greetings The Aastra WAV Converter is used for compressing and converts the wave files from audio format G.711 to audio format G.729. The compressed format is needed if the voice mail system is operated in expanded mode.
- Download of all audio data and temporary deleting of the audio data on the communication server file system This function is useful when there is insufficient free storage space available in the file system to upload the system software.

See also:
The relevant procedure is described in detail in the AMS Help.

5. 5. 3 Import / Export Configuration data

Importing and exporting data tables

The Import / Export function allows the user to import data tables (abbreviated dialling numbers, DDI numbers and names, user numbers and user names, terminal data) into the AMS database or to export such tables from the database. The exported tables are stored in Excel format and can then be sorted or modified.

Importing data from an Aastra 415 into an Aastra 430

AMS configuration data from an Aastra 415 communication server can be read into the database of an open Aastra 430 communication server. The AMS Shell provides the following function for this purpose: *Tools* / *Import* / *Import data from Aastra 415…*

Importing data from older communication servers

System data from an Aastra IntelliGate system can be imported into the AMS database using a backup file. The AMS Shell provides an import function for this purpose. The following combinations of source and destination communication servers are possible:

Tab. 87 Import combinations

Source communication server	Destination communication server
IntelliGate 150	Aastra 415
IntelliGate 300	Aastra 430
IntelliGate 2025	Aastra 415, Aastra 430, Aastra 470
IntelliGate 2045	Aastra 430, Aastra 470
IntelliGate 2065	Aastra 470

To import data from an IntelliGate communication server, proceed as follows:

1. Create a backup of the IntelliGate communication server using the latest version of AIMS 7.9 (AIMS-Shell: *Tools* / *Backup (PC -> Disk)*).
2. Create a new Aastra 400 communication server in AMS (offline).
3. Configure all the cards on your new communication server in AMS (offline).
4. Import the backup file of theIntelliGate communication server (AMS Shell: *Tools* / *Import* / *Import data from Aastra IntelliGate…*).

5. 6 Configuring

The configuration steps are based on the information determined during the planning and, where applicable, the installation.

See also:
The procedure for setting up and clearing down an online connection from AMS to the communication server and the steps for configuring a single system, a private network (PISN) or an Aastra Intelligent Net (AIN) are described in detail in the AMS help.

The sections below contain information that may be useful before, during or after a configuration.

First start of the communication server

If an existing ommunication server is to be upgraded, it must first be in a defined state. This involves setting or deleting all the parameter values to their country-specific default values and carrying out a self-test.

This initialization can be achieved in the following ways:

- Using the control panel on the front panel
  See "Display and control panel", page 200
- With AMS
  In the AMS Configuration Manager or Fault & Maintenance Manager a *First start* can be carried out under *Online* / *Reset communication server*. If the sales channel is also to be modified, create a new communication server in the AMS Shell and select a sales channel. Next *Set/change the sales channel* under*Tools*. This executes a first start and the country-specific default values are loaded.

Note:
To perform a first-start or a sales channel change, either a user account with the corresponding authorization profile is necessary (see "User accounts and authorization profiles", page 157) or the local, password-free access must be open (see "Password-free access", page 162).

Preparing Configuration with AMS Offline

The complete configuration of a communication system can be created on the PC without access to the communication server and stored in the database. The prepared configuration can then be uploaded to the communication server file system (see "Upload (AMS -> communication server)", page 169).

Configuration with AMS (online)

If a communication system that has already been configured is present, the configuration can be loaded from the configuration server in AMS and edited online (see "Connect (Online)", page 168).

If the system to be configured is in the first-start state, the country-specific default values are loaded.

See also:
Part of the configuration settings is also accessible via the System Assistant function on the Office 45. A separate set of User's Guide is available for this.

Activating the licences

The licence information is stored on the EIM (Equipment Identification Module) card.

The licence information includes:

- The EID (Equipment Identification) serial number of the EIM card
- The sales channel identification CID (Channel Identification)
- Licence code LIC
- System type

Each communication server is supplied with a licence certificate containing the above information (without licence code). Please keep the certificate in a safe place.

Tab. 88 Example of licence information

Licensing	
Equipment Identification (EID):	81154445474349760E5844D276000035A317
Channel Identification (CID):	0
Licence code (LIC):	0408040158F396792739
System type:	Aastra 470

The licences must be activated. The licence code can be edited both online and offline with AMS:

1. The licence has to be activated with the aid of the EID via the Aastra 400 activation portal on the extranet (partner login required). The licence code issued as a result contains the appropriate *Software Release* licence (and any other licences you may have acquired).
2. Enter the licence code under CM_1.2_*Licence code* in AMS and save it in the communication server. The licence code is stored on the EIM card.
3. The newly licensed features are enabled. It is not necessary to restart the communication server (exception: AIN licences).

All the features (even those subject to charges) can be configured offline without a valid licence. During the configuration or during the configuration data upload the user is warned that the communication server does not yet have the required licence.

Each licence code can only be used for one communication server. If a communication system consists of several communication servers (e. g. in a AIN), normally only one licence code is required on the Master.

To licence several communication servers, you will obtain separate licence codes to match the licence information of the individual communication server.

The licence information can be viewed directly from the communication server using the Configuration Manager in AMS.

The data stored on the EIM card is not deleted by a first start of the PBX, and remains available.

See also:
"Licences", page 59

Reading out default values

There is a simple method for reading out the country-specific default values:

1. In offline mode on the AMS Shell create a new communication server for the required sales channel.
2. Log in with the default access data
3. Open Configuration Manager
4. Add the desired hardware in the *System configuration*.
5. Add system terminals, mailboxes, direct dialling numbers etc.
6. Most default values can now be read out.

6 Operation and Maintenance

This chapter describes maintaining the system and configuration data as well as updating the system software. Replacing cards, modules and terminals are also described. The display and control panel of the communication server as well as operations supervision using the event message concept, the operating state display, and the error display are also topics covered in this chapter.

6. 1 Data Maintenance

6. 1. 1 What data is stored where

The communication server's data storage system consists of different elements:

- In the Flash components are stored the system software, the boot software and the configuration data. The contents of the memory are retained even when there is no power supply.
- In the RAM components (main memory) are stored volatile data that cannot be saved. It is available only when the system is in operation.
- The EIM card (Equipment Identification Module) contains the system-specific data (system ID, system type, sales channel, licence code, generation, DECT identification numbers), IP address of the Ethernet interface on the configuration server). The contents of the memory are retained even when there is no power supply.
- The data of applications on the applications server (if an CPU2 applications card is fitted) is stored on a hard disk.

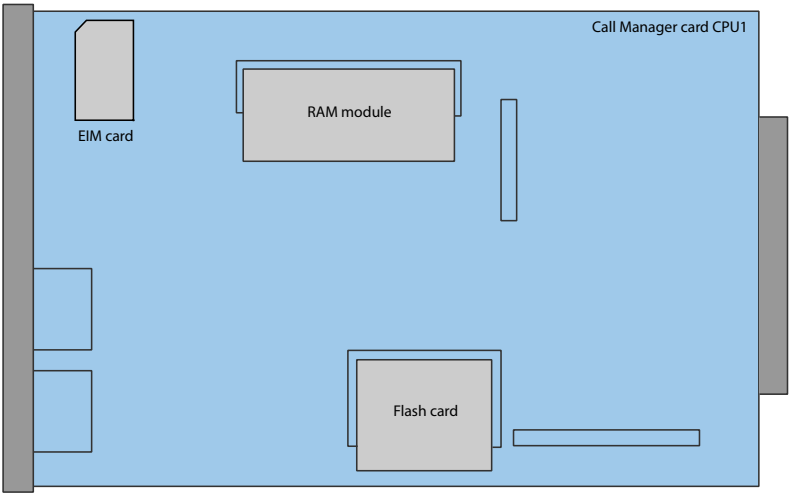


Fig. 76 Memory of the Call Manager card CPU1

6. 1. 1. 1 System software

The communication server's entire system software package is stored in compressed form in the Flash memory.

The RAM components comprise the main memory for program data. When the PBX starts up, the communication server software on the serial Flash memory is decompressed, loaded into the main memory and started.

6. 1. 1. 2 File system of the communications server

The file system of the communication server comprises the system software, the software for system phones, the system and terminal configuration data, the audio data (voice mail, announcement service, music on hold, audio guide), system logs, data for WebAdmin, etc. The data is stored in the Flash memory.

The AMS Shell provides functions for uploading and downloading the configuration data and the audio data (see "Data exchange between communication server and PC", page 166).

The file system can also be accessed with an FTP client. This is useful for instance for the software upload for Aastra SIP terminals.

Note:
Modifying or deleting files on the file system of the communication server can result in a system that is no longer able to run.

See also:
The WebAdmin configuration tool also provides upload and download functions as well as access to the file system of the communication server.

6. 1. 1. 3 Boot software

The boot software is stored in a different Flash memory, which allows the communication server to start up in the boot mode, even if without executable system software.

6. 1. 1. 4 System-specific data

The system-specific data (system ID, system type, sales channel, licence code, generation, DECT identification numbers, IP address of the Ethernet interface on the communication server) is stored on the EIM card (chip card). This data is not deleted by a first start of the PBX, and remains available. It can be ported to a different communication server by replacing the EIM card.

6. 1. 2 Updating configuration data

There are system-wide, user-related and terminal-related configuration data:

- System-wide configuration data can only be modified using AMS or WebAdmin.
- Terminal configuration data such as key assignments or ringing melodies can be modified either directly on the terminal, with AMS or with WebAdmin. With some system phones configuration is also possible using the web user interface or with the help of configuration files.
- User-related configuration data such as private contacts or CFUs is valid for all the terminals assigned to the user and can be configured using AMS or WebAdmin, in some cases directly on the terminal itself.

Access to the configuration data via AMS or WebAdmin is regulated by a User Access Control with user accounts, authorization profiles and authorization levels. More information can be found in the Chapter "Configuration", page 152.

6. 2 Update Software

6. 2. 1 System software

The communication server software is loaded using the AMS Upload Manager, WebAdmin or in the case of newly delivered systems also with the "Smart Software Update" auxiliary application.

The system software also comprises the software for the digital system phones, the IP system phones, the Aastra DECT radio units, the Aastra DECT cordless phones and the Aastra SIP phones.

There are several possibilities for establishing a communication link between the communication server and the AMS Upload Manager (see "Access types", page 156).

Tip
The software version of the communication server can be displayed as follows on digital and IP system phones with display:

1. Access the configuration menu
2. Long-click on the * key

Depending on the phone, additional information is displayed.

6. 2. 1. 1 AMSUpload Manager

The Upload Manager called up via the AMS Shell is a convenient and reliable way of loading a new system software on to the communication server file system. The activation point of the new software is selectable. After the new software has been uploaded, the old software can be loaded and activated at any time during a user-definable monitoring time.

The Upload Manager supports what is known as an "Emergency Upload via LAN". This emergency upload is useful in exceptional cases where there is no longer any executable software left on the system.

See also:
For a more detailed description of the functions and parameters and the procedure in a Aastra Intelligent Net (AIN) please call up the Upload Manager's online help.

6. 2. 1. 2 Standard upload

New system software is uploaded in different phases. The Upload Manager monitors the system software copying process from the PC to the communication server. The version transfer is monitored by the new system software.

Sequence phases for the standard upload:

- Preparation phase:
  The Upload Manager prepares the communication server for the transmission of the new system software.
- Upload and backup phase:
  The new system software is transferred to the communication server's file system in compressed form and stored there. The previous system software remains stored as a backup.
- Software update phase:
  The current system software is replaced by the freshly loaded system software.
- Restart phase and version transfer:
  The communication server is restarted automatically. The boot software starts the new system software and runs a version transfer at the same time.
- Monitoring phase:
  During the monitoring phase, the new system software is active, but the old remains. In this phase, the old system software can be reactivated at any time with a *Rollback*. When the monitoring phase is finished, the old application is deleted.

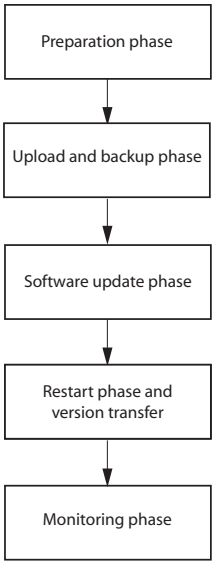


Fig. 77 Software upload sequence

During a standard upload the communication server remains operational during the upload phase. After successful software upload, the communication server runs an automatic restart at the set time and restarts with the newly loaded system software.

If there is insufficient storage space left in the Flash memory to update the system software, the wave files (voice mail, announcement service and music on hold) can be stored on the PC and deleted from the Flash memory. When the monitoring phase is finished, the wave files can be reloaded to the communication server file system (see "File system of the communications server", page 177).

If for whatever reasons the software upload is not possible or if a fault occurs during the upload, the previous system software with the previous associated configuration data remains activated.

If errors are detected in the system software during the time in which the newly loaded system software is being monitored for fault-free operation, the previous system software is reactivated.

Successful and failed software uploads are stored as event messages and sent to the configured signal destinations.

See also:
For information on event messages and signal destinations, see "Event message concept", page 206.

Initiating an upload process

To ensure a successful software upload, carry out the following preparatory steps:

1. Recommendation: Use AMS to save the configuration data (*Tools* / *Backup*).
2. Save the wave files (voice mail, announcement service and Music on hold) (*Tools* / *Managing audio data* / *Download audio data*).
3. Call up the AMS Upload Manager.
4. Select the *Configuration* tab.
5. Enter user name and password (changed) of a user account.
   Note: To perform the upload, the user account must be assigned an authorization profile for which the *FTP* interface access is enabled (see "User Access Control", page 157).
6. Select the system type.
7. Select a software package (zip file). If necessary, load a new software package beforehand using the *Add* button.
8. If a new licence code is required to operate the new system software, enter it under *Licence code*.
   Note: The licence code is not required for the actual upload. However, if the licence code is not entered within 4 hours of commissioning the system software, the communication server switches to a restricted operating mode that only provides basic functions.
9. Select access type.
10. Use the *Settings* button to set the connection parameters.
11. Select the *Upload* tab.
12. Set the time at which you want the newly loaded system software to be activated.
13. Set the period of time during which you want the newly loaded system software to be monitored for fault-free operation.
14. Click the *Upload* button.
    → The upload process is now initiated.

Bar indicator

During the software upload a dialog box with a horizontal bar indicates the time progress of the upload process.

If you need to stop the upload at any stage, click the *Cancel* button. The software upload is then stopped and the current system software remains in operation.

Status display

The status display provides information with date and time indications on the current software upload, including all the event messages output in connection with the current software upload.

Upload log

Once an upload process is completed or if it is terminated prematurely, the settings of the software upload including the data automatically entered in the log directory are printed out on the system printer.

See also:
Further information about uploading is available in Help of the Upload Manager.

6. 2. 1. 3 Emergency Upload of the system software

An Emergency Upload has to be activated whenever a standard software upload is not possible, has proved faulty or to replace a Flash card. To ensure a successful Emergency Upload, proceed as follows:

The Emergency Upload is carried out via the LAN interface using the Upload Manager:

1. Set the system to boot mode using the navigation keys (see "Boot mode", page 202).
2. Call up the AMS Upload Manager.
3. Enter user name and password (changed) of a user account.

Note:
To perform the upload, the user account must be assigned an authorization profile for which the *FTP* interface access is enabled (see "User Access Control", page 157).

4. Select configuration server.
5. Select a software package (zip file). If necessary, load a new software package beforehand using the *Add* button.
6. Select *EUL via LAN* and use the *Settings* button to enter the IP address.
7. Click the *Upload* button.
   → The Emergency Upload is started.

6. 2. 2 Software of corded system phones

The communication server's software package contains the software for the system phones, which is therefore updated in each case along with the system software.

The Office 10, Office 25 and Aastra 5360 system phones do not have their own memory. The system phones Office 35, Office 45, Aastra 5370, Aastra 5380, all the IP phones of the Aastra 5300ip series and all the SIP phones of the Aastra 6753i series have a Flash memory.

System phones with flash memory

The flash memory contains the boot software and the application software. DSI terminals also have an area with the interface software.

The actual software for the radio unit is contained in the communication server's software. Office 35). When you start up the terminal, the software versions of the terminals are compared with that of the communication server. If the versions differ, the software is downloaded from the communication server to the terminal. When updating the system software this can take several minutes for each DSI terminal.

The expansion key modules Aastra M530 and Aastra M535 also have a flash chip containing software. The update mechanism is the same as the one described above. However a local power supply is always required (Power over Ethernet is also possible with IP terminals).

6. 2. 3 Software system Aastra DECT

DECT radio units SB-4+, SB-8 and SB-8ANT

The Flash memory on the radio units contains an area that cannot be modified. It is used for starting the radio unit and receiving the software for the radio unit.

The actual software for the radio unit is contained in the communication server's system software. The loaded software is tested when the radio unit starts up. If the loaded software is not identical to the version in the system software, the software will be downloaded from the communication server on to the radio unit and stored in the Flash memory of the radio unit.

DECT cordless phones of the family Aastra 600d

The software for the Aastra 610d, Aastra 620d and Aastra 630d cordless phones, is updated via radio (Air-Download) The update can be enabled or disabled individually for each cordless phone using the menu *System - Download server* on the cordless phones. If the cordless phone is logged on to several systems, this menu defines which system the software update is relevant to.

There is only one software for the cordless phones of the Aastra 600d series. It is included in the communication server's software package and stored in the file system of the communication server. If the phone software is to be updated independently of the communication server software, it can be updated using FTP (File Transfer Protocol). The communication server's file system can be accessed with an FTP Client (e. g. Filezilla) or with the Windows Explorer. The section below describes access with the Windows Explorer:

1. Start the Windows Explorer.
2. In the address bar enter the communication server's IP address (ftp ://<IP address>).
   Note: If the address bar is not visible, it can be unhidden under *View - Icon bars - Address bar*.
3. In the login window enter the communication server's user name and password. You are now in the communication server's file system.
4. Switch the "sw\handset" subdirectory and replace the "mddf.ini" file.
5. Switch the "sw\handset\aastra600d" subdirectory and replace the files "pp.hdf" and "firmware.cnt".
6. All the cordless phones that selected this system for the download and have not disabled the download will now automatically start the software update.

DECT cordless phones Office 135 and Office 160

The software for the Office 135 and Office 160 cordless phones, is updated via radio (Air-Download). This requires the cordless phone to be logged on to system A.

The memory in the cordless phones is a Flash memory. The Flash memory contains an area that cannot be modified. This area contains the cordless phone's boot software.

The software for the cordless phones is contained in the communication server software package. The loaded software is tested when the cordless phone starts up. If the loaded software is not identical to the version in the system software, the system will initiate an Air-Download. The software is loaded from the communication server onto the cordless phones via radio and stored in the Flash memory.

To be able to run an Air-Download, you need to ensure that the cordless phone contains a functional software.

The cordless phone remains fully functional during an Air-Download. The new loaded software is activated only once the Air-Download has been successfully completed. A restart is carried out on the cordless phone.

6. 3 Hardware update

Hardware maintenance comprises replacing cards and modules when there is a defect or for a generation change. Safety regulations must be observed and the step-by-step procedure must be followed.

6. 3. 1 Preparations

The following preliminary steps apply to interface cards, system cards and system modules as well as to the call manager card of the communication server itself. The preliminary steps for replacing an applications card are described separately.

First steps before cards are removed or added:

1. Inform users
2. Prebar the system
3. Shutting down the call manager

Inform users

Inform all concerned users if the system has to be put out of operation during working time.

Tip
To inform users, use the internal messaging system on the system phones.

Prebar the system

Prebarring the system prevents setting up new connections. Ongoing calls are not cleared down. If a user tries to set up a call while prebarring is activated, he will obtain no dialling tone and the system phone display will read *Not available*

The system is prebarred in the AMS Configuration Manager or in the Fault & Maintenance Manager under *Slot configuration*: press the *Prebar system* button. Alternatively the system can also be prebarred via the display and control panel.

The colour display on the front panel shows when the system is prebarred (see Tab. 99).

Aastra Intelligent Net:
In an AIN every node can be individually prebarred and unlocked again.

As soon as there are no more active connections in the prebarred system, the call manager can be shut down.

Note:
Prebarring the system can be dispensed with if all concerned are aware that existing connections will be disconnected.

Shutting down the call manager

Shut down the call manager via the control panel (see "On/Off key", page 200).

6. 3. 2 Licenses and EIM card

The license information and IP address of the communication server's Ethernet interface are stored on the EIM card.

6. 3. 2. 1 Licences

To expand a system already in operation or to re-order a licence for a new system (see "Licences", page 59), proceed as follows:

1. Order the licences you require from your authorized dealer, specifying the EID number, which is used to identify the communication server.
2. The new licence code can be obtained either from your authorized dealer or via the Aastra 400 activation portal on the extranet using the EID (partner login required).
3. Enter the licence code under CM_1.2_*Licence code* in AMS and save it in the communication server.
4. The newly licensed features are enabled. It is not necessary to restart the communication server (exception: AIN licences).

6. 3. 2. 2 EIM card

The EIM card must be replaced in the following cases:

- A licence is transferred to another communication server
- The call manager card is defective
- The EIM card is defective

A licence is transferred to another system of the same type

A licence can only be transferred to a communication server of the same type. To do so you need to replace the EIM card with the licence information.

The call manager card is defective

If a defective call manager card is replaced, the EIM card has to be switched from the defective call manager card to the new one. For instructions on how to replace the call manager card, see "To replace a call manager card, proceed as follows:", page 196.

The EIM card is defective

In the unlikely event of a defective EIM card, contact your authorized dealer to discuss the procedure.

For the procedure for switching an EIM card see "Replacing the EIM card", page 194.

6. 3. 3 Interface cards

The different card types, the number of slots and the maximum configuration are all determined by the system capacity (see "3 Expansion Stages and System Capacity").

A number of rules have to be observed when fitting the cards (see "Component mounting rules", page 96.

All configuration data is centrally stored in non-volatile Flash memory. This means that configuration data is preserved whenever a defective interface card has to be replaced by a new one.

6. 3. 3. 1 Replacing a defective interface card

A card is replaced by the same card type with the same number of ports.

Procedure:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the defective interface card and remove the card by pulling the fastening screw.
3. Carefully slide the new interface card into the slot shaft and gently press the card as far as it goes into the connection on the backplane.
4. Use the screw to secure the card in its slot.
5. Restart the call manager by pressing the On/Off button on the call manager card.

6. 3. 3. 2 New card with fewer ports

A card is replaced by a similar card with fewer ports.

Procedure:

Change the card and put the system into operation again. Similar procedure as described in "Replacing a defective interface card", page 189.

The following data is deleted:

- The system and terminal configuration data of the terminals on the terminalinterfaces that are no longer present in the new configuration.
- The system configuration data of the network interfaces that are no longer present in the new configuration.

Tab. 89 Example: Reducing the number of terminal or network interfaces

16DSI → 8DSI	The configuration data of terminal interfaces 9...16 are deleted.
8BRI → 4BRI	The configuration data of network interfaces 5...8 are deleted.

Note:
If the terminal configuration data of system phones is deleted following the reconfiguration of a card, a warning message will appear beforehand to give you the possibility of cancelling the process. However, this is possible only if the configuration data of the original card was not already deleted beforehand.

6. 3. 3. 3 New card with more ports

A card is replaced by a similar card with more ports.

Procedure:

1. Change the card and put the system into operation again. Similar procedure as described in "Replacing a defective interface card", page 189.
2. Select *Confirm system configuration* in the AMS Configuration Manager.
3. Configure new ports.

The system configuration data (User No., User configuration, etc.) of the terminals on the new ports is created as new data (default values).

Tab. 90 Example: Expanding the number of terminal or network interfaces

8DSI → 16DSI	The configuration data of terminal interfaces 9...16 is created as new data.
4BRI → 8BRI	The configuration data of terminal interfaces 5…8 are created as new.

6. 3. 3. 4 Change slot

Interface cards can be moved to a different slot. The terminal configuration data of the system phones can be transferred.

Procedure:

1. Change the slot and put the system into operation again. Similar procedure as described in "Replacing a defective interface card", page 189.
2. Connect the system phones to the ports of the new slot.
3. Re-configure port allocation using the AMS Configuration Manager.
4. Insert the card in the new slot in AMS and remove it from the old slot. The configuration data at the old slot location is now deleted.

Note:
Not all cards can be equipped on all slots (see "Component mounting rules", page 96).

6. 3. 4 System modules

The category system modules comprises the modules expandable as an option (DSP modules, IP media modules, call charge modules) and the mandatory modules (RAM module).

6. 3. 4. 1 Change the DSP module

DSP modules are available in various versions (SM-DSPX1, SM-DSPX2, SM-DSP1, SM-DSP2). Compared with DSP modules, modules with the designation DSPX are fitted with more powerful DSP chips. The following describes how to replace a DSP module if it is defective or how to replace it for a more powerful module. DSP modules are fitted to the call manager card.

To change a DSP module, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Remove the old or defective module by loosening the fastening screw and carefully pulling the module out vertically of the module slot.

Note:
If multiple modules are equipped and the defective card is not topmost, the spacing sleeves have to be loosened and the modules pulled. The order of the modules on the slot is relevant only if different types of modules are equipped.

4. Press the new module downward evenly on both connectors to the stop.
5. Secure the module with the fastening screw.
6. Carefully push back the call manager card into the shaft and gently press the card as far as it goes into the connection on the backplane.
7. Secure the Call Manager card back into its slot with the screw.
8. Restart the call manager by pressing the On/Off button on the call manager card.

6. 3. 4. 2 Change the IP media module

IP Media modules are fitted either to the call manager card or to PRI trunk cards.

To replace a defective IP media module to a call manager card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Remove the defective module by loosening the 2 fastening screws and carefully pulling the module out vertically of the module slot.
4. Place the new module in the slot and press it down evenly into the slot as far as the stop.
5. Fit the module on to the call manager card from below using the 2 fastening screws.
6. Carefully push back the call manager card into the shaft and gently press the card as far as it goes into the connection on the backplane.
7. Secure the Call Manager card back into its slot with the screw.
8. Restart the call manager by pressing the On/Off button on the call manager card.

Proceed accordingly to replace one defective IP media module to a PRI trunk card.

6. 3. 4. 3 Replacing the call charge module

Call charge modules are fitted to FXO trunk cards.

To replace a defective call charge module on an FXO trunk card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the FXO card and remove the card by pulling the fastening screw.
3. Remove the defective module by loosening the fastening screw and carefully pulling the module out vertically of the module slot.

4. Place the new module in the slot and press it down evenly into the slot as far as the stop.
5. Secure the module with the fastening screw on the spacer sleeve.
6. Carefully slide the FXO card into the slot shaft and gently press the card as far as it goes into the connection on the backplane.
7. Use the screw to secure the FXO card back into its slot.
8. Restart the call manager by pressing the On/Off button on the call manager card.

6. 3. 4. 4 Changing the RAM module

The RAM module is fitted to the call manager card and available as a spare part. To replace a defective RAM module, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Remove the defective RAM module by pressing the two lateral metal clamps outward at the same time and gently lifting the RAM module.
4. Place the RAM module at a slight angle into the slot (see Fig. 78).
5. Carefully press the RAM module downwards until the two lateral metal clamps engage.
6. Carefully push back the call manager card into the shaft and gently press the card as far as it goes into the connection on the backplane.
7. Secure the Call Manager card back into its slot with the screw.
8. Restart the call manager by pressing the On/Off button on the call manager card.

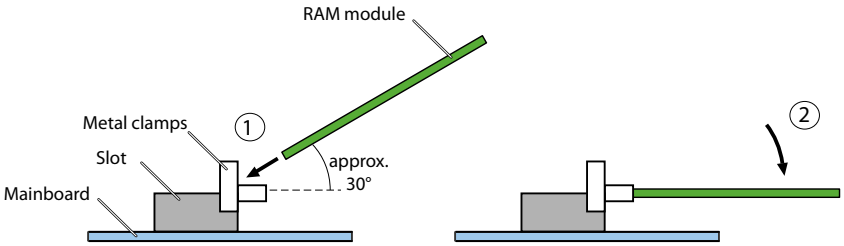


Fig. 78 Changing the RAM module

6. 3. 5 System cards

The category system cards comprises the EIM card and the Flash card.

6. 3. 5. 1 Replacing the EIM card

The EIM card is located in a chip-card holder that is secured directly on the call manager card. The position of the chip-card holder on the call manager card is shown in Fig. 76.

To fit an EIM card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Lift the EIM card slightly at its bevelled corner, and slide it out of the chip-card holder by gently pushing the guide tongues.
4. Push the new EIM card under the guide tongues and through to the stop in the chip-card holder. Make sure the contacts of the EIM card are facing downwards and the bevelled edge of the EIM card is pointing towards the edge of the call manager card and not against the capacitor (C) (see Fig. 79).
5. Carefully push back the call manager card into the shaft and gently press the card as far as it goes into the connection on the backplane.
6. Secure the Call Manager card back into its slot with the screw.
7. Restart the call manager by pressing the On/Off button on the call manager card.

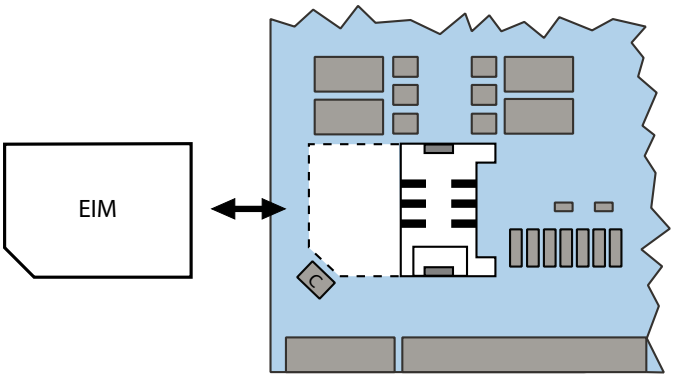


Fig. 79 EIM card

Notes:

- The EIM card must be fitted before the system is put into operation. The communication server will not start without the EIM card.
- If the defective EIM card was replaced by a new one, all DECT cordless phones must be logged on again. This is necessary because the DECT identification numbers are stored on the EIM card.

6. 3. 5. 2 Replacing the Flash Card

The Flash card is fitted to the call manager card and available as a spare part.

To replace a defective Flash card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Carry out preparations (see "Preparations", page 186).
2. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
3. Remove the defective Flash card by pulling it out on the side.
4. Fit the new Flash card and gently press the card as far as it will go into the plug-in connection.
5. Carefully push back the call manager card into the shaft and gently press the card as far as it goes into the connection on the backplane.

6. Secure the Call Manager card back into its slot with the screw.
7. Restart the call manager by pressing the On/Off button on the call manager card.

Notes:
- The Flash cards are expected to meet high demands in terms of data security (read and write cycles). That is why only original Flash cards are to be used.
- Flash cards that are ordered as spare parts do not contain any software. In this case an Emergency Upload has to be carried out (see "Emergency Upload of the system software", page 183).

6. 3. 6 Call manager card CPU1

If the components on the call manager card are defective or permanently faulty, the entire call manager card must be replaced. As a spare part the call manager card does not contain any RAM module, Flash card or EID card. They can be taken from the defective call manager card and fitted to the new call manager card.

To replace a call manager card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Backup the configuration data using AMS if still possible.
2. Carry out the preliminary steps if still possible (see "Preparations", page 186).
   Note: If the call manager cannot be shut down in the normal way, its shutdown has to be forced (see "Display and control panel", page 200).
3. Unscrew the screw on the Call Manager card and remove the card by pulling the fastening screw.
4. Replace the system modules (see "System modules", page 191), the system cards (see "System cards", page 194) on the new call manager card.
5. Dismantle all the connected cables in such a way that the new communication server can be identically reconnected.
   Note: The CPU card is not dismantled but replaced complete with metal housing.
6. The new communication server can now be reassembled, fitted and installed in the reverse sequence.
7. Restart the call manager by pressing the On/Off button on the call manager card.

8. Carry out a first start of the system (see "First start of the communication server", page 172) and upload the configuration data back on to the communication server using AMS.

Tip:
A defective call manager card can make it impossible to read out unstored configuration data with AMS. In such cases the data can be saved using a new call manager card by replacing the Flash card.

6. 3. 7 Application card CPU2

If chips on the applications card are defective or permanently faulty, you need to replace the entire applications card.

To replace an application card, proceed as follows:

Warning
Be sure to observe the "Safety regulations", page 79.

1. Shut down the application server via the control panel (see "On/Off key", page 200).
2. Detach the cables of any assigned interfaces on the front panel of the applications card.
3. Unscrew the screw on the applications card and remove the card by pulling the fastening screw.
4. Carefully slide the new application card into the shaft of slot 2 and gently press the card as far as it goes into the connection on the backplane.
5. Use the screw to secure the card in its slot.
6. Connect the cables of any assigned interfaces on the front panel of the applications card.
7. Start up the applications server by pressing the On/Off button on the applications card.

6. 3. 8 Replacing system terminals

6. 3. 8. 1 Corded system phones

Phones with the same level of added features

Replacing a defective phone

Once the defective system phone has been replaced by an identical phone the terminal configuration data is automatically transferred.

Relocating a phone

The terminal configuration data of a system phone can be copied to another phone with the same level of added features using the AMS Configuration (*Edit* / *Copy* and *Edit* / *Paste*). You can choose the parameters to copy from a list. The data can also be saved with AMS and then reloaded if the system phone is logged on to a different card.

Phones with a different level of added features

Given that every level of added features on system phones has a certain number of features, the features are adapted (reduced or increased) to the new phone. The features are reduced if a phone is replaced by a phone with a lower level of added features (e. g. Aastra 5380 → Aastra 5370) or by a predecessor model (e. g. Aastra 5380 → Office 45).

If a system phone is replaced by a system phone of a different level of added features, the phone display will display the message *Wrong phone type*. On the Office 10 the LED flashes slowly. In this situation, although the phone can be used for basic telephone operations, none of the added features will be available.

Before the added features of the new system phone can be used, the new terminal type will have to be entered in the system using the AMS Configuration Manager *Terminal data* or by configuring at the terminal.

6. 3. 8. 2 DECT terminals

Replacing a radio unit

1. Dismantle the defective radio unit.
2. Fit the new radio unit.

Note:
If the ports of a radio unit are to be changed or if a radio unit is no longer used, it is important to remove the radio unit in the system configuration. If not, start-up problems may occur when another radio unit is connected to the same ports.

Replacing a cordless phone

1. Log off the previous DECT user via AMS.
2. Log on the new cordless phone. The cordless phone data is preserved until the user number is also deleted.

Logging a cordless phone off the system

Click in the system configuration under*Terminal data*, *DECT settings* tab, on the button *Logout cordless phone*.

Tip:
The identification of the cordless phone is deleted only if the cordless phone is located within the coverage range of a radio unit; otherwise, it must be deleted manually on the cordless phone (see the cordless phone's User's Guide). The user number and data in the system are retained.

Logging a cordless phone onto the system

1. Prepare the cordless phone for login (see the cordless phone's User's Guide).
2. Prepare system for logon. To do so, click the *Log on cordless phone* button on the *DECT settings* tab under *Terminal data* in the AMS system configuration.

Note:
The user of the cordless phone may have to identify himself to the system using an access code. The access code has to be entered in the system configuration prior to the logon procedure.

6. 4 Display and control panel

The display and control panel on the call manager card consists of the colour display with the navigation keys and the On/Off button with integrated status LED. It is used to indicate operating states and carry out functions.

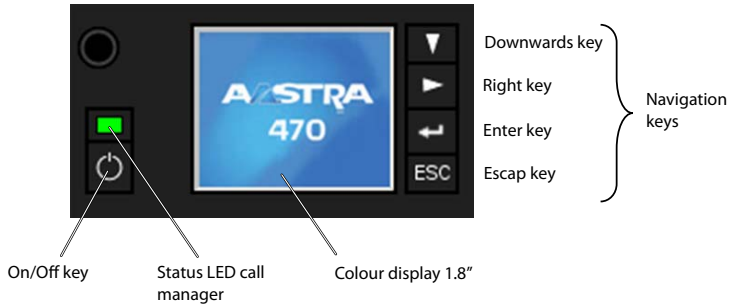


Fig. 80 Aastra 470 display and control panel

Other status LEDs can be found on the Ethernet interfaces and the applications card (see "Status LEDs", page 201).

6. 4. 1 PIN control panel

A number of functions executed via the navigation keys require a PIN (e. g. run first start).

The PIN always consists of 4 digits and can be modified via AMS in the access control using the *SystemUserInterface*user account:

Tab. 91 Default PIN control panel

Default PIN	4321

It is advisable to change the PIN immediately to prevent unauthorized access to the communication server.

6. 4. 2 On/Off key

Pressing the On/Off button starts up the call manager (which is switched off).

In normal operation a short key press of the On/Off key brings up the Shut Down menu, offering the choice of shutting down the Call Manager, the application

server or the entire communication server. The navigation keys are used to select from the menu.

Tab. 92 On/Off key

Function	Action	Note
Start the call manager	Short key press	Requirements: • Power supply on • Executable system software loaded
Shut down the communication server, call manager or applications server	Short key press	The display shows the Shut Down menu with the following selection: • Shut down full system: Shut down communication server (CPU1 and CPU2[1]).[2] • Shut down Call Manager: Shut down CPU1 only • Shut down Application Server: Shut down CPU2 only[1]
Force Call Manager shut down	Keypress longer than 6 seconds	Note: The forced shut-down of the Call Manager should only be made if shutting down via the Shut Down menu is no longer possible for whatever reason.

[1] Shutting down the applications server can take some time and can be checked using the status LED on the On/Off button (see Tab. 98).

[2] This corresponds to the "Off state" in accordance with EU Directive 2005/32/EC.

6. 4. 3 Status LEDs

Status LEDs can be found on the On/Off buttons and on the Ethernet interfaces of the call manager card and the applications card. The applications card also has one LED for each of the USB ports and the hard disk.

6. 4. 3. 1 Call manager LED status

The status LED on the On/Off button of the call manager is used as an operating state and error indicator during the start-up phase and during operation.

The status LED may be lit in the three colours green (G), orange (O) and red (R), flashing slowly or rapidly, or be inactive (–).

An LED activation period lasts 1 second and is subdivided into 4 units of 250 ms. Different display patterns can be displayed in this way.

Tab. 93 Examples of display patterns

LED activation period (1s)				LED	Description
On	On	On	On	G	LED lit green
On	On	Off	Off	O –	LED slowly flashing orange
On	Off	On	Off	O – R –	LED flashing rapidly orange/red

Startup and operating state display

In the system setup the status LED indicates the current operating state of the Call Manager.

The start-up phase can be divided into three parts:

System setup 0:
In this phase, the system can be set to the boot mode (see "Boot mode", page 202)

System setup 1:
The colour display is not yet operational. Any errors that occur are indicated with the status LED (see "Error display with status LED", page 203).

System setup 2:
The colour display is operational. In this phase, the boot menu is shown (see "Boot menu", page 203). Any errors that occur are displayed via the colour display.

Tab. 94 Display pattern at system setup

Pattern	LED	Duration [s]	Meaning	Start-up phase
0	–	steady	Call manager is switched off	
1	R	~1,5	Red LED test	0
2	O	~1,5	Orange LED test	0
3	G	~1,5	Green LED test	0
4	G – G	~4	RAM test, load boot software, boot software CRC test	1
5	O –	~10	Boot software running, load system software, system software CRC test	2
6	G –	steady	System software running error-free	

Boot mode

The boot mode enables an Emergency Upload via the Ethernet interface (EUL via LAN). This is required whenever there is no longer any executable system software stored on the communication server for whatever reason.

The boot mode is indicated by the status LED flashing red.

Tab. 95 Display pattern in the boot mode

Pattern	LED	Duration	Meaning
10	R –	As long as the boot mode is active	Boot mode active

To access the boot mode press the enter key during the LED test red, which is executed during the start-up phase 0.

The boot mode remains active until the Emergency Upload is completed or the system is restarted manually.

Error display with status LED

Errors that occur during the start-up phase 1 are indicated with the status LED.

Tab. 96 Error displays during system setup 1:

Pattern	LED	Duration	Meaning
7	O – O –	As long as the error remains	RAM test faulty
8	O – R –	As long as the error remains	Boot software missing
9	R – R –	As long as the error remains	CRC test boot software faulty

Boot menu

The boot menu is shown during the start-up phase 2 (LED pattern 5 in Tab. 94) during approx. 3 seconds. The boot menu allows the user to reset the IP address data or to carry out a first start. The boot mode is exited automatically and the startup then continues normally if no input is made within 3 seconds.

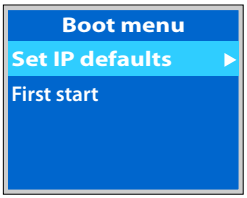


Fig. 81 Boot menu Aastra 470

Display of event messages

If an event message occurs in normal operation, the LED pattern switches from "slowly flashing green" to "slowly flashing orange-green" and the event message is indicated on the colour display.

Tab. 97 Display of event messages in normal operation:

Pattern	LED	Duration	Meaning
11	O G	As long as the event message exists	Event message present

Status LEDs on Ethernet interfaces

For explanations of the status LEDs on Ethernet interfaces see "Status LED", page 138.

6. 4. 3. 2 Status LEDs on the applications server

The applications server has a three-coloured status LED on the On/Off button (On/Off LED), which indicates the operating state of the applications server, two LEDs on the Ethernet interface, and one LED each for the USB ports and the hard disk.

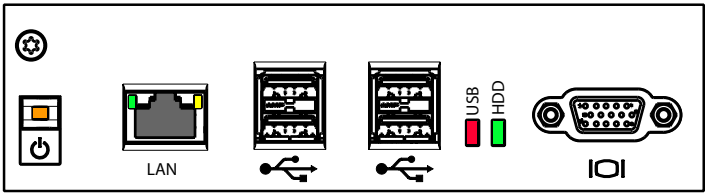


Fig. 82 Status LEDs on the applications server

Tab. 98 Explanation of the status LEDs on the applications card

LED	Signalling	Meaning
On/Off	Steady green	Applications server running fault-free
On/Off	Steady red	Error on the applications server
On/Off	Steady orange	Applications server is switched off
HDD	Flickering green	Hard disk access
USB	Steady red	Power overload on one of the USB interfaces. Note: The maximum permissible current input at the USB interfaces varies (see Tab. 26)
LAN	The Ethernet interface on the applications server is covered as there is currently no provision for its use.	

6. 4. 4 Colour display

The colour display has different display modes, which depend in part on the Call Manager's operating mode.

The table below summarises the display modes.

Tab. 99 Operating modes and display priorities

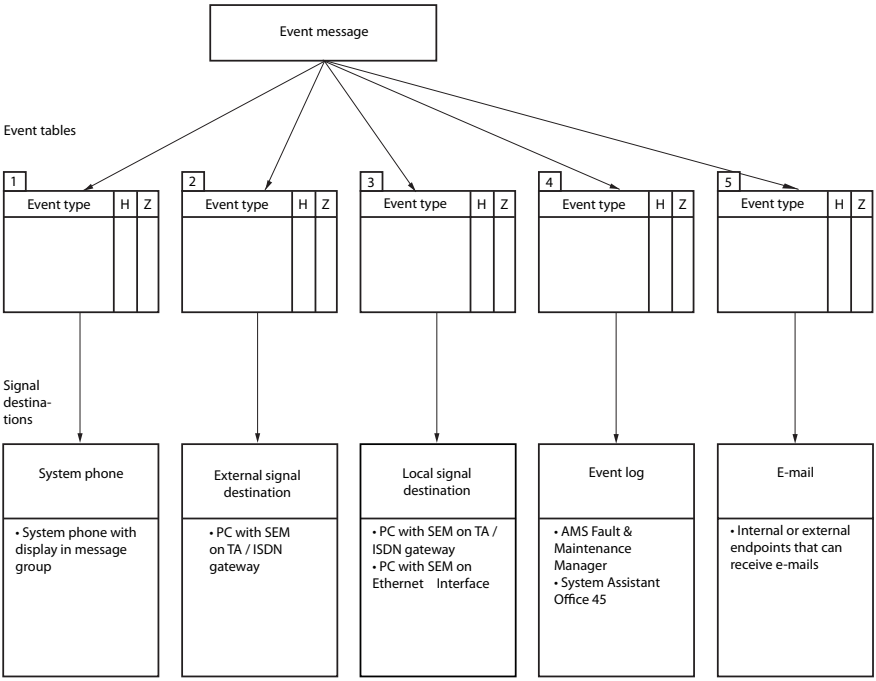
Display mode of the colour display	Call Manager operating mode	Trigger event and purpose
Error mode (Error Mode)	System setup 2	• Triggered by software or hardware error. • The error is shown on the display. • The system is unable to run.
Boot menu (Boot command mode)	System setup 2	• Is shown during the start-up phase 2 (LED pattern 5 in Tab. 94) during approx. 3 seconds. • Allows the user to reset the IP address data or to carry out a first start.
Menu mode (Application command mode)	Normal operation	• Triggered by pressing any navigation key briefly in the traffic load mode. • Allows the user to run various advanced functions.
Traffic load mode (Traffic mode)	Normal operation	• After the startup of the Call Manager or after exiting the menu, idle or event message mode. • Shows the current traffic load of the Call Manager.
Idle mode (Idle mode)	Normal operation	• After a certain amount of time without user interaction from the traffic mode or the event message mode. • Screen saver and energy saving function.
Event message mode (Event message mode)	Normal operation	• After one or more event messages are received.

6. 5 Operations supervision

6. 5. 1 Event message concept

The system generates an event message every time an event or error occurs. The event tables in the Fault & Maintenance Manager are used to specify how often an event message of a particular type may be generated by the system over a given time period before the event message is sent to the allocated signal destinations.

The Fault & Maintenance Manager has 5 event tables that can be allocated to 5 signal destinations:



F = Frequency

T = Time period

Fig. 83 Distribution principle for an event message

6. 5. 1. 1 Event types

Tab. 100 Event types, in alphabetical order

Event/ error message	Trigger condition	Details
ACD server out of service	ACD server defined as destination but not responding.	Date, time
Application card CPU2 Data communication out of service	Data communications with the CPU2 applications card have been interrupted for an unusually long period of time (> 1 hour) due to an error (after a Windows update or due to other reasons).	Date, time
Application card CPU2 Data communications back in service	Data communications with the CPU2 applications card have been restored.	Date, time
ATAS: connection established	ATAS: connection (re) established	Date, time
ATAS: Connection lost	ATAS: connection lost	Cause (0: Logoff, 1: missing cycle signal), date, time
Card out of service	A card previously in operation has stopped functioning.	Number of the expansion slot, date, time
CL Printer Jam	• No response from system printer for past 4 minutes • Printer out of paper or switched off	interface, interfaces/card number, port number, date, time
CL-Printer available again	Printout on the system printer available once again	Date, time
Compatible PMS application	The external hotel management system (PMS application) is suitable for communicating with the communication server.	Date, time
Connection to PMS system established	A connection with a hotel management system (PMS system) has now been successfully established.	Date, time
Connection to PMS system failed	An unsuccessful attempt was made to establish a connection with a hotel management system (PMS system).	Date, time
CTI first party Connection lost	The ATPC3 first-party link was interrupted because the cycle signal is missing.	User number, date, time
CTI first party Connection re-established	The ATPC3 first-party link was (re)established	User number, date, time
CTI third party: Connection lost	The ATPC3 third-party link was interrupted	Cause (0: Logoff, 1: missing cycle signal), date, time
CTI third party: Connection re-established	The ATPC3 third-party link was (re)established	Date, time
E-mail successfully sent	The system has now successfully sent an e-mail.	Date, time
ESME reachable	The LAN connection between the SMSC and the ESME is now available	IP address, date, time
ESME unobtainable	The LAN connection between the SMSC and the ESME is interrupted	IP address, date, time
Ethernet deactivated due to overload	The system has detected an overload on the Ethernet interface. The interface is temporarily deactivated.	Date, time
Ethernet re-activated	The overload on the Ethernet interface no longer exists. The interface has been reactivated.	Date, time

Event/ error message	Trigger condition	Details
External event message destination not reachable	External signal destination not automatically reachable	Cause (0: Busy / 1: Not available / 2: Barred / 3: Undefined), date, time
External event message destination reachable	External signal destination is now reachable	Date, time
External SMS gateway unobtainable	External SMS gateway unobtainable by network provider or incorrectly configured	Date, time
Fan failure	The fan is jammed or defective or the connection is no longer making contact. • Parameter = 0: No more fans in operation. → Risk of overheating: System shut down after 2 minutes. → Replace defective fan. • Parameter = 1: Only one fan left in operation. → System still running with only one fan. → Replace defective fan.	Parameter, date, time
FIAS command buffer full	The command buffer to the PMS interface is full.	Date, time
FIAS interface usable again	The command buffer to the PMS interface is back below the critical limit.	Date, time
ICC overflow	Individual cumulative counter or cost centre counter overflow	User number, cost centre, exchange line, room number, date, time
Inactive radio unit port	Radio unit not responding	Card number, port number, date, time
Incompatible PMS application	The external hotel management system (PMS application) is not suitable for communicating with the communication server.	Date, time
Incorrect Ethernet configuration	The setting of the connected switch port and the Ethernet setting of the communication server do not match. This can result in collisions and blocked connections.	Cause, date, time
Insufficient bandwidth	An user in an AIN is trying to set up a connection and the bandwidth currently available with the WAN link is insufficient.	Link ID, WAN link name, available bandwidth in Kbit/s, date, clock
Internal event message destination not reachable	Local output blocked or not available	Cause (0: Busy / 1: Not available / 2: Barred / 3: Undefined), date, time
Internal event message destination reachable	Local output available once again	Date, time
IP system phone licence is now available	A sufficient number of licences is now available again for Aastra 5360ip/5361ip/5370ip/5380ip.	Date, time
IP system phone: Connection lost	An IP system phone is no longer connected to the communication server.	User number, terminal ID, date, time
IP system phone: Connection re-established	An IP system phone has re-established the connection to the communication server.	User number, terminal ID, date, time
LCR on alternative network provider	Automatic switch from primary network provider to secondary network provider using LCR function	Provider ID, date, time

Event/ error message	Trigger condition	Details
Licence for mobile phone available	A sufficient number of licences is now available again for integrated mobile phones.	Date, time
Licence for PMS interface available	Either the *Hospitality PMS Interface* licence is missing or the number of *Hospitality PMS Rooms* licences available is insufficient.	Number of licensed rooms, number of configured rooms, date, time
Licence invalid; restricted operating mode 4 hours after restart	The system software loaded requires a software release licence. Without this licence the system software's functionality is severely restricted 4 hours after the restart.	Date, time
Licences for offline operations expired	The maximum duration of two hours for the temporary licence activation has expired.	Date, time
Limits reached for busy lamp field	A busy lamp field on an SIP/Aastra SIP terminal could not be configured because the system limit for the platform has been reached.	Terminal ID, key number, date, time
Local supply error on the radio unit	Local power supply of a SB-4+ / SB-8 / SB-8ANT radio unit failed or unavailable	Card number, port number, date, time
Local supply on radio unit available	Local power supply of a SB-4+ / SB-8 / SB-8ANT is now again available	Card number, port number, date, time
Mains voltage failure	Event message once mains power is restored • Mains power has failed more frequently than entered in the trigger table	Date, time
Malfunction	With 3-digit error ID Hardware or software error during self-test With 5-digit error ID: General error during operation. The error ID can help Support to pinpoint the possible cause of the error.	Error ID, date, time
Memory usage below the critical range	The free storage space available in the file system has once again increased above 3 Mbytes	File type ID, Usage, Date, Time
Memory usage over the critical range	The free storage space available in the file system has dropped below 3 Mbytes	File type ID, Usage, Date, Time
Monitor Event	Monitor Event	Monitor Type, Date, Time
No DECT-DSP channels available	DECT channels on DSP-0x overloaded	Date, time
No DTMF receiver available for integrated mobile phones	A permanent DTMF receiver (for detection suffix dialling function codes) could not be assigned to an integrated mobile phone with enhanced functionality.	BCS Ref., date, time
No free IP system phone licences	An Aastra 5360ip/5361ip/5370ip/5380ip was unable to register because there are too few IP system phone licences.	Date, time
No response from network	No answer to Call Setup on BRI-T/PRI interface	Port number of the exchange line circuit, date, time
Node: Connection lost	A node is not connected to the Master for a certain amount of time (configurable).	Node number, date, time
Node: Connection reestablished	A node is reconnected with the Master for a certain amount of time (configurable) after an interruption.	Node number, date, time

Event/ error message	Trigger condition	Details
Not enough mobile phone licences	The connection setup with an integrated mobile phone has failed because the number of configured mobile phones is greater than the number of licences available. All the integrated mobile phones remain blocked until a sufficient number of licences are available.	Number of licences, number of configured mobile phones, date, time
NTP: Synchronisation failed	Time synchronization via the NTP server (NTP = Network Time Protocol) has failed.	Date, time
NTP: Synchronisation reestablished	Time synchronization via the NTP server (NTP = Network Time Protocol) has been restored.	Date, time
Numbers missing	Card(s) not full logged on • Insufficient memory reserved in the numbering plan to enable allocation of numbers to all users: Type in missing numbers by hand	Date, time
Outgoing call rejected	Call rejected by the network • On any line: error code 34 • On required line group: error code 44	Port number of the exchange line circuit, cause, date, time
Overheat	The temperature inside the housing is too high. Appropriate measures must be taken immediately to improve heat dissipation. Measures are automatically adopted, depending on where the overheating occurs: FXO and FXS interface card: • the ports are deactivated in groups of 4 ports. • Once they have cooled down below a defined card-specific value, the ports are automatically reactivated group by group. Application card CPU2: • The card will be completely deactivated. Once it has cooled down below a defined value, the card is automatically reactivated. Internal power suply unit PSU2U or call manager card CPU1: • the communication server will be shut down completely. **Notes:** • To prevent the system from overheating, no more than 30% of the FXS ports should be active simultaneously per 32FXS card and no more than 50 FXS ports per system. • PRI, BRI and DSI cards do not have temperature sensors and are therefore never deactivated due to overheating.	Date, time
Overload detected at USB port (CPU2)	A (current) overload was detected at one of the USB interfaces on the applications card (CPU2). Note: The maximum current input at the USB interfaces varies (see Tab. 26).	Date, time

Event/ error message	Trigger condition	Details
Port out of service	A port previously in operation has stopped functioning.	Number of the slot, relevant port number, date, time
QSIG licence limit reached	Maximum number of licensed outgoing connections with QSIG protocol exceeded	Route number, user number, date, time
Radio unit port active	The radio unit is responding again	Card number, port number, date, time
Recording error	• Card not fitted • Card not logged on • Card defective	Card number, date, time
Remote maintenance disabled	Remote maintenance has been deactivated	Date, time
Remote maintenance is activated	The remote maintenance has been activated (Unfiltered output to local destinations).	Date, time
Reset card	A reset was carried out for one card	Number of the expansion slot, date, time
Satellites missing after supervision time	After an AIN update (Master and all satellites) some satellites no longer have a connection to the Master.	Total satellites missing, Satellites rolled back, Date, Time
Send e-mail failed	The system was unable to send an e-mail because an error occurred.	Cause/action, e-mail client, additional parameter, date, time
SIP account available	The SIP account is unable to register with the SIP provider for a specific reason (0: Provider cannot be reached / 1: No authorization). The event is triggered only if the parameter *Registration required* is configured to *Yes*.	Provider, account, date, time
SIP account available	The SIP account has successfully registered with the SIP provider.	Provider, account, date, time
SMS gateway reachable	External SMS gateway again reachable	Date, time
Software upgrade IP system phone failed	The software update of an Aastra 5360ip/5361ip/5370ip/5380ip has failed for the stated reason.	User number, terminal ID, reason, date, time
Software upgrade IP system phone successful	The software update of an Aastra 5360ip/5361ip/5370ip/5380ip has now been successfully completed after unsuccessful attempt(s).	User number, terminal ID, date, time
Software upload	During an upload in system status: • *Update running* • *Supervision running* • *Normal running*	• New communication server software loaded, starting... • New communication server software crashed, rollback performed • New communication server software started and running well Date, time
Sync. lost on trunk re-established	A BRI/PRI interface entered in the clock pool has been successfully re-synchronized with the system clock.	Port number, date, time

Event/ error message	Trigger condition	Details
Sync. lost re-established	Synchronization with the network has been restored on at least one BRI/PRI interface.	Date, time
Synchronisation loss to exchange	A BRI/PRI interface entered in the clock pool has lost the system clock	Port number, date, time
System Overload	Network access attempted when all lines are seized or the system is overloaded.	Route number, user number, date, time
Terminal power supply: Overload	Rated output slightly exceeded for > 4 s (see also "Overload shutdown", page 75).	Date, time
Terminal power supply: Shutdown	Rated output clearly exceeded for > 4 s	Date, time
The communication server has been restarted!	The communication server was restarted manually or automatically due to an error.	Date, time
The licence limit for Aastra SIP terminals has been reached	An Aastra SIP terminal is unable to register or use the video functionality because there are too few *Aastra SIP Terminals* or *Aastra Video Terminals* licences available.	Parameter 1=1: Missing *Aastra SIP Terminals* licence , Parameter 2=1: Missing *Aastra Video Terminals* licence, Parameter 3=3: Max. number of licences, date, time
The licence limit for CSTA sessions has been reached	An applicable is unable to set up a CSTA session to monitor/check a terminal because there are too few *CSTA Sessions* licences available.	Max. number of licences, date, time
The licence limit for standard SIP terminals has been reached	A standard SIP terminal is unable to register or use the video functionality because there are too few *SIP Terminals* or *Video Terminals* licences available.	Parameter 1=1: Missing *SIP Terminals* licence , Parameter 2=1: Missing *Video Terminals* licence, Parameter 3=3: Max. number of licences, date, time
The licensing limit for the maximum number of users has been reached	When the 37th user is created in AMS or WebAdmin and no *Aastra 470 Expansion* licence is in place.	Date, time
The maximum number of users is back below the licence limit	An *Aastra 470 Expansion* licence is now available or the number of users has been reduced to 36.	Date, time
TLS certificate update failed	The update of the TLS certificate for an SIP node or SIP endpoint via FTP has failed and needs to be renewed manually.	Type of endpoint, node ID or certificate name, date, time
TLS certificate update successful	A TLS certificate was successfully renewed	Type of endpoint, node ID or certificate name, date, time
TLS certificate was generated: Update non-Aastra endpoints now	A TLS certificate has been generated. If generation is manual, the certificate must be imported manually into the Aastra SIP nodes. The certificate must always be imported manually on all non-Aastra nodes and non-Aastra endpoints.	Date, time

Event/ error message	Trigger condition	Details
TLS certificate will expire soon	A TLS certificate for an SIP node or SIP endpoint is about to expire and needs to be renewed.	Type of endpoint, node ID or certificate name, date, time
Too few FoIP channels	Setting up a fax connection via T.38 failed because no FoIP channel is available.	Available FoIP channels on nodes
Too few licences for PMS interface	The *Hospitality PMS Interface* licence or a sufficient number of *Hospitality PMS Rooms* licences are now available.	Date, time
Too few VoIP channel licences	Connection setup failed because the licence limit for simultaneously active VoIP channels has been reached.	No. of licensed VoIP channels, Date, Time
Too few VoIP channels	An user is trying to set up a connection that requires one or more VoIP channels which are currently not available.	Available VoIP channels on this node, date, time
Too many event messages	Number of message types exceeds limit entered in the table on: • "Synch. loss on BRI/PRI" • "Outgoing Call Rejected" • "No response from network"	Date, time
Too many network interfaces	System capacity exceeded	Card No., date, time
Too much user data	System capacity exceeded	Date, time
Total Synchronization loss	Network synchronisation has failed on all BRI/PRI interfaces	Date, time
Trial licence expired	The duration for which a trial licence can be used for a specific feature has expired and there is no valid licence.	Licence ID, date, time
User does not answer	No answer to incoming DDI call from user on S bus or DSI	DDI No., date, time
User event message	With *77[nnnn] from a terminal	nnnn [0000...99999], user number, date, time
Wake-up call unanswered	The room wake-up call was not answered	Room No., date, time
Wake-up order confirmed	The room wake-up call has now been answered	Room No., date, time

6. 5. 1. 2 Event tables

Event tables list all the event messages the system is capable of generating (see Tab. 100).

The frequency of event messages can range between "0" and "20".
The time period is indicated in hours, ranging between "0" and "672". The longest time period "672" corresponds to 28 days or 4 weeks.

If the frequency of event messages is set to "0", the time period will also automatically be set to "0". No event message is sent to a signal destination.

If the frequency of event messages is set to "1", the time period will automatically be set to "0".
The event message will immediately be sent to the signal destinations.

If the time period is set to "0" hours, the frequency of the event message will automatically be set to "1".
The event message will immediately be sent to the signal destinations.

There are 4 event tables in the Fault & Maintenance Manager. Each event table can be individually configured and allocated to one of the 4 signal destinations. This means it is possible to decide which event message – if any – should be sent to a particular signal destination either immediately, with a delay or not at all.

Example

Tab. 101 Example of event table

Event type	Frequency	Time period
Total Synchronization loss	10	1
System Overload	1	0
No response from network	0	0

In this example an event message is sent to the message destinations if there is a *Total synchronization loss* event message when the system generates the event message 10 times within 1 hour. With the event type *System overload*, an event message is sent to the signal destinations immediately; while the event type *No response from network*, no event message needs to be sent to the signal destinations.

6. 5. 1. 3 Signal destinations

5 signal destinations can be configured in the Fault & Maintenance Manager. Any one of the five event tables can be assigned to each signal destination.

When a communication server is first started, one event table with its own number is assigned to each signal destination.

Signal destinations include:

- System phones with alphanumeric display)
- External signal destination (signal destination PC (SEM) via ISDN or LAN / WAN to T interface)
- Local signal destination (e.g. PC (SEM) / printer, PC (SEM) on S interface / Ethernet interface)
- Event log (event protocols in the Fault & Maintenance Manager)
- Internal or external e-mail destinations

There are several possibilities for connecting the signal destinations with a communication server:

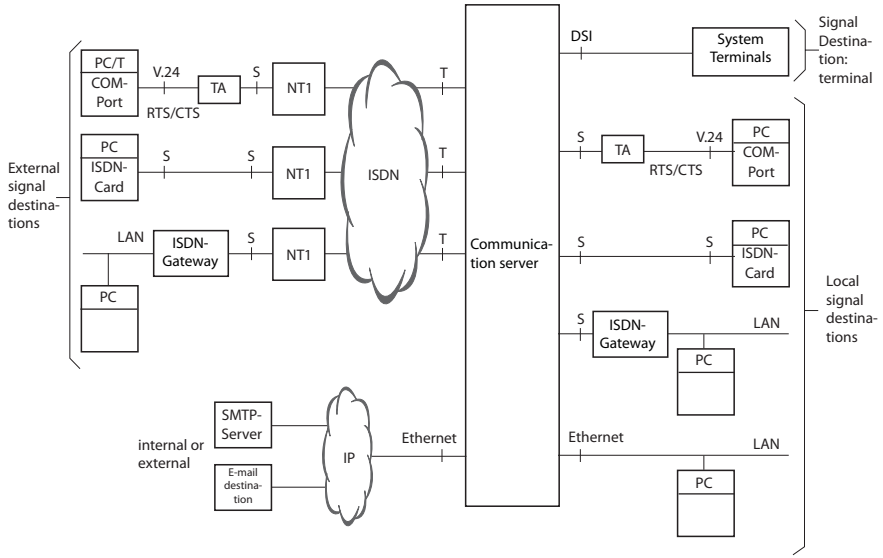


Fig. 84 Overview of connection possibilities for the various signal destinations

Signal destination system phone

Depending on the allocated event table, event messages are sent to all the system phones that have a display and are entered in message group 16.

External signal destinations

Depending on the event table allocated, event messages are sent to a specified external signal destination. Two external signal destinations can be specified:

- 1 preferred external signal destination
- 1 alternative external signal destination

Signalling an event message to an external signal destination

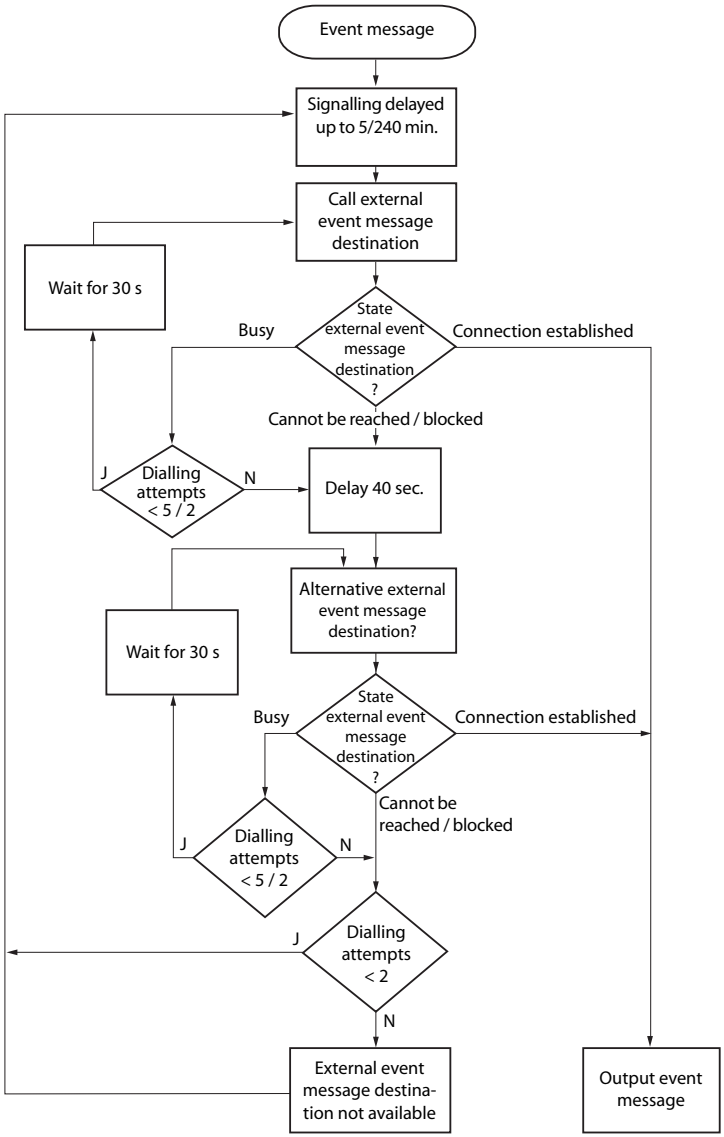


Fig. 85 Flowchart of the signalling of an event message to an external signal destination

The following principles govern the way event messages are signalled to an external signal destination:

- Individual event messages are not signalled if they occur at short intervals. The event messages are stored temporarily for 5 minutes and then sent together to the external signal destination.
- If over a period of one hour an attempt is made unsuccessfully to send the event messages to the external signal destination, the signalling period is extended from 5 minutes to 4 hours. As soon as the event messages are successfully output at the external signal destination, the time period is reset to 5 minutes.
- If over a period of 1 hour an attempt is made unsuccessfully to send an event message to an external signal destination, the number of dialling attempts is reduced from 5 to 2. As soon as an event message has been successfully sent, the number of dialling attempts is increased to 5 again.
- If the attempt to send an event message to an external signal destination was unsuccessful, the system will generate the event message *External event message destination missing*".

Note:
Event tables and signal destinations should be set in such a way that the event message *External event message destination missing* is signalled immediately to any signal destination still available.

Routing an external signal destination

The following points are to be taken into account when specifying the routing to external signal destinations:

- If the external signal destination is dialled up via an exchange access prefix followed by the call number, the call will be routed via route 3. To use a different route, you need to configure a route selection.
- Digit barring for external calls and printer faults (in the case of call logging) do not affect outgoing event messages.

Configuring external signal destinations

If a system sends an event message, the event message opens a PPP communication channel via the public network from the communication server to a Terminal Adapter, connected either directly to a PC with the System Event Manager (SEM) software program or indirectly via a LAN / WAN (ISDN gateway). Once the event message has been confirmed, the system clears down the PPP connection.

Two external signal destinations (*Preferred event message destination* and *Alternative event message destination*) can be configured.

The PPP via ISDN transmission protocol is used for the connection between the communication server and the external signal destination.

The following parameters need to be selected or entered in the Fault & Maintenance Manager for each of the two external signal destinations:

- Call number of the external signal destination (possibly as a route selection)
  Possible external signal destinations include:
  – Ordinary exchange output (route 3 is used)
  – Route selection
  – Cost centre selection (route 3)

  After initialization, the call charges are allocated to cost centre 100.
- IP address of the PC if the communication server is to connect with the PC via an ISDN gateway.
  If the communication server is to connect with the PC without ISDN gateway, the *IP address* entry should remain empty.
- TCP port number (the default value is 1062; if the value is changed in the SEM, it will have to be altered accordingly on the communication server side.)
- User name and password of the dial-up networking of the PC or ISDN gateway, to gain access via the TA or the ISDN gateway to the PC with the SEM.

Other necessary configurations

The following parameters must also be configured.

- In the Fault & Maintenance Manager:
  System ID of the communication server. This is important so that the communication server can be identified by the SEM. The system ID must match the one in the AMS Shell. In the system ID you can store a serial number or the DDI number for the remote maintenance of the system (20 digits).
- In the Configuration Manager:
  Route 3 must be allocated trunk groups with digital network interfaces (*Routes* setting).

Local signal destinations

Depending on the event table allocated, event messages are sent to a specified local signal destination.

Note:
Event tables and signal destinations should be set in such a way that the event message *Internal event message destination missing* is signalled immediately to any signal destination still available.

Configuring a local signal destination on an S interface / ISDN

As with an external signal destination the event message opens a PPP communication channel from the communication server to a Terminal Adapter, connected either directly to a PC with the System Event Manager (SEM) or indirectly via a LAN (ISDN gateway). Once the event has been confirmed, the system clears down the PPP connection.

Configuring a local signal destination on an S interface

The event messages are displayed in PC format.

The *Local output interface* must be set on *IP destination* in the Fault & Maintenance Manager.

The following parameters need to be selected or entered in the Fault & Maintenance Manager:

- Destination: *Local PPP* communication protocol.
- Call number of the local signal destination (the call number is checked by the system, a warning message will appear if the call number is incorrect)
- IP address of the PC if the communication server is to connect with the PC via an ISDN gateway.
  If the communication server is to connect with the PC without ISDN gateway, the *IP address* entry should remain empty.
- TCP port number (the default value is 1062; if the value is changed in the SEM, it will have to be altered accordingly on the communication server side.)
- User name and password of the dial-up networking of the PC or ISDN gateway, to gain access via the TA or the ISDN gateway to the PC with the SEM.

Configuring a local signal destination on ISDN

The event messages are displayed in PC format.

The *Local output interface* must be set on *IP destination* in the Fault & Maintenance Manager.

The following parameters need to be selected or entered in the Fault & Maintenance Manager:

- Destination: PPP via ISDN communication protocol
- Call number of the local signal destination (the call number is not checked by the system, if the entered call number is incorrect, the system will issue the event message *Internal message destination is missing*).
- IP address of the PC if the communication server is to connect with the PC via an ISDN gateway.
  If the communication server is to connect with the PC without ISDN gateway, the *IP address* entry should remain empty.
- TCP port number (the default value is 1062; if the value is changed in the SEM, it will have to be altered accordingly on the communication server side.)
- User name and password of the dial-up networking of the PC or ISDN gateway, to gain access via the TA or the ISDN gateway to the PC with the SEM.

Configuring a local signal destination on an Ethernet interface

A PC (with the System Event Manager) connected either directly to the Ethernet interface or to the communication server via a LAN (LAN connection) can be configured as the local signal destination.

The event messages are displayed in PC format.

The *Local output interface* must be set on *IP destination* in the Fault & Maintenance Manager.

The following parameters need to be selected or entered in the Fault & Maintenance Manager:

- Destination: Ethernet
- IP address of the PC
- TCP port number (the default value is 1062; if the value is changed in the SEM, it will have to be altered accordingly on the communication server side.)

SNMP destination

5 SNMP destinations can be defined. These destinations are linked with the same event table as the local destination, and so the same rules are applied. Forwarding to the SNMP destinations can be activated and deactivated independently of the forwarding to the local and external signal destinations.

For configuration in the Fault & Maintenance Manager proceed as follows:

1. In the tab *SNMP destination* enter the IP address under *IP address/host name* (or the host name if DNS is configured)
2. Configure the remaining parameters
3. Repeat the procedure for all the destinations
4. Switch the parameter *Destination SNMP event message* to *On*.

SNMP stands for "Simple Network Management Protocol" and is used by Network Management Systems (NMS). The systems of the Aastra 400 series support the SNMP V1 version.

If the Network Management System is to know the potential events of the communication system, the corresponding system components have to be defined in the form of configurable objects (Managed Objects: MO). These objects and the related event messages are stored in an object library referred to as the Management Information Base (MIB). The current MIB version can be downloaded from https://pbxweb.aastra.com. The user name and password are required in order to access the data. Registration with the "Aastra Application Partner Programm" is required.

Signal destination Event Log

When the communication server is initialized, the signal destination Event Log is automatically allocated event table 4. In event table 4 the frequency for all event types (with the exception of the event type *Too many event messages*) is set on "1" and the time period on "0". This means that all the event messages are immediately entered in the event log.

If the signal destination event log is assigned a different event table or if event table 4 is reconfigured, the event messages are entered in the event log in accordance with the new event table or the new configuration.

The Event Log consists of four protocols:

- Event messages (max. 254 entries)
- System failures (max. 80 entries)

- Power failures (max. 10 entries)
- Card failures (max. 150 entries)

If the maximum number of entries is exceeded, the oldest entry in each case is deleted.

These 4 Event Logs protocols are not printed out automatically; likewise, your attention is not drawn to any incoming event message. The protocols have to be retrieved manually in the Fault & Maintenance Manager or printed out.

See also:
Event messages entered in the protocols of the Event Logs can also be retrieved on the Office 45 using the System Assistant function on Office 45 (see "Maintenance menu on the Office 45", page 232).

E-mail signal destination

With the e-mail client integrated in the communication server, event messages can be sent to internal or external e-mail destinations. After a first-start of the communication server, the signal destination *E-mail destination* is automatically allocated event table 5. Up to 5 e-mail destinations can be defined in the Fault & Maintenance Manager, and e-mail notification can be activated or deactivated globally.

For the communication server to send the e-mails, the IP address or the host name, the port and, where necessary, a user name with password must be configured under *SMTP server* in the Configuration Manager.

Testing the signal destination configuration

To test the configuration, you can trigger a test event message via the Fault & Maintenance Manager. The event message is signalled without any delay, directly at the selected signal destination.

If the communication server is connected with AMS via a TA, the test event messages will be signalled only once the connection is cleared down.

6. 5. 2 System Event Manager SEM

The System Event Manager (SEM) is a program capable of receiving and handling communication system event messages. It consists of the components:

- SEM Configurator
- SEM Server
- SEM Viewer

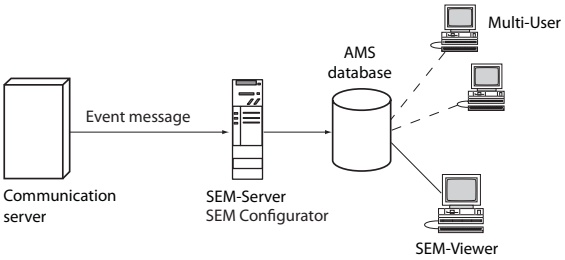


Fig. 86 SEM concept (general)

Event messages are sent to the SEM Server by the communication server. The SEM Server stores all the important data in the corresponding AMS database. This data can be retrieved and edited using the SEM Viewer.

SEM Configurator

The SEM Configurator is used to start or end the SEM Server.

The relevant TCP port has to be activated for data transmission.

The event types can be assigned different priorities in the SEM Configurator.

The SEM Configurator is also used to set, for each individual AMS database, the way in which the SEM Server should respond to each incoming event message (e. g. send e-mail, print out on a printer).
If you want a beep or melody to signal that the SEM Server has received an event message, make the appropriate setting in the SEM Configurator.

SEM Server

The SEM Server receives event messages from communication servers and stores all the important data in the corresponding AMS databases.

For the program to operate correctly there has to be at least one AMS database.

SEM Viewer

The SEM Viewer is used to edit the event messages stored by the SEM Server; they can then be filtered, sorted, printed or written into a file according to, for example, status, customer, communication server or priority.

The SEM Viewer can also be used to set, for each AMS database, the way in which the SEM Server should respond to an event message (e.g. send e-mail, print out on a printer).

6. 5. 3 Operating state and error displays

6. 5. 3. 1 System operating state

During the start-up phase, various self-tests are performed and the individual phases are indicated with the status LED on the front panel (see "Status LEDs", page 201).

When operation is OK, the status LED flashes green, regularly, and once per second in the display on the front panel. The system is in normal mode. All additional information and operating modes are indicated using the colour display on the front panel (see "Colour display", page 205).

6. 5. 3. 2 System error displays

Whenever the system detects an error, it displays the corresponding error code in the colour display on the front panel (providing the communication server is still powered and the display is working). During system startup, if the colour display is not yet fully functional any errors that occur are indicated with the status LED (see "Error display with status LED", page 203).

In the event of sporadic errors check the installation for earth loops.

6. 5. 3. 3 Terminals

Tab. 102 Malfunctions on the terminal side

Error description	Error cause / error handling
Digital system phones on the DSI bus display *Not Configured* along with the node number, the slot number and the port number.	No terminal has yet been created on the connected port or an incorrect terminal selection digit (TSD) has been allocated to the terminal: • Check system and terminal configuration • Check installation and connecting cable
System phones do not obtain dial tone when seizing a line; display reads *Not available*.	System is prebarred • Unlock system • Replace phone or inteface card if necessary
Terminals with configurable dialling method experience sporadic malfunctions whenever control key is pressed.	System earth must not be connected on terminals configured for MFV / DTMF (double signalling on Flash / earth key).
Analogue terminals do not obtain a dial tone when off-hook.	No terminal has been created on the connected port or the terminal created has not been allocated to a user. • Create a terminal and allocate a user • Check installation or connecting cable

6. 5. 3. 4 Operating state of the Aastra DECT radio units

Each radio unit is equipped with 3 LEDs. The operating state the radio units is indicated by different colours and flashing sequences in cycles of 1 s, specifically by one of the two outer LEDs on the SB-4+ and by both outer LEDs on the SB-8 / SB-8ANT (separately for each DSI bus). Each character (G, R or -) corresponds to 1/8 of a second.

Example:
During the synchronization phase GGGGRRRR the LED flashes periodically 1/2 second green, 1/2 second red.

Tab. 103 Flashing sequences of the status LED on the DECT radio unit

State	Cycle	Meaning
No flashing	- - - - - - - -	LED switched off / software not running / RU not connected
Red		Error:
	R R R R R R R -	DSI bus not in order
	R - - - - - - -	Power supply error or DSI line too long
Green / red		Startup process:
	G R R R R R R R	DSI ok
	G R G R G R G R	Software downloading
	G G G G G R R R	Synchronizing
	G G G G G G G R	Starting DECT
	G G G G G R G R	HF Power Down / DECT System Status Passive[1)]

State	Cycle	Meaning
Green		Normal operation (requirement: LED not switched off):
	G - - - - - - -	All B channels available
	G G G G - - - -	1 to 3 B channels busy
	G G G G G G G -	> 3 B channels busy

1) This operating state appears in the following situations:
- during a configuration data upload
- After a system first-start
- If the parameter *DECT system state* is set to *Passive* in the AMS Configuration Manager
- If a radio unit is not allocated to a Location Area (this may happen after adding a radio unit to a system with several Location Areas, which is the case when a radio unit has already been set in a Location Area unequal 0). In this case the added radio unit has to be manually allocated to the selected Location Area.)

An orange status LED indicates that the DECT signalling is active, i.e. DECT sequences are currently being transmitted between the cordless phone and the radio unit. Examples:

- With each keystroke on the cordless phone the LED briefly lights up orange.
- During a cordless phone software download the orange LED remains lit until the download is completed.

On an SB-8ANT radio unit the middle LED indicates whether the internal or external antennas are active. If the LED is lit green, the external antennas are active.

Note:
After the system initialization the radio unit starts in status "DSI ok". It is only ready to operate once at least one DECT user has been entered in the numbering plan or the parameter *DECT system state* has been set to *Active* in the AMS Configuration Manager.

6. 5. 3. 5 Malfunction of the Aastra DECT radio unit

Tab. 104 Malfunction of the Aastra DECT radio unit

Error description	Error cause / error handling
No radio connection in a coverage area.	Check LED on radio unit: LED is flashing red (short red phase): • Check power supply / line length of DSI bus cable LED is flashing red (long red phase): • Check DSI bus cable • Unplug DSI bus cable for one minute, then reconnect LED is flashing green (long green phase): • All B channels busy
Radio unit not activated.	LED on radio unit is flashing red/green (various patterns): • Radio unit in startup phase LED on radio unit is flashing red (long red phase): • Radio unit defective If LED on radio unit not flashing: • Check trunk connections • Radio unit defective • LED of the radio units deactivated throughout the system

6. 5. 3. 6 Malfunctions of Aastra DECT cordless phones

Tab. 105 Malfunctions of Aastra DECT cordless phones

Error description	Error cause / error handling
No display.	• Switch cordless phone on and test • Replace or charge battery
No radio link to radio unit; no aerial symbol.	Check coverage area (within range of a radio unit). • Check radio units in this section Cordless phone not logged on to system • Log cordless phone on
Impossible to dial.	Keypad blocked (keylock) • Reactivate keypad
No dial tone.	• Check radio units in this section
Poor connection quality (echo effect).	• Activate echo compensation
Cordless phone beeps approx. every 10 s during a call (or in standby) while battery indicator is flashing.	• Replace battery immediately, either after or during the call (see cordless phone user's guide)
Call breaking up.	You are moving out of range. • Find a location with a better radio contact

Error description	Error cause / error handling
A cordless phone is called from a different system phone, but cannot be reached.	Busy tone obtained and display reads *Busy* • Cordless phone is busy Congestion tone obtained and display reads *Circuit overload* • All radio channels busy If congestion tone is obtained after 8 seconds and display reads *No answer*. Reasons why the cordless phone could not be reached: • It is switched off • It is not within reachable radio area • No radio channels currently available • It is not logged on to system • Call diverted due to unobtainable
Cordless phone is not ringing.	• Activate tone ringing
The cordless phone cannot be configured; PIN missing (or forgotten).	• Reset PIN using AMS (overwrite)

6. 5. 3. 7 Malfunctions of the DECT charging bays

Tab. 106 Malfunctions of the DECT charging bay

Error description	Error cause / error handling
The cordless phone will not charge.	• Connect power supply • Check the charging contacts • Check battery and replace if necessary. About the charging process: • Battery symbol on the cordless phone is flashing (Office 135) or filling up (Office 160, Aastra 600d) when the battery is being charged. • Check tone indicates correct contact.

6. 5. 3. 8 Longclicks on Aastra DECT cordless phones

In normal DECT cordless phone operation, long-clicking the following keys accesses additional functions directly.

Tab. 107 Longclicks on Aastra DECT cordless phones

Function	Office 135	Office 160	Aastra 600d
In a list box: change scroll direction. Long-click "⁂" switches to "⁑" and vice versa.	Foxkey right	Foxkey right	—
Direct access to the configuration menu	M	M	—
Switch cordless phone on/off	C , 0	0	End key
Switches over to the next radio system temporarily.	1	1	2
Indicates the radio system parameters (cordless phone IPEI and radio system PARK). With each additional call the next radio system is indicated in each case if there are other logons.	2	2	—
Indicates the cordless phone's internal diagnostics.	3	3	—
Switches to a special alarm menu of the cordless phone.	—	—	3[1)]
Indicates the data of the valid radio unit ("Show Measurement Mode", see "Planning DECT Systems" in the User's Guide).	4	4	—
Indicates the cordless phone's software version.	5	5	—
Jumps to the cordless phone's service menu.	—	—	5
Indicates battery charge status and the type.	6	—	—
Indicates the communication server's software version.	7	7	—
Activates "semi" key lock. See Operating Instructions for details.	8	8	—
Activates key lock. See Operating Instructions for details.	9	9	#
Switch dialling type DTMF on/off. See Operating Instructions for details.	*	*	—
Switch tone ringing on/off.	—	—	*
Jumps to the cordless phone's tone ring menu.	Loud-speaker key	Loud-speaker key	—
Menu for display contrast, display backlighting, area tone and overload tone. See Operating Instructions for details.	#	#	—
Configuration mode for hotkey. See Operating Instructions for details.	Hotkey	Hotkey	Hotkey
Switch error messages on/off (default value: off). Messages relating to the following errors cannot be switched on/off: HS logon error, incorrect location registration, no locatable radio unit, network, system or radio unit overload.	5 + 3	5 + 3	—

1) Aastra 630d only

6. 5. 3. 9 Overload code displays Office 135 / Office 160

The overload code displays on the DECT cordless phones Office 135 and Office 160 can be activated and deactivated using the following key combination (toggle function):
Long-click key 5 and then long-click key 3 (long = long-click = > 2 seconds).

The overload code display is always deactivated after system initialization.

Tab. 108 DECT overload code displays Office 135

Code	Name	Error description	Error handling
05 / 06	IPEI Not Accepted	Cordless phone already logged on to system under different number.	• Check existing subscriber No. under "Config."; log that particular subscriber off • Try again
10	Authentication failed	Logon error	Try again
51	DL 04 Expiry	Timer (on cordless phone) has expired	Try again
			Try again
70	Timer Expired	MM timer in system has expired (during logon)	Try again
44	Failure to set up traffic bearer	Connection cannot be set up as too many cordless phones are phoning within the same range	• Try again • If still unsuccessful after several attempts, "Reset cordless phone" (normally it is enough to press key 0 with a long keystroke and switch back on)
45	No Quiet Channel	No channel available, same as code 44	Same measures as for code 44
80	Reject Location Area. Not allowed. Mis-used to indicate wrong "design" version.	Wrong mode during logon.	Logon to the system < I5 • Office 135: Long-click"Home" Logon to the system > I5: • Office 135: Short-click "Home"

6. 5. 4 Other aids

6. 5. 4. 1 Maintenance menu on the Office 45

The System Assistant function on the Office 45 under the *Maintenance* menu item can be used to retrieve system information which in the event of a malfunction provides important clues as to the cause of the fault:

Tab. 109 *Maintenance* menu selection:

1: *View*	3: *Delete*
2: *Print*	4: *Both*

You can select from the following menu items:

1. System status
2. System failures
3. Mains voltage failures
4. Event messages

System status menu item

Tab. 110 Display of the system status lines

== *SYSTEM STATUS*		
BCS: 00000	*CC*: 00000	
SUBS: 0011	*NSUB*: 0000	*LINE*: 0001
DIST: 0001	*DDIN*: 0000	*ABB*: 1000
Back with [<-- |]		

The system status lines provide useful information for a more in-depth fault diagnosis. They can be printed out and sent to customer support on request.

Tab. 111 The displayed data and what it means

Display	Description	Normal value / idle state	Note
BCS: xxxxx	Number of existing BCS references	*BCS*: 00000	Each active connection needs 2 BCS references
CC: xxxxx	Number of existing call controls	*CC*: 00000	For each BCS reference there is one or more CC
SUBS: xxxx	Number of users in the system	*SUBS*: 0000	0000: No ports busy
NSUB: xxxx	Number of PISN users in the system	*NSUB*: 0000	0000: No PISN user in the system
LINE: xxxx	Number of lines in the system	*LINE*: 0000	0000: No lines defined

Display	Description	Normal value / idle state	Note
DIST: xxxx	Number of call distributions in the system	*DIST*: 0000	0000: No call distribution defined
DDIN: xxxx	Number of DDI numbers in the system	*DDIN*: 0000	0000: No DDI numbers defined
ABB: xxxx	Number of abbreviated dialling numbers in the system	*ABB:* 1000	1000: Default value unchanged

System failures menu item

Tab. 112 System failures display

== *SYSTEM FAILURES*E				52
W 15/09/2010	13:32	011A59F2,	011A5A8C,	01156FFE
W 06/12/2010	13:32	011A59F7	011A5A82	01156FF1

The system's last 80 system failures (resets) are displayed. The resets are incremented in the counter in the top right (0...255).

Significance of the display: Error type W = restart (watchdog), date, time

When printing, only the last 4 addresses are printed out.

Power failures menu item

Tab. 113 Power failures display

== *POWER FAILURES*	
01.12.10	16:13

Only the restart time is recorded.

Event messages menu item

Tab. 114 Event messages display

== *EVENT MESSAGES*		
01.12.10	00:01	OUTGOING CALL REJECTED TO LINE: 12.25
02.12.10	09:15	TOO MANY EVENT MESSAGES

The event messages are identical to the displays obtained when entering the configuration with System Assistant on the Office 45. They are stored in event table 4 (see "Event message concept", page 206). The entries in the Maintenance menu remain stored until they are deleted with the *Delete* command.

Remarks

- The display on the event message header line ("1") indicates the number of event messages that have occurred (max. 255). You can use the cursor keys to scroll through the lines (not visible)(e.g.4 events 1/2: 2 events on page 1,2 events on page 2)
- The last 254 entries can be displayed.
- The event entries record only the time of the error incident, not the time at which it was remedied.
- More detailed information on triggering and printing event messages can be found in "Event message concept", page 206.

See also:
Event messages can also be called up in the AMS Fault & Maintenance Manager (see "Signal destination Event Log", page 222).

6. 5. 4. 2 Fault & Maintenance Manager

For information on the Fault & Maintenance Manager see "Event message concept", page 206.

6. 5. 4. 3 System Event Manager SEM

For information on the System Event Manager (SEM) see "System Event Manager SEM", page 224.

6. 5. 4. 4 Measuring equipment for cordless systems

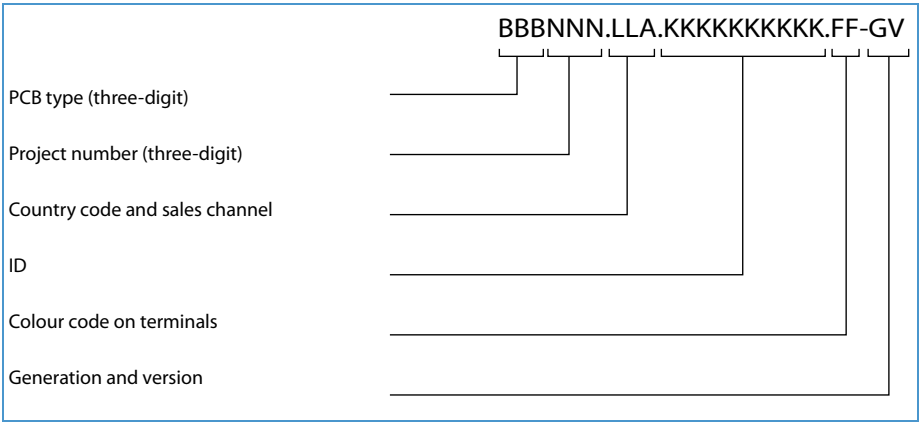
The aids required for measuring out DECT systems are described under “Planning DECT Systems” in the User’s Guide.

7 Annex

This chapter informs you about the systematic designation system and provides you with an equipment overview of the communication server with cards, modules and optional components. It also provides the technical data for interfaces, communication server and system terminals as well as a table overview of the digit key assignments and function keys for the system phones. Finally here is a list of functions and products no longer supported, licence information on third-party software products, and a table summary of related documents and online help.

7. 1 Systematic Designation System

Tab. 115 PCB Designation



Tab. 116 Explanation of the PCB Designation

Part of the PCB designation	Remarks and examples
PCB type (three-digit)	LPB = Printed circuit board fitted KAB = Cable fitted PBX = Complete system SEV = Set packed EGV = Terminal packed MOV = Module/card packed
Project number (three-digit)	958 (System Aastra 470)
Country code and sales channel (one to three-digit, with full stops)	Two-digit country code as per ISO 3166, Sales channel (1...9) for various sales channels. Example: EXP = Export channels (not country-specific) Space = No country code
ID	4FXS = analogue terminal card with 4 FXS interfaces
Colour code on terminals	Colour designation in accordance with EU directive
Generation and version	Example: –3C = 3rd generation, version C (Generation new modules: –1) Notes: • A generational change is effected following substantial changes to the functionality of a PCB. • A change of version is effected following small changes to functions or once faults have been remedied. Backward compatibility is guaranteed.

7. 2 Rating Plate and Designation Stickers

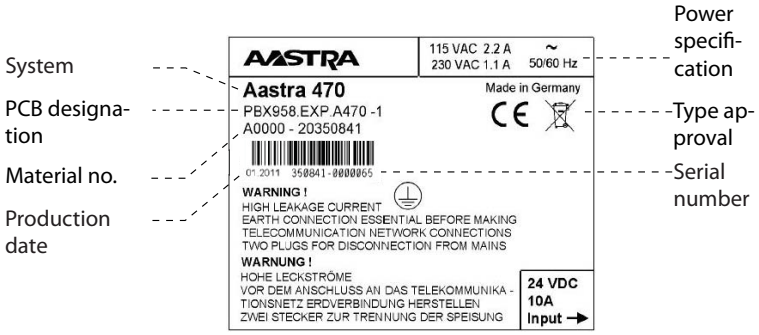


Fig. 87 Rating plate (example Aastra 470 communication server)

Fig. 88 Designation stickers (example interface card)

7. 3 Equipment Overview

Tab. 117 Equipment Overview

Designation	Description
PBX958.EXP.A470-1	Aastra 470 basic system with CPU1 call manager card
MOV958.EXP.CPU2-1	Application card CPU2
MOV957.EXP.SM-DSPX1-1	DSP module SM-DSPX1
MOV957.EXP.SM-DSPX2-1	DSP module SM-DSPX2
EIP1-8	IP Media module EIP1-8
EIP1-32	IP Media module EIP1-32
MOV958.EXP.4TAX-1	4TAX[1)] call charge module
MOV958.EXP.8TAX-1	8TAX[1)] call charge module
MOV958.EXP.16TAX-1	16TAX[1)] call charge module
MOV958.EXP.1PRI-1	1PRI ISDN primary trunk card
MOV958.EXP.2PRI-1	2PRI ISDN primary trunk card
MOV958.EXP.4BRI-1	4BRI ISDN basic trunk card/terminal interface card
MOV958.EXP.8BRI-1	8BRI ISDN basic trunk card/terminal interface card
MOV958.EXP.4FXO-1	4FXO[1)] analogue trunk card
MOV958.EXP.8FXO-1	8FXO[1)] analogue trunk card
MOV958.EXP.16FXO-1	16FXO[1)] analogue trunk card
MOV958.EXP.8DSI-1	Terminal card 8DSI
MOV958.EXP.16DSI-1	Terminal card 16DSI
MOV958.EXP.32DSI-1	Terminal card 32DSI
MOV958.EXP.4FXS-1	Terminal card 4FXS
MOV958.EXP.8FXS-1	Terminal card 8FXS
MOV958.EXP.16FXS-1	Terminal card 16FXS
MOV958.EXP.32FXS-1	Terminal card 32FXS
MOV958.EXP.FOP-1	Fan-out-panel (FOP)
MOV958.EXP.APS2-1	Auxiliary power suply unit with fastening kit(APS2)
SEV958.EXP.RFU-1	Redundant fan unit on fastening frame (RFU)
KAB958 CABLE RJ45-08-6M-1	Prefabricated system cable 4 x RJ45, 6 m
ELE957 CABLE-RJ45-6M-1	Prefabricated system cable 12 x RJ45, 6 m
CABLE PATCH 8P 1M SHIELDED BLUE	RJ45 patch cable, blue, screened, 1 m

1) The availability/release depends on the sales channel.

Tab. 118 Overview of spare parts

Designation	Description
SPARE PART /SEV958 CPU1-1	Call manager card CPU1 (excl. RAM, Flash, EIM)
SPARE PART /SEV958 DRAM-1G-1	RAM module for call manager card CPU1
SPARE PART /SEV958 CF-1G-1	Flash module for call manager card CPU1
SPARE PART /SEV958.EXP.A470-LIC-1	EIM card for call manager card CPU1
SPARE PART /SEV958 FAN-1	Fan with fastening screws

7. 4 Technical Data

7. 4. 1 Network interfaces

The following technical data applies to the network interfaces:

Basic rate interface BRI-T

- Standard Euro ISDN interface as per CTR-3
- Configurable for point-to-point or point-to-multipoint operation

Analogue network interfaces

- Voice path with A/D and D/A conversion (standard PCM, A-law)
- Transmission as per ES 201 168 (level country-specific)
- Signalling as per TBR 21
- Pulse or DTMF dialling, Flash signal
- Loop current detection
- Call charge receive 12 or 16 kHz (frequency and level setting country-specific)
- CLIP detection in accordance with ETS 300 778-1

7. 4. 2 Terminal interfaces

The following technical data applies to the terminal interfaces:

Digital terminal interface DSI

- Proprietary interface, two-wire
- Two system phones of the Aastra 5300 series can be connected per interface (AD2 protocol) [1)]
- One system phone of the Dialog 4200 series can be connected per interface (DASL protocol)
- One SB-4+/SB-8 radio unit can be connected (with 8 channels the SB-8 radio units requires two DSI interfaces)
- Power supply min. 75 mA, limiting at approx. 80 mA, terminal voltage 36…48 V

[1)] Office 10, Office 25, Office 35, Office 45/45pro are supported as before

- Line termination in the phone
- Transparent transmission of 2 PCM channels

Digital terminal interface BRI-S

- Standard Euro ISDN interface
- Phantom power supply min. 140 mA, limiting at approx. 170 mA, terminal voltage 36…41 V
- Up to 8 terminals can be connected
- Maximum of 2 simultaneous call connections

Analogue terminal interface FXS

- Configurable multifunctional interface for connecting analogue terminals and equipment.
- For the FXS mode *Phone/fax*, *two-wire door* and *general bell* the following applies:
  - Voice path with A/D and D/A conversion (standard PCM, A-law)
  - Transmission as per ES 201 168 (level country-specific)
  - Constant-current loop supply approx. 25 mA (with loop resistances ≤ 1000 Ω)
  - Receive pulse or DTMF dialling
  - CLIP display on all analogue terminal interfaces (only on 2 analogue terminals simultaneously).
  - Ringing supply 40…43 V 50 Hz at load 4 kΩ; no DC voltage overlay (country-specific versions also with 25 Hz)
  - No control key detection
  - No charge signalling pulses
- For more technical details and cable requierements see "Multifunctional FXS interfaces", page 128.

7. 4. 3 Communication server

Tab. 119 Dimensions and weights

	Aastra 470
Height	85 mm
Width	481 mm
Depth	380 mm
Weight (with call manager card but without mains cord, interface cards, modules and packaging)	6.71 kg

Tab. 120 Electrical isolation of interfaces

Interface	Aastra 470	
Analogue network interfaces	0.2 kV	Operating isolation
Digital network interfaces BRI		Operating isolation
Control input on FXS interface		no isolation
Control output on FXS interface		no isolation
Audio input on FXS interface		no isolation

Tab. 121 Ambient conditions

Condition	Aastra 470
Ambient temperature	5 ? to 45 ?
Relative air humidity	30% to 80%, non-condensating

Tab. 122 Electrical data

	Internal power supply Aastra 470	auxiliary power suply unit (APS2)
Class of protection	1	1
Input voltage	103 V...127 V or 207 V...253 V, 48...62 Hz	100 V…240 V, 48...62 Hz
Input current	ca. 0.2 A...2.2 A (with 115 V) approx. 0.1 A...1.1 A (with 230 V)	approx. 0.2 A...4.0 A (with 115 V) approx. 0.2 A...2.0 A (with 230 V)
Resistant to voltage breaks	< 20ms	< 20ms
Power input with min. configuration	ca. 25 W	ca. 25 W
Power input with max. configuration	ca. 140 W	ca. 260 W
Undervoltage limit (system reset, data backup)	< 90 V	< 90 V

Tab. 123 Heat dissipation

	Aastra 470
Basic system with auxiliary power supply unit	approx. 140 W = 504 kJ/h
Maximally configured system	approx. 400 W = 1440 kJ/h

7. 4. 4 Dimensions of cards and modules

Tab. 124 Dimensions of cards and fan-out panels

Card	Dimensions width x height x depth [mm]
Interface cards	93 x 41 x 265
Call Manager card CPU1	154 x 41 x 265
Application card CPU2	154 x 41 x 265
Fan-out panel FOP	481 x 44 x 69

Tab. 125 Modules

Card	Dimensions length x width [mm]
DSP module	90 x 56
IP Media module	85 x 85
Call charge module	83 x 60

7. 4. 5 LAN switch

Tab. 126 LAN switch on CPU card CPU1

- 10Base-TX / 100Base-TX / 1Gb-TX switch
- Fully compliant with IEEE 802.3/802.3u
- Auto MDI-X, Autopolarity, Autonegotiation
- Flow control fully supported (half duplex: backpressure flow control, full duplex: IEEE 802.3x flow control)
- Embedded SRAM for packet storage
- 1024-entry look-up table, direct mapping mode
- QoS: 802.1p VLAN tag, DiffServ/TOS field in TCP/IP header, IP-based priority

Tab. 127 LAN switch on the backplane

- 100Base-TX
- Fully compliant with IEEE 802.3/802.3u
- Embedded SRAM for packet storage
- 1024-entry look-up table, direct mapping mode
- QoS: 802.1p VLAN tag, DiffServ/TOS field in TCP/IP header, IP-based priority

7. 4. 6 Digital and IP system phones

Tab. 128 Digital and IP system phones

	Aastra 5360/5360ip, Aastra 5361/5361ip, Aastra 5370/ 5370ip, Aastra 5380/5380ip, Office 10, Office 25, Office 35, Office 45/45pro
Ambient temperature in operation	0 °C to 40 °C
Relative humidity in operation	30 % to 80 %
Admissible storage temperature	-25 ° to 45 °C
Power consumption, digital system phones	see table "Average power requirements of terminals", page 74 and table "Maximal power requirements of the system phones on the DSI bus", page 116
Power consumption, IP system phones	see System Manual for "Aastra Intelligent Net (AIN) and IP system phones"

Tab. 129 Dimensions and weights, digital and IP system phones

Terminals	Height (Type of mounting)	Width	Depth (Type of mounting)	Weight
Aastra 5360, Aastra 5360ip, Aastra 5361, Aastra 5361ip	115 mm (Desktop 25 °) 151 mm (Desktop 45 °) 199 mm (Wall)	262 mm	198 mm (Desktop 25 °) 166 mm (Desktop 45 °) 90 mm (Wall)	approx. 850g
Aastra 5370, Aastra 5370ip	115 mm (Desktop 25 °) 151 mm (Desktop 45 °) 199 mm (Wall)	262 mm	198 mm (Desktop 25 °) 166 mm (Desktop 45 °) 90 mm (Wall)	approx. 875 g
Aastra 5380, Aastra 5380ip	115 mm (Desktop 25 °) 151 mm (Desktop 45 °) 199 mm (Wall)	262 mm	198 mm (Desktop 25 °) 166 mm (Desktop 45 °) 90 mm (Wall)	approx. 935 g
Expansion key module Aastra M530	115 mm (Desktop 25 °) 151 mm (Desktop 45 °) 199 mm (Wall)	95 mm	198 mm (Desktop 25 °) 166 mm (Desktop 45 °) 90 mm (Wall)	approx. 180 g
Expansion key module Aastra M535	115 mm (Desktop 25 °) 151 mm (Desktop 45 °) 199 mm (Wall)	128 mm	198 mm (Desktop 25 °) 166 mm (Desktop 45 °) 90 mm (Wall)	approx. 325g
Office 10	55 mm	82 mm	200 mm	approx. 360 g
Office 25	56 mm	224 mm	203 mm	approx. 500 g

Terminals	Height (Type of mounting)	Width	Depth (Type of mounting)	Weight
Office 35	75 mm	254 mm	203 mm	approx. 680 g
Office 45/45pro	97 mm	336 mm	203 mm	approx. 960 g
Expansion key module EKP	44 mm	82 mm	133 mm	approx. 115 g
Alpha keyboard AKB	21 mm	190 mm	82 mm	approx. 150 g

7. 4. 7 Aastra DECT Radio units

GAP functionality

The following table contains the network features as defined in the GAP standard. For each feature a separate column indicates whether it is supported by communication servers of the Aastra 400 family or Aastra DECT cordless phones.

Tab. 130 Features supported as per GAP standard

No.	Feature	PP	In Aastra DECT cordless phones	FP	In Aastra 400
1	Outgoing call	M	✓	M	✓
2	Off hook	M	✓	M	✓
3	On hook (full release)	M	✓	M	✓
4	Dialled digits (basic)	M	✓	M	✓
5	Register recall	M	✓	O	✓
6	Go to DTMF signalling (defined tone length)	M	✓	O	✓
7	Pause (dialling pause)	M	✓	O	—
8	Incoming call	M	✓	M	✓
9	Authentication of PP	M	✓	O	✓
10	Authentication of user	M	✓	O	—
11	Location registration	M	✓	O	✓
12	On air key allocation	M	✓	O	✓
13	Identification of PP	M	✓	O	—
14	Service class indication / assignment	M	✓	O	—
15	Alerting	M	✓	M	✓
16	ZAP	M	3	O	—
17	Encryption activation FP initiated	M	✓	O	—
18	Subscription registration procedure on-air	M	✓	M	✓
19	Link control	M	✓	M	✓
20	Terminate access rights FP initiated	M	✓	O	✓
21	Partial release	O	✓	O	✓
22	Go to DTMF (infinite tone length)	O	—	O	—
23	Go to Pulse	O	—	O	—
24	Signalling of display characters	O	✓	O	—
25	Display control characters	O	—	O	—
26	Authentication of FP	O	✓	O	✓
27	Encryption activation PP initiated	O	—	O	—
28	Encryption deactivation FP initiated	O	—	O	—
29	Encryption deactivation PP initiated	O	—	O	—
30	Calling Line Identification Presentation (CLIP)	O	✓	O	✓
31	Internal Call	O	✓	O	—
32	Service Call	O	—	O	—

PP: Portable Part

FP: Fixed Part

M: Mandatory (this feature must be supported by GAP compliant equipment)

O: Optional

—: The Aastra DECT cordless phones and Aastra 400 communication servers do not support the feature.

Technical data

Tab. 131 Aastra DECT Radio units

Duplex method	Time-division multiplex, 10 ms frame length
Frequency range	1880 MHz to 1900 MHz
Frequency bands (carrier)	10
Channel spacing (carrier distance)	1,728 MHz
Transmission rate	1152 kbit/s
Duplex channels per carrier SB-4+ / SB-8	6 / 12
Number of channels (duplex channels) SB-4+ / SB-8	60 / 120
Modulation	GFSK
Data transfer rate	32 kbit/s
Voice encoding	ADPCM
Transmit power	250 mW peak value 10 mW, average power per channel
Range	30 to 250 m
Max. line length to radio unit - power supply via DSI bus (0.5mm) - with power supply unit (9–15 VDC, 400 mA)	 1200 m 1200 m
Ambient temperature, radio unit in operation	-10 ? to 55 ?
Admissible storage temperature	-25 ? to 55 ?
Relative humidity in operation	30 % to 80 %
IP class of protection	IP 30
Dimensions: Radio unit W x H x D:	165 x 170 x 70 mm
Weight: Radio unit	320 g
Local power supply to radio unit (optional)	Plug-in power supply unit (Euro-plug)

7. 5 Operation of digital system phones

7. 5. 1 Digit key assignment of system phones

Digit key assignment depends on the system phones series and the language set for the communication server.

The following Latin script assignment for the digit keys applies to the system phones / Aastra 5360/5360ip, Aastra 5361/5361ip, Aastra 5370/5370ip, Office 35, Office 45/45pro, Office 135/135pro and all models of Office 160 for all communication server languages with the exception of Greek:

Tab. 132 Latin-script digit key assignment

1	-.?1!,:;'"¿¡ -.?1!,:;'"¿¡
2 ABC	A B C 2 Ä Æ Å Ç a b c 2 ä æ å à ç
3 DEF	D E F 3 É d e f 3 é è ê
4 GHI	G H I 4 g h i 4 ì
5 JKL	J K L 5 j k l 5
6 MNO	M N O 6 Ñ Ö Ø m n o 6 ñ ö ø ò
7 PQRS	P Q R S 7 p q r s 7 ß
8 TUV	T U V 8 Ü t u v 8 ü ù
9 WXYZ	W X Y Z 9 w x y z 9
0	+ 0 + 0
*	* / ( ) < = > % £ $ ¤ ¥ ¤ @ & § * / ( ) < = > % £ $ ¤ ¥ ¤ @ & §
#	Space # Space #

Notes:

- The Aastra 5360 and Office 25 phones does not have a graphics-compatible display and therefore cannot display all the characters featured (see also the corresponding user guide).
- On the Office 160 cordless system phone the space character is stored under digit 0 and the special characters are stored under the #-key instead of the *-key.

The following Latin script assignment for the digit keys applies to the system phones Aastra 5360/5360ip, Aastra 5361/5361ip, Aastra 5370/5370ip, Office 35, Office 45/45pro, Office 135/135pro and all models of Office 160, if the communication server language is set to Greek. Greek letters are always displayed in upper case on the phone displays:

Tab. 133 Greek-script digit key assignment

1 -.?1!,:;'" -.?1!,:;'"	2 ABC Α Β Γ 2 A B C Α Β Γ 2 a b c
3 DEF Δ Ε Ζ 3 D E F Δ Ε Ζ 3 d e f	4 GHI Η Θ Ι 4 G H I Η Θ Ι 4 g h i
5 JKL Κ Λ Μ 5 J K L Κ Λ Μ 5 j k l	6 MNO Ν Ξ Ο 6 M N O Ν Ξ Ο 6 m n o
7 PQRS Π Ρ Σ 7 P Q R S Π Ρ Σ 7 p q r s	8 TUV Τ Υ Φ 8 T U V Τ Υ Φ 8 t u v
9 WXYZ Χ Ψ Ω 9 W X Y Z Χ Ψ Ω 9 w x y z	0 + 0 + 0
* * / ( ) < = > % £ $ ¤ ¥ ¤ @ & § * / ( ) < = > % £ $ ¤ ¥ ¤ @ & §	# Space # Space #

Notes:

- The Aastra 5360 and Office 25 phones does not have a graphics-compatible display and therefore cannot display all the characters featured (see also the corresponding user guide).
- On the Office 160 cordless system phone the space character is stored under digit 0 and the special characters are stored under the #-key instead of the *-key.
- If only the language of the phone and not the communication server language is set to Greek, only the static and dynamic menus will appear in Greek letters on the phone. In such cases it is not possible to key in Greek letters or to edit texts in Greek letters (e.g. run alpha dialling, edit private phone book, etc.)

7. 5. 2 Alpha keyboard Aastra 5380/5380ip

The integrated alphanumerical keyboard on the Aastra 5380/5380ip is available in a QWERTY and AZERTY version. The special characters can be called up using the "Ctrl" key and the "Shift" key.

Tab. 134 Integrated alphanumerical keyboard Aastra 5380/5380ip

Key	<Key>	Shift + <key>	Ctrl + <Key>	CTrl + Shift + <Key>
A	a	A	ä á à â ã å æ	Ä á à â Ã Å Æ
B	b	B		
C	c	C	ç	Ç
D	d	D		
E	e	E	é è ê ë	É è ê Ë
F	f	F		
G	g	G		
H	h	H		
I	i	I	ï í ì î	ï í ì î
j	j	j		
K	k	K		
L	l	L		
M	m	M		
N	n	N	ñ	Ñ
O	o	O	ö ó ò ô õ ø	Ö ó ò ô Õ Ø
P	p	P		
Q	q	Q		
R	r	R		
S	s	S	ß	
T	t	T		
U	u	U	ü ú ù û	Ü ú ù û
V	v	V		
W	w	W		
X	x	X		
Y	y	Y	ÿ	
Z	z	Z		
@	@	@		
+	+	+	- . ? ! , : ; . " / \ ( ) = < > % £ $ ō ¥ ª & § ¿ ¡	

7. 5. 3 Alphanumerical keyboard (AKB)

The alpha keyboard for Office 35 and Office 45 is available in 2 variants, which differ in the keypad printing.

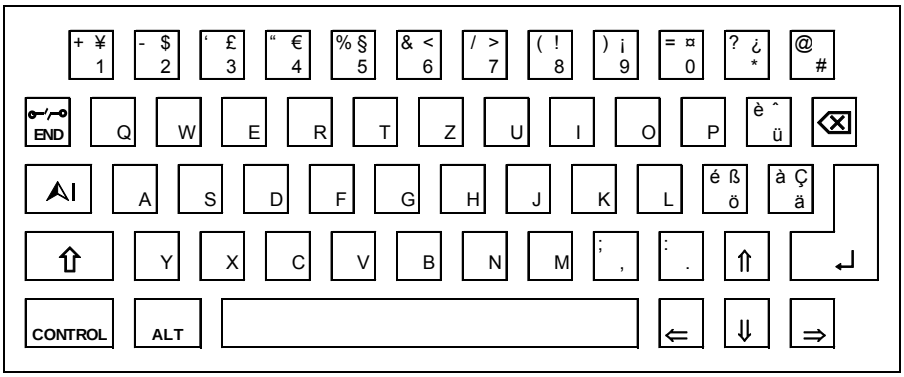


Fig. 89 AKB QWERTZ

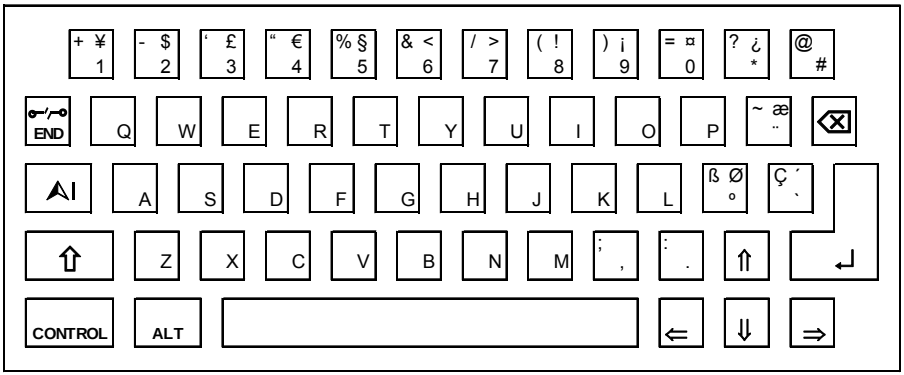


Fig. 90 AKB QWERTY

If an alpha keyboard (QWERTZ or QWERTY) is connected to a communication server that is set to Greek, the following keyboard assignment applies:

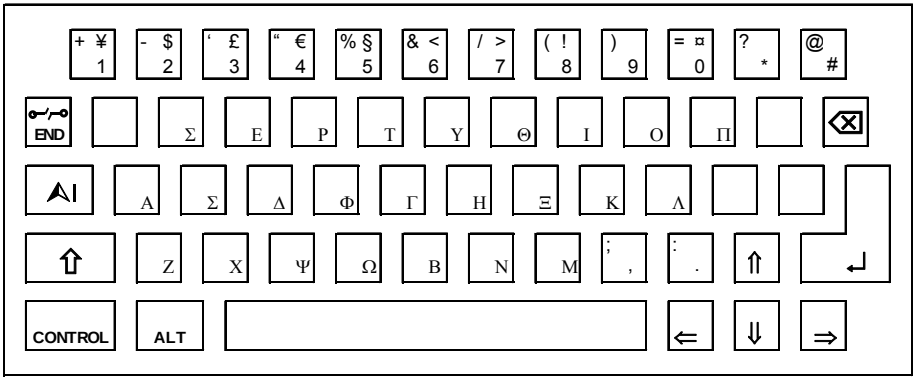


Fig. 91 Greek keyboard assignment

Note:
The keyboard can be switched from Greek to Latin using "Alt Tab" subject to certain restrictions with regard to special characters. This means that Latin characters can be keyed in via the AKB even though the communication server language is set to Greek.

7. 5. 4 Function commands (macros)

Function commands are used mainly for automatically activating / deactivating features using the function keys of the system phones. The following function commands are available:

Tab. 135 Function commands for system phones

Function command	Meaning
"A"	Seize line with maximum priority[1)]
"I"	Seize line
"X"	Disconnect
"P"	Pause 1 second before next action
"Lxx"	Seize line xx (line keys)[1)]
"N"	Enter call number keyed in during call preparation
""	Control keys function
"Z"	Activate / deactivate DTMF mode (tone dialling)
"R"	Use call number last dialled
"Y"	End call and reseize line [2)]

1) Available only with the key telephones.

2) Not available for Office 10.

The function commands can be stored directly on the system phones or on the function keys via AMS.

Note:
As the Office 10 does not have a text mode, only 3 function commands can be stored on function keys on this phone. The 3 function commands are entered using the following keys:

Tab. 136 Function commands on function keys Office 10

	Pause 1 second before next action
	Control keys function
	Activate / deactivate DTMF mode (tone dialling)

7. 6 Functions and terminals no longer supported

The Aastra 400 series continues to support the terminals and functions of the Aastra IntelliGate series. Exceptions include the following terminals and functions:

- Digital system phones Office 20, Office 30, Office 40
- IP system phones Office 35IP, Office 70IP-b
- Cordless system phones Office 100, Office 130/130pro, Office 150, Office 150EEx, Office 155pro/155ATEX
- The Aastra 6751i phone is no longer supported as an Aastra SIP phone.
- IP system softphone Office 1600/1600IP
- DECT radio unit SB-4
- Pocket Adapter V.24
- X.25 in the D channel
- Ascotel® Mobility Interface (AMI) and DCT terminals
- Universal Terminal Interface (UTI)

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7. 8 Documents and online help systems with further information

Product	Document
Products of the Aastra 400 family	System Manual for Aastra 415/430 System Manual for System Functions and Features System Manual for SIP and SIP terminals SIP Access User's Guide (English) User's Guide for function codes on Aastra 400 Application Notes, technical information, FAQs and compatibility lists are all available on the internet/extranet support page at: https://pbxweb.aastra.com
AMS	Readme file Information Manager Online help Tooltips Application Notes
WebAdmin	Online help Configuration assistant
Upload Manager	Online help
System Event Manager	Online help
Project planning application Aastra Plan	Online help
DECT	Planning DECT systems User's Guide
SIP-DECT	User's Guide for SIP-DECT on Aastra 400
Basic/Enterprise voice mail system	User's Guide for voice-mail system on Aastra 400 System Manual for System Functions and Features
OIP	What's New System Manual for Open Interfaces Platform Online help OfficeSuite User's Guide User's Guide for First Party TAPI Service Provider
Networking	System Manual for Aastra Intelligent Net (AIN) and IP system phones System Manual for PISN/QSIG Networking
IP system phones	Quick User's Guide Aastra 5360ip / Aastra 5361ip / Aastra 5370ip / Aastra 5380ip Operating Instructions for Aastra 5360ip / Aastra 5361ip / Aastra 5370ip / Aastra 5380ip / Aastra 2380ip
Digital system phones	Quick User's Guides for Office 10 / Office 25 / Office 35 / Office 45/ 45pro / Office 135/135pro / Office 160pro/Safeguard/ATEX / Aastra 5360 / Aastra 5361 / Aastra 5370 / Aastra 5380 / Aastra 610d / Aastra 620d / Aastra 630d

Product	Document
	User's guides for Office 10 / Office 25 / Office 35 / Office 45/45pro / Office 135/135pro / Office 160pro/Safeguard/ATEX / Aastra 5360 / Aastra 5361/ Aastra 5370/ Aastra 5380 / Aastra 5380 / Aastra 610d / Aastra 620d / Aastra 630d Office 45 System Assistant Operating Instructions
PC operator console	Aastra 1560/1560ip User's Guide Office 1560/1560IP Quick User's Guide Online help
Mobile phones	User's Guide for mobile phones on Aastra 400 Aastra Mobile Client User's Guide

The documents can be accessed at http://www.aastra.com/docfinder.

Further documents in the Internet:

- Environmental information for communication server and system phones
- Declarations of conformity for communication server and system phones
- Labels for system phones and expansion key modules
- Safety instructions for system phones
- Application Notes
- Product information
- Leaflets
- Brochures
- Data sheets

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