Praesideo 4.3

Digital Public Address and Emergency Sound System

BOSCH

en **Installation and User Instructions**

Disclaimer

Although every effort has been made to ensure the information and data contained in these Installation and User Instructions is correct, no rights can be derived from the contents.

Bosch Security Systems disclaim all warranties with regard to the information provided in these instructions.
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Important Safeguards

Prior to installing or operating this product, always read the Important Safety Instructions which are available as a separate document and are packed with all units that can be connected to the mains.

Old electrical and electronic appliances

Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive). To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

FCC Requirements Class A

All Praesideo devices are verified to comply according 47 CFR subpart 15 B, Unintentional Radiators. Class A Digital device, peripherals and external switching power supplies.

NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Notice
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Modifications
Any modifications made to this device that are not approved by the manufacturer may void the authority granted to the user by the FCC to operate this equipment.

Canada
This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬(Cr6+)	多溴联苯 (PBB's)	多溴二苯 (PBDE's)
印制电路板	X	O	O	O	O	O
线缆	X	O	X	X	X	X
电子元件	X	O	X	X	O	O
塑料零件	O	O	O	O	X	X
装备配件	X	O	X	X	O	O
金属零件	X	O	X	X	O	O
O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 规定的限量要求以下.						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 规定的限量要求.						

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Bosch Security Systems has made a great effort for the design and manufacturing of the components and also supplies all documentation that enables the assembly of a safe and high quality emergency unit in accordance with EN54-16:2008 and ISO7240-16:2007. Bosch Security Systems has made up this list of requirements, based on the standard, which needs to be filled in and subsequently signed off by both parties. The signed paper has the nature of a certificate and can have significant meaning in the case of a legal investigation of the liability issue for personal injuries.

- The safety of the system in accordance with EN54-16:2008 and ISO7240-16:2007 in an alarm and emergency application does not only depend on component safety, but also highly on the installation engineer and the operator. For example, the sound pressure level of the system depends on the installation. Moreover, the system should only be installed and operated by qualified personnel.
- Modifications of the system should only be executed by authorized persons in accordance with the safety concept and need to be registered in the system documentation.
- If third party components (not delivered by Bosch Security Systems) are added to the minimal configuration of Praesideo, then the EN54-16:2008 and ISO7240-16:2007 certification becomes expired.
- Only use Power Supply Equipment that is compliant to the current standards and legislation in combination with the Praesideo system. Within Europe the Power Supply Equipment shall be EN54-4 compliant.
- The end-user must maintain a journal for the system.
- In case continuous event logging (beyond the possibilities and capacity provided by the Network Controller) is required, the end-user/installer must use the Praesideo system in combination with a logging PC. In that case the logging PC is considered as a basic element of the system.
- The installer is responsible for security measures to prevent improper use of the system via the Internet and local wired or wireless networks.
- Bosch Security Systems refuses any liability for damage that might result from non-observance of these instructions.

Herewith the undersigned states that he/she has processed for him/her applicable requirements, as specified in this document, in an adequate way and has confirmed this fact by signing the rightmost column of each applicable requirement.

Installer
Name:
Signature:
Date:
Place:

End-user
Name:
Signature:
Date:
Place:

List of authorized end-users

Name	Name

EN54-16: 2008 compliancy checklist

Clause / Requirement	Compliance	Signature
4 General requirements		
4.1 General	Praesideo is compliant.	
4.1.1 If an optional function with requirements is included in the VACIE, then all the corresponding requirements shall be met (see Annex B).	The following optional functions, with requirements, are included in Praesideo from version 3.3 upwards: • Audible warning (7.3) • Phased evacuation (7.5) • Manual silencing of the voice alarm condition (7.6.2) • Manual reset of the voice alarm condition (7.7.2) • Output to fire alarm devices (7.8) • Voice alarm condition output (7.9) • Indication of faults related to the transmission path to the CIE (8.3) • Indication of fault related to voice alarm zones (8.4) • Voice alarm manual control (10) • Interface to external control device(s) (11) • Emergency microphone(s) (12) • Redundant power amplifiers (13.14) The following optional functions with requirements are not included in Praesideo: • Delay(s) to entering the voice alarm condition (7.4) • Disabled condition (9)	
4.1.2 If functions other than those specified in this European Standard are provided, they shall not jeopardize compliance with any requirements of this European Standard	Praesideo power amplifiers and basic amplifiers shall not be configured to enter the power save mode when mains power fails. Although this would save battery power, the amplifier supervision and line/loudspeaker supervision is not active in this mode, which is a necessity for systems operating in accordance with EN54-16. The Praesideo PC call station shall not be used as an emergency call station in systems operating in accordance to EN54-16. A PC does not comply with the requirements as set forward by this standard.	
4.2 Combined VACIE and CIE		
When the VACIE and CIE are combined they may share common indications, manual controls and outputs (see Annex F). In this case, the following shall apply: a single fault in the CIE shall not adversely affect the mandatory functions of the VACIE; b indication(s) and manual control(s) of the voice alarm condition shall be clearly identifiable, with the exception of the optional audible warning.	This requirement is not applicable. In Praesideo, the Voice Alarm Control and Indicating Equipment (VACIE) is not combined with a fire alarm Control and Indicating Equipment (CIE).	

Clause / Requirement	Compliance	Signature
4.3 Power supply	Praesideo is compliant.	
Power supply equipment, external or included in the VACIE, shall comply with the requirements of EN 54-4.	The network controller and all amplifiers are supplied with a mains supply and DC backup supply (48V) input. Switch over between the both takes place automatically, without any interruption or status change other than the power supply related indications. The installer must use battery charging equipment in accordance with EN54-4. Battery chargers must be installed in a separate cabinet, not shared with the Praesideo system, unless one of the following chargers is used, that are approved for use with Praesideo: • The PRS-48CH12 and PRS-48CHxx-DE series of 48V battery chargers have been certified in combination with Praesideo equipment for mounting in the same 19"-cabinet, provided that the batteries are placed on the ground plane of the cabinet, free from the walls. Although not required by and therefore excluded from EN54-4/16 certification, a battery mid-point monitor, model SD08 from Alpha Technologies Ltd., may be used with the PRS-48CH12 battery charger and mounted in the Praesideo cabinet, in accordance with the German standard VDE 0833-4. • In addition, the Praesideo equipment can be combined with the Merawex power supply system ZDSO400E-AK3 in its rack. This system may consist of the main power supply ZDSO-400-E, additional power supply ZDSOR-400-E, additional power supply ZDSOT-400-E, distribution panel PD-2U-x, battery circuit resistance measurer RMB-1. The installer must ensure that the output voltages of the battery charger or other power supply equipment do not exceed the specifications of the mains and battery inputs of the connected Praesideo equipment. Loading the 48V auxiliary output of the PRS-48CH12 and PRS-48CHxx-DE battery chargers will reduce the maximum available charging current for the 48V batteries and this reduction must be taken into account when determining the maximum battery capacity for an EN54-16 certified Praesideo system. The content of the EN54-16 certificate is subject to change. The most recent version of this certificate can be found on http://www.boschsecurity.com.	
NOTE - The power supply may be shared with that of the fire detection and fire alarm system.	The power supply may be shared with that of a fire detection system, but when operated with a battery a new capacity calculation is required.	

Clause / Requirement	Compliance	Signature
5 General requirements for indications		
5.1 Display and functional conditions	Praesideo is compliant.	
5.1.1 The VACIE shall be capable of unambiguously indicating the following functional conditions, as described in Clauses 6 to 9: • quiescent condition; • voice alarm condition; • fault warning condition; • disablement condition (option with requirements)	See Clauses 6 to 9.	
5.1.2 The VACIE shall be capable of being simultaneously in any combination of the following functional conditions on different voice alarm zones:	The Praesideo system is capable of being simultaneously in the voice alarm condition and in the fault warning condition.	
• voice alarm condition;	The voice alarm condition is indicated per system on each call station (system status LED) and on the display of the network controller (emergency menu). This system wide indication can be combined with the indication of the fault warning condition: each call station uses a different LED (power/fault LED) for indication of the fault warning condition; therefore both conditions can be indicated simultaneously. The display of the network controller can indicate both the voice alarm condition and the fault warning condition (note that it will only show one condition automatically, the voice alarm condition has precedence; the user is able to see the fault warning condition by navigating through the menu if both conditions apply to the system simultaneously). To indicate the voice alarm condition per zone, the installer shall use a call station keypad module with correctly connected red LEDs (see clause 13.9.1) with configuration of the 'Zone status'.	
• fault warning condition;	The fault warning condition is indicated per system on each call station (power/fault LED) and on the display of the network controller (faults menu). This system wide indication can be combined with the indication of the voice alarm condition: each call station uses a different LED (system status LED) for indication of the voice alarm condition; therefore both conditions can be indicated simultaneously. The display of the network controller can indicate both the voice alarm condition and the fault warning condition (note that it will only show one condition automatically, the voice alarm condition has precedence; the user is able to see the fault warning condition by navigating through the menu if the system is in both conditions simultaneously). The installer must configure zone names in a way that the zone name is visible in the fault logging and network controller display (see clause 8.2.7 for details). In this way faults are indicated per zone.	
• disablement condition (option with requirements).	The optional disablement condition is not implemented in Praesideo.	
5.2 Indication display	Praesideo is compliant.	
All mandatory indications shall be clearly identifiable, except where otherwise specified in this European Standard.	The Praesideo system uses the following color coding for indications throughout the system: • Green: system ok • Red: system/zone in voice alarm condition • Yellow: system in fault warning condition	

Clause / Requirement	Compliance	Signature
5.3 Indication on alphanumeric displays	Praesideo is compliant.	
Where an alphanumeric display is used to display indications relating to different functional conditions these may be displayed at the same time. However, for each functional condition there shall be only one window, in which all of the information relating to that functional condition is grouped.	The alphanumeric display of the network controller indicates the voice alarm condition by means of the emergency menu. The display indicates the fault warning condition by means of the faults menu. If a fault occurs in the system, the faults menu is displayed automatically. If the system enters the voice alarm condition, the emergency menu is displayed automatically. The emergency menu has precedence over the faults menu. The faults menu has a submenu for each individual fault. The user can scroll through the individual faults. The logging application delivered with the Praesideo system offers a graphical user interface for viewing events (Logging Viewer). The Logging Viewer has three separate tab pages: Fault Events (shows events related to the fault warning condition), Call Events and General Events (shows events related to the voice alarm condition).	
5.4 Indication of the supply of power	Praesideo is compliant.	
5.4.1 A visible indication shall be given by means of a separate discrete light-emitting indicator while the VACIE is supplied with power.	Each Praesideo system component either has a dedicated power LED or a display with a backlight. For components with a power LED, the LED is on when the component is supplied with power. For components with a display, the backlight of the display is on when the component is supplied with power.	
5.4.2 Where the VACIE is distributed in more than one cabinet, an indication of supply of power to each distributed cabinet shall be given at that point.	The Praesideo system can be distributed in more than one cabinet, depending on the installation of the system. Many system components can be mounted in a 19'' rack. Each cabinet will indicate supply of power independently if the system is distributed in more than one cabinet.	
5.5 Additional indications	Praesideo is compliant.	
Where additional indications are provided, they shall be clearly identifiable and shall not override the primary indication of the VACIE.	For LEDs with multiple indication functions , all of the additional indications are clearly identified (in the Installation and User Instructions of the Praesideo system); since the fault warning indication and the voice alarm indication always have precedence over the additional indications, the primary indications are not overridden. The LED indicator belonging to a key of the call station keypad is used for status indications. The status indications depend on the function which has been assigned to the programmable key. The Installation and User Instructions of the Praesideo system clearly identifies the possible status indications. These status indications do not override the primary indication of the Praesideo system, since they are separate LEDs. The display of the network controller offers a menu that is also used for other indications than indication of the voice alarm and/or fault warning condition. The Installation and User Instructions of the Praesideo system clearly identifies the other indications of the menu. The other menus do not override the emergency and faults menu; indication of the faults menu and emergency menu has precedence (higher priority) over indication of the other menus.	

Clause / Requirement	Compliance	Signature
6 The quiescent condition		
Any kind of system information may be displayed during the quiescent condition. However, no indications shall be given which could be confused with indications used in the	Praesideo is compliant.	
• voice alarm condition,	If the Praesideo system enters the voice alarm condition each call station will show a red system status LED and the emergency menu will pop up on the display of the network controller. In the quiescent condition no red indicators are used at all and the display of the network controller will never automatically switch to the emergency menu.	
• fault warning condition,	If the Praesideo system enters the fault warning condition each call station will show a yellow (blinking or on) power/fault LED and the faults menu will pop up on the display of the network controller. In the quiescent condition the power/fault LED of each call station will be green and the display of the network controller will never automatically switch to the faults menu.	
• disablement condition (option with requirements).	The disablement condition is not implemented in Praesideo.	

Clause / Requirement	Compliance	Signature
7 The voice alarm condition		
7.1 Reception and processing of fire signals	Praesideo is compliant.	
7.1.1 The VACIE shall be capable of receiving and processing alarm signals from the CIE or from manual control on the VACIE or both, and causing the appropriate voice alarm outputs to be activated within 3 s or on expiry of any delay period (see 7.4).	Alarm signals from the CIE can be received from input contacts and the Open Interface. Manual control is possible via input contacts, the Open Interface and call station (keypad) keys.	
NOTE - See Annex E for additional information relating to the interface between the VACIE and the CIE.	If input contacts are used for connection of the CIE to the Praesideo system then the input contacts can be monitored for short circuit and open line. If the Open Interface is used for connection of the CIE to the VACIE, the communication is monitored using keep-alive messaging.	
7.1.2 The mandatory indications and or outputs shall not be falsified by multiple alarm signals received simultaneously from the CIE and/or manual controls.	The Praesideo system offers 32 discrete alarm priorities. Correct configuration assures that mandatory indications and or outputs behave consistently when multiple alarm signals are received simultaneously from the CIE and/or manual controls. Higher priorities overrule lower priorities in case of resource or destination conflicts. Calls with the same priority operate on first come first serve basis, except in the case of priority 255: calls with the same priority 255 overrule each other, so the latest becomes active. This assures that high priority microphones that are left behind in an active state will never block the system.	
7.1.3 Where the VACIE and CIE are in separate cabinets, failure of the transmission path between the CIE and the VACIE shall not result in any loss of control or any change of state of the VACIE.	The Praesideo system is an autonomous subsystem that can operate without connection to the CIE. The effect of the failure of the transmission path between the CIE and the Praesideo system is limited to fault reporting and losing interaction between the CIE and the Praesideo system.	
7.2 Indication of the voice alarm condition	Praesideo is compliant.	
7.2.1 The presence of a voice alarm condition shall be indicated on the VACIE, without prior manual intervention, by:		
a a visible indication by means of a separate discrete light emitting indicator (the General Voice Alarm Activated indicator);	A voice alarm condition is indicated on the Praesideo system by: • A red indicator on all call stations (the system status LED). • A textual indicator on the network controller display (the 'emergency menu' that is automatically shown when the system enters the voice alarm state). • An output contact configured in the site specific data as voice alarm activated indicator (Emergency alarm indicator). This output contact can be used to control the General Voice Alarm Activated indicator. • The installer must mount a red (flash) light to indicate the voice alarm condition, clearly visible from the front side of the rack, behind the glass door of the rack.	
b a visible indication for each activated voice alarm zone where manual controls are provided (see 10.2);	The keys on call station keypads can be configured to have their key indicator show that an emergency is active for a specific zone or group of zones. This is achieved by configuring the action 'Zone status' for the key, and configuring the lowest possible alarm priority (224) for that action to ensure that for all alarm priorities (224 - 255) the indicator will be activated.	
NOTE - This may be by means of separate discrete indicators or an alphanumeric display as specified in 13.8.		
c an optional audible indication, as specified in 7.3.	The Praesideo PRS-NCO3 has an internal buzzer for this purpose. Also, an output contact of a Praesideo system component can be configured in the site specific data as audible voice alarm activated indicator (Emergency alarm buzzer). This output contact can be connected to a buzzer. This way the voice alarm condition is indicated audibly.	
7.2.2 The audible warning shall be capable of being silenced at access level 1 or 2.	The connected buzzer (see 7.2.1.c) can be silenced by acknowledging the voice alarm condition. The voice alarm condition can be acknowledged by means of an input contact, call station key, the front panel menu of the network controller or via the Open Interface.	

Clause / Requirement	Compliance	Signature
7.3 Audible warning (option with requirements)		
An audible warning of the voice alarm condition might be the same as that for the fault warning condition. If they are different, the voice alarm condition warning shall have priority.	The internal buzzer of the PRS-NCO3 is used to indicate both the voice alarm condition as the fault warning condition. Alternatively, output contacts of the Praesideo system can be configured in the site specific data as either Emergency alarm buzzer or Fault alarm buzzer. A buzzer must always be connected to the output contact to generate the actual audible warning. A single buzzer can be used as audible warning device for both the voice alarm condition and the fault warning condition, by using a parallel connection of the output contacts of the Emergency alarm buzzer and the Fault alarm buzzer to control the actual buzzer. The Praesideo system does not offer priority handling for the Emergency alarm buzzer (i.e. the Fault alarm buzzer is not automatically silenced when the Emergency alarm buzzer is activated).	
7.4 Delays to entering the voice alarm condition (option with requirements)		
The VACIE may be provided with a facility to introduce a delay before entering the voice alarm condition. In this case:	Since the Praesideo system does not process the fire sensors, this functionality is better handled by the device managing the fire sensors (the CIE). The Praesideo system itself does not implement this requirement.	
a the operation of the delay shall be selectable at access level 3;		
b the operation of the delay shall be in increments not exceeding 1 min up to a maximum of 10 min;		
c the delay to one output signal shall not affect the delay to other outputs;		
d it shall be possible to override the delay by a manual operation at access level 1;		
e there shall be provision to switch on and switch off delays by means of a manual operation at access level 2 (see Annex A for information on access levels);		
f there may be provision to automatically switch on and/or switch off delays by means of a programmable timer which shall be configurable at access level 3;		
g a separate discrete light emitting indicator and/or a field on the alphanumeric display shall be visible when a fire signal is received and the delay activated. This indication shall be suppressed when the VACIE enters the voice alarm condition.		
7.5 Phased evacuation (option with requirements)	Praesideo is compliant.	
The VACIE may have a provision to phase the warning signals to the emergency loudspeaker zones. The facility shall be configurable at access level 3. There may be provision to switch on and switch off the phased evacuation sequence by means of a manual operation at access level 2 (see Annex A for information on access levels).	Phased evacuation can be accomplished by phased triggering of input contacts that start the same voice alarm call in different zones. The device managing the fire sensors (CIE) is responsible for the phased triggering of the contacts. Voice alarm calls can also be started via the Open Interface, where the device managing the fire sensors (CIE) is responsible for the phased invocation of the necessary Open Interface methods. The input contacts must be configured at access level 3. Using the Open Interface requires access level 2. Praesideo also offers the possibility to start up to 5 calls simultaneously from a single input contact or key, configured as 'Call activation key' or 'Start', where phasing can be implemented using accurately defined periods of silence in the call macros, preceding the actual tone or message. The installer shall configure the calls correctly using these chimes/messages (at access level 3) and use call station keypad keys to switch on and off the chimes/messages (at access level 2).	
7.6 Silencing of the voice alarm condition	Praesideo is compliant.	
7.6.1 Silencing of the voice alarm condition from the CIE		
7.6.1.1 Where the voice alarm condition has been triggered from the CIE, the VACIE shall respond appropriately to a silence instruction from the CIE.	Voice alarm calls triggered from the CIE can also be stopped from the CIE. To reset the voice alarm condition an Acknowledge Emergency and Reset Emergency action is required.	

Clause / Requirement	Compliance	Signature
7.6.1.2 The silencing procedure may allow for the completion of messages in the process of being broadcast.	A voice alarm call that is stopped while not being finished will still complete the running message. Praesideo also offers the possibility to abort running calls in which case a running message will not be completed. Praesideo allows configuration of two different voice alarm reset actions: one that can only reset a voice alarm condition when all running alarm calls have been finished, and one that aborts all still running alarm calls.	
7.6.2 Manual silencing of the voice alarm condition (option with requirements)		
7.6.2.1 It shall be possible to manually silence the voice alarm message from the VACIE at access level 2.	Praesideo offers the possibility to stop voice alarm calls by de-activating the contact or key that started the call. Using the 'Stop' action, also calls started by a 'Start' action from a different key or contact can be aborted.	
7.6.2.2 Following silencing, it shall be possible to re-activate the voice alarm message at access level 2.	Voice alarm call can be re-activated by starting that call again from a contact, a key or the Open Interface.	
7.7 Reset of the voice alarm condition	Praesideo is compliant.	
7.7.1 Reset of the voice alarm condition from the CIE		
Where the voice alarm condition has been triggered from the CIE, the VACIE shall respond appropriately to a reset instruction from the CIE.	See 7.6.1.1.	
7.7.2 Manual reset of the voice alarm condition (option with requirements)		
7.7.2.1 It shall be possible to reset the voice alarm condition from the VACIE at access level 2 by means of a separate manual control. This control shall be used only for reset and may be the same as that used for reset from the fault warning condition.	To reset the voice alarm condition an Acknowledge Emergency and Reset Emergency action is required. Praesideo allows configuration of two different voice alarm reset (Emergency Reset) actions: one that can only reset a voice alarm condition when all running alarm calls have been finished, and one that aborts all still running alarm calls.	
7.7.2.2 Following a reset operation, the indication of the correct functional condition corresponding to any received signals shall either remain or be re-established within 20 s.	After a reset operation, the Praesideo system will immediately indicate the functional condition it is currently in. It will also immediately respond to received signals that will bring it into another functional condition.	
7.8 Output to fire alarm devices (option with requirements)	Praesideo is compliant.	
In addition to the voice alarm outputs the VACIE may have provision for the automatic transmission of fire alarm signals to fire alarm devices such as beacons and vibrating devices. In this case, the following shall apply:		
a it shall be possible to de-activate the fire alarm devices at access level 2;	Fire alarm devices can be activated from control outputs that are assigned to zones, which themselves are assigned to calls. If a call is started via a 'Start' action, the zone with the associated control output can be added to that call by means of an additional 'Start' action for the same call macro. Then it can be de-activated also by de-activating that 'Start' action, or using an associated 'Stop' action.	
b following de-activation, it shall be possible to re-activate the fire alarm devices at access level 2;	Re-activating the 'Start' action, after being de-activated, will add the zone with the associated control output to the call again. The control output will activate the alarm device again.	
c the fire alarm devices shall not be de-activated automatically;	Using a 'Start' action with Momentary behavior, the fire alarm devices will run in parallel with the original call to which they are assigned. In case the fire alarm devices should continue when the original call is stopped, then its 'Start' action should use Single-shot behavior to remain activated until a 'Stop' action occurs.	
d it shall be possible to configure the VACIE at access level 3 to automatically reactivate the fire alarm devices if an alarm is reported in an other zone.	Praesideo allows multiple calls to be started simultaneously from the same key or contact. An alarm in an other zone that triggers the Praesideo system for action in that zone may also start a call that activates or re-activates the alarm device that is associated to a different zone.	

Clause / Requirement	Compliance	Signature
7.9 Voice alarm condition output (option with requirements)	Praesideo is compliant.	
The VACIE may have provision for transmitting a signal that is in the voice alarm condition. In this case, it shall activate the output only in the voice alarm condition.	The Praesideo system transmits a signal that it is in the voice alarm condition via control output contacts and the Open Interface. An output contact must be configured as voice alarm activated indicator (Emergency alarm indicator). The Praesideo system then activates the output contact when it enters the voice alarm condition and deactivates the output contact when it leaves the voice alarm condition (i.e. the voice alarm condition is reset). The Praesideo system also indicates this condition via the Open Interface.	

Clause / Requirement	Compliance	Signature
8 Fault warning condition		
8.1 Reception and processing of fault signals	Praesideo is compliant.	
8.1.1 The VACIE shall enter the fault warning condition when signals are received which, after any necessary processing, are interpreted as a fault.	When the Praesideo system receives a supervision fault signal (i.e. detects a fault in the system), the fault warning condition is entered until this state is explicitly reset.	
8.1.2 The VACIE shall be capable of simultaneously recognizing all of the faults specified in 8.2 and, if provided, in 8.3 unless this is prevented by:		
• the presence of an alarm output signal on the same voice alarm zone, and/or	All Praesideo system faults are handled (acknowledged and reset) individually. Also, the Praesideo system is capable of recognizing all of its system faults simultaneously. The Praesideo system is able to recognize faults in a voice alarm zone even when there is an alarm output signal on the zone.	
• the disablement of the corresponding voice alarm zone or function.	Optional disablement of voice alarm zones or functions is not implemented in Praesideo.	
8.1.3 The VACIE shall enter the fault warning condition within 100 s of the occurrence of any fault, or the reception of a fault signal or within another time as specified in this European Standard or in other parts of EN 54.	The Praesideo system recognizes and reports all faults within 100 seconds.	
8.2 Indication of faults in specified functions	Praesideo is compliant.	
8.2.1 The presence of faults in specified functions shall be indicated on the VACIE without prior manual intervention. The fault warning condition is established when the following are present:		
a a visible indication by means of a separate light emitting indicator (the general fault warning indicator);	The Praesideo system provides a visible indication when it is in the fault warning condition via the fault LED of the call stations, output contacts, key indicators of call station keys, the fixed fault output contact of the network controller and the front panel menu of the network controller. The installer must mount a yellow (flash) light to indicate the fault warning condition, clearly visible from the front side of the rack, behind the glass door of the rack.	
b a visible indication for each recognised fault as specified in 8.2.3, 8.2.4, 8.3 (if provided), 8.4 (if provided) and 8.5 and	The Praesideo system offers two ways of visual indication of individual faults: via the front panel menu of the network controller and via the Praesideo logging application.	
c an audible indication, as specified in 8.6.	The Praesideo PRS-NCO3 has an internal buzzer for this purpose. Also, the Praesideo system provides an audible fault indication when it is in the fault warning condition via output contacts and the fixed audible fault output contact of the network controller.	
8.2.2 If the indication is on an alphanumeric display, which cannot simultaneously indicate all of the faults because of its limited capacity, at least the following shall apply:		
a the presence of fault indications which have been suppressed shall be indicated;	The network controller alphanumeric display is used to indicate the fault warning condition and all individual faults. The normal display information of the network controller is automatically overruled when there are faults present, i.e. when the system enters the fault warning state. The display of the network controller indicates the number of faults present.	
b suppressed fault indications shall be capable of being displayed by means of a manual operation at access level 1 or 2 which interrogates only fault indications.	The individual faults are presented in the 'Faults' menu of the front panel menu of the network controller. Manual operation is needed to display and navigate through the individual faults. Each individual fault is shown in a submenu of the 'Faults' menu.	
8.2.3 The following faults shall be indicated by means of separate light emitting indicators and/or an alphanumeric display:	Faults of the supervised items are detected and reported through the general fault warning indication. Additionally all faults are reported individually as well and can be inspected using the network controller front panel menu and the logging application.	
a an indication at least common to any power supply fault resulting from:	The mains and backup power of all Praesideo system elements are supervised individually.	
1 a short circuit or an interruption in a transmission path to a power supply (item L of Figure 1 of EN 54-1), where the power supply is contained in a different cabinet from that of the VACIE, and		

Clause / Requirement	Compliance	Signature
2 the power supply faults as specified in EN 54-4;		
b an indication at least common to any earth fault of less than 50 kΩ is capable of affecting a mandatory function, and which is not otherwise indicated as a fault of a supervised function;	All 100V lines of the Praesideo system can be supervised individually for earth faults (i.e. connections to earth with a leakage resistance of less than 50 k).	
c an indication of the rupture of any fuse within the VACIE, or the operation of any protective device within the VACIE which is capable of affecting a mandatory function in the fire alarm condition;	Every rupture of a fuse or the operation of a protected device that affects a mandatory function will result in a fault since the mandatory functions are supervised. The reported fault is as close to the located defect as possible. E.g. a mains related fault is reported as a mains fault and an amplifier defect is reported as defect for that amplifier channel.	
d an indication of any short circuit or interruption, at least common to all transmission paths between parts of the VACIE contained in more than one cabinet, which is capable of affecting a mandatory function and which is not otherwise indicated as a fault of a supervised function.	All network based transmission paths of the Praesideo system are supervised using a keep-alive mechanism. The CobraNet transmission path of the Praesideo system is supervised by means of clock availability. When the Praesideo system is used in a redundant loop configuration, the loss of the redundant path is reported. All control input contacts of the Praesideo system can be supervised for shorts and interruptions. Analog audio connections to external parties can be supervised by pilot tone supervision. The analog fail safe bypass input of the Praesideo multi channel interface can be supervised by pilot tone supervision.	
These indications may be suppressed during the fire alarm condition.	Praesideo fault indicators are not suppressed. There are separate indicators for fault and voice alarm conditions. The only exception is that the automatic indication of the voice alarm condition has precedence over the automatic indication of the number of present faults on the display of the network controller.	
8.2.4 The following faults shall be indicated at least by means of the general fault warning indicator:		
a any short-circuit or interruption in a voice alarm transmission path between parts of the VACIE contained in more than one cabinet even where the fault does not affect a mandatory function;	All network based transmission paths of the Praesideo system are supervised using a keep-alive mechanism. The CobraNet transmission path of the Praesideo system is supervised by means of clock availability. When the Praesideo system is used in a redundant loop configuration, the loss of the redundant path is reported. All control input contacts of the Praesideo system can be supervised for shorts and interruptions. Analog audio connections to external parties can be supervised by pilot tone supervision. The analog fail safe bypass input of the Praesideo multi channel interface can be supervised by pilot tone supervision.	
b any short-circuit or interruption in the voice alarm transmission path to the emergency microphone capsule, if provided;	The capsule of the Praesideo (emergency) call station microphone can be supervised for both short-circuit and interruption. This is configurable. Also the microphone inputs on the power amplifiers supervise the connected microphone.	
c any short-circuit or interruption in the voice alarm transmission path between the VACIE and loudspeakers even where the fault does not affect the operation of loudspeakers.	The loudspeaker lines of the Praesideo system can be supervised using a master-slave communication system that uses the actual loudspeaker wiring for polling. The communication is inaudible and not affected by audio signals present. Praesideo offers two options: single loudspeaker line supervision (master-slave) and multiple loudspeaker line supervision (master-multiple slaves) that detect short-circuits and interruption of the loudspeaker lines. The installer shall only use the 100 V outputs of the Praesideo amplifiers.	

Clause / Requirement	Compliance	Signature
d any short-circuit or interruption in the transmission path between the VACIE and fire alarm devices when used (see 7.8).	The Praesideo system does not offer this functionality directly: control inputs are supervised, but control outputs are just voltage free relay contacts. The installer must create a feedback signal (corresponding to the transmission path status between the Praesideo system and the fire alarm device) to a supervised input contact of the Praesideo system.	
e failure of any power amplifier.	All Praesideo power amplifiers are supervised for overload, overheating, short-circuit, ground short and amplifier defect.	
8.3 Indication of faults related to the transmission path to the CIE (option with requirements)		
The VACIE may have provision for an indication of faults related to the transmission path to the CIE. In this case, the short-circuit or interruption of the transmission path to the CIE shall be indicated by means of a separate light emitting indicator and/or an alphanumeric display.	All input contacts of the Praesideo system can be supervised for short and interruption. Open Interface connections are supervised through keep-alive messaging. Faults related to the transmission path to the CIE are therefore individually reported and can be inspected using the front panel menu of the network controller or the logging application. The faults are also reported through the general fault warning indication.	
8.4 Indication of faults related to voice alarm zones (option with requirements)		
The VACIE may have provision for an indication of faults related to voice alarm zones. In this case the short-circuit or interruption of a voice alarm transmission path between the VACIE and the loudspeakers in that zone shall be indicated by means of a separate light emitting indicator per zone and/or an alphanumeric display.	Faults that occur in the Praesideo system are reported per defective input or output for fault allocation. When an individual fault is reported the name of the event originator (i.e. the location of the fault) is provided. The installer must give audio outputs that are assigned to a zone, clear names, identifying the zone. This way the event originator field in the indication of the individual fault will immediately show in which zone the fault has occurred. Praesideo provides zone fault status indicators, assigned to keypad modules. One or more zones can be configured to control such an indicator.	
8.5 System fault	Praesideo is compliant.	
A system fault is a fault as specified in 14.4 Program monitoring (see also Annex C)or 14.6 Monitoring of memory contents in the case of software controlled VACIE. A system fault may prevent requirements of this European Standard, other than those specified below, from being fulfilled. In the event of a system fault at least the following shall apply:	14.4 Program monitoring (see also Annex C)	
a a system fault shall be visibly indicated by means of the general fault warning indicator and a separate light emitting indicator on the VACIE. These indications shall not be suppressed by any other functional condition of the VACIE and shall remain until a manual reset and/or another manual operation at access level 2 or 3;	System faults are individually reported by the Praesideo system and can be inspected using the front panel menu of the network controller or the logging application. Faults are also reported through a general fault warning indicator, connected to a control output that is configured as Fault alarm buzzer or visual Fault alarm indicator. Both the individual fault indicator of each system fault and the general fault warning indicator are not suppressed by any other functional condition of the Praesideo system.	
b a system fault shall be audibly indicated. This indication may be capable of being silenced.	A control output contact of a Praesideo system component can be configured as Fault alarm buzzer. This output contact can be connected to a buzzer. This way all faults, including system faults, are indicated audibly. The Fault alarm buzzer can be silenced by acknowledging all faults via a key or control input that is configured as Fault acknowledge key. The control output for the visual Fault alarm indicator is only deactivated upon resolving and resetting all fault conditions.	
8.6 Audible indication	Praesideo is compliant.	
8.6.1 The audible indication of faults required in 8.2 shall be capable of being silenced manually at access level 1 or 2 at the VACIE. The same manual operation may be used as for silencing the voice alarm condition.	The Fault alarm buzzer can be silenced by acknowledging all faults via a key or control input that is configured as Fault acknowledge key. Individual faults can also be acknowledged from the front panel menu of the network controller or via the Open Interface.	

Clause / Requirement	Compliance	Signature
8.6.2 The audible indication shall be silenced automatically if the VACIE is automatically reset from the fault warning condition.	Since the Praesideo system does not offer automatic reset from the fault warning condition this requirement does not need to be implemented.	
8.6.3 If previously silenced, the audible indication shall resound for each newly recognized fault.	After the audible indication has been silenced (by acknowledging all faults) the Praesideo system will resound the indication upon occurrence of a new fault or reoccurrence of a previously resolved fault.	
8.7 Reset of fault indications	Praesideo is compliant.	
8.7.1 Indications of faults as required in 8.2 shall be capable of being reset		
a automatically when faults are no longer recognized, and/or	The Praesideo system does not offer automatic reset of faults	
b by a manual operation at access level 2.	Faults can be manually reset by acknowledging and resetting them individually or all in one action. Acknowledging and/or resetting faults individually can be done via the front panel menu of the Network Controller and via the Open Interface. Acknowledging and/or resetting all faults in one action can be done via the front panel menu of the network controller, control input contacts, call station keys or the Open Interface.	
8.7.2 Following reset as specified in 8.7.1, the indication of the correct functional conditions corresponding to any received signals shall either remain or be re-established within 20 s.	A fault reset is processed by Praesideo within 20 s to update the status of all fault indicators. Praesideo will enter the fault warning condition again within 100 s of the occurrence of a new or still unresolved fault.	
8.8 Transmission of the fault warning condition	Praesideo is compliant.	
The VACIE shall have provision for transmitting, by means of at least general fault signal, all faults specified in 8. This fault signal shall also be given if the VACIE is de-energized.	Output contact 5 of the Praesideo network controller is the fixed Fault alarm indicator output. This relay output contact indicates no fault when open (energized) and indicates a fault when closed (de-energized). If the Praesideo system is de-energized this output contact is closed, therefore the fault signal will also be given.	

Clause / Requirement	Compliance	Signature
9 Disablement condition (option with requirements)	Praesideo does not support the disablement condition.	
9.1 General requirements		
9.1.1 Disablements in accordance with the requirements of 9.4 shall inhibit all corresponding mandatory indications and/or outputs but shall not prevent other mandatory indications and/or outputs.		
9.1.2 The VACIE shall have provision to independently disable and re-enable the function specified in 9.4 by means of manual operations at access level 2.		
9.1.3 The VACIE shall be in the disabled condition while a disablement in accordance with the requirements of 9.4 exists.		
9.1.4 Disablement and re-enablement shall not be affected by a reset from the voice alarm condition or from the fault warning condition.		
9.2 Indication of the disabled condition		
The disabled condition shall be indicated visibly, by means of		
a a separate light emitting indicator (the general disablement indicator), and		
b an indication for each disablement, as specified in 9.3 and 9.4.		
9.3 Indication of specific disablements		
9.3.1 Disablements shall either be indicated within 2 s of the completion of the manual operation or, where a disablement cannot be completed within 2 s, it shall be indicated within 2 s that the disabling process is running.		
9.3.2 The same light-emitting indicator may be used as that for the indication of the corresponding fault, although the indication shall be distinguishable.		
9.3.3 If the indication is on an alphanumeric display, which cannot simultaneously indicate all of the disablements because of its limited capacity, at least the following shall apply:		
a the presence of disablement indications which have been suppressed shall be indicated;		
b suppressed disablement indications shall be capable of being displayed by means of a manual operation at access level 1 or 2 which interrogates only disablement indications.		
9.4 Disablements and their indication		
Voice alarm zones may be capable of being independently disabled and re-enabled. In this case the disablements shall be indicated by means of separate light emitting indicators per zone and/or an alphanumeric display. The indications shall not be suppressed during the voice alarm condition.		
9.5 Transmission of the disablement condition		
The VACIE shall have provision for transmitting, by means of a general disablement signal, all disablement conditions specified in this clause.		

Clause / Requirement	Compliance	Signature
10 Voice alarm manual control (option with requirements)		
10.1 General requirements	Praesideo is compliant.	
The VACIE may have provision for manually activating the voice alarm output condition. If a voice alarm output control facility is provided the following shall apply:		
a a manual control which causes a voice alarm output condition to be given shall only be accessible at access level 2;	The Praesideo system can enter the voice alarm output condition manually via control input contacts, the Open Interface and call station (keypad) keys, by starting a call with a high enough priority.	
b it shall be possible to activate each voice alarm zone individually and/or in group(s) of voice alarm zones;	A voice alarm priority call can be manually activated in one or more individual zones or zone groups. Zone selection is possible via call station keypad keys or via the Open Interface (e.g. using a PC Call Station for graphical representation of zones with mouse or touch screen selection). Zones can also be added to and removed from a running voice evacuation call using the 'Start' action, even from other call stations or control inputs on other system elements. A separate 'Stop' action is available to stop such a call from any location.	
c the manual activation of a voice alarm zone shall not prevent the mandatory indications and outputs to other voice alarm zones.	Praesideo uses the concept of audio output assignment to a dedicated zone. Because different zones use different amplifiers, the activation of an additional voice alarm zone will not affect other voice alarm zones. Praesideo can be configured to abort lower priority calls and BGM (Background Music) if a voice alarm state is present. The mandatory zone related indications are based on the priority of the active call in the voice alarm zones. This means that the lower priority boundary of the Zone status indicator for each zone should be set to include all priorities of possible alarm calls into that zone. Using priority level 224 as lower boundary is a safe choice, because then the Zone status indicator will cover all possible alarm priorities (224-255).	
10.2 Indication of the voice alarm zones in an activated condition	Praesideo is compliant.	
The indication for the voice alarm condition in the voice alarm zone(s) associated with each manual control shall be available without any manual action and shall not be suppressed. This indication shall be by means of		
a a separate light emitting indicator (the General Voice Alarm Output activated indicator), and	The voice alarm condition is indicated on the Praesideo system by: • A red indicator on all call stations (the system status LED). • A textual indicator on the network controller display • An output contact configured as voice alarm activated indicator (Emergency alarm indicator). This output contact can be used to control the General Voice Alarm Activated indicator.	
b a separate light emitting indicator and/or alphanumeric display for each voice alarm zone and/or an indication for group(s) of voice alarm zones.	The key-indicators on call station keypad modules (or regular keypads) can be configured for 'Zone status', to show that a (voice) alarm is active for a specific zone or group of zones. The indication is based on the priority of the active call in that zone, see 10.1. c.	
NOTE - These indicators may not necessarily indicate which emergency message is being broadcast in each voice alarm zone.		
10.3 Indication of the voice alarm zones in fault condition	Praesideo is compliant.	
The indication for the fault condition which would prevent the generation and transmission of the voice alarm signal to the voice alarm zone(s) associated with each manual control shall be available without any manual action and shall not be suppressed. This indication shall be by		

Clause / Requirement	Compliance	Signature
a a separate light emitting indicator (the general fault indicator), and	The Praesideo system provides a visual indication when it is in the fault warning condition via the fault LED of the call stations, control output contacts, key indicators of call station keys, the fixed fault output contact of the network controller and the front panel menu of the network controller. All Praesideo call stations have a specific fault indicator, the power/fault LED, which is blinking yellow for a system fault and steady yellow when there is a fault in the call station or the Praesideo network is not operational. The power/fault LED is green when there is no fault in the system. Control output contacts can be configured as 'Fault alarm indicator'. A visual indicator (e.g. a lamp) can be connected to the output contact. The output contact is activated when the system enters the fault warning condition. The output contact is de-activated when the system leaves the fault warning condition, i.e. when all faults are reset. Call station keypad keys can be configured to the action 'Reset fault' or 'Ack and reset fault'. The key indicator of such a key will now light up when the system enters the fault warning condition. The key indicator is turned off when the system leaves the fault warning condition. Output contact 5 of the network controller is the fixed Fault alarm indicator output. Other control outputs can be configured for the same function. If a visual indicator is connected to this output contact it can be used as the general fault warning indicator. The network controller displays the number of present faults. This fault indication overrules the normal display information.	
b an indication for each voice alarm zone and/or an indication for defined group(s) of zones.	The key-indicators on call station keypad modules (or regular keypads) can be configured for 'Zone status', to show that a (voice) alarm is active for a specific zone or group of zones. A second key indicator for this 'Zone status' function shows whether the zone is in fault state. The zone fault state indicator is the visual representation of the collection of all faults that may affect the voice alarm in that zone. The zone fault state is also available on PC call stations, connected to the Open Interface. Here the zone-icons on the screen get a fault warning indication in case of a zone fault. More in general: all faults are visible on the front panel menu of the Network Controller and via the Praesideo logging application. By configuring sensible names for the zones and amplifier outputs contributing to these zones, fault indications become clear and easy to understand. For instance, a zone can have the name 'Floor_3' and output 4 of amplifier 'A6', contributing to that zone may have the name 'Floor_3 A6_4'. A short circuit on that amplifier output will then be shown including its name 'Floor_3 A6_4' and it will be clear that the sound on Floor_3 will be affected.	
10.4 Indication of the voice alarm zones in disablement condition		
The indication for the disablement condition in the voice alarm zone(s) associated with each manual control shall be available without any manual action and shall not be suppressed. This indication shall be by	Praesideo does not support the optional disablement condition.	
a a separate light emitting indicator (the general disablement indicator), and		
b an indication for each voice alarm zone and/or an indication for defined group(s) of zones.		

Clause / Requirement	Compliance	Signature
11 Interface to external control device(s) (option with the requirements)		
The VACIE may have provision for interfacing to external control device(s) such as standardized user interfaces required by local regulations. In this case, the following shall apply:	Praesideo is compliant.	
a the interface shall allow only access level 1 and 2 functions;	Using the Open Interface requires access level 2. The Open Interface functionality is limited to call and BGM (Background Music) control as well as acknowledge/reset of fault and emergency states. Praesideo provides control input contacts with supervision and control output contacts for external control devices, with extensive configurable functionality.	
b the mandatory functions of the VACIE shall not be overridden;	The Praesideo system operates as an autonomous system. All external activations are priority based to control preference. By proper configuration system behavior is tightly controlled and the mandatory functions of the VACIE will not be overridden.	
c any short-circuit , interruption or earth fault in the transmission path to the external device(s) shall		
1 not prevent the mandatory function of the VACIE, and	The Praesideo system operates as an autonomous system, so its operation (functionality) is not affected by loss of connection to an Open Interface client.	
2 be indicated on the VACIE, at least by means of the general fault warning indicator.	The connection to an Open Interface client is monitored by means of a keep-alive mechanism; if the connection is lost the general fault warning indicator is activated and a specific fault is reported.	
NOTE - The external control devices should comply with available local or national standards.		

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12 Emergency microphone(s) (option with requirements)		
The VACIE may have provision for emergency microphone(s). In this case the emergency microphone(s) shall have	The Praesideo system offers two types of emergency microphones with microphone supervision: • a call station can be configured to be of class 'emergency' which makes the microphone of the call station an emergency microphone; • if an audio input of the system is configured to the auxiliary microphone function, a connected microphone can act as emergency microphone.	
a priority over all inputs, including pre-recorded messages,	The priority can be configured of a call stations' 'PTT' key or audio input that is activated from a control input defined in a call macro. The emergency microphones must be configured to have priorities in the range 224 to 255 (highest). Higher priorities overrule lower priorities in case of resource or destination conflicts. Calls with the same priority operate on first come first serve basis, except in the case of priority 255: calls with the same priority 255 overrule each other, so the latest becomes active. This assures that high priority microphones that are left behind in an active state will never block the system. Calls may contain pre-recorded messages. The prerecorded messages then adopt the priority of that call.	
b an emergency microphone control to open the microphone channel, at access level 2,	If the microphone of a call station is used as emergency microphone, the microphone channel can be opened via: • the 'PTT' key of the call station • a call station keypad key or call station module input contact If a microphone connected to an audio input is used as emergency microphone, the microphone channel can be opened via: • a control input contact • a call station keypad key The actual way of operation is defined in the system and is subject to configuration.	
c where a pre-announcement attention drawing signal is provided, an indicator adjacent to the microphone shall show when the signal has finished and live speech can commence, and	A call station has a call status LED. This LED is blinking green when a pre-announcement attention signal or pre-recorded message is playing. The LED is steady green when the live speech can commence. Pre-announcement signals are also audible from the call stations' monitor loudspeaker, to alert the experienced user about the progress. For an emergency microphone connected to an audio input, under control of a control input contact, no such indicator exists; therefore such emergency microphones should only be configured for calls that do not have pre-announcement signals or messages. The user interface of the Praesideo PC call station shows the call progress in a progress bar on the screen with clear indication when the speech can commence.	
d when the emergency microphone control is operated, any audible indication that might interfere with the use of the microphone shall be automatically muted.	The monitor speaker of the call station is muted during the live speech phase. Other sources of interference should be minimized by proper installation, e.g. keep HVAC equipment and loudspeakers at a distance from the microphone. The installer must use the priority mechanism of Praesideo for switching off non-relevant loudspeakers, either directly, if the loudspeakers are connected to the Praesideo system, or indirectly via control output contacts that interrupt an external system or audio path. Other audible indications, like audible fault warning or voice alarm indications, must be muted by configuring an output contact that is wired in series with the audible indications. . If it is not possible to avoid interference from closely mounted loudspeakers receiving the call, the call stacking function of Praesideo allows for recording a call with delayed playback after the spoken announcement has finished.	

Clause / Requirement	Compliance	Signature
e where the VACIE has provision for the connection of more than one emergency microphone, they shall be configurable for priority at access level 3 or 4 and only one emergency microphone shall be active at any one time.	Configuration of the emergency microphones is performed via the web interface of the network controller. This web interface requires access level 3. For emergency microphones 32 priority levels are available, in the range 224 to 255 (highest). Higher priorities overrule lower priorities in case of resource or destination conflicts. Calls with the same priority operate on first come first serve basis, except in the case of priority 255: calls with the same priority 255 overrule each other, so the latest becomes active. This assures that high priority microphones that are left behind in an active state will never block the system. If multiple microphones are configured for the same priority the Praesideo system prevents that they are audible in the same zone at the same time. Only one microphone will be active at any one time in the same zone.	

Clause / Requirement	Compliance	Signature
13 Design requirements		
13.1 General requirements and manufacturer's declarations	Praesideo is compliant.	
13.1.1 The VACIE shall comply with the design requirements of this clause, where relevant to the technology used. Some requirements can be verified by testing. Others can only be verified by inspection of the design and its accompanying documentation because of the impracticability of testing all of the possible combinations of functions and of establishing the long-term reliability of the VACIE.	See the relevant clauses regarding testing and documentation.	
13.1.2 In order to assist the process of design inspection, the manufacturer shall declare the following in writing:		
a that the design has been carried out in accordance with a quality management system which incorporates a set of rules for the design of all elements of the VACIE;	The Bosch Security Systems development department responsible for development/maintenance of the Praesideo system works according its own development process, Standard Development Process or SDP, that is created using the CMMI model. The SDP implements all process areas at maturity level 2 of the CMMI model, and some process areas at maturity level 3 of the CMMI model. Rules for the design of all elements of the Praesideo system can be found in the SDP repository. In the SDP repository all process descriptions, process implementation documents, templates, guidelines, etc. of the development processes can be found. The SDP repository is a version control system.	
b that the components of the VACIE have been selected for the intended purpose and are expected to operate within their specification when the environmental conditions outside the cabinet of the VACIE comply with Class 3k5 of EN 60721-3-3:1995 + A2:1997.	The components of the Praesideo system operate within their specification within the specified environmental conditions (Class 3k5 of EN 60721-3-3:1995 + A2:1997). This is verified by means of testing and is documented in the test reports. The 19"-racks for Praesideo are part of the system and subject to certification. A rack must be selected from the list of approved racks for this purpose.	
13.2 Documentation	Praesideo is compliant.	
13.2.1 The manufacturer shall prepare installation and user documentation which shall be submitted to the testing authority together with the VACIE. This shall comprise at least the following:	The Praesideo Installation and User Instructions (IUI) are provided as multilingual pdf-files on the DVD that contains the software for installation and configuration. The IUI can also be downloaded from Extranet.	
a a general description of the equipment, including a list of	The IUI contains a general description of the Praesideo system. It includes an EN54-16 checklist, containing a list of supported optional functions. It describes all Praesideo functions related to EN54-16 or otherwise.	
1 the optional functions with requirements of this European Standard,	See this checklist, clause 4.1.1.	
2 the functions relating to other parts of EN 54, and		
3 the ancillary functions not required by this European Standard;		
b technical specifications of the inputs and outputs of the VACIE, sufficient to permit an assessment of the mechanical, electrical, and software compatibility with other components of the system (e.g. as described in EN 54-1), including where relevant	The inputs and outputs for audio and control are described in the IUI, including the technical data, system functions, configuration instructions, compliancy to standards. This includes the information as requested in 13.2.1 b) 1)..7). The Open Interface is described in the 'Open Interface Programming Instructions' (OIPI). This document is always delivered together with the Praesideo system as a pdf-file on the distribution DVD. This document gives enough information for third party programmers to create applications to control or display Praesideo functions.	
1 the power requirements for recommended operation,		
2 the maximum number of voice alarm zones,		
3 information concerning the connection of emergency microphones,		
4 the maximum and minimum electrical ratings for each input and output,		

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5 information on the communication parameters employed on each transmission path,		
6 recommended cable parameters for each transmission path, and		
7 fuse ratings;		
c specified means to limit the consequences of fault (see 13.5.2);	The IUI describes the following means to limit the consequences of fault: • Switchover to spare (standby) amplifiers • Audio/control input supervision • Backup power supply • Redundant network cabling • Loudspeaker line supervision • The ability of the emergency call station to make a 'fail safe' call in case of a network controller defect • A/B group wiring of loudspeakers • The ability of the multi channel interface to bypass routing in case of a fatal fault in the MCI	
d configuring and commissioning instructions;	Configuring and commissioning instructions are included in the IUI.	
e operating instructions;	Operating instructions are included in the IUI.	
f maintenance information.	Maintenance information of the Praesideo system are included in the IUI.	
13.2.2 The manufacturer shall prepare design documentation that shall be submitted to the testing authority together with the VACIE. This documentation shall include drawings, parts lists, block diagrams, circuit diagrams and a functional description to such an extent that compliance with this European Standard may be checked and that a general assessment of the mechanical and electrical design is made possible.	All of the mentioned design documentation is available as TPD for inspection by testing authorities.	
13.3 Mechanical design requirements	Praesideo is compliant.	
13.3.1 The cabinet of the VACIE shall be of robust construction consistent with the method of installation recommended in the documentation. It shall meet at least classification IP30 of EN 60529:1991+A1:2000.	The Praesideo call station product range, network splitter and fiber interfaces comply with this requirement. The installer must implement this requirement for 19"-units, by means of using a correct 19"- frame, meeting at least classification IP30 of EN 60529:1991+A1:2000. The EN 54-16 certification of Praesideo includes the 19"-rack. A rack must be used from the list of approved racks.	
13.3.2 All interconnections and settings inside the cabinet shall be accessible at level 3.	The installer must ensure that the physical access to the Praesideo system is restricted to access level 3, then accessibility to all interconnections and settings inside the cabinet (e.g. interconnections between the system elements) is restricted to this access level.	
13.3.3 The VACIE may be housed in more than one cabinet. If the documentation shows that the cabinets may be installed in locations distributed within the protected premises, then all of the mandatory manual controls and indicators shall be on one cabinet or on cabinets declared to be only suitable for mounting adjacent to each other.	The IUI shows that the Praesideo cabinets may be installed in locations distributed within the premises. One dedicated Praesideo call station with call station keypad(s) or call station with call station keypad module(s) can then be used for all of the mandatory controls and indicators. The installer shall take care of proper installation in order to fulfill this requirement.	
13.3.4 All mandatory manual controls and light emitting indicators shall be clearly labeled to indicate their purpose. The labels shall be legible at 0.8 m distance in an ambient light intensity from 100 lux to 500 lux.	The Praesideo call station keypad has a paper slot next to each of its programmable keys. The installer must provide proper labels that fit into these paper slots and implement this requirement. Note that if the call station keypad module is used, the installer must provide custom-made call station keypads, including the labels. A regular font with with characters of 3 mm height offers sufficient readability in case of high contrast between text color and background. Lower contrast color selections will require bigger characters.	
13.3.5 The terminations for transmission paths and the fuses shall be clearly labeled.	All terminations for transmission paths are clearly labeled on all of the Praesideo system elements (near the relevant connectors). The mains fuse for each Praesideo system element that has a mains connector is labeled on the rear plate of the element. Internal fuses have a parts code indication on the Printed Circuit Board on which they are mounted. These fuses may only be replaced by qualified service personnel having access to the service documentation.	

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13.4 Electrical and other design requirements	Praesideo is compliant.	
13.4.1 The processing of signals shall give the highest priority to the voice alarm condition.	Calls within the Praesideo system have a configured priority. In case of conflicting requirements, system resources are assigned to the calls in order of priority. Voice alarm call must be configured with a high priority (priority 224-255). Many secondary functions of the system can be configured to stop or pause in case calls above a certain configured priority are present; this includes calls below a certain configured priority.	
13.4.2 Transitions between the main and the standby power sources shall not change any indications and/or the state of any outputs, except those relating to the power supplies.	Transition between the main and standby power sources does not change any of the indications and/or state of any outputs of the Praesideo system, except for the fault warning indication (global and individual) in order to report the failure of a power source.	
13.4.3 If the VACIE has provision for disconnecting or adjusting the main or the standby power source, this shall only be possible at access level 3 or 4.	The Praesideo system elements that have a mains and backup power supply offer connectors for the main and standby power source, a rear-mounted voltage selector switch and on/off switch. The installer must ensure that these items are only accessible at access level 3 or 4.	
13.5 Integrity of transmission paths	Praesideo is compliant.	
13.5.1 A fault in any voice alarm transmission path between the VACIE and other components of the voice alarm system shall not affect the correct functioning of the VACIE or of any other voice alarm transmission path.	The Praesideo system has the following voice alarm transmission paths between itself and other parts of the voice alarm system: • transmission path between CIE and Praesideo system via input contact or Open Interface; • transmission path between Praesideo system and the loudspeaker(s). If there is a fault in the transmission path between the CIE and an input contact of the Praesideo system, the configured action of the input contact will not be automatically activated or de-activated. The correct functioning of the Praesideo system or of any other voice alarm transmission path is therefore not affected. The fault will just be reported. If there is a fault in the transmission path between the CIE and the Ethernet connection of the network controller of the Praesideo system (connection via Open Interface), methods can no longer be invoked by the CIE and no events can be notified to the CIE. However the fault will not affect the correct functioning of the Praesideo system or any other voice alarm transmission path. The fault will just be reported. If there is a fault in the transmission path between the Praesideo system, i.e. the amplifier outputs and the loudspeaker(s), the loudspeaker(s) will not be able to produce the intended audio signal. However the fault will not affect the correct functioning of the Praesideo system or any other voice alarm transmission path. The fault will just be reported.	
13.5.2 A short circuit or an interruption in the transmission path to the loudspeaker(s) shall not affect more than one voice alarm zone for longer than 100 s following the occurrence of the fault.	Each audio output of the Praesideo system can only be assigned to one voice alarm zone by means of configuration. The IUI specifies this clearly. Due to this, a short circuit or interruption in the transmission path to the loudspeaker(s) only affects the voice alarm zone it was assigned to.	

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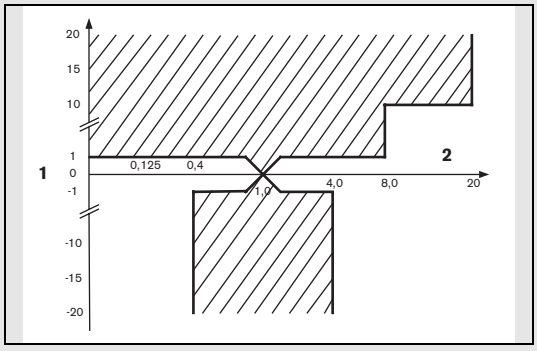
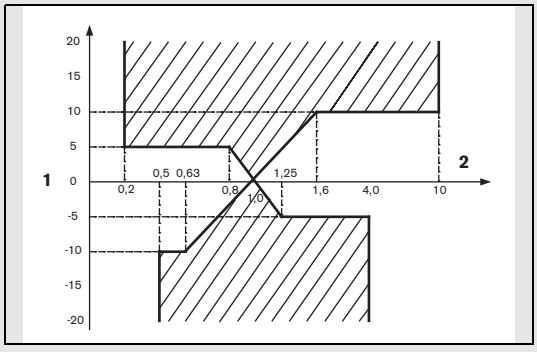
13.5.3 A single short circuit or an interruption in any voice alarm transmission path between distributed cabinets of a VACIE shall not prevent the activation of a voice alarm output condition to more than one voice alarm zone for longer than 100 s following the occurrence of the fault.	The voice alarm transmission path between distributed cabinets of the Praesideo system is achieved by means of the system bus. A single interruption or short circuit in any data segment of this system bus does not prevent proper functioning of the system (including activation of a voice alarm output condition to more than one voice alarm one) as long as the system has redundant cabling. The system bus also offers a power circuit. This power circuit is used to provide power to system elements that do not have its own main power supply. These elements are: audio expander, CobraNet interface, multi channel interface, call station basic with call station keypads, call station module with call station keypad modules, call station interface, remote call station with call station keypads, remote call station module with call station keypad modules. A single interruption or short circuit in the power circuit of the system bus can affect these system elements, since they will lose their power and therefore be turned off. However this can be fixed by proper installation and configuration for the following elements: • multi-channel interface - this unit can be configured to use a connected basic amplifier as its power source (default setting) to share the main and backup power supply of the basic amplifier. • call station module - a backup power supply can be connected in order to power the call station externally if the network power supply fails. • call station interface - a backup power supply can be connected in order to power the call station interface externally if the network supply fails; this back-up power supply can then power both the call station interface and the connected remote call station. • remote call station - an external power supply can be connected in order to power the call station externally if the network power supply fails. • remote call station module - a backup power supply can be connected in order to power the call station externally if the network power supply fails. The basic call station does not have a backup power supply and should therefore not be used as voice evacuation call station. The installer must take care of proper installation and configuration of the system. The audio expander and CobraNet interface units will not prevent the activation of a voice alarm output condition to more than one voice alarm zone as long as they do not interrupt the system bus when the network power supply fails. This can be achieved in two ways: either by installing them on tap-off points in the network using a network splitter or by ensuring all of these units are placed together on the ring with no other type of units in between them. This way they can never break the redundant ring. The installer must deploy one of these solutions in the system installation.	
13.5.4 If the VACIE is designed to be used with a power supply (item L of Figure 1 of EN 54-1) contained in a separate cabinet, then an interface shall be provided for at least two voice alarm transmission paths to the power supply, such that a short circuit or an interruption in one does not affect the other.	If a 19”-cabinet (rack) or adjacent cabinets provide enough space for the battery and/or charger, the installer can install the complete PSE (power supply equipment) as referred in EN54-4 in one cabinet. In that case this requirement is not applicable. In case the installer installs the backup part of the PSE (battery and charger) in a separate cabinet, Praesideo provides a separate (monitored) DC-backup connection on the Praesideo units. This implies that a Praesideo installation will always have two separate voice alarm transmission paths to the power supply: one for mains and one for DC backup. Both will not influence each other. The installer must take care that the installation complies with this requirement.	

Clause / Requirement	Compliance	Signature
13.6 Accessibility of indications and controls	Praesideo is compliant.	
Four access levels shall be provided on the VACIE, from access level 1 (most accessible) to access level 4 (least accessible). Manual controls at a given access level shall not be accessible at a lower access level.The following shall apply:	The Praesideo system offers three types of user accounts (with different access rights): • User: user account type that offers operational control of the system; meant for operational users of the Praesideo system; • Installer: user account type that offers operational control, configuration and diagnosis of the Praesideo system; meant for installers and/or configurators of the Praesideo system; • Administrator: user account type that offers full control of the system including user management, i.e. the ability to add and delete user accounts. Access level 1 is intended for operational users of the Praesideo system. It provides direct (unrestricted) operational access to the Praesideo system via: • A call station that does not have access control (call station keys) Access level 2 is intended for operational users of the Praesideo system. It provides operational access to the system after (some form of) identification. The Praesideo system enforces logical identification for the following access points: • A call station with access control (via numeric keypad); a pin code must be entered before the call station can be used • The open interface; a username and password are needed to connect to the Praesideo system via the Open Interface); the user of the Open Interface must at least have a user account of type 'user' (i.e. user, installer or administrator access rights) Note that access level 2 can also be enforced for the access level 1 access points by means of physical access control, which restricts access to persons that possess the physical access device (e.g. key, access card, et cetera). This is applicable for: • Input contacts with physical access control; the system components offering the input contacts are located in a room/cabinet that is not generally accessible • The front panel menu (with physical access control); the system components that have a front panel menu are located in a room/cabinet that is not generally accessible • A call station with physical access control; the call station is located in a room/cabinet that is not generally accessible Access level 3 is intended for installers and/or configurators of the Praesideo system. It provides access for configuration and diagnosis of the Praesideo system after logical and/or physical identification. This level of access is offered through: • The web interface offered by the web server of the network controller. A user name and password need to be provided to get access to this web interface. The user must have at least a user account of type 'installer' (i.e. Installer or administrator access rights). The web interface can be used for configuration and logical diagnosis of the system. • Physical access control by means of installing the system elements in a restricted environment, such as placing the 19"-units in a 19"-rack with key lock. This type of access can be used for physical diagnosis of the system, e.g. inspect interconnections. Access level 4 is intended for maintenance personnel of the Praesideo system. It provides software/firmware upgrade of the Praesideo system components after logical identification. This level of access is offered through: • The file transfer application of the Praesideo system to transfer message sets to the network controller and upgrade the system software. A user name and password is needed to be able to use the File Transfer Application and get access to the network controller. The user must have at least a user account of type 'Installer' (i.e. installer or administrator access rights).	

Clause / Requirement	Compliance	Signature
a all mandatory indications shall be visible at access level 1 without prior manual intervention (e.g. the need to open a door);	All indicators of the Praesideo system can be visible at access level 1. The installer must ensure correct implementation of this requirement.	
b manual controls at access level 1 shall be accessible without special procedures;	Manual controls of the Praesideo system at access level 1 are accessible without special procedures.	
c indications and manual controls that are mandatory at access level 1 shall also be accessible at access level 2;	All Praesideo indications (LEDs, equipment connected to output contacts, front panel display) and manual controls (input contacts, call station keys, front panel menus) that are accessible at access level 1 are also accessible at access level 2.	
d entry to access level 2 shall be restricted by a special procedure;	Entry to access level 2 is restricted by a special procedure; refer to clause13.6, access level 2 description for details.	
e entry to access level 3 shall be restricted by a special procedure, differing from that for access level 2;	Entry to access level 3 is restricted by a special procedure, see clause13.6, access level 3 description for details. Correct configuration and installation (physical access control) will ensure that the special procedure differs from that of access level 2. The system administrator shall define users of type 'user' for access level 2 and users of type 'installer' for access level 3. The installer shall ensure that the physical access procedure differs from that of the physical access procedure of access level 2.	
f the entry to access level 4 shall be restricted by special means which are not part of the VACIE.	Entry to access level 4 is restricted by means of having to use the File Transfer Application (FTA), see clause13.6, access level 4 description for details. This FTA is only used for access level 4 functions and is therefore not part of the daily operation/configuration of the Praesideo system.	
NOTE - Further access levels are permitted provided that they are distinct from the access levels described in this standard.		
13.7 Indications by means of light-emitting indicators	Praesideo is compliant.	
13.7.1 Mandatory indications from light emitting indicators shall be visible in an ambient light intensity up to 500 lux, at any angle up to 22.5° from a line through the indicator perpendicular to its mounting surface • at 3 m distance for the general indications of functional condition, • at 3 m distance for the indication of the supply of power, and • at 0.8 m distance for other indications.	All of the light emitting indicators of the Praesideo system fulfill this requirement. When external light emitting indicators are installed, such as LEDs connected to a call station module or call station keypad module, or light emitting indicators connected to output contacts, the installer shall use indicators that fulfill this requirement.	
13.7.2 If flashing indications are used, both the on period and the off period shall be greater than or equal to 0.25 s, and the frequencies of flash shall not be less than • 1 Hz for voice alarm indications, and • 0.2 Hz for fault indications.	The voice alarm indication does not flash; it is steady on both call stations and on output contacts. The fault indication on a call station flashes with a frequency of 2 Hz (on and off period of 0.25 s) when there is a fault in the system or is steady on when there is a fault in the call station itself. The fault indication on output contacts is always steady on.	
13.7.3 If the same light emitting indicators are used for the indication of specific faults and disablements, fault indications shall be flashing and disablement indications shall be steady.	Disablement indication is not available in the Praesideo system since Praesideo does not support the optional disablement condition.	
13.8 Indications on alphanumeric displays	Praesideo is compliant.	
13.8.1 If an alphanumeric display consists of elements or segments, the failure of one of these shall not affect the interpretation of the displayed information.	Praesideo system elements that have an alphanumeric display all have a dot matrix LCD. If a single dot of such a display fails the interpretation of the displayed information is not affected.	
13.8.2 If an alphanumeric display is used to display mandatory indications, it shall be clear and unambiguous.	The display of the network controller is used to display mandatory indications. Indication of the voice alarm condition is by means of the text 'Emergency' and the name of the key that activated the voice alarm condition. Indication of the fault warning condition is by means of the text 'Faults' and an indication of the number of active faults in the system. Individual faults with details are shown in a menu structure.	

Clause / Requirement	Compliance	Signature
13.8.3 Mandatory indications on an alphanumeric display shall be legible for at least one hour following the display of a new indication of the voice alarm condition and at least 5 minutes for fault or disablement conditions, at 0,8 m distance, in ambient light intensities from 5 to 500 lux, at any angle from the normal to the plane of the display up to • 22.5° when viewed from each side, and • 15° when viewed from above and below.	If the Praesideo system enters the voice alarm condition the display of the network controller will automatically show the 'Emergency' menu. This indication stays on as long as the system is in the voice alarm condition (i.e. until the voice alarm condition is reset). If the Praesideo system enters the fault warning condition the display of the network controller will automatically show the 'Faults' menu with the current number of active faults. This indication stays on until either the rotary knob of the network controller is used to navigate through the menu, or the system enters the voice alarm condition. The 'Faults' menu will always be present in the Network Controller menu. Individual faults are present in this 'Faults' menu until they are reset or until they are overwritten by newer faults The menu can show up to 200 individual faults after which the oldest faults are deleted when new faults occur. The display of the Network Controller complies with the legibility demands of this clause.	
13.9 Indication colors	Praesideo is compliant.	
13.9.1 The colors of the general and specific indications from light emitting indicators shall be		
a red for indications of voice alarms;	The system status LED of Praesideo call stations is on (red) when the system is in the voice alarm condition. The installer must connect a red light emitting indicator to an 'Emergency alarm indicator' output contact of the Praesideo system. The key of a call station keypad module shall be configured to the action 'Zone status'. The installer must connect a red LED to the appropriate control output belonging to this key.	
b yellow for indications of 1 fault warnings, and 2 disablements, or	The Power/Fault LED of Praesideo call stations is yellow (on or flashing) when the system is in the fault warning condition. The installer must connect a yellow light emitting indicator to the 'Fault alarm indicator' output contact (or another output contact configured for this function). A call station key indicator lights up yellow when the key is configured to the action 'Reset fault' or 'Ack and reset' and the system enters the fault warning condition. Disablement indication is not available in the Praesideo system since Praesideo does not support the optional disablement condition.	
c green for the indication that the VACIE is supplied with power.	All light emitting indicators of the Praesideo system that indicate power supply are green.	
NOTE - Where voice alarm automatic message status indicators are provided, it may be advantageous to indicate the difference between evacuation and alert messages. In this case, red will be used for emergency messages and yellow may be used for alert messages.		
13.9.2 The use of different colors is not necessary for indications on alphanumeric displays. However, if different colors are used for different indications, the colors used shall be as specified in 13.9.1.	The alphanumeric displays used in the Praesideo system do not use different colors for indications.	
13.10 Audible indications	Praesideo is compliant.	
13.10.1 Audible indicators shall be part of the VACIE. The same device may be used for voice alarm zone activated and fault warning indications.	The installer must connect buzzers to output contacts configured as 'Emergency alarm buzzer' or 'Fault alarm buzzer'. The installer may decide to connect both the voice alarm activated output contact as well as the fault warning condition activated output contact in parallel to the same buzzer.	
13.10.2 The minimum sound pressure level, measured under anechoic conditions at a distance of 1 m, with any access door(s) on the VACIE closed, shall be • 60 dBA for the voice alarm condition, and • 50 dBA for the fault warning condition.	The installer must connect the buzzer, provided with Praesideo, that complies with this clause.	

Clause / Requirement	Compliance	Signature
13.11 Indicator testing	Praesideo is compliant.	
All mandatory visible and audible indicators shall be testable by a manual operation at access level 1 or 2.	Praesideo provides an 'Indicator test' action that can be configured for a key on a call station keypad or keypad module. When activated all indications on that call station and all its connected keypads are switched on to visually check the indicators. Bi-color indicators alternate between both colors. The call station monitor loudspeaker will sound a single tone chime with priority 223. If a numeric keypad is connected to the call station, its LCD shows an alternating test pattern to visually check all pixels. The installer must take care that indicators that are connected to control output contacts are testable.	
13.12 Audio performance	Praesideo is compliant.	
13.12.1 Output power		
The VACIE output power shall be as declared by the manufacturer.	The output power of the amplifier elements of the Praesideo system (Power Amplifiers, Basic Amplifiers) are specified in the data sheets and in the IUI.	
13.12.2 Signal-to-noise ratio		
The VACIE shall have an A-weighted signal-to-noise ratio of at least 45 dB (see IEC 60268-1).	The A-weighted signal-to-noise ratio of the Praesideo amplifiers (Power Amplifiers and Basic Amplifiers) is specified in the data sheets and in the IUI. The signal-to-noise ratio is above 85 dB. The complete signal chain from microphone to loudspeaker is compliant to this clause.	
13.12.3 Frequency response		
The frequency response of the VACIE shall fit within the non-shaded area in Figure 1 for sound sources without microphone(s) (e.g. message store) and Figure 2 for sound sources with microphone(s).		

Clause / Requirement	Compliance	Signature
 *figure 1: VACIE frequency response limits without microphone(s)* **Key** 1 - relative output signal level, with reference to 0 dB signal level measured at 1 kHz (dB) 2 - 1/3 octave frequency band (Hz)	The frequency response of all Praesideo sound paths that do not include microphones is within the specified limits of this clause, with the following remarks for the LBB4428/00. The frequency response of the LBB4428/00 power amplifier shows some interaction with the attached load impedance. For certain load conditions this causes a resonance peak around 10-20 kHz, just exceeding the +1 dB limit in the frequency band between 6 and 8kHz. The installer shall use the built-in parametric equalizer of this amplifier to flatten the frequency response of each channel by activating the high frequency shelving filter, with gain setting -2 dB at a corner frequency of 6.8 kHz. This setting is valid for all rated load conditions. A high pass filter at 68 Hz in the equalizer section is enabled by default to decrease the risk of loudspeaker transformer saturation for high level low frequency signals. The high pass filter must remain enabled. The PRS-CSM and PRS-CSRM already contain a built-in speech-filter for improved intelligibility. However, this causes the frequency response of these call station modules just to exceed the -1 dB limit at 400 Hz. The installer shall use the built-in parametric equalizer of these call station modules to flatten the frequency response by activating the first full parametric section to +2 dB at 390 Hz with a Q of 0.8 for the PRS-CSRM, or +3 dB at 390 Hz with a Q of 0.8 for the PRS-CSM.	
 *figure 2: VACIE frequency response limits with microphone(s)* **Key** 1 - relative output signal level, with reference to 0 dB signal level measured at 1 kHz (dB) 2 - 1/3 octave frequency band (Hz)	The frequency response of all Praesideo sound paths that include microphones is within the specified limits of this clause.	
NOTE - The frequency response limits exclude loudspeakers.		
NOTE - A bandwidth of 400 Hz to 4 kHz is sufficient to achieve acceptable intelligibility in some acoustic environments. However, a higher frequency limit may be necessary to achieve acceptable intelligibility in more difficult acoustic environments due, for example, to the masking effect caused by reverberation and/or ambient noise.		
13.13 Message store(s)	Praesideo is compliant.	
Pre-recorded messages shall be stored in non-volatile memory that retains the messages when all power sources are removed.	The pre-recorded messages of the Praesideo system are digitally stored on a Compact Flash card in uncompressed format (linear PCM, 16-bit, 44.1kHz). This card retains the messages when all power sources are removed.	
NOTE - The use of tapes or magnetic or optical data disks for the storage of emergency messages is not acceptable at the time of drafting this European Standard (see Annex C)		

Clause / Requirement	Compliance	Signature
13.14 Redundant power amplifiers (option with requirements)	Praesideo is compliant.	
13.14.1 The VACIE may have provision for at least one spare power amplifier. In this case:	Each power amplifier channel of the Praesideo system has an input for connecting a spare amplifier channel. It also contains a switch-over relay to switch the loudspeaker load from the original amplifier output to the spare amplifier output. A spare amplifier channel assignment is configurable to multiple main amplifier channels.	
a in the event of the failure of a power amplifier, the faulty amplifier shall be capable of being replaced automatically with a spare amplifier within 10 s of the fault being detected;	After fault detection of an amplifier all loudspeaker lines are switched automatically to the spare amplifier (if connected and configured) within 10 s.	
NOTE - This can be achieved, for example, by switching or by permanently connected parallel amplifiers.		
b the spare power amplifier(s) shall have at least the same functionality and output power as the replaced amplifier.	Each power amplifier channel of the Praesideo system has a spare amplifier input. The installer shall take care of proper installation and configuration of the amplifiers to match amplifier power and number of channels per amplifier. Praesideo takes care of input signal switching to the spare amplifier channel, including adaptive sound processing. This way the spare power amplifier(s) will have the same functionality and output power as the replaced amplifier.	
13.14.2 Every fault of an amplifier shall be indicated by a general fault warning indicator as specified in 8.2	All Praesideo power amplifiers are supervised for overload, overheating, short-circuit, ground short and amplifier defect. If any such fault is detected it is indicated both by means of the general fault warning indicator and by means of an individual fault report.	
13.14.3 Supervision of the spare amplifier(s) shall be maintained during the functional condition whilst the VACIE is powered by either the mains or standby power supplies.	The spare amplifiers can be continuously supervised, whether it is in idle or active state; this is configurable. The supervision is active whilst the Praesideo system is powered by either the mains or standby power supplies.	

Clause / Requirement	Compliance	Signature
14 Additional design requirements for software controlled VACIE		
14.1 General requirements and manufacturer's declarations	Praesideo is compliant.	
In order to fulfill requirements of this European Standard the VACIE may contain elements which are controlled by software. In this case, the VACIE shall comply with the requirements of Clause 13 Design requirements and this clause where relevant to the technology used.	The Praesideo system is centrally controlled by the software running on the network controller.	
14.2 Software documentation	Praesideo is compliant.	
14.2.1 The manufacturer shall prepare documentation that gives an overview of the software design, which shall be submitted to the testing authority together with the VACIE. This documentation shall be in sufficient detail for the design to be inspected for compliance with this European Standard and shall comprise at least the following:	The software design documentation is available for testing authorities. It is in sufficient detail for the design to be inspected for compliance.	
a functional description, using a clear methodology appropriate to the nature of the software, e.g. graphical representations of the system design, data flows and control flows and of the main program flow, including:	An extensive set of architecture documents and software design documents are available and maintained.	
1 a brief description of each module and the tasks it performs,	Architecture documents are available.	
2 the way in which the modules interact,	Architecture and design documents are available.	
3 the way in which the modules are called, including any interrupt processing, and	Architecture and design documents are available.	
4 the overall hierarchy of the program;	Architecture documents are available.	
b a description of which areas of memory are used for the various purposes (e.g. the program, site specific data and running data);	Memory usage is described in the system architecture document.	
c a description of how the software interacts with the hardware of the VACIE.	Hardware software interaction is described in a set of Hardware-Software Interface documentation.	
Where dynamic memory management is employed, a separation shall be implemented between the program, site specific data and running data and this shall be described in connection with the method of memory allocation.	The program is located in separate Flash EPROMs that are reserved for the program executable. The message data is stored on a separate Flash card. The site specific configuration data is stored on the Flash file system. The running data (static variables, stacks and heap data) is stored in RAM. After loading the program executable from Flash EPROM into RAM, the code space and the running data are separated from each other: the code space is in the bottom area of the RAM and the running data takes up the remainder. Dynamic memory is allocated from the heap using the VxWorks (first fit policy based) memory manager. The file system that, apart from storing the site specific data, also stores the logging information and configuration web pages, is a Flash EPROM based DOS FAT file system that is managed by the VxWorks Flash file system manager.	
14.2.2 The manufacturer shall prepare and maintain detailed design documentation. This need not be submitted to the testing authority but shall be available for inspection in a manner which respects the manufacturer's rights of confidentiality. This documentation shall comprise at least the following:	The software design documents contain detailed design documentation. Furthermore code comments also contain detailed design documentation.	
a a description of each module of the program, as it is implemented in the source code of the program, containing: 1 the name of the module, and 2 the identification of the author(s);	The Praesideo software component descriptions (module descriptions) are available from the software architecture documents. These documents contain the names of the components. The author information can be obtained from the version manager (Merant Version Manager) used for the documentation.	
b the source code listing, including all global and local variables, constants and labels used, and sufficient comment for the program flow to be recognized;	All of the source code listing (including all global and local variables, constants and labels used) can be obtained from the version manager (Merant Version Manager) used for the code. All of the Praesideo code is commented.	

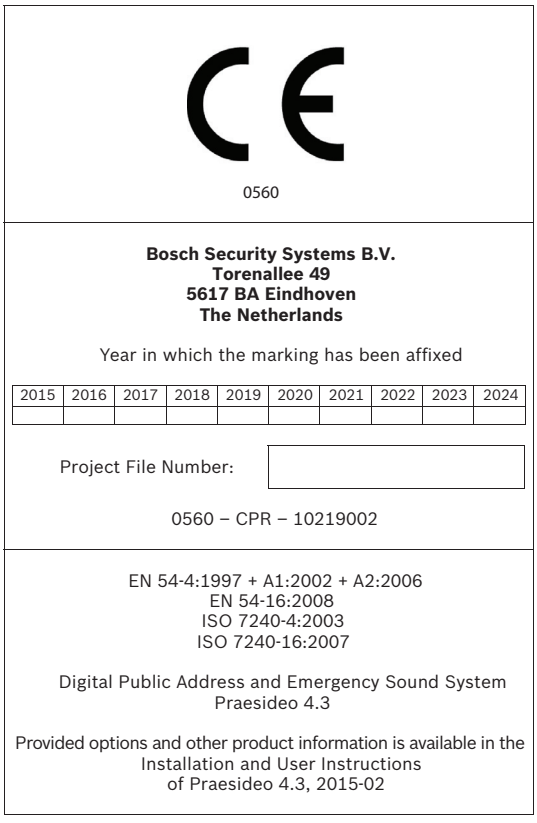
Clause / Requirement	Compliance	Signature
c details of any software tools used in the preparation of the program (e.g. high level design tools, compilers, assemblers).	The list can be composed on request and contains high level design tools, compilers for various processors, syntax validation tools, build tools, test tools, performance validation tools, version control tools, defect tracking tools.	
14.3 Software design	Praesideo is compliant.	
In order to ensure the reliability of the VACIE the following requirements for software design shall apply:		
a the software shall have a modular structure;	The modular structure of the Praesideo software is documented in the software architecture documents.	
b the design of the interfaces for manually and automatically generated data shall not permit invalid data to cause an error in the program execution;	The interfaces between the modules and to external components are well defined and described in the design documents and external interface documents (Open Interface). Asserts are used to validate inputs on component boundaries.	
c the software shall be designed to avoid the occurrence of a deadlock in the program flow.	Design guidelines are in place to avoid deadlocks. Multi threading within components is avoided where feasible and components have an input command queue for safe decoupling of threads.	
14.4 Program monitoring (see also Annex C)	Praesideo is compliant.	
14.4.1 The execution of the program shall be monitored as under 14.4.2 or 14.4.3. If routines associated with the main functions of the program are no longer executed, either or both of the following shall apply:		
a the VACIE shall indicate a system fault (as in 8.3);	Upon activation of a watchdog, a fault is reported after restart of the failing component indicating the failing unit and processor. If a restart of the failing component is not possible, a less detailed fault will be reported. A system fault is indicated when entering the fault condition.	
b the VACIE shall enter the fault warning condition and indicate faults of affected supervised functions (as in 8.2.3, 8.2.4, 8.3, 8.4 and 8.5), where only these functions are affected.	Upon activation of a watchdog, a fault is reported after restart of the failing component indicating the failing unit and processor.	
14.4.2 If the program executes in one processor, the execution of the routines in 14.4.1, it shall be monitored by a monitoring device as in 14.4.4.	All processors used in the Praesideo system are either guarded by a hardware watchdog or are monitored by a processor that is guarded by a hardware watchdog.	
14.4.3 If the program executes in more than one processor, the execution of the routines in 14.4.1 shall be monitored in each processor. A monitoring device as in 14.4.4 shall be associated with one or more processors, and at least one such processor shall monitor the functioning of any processor not associated with such a monitoring device.	All processors are either guarded by a hardware watchdog or are monitored by a processor that is guarded by a hardware watchdog:. The network controller is responsible for monitoring all processors in the system. Upon failure of one of the processors, either due to a watchdog failure or due to a communication failure a fault is generated. Failure of the network controller itself will cause the system fault output contact to be de-energized to indicate a system fault.	
14.4.4 The monitoring device of 14.4.2 and 14.4.3 shall have a time-base independent of that of the monitored system. The functioning of the monitoring device, and the signaling of a fault warning, shall not be prevented by a failure in the execution of the program of the monitored system.	All processors are either guarded by a hardware watchdog or are monitored by a processor that is guarded by a hardware watchdog. Additionally the correct operation of the main processor of all system elements is validated by adding execution checks on relevant locations in the code. This to assure that no important flow is excluded from execution. The network controller multi-threaded environment is validated on correct operation by monitoring the threads: all relevant threads must report to a single thread that is responsible for resetting the watchdog. If threads do not report within a given time frame the watchdog feeding process is halted. This monitoring thread itself is supervised by a hardware watchdog.	
14.4.5 In the event of a system fault as specified in 14.4.1 a) or 14.6, those parts of the VACIE affected shall enter a safe state not later than the indication of the system fault. This safe state shall not result in the false activation of mandatory outputs.	Upon restart of a unit other than the Network Controller, the unit will be reinitialized and reordered to its expected state. Upon restart of the network controller and subsequent loss of the audio and communication network, all units will assume a safe state. The network controller orders the units to their initialization state and is responsive to new stimuli when restarted. Information about errors and fatal errors (those resulting in a reboot) are saved in SRAM for post mortem analysis. Additionally to the display, a fault indicator can be supplied that indicates the presence of a fault.	

Clause / Requirement	Compliance	Signature
14.5 The storage of programs and data (see also Annex C)	Praesideo is compliant.	
14.5.1 All executable code and data necessary to comply with this European Standard shall be held in memory that is capable of continuous, unmaintained, reliable operation for a period of at least 10 years.	All Praesideo programs (executable code and data) are stored in Flash EEPROM.	
14.5.2 For the program, the following requirements shall apply:		
a the program shall be held in non-volatile memory, which can only be written to at access level 4, and	Firmware (i.e. the program) can be replaced using the File Transfer Application. Using the File Transfer Application requires access level 4.	
b it shall be possible to identify the version reference or references of the program at access level 3. The version reference or references shall be in accordance with the documentation of 14.2.1.	The version of the firmware of the units that have an LCD (access level 3) is visible on the units and on the firmware upgrade web page (that can be accessed via the web interface of the network controller). The version of the network controller software is visible on the network controller display and the web start page. Getting access to the web interface of the network controller requires access level 3.	
14.5.3 For site-specific data, including emergency message(s), the following requirements shall apply:		
a the alteration of site specific data shall only be possible at access level 3 or 4;	Alteration of site specific data can only be done via the web pages offered by the web interface of the network controller (configuration data) and via the File Transfer Application (message sets). Getting access to the web interface of the network controller requires access level 3. Using the File Transfer Application requires access level 4.	
b the alteration of site specific data shall not affect the structure of the program;	Configuration of the Praesideo system is implemented to be data-driven and is not part of the program executable. Also transferring message sets to the Praesideo system is data-driven and is not part of the program executable. Therefore alteration of the site specific data does not affect the structure of the program.	
c if stored in read-write memory, there shall be a mechanism which prevents the memory being written to during normal operation at access level 1 or 2, such that its contents are protected during a failure in program execution;	Site specific data is stored in a Flash EEPROM based file system. The file system is maintained by the VxWorks Flash file system manager using a dedicated cyclic Flash-Write program mechanism.	
d It shall be possible to either read or interrogate the site specific data at access level 2 or 3, or the site specific data shall be given a version reference that shall be updated when each set of alterations is carried out.	Site specific data can be viewed and maintained from the configuration web interface. Using the web interface requires access level 3.	
e If the site specific data has a version reference, it shall be possible to identify this at access level 2 or 3.	The site specific data of the Praesideo system does not have a version reference.	
14.6 Monitoring of memory contents	Praesideo is compliant.	
The contents of the memories containing the site specific data shall be automatically checked at intervals not exceeding 1 h. The checking device shall signal a system fault if a corruption of the memory contents is detected.	The message store is checked every 100 s using checksum validation. Upon detecting corruption, a fault is reported indicating a corrupt message store. The configuration file is checked at intervals not exceeding 1 h using checksum validation. Upon detecting corruption, a fault is reported indicating a corrupt configuration.	

Clause / Requirement	Compliance	Signature
15 Marking	Praesideo is compliant.	
The VACIE shall be marked with the following information, which shall be legible at access level 1:		
a the number of this European Standard;	The installer must mark the Praesideo system with the number of this European standard (which is legible at access level 1) since the installer must install and configure the system properly in order to let the installation comply with this standard.	
b the name or trademark of the manufacturer or supplier;	The name 'Bosch' is visible on each element of the Praesideo system. The installer must ensure that this name is legible at access level 1 for all system elements.	
c the type number or other designation of the VACIE.	The type number of each unit of the Praesideo system is present on the unit itself. The installer imust ensure that this type number is legible at access level 1.	
It shall be possible to identify a code or number that identifies the production period of the VACIE at access level 1 or 2 or 3.	The hardware version and production data are visible on the type number plate of each unit of the Praesideo system. The installer must ensure that this type number plate is identifiable at access level 1, 2 or 3.	
Where Annex ZA.3 covers the same requirements as this clause, the requirements of this clause are met.		

Clause / Requirement	Compliance	Signature
16 Tests	All tests as asked for in the clauses of section 16 have been carried out by an accredited certification body for EN54-16 compliancy. The Praesideo system has been found compliant to EN-54-16 and received a certification of compliancy.	

EN54-16: 2008 VACIE label



IMPORTANT

The proper functioning of an emergency sound system (VACIE) in accordance with EN54-16 is the responsibility of the manufacturer of the system. Because a Praesideo emergency sound system contains system elements that are built together and interconnected during system installation, the correct design, installation and configuration of the system are crucial for compliancy to EN54-16. Therefore Bosch Security Systems and the Notified Body that certified the Praesideo system have agreed that a strict adherence to the following rules is a necessity for compliancy of an installed Praesideo emergency sound system (VACIE) to EN54-16.

1 Bosch Security Systems shall provide training courses for VACIE installers. Such a training course will cover all necessary subjects to do successful installations of the products for which this course is intended, including the specific requirements for EN54-16, such as how to configure an EN54-16 compliant VACIE using the correct components (correct HW/SW).
2 VACIE installers who have participated in the Bosch Security Systems training and passed the examination will be certified. Certified VACIE installers need to renew their certification once every 2 years by participating in the Bosch/Dynacord follow-up training course on this subject and/or successfully pass the exam to extend their certificate.
3 Bosch Security Systems shall keep and maintain a list of all certified VACIE installers.
4 VACIE installations:
   - The VACIE shall be installed according to the applicable clauses mentioned in the EN54-16 standard by or under the supervision of a certified VACIE installer.
   - The certified VACIE installer shall check each clause of the EN54-16 checklist, as provided in the Installation and User Instructions, upon fulfilling the requirements of that clause.

Note: Some requirements will be met by design of the equipment used, some other requirements may need a specific configuration in hardware or software.

- The certified VACIE installer shall login to the Bosch/Dynacord system registration website to register the system, and apply for a unique project file number by entering the system documentation:
  1. Confirmation of having checked each clause of the EN54-16 checklist for this system.
  2. A copy of the configuration file of each network controller used in the system.
  3. Entering the following data of each product in the installation: serial number, product name, hardware release number and software release number.
  4. Enter personal information of the certified VACIE installer and confirmation that the provided information has been entered correctly and completely.
- Bosch Security Systems will check the entered information on completeness and correctness.
- If the entered information is found to be correct, Bosch Security Systems will store the project information for future reference and email the project file number to the certified VACIE installer.
- The certified VACIE installer shall fill-in the year and project file number on the VACIE label and affixes the VACIE-label to one of the main equipment rack(s) of the VACIE, in accordance with the checklist and instructions in the Installation and User Instructions. Filling-in the year and project file number on the label shall be done legibly and indelibly.

  Note: indelibly means that it cannot be easily removed with water or petroleum spirits.

5 Correctness of the entered information in the system registration website is granted if all relevant clauses of the EN54-16 checklist have been checked, and all entered devices with HW/SW versions and its combinations are listed in the valid EN54-16 certificate, and that the configuration uses allowed settings according to the user manual, and that the personal information is correct and confirmation of completeness and correctness of the entered information is given by the certified VACIE installer.

EN54-16: 2008 products description

EN 54-16 is a product standard governing 'Voice Alarm Control and Indicating Equipment' (VACIE). Telefication has declared as designated Notified Body for the European Construction Products Regulation that the products as listed in the table below are in conformity with Regulation (EU) No 305/2011 based on the applicable Technical Standards and Specifications.

Telefication has issued a Certificate of Constancy of Performance with the following certificate number:

560-CPR-10219002

Trademark	Main product description	Main type designation	Hardware release	Software release
Bosch	Network Controller	PRS-NCO-B	21/05, 21/08	3.5x, 3.6y
Bosch	Network Controller	PRS-NCO3	30/00, 30/10	4.0y, 4.1, 4.3
Bosch	Audio Expander	LBB4402/00	16/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Audio Expander	PRS-4AEX4	17/00	3.61, 4.1, 4.3
Bosch	CobraNet Interface	LBB4404/00	03/10, 03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Multichannel Interface	PRS-16MCI	04/10, 04/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Network Splitter	PRS-NSP	03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Fiber Interface	PRS-FIN	03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Fiber Interface Non-Addressable	PRS-FINNA	03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Fiber Interface Single-Mode	PRS-FINS	03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Power Amplifier 8 x 60 W	LBB4428/00(-EU)	04/05, 05/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Power Amplifier 1 x 500 W	PRS-1P500(-EU)	06/05, 06/10	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Power Amplifier 2 x 250 W	PRS-2P250(-EU)	06/05, 06/10	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Power Amplifier 4 x 125 W	PRS-4P125(-EU)	06/05, 06/10	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Basic Amplifier 1 x 500 W	PRS-1B500(-EU)	06/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Basic Amplifier 2 x 250 W	PRS-2B250(-EU)	06/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Basic Amplifier 4 x 125 W	PRS-4B125(-EU)	06/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Basic Amplifier 8 x 60 W	PRS-8B060(-EU)	06/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Basic Call Station	LBB4430/00	06/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Call Station Keypad	LBB4432/00	01/18, 01/19	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Numeric Keypad	PRS-CSNKP	01/18	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Call Station Interface	PRS-CSI	01/15, 01/20, 01/30	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Remote Call Station	PRS-CSR	01/15, 01/20, 01/30	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Call Station Module	PRS-CSM	11/00	4.1, 4.3
Bosch	Remote Call Station Module	PRS-CSRM	11/00	4.1, 4.3
Bosch	Call Station Keypad Module	PRS-CSKPM	11/00	4.1, 4.3
Bosch	Supervision Control Board	LBB4440/00	01/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	LSP Supervision Board	LBB4441/00	01/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Line Supervision Set	LBB4442/00	01/10	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	EOL Supervision Board	LBB4443/00	01/05	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Call Stacker	PRS-CRF	01/10, 06/10	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	SPEC RCS Master	PSP-D00039	03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	SPEC RCS Slave	PSP-D00040	03/15	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	IP Audio Interface	PRS-1AIP1	02/00	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	48VDC Battery Charger	PRS-48CH12	n.a.	3.5x, 3.6y, 4.0y, 4.1, 4.3
PSD	48VDC Battery Charger	PRS-48CHxx-DE	n.a.	3.5x, 3.6y, 4.0y, 4.1, 4.3
Merawex	Power Supply System	ZDSO400E-AK3	n.a.	3.5x, 3.6y, 4.0y, 4.1, 4.3
Bosch	Line Isolator System Master	PM1-LISM6	01/00	4.1, 4.3
Bosch	Loudspeaker Line Isolator	PM1-LISS	01/00	4.1, 4.3
Bosch	Loudspeaker DC Blocking Board	PM1-LISD	01/00	4.1, 4.3

x = 0, 1, 2, 3
y = 0, 1

This list of products is subject to change. The most recent version of this list can be found on www.bosch.com.

Certification of the Praesideo Digital Public Address and Emergency Sound System includes the cabinets (i.e. the enclosed 19"-racks) in which the system elements are mounted. It is allowed to use one or more cabinets, depending on the size of the Praesideo system. Within the same cabinet family, different heights are allowed up to a maximum height that depends on the brand and type of an approved cabinet. The following cabinets have been approved for use with Praesideo:

- Rittal TS8 series, with lockable glass door, side panels, temperature controlled top fans and having a fixed frame with a maximum height of 42 HU or a lockable swing frame with a maximum height of 40 HU.
- Schroff 20130073PRAESIDEO, specifically designed for Praesideo.

The list of approved cabinets is subject to change. The most recent version of this list can be found on www.boschsecurity.com.

Certification of the Praesideo Digital Public Address and Emergency Sound System includes the LBB4404/00 CobraNet Interface under the condition that it is directly connected to an Ethernet switch of the type Belden/ Hirschmann RSR20-0800M2M2T1UCCHPHH (an extended temperature version of the RSR20-0800M2M2T1SCCHPHH) in the same cabinet. This switch may also be used to connect, within the same cabinet, other EN54-16 compliant products, as listed in the table on the previous page.

ISO7240-16: 2007 compliancy checklist

Clause / Requirement	Compliance	Signature
EN54-16 and ISO7240-16 are very similar standards. The following list gives a summary of the differences between the EN54-16 and the ISO7240-16 standards for voice alarm control and indicating equipment. Only essential differences are listed. Differences in phrasing between the standards (that occur very frequently) are omitted. Also similar clauses that have a different number in ISO7240-16 compared to EN54-16 are not listed. The changes are divided into sections • **Additions**: clauses in ISO7240-16 that do not exist in EN54-16; the ISO7240-16 text is generally given. • **Changes**: clauses in EN54-16 and ISO7240-16 that are basically the same but differ in detail, the change is given by using *italic* typeface. • **Exclusions**: requirements that are in EN54-16 but are not in ISO7240-16.	Responsibility of the installer. The installer must use the checklist for EN54-16 before proceeding with this list for ISO7240-16	

Additional clauses

Clause / Requirement	Compliance	Signature
6 Quiescent condition Any kind of system information may be displayed during the quiescent condition. However, no indications shall be given that can be confused with indications used in • the test condition.	The optional test condition is not supported by the Praesideo system.	
***7* Voice-alarm condition**		
7.1 Reception and processing of alarm signal		
7.1.4 Where the s.s.c.i.e. is used for non-emergency purposes, the voice-alarm condition shall disable or override any functions not connected with the emergency functions.	Upon entering the emergency mode Praesideo can be configured to override non-emergency functions, based on priority settings.	
7.2 Alert signal - Optional function		
7.2.1 The s.s.c.i.e. may produce one or more alert signals complying with ISO 7731.	Praesideo offers various alert signals that comply with ISO7731. Also prerecorded signals can be stored and selected in Praesideo. The installer must select and configure an alert signal that is in compliance with ISO7731 from the list of available signals that Praesideo offers. The preferred signal and required sound pressure level depend on the the actual application, as the parameters of the danger signal (signal level, frequency spectrum, temporal pattern, etc.) shall be designed to stand out from all other sounds in the reception area and shall be distinctly different from any other signals. The sound pressure level shall be at least 65dBA at any position in the signal reception area, while being at least 15dB above A-weighted ambient noise, but it may not exceed 118dBA. The danger signal shall include frequency components between 500Hz and 2500Hz. Pulsating danger signals are preferred to signals that are constant in time, while the repetition frequencies shall be in the range from 0.5Hz to 4Hz. Examples of compliant Praesideo tones are the ‘DIN alarm’ (sweeping signal from 1200Hz down to 500Hz in 1s, repeating) and the ‘2-tone alarm 2’ (alternating frequencies of 650Hz and 850Hz, every frequency lasts 500ms, repeating).	

7.2.2 Where a voice signal is used as part of the alert signal, the alert signal shall precede the first pre-recorded voice message for 3 s to 10 s. Successive alert signals and messages shall then continue until either automatically or manually changed or silenced. The interval between successive messages shall not exceed 30 s and alert signals shall be broadcast whenever periods of silence might otherwise exceed 10 s.	Praesideo offers this functionality via its call macros. The installer must configure the call macros accordingly.
7.2.3 Where more than one alert signal is provided, each signal shall be clearly distinguishable.	Praesideo offers a wide choice of independent alert and alarm signals.
7.3 Evacuate signal	
7.3.1 The evacuate signal may be preceded by an alert signal (see 7.2). The use of an alert signal, together with an evacuate signal, should be assessed as part of an emergency management plan (see ISO 7240-19). For buildings and structures where the plan requires the unassisted evacuation of occupants, the s.s.e.p. may be configured to generate a warning signal that does not incorporate an alert signal.	Praesideo offers the possibility to configure a call macro with an evacuation signal or evacuation message only.
7.3.2 The evacuate signal shall include the tone signal and pre-recorded voice messages, as specified in ISO 8201. Manufacturers may implement other signal templates to satisfy specific mandated national requirements.	The installer must configure one of the dedicated ISO8201 compliant evacuate signals that Praesideo offers. These emergency signals have the temporal pattern as described by ISO8201 and have a predefined name 'Emg x ISO8201 C', with x being a sequential number. The installer must ensure that the sound pressure level of the evacuate signal is at least 65dBA, or 75dBA if the signal is intended to arouse sleeping occupants. ISO8201 does not specify pre-recorded voice messages, but Praesideo offers the possibility to store and select custom voice messages to satisfy specific mandated national requirements.
7.5 Audible warning - Optional function	
7.5.3 The audible warning shall be silenced automatically when the s.s.c.i.e. is reset from the voice alarm condition.	Praesideo silences the audible warning signal upon acknowledge of the voice alarm condition. Acknowledge and reset can be combined in a single action.
7.6 Delay before entering the voice-alarm condition - Optional function	
d It shall be possible to override the delay by a manual operation at access level 1 and/or by a signal from a manual call point.	Since the Praesideo system does not process the fire sensors, this functionality is better handled by the device managing the fire sensors (the CIE). The Praesideo system itself does not implement this requirement.
7.7 Phased evacuation - Optional function	
c When switching from phased evacuation to manual mode, the phased evacuation sequence shall halt.	Praesideo has multiple priority levels to override (phased evacuation) calls by manually activated calls.
d When switching from manual mode to phased evacuation, the phased evacuation sequence shall resume from the point at which it was halted.	Praesideo will resume manually overruled calls without live speech but with emergency priority, after the overruling call has finished.

Clause / Requirement	Compliance	Signature
8 Fault-warning condition		
8.1 Reception and processing of fault signals		
8.1.2 The s.s.c.i.e. shall be capable of simultaneously recognizing all of the faults specified in 8.2, and in 8.3 if provided, unless this is prevented by • the presence of voice-alarm signals in the same emergency loudspeaker zone, and/or • the disablement of the corresponding emergency loudspeaker zone or function, and/or • the testing of a corresponding zone or function.	In Praesideo supervision is always active.	
8.2 Indication of faults in specified functions		
8.2.2 If the indication is by means of separate light-emitting indicators, these may be the same as those used to indicate disablement and/or testing of the corresponding emergency loudspeaker zones or functions.	Praesideo uses separate indicators for faults. The optional disablement and test conditions are not supported by the Praesideo system.	

8.6 Fault-warning condition output signal The s.s.c.i.e. shall have an output to transmit the fault-warning condition specified in 8.2. The output signal shall be given if the s.s.c.i.e. is de-energized.	The Praesideo network controller provides two predefined control outputs for audible and visual fault indicators with fail-safe behavior. When de-energized, the contacts of these control outputs are closed (activated).	

Clause / Requirement	Compliance	Signature
9 Disabled condition - Optional function		
9.3 Indication of specific disablements		
9.3.1 Each emergency loudspeaker zone shall be indicated by means of separate light-emitting indicators and/or an alphanumeric display. The indications shall not be suppressed during the voice-alarm condition.	The optional disablement condition is not supported by the Praesideo system.	
9.3.3 The same light-emitting indicator may be used as that for the indication of the corresponding fault, although the indication shall be distinguishable. The same light-emitting indicator and the same indication may be used to indicate a disabled emergency loudspeaker zone and an emergency loudspeaker zone under test.	The optional disablement condition is not supported by the Praesideo system.	

Clause / Requirement	Compliance	Signature
10 Test condition - Optional function	The optional test condition is not supported by the Praesideo system.	

Clause / Requirement	Compliance	Signature
11 Manual mode control - Optional function		
11.1.2 In the manual mode, the receiving and display of signals shall not be inhibited.	Praesideo does not inhibit the receiving and display of signals in the manual mode.	
11.1.3 In the manual mode, any phased evacuation sequence shall be halted. Returning the system to automatic mode shall reinstate the phased evacuation sequence as if it had not been halted.	Praesideo will resume manually overruled calls after the overruling call has finished, providing that the overruled call was without live speech and had emergency priority.	

Clause / Requirement	Compliance	Signature
13 Emergency microphone - Optional function		
13.1 General		
c The emergency microphone control shall mute alert and evacuate signals within the selected emergency loudspeaker zone.	If the configured call of the emergency microphone was given a higher priority than the calls that generate alert and evacuate signals within the same emergency loudspeaker zone, these calls will be aborted and mute.	
d Use of the emergency microphone shall not reset an existing functional condition. After the microphone is no longer used, the functional condition shall be re-established.	Praesideo will resume overruled calls after the overruling call has finished, providing that the overruled call was without live speech and had emergency priority. The emergency state that was entered upon starting a call with emergency priority, will remain until explicitly manually reset.	
e Unless 13.3 applies, the microphone shall broadcast voice messages to a pre-configured set of emergency loudspeaker zones.	Praesideo allows for free assignment of emergency loudspeaker zones to calls that may contain live speech or prerecorded messages. This assignment can be manually during operation or in advance during configuration.	
13.2 Microphone priority - Optional function		
13.2.2 Where more than one microphone is configured at each priority level, only one microphone shall be active at any one time. If more than one microphone at the same priority is activated, the most recently activated microphone shall be enabled.	Praesideo allows more than one microphone to be configured for calls with the same priority, but in that case typically the most recently activated one will not be enabled until the previous one has finished, i.e. first come, first served. Only in case of the highest priority, 255, multiple calls with this priority act on overruling basis, i.e. the most recently activated microphone will be enabled. Only one microphone will be active at any one time in the same zone.	
13.3 Microphone emergency loudspeaker zone control - Optional function		
The s.s.c.i.e. may be configurable to route microphone messages to groups of emergency loudspeaker zones, with each group containing at least one emergency loudspeaker zone.	Praesideo allows for configuration of zone groups, containing one or more emergency loudspeaker zones. Calls can be made to a free selection of zones and zone groups.	

Clause / Requirement	Compliance	Signature
14 Design requirements		
14.2 Documentation		
14.2.1 The manufacturer shall prepare installation and user documentation, which shall be submitted to the testing authority together with the s.s.c.i.e. This shall comprise at least the following:		
b technical specifications of the inputs and outputs of the s.s.c.i.e., sufficient to permit an assessment of the mechanical, electrical, and software compatibility with other components of the system (e.g. as described in ISO 7240-1), including where relevant 3 the maximum number of alarm inputs from an emergency detection system	The inputs and outputs for audio and control are described in the IUI, including the technical data, system functions, configuration instructions, compliancy to standards. This includes the information as requested in 14.2.1 b 3.	
c installation information, including	The IUI contains all information as requested in 14.2.1 c 1-5.	
1 the suitability for use in various environments,		
2 how the requirements of 14.3.3 and 14.5.3 can be met if the s.s.c.i.e. is contained in more than one cabinet,		
3 how the requirements of 14.3.3 and 14.5.4 can be met if the s.s.c.i.e is designed to be used with power-supply equipment contained in a separate cabinet,		
4 mounting instructions, and		
5 instructions for connecting the inputs and outputs.		
14.3.3 The s.s.c.i.e. may be housed in more than one cabinet. If the documentation shows that the cabinets may be installed in locations distributed within a site, then all of the mandatory manual controls and indicators shall be on one cabinet or on cabinets declared to be suitable only for mounting adjacent to each other. ***NOTE*** *For the purposes of 14.3.3, adjacent cabinets are those that are mounted in physical contact with each other.*	In case Praesideo is installed in multiple cabinets in locations distributed within a site, the installer must arrange that all mandatory manual controls and indicators are on the same location, either by installing them on a single cabinet or on adjacent cabinets that are mounted in physical contact with each other.	
14.8 Indications on alphanumeric displays		
14.8.2 Alphanumeric displays used for mandatory indications shall have at least one clearly distinguishable window, consisting of at least two clearly identifiable fields.	The display of the network controller is used to display mandatory indications. It consists of two separate lines of text, each representing a specific field, clearly identifiable.	
14.8.3 If not included in the displayed information, the purpose of each field shall be clearly labelled.	Indication of the voice alarm condition is by means of the text 'Emergency' and the name of the key that activated the voice alarm condition. Indication of the fault warning condition is by means of the text 'Faults' and an indication of the number of active faults in the system. Individual faults with details are shown in a menu structure.	
14.8.4 Where roman characters are used, a field shall be capable of containing at least the following:		
a at least 16 characters where the display of a functional condition uses a cross-reference to other information to identify the location;	The display of the network controller consists of two lines with 16 characters each. It uses a menu with rotary knob navigation to select additional detailed information about functional conditions.	
b at least 40 characters where the display is intended to include the complete information on the location of a functional condition.	Not applicable, see 14.8.4.a.	
14.8.5 Where other characters are used, a field shall be capable of containing at least the following:	Not applicable, see 14.8.4.	
a at least 4 characters where the display of a functional condition uses a cross-reference to other information to identify the location;		
b at least 8 characters where the display is intended to include the complete information on the location of a functional condition.		
14.9 Colours of indications		
14.9.1 The colours of the general and specific indications from light-emitting indicators shall be as follows:		
b yellow for indications of		
3 emergency loudspeaker zones in the test state.	The test condition is an optional function and is not supported by Praesideo. See 10.	

Clause / Requirement	Compliance	Signature
17 Tests	All tests as asked for in the clauses of section 17 have been carried out by an accredited certification body for ISO7240-16 compliancy. The Praesideo system has been found compliant to ISO7240-16 and received a certification of compliancy.	

Clause / Requirement	Compliance	Signature
18 Test report	The tester must take care of documenting the testing programme and the results of the tests in a test report that at least contains the information as listed in clause 18.	

Changed clauses

Clause / Requirement	Compliance	Signature
4.3 Power supply Power-supply equipment shall comply with the requirements of ISO 7240-4 and may be internal or external to the s.s.c.i.e. cabinet. The power supply may be shared with that of the emergency detection system.	The installer must use power supplies and battery charging equipment in accordance with ISO7240-4, with separate wiring for mains (230Vac) and battery backup (48Vdc) from the power supply to the Praesideo system. The power supply equipment must be installed in a separate cabinet, not shared with the Praesideo system, unless the combination of the actual power supply equipment and Praesideo system elements in the same cabinet has been certified. The content of the ISO7240-16 certification is subject to change. The most recent version of this certificate can be found on www.boschsecurity.com. The network controller and all amplifiers are supplied with a mains supply and DC backup supply (48V) input. Switch over between the both takes place automatically, without any interruption or status change other than the power supply related indications. The installer must ensure that the output voltages of the power supply equipment do not exceed the specifications of the mains and battery inputs of the connected Praesideo equipment.	

Clause / Requirement	Compliance	Signature
8 Fault-warning condition		
8.5 Reset of fault indications		
8.5.2 Following the completion of the reset process, the indication of the correct functional conditions corresponding to any received signals shall either remain or be re-established *within 100 s*.	If any individual fault is reset while it is not actually resolved in the system, the Praesideo system will report the fault again within 100 seconds. If all faults are reset in one action, all individual faults that are not actually resolved in the system are reported again within 100 seconds.	

Clause / Requirement	Compliance	Signature
9 Disabled condition - Optional function		
9.3 Indication of specific disablements		
9.3.4 If the indication is on an alphanumeric display that cannot simultaneously indicate all of the disablements because of its limited capacity, at least the following shall apply.	Praesideo does not support the optional function disabled condition. See 9.	
b Suppressed disablement indications shall be capable of being displayed, *independently of other indications*, by means of a manual operation at access level 1 or 2, which interrogates only the disablement indications.		

Clause / Requirement	Compliance	Signature
14 Design requirements		
14.1 General requirements and manufacturer's declarations		
14.1.2 In order to assist the process of design inspection, the manufacturer shall declare in writing that		
a the design has been carried out in accordance with a quality management system that incorporates a set of rules for the design of all elements of the s.s.c.i.e. *[e.g. ISO 9001].*	The Bosch Security Systems development department responsible for development / maintenance of the Praesideo system works according its own development process, Standard Development Process or SDP, which is created using the CMMI model. The SDP implements all process areas at maturity level 2 of the CMMI model, and some process areas at maturity level 3 of the CMMI model. Rules for the design of all elements of the Praesideo system can be found in the SDP repository. In the SDP repository all process descriptions, process implementation documents, templates, guidelines, etc. of the development processes can be found. The SDP repository is a version control system. Bosch Security Systems is ISO9001 certified.	
14.8.6 Mandatory indications on an alphanumeric display shall be legible *for the lesser of 1 h or the duration of the standby power source*, following the display of a new indication of a functional condition, at 0,8 m distance in ambient light intensities from 5 lx to 500 lx and at any angle from the normal to the plane of the display up to • 22,5° when viewed from each side; • 15° when viewed from above and below. Following the lesser of 1 h or the duration of the standby power source, the indications shall be legible at 100 lx to 500 lx at the above distance and angles. It shall be possible to re-establish the legibility at 5 lx to 100 lx by means of a manual operation at access level 1.	If the Praesideo system enters the voice alarm condition the display of the network controller will automatically show the 'Emergency' menu. This indication stays on as long as the system is in the voice alarm condition (i.e. until the voice alarm condition is reset). If the Praesideo system enters the fault warning condition the display of the network controller will automatically show the 'Faults' menu with the current number of active faults. This indication stays on until either the rotary knob of the network controller is used to navigate through the menu, or the system enters the voice alarm condition. The 'Faults' menu will always be present in the Network Controller menu. Individual faults are present in this 'Faults' menu until they are reset or until they are overwritten by newer faults The menu can show up to 200 individual faults after which the oldest faults are deleted when new faults occur. The display of the Network Controller complies with the legibility demands of this clause.	
14.10 Audible indication		
14.10.2 The minimum sound level, measured under anechoic conditions, at a distance of 1 m with any access door on the s.s.c.i.e. closed, shall be either • 60 dBA for voice-alarm indications and 50 dBA for fault-warning indications, *or* • *85 dBA for voice-alarm indications and 70 dBA for fault-warning indications.* ***NOTE*** *The allowance for two sets of audible indications contemplates some s.s.c.i.e. being installed in normally occupied areas (such as a security room). The selection of an appropriate sound level can be controlled by national requirements.*	The installer must connect the buzzer that is provided with Praesideo and complies with the sound levels according to the first option, or use a different buzzer with sound levels according to the second option. The selection depends on the background noise on the location where Praesideo is installed or by national requirements.	
14.12.3 Frequency response of s.s.c.i.e.	The frequency response requirements of ISO7240-16, clause 14.12.3 are less stringent than required by EN54-16, clause 13.12.3. The Praesideo sound paths are within the specified limits of this clause.	

Clause / Requirement	Compliance	Signature
17 Tests	All tests as asked for in the clauses of section 17 have been carried out by an accredited certification body for ISO7240-16 compliancy. The Praesideo system has been found compliant to ISO7240-16 and received a certification of compliancy.	
17.1 General		
17.1.5 Mounting arrangements The specimen shall be mounted by its normal means of attachment in accordance with the manufacturer's instructions. *If these instructions describe more than one method of mounting, then the method considered to be the least favourable shall be chosen for each test.*		
17.2 Functional test		
17.2.2.4 Test schedule - Disabled condition Where a disablement function is provided, disable and restore *at least two emergency* loudspeaker zones (unless only one zone is provided). Check that the operation of the disablement controls result in the correct indication on the s.s.c.i.e., that only the relevant parts of the system are disabled and that, on restoration of the disablements, the function is restored.	Praesideo does not support the optional function disabled condition. See 9.	
17.3 Test schedule		
17.3.4 Test for three specimens *If three specimens are supplied for environmental testing, then one test specimen is subjected to all the operational tests, which may be carried out in any order. The second specimen shall be subjected to one of the endurance tests, and the third specimen shall be subjected to the other endurance test. Before and after each environmental test, a functional test shall be carried out.* For *the first* specimen, the functional test after one environmental test may be taken as the functional test before the next environmental test.		
17.4 Output power		
17.4.2.2 State of the specimen during conditioning Mount the specimen as specified in 17.1.5 and connect it to suitable power-supply, monitoring and loading equipment, as specified in 17.1.3. *The specimen shall be in the quiescent condition.*		
17.4.2.3 Conditioning Apply the following severity of conditioning: • temperature: 40 °C ± 2 °C. Precondition the specimen at the conditioning temperature (40 °C ± 2 °C) until temperature stability has been reached to prevent the formation of water droplets on the specimen. Terminate the s.s.c.i.e. output(s) with the minimum resistive and maximum capacitive load representing the loudspeaker lines and loudspeakers. *Adjust the power-supply equipment output to the nominal primary power source level.* Apply the 1 kHz sinusoidal signal to the input of the specimen and adjust the gain of the system until the rated r.m.s. output power is achieved. Maintain this gain for 1 min.		
17.4.2.5 Final measurements *After 1 h recovery time at standard atmospheric conditions*, measure the frequency response of the specimen in accordance with 17.6 or 17.7, as applicable.		

Excluded clauses

Clause / Requirement	Compliance	Signature
EN54-16, clause 12.1 Emergency microphone - option with requirements.		
c Where a pre-announcement attention drawing signal is provided, an indicator adjacent to the microphone shall show when the signal has finished and live speech can commence.	This clause is not part of ISO7240-16.	

Clause / Requirement	Compliance	Signature
EN54-16, clause 13.4.1 Electrical and other design requirements The processing of signals shall give the highest priority to the voice alarm condition.	This clause is not part of ISO7240-16.	
EN54-16, clause 13.13 Message store(s) Pre-recorded messages shall be stored in non-volatile memory that retains the messages when all power sources are removed. ***NOTE*** *The use of tapes or magnetic or optical data disks for the storage of emergency messages is not acceptable at the time of drafting this European Standard (see Annex C)*	The NOTE is not part of ISO7240-16.	

DNV-GL Type Approval

Introduction

This section provides background information concerning the installation of Praesideo systems on vessels in case the installation needs to be compliant with the DNV Type Approval (EN60945).

Involved Praesideo products

The products which are involved in the DNV Type Approval certification are specified in the table below. This is a subset of the complete Praesideo product family.

Type number	Description
PRS-NCO3	Network Controller
PSP-D00039	SPEC RCS, Special Network Splitter, Master
PSP-D00040	SPEC RCS, Special Network Splitter, Slave
LBB4402/00	Audio Expander
PRS-16MCI	Multi Channel Interface
PRS-2B250	Basic Amplifier 2x250W
PRS-8B060	Basic Amplifier 8x60W
PRS-1B500	Basic Amplifier 1x500W
PRS-4B125	Basic Amplifier 4x125W
PRS-2B250-EU	Basic Amplifier 2x250W
PRS-8B060-EU	Basic Amplifier 8x60W
PRS-1B500-EU	Basic Amplifier 1x500W
PRS-4B125-EU	Basic Amplifier 4x125W
PRS-NSP	Network Splitter
PRS-FIN	Fiber Interface
PRS-FINNA	Fiber Interface Non-Addressable
PRS-FINS	Fiber Interface Single-Mode
PRS-CRF	Call Stacker
PRS-CSI	Call Station Interface
PRS-CSR	Remote Call Station
LBB4432/00	Call Station Keypad
PRS-CSRM	Remote Call Station Module
PRS-CSKPM	Call Station Keypad Module
PRS-CSM	Call Station Module

Praesideo products used in PA/GA installations, which are not specified in this table are not certified according the DNV Type Approval.

Abbreviation

Abbreviation	Description
dB(A)	decibel, A-weighted
DNV	Det Norske Veritas
GA	General Alarm
GOF	Glass Optical Fiber
PA	Public Address
RCS	Redundant network Controller Switch

Installation Guidelines

In the DNV Type Approval, requirements are specified concerning the installation of PA/GA systems on board of vessels.
In this chapter specific issues that require special attention from the installers when installing a Praesideo system are described.

Restrictions where to install the products

The Praesideo system may be used in cargo ships, passenger vessels, high-speed & light craft and mobile offshore units for compliance with the following codes/rules/regulations:

- SOLAS
- HSC Code
- MODU Code
- DNV Statutory Interpretations [Sept 2013]

The involved Praesideo equipment has to be installed in a protected and climate controlled environment, i.e. indoor. Moreover, at installation the following distance to a magnetic compass on board of a vessel must be taken into account:

- Rack mounted products: > 5 m
- PRS-CSR and LBB4432/00 combination: > 5 m
- PRS-CSM and PRS-CSKPM combination: > 0.75 m
- PRS-CSRM and PRS-CSKPM combination: > 0.85 m

System setup

The following issues must be taken into account to ensure that the systems are installed and configured in accordance with the DNV Type Approval requirements:

- For a system used for PA on passenger vessels or used for integrated PA and GA on any vessel, essential parts of the system shall be duplicated (A+B systems). Various duplications are possible within Praesideo, like network controller, multi channel interfaces, amplifiers and A/B loudspeaker cabling. Information about duplication of essential parts of a system is available in this “Installation and User Instructions” manual of Praesideo.
- When used for passenger vessels, the A+B systems are to be installed in separate fire zones.
- When used for a combined PA/GA system, as a minimum two independent speaker loops are required.
- For ongoing announcements during a switchover between the master and slave network controller the following should be taken into account:
  - For GA and automated Emergency PA announcements (e.g. pre-recorded messages) the automated signal must continue after a switchover.
  - For manual Emergency PA announcements (i.e. using PTT key on a call station), it is acceptable that the announcement is terminated and re-initiated by the user after a switchover.

  - The call stations capable of issuing GA and Emergency PA shall be connected to both network controllers (master and slave). This shall be done with the special network splitters (PSP-D00039 and PSP-D00040) to create the redundant network controller solution.
- The following power management instructions must be taken into account. Connection to mains and emergency source of power are handled by a UPS outside the Praesideo system. It is not allowed to use the 48V DC input supply connections inside the Praesideo system for installations.
- Output contacts shall be used to override local muting or local volume control (at the speakers) during a GA and Emergency PA.
- Emergency PA shall have a priority higher than GA, otherwise it is not possible to have an Emergency PA announcement when GA is already running. General PA should have a priority that is lower than GA and PA. Any call station which is not used for Emergency PA activation shall have a lower priority than GA.
- Call stations with functions for activation of Emergency PA and GA are to be installed in locations with access control.
- Call stations with functions for activation of Emergency PA and GA shall be provided with means to avoid unintended use. For each programmable key a clear descriptive label has to be slid into the corresponding paper slot, to identify where the programmable key has been configured for. To protect keys from being pushed accidentally, key covers (LBB4436/00) should be put on these keys.
- In order to reset a GA emergency alarm as a default single key action, a combined Acknowledge/Reset action must be programmed for that key to prevent that two keys need to be pressed separately. In addition, by selecting “Reset aborts active emergency calls” for that key, the Reset action will not be blocked by emergency calls that are still active.
- In order to achieve the required audibility, i.e. to adjust the GA and Emergency PA sound pressure level between 75dB and 120dB, the volume can be adjusted on amplifier output level (via “Audio Processing” pages) and/or via Zone configurations. Detailed information about this subject is available in this “Installation and User Instructions” manual of Praesideo.
- Interference/feedback is avoided by not installing a loudspeaker nearby a call station microphone. Because a call station has a monitor speaker (build in for a remote call station and attached for a remote call station module) there is no need to install a loudspeaker nearby a call station.

Praesideo rack mounting on board of vessels

By installing a Praesideo system on board of vessels, special attention should be taken to the mechanical mounting of Praesideo units.
Praesideo amplifiers are supplied with prolonged 19"-rack mounting brackets for a solid construction, less sensitive to shocks and vibrations.

Cabling

Cables and wiring serving internal communications or signals should, as far as practicable, be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas unless serving those spaces.
Where practicable, all such cables should be run in such a manner so as to preclude they are being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space. All areas of each fire zone should be served by at least two dedicated loops, sufficiently separated throughout their length, from independent amplifiers.

In case heat resistant glass optical fiber cable (GOF) is specified within the system design, the following cables are recommended.

Fiber optic cable Incore 4OF50/125-E30

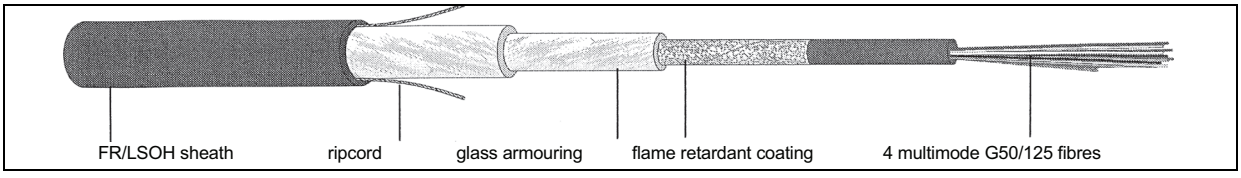


figure 1: Fiber optic cable 4OF50/125-E30

- 4 fibers, multimode G50/125, loose tube
- Functional integrity during fire according to DIN 4102 Part 12: 30 minutes (E30)
- Halogen free to IEC 60754-1/2
- Fire resistance according to IEC 60331, IEC 60332.3C and BS 6387 cat. C
- Suitable for indoor use; outdoor use with proper mechanical protection
- Water tight and non-metallic rodent protected
- High crush resistance
- Temperature range during operation: -25 °C to +70 °C

Fiber optic cable Incore QFCI

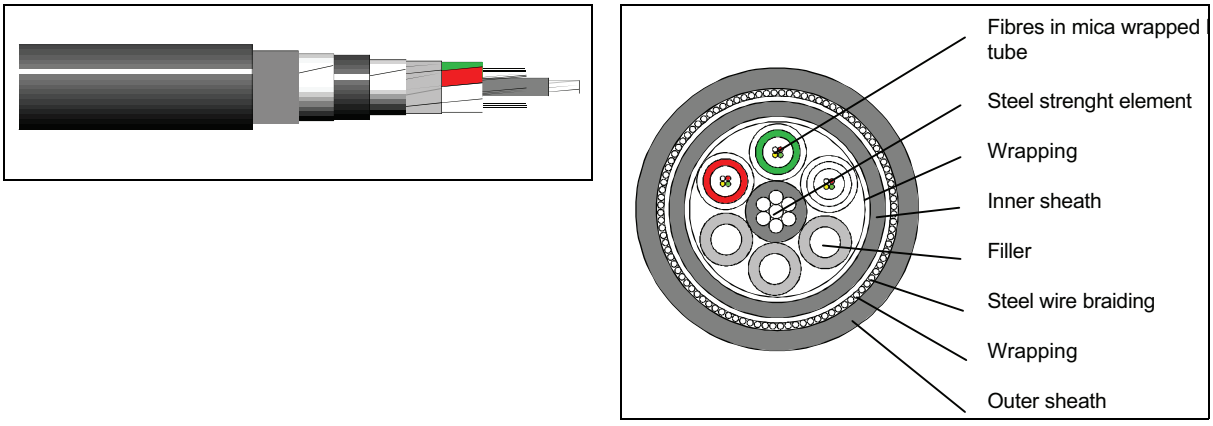


figure 2: Fiber optic cable QFCI

- 42 - 24 fibers, multimode G62.5/125, loose tube
- Steel wire braid armoured
- Applications: offshore and marine
- Functional integrity during fire according upgraded IEC 60331: 3 hours at 1.000 °C
- Halogen free to IEC 60754-1/2
- Fire resistant according to IEC 60331, IEC 60332-3C, BS 6387 cat. C
- Suitable for both indoor and outdoor use
- Temperature range during operation : -30 °C to +60 °C

The use of a certain type of glass fiber cable depends on specific installation and environmental requirements. Please, check always the actual requirements.

1 About this manual

1.1 Purpose of this manual

This manual supplies an engineer with the information required to install a Praesideo system.

Praesideo recognizes the following authorization levels:

- **Administrator**
  Typically a person who is responsible for ensuring that the system is properly maintained and repaired so as to continue to operate as specified.
- **Installer**
  Typically an installation engineer who installs the system.
- **User**
  Typically an end-user of the system.

1.2 Intended audience

This manual has been written with administrators and installers in mind. To be able to make the right judgements in error situations, it is preferred that you have followed a general Praesideo training. User instructions for the end-users must be provided by the administrator(s) and installer(s).
Sections in this manual that carry a Caution, Warning or Danger sign describe servicing instructions for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

1.3 Related documentation

The following related documents are available:

- Release notes on the DVD
- Commercial Brochure on the website (www.boschsecurity.com)
- Data Brochure on the website (www.boschsecurity.com)
- Architect's & Engineer's Specification on the website (www.boschsecurity.com)

1.4 Alerts

In this manual, four types of alerts are used. The alert type is closely related to the effect that may be caused when it is not observed.

These alerts - from least severe effect to most severe effect - are:

- **Note**
  Alert containing additional information. Usually, not observing a note alert does not result in damage to the equipment or personal injuries.
- **Caution**
  The equipment can be damaged if the alert is not being observed.
- **Warning**
  Persons can be (severely) injured or the equipment can be seriously damaged if the alert is not being observed.
- **Danger**
  Not observing the alert can result in death.

1.5 Signs

Except for note alerts, the nature of the effect that can be caused when the alert is not observed, is indicated using a sign. For note alerts, the sign provides more information about the note itself. In this manual, the following signs are used in combination:

Note
General sign for notes.

Note
Consult the indicated source of information.

Caution, Warning, Danger
General sign for cautions, warnings and dangers.

Caution, Warning, Danger
Risk of electric shock.

Caution, Warning, Danger
Risk for electrostatic discharges.

2 System overview

2.1 Introduction

Praesideo is a fully digital public address system that meets all the requirements placed by professional users on a public address/emergency system. The system brings highly innovative and advanced digital technology to the public address market. The processing and communication of both audio signals and control data entirely in the digital domain makes the system a superior public address and emergency sound system.

Digital signal processing allows significant improvements in audio quality to be achieved. The Praesideo system is designed for configuration from a PC, which makes installation and setting of operating parameters very simple and user-friendly.

The Praesideo system satisfies almost all public address and voice alarm system requirements. All audio processing is performed in the digital domain. Communication between the units is via plastic fiber or glass fiber cabling, depending on the distance between the units. The cabling uses the daisy chain principle. This makes the cabling and installation very quick, simple and easy. The system cabling supports a closed loop, which allows redundancy to be achieved. If redundancy is not required, also branching is possible.

2.2 User-friendly software control

The system is supplied with user-friendly software for system configuration. This allows all system functions to be configured. The software is based on web technology, which gives authorized users full freedom of configuration in terms of time and location. The simplified and accurate organization of the programming features makes navigation highly user-friendly and fault-tolerant. The software also provides clear indication of any parameters, which have not been configured before exiting from any stage of the configuration process.

2.3 Networked approach

The system architecture is based on daisy-chaining of units. It is possible to add or remove equipment anywhere in the network without affecting the performance of other units, provided that the network connection is available. This makes the system easily expandible by the customer, without adding any additional electronics at the network controller unit. Thanks to this network architecture, users can start with a small system in the initial stage and expand the system later simply by adding the required new units to the existing network. The system can be configured for redundant cabling using a ring cabling structure.

2.4 Distributed control

The system is designed for distributed control of various system functions. The external interfaces which are control inputs and outputs can be located anywhere in the network. The processing of audio input and output signals is located in each unit. This allows the network controller to concentrate on other activities like routing of announcements and taking actions on control inputs, etc. As a result the response times are much shorter than for systems with centralized processing of all signals.

2.5 Combination of functions

The Praesideo range of equipment has multiple functions combined in a single unit. This feature drastically reduces the number of different types of equipment used in the system. Functions like audio processing, audio delay, amplifier monitoring and automatic amplifier change-over and receivers for speaker line monitoring are provided in the power amplifier unit itself. This makes the overall system highly cost-effective. The flexible architecture of the Praesideo range of equipment allows the customer to locate any type of equipment anywhere in the building. The configuration software enables the user to configure all the functional parameters. No programming is required at the equipment end, which drastically reduces the installation and commissioning time.

2.6 Evacuation compliance

The Praesideo range of equipment complies with the various emergency standards which are applicable all over the world. The network controller is capable of monitoring all the units in the system, from the microphone capsule of the call station to the loudspeaker line. A built-in memory stores the last 200 fault messages. Any fault is reported back to the network controller. The system also meets emergency requirements for emergency call stations. The highly open system concept, with the possibility for large numbers of control inputs and outputs satisfies even difficult emergency requirements.

2.7 External interfaces

The interfaces to the system can be audio, control input or Ethernet. The Ethernet interface is provided at the network controller. The audio and control inputs can be anywhere in the system, for example at the power amplifier, audio expander or network controller.

The system also accepts contact closures via the control inputs. The configuration allows the user to configure the input to initiate the desired actions in the system. The flexibility to route any input from one system unit to another makes it possible to use the Praesideo range of products or a wide range of public address and emergency sound system applications.

2.8 Reduced installation costs

The Praesideo architecture uses the daisy chain principle with the possibility of branching for both data and audio signals. This makes the system wiring very cost-effective, using 2 fiber cores for data and audio communication and a copper wire pair to supply power to the units. Power supply for the system units can be provided locally if the distances are very long.

Combining various functions in a single unit also makes equipment more cost-effective than systems in which separate units have to be purchased for all the specific functions. This combination of functions also saves lot of rack space and further reduces installation costs.

2.9 High system flexibility

The Praesideo system is a highly versatile system which gives the user a high degree of flexibility in the number of zones, call stations, audio inputs and outputs, control inputs and outputs, etc.

3 Calls

3.1 Introduction

As Praesideo is a public address and emergency sound system, it is used to distribute background music, live speech and evacuation messages. All audio in the system is distributed in the form of calls.

3.2 Call attributes

3.2.1 Introduction

A call always consists of the following attributes:

- Priority (see section 3.2.2)
- Call content (see section 3.2.3)
- Routing (see section 3.2.4)
- Timing (see section 3.2.5)

3.2.2 Priority

To each call, a priority is assigned. When two or more calls are addressed to the same zone or need shared resources (e.g. the message player), the system only starts the call with the highest priority. The range of priorities that is available for a call depends on the type of call (see table 3.1).

Calls with the same priority operate on first come first serve basis, except in the case of priority 255: calls with the same priority 255 overrule each other, so the latest becomes active. This assures that high priority microphones that are left behind in an active state will never block the system.

table 3.1: Priorities and call types

Priority	Call type
0 to 31	BGM calls
32 to 223	Normal calls
224 to 255	Emergency calls

3.2.3 Call content

The content of a BGM call typically consists of an audio signal coming from a BGM source, such as a CD player or a tuner. The content of normal calls and emergency calls is defined by a call macro, which can consist of:

- A start chime
- Prerecorded message(s)
- Live speech
- An end chime

3.2.4 Routing

The routing of the call is the set of zones to which the call is intended to be addressed. Whether the call actually is addressed to the selected zones depends on the priority of the call (see section 3.2.2) and its routing scheme.

Each call can have one of the following routing schemes:

- Partial
- Non-partial
- Stacked

By definition, partial calls do not require the entire routing to be available at the start of the call and during the call. When a partial call is started and a part of the routing is not available, the call is only distributed to the available part of the routing. When a part of the routing becomes unavailable during the call, the call continues in the parts of the routing that are still available.

Non-partial calls are calls that require the entire routing to be available at the start of the call and during the call. When during the call a part of the routing becomes unavailable, the call is aborted.

Note
Non-partial normal calls **can only** be started when the entire routing is available. BGM and emergency calls **can** be started when the entire routing is not available.

Note
BGM calls and emergency calls without live speech are started in the non available parts of the routing as soon as these parts are released.

Stacked calls are calls that have been recorded for later playback. This feature is only available in combination with a call stacker (see chapter 24).

3.2.5 Timing

Most calls are broadcast immediately, but calls can be time-shifted for broadcasting after completion of the original call. This avoids acoustic feedback between the microphone and nearby loudspeakers. A time-shifted call can also be pre-monitored to check the content before it is broadcast and optionally cancelled. This feature is only available in combination with a call stacker (see chapter 24).

3.2.6 System size

The maximum size of a single Praesideo system is limited by the maximum number of nodes in a system, which is 63, and the maximum length of the system bus, which depends on the actual number of nodes in use. See section 32.4 and 32.5 for details.

The mandatory network controller occupies 3 nodes, leaving 60 nodes for other system elements, such as amplifiers and call stations. Different models of Praesideo power amplifiers have 1 - 4 outputs per occupied node and each output can serve an independent voice alarm zone. This adds up to a maximum of 240 voice alarm zones for a single system. This number can be increased by coupling of multiple subsystems, as indicated in section 33.6. Alternatively, the maximum number of voice alarm zones can be increased by using a combination of basic amplifiers and multi channel interfaces, see section 10 and 11. A multi channel interface occupies only 1 node and can drive 14 independent voice alarm zones. For response time reasons it is recommended not to use more than 20 multi channel interfaces in a system. Together with the other power amplifiers and call stations, this yields a practical limit of some 400 voice alarm zones in a single system.

3.3 Types

3.3.1 Introduction

As mentioned before, Praesideo uses the following types of calls:

- BGM (background music) calls (see section 3.3.2).
- Normal calls (see section 3.3.3).
- Emergency calls (see section 3.3.4).

3.3.2 BGM calls

BGM (background music) calls are typically used to distribute background music. Their content consists of an audio signal from a BGM source, such as a CD player or a tuner. By default, BGM calls are partial calls. Zones can be added to the routing of a BGM call at any time. If an added zone is already in use by another call with the same priority or higher, the BGM call will not be routed to that zone until it has been released by the other call.

3.3.3 Normal calls

Normal calls typically contain live speech and optionally chimes and prerecorded messages. The content of normal calls is defined by a call macro (see section 3.2.3). Normal calls can be partial, non-partial, or stacked.

3.3.4 Emergency calls

Emergency calls are similar to normal calls (see section 3.2.3). The major difference is that emergency calls put the system in the emergency state and are always partial. In the emergency state, Praesideo stops all BGM calls and normal calls.

7

4 Glossary

A

A/D
Analog-to-digital converter.
AEX
Audio expander.
AVC
Automatic volume control. This improves the intelligibility of calls by adjusting the volume of a call related to the measured ambient noise.

B

BAM
Basic amplifier.
BGM
Background music.

C

CST
Call station.

D

D/A
Digital-to-analog converter.
DCN NG
Digital Congress System Next Generation. Digital congress system of Bosch Security Systems.
DSP
Digital signal processor.

E

ESD
Electrostatic discharge. This might damage electronic components.

G

GOF
Glass optical fiber. Type of fiber that is used to cover distances > 50 m in the Praesideo network.

L

LCD
Liquid crystal display. Type of display.
LED
Light emitting diode. Electronic component frequently used as indicator.
LSP
Loudspeaker.
LSZH
Low smoke, zero halogen.

M

MAC address
Media access control address. Unique hardware address.
MCI
Multi channel interface
MTBF
Mean-time-between-failures.

N

NCO
Network controller.
NC
Normally closed. Control output behavior. When the output is activated, the NC contact is opened.
NO
Normally open. Control output behavior. When the output is activated, the NO contact is closed.

P

PAM
Power amplifier.
PCB
Printed circuit board.
POF
Plastic optical fiber. Type of fiber that is used to cover distances < 50 m in the Praesideo network.
PTT key
Press-to-talk key. A key to start a call with a predefined priority based on a call macro that will be addressed to one or more predefined zones or zone groups.

5 PRS-NCO3 Network Controller

5.1 Introduction

The PRS-NCO3 network controller is the successor of the PRS-NCO-B and the heart of the Praesideo system. This is the third generation network controller, the PRS-NCO-B being second and the LBB4401/00 being the first version.
The LBB4401/00 supports software releases up to 2.36.
The PRS-NCO-B supports software releases 3.00 to 3.6x.
The PRS-NCO3 supports software releases from 4.0 onwards.
The network controller controls up to 60 nodes and 28 audio channels. The network controller also provides the power to the system and keeps the configuration for all elements in the system. The network controller is the interface to other systems.
See figure 5.1 for a block diagram of the network controller.

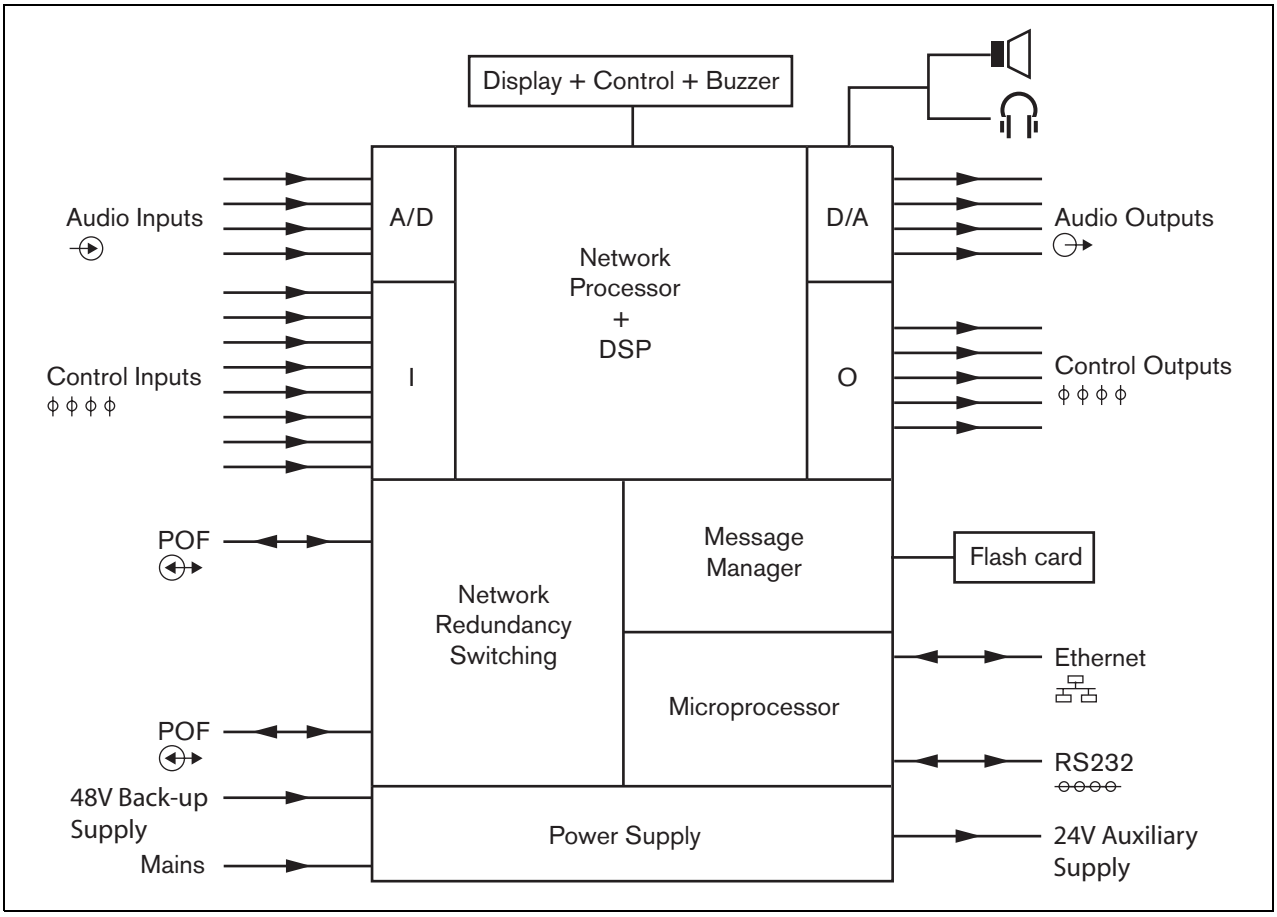


figure 5.1: Block diagram of the network controller

5.2 Controls, connectors and indicators

5.2.1 Front view

The front of the network controller (see figure 5.2) contains the following:

1 **Loudspeaker** - A loudspeaker for audio monitoring purposes. The loudspeaker is muted when monitoring headphones are connected to the monitoring headphones output (4).

2 **Menu display** - A 2x16 character LCD display gives information about the network controller (see section 5.5).

3 **Menu button** - A turn-and-push button to operate the menu (see section 5.5).

4 **Monitoring headphones output** - A 3.5 mm (1/8 inch) jack socket to connect headphones for audio monitoring purposes. The loudspeaker (1) is muted when headphones are connected.

5 **Buzzer** - A buzzer for notification the system being in Fault state or Emergency state.

5.2.2 Rear view

The rear of the network controller (see figure 5.2) contains the following:

6 **Ground** - A connection to electrically ground the network controller.

7 **Audio inputs** - Four audio inputs for receiving audio signals from analog audio sources. Two of the audio inputs are selectable between microphone and line. The other two audio inputs are fixed line inputs. Each audio input has a XLR as well as a double cinch connector (see section 5.3.6).

8 **Audio outputs** - Four audio outputs for extracting analog audio signals. Each audio output has a XLR as well as a double cinch connector (see section 5.3.7).

9 **Voltage selector** - A switch to select the local mains voltage (see section 5.3.2).

10 **Mains on/off switch** - A switch to switch the network controller on and off (see section 5.3.2).

11 **Fuse holder** - A fuse holder with a fuse that protects the power supply of the network controller (see section 5.3.2).

12 **System bus** - Two system bus connectors to connect the network controller to other Praesideo equipment (see section 5.3.4).

13 **Ethernet interface** - An interface to connect the network controller to external logging and configuration devices/systems. This interface usually will be used to connect a configuration PC (see section 5.3.5) or an open interface client to the Praesideo system.

14 **Control inputs** - The control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 5.3.8).

15 **RS232 interface** - For factory/development use.

16 **Control outputs** - The control outputs can be used to send signals to third party equipment to trigger actions generated by the Praesideo network (see section 5.3.9).

17 **Battery 48V** - Back-up battery supply (see section 5.3.3).

18 **Mains inlet** - A socket to connect the network controller to the mains (see section 5.3.2).

19 **Buzzer switches** - These switches enable the buzzer to be activated in case the system enters a Fault or Emergency state, corresponding with the activation of Control Out 4 and 2 respectively.

20 **Auxilary output for 24 V** - to power auxilary devices like a Fault or Emergency light indicator. Output current is limited to 100 mA maximum.

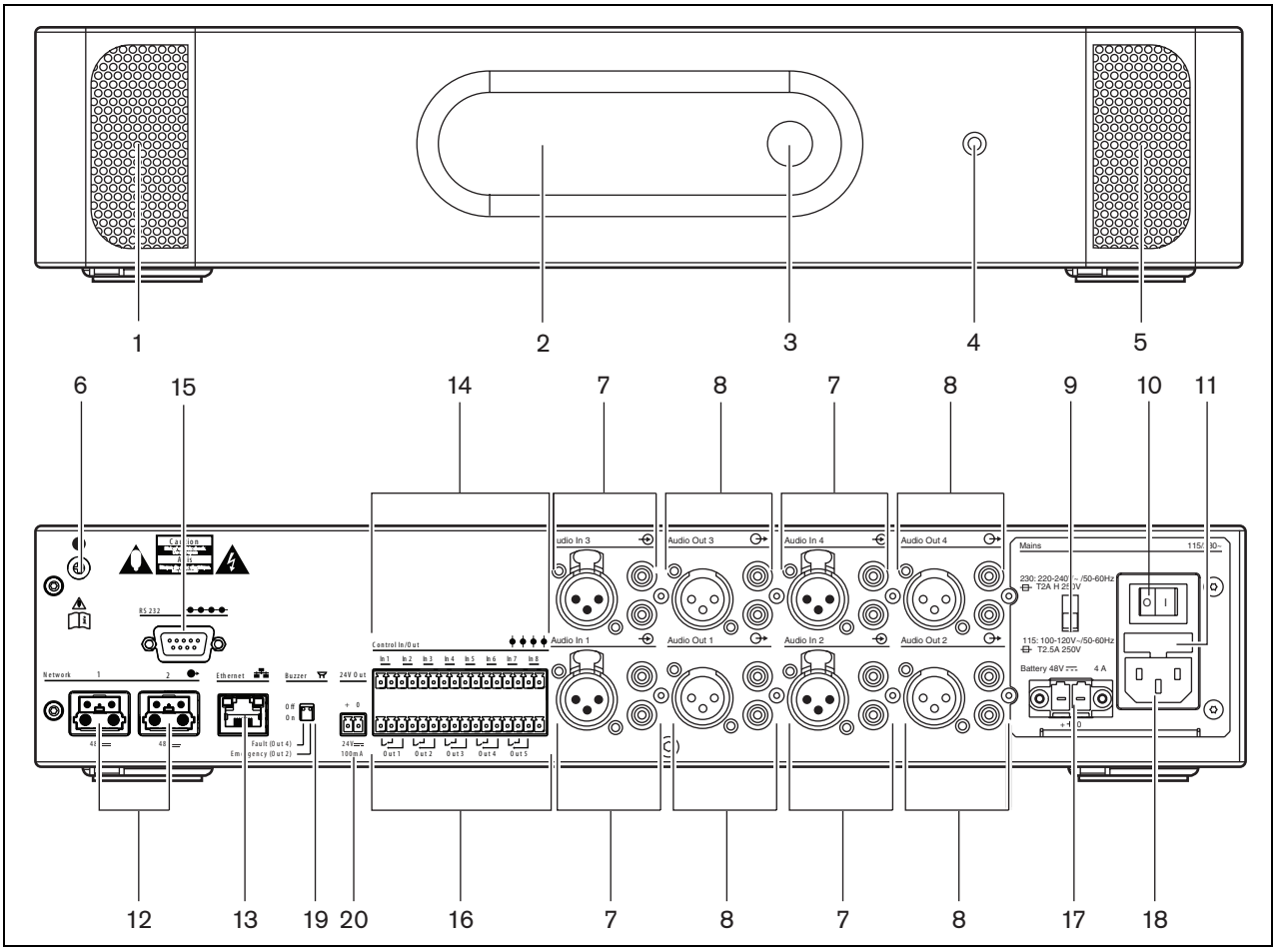


figure 5.2: Front and rear views of the network controller

5.2.3 Internal view

The interior of the network controller (see figure 5.3) contains the following:

21 **Ground jumper** - A jumper that connects the signal ground to the safety ground.

22 **Compact flash card** - A connector for a compact flash card for storage of messages (see section 5.3.13).

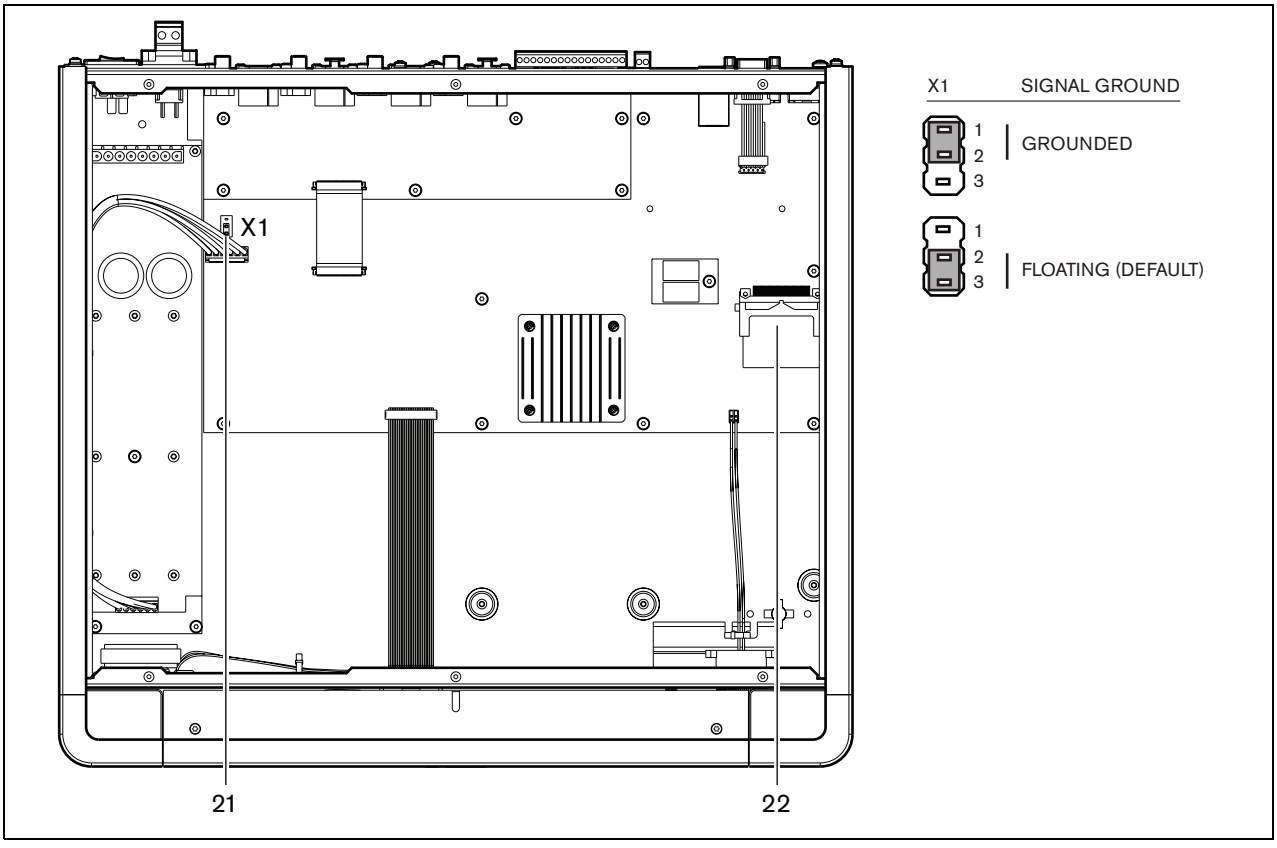


figure 5.3: Internal view of the network controller

5.3 Connections

5.3.1 Introduction

This section gives an overview of typical system connections using the network controller.

- Connecting the mains (see section 5.3.2).
- Connecting the network (see section 5.3.4).
- Connecting a configuration PC (see section 5.3.5).
- Connecting audio inputs (see section 5.3.6).
- Connecting audio outputs (see section 5.3.9).
- Connecting control inputs (see section 5.3.8).
- Connecting control outputs (see section 5.3.9).
- Connecting the RS232 port (see section 5.3.12).
- Inserting a compact flash card (see section 5.3.13).

5.3.2 Connecting the mains

Proceed as follows to connect the network controller to the mains:

1 Select the correct local mains voltage using the voltage selector on the rear of the network controller (see table 5.1).

table 5.1: Voltage selector and fuse

Selector	Mains voltage V(AC)	Fuse
115	100 - 120	T2.5A 250V (UL 248 / IEC 60217)
230	220 - 240	T2.5A 250V (UL 248 / IEC 60217)

2 Connect the mains cord to the network controller.

3 Connect the mains cord to a locally approved mains outlet.

5.3.3 Connecting back-up power

Connect the back-up supply to the back-up power connector on the back of the network controller. Refer to figure 5.4.

Use the connector supplied with the unit. The fuse for the back-up supply is inside the unit. The back-up supply input is protected against voltage reversal.

The back-up voltage range is 43 to 56 V. The system voltage on the system bus is a constant 48 V. The power supply to the units that receive power from the system bus is not affected by a changing back-up battery voltage.

Warning

For safety reasons you must use an external circuit breaker. Install in accordance with the local Electrical and Building Code, e.g. for USA and Canada in accordance with NEC/CEC and for Germany in accordance with VDE0108-1.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

Note

When the network controller has a back-up power supply connected, the network controller cannot be switched off just by the mains on/off switch (9). The battery connection must also be removed.

Warning

Never ground the positive terminal of the battery, as this will damage the Praesideo equipment.

If the back-up power supply (battery) is grounded, always connect the negative terminal (0) first and the positive terminal (+) second. Disconnect in reverse order: disconnect the positive terminal first and the negative terminal second. This avoids excessive ground loop currents.

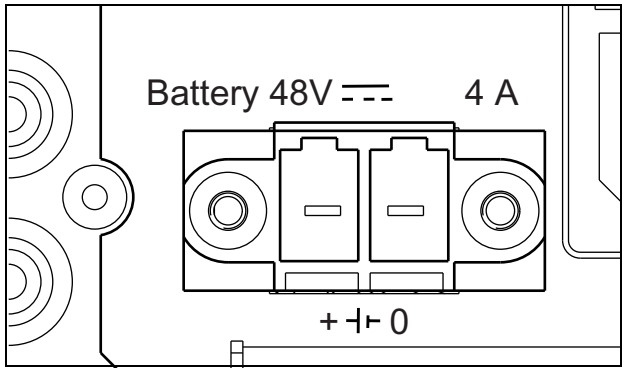


figure 5.4: Back-up power supply

5.3.4 Connecting the network

Connect the network controller to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

5.3.5 Connecting a PC

5.3.5.1 Introduction

The network controller has one RJ45 socket to interface with the Praesideo configuration PC. Using the configuration PC, the Praesideo system can be configured and diagnosed. Basically, there are two ways to connect the configuration PC to the network controller: directly or via a network. In both cases a normal straight through CAT-5 cable can be used because the PRS-NCO3 has an automatic MDI/MDI-X configuration feature. No special crossover cable is required for a direct connection.

Caution
Do not connect the network controller and configuration PC to any network without consulting the network administrator.

Caution
The Praesideo network interfaces do not provide extensive security measures to protect the system against malicious network attacks. Such measures would be insufficient on the long term anyway, because Praesideo systems in operation are unlikely to be updated regularly to repair security leaks. Therefore do not keep the network controller permanently connected to an open Ethernet network. When a network connection is needed after configuration, e.g. in case of connection to a PC Call Server or a Logging Server, then use a separate network, not accessible by others, or setup a Praesideo specific VLAN by using Ethernet switches with VLAN capabilities to partition the network into multiple broadcast domains with one domain assigned solely to Praesideo. When also audio connections are established on Ethernet, via CobraNet interfaces or OMNEO interfaces, these interfaces must be connected to the separate network or VLAN too. Because audio connections on Ethernet consume considerable network bandwidth and, unlike physically separate networks, VLANs share bandwidth, VLAN trunks may require aggregated links and/or quality of service prioritization.

5.3.5.2 Requirements

The configuration PC must meet the following minimum requirements:

- Operating system:
  Microsoft® Windows 7, 8 or 8.1
- Network connection: 100 base-T or 1000 base-T
- 1 GB RAM
- Web browser installed, such as Firefox (preferred)

5.3.6 Connecting audio inputs

The network controller has 4 audio inputs to interface with analog audio sources. Each audio input has two connectors on the rear of the network controller; one XLR connector (for balanced signals) and one double cinch connector (for unbalanced signals). The network controllers mixes stereo signals connected to the cinch connectors of the same audio input into one single mono signal.

The analog audio can be a line source as well as a microphone. See table 5.2 for an overview of the input types supported by each of the inputs.

Note
The microphone inputs should not be used to connect emergency microphones. These inputs do not provide microphone connection supervision.

table 5.2: Audio input types

Audio Input	Microphone (XLR only)	Line
1	Yes	Yes
2	Yes	Yes
3	No	Yes
4	No	Yes

Note
The audio inputs can handle electret microphones as well as dynamic microphones, since the network controller can generate the phantom supply for electret microphones.

See figure 5.5 for details about the audio input sockets of the network controller.

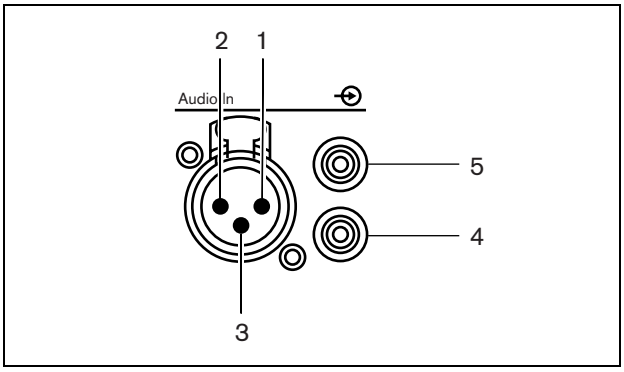


figure 5.5: Audio input sockets

table 5.3: Audio input socket details

Pin	Socket	Definition	Description
1	XLR (female)	Xternal	Shield/ground (phantom supply -)
2		Live	Positive signal (phantom supply +)
3		Return	Negative signal (phantom supply +)
4	Cinch	Right	Right channel in
5		Left	Left channel in

‘

5.3.7 Connecting audio outputs

The network controller has 4 audio outputs to route analog audio signals to other equipment (e.g. active loudspeakers). Each audio output has two connectors on the rear of the network controller; one XLR connector (for balanced signals) and one double cinch connector (for unbalanced signals).

Note
The right and left cinch connectors carry the same mono signal.

See figure 5.6 for details about the audio output sockets of the network controller.

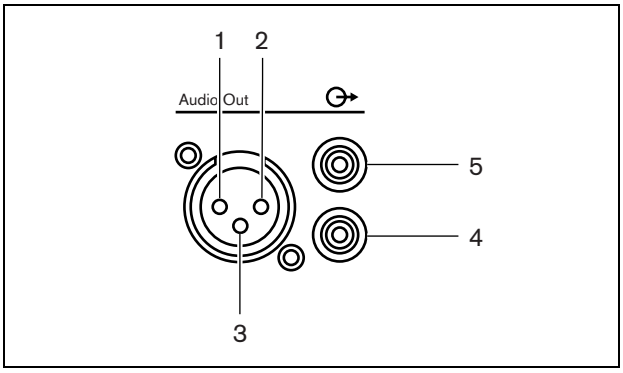


figure 5.6: Audio output sockets

table 5.4: Audio output socket details

Pin	Socket	Definition	Description
1	XLR (male)	Xternal	Shield/ground
2		Live	Positive signal
3		Return	Negative signal
4	Cinch	Right	Mono out
5		Left	Mono out

5.3.8 Connecting control inputs

The network controller has 8 control inputs. The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 44.2). It is also possible to supervise the cables for short-circuits and open connections (see figure 5.7 and figure 5.8). Whether a control input is actually supervised or not is defined in the configuration.

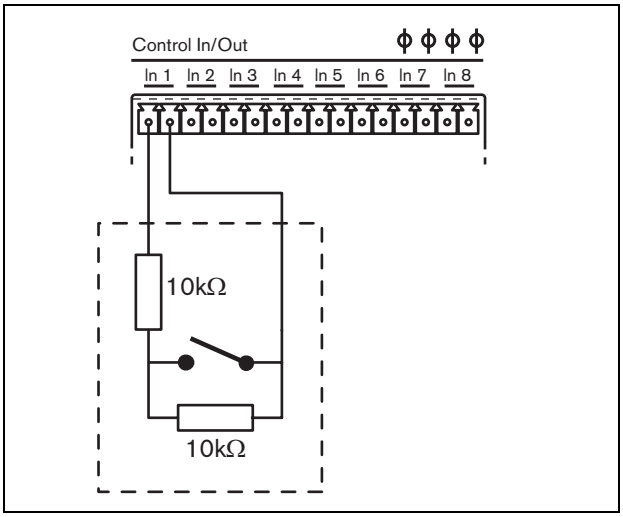


figure 5.7: Supervised control input

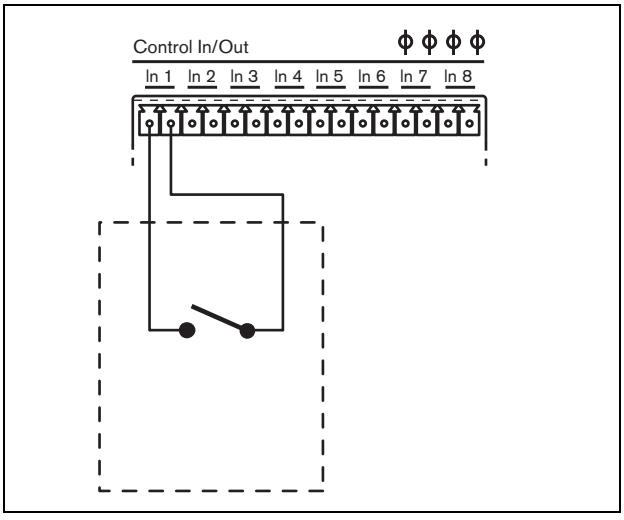


figure 5.8: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

5.3.9 Connecting control outputs

The network controller has 5 control outputs. The control outputs can be used to send signals to third party equipment to trigger actions. Each control output connection has three pins (see figure 5.9).

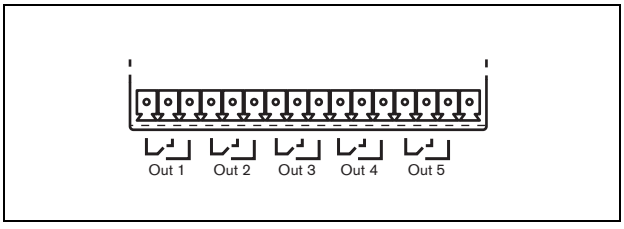


figure 5.9: Control outputs

The common (C) pin of the control output should always be connected. Whether the other pin that is connected is the normally closed (NC) or normally open (NO) depends on which action that has to take place when the control output is active (see table 5.5).

table 5.5: Control outputs details

Connection	Abbr.	Description
Normally closed	NC	When the output is activated, the NC contact is opened.
Normally open	NO	When the output is activated, the NO contact is closed.

In the configuration, a purpose must be attached to the control output that indicates the action to be taken when it becomes active (see table 44.6). Control outputs 4 and 5 already have a fixed purpose (see table 5.6).

table 5.6: Control outputs 4 and 5

Control output	Purpose
4	*Fault alarm buzzer*
5	*Fault alarm indicator*

Note
For fail-safe behavior, these fixed control outputs are energized in the default (faultless) situation, so NC is open and will be closed if a fault occurs.

5.3.10 Setting the buzzer switches

The network controller contains an internal buzzer for audible notification when the system enters the fault state or the emergency state. The buzzer can be activated in parallel with control output contacts 2 and 4.

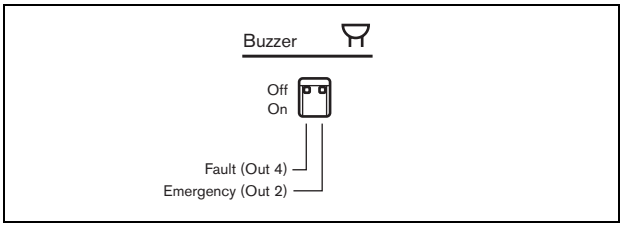


figure 5.10: Buzzer switches

Control output 4 is pre-configured as *Fault alarm buzzer*. Switching the buzzer switch on the left to On will activate the buzzer when control output 4 switches to

the Fault position; because this is a special fail-safe contact, this is the de-energized state.
Control output 2 is not pre-configured, but should be configured as *Emergency alarm buzzer* (see table 44.6) for compliance to various voice alarm standards. When the buzzer switch on the right is switched to On, the buzzer will be activated when the system enters the Emergency state. If needed, the buzzer can also be activated in case of other situations, depending on the configured function for control output 2.

5.3.11 Using the 24 V auxiliary output

The network controller provides a current limited (100 mA) voltage output of 24V.

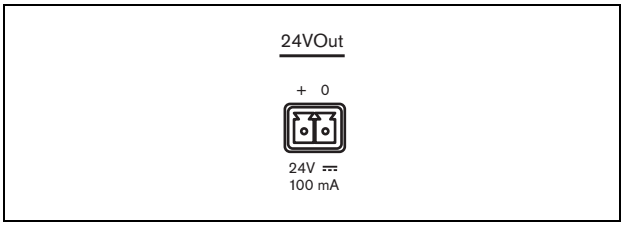


figure 5.11: 24 V auxiliary output

This voltage output can be used for various purposes. When a 48 V backup power supply (battery) is connected to the back-up battery input, this 24 V output is also available in case of a mains failure. A typical application is to use this output as the power source for an external fault/emergency light tower on top of an equipment rack, using the control output contacts to switch the segments of the light tower. Select a light tower with 24V high efficiency LED indicators to keep the total current below 100mA, for instance the PatLite LCE-302-RYG series or similar, with or without audible alarm. Green is active when everything is normal, yellow in case of a Fault condition and red in case of an Emergency condition. Use the control output switches *Fault alarm indicator* (control output 5 on the network controller) and *Emergency alarm indicator.*

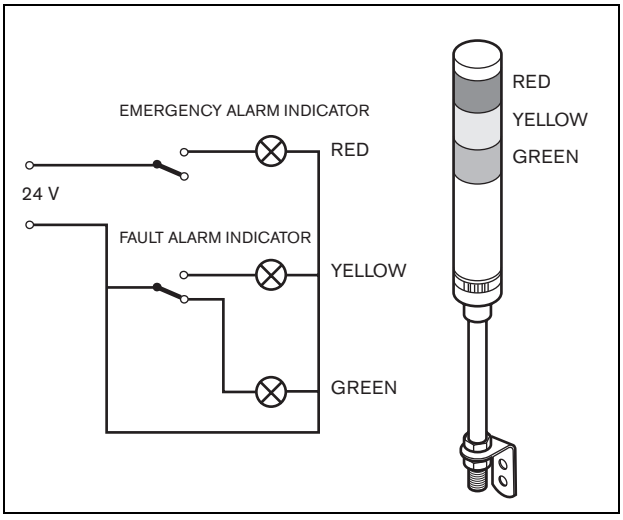


figure 5.12: Buzzer switches

5.3.12 Connecting RS232 port

The network controller has a RS232 connector for production and development purposes. Do not use this connector in installed Praesideo systems.

5.3.13 Compact flash card

Praesideo stores up to 1024 digital audio messages on a type 1 compact flash card. Although the network controller is delivered with a 1 GB card, only the first 128 MB are supervised and suitable for emergency messages. This is equivalent to the first 25 minutes of the message set. This flash card can store more than 3 hours of audio messages. The system can play up to four messages in the set simultaneously, as part of a call. All of these calls may use the same message, if required, time-shifted or not.

A specially selected 1 GB compact flash card is supplied together with the network controller. This card does automatic refreshing of the data, permitting very frequent reading of the content for the purpose of supervision. Do not replace this card with just any compact flash card, but contact the spare parts logistic channel or your local Bosch contact person for a selected new compact flash card.

Note
The electronics inside the network controller are susceptible to electrostatic discharges. Wear an anti-ESD bracelet during the installation of the compact flash card.

Warning
To prevent the hazard of electric shocks, disconnect the mains cord from the network controller before starting installing the compact flash card.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

5.4 Installation

The network controller is suitable for either table-top or 19-inch rack installation. Four feet (for table-top use) and two brackets (for rack installation) are supplied.

Note
The center bracket positions can be used to secure the unit on a table or shelf. They can also be used to install the unit vertically to a wall.

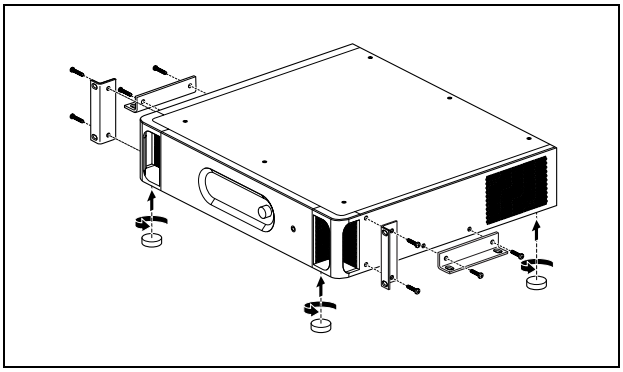


figure 5.13: Installation

Caution
When mounting the brackets to the unit, use the screws that are supplied with the brackets. Screws with a length of >10 mm may touch or damage internal parts of the unit.

5.5 Using the configuration menu

5.5.1 Overview

A number of network controller settings are available via an interactive menu, using a 2x16 LCD display and a 'turn-and-push' menu button. The next figure gives an overview of the menu structure.

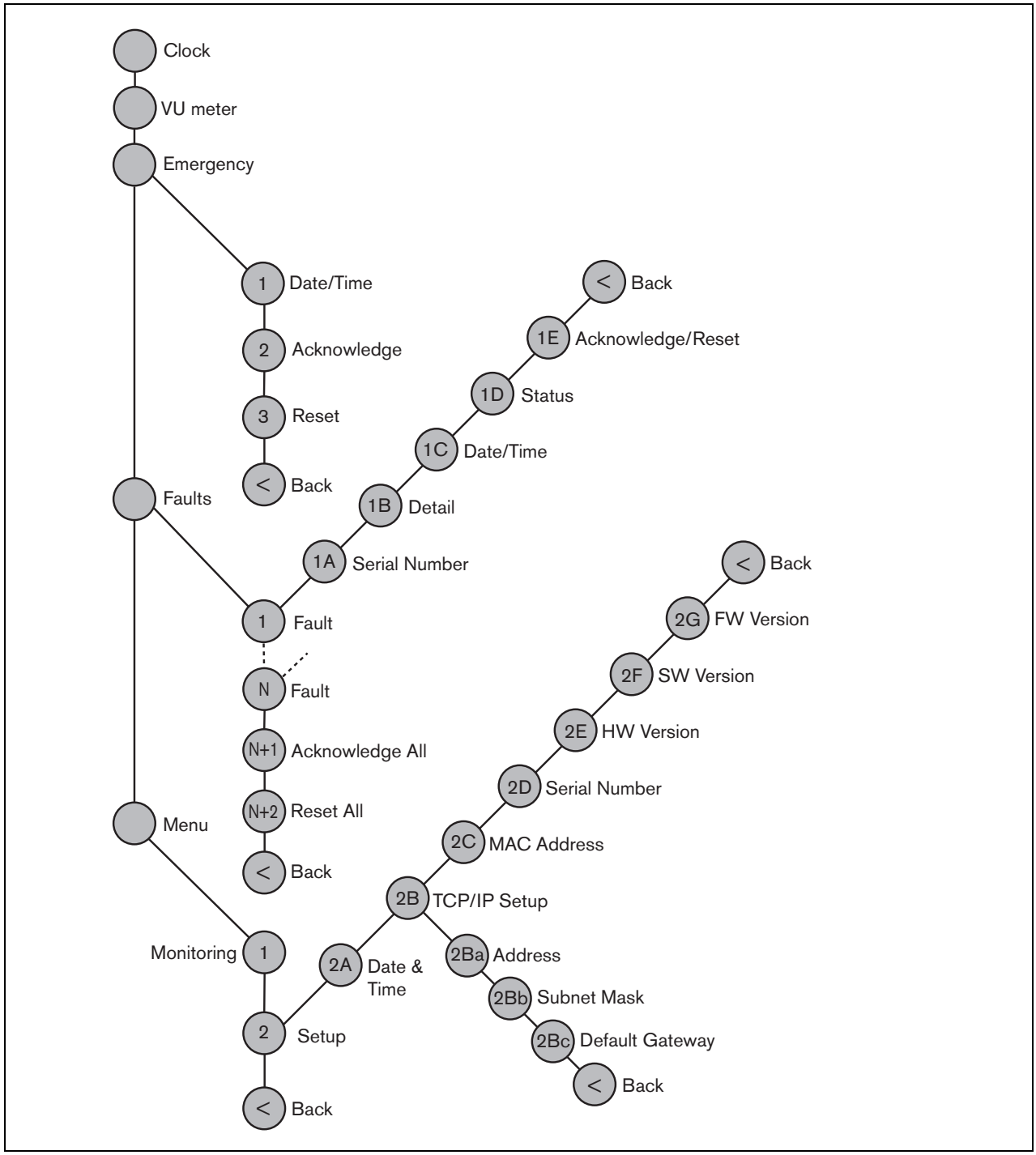


figure 5.14: Structure of the network controller front panel menu

5.5.2 Navigate through the menu

Operating the menu is always a sequence of alternating turns and pushes:

Turn the button to:
- Cycle through the menu items within a menu.
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

Push the button to:
- Confirm a chosen menu item (a blinking cursor appears).
- Go to a submenu (the submenu item character starts blinking).
- Confirm the selection of a settable option (the cursor disappears, the option value starts blinking).
- Confirm a selected value for a settable option (the value stops blinking, the cursor appears again).

Each menu is identified by a number or by a number plus a character (see figure 5.15). The item identification can be found at the start of the first line and is used to navigate to and from the submenus. Most menu items have one or more options. The value of an option can be changed by selecting a value from a list of available values.

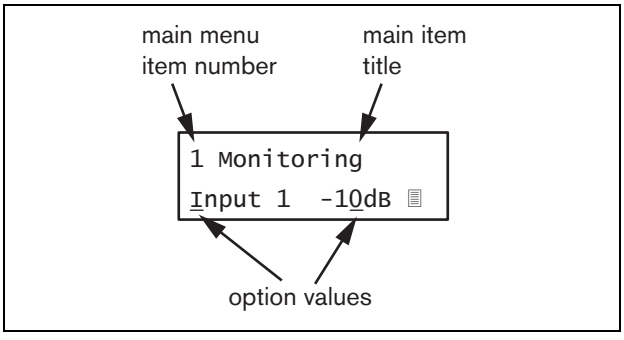


figure 5.15: Menu item screen elements

To navigate through the status screens:
1 Turn the button to move through the status screens (i.e. the *Clock*, *VU meter*, *Emergency* ..., *Faults* ... and *Menu* ... screens).

To navigate through the main menu:
1 Navigate in the status screens to *Menu*....
2 Push the button to go to the main menu. The menu item number starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To jump to a submenu:
1 Navigate to an item with three dots (e.g. *Setup*...).
2 Push the button to go to the submenu. The submenu item character starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To navigate through a submenu:
1 Turn the button to move the cursor to the submenu item character.
2 Push the button. The item character and title starts blinking.
3 Turn to select another submenu item character.
4 Push to confirm the selection.

To change option values:
1 Navigate to the applicable menu item.
2 Turn the button to move the cursor to the option value you want to change.
3 Push the button to activate the option. The option starts to blink.
4 Turn the button to select a new option value.
5 Push the button to confirm the new value. The option value stops blinking.
6 Turn the button to move the cursor to another settable option (when available) and repeat steps 3 to 5.

To jump back from a submenu to an item of the main menu:

1 Turn the button to move the cursor to the main menu item number.
2 Push the button. The item number starts blinking.
3 Turn to select another item number.
4 Push to confirm the selection.

OR

1 Turn the button to *< Back*.
2 Push to confirm.

To jump back from the main menu to the status screens:

1 Jump back to the main menu.
2 Turn the button to *< Back*.
3 Push to confirm.

Example:

Set the IP address of the network controller. (This example assumes you start from the default screen):

```
Netw Controller
2002/09/27 13:27
```

1 Turn the button to go to the *Menu ...* in the status screens:

```
Menu...
```

2 Push the button to confirm:

```
1 Monitoring
Off
```

3 Turn the button to go to the *Setup* submenu:

```
2 Setup
              ...
```

4 Push the button to confirm:

```
2A Date & Time
2002/09/27 13:27
```

5 Turn the button to go to the *TCP/IP Setup* submenu:

```
2B TCP/IP Setup
              ...
```

6 Push the button to confirm:

```
2Ba Address
000.000.000.000
```

7 Push the button to confirm:

```
2Ba Address
000.000.000.000
```

8 Turn the button to move the cursor to the first part of the IP address:

```
2Ba Address
000.000.000.000
```

9 Push the button to confirm:

```
2Ba Address
000.000.000.000
```

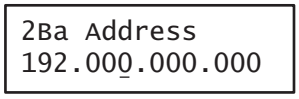
10 Turn the button to change the first part of the IP address:

```
2Ba Address
192.000.000.000
```

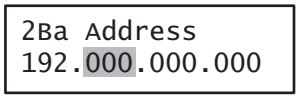
11 Push the button to confirm:

```
2Ba Address
192.000.000.000
```

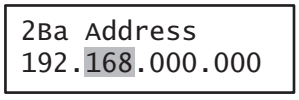
12 Turn to move the cursor to the second part of the IP address:



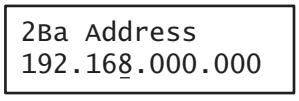
13 Push the button to confirm:



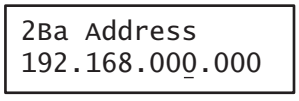
14 Turn the button to change the second part of the IP address:



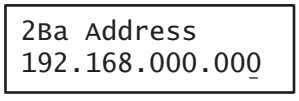
15 Push the button to confirm:



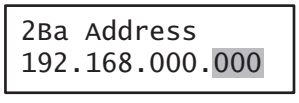
16 Turn to move the cursor to the third part of the IP address:



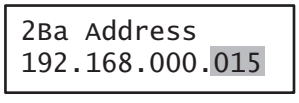
17 Turn to move the cursor to the fourth part of the IP address:



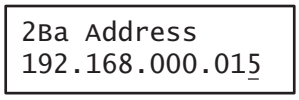
18 Push the button to confirm:



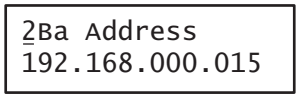
19 Turn the button to change the fourth part of the IP address:



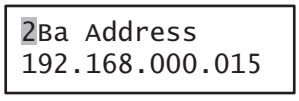
20 Push the button to confirm:



21 Turn to move the cursor to the menu number:

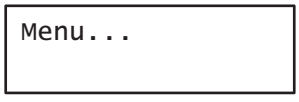


22 Push the button to confirm:



23 Turn to move to the < *Back* item:

24 Push the button to confirm:



25 Turn the button to go to the default screen:

5.6 Configuration and operation

5.6.1 Introduction

The next sections give descriptions of the possible configuration options. Each description is followed by the relevant menu items with detailed instructions per menu option. The default values are indicated by an asterisk (*) when applicable.

5.6.2 Start-up

When the network controller is (re)started, the display shows the name of the unit and the clock (first of the status screens).

5.6.3 Status screens

The status screens (see table 5.7) provide general information about the network controller.

table 5.7: Status screens

Menu item	Description
Clock	Shows the name of the unit and the time and date.
VU Meter	Visual indication of the signal strengths on all audio inputs and audio outputs of the network controller.

5.6.4 Emergency menu

The *Emergency ...* item (see figure 5.14) provides access to the emergency menu. This menu is automatically activated when the system is put into the emergency state. It changes automatically back to the *Clock* screen when the emergency state is reset. The *Emergency ...* menu screen itself shows the name of key that was used to activate the emergency state or the IP address of the open interface controller that activated the emergency state. For example:

```
Emergency     ...
CST-EM-PTT
```

In this example, *Emergency* indicates that the emergency state is active and that it was activated by button *CST-EM-PTT*.

The menu items in the emergency menu provide additional information about the emergency state and allow to acknowledge and reset the emergency state (see table 5.8). When the emergency state is reset, all emergency calls are aborted.

table 5.8: Emergency menu

Menu item	Description
1 Date/Time	Date and time on which the emergency state was activated.
2 Acknowledge	Acknowledges the emergency state.
3 Reset	Resets the emergency state.

5.6.5 Faults menu

The *Faults ...* menu (see figure 5.14) provides access to the faults menu. This menu is automatically activated when there is a fault in the system. Because the number of active faults in the system can vary, the item numbers in this menu are not fixed. The youngest fault is the fault with the lowest number. The maximum number of faults is 200.

Note
When a new fault occurs while another fault is being viewed, the item number of the fault that is being viewed is automatically incremented. For example, when *23 Overload* is being viewed while a new fault occurs, it becomes automatically *24 Overload*.

Note
When fault *200* is being viewed while a new fault occurs, fault *200* is automatically deleted and replaced by the next fault. For example, fault *200* is *200 Overload* and the next fault is *199 Gnd Short*. Then *200 Overload* automatically becomes *200 Gnd Short* when a new fault occurs.

The *Faults ...* menu screen itself shows the number of active faults in the system. For example:

```
Faults          ...
 27 faults
```

The numbered menus in the faults menu shows the name of the fault and the unit that generated the fault. For example:

```
23 Overload
PAM_01
```

In this case the fault is *Overload*, which was generated by the unit named *PAM_01*. The menu items in the faults menu provide additional information about the selected fault and allow to acknowledge and reset faults (see table 5.9).

Note
In the next table, n indicates the nth fault in the faults menu, whereas N indicates the total number of faults in the faults menu.

table 5.9: Faults menu

Menu item	Description
nA Serial Nr	Shows the serial number of the unit that generated the fault n.
nB Detail	Shows the fault detail of fault n. See table 5.11.
nC Date/Time	Shows the date and time on which fault n occurred.
nD Status	Shows the status of fault n See chapter 52
nE Acknowledge	Acknowledge the selected fault. See chapter 52.
nF Reset	Reset the selected fault. See chapter 52.
N+1 Ack All	Allows to acknowledge all faults in the system. See chapter 52.
N+2 Reset All	Resets all faults in the system. See chapter 52.

The faults and fault details displayed by the network controller are closely related to the faults that are displayed in the *Logging Viewer* (see chapter 59). In table 5.11, all faults that can be displayed by the network controller are listed. Use this table in combination with the information in chapter 55 to find out the cause of a fault or the recommended action to take.

5.6.6 Main menu

The *Menu ...* item (see figure 5.14) provides access to the main menu.

table 5.10: Main menus

Menu item	Description
1 Monitoring	Go to the *Monitoring* submenu. See section 5.6.7.
2 Setup	Go to the *Setup* submenu. See section 5.6.8 (and further).

table 5.11: Faults event table

Fault	Detail	Logging message
A/B fault	(channel)	*Group A or B line fault*
Amp missing	(channel)	*Amplifier missing*
Amp standby		*Amplifier initialization failure*
Audio path		*Call station audio path fault*
CobraNet	*fault code*	*CobraNet network fault: fault code*
Config file	*Not valid*	*No valid configuration file found; a new configuration file will be created*
	Mismatch	*Configuration file version mismatch: version x.xx found y.yy expected*
	Error	*Configuration file error*
Ctrl input	(control input)	*Control input line failure*
End of line	(channel)	*Loudspeaker line failure*
Failure	(channel)	*Amplifier failure*
	(channel)	*Amplifier failure or overload*
Fault input	(text)	*Fault input*
Flashcard	*Missing*	*Flash card missing*
	Checksum	*Flash card data error*
	Message names	*Messages missing:*
Gnd short	(channel)	*Amplifier ground short*
Grp A fault	(channel)	*Group A fault*
Grp B fault	(channel)	*Group B fault*
HW Version	*Mismatch*	*Hardware version mismatch*
Internal	*Fault* (number)	*CobraNet interface fault / OMNEO interface fault*
Keypad	n/m *mismatch*	*Keypad mismatch*
Line input	(audio input)	*Line input failure*
Loop fault	(channel)	*Class-A switchover*
Loudspeaker	(channel)	*Loudspeaker failure*
Lsp Line	(channel)	*Amplifier loudspeaker line failure*
Memory	*EEPROM*	*Memory error*
	FLASH	
Mic input	(audio input)	*Microphone Failure*
Missing		*Unit missing*
Net pwr RCS		*Network power supply failure remote call station*
No mains		*Mains power supply failure*
No sec pwr		*Back up power supply failure*
OMNEO	*fault code*	*OMNEO network fault: fault code*
Overheat	(channel)	*Amplifier overheat*
Overload	(channel)	*Amplifier overload*
	(channel)	*Amplifier short circuit*
Proc reset	*MMP*	*Processor reset: MMP* (network processor)
	CPU	*Processor reset: CPU* (system processor)
	CNM	*Processor reset: CNM* (CobraNet module)
	OMNEO	*Processor reset: OMNEO* (OMNEO module)
	SCB	*Processor reset: SCB* (supervision control board)
RCS connect		*Remote call station connection failure*

table 5.11: Faults event table

Fault	Detail	Logging message
Ring broken	*System Network*	*Redundant ring broken*
SCB failure		*Supervision Control Board failure*
Sec pwr RCS		*Backup power supply failure remote call station*
Supervision	(channel)	*Pilot tone calibration*
	(channel)	*Line supervision master mismatch*
Supply 24V	(channel)	*Redundant supply 24V*
Uncfgd unit		*Unit not configured*
Unknwn unit		*Unknown unit type*
Zone line	(control input)	*External line fault*

5.6.7 Set monitoring options

The *Monitoring* submenu is used to set which signal is sent to the monitoring loudspeaker or headphones. It can be one of the audio inputs, one of the audio outputs or no signal at all. Furthermore, the screen provides level meters for a visual identification of the actual signal strength.

table 5.12: Monitoring submenu

Menu item	Option	Value 1	Value 2	Description
1 Monitoring	Source:			
	- *Input* n	Input nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio input n is available on the monitoring loudspeaker or headphones output.
	- *Output* n	Output nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio output n is available on the monitoring loudspeaker or headphones output.
	- *Off**			The monitoring loudspeaker or headphones output is off during normal operation.

5.6.8 Set date and time

The *Date & Time* menu item is used to change the date and time displayed by the network controller.

table 5.13: Date & Time menu item

Menu item	Option	Value 1	Value 2	Description
2A Date & Time		Date: *2000-01-01* to *2037-12-31*	Time *00:00* to *23.59*	The date is displayed in the yyyy-mm-dd format, the time is displayed in the hh:mm format.

5.6.9 Setup TCP/IP

The *TCP/IP Setup* submenu is used to set the TCP/IP parameters of the network controller.

table 5.14: TCP/IP Setup submenu

Menu item	Value	Description
2Ba Address	e.g. *192.168.000.015*	IP address of the network controller.
2Bb Subnet Mask	e.g. *255.255.255.000*	Subnet mask for the network controller.
2Bc Def. Gateway	e.g. *192.168.000.050*	Default gateway for the network controller.

5.6.10 View MAC address

The *MAC Address* menu item can be used to view the MAC address of the network controller. The MAC address is a unique address that is factory-set and cannot be changed. Within networks, it can be used to get access to the unit.

table 5.15: MAC address menu item

Menu item	Value (read-only)	Description
2C MAC address	e.g. *000463-004209*	Show the MAC address of the network controller.

5.6.11 View version information

The *Serial Number*, *HW Version*, *SW version* and *FW version* menu items are used to obtain version information about the network controller.

table 5.16: Version information menu items

Menu item	Value (read-only)	Description
2D Serial Number	e.g. *11.0.15012*	Shows the hexadecimal serial number.
2E HW Version	e.g. *30.00*	Shows the hardware version.
2F SW Version	e.g. *4.00.3525*	Shows the version number of the Praesideo software.
2G FW Version	e.g. *6.00.2818*	Shows the version number of the firmware. This must be the same for all units in the system.

5.7 Technical Data

5.7.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm depth behind the brackets, 40 mm in front of the brackets)
92 x 440 x 400 mm (table-top, with feet)

Weight:
7 kg

5.7.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)

Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)

Air pressure:
600 to 1100 hPa

5.7.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
(Compliancy to EN50121-4 and EN/IEC60945 requires an external input filter, model Schaffner FN2080-6-06, on the DC (battery) input)

Electrical safety:
IEC60065 (CB-scheme)
EN60065

Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

5.7.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C

MTBF:
400,000 hours
(based on real warranty return rate data)

5.7.5 System bus

Connector (rear side):
Proprietary connector

Preferred cable:
LBB4416/xx

Maximum cable length:
50 m (per system bus connector)

Data signal interface
Plastic optical fiber

Network power supply:
2 x 55 W (at network output)

5.7.6 Power supply mains

Connector (rear side):
IEC male power inlet with fuse holder

Preferred cable:
Mains cord meeting CE standard

Voltage selector (rear side)
115 V(AC)/230 V(AC)

Nominal input voltage range:
115 V (typical): 100 - 120 V(AC) at 50 - 60 Hz
230 V (typical): 220 - 240 V(AC) at 50 - 60 Hz

Input voltage limits:
115 V (typical): 90 - 132 V(AC) at 50 - 60 Hz
230 V (typical): 198 - 264 V(AC) at 50 - 60 Hz

On/Off switch:
Located at the rear

Power consumption:
21 W (44 VA) without network load
160 W (265 VA) at maximum load

Power factor (PF):
> 0.6

5.7.7 Power supply battery

Connector (rear side):
2 pole for removable screw connector

Input voltage:
48 V(DC)

Input voltage range:
43 to 56 V(DC)

Power consumption:
14 W without network load,
130 W at maximum load

5.7.8 Audio line inputs

Connector (rear side):
Female XLR and female stereo cinch socket per input. The stereo signal from the cinch is internally converted to a mono signal
Preferred cable:
Shielded
Maximum input signal level:
18 dBV ± 1 dB (XLR)
6 dBV ± 1 dB (cinch)
Input range:
-12 dB to 0 dB with respect to maximum input level
Input sensitivity setting:
Software
Frequency response:
-3 dB points at 20 Hz and 20 kHz (tolerance ± 1 dB)
Input impedance:
100 kΩ (XLR)
12 kΩ (cinch)
Signal/Noise ratio:
> 87 dB(A) at maximum level
Common mode rejection ratio:
> 40 dB
Input cross-talk:
> 75 dB at maximum level at 100 Hz, 1 kHz and 10 kHz
Distortion:
< 0.05% at 1 kHz at -3 dB of the maximum input level

5.7.9 Audio microphone inputs (only input 1 and input 2)

Connector (rear side):
Female XLR per input
Preferred cable:
Shielded
Nominal input level:
-57 dBV
Headroom:
30 dB
Input range:
-7 to +8 dB with respect to nominal input level (limiter threshold)
Input sensitivity setting:
Software
Frequency response:
-3 dB points at 300 Hz and 20 kHz (tolerance ± 1 dB)
First order, high-pass speech filter at 300 Hz
Input impedance:
1360 Ω
Signal/Noise ratio:
> 62 dB(A) with 25 dB headroom
Common mode rejection ratio:
> 55 dB at 100 Hz
> 65 dB at 1 kHz and 10 kHz
Phantom supply:
12 V ± 1 V (max. 15 mA)
Limiter:
Analog limiter, level -8 dB with respect to maximum.
• attack time: 1 ms
• decay time: 300 ms
• threshold at nominal input level

5.7.10 Audio outputs

Connector (rear side):
One XLR and one stereo (dual mono) cinch for each output
Preferred cable:
Shielded
Maximum output level:
18 dBV ± 1 dB for XLR
6 dBV ± 1 dB for cinch
Output range:
-30 dB to 0 dB with respect to maximal output level
Output level setting:
Software
Frequency response:
-3 dB points at 20 Hz and 20 kHz (tolerance ± 1 dB)
Output impedance:
< 100 Ω
Signal/Noise ratio:
> 89 dB(A) at maximum level
Output cross-talk:
< -85 dB
Distortion:
< 0.05% at 1 kHz at -3 dB of the maximum input signal

5.7.11 Control inputs

Connector (rear side):
Removable screw connector
Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)
Resistance detection (supervision enabled):
Cable short circuit
< 2.5 kΩ
Contact closed
7.5 kΩ to12 kΩ
Contact open
17.5 kΩ to 22 kΩ
Cable broken
> 27 kΩ
Resistance detection (supervision disabled):
Contact closed
< 12 kΩ
Contact open
> 17.5 kΩ
Maximum open voltage:
24 V(DC)
Internal pull-up current:
0.5 mA
External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

5.7.12 Control outputs

Connector (rear side):
Removable screw connector
Maximum cable length:
1 km
Contact type:
Relay contact, single pole, change-over contact (SPDT)
Maximum switching power:
Refer to the graph.
Off state (unpowered):
C-NC is closed, C-NO is open

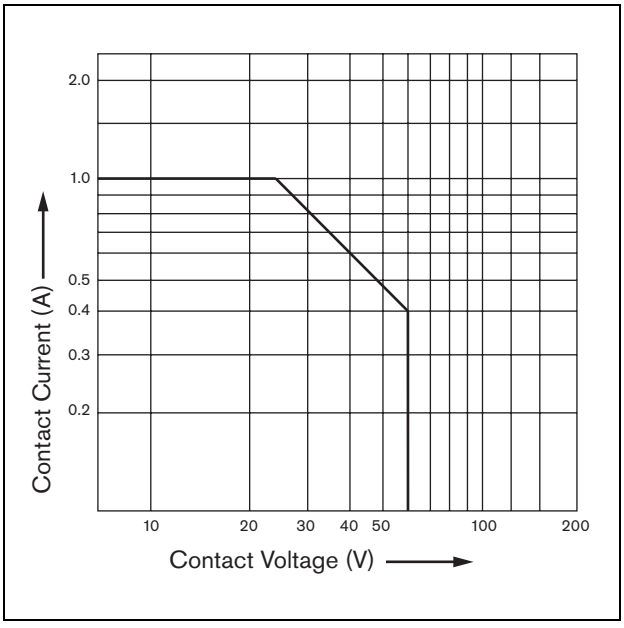


figure 5.16: Maximum switching power

5.7.13 RS232 interface

Connector (rear side):
Female 9 pole SUB-D connector
Maximum cable length:
15 m
Signal levels:
According to EIA RS232-C interface specification

5.7.14 Ethernet

Medium:
10Base-T/100Base-TX/1000Base-T with crossover detection and auto-correction
Connector (rear side):
RJ45
Preferred cable:
UTP cable category 5
Maximum length:
100 m (point-to-point)
Signal levels:
According to IEEE 802.3

5.7.15 Headphones

Connector (front side):
3.5 mm stereo jack socket for headphones
Maximum output voltage:
6 dBV with volume control
Rated load impedance:
8 to 600 Ω
Signal/Noise ratio
> 80 dB (at maximum output level)
Distortion:
< 0.5%

6 PRS-4AEX4 Audio Expander

Note
Systems running on an older release need to be upgraded. For backwards compatibility, SW release 3.61 and 4.10 support the PRS-4AEX4 as well as the previous LBB4402/00.

6.1 Introduction

The PRS-4AEX4 is the successor of the LBB4402/00 audio expander with exactly the same functionality. This change is due to obsolescence of some internal parts of the previous audio expander. The new PRS-4AEX4 requires specific firmware that is incorporated in software release 3.61 for the PRS-NCO-B and software release 4.10 and later for the PRS-NCO3.

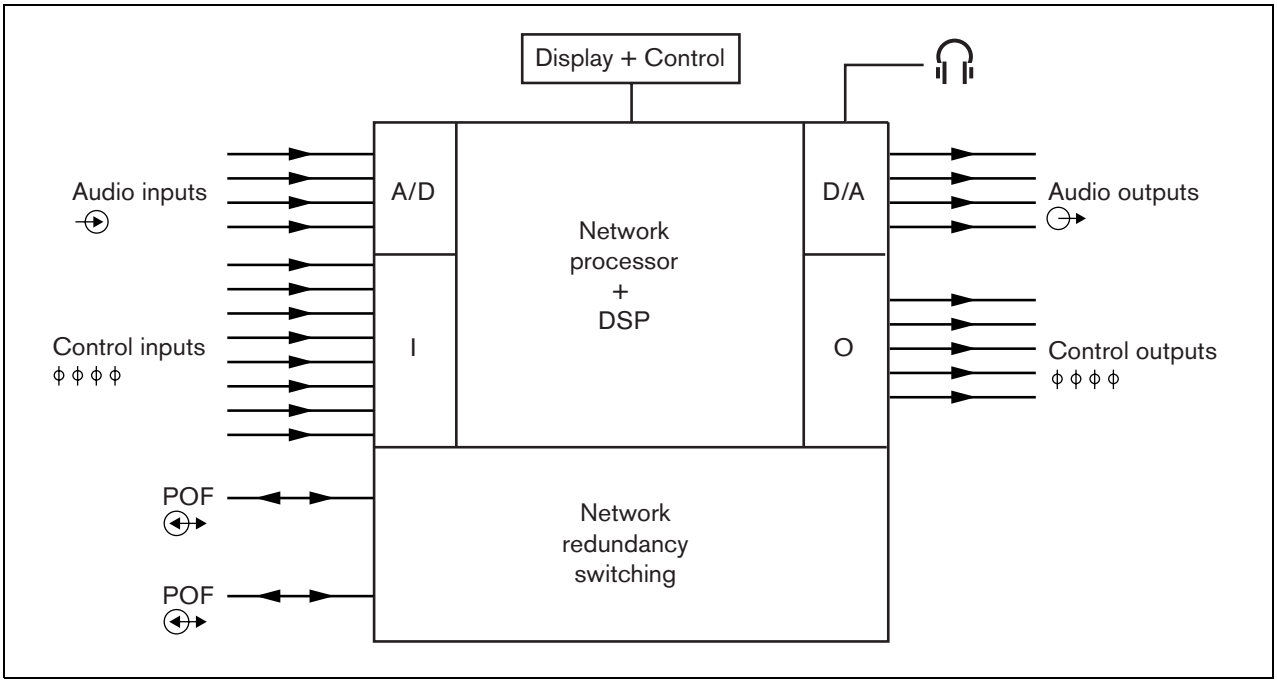


figure 6.1: Block diagram of the audio expander

6.2 Controls & connectors

6.2.1 Front view

The front of the audio expander (see figure 5.2) contains the following:

1 **Menu display** - A 2x16 character LCD display gives information about the audio expander (see section 6.5).
2 **Menu button** - A turn-and-push button to operate the menu (see section 6.5).
3 **Monitoring headphones output** - A 3.5 mm (1/8 inch) jack socket to connect headphones for audio monitoring purposes.

6.2.2 Rear view

The rear of the audio expander (see figure 6.2) contains the following:

4 **Audio inputs** - Four audio inputs for receiving audio signals from analog audio sources. Two of the audio inputs are selectable between microphone and line. The other two audio inputs are fixed line inputs. Each audio input has a XLR as well as a double cinch connector (see section 6.3.3).

5 **Audio outputs** - Four audio outputs for extracting analog audio signals. Each audio output has a XLR as well as a double cinch connector (see section 6.3.4).

6 **Ground** - A connection to electrically ground the audio expander.

7 **System bus** - Two system bus connectors to connect the audio expander to other Praesideo equipment (see section 6.3.2).

8 **Control inputs** - The control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 6.3.5).

9 **Control outputs** - The control outputs can be used to send signals to third party equipment to trigger actions generated by the Praesideo network (see section 6.3.6).

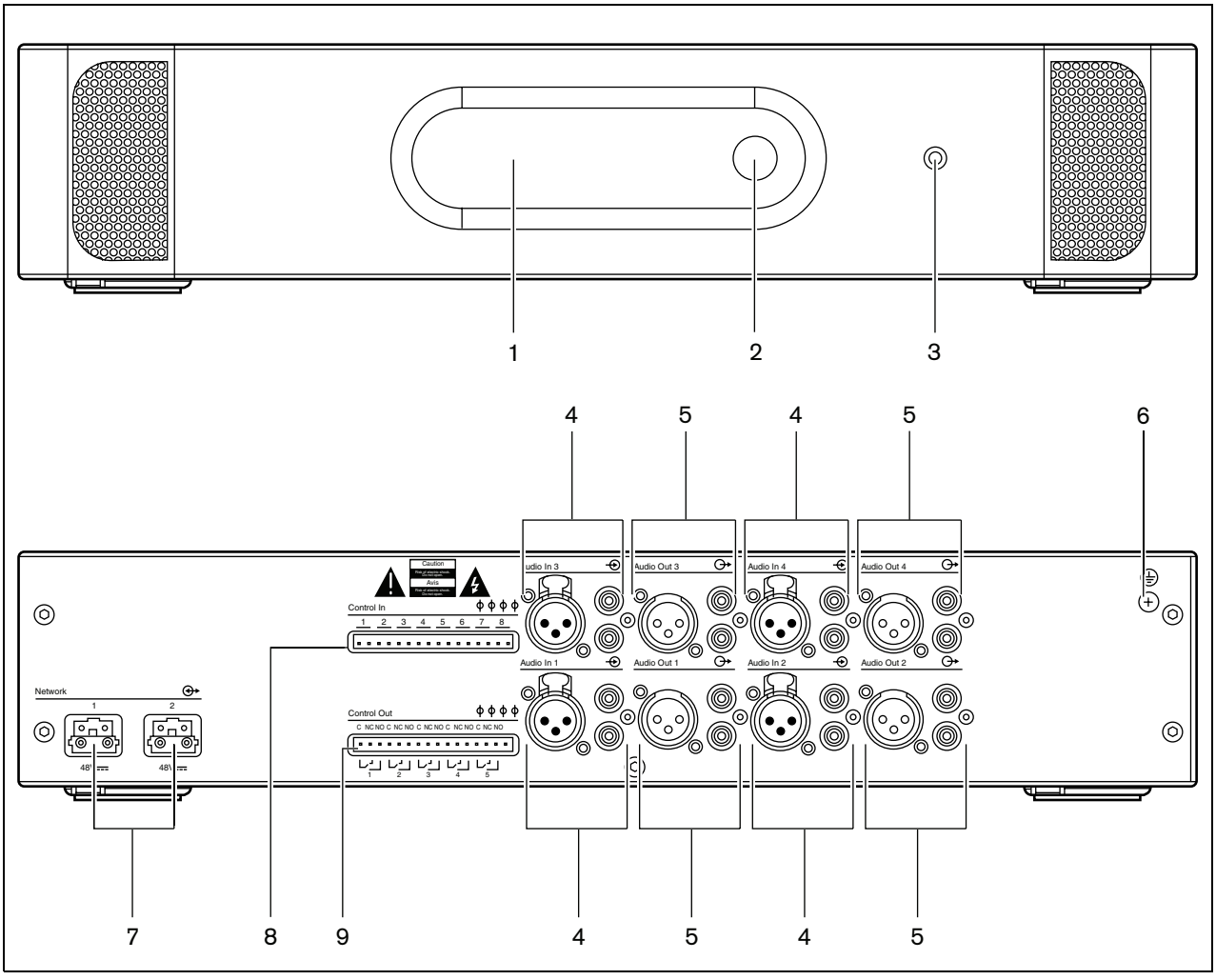


figure 6.2: Front and rear views of the audio expander

6.3 Connections

6.3.1 Introduction

This section gives an overview of typical system connections using the audio expander.

- Connecting the network (see section 6.3.2).
- Connecting audio inputs (see section 6.3.4).
- Connecting audio outputs (see section 6.3.4).
- Connecting control inputs (see section 6.3.5).
- Connecting control outputs (see section 6.3.6).

6.3.2 Connecting the network

Connect the audio expander to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

This unit is powered by the network controller, via the Praesideo system bus.

6.3.3 Connecting audio inputs

The audio expander has 4 audio inputs to interface with analog audio sources. Each audio input has two connectors on the rear of the audio expander; one XLR connector (for balanced signals) and one double cinch connector (for unbalanced signals). The audio expander mixes stereo signals connected to the cinch connectors of the same audio input into one single mono signal.

The analog audio can be a line source as well as a microphone. See table 6.1 for an overview of the input types supported by each of the inputs.

Note
The microphone inputs should not be used to connect emergency microphones. These inputs do not provide microphone connection supervision.

table 6.1: Audio input types

Audio Input	Microphone (XLR only)	Line
1	Yes	Yes
2	Yes	Yes
3	No	Yes
4	No	Yes

Note
The audio inputs can handle electret microphones as well as dynamic microphones, since the audio expander can generate the phantom supply for electret microphones.

See figure 6.3 for details about the audio input sockets

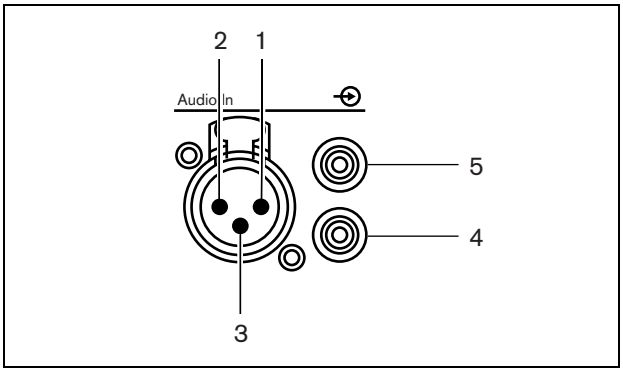


figure 6.3: Audio input sockets

table 6.2: Audio input socket details

Pin	Socket	Definition	Description
1	XLR (female)	Xternal	Shield/ground (phantom supply -)
2		Live	Positive (phantom supply +)
3		Return	Negative (phantom supply +)
4	Cinch	Right	Right channel in
5		Left	Left channel in

6.3.4 Connecting audio outputs

The audio expander has 4 audio outputs to route analog audio signals to other equipment (e.g. a tape deck to record a specific audio signal). Each audio output has two connectors on the rear of the audio expander; one XLR connector (for balanced signals) and one double cinch connector (for unbalanced signals).

Note
The right and left cinch connectors carry the same mono signal.

See figure 6.4 for details about the audio output sockets.

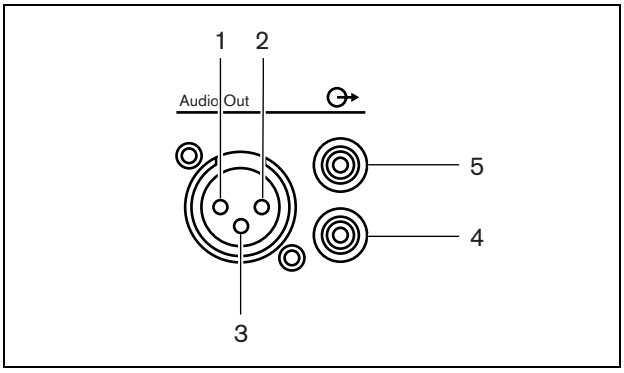


figure 6.4: Audio output sockets

table 6.3: Audio output socket details

Pin	Socket	Definition	Description
1	XLR	Xternal	Shield/ground
2	(male)	Live	Positive
3		Return	Negative
4	Cinch	Right	Right channel out
5		Left	Left channel out

6.3.5 Connecting control inputs

The audio expander has 8 control inputs. The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 44.6). It is also possible to supervise the cables for short-circuits and open connections (see figure 6.5 and figure 6.6). Whether a control input is actually supervised or not is defined in the configuration.

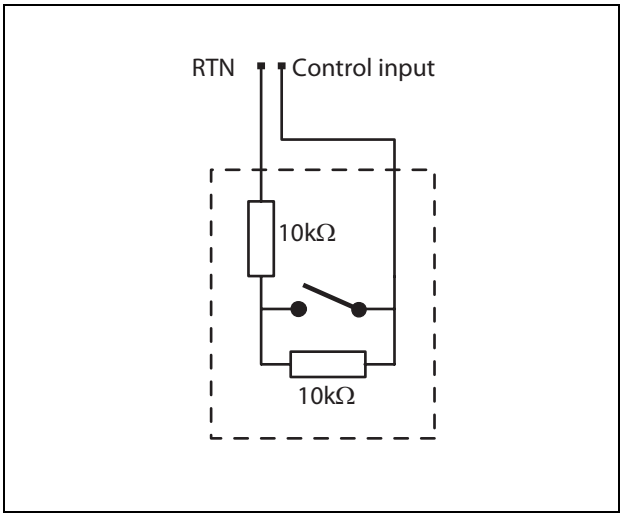


figure 6.5: Supervised control input

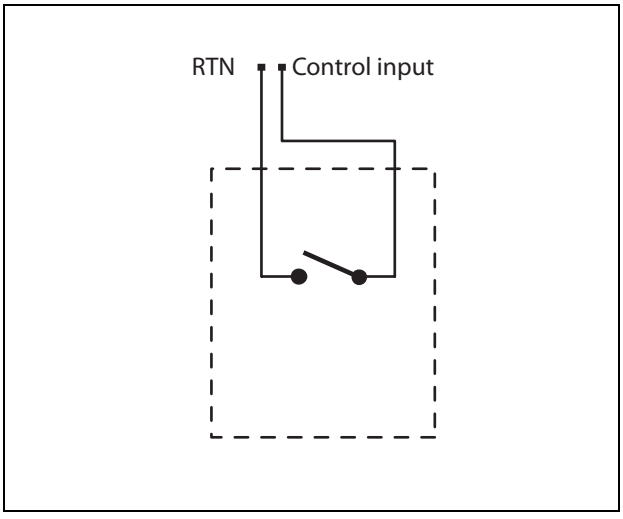


figure 6.6: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

6.3.6 Connecting control outputs

The audio expander has 5 control outputs. The control outputs can be used to send signals to third party equipment to trigger actions. Each control output connection has three pins (see figure 6.7).

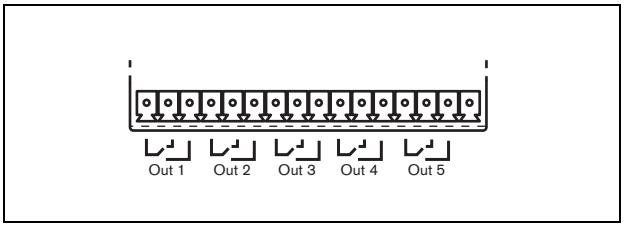


figure 6.7: Control outputs

The common (C) pin of the control output should always be connected. Whether the other pin that is connected is the normally closed (NC) or normally open (NO) depends on which action that take place when the control output is active (see table 6.4).

table 6.4: Control outputs details

Connection	Abbr.	Description
Normally closed	NC	By default, the NC contact is connected with common contact C. When the output is activated, the NC contact is opened.
Normally open	NO	By default, the NO contact is not connected with common contact C. When the output is activated, the NO contact is closed.

In the configuration, a purpose must be attached to the control output that indicates the action to be taken when it becomes active (see table 44.6).

6.4 Installation

The audio expander is suitable for either table-top or 19-inch rack installation. Four feet (for table-top use) and two brackets (for rack installation) are supplied.

Note
The center bracket positions can be used to secure the unit on a table or shelf. They can also be used to install the unit vertically to a wall.

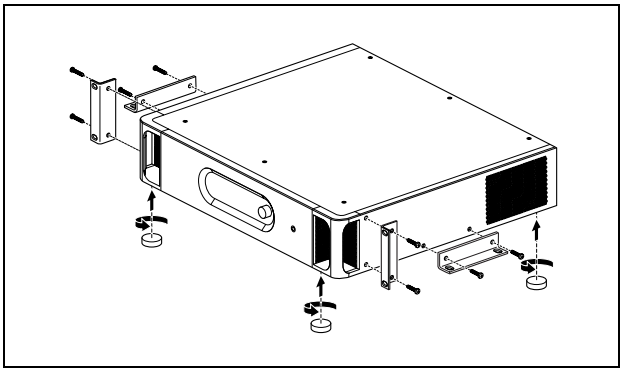


figure 6.8: Installation

Caution
When mounting the brackets to the unit, use the screws that are supplied with the brackets. Screws with a length of >10 mm may touch or damage internal parts of the unit.

6.5 Using the configuration menu

6.5.1 Overview

A number of audio expander settings are available via an interactive menu, using a 2x16 LCD display and a 'turn-and-push' menu button. The next figure gives an overview of the menu structure.

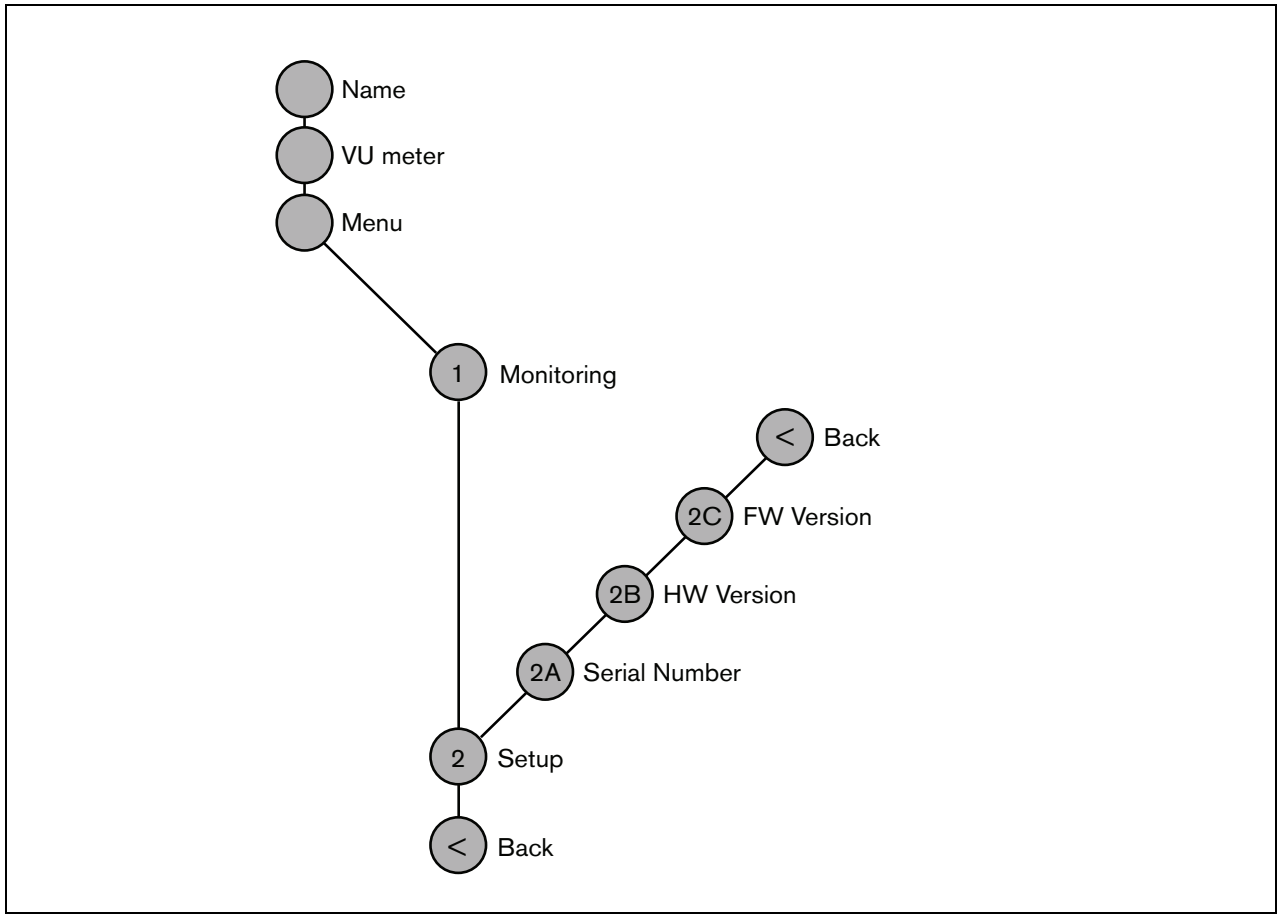


figure 6.9: Structure of the audio expander front panel menu

6.5.2 Navigate through the menu

Operating the menu is always a sequence of alternating turns and pushes:

Turn the button to:
- Cycle through the menu items within a menu.
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

Push the button to:
- Confirm a chosen menu item (a blinking cursor appears).
- Go to a sub-menu (the sub-menu item character starts blinking).
- Confirm the selection of a settable option (the cursor disappears, the option value starts blinking).
- Confirm a selected value for a settable option (the value stops blinking, the cursor appears again).

Each menu is identified by a number or by a number plus a character (see figure 6.10). The item identification can be found at the start of the first line and is used to navigate to and from the sub-menus. Most menu items have one or more options. The value of an option can be changed by selecting a value from a list of available values.

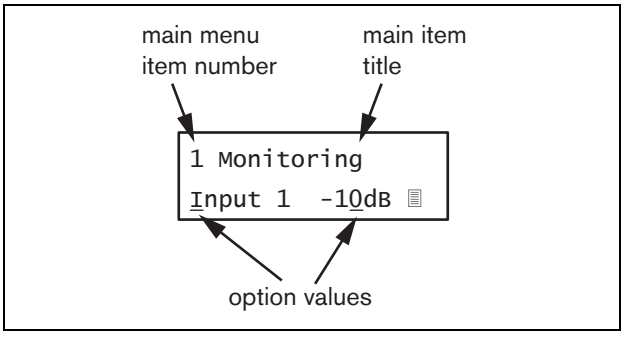


figure 6.10: Menu item screen elements

To navigate through the status screens:
1 Turn the button to move through the status screens (i.e. the *Name*, *VU meter* and *Menu ...* screens).

To navigate through the main menu:
1 Navigate in the status screens to *Menu...*.
2 Push the button to go to the main menu. The menu item number starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To jump to a sub-menu:
1 Navigate to an item with three dots (e.g. *Setup...*).
2 Push the button to go to the sub-menu. The sub-menu item character starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To navigate through a sub-menu:
1 Turn the button to move the cursor to the sub-menu item character.
2 Push the button. The item character and title starts blinking.
3 Turn to select another sub-menu item character.
4 Push to confirm the selection.

To change option values:
1 Navigate to the applicable menu item.
2 Turn the button to move the cursor to the option value you want to change.
3 Push the button to activate the option. The option starts to blink.
4 Turn the button to select a new option value.
5 Push the button to confirm the new value. The option value stops blinking.
6 Turn the button to move the cursor to another settable option (when available) and repeat steps 3 to 5.

To jump back from a sub-menu to an item of the main menu:

1 Turn the button to move the cursor to the main menu item number.
2 Push the button. The item number starts blinking.
3 Turn to select another item number.
4 Push to confirm the selection.

OR

1 Turn the button to < *Back*.
2 Push to confirm.

To jump back from the main menu to the status screens:

1 Jump back to the main menu.
2 Turn the button to < *Back*.
3 Push to confirm.

Example:

Set the output that is available on the headphones output of the audio expander. (This example assumes you start from the default screen):

```
Audio Expander
```

1 Turn to the button to go to the *Menu ...* in the status screens:

```
Menu...
```

2 Push the button to confirm:

```
1 Monitoring
Off
```

3 Push the button to confirm:

```
1 Monitoring
Off
```

4 Turn the button to the *Monitoring* option:

```
1 Monitoring
Off
```

5 Push the button to confirm:

```
1 Monitoring
Off
```

6 Turn the button to change the audio output you want to listen to:

```
1 Monitoring
Output 3    0 dB
```

7 Push the button to confirm:

```
1 Monitoring
Output 3    0 dB
```

8 Turn to move the cursor to the menu number:

```
1 Monitoring
Output 3    0 dB
```

9 Push the button to confirm:

```
1 Monitoring
Output 3    0 dB
```

10 Turn to move to the < *Back* item:

```
< Back
```

11 Push the button to confirm:

```
Menu...
```

12 Turn the button to go to the default screen:

```
Audio Expander
```

6.6 Configuration and operation

6.6.1 Introduction

The next sections give descriptions of the possible configuration options. Each description is followed by the relevant menu items with detailed instructions per menu option. The default values are indicated by an asterisk (*) when applicable.

6.6.2 Start-up

When the audio expander is (re)started, the display shows the name of the unit. If it shows *Load Unit Software*, the unit does not contain any firmware or contains DCN Next Generation firmware. DCN Next Generation firmware must be replaced by Praesideo firmware (see section 37.5).

6.6.3 Status screens

The status screens (see table 6.5) provide general information about the status of the audio expander.

table 6.5: Status screens

Menu Item	Description
Name	Shows the name of the unit and (possibly) its fault event status (see section 6.6.4).
VU Meter	Visual indication of the signal strengths on all audio inputs and audio outputs of the audio expander.

6.6.4 Fault status

If there is an active fault, the *Name* screen also shows the fault status (see table 6.6). If there is more than one active fault, only the most severe fault is shown. A fault status only provides global information. The exact source of a fault can be found out using the fault events list in this manual (see chapter 53).

table 6.6: Fault status (high to low)

Fault status	Description
No network	The optical network is not available.
Fault: Input CIn	Fault in control input n. (If n = +, faults in multiple control inputs.)
Fault: Input AIn	Fault in audio line input n. (If n = +, faults in multiple audio inputs.)

6.6.5 Main menu

The *Menu* ... item (see figure 6.9) provides access to the main menu.

table 6.7: Main menus

Menu item	Description
1 Monitoring	Go to the *Monitoring* submenu. See section 6.6.6.
2 Setup	Go to the *Setup* submenu. See section 6.6.7 (and further).

6.6.6 Set monitoring options

The *Monitoring* submenu is used to set which signal is sent to the monitoring headphones. It can be one of the audio inputs, one of the audio outputs or no signal at all. Furthermore, the screen provides level meters for a visual identification of the actual signal strength.

table 6.8: Monitoring submenu

Menu item	Option	Value 1	Value 2	Description
1 Monitoring	Source:			
	- *Input* n	Input nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio input n is available on the headphones output.
	- *Output* n	Output nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio output n is available on the headphones output.
	- *Off**			The headphones output is off during normal operation.

6.6.7 View version information

The *Serial Number*, *HW Version* and *SW Version* menu items are used to obtain version information about the audio expander.

table 6.9: Version information menu items

Menu item	Value (read-only)	Description
2A Serial Number	e.g. *12.0.0030C*	Shows the hexadecimal serial number.
2B HW Version	e.g. *15.00*	Shows the hardware version.
2C FW Version	e.g. *3.00.1419*	Shows the version number of the firmware. This must be the same for all units in the system.

6.7 Technical data

6.7.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm depth behind the brackets, 40 mm in front of the brackets)
92 x 440 x 400 mm (table-top, with feet)
Weight:
6.2 kg

6.7.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

6.7.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

6.7.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
450,000 hours
(based on real warranty return rate data)

6.7.5 System bus

Connector (rear side):
Proprietary connector
Preferred cable:
LBB4416/xx
Maximum cable length:
50 m (per system bus connector)
Data signal interface:
Plastic optical fiber
Power supply via network:
27 to 56 V(DC)
Network power consumption:
9.0 W

6.7.6 Audio line inputs

Connector (rear side):
Female, galvanically separated XLR and female stereo cinch socket per input. The stereo signal from the cinch is internally converted to a mono signal
Preferred cable:
Shielded
Maximum input signal level:
18 dBV ± 1 dB (XLR)
6 dBV ± 1 dB (cinch)
Input range:
-12 dB to 0 dB with respect to maximum input level
Input sensitivity setting:
Software
Frequency response:
-3 dB points at 20 Hz and 20 kHz (tolerance ± 1 dB)
Input impedance:
100 kΩ (XLR)
12 kΩ (cinch)
Signal/Noise ratio:
87 dB(A) at maximum level
Common mode rejection ratio:
40 dB at 1 kHz
Input cross-talk:
75 dB at 100 Hz, 1 kHz and 10 kHz
Distortion:
< 0.05% at 1 kHz at -3 dB of the maximum input level

6.7.7 Audio microphone inputs (only input 1 and input 2)

Connector (rear side):
Female galvanically separated XLR per input

Preferred cable:
Shielded

Nominal input level:
-57 dBV based on 91 dBSPL for a microphone with sensitivity of 2 mV/Pa, a male voice with normal loudness and a speaker to microphone distance of 0.15 m

Headroom:
30 dB

Input range:
-7 to +8 dB with respect to nominal input level (limiter threshold)

Input sensitivity setting:
Software

Frequency response:
-3 dB points at 300 Hz and 20 kHz (tolerance ± 1 dB)
First order, high-pass speech filter at 300 Hz

Input impedance:
1360 Ω

Signal/Noise ratio
> 62 dB(A) with 25 dB headroom

Common mode rejection ratio:
> 55 dB at 100 Hz
> 65 dB at 1 kHz and 10 kHz

Phantom supply:
12 V ± 1 V (max. 15 mA)

Limiter:
Analog limiter, level -8 dB with respect to maximum
- attack time: 1 ms
- decay time: 300 ms
- threshold at nominal input level

(Only for audio expanders of version HW15/xx and higher. Hardware information can be obtained using the front panel menu.)

6.7.8 Audio outputs

Connector (rear side):
One galvanically separated XLR and one stereo (dual mono) cinch for each output

Preferred cable:
Shielded

Maximum output level:
+ 18 dBV ± 1 dB (XLR)
+ 6 dBV ± 1 dB (cinch)

Output range:
-30 dB to 0 dB with respect to maximal output level

Output level setting:
Software

Frequency response:
-3 dB points at 20 Hz and 20 kHz (tolerance ± 1 dB)

Output impedance:
< 100 Ω

Signal/Noise ratio:
> 89 dB(A) at maximum level

Output cross-talk:
< -85 dB

Distortion:
< 0.05% at 1 kHz at -3 dB of the maximum input signal

6.7.9 Control inputs

Connector (rear side):
Removable screw connector

Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)

Resistance detection (supervision enabled):

Cable short circuit
< 2.5 kΩ

Contact closed
7.5 kΩ to12 kΩ

Contact open
17.5 kΩ to 22 kΩ

Cable broken
> 27 kΩ

Resistance detection (supervision disabled):

Contact closed
< 12 kΩ

Contact open
> 17.5 kΩ

Maximum open voltage:
24 V(DC)

Internal pull-up current:
0.5 mA

External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

6.7.10 Control outputs

Connector (rear side):
Removable screw connector

Maximum cable length:
1 km

Contact type:
Relay contact, single pole, change-over contact (SPDT)

Maximum switching power:
Refer to the graph.

Off state (unpowered):
C-NC is closed, C-NO is open

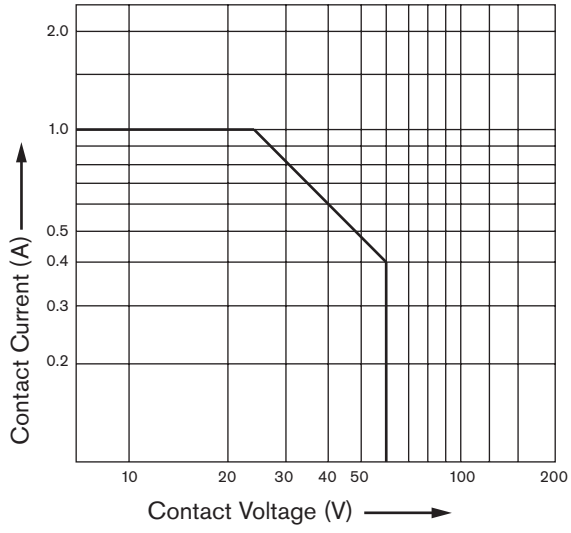


figure 6.11: Maximum switching power

6.7.11 Headphones

Connector (front side):
3.5 mm stereo jack socket for headphones

Maximum output voltage:
6 dBV with volume control

Rated load impedance:
8 to 600 Ω

Signal/Noise ratio:
> 80 dB (at maximum output level)

Distortion:
< 0.5%

7 LBB4404/00 CobraNet Interface

7.1 Introduction

The LBB4404/00 CobraNet Interface is used to interface between a CobraNet and Praesideo. The CobraNet interface can convert up to 4 audio channels from Praesideo to CobraNet and 4 audio channels from CobraNet to Praesideo at the same time. See figure 7.1 for a block diagram of the CobraNet interface.

Note

CobraNet™ is a registered trademark of Peak Audio, a division of Cirrus Logic, Inc.

CobraNet is a combination of software, hardware and network protocol which allows distribution of many channels of real-time, high quality digital audio over an Ethernet network. CobraNet is supported for switched Ethernet variants. CobraNet uses standard Ethernet packets and network infrastructure (controllers, switches, cabling, etc.) that operate in compliance with the IEEE 802.3u specification for Fast Ethernet. Fast Ethernet distance limitations apply to CobraNet installations: 100 meters over Cat-5 copper cable, 2 kilometers over multimode fiber. Proprietary Fast Ethernet via single mode fiber solutions can reach even further.

CobraNet can sent up to 64 channels of 48 kHz, 20-bit audio over a single 100 Mbit link in each direction. These channels are grouped in bundles.

See www.cobranet.info for information on CobraNet, including network design, network installation, network redundancy and troubleshooting.

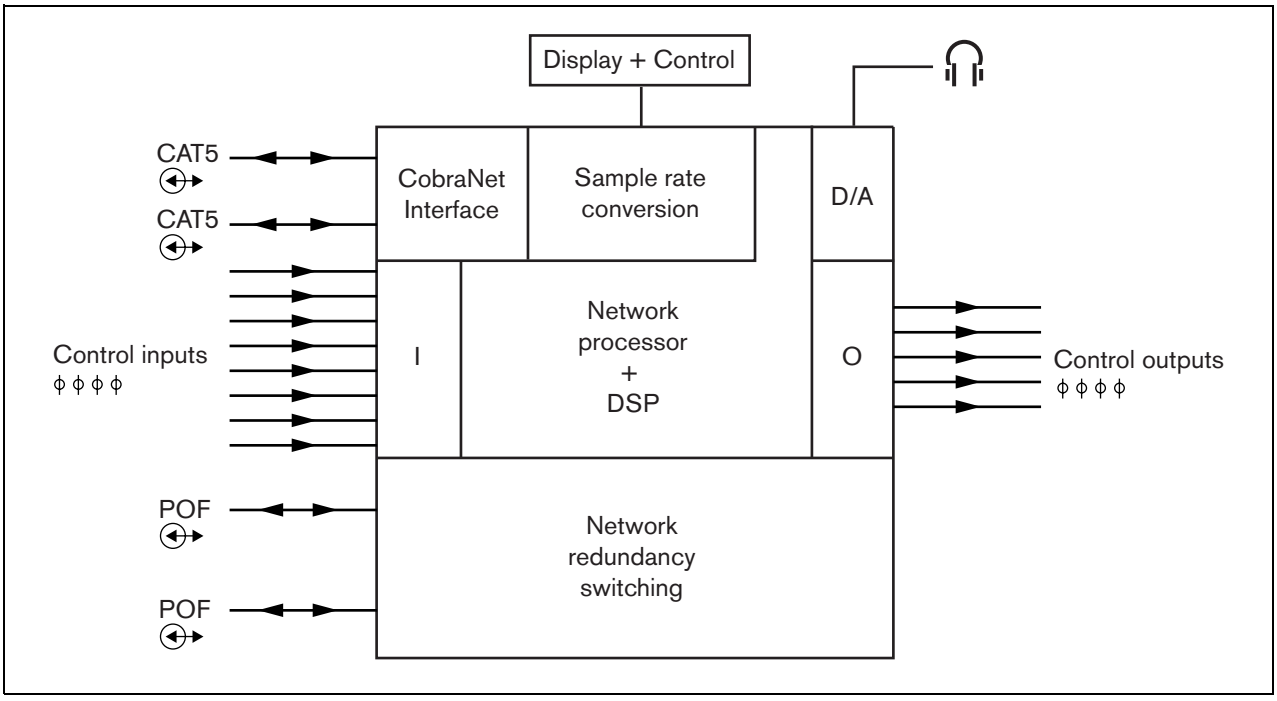


figure 7.1: Block diagram of the CobraNet interface

7.2 Controls and connectors

7.2.1 Front view

The front of the CobraNet interface (see figure 7.2) contains the following:

1 **Menu display** - A 2x16 character LCD display gives information about the CobraNet interface (see section 7.7).

2 **Menu button** - A turn-and-push button to operate the menu (see section 7.7).

3 **Monitoring headphones output** - A 3.5 mm (1/8 inch) jack socket to connect the headphones for audio monitoring purposes.

7.3 Rear view

The rear of the CobraNet interface (see figure 7.2) contains the following:

4 **System bus** - Two system bus connectors to connect the CobraNet interface to other Praesideo equipment (see section 7.4.2)

5 **CobraNet interface** - Two RJ45 sockets to connect the CobraNet interface to the CobraNet network (see section 7.4.3)

6 **Control inputs** - The control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 7.4).

7 **Control outputs** - The control outputs can be used to send signals to third party equipment to trigger actions generated by the Praesideo network (see section 7.4.5).

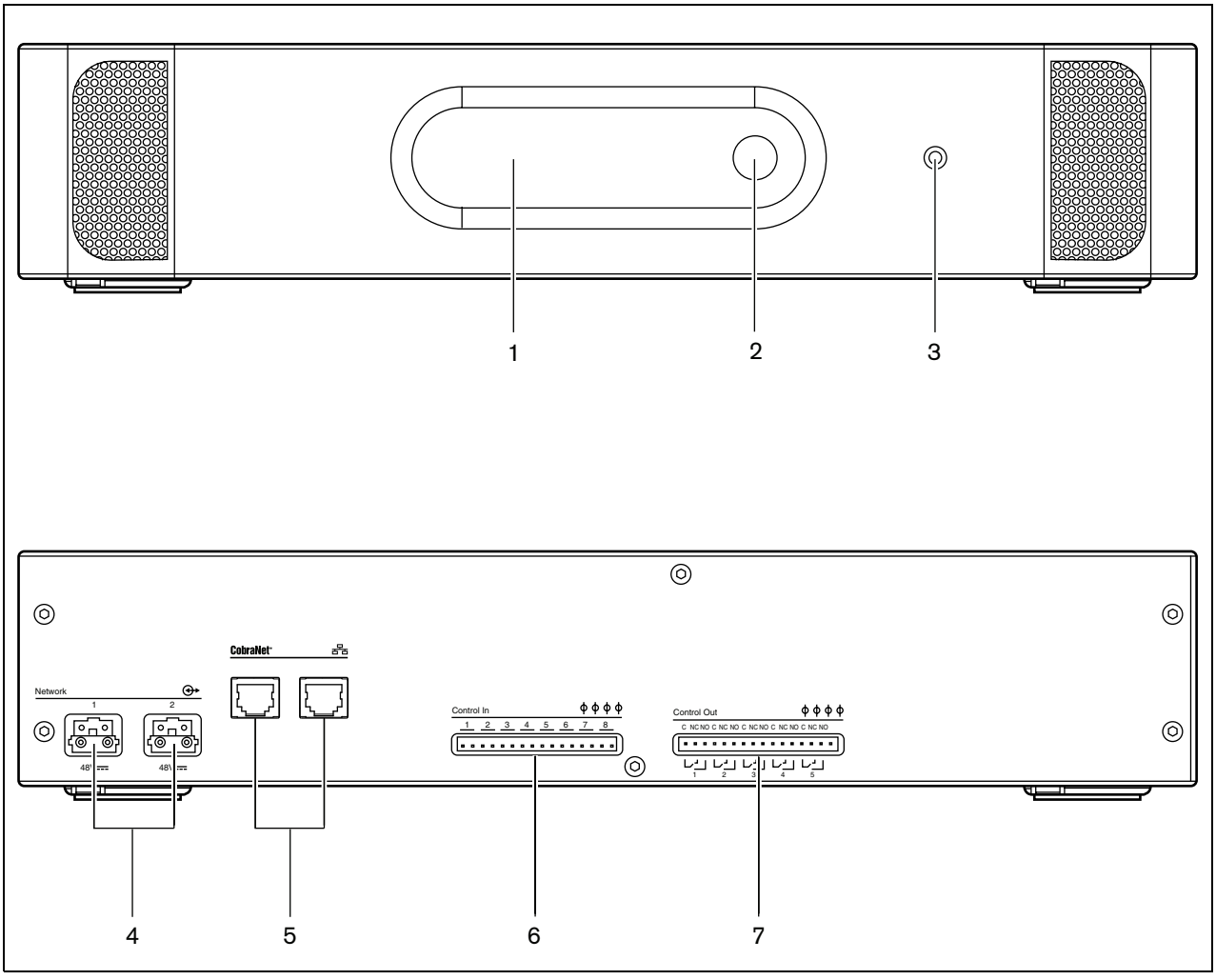


figure 7.2: Front and rear views of the CobraNet interface

7.4 Connections

7.4.1 Introduction

This section gives an overview of typical system connections using the CobraNet interface.

- Connecting the Praesideo network (see section 7.4.2).
- Connecting the CobraNet network (see section 7.4.3).
- Connecting control inputs (see section 7.4).
- Connecting control outputs (see section 7.4.5).

7.4.2 Connecting the Praesideo network

Connect the CobraNet interface to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

This unit is powered by the network controller, via the Praesideo system bus.

7.4.3 Connecting the CobraNet network

Connect the CobraNet interface to the CobraNet network using the Ethernet connectors and Cat-5 Ethernet cables. Use either one Cat-5 connection for a normal Ethernet connection or two for a redundant connection. Ethernet supports redundant connections between switches using self-healing topologies. Each connection has two indicators:

- The right indicator shows green for Ethernet link and flashing green for Ethernet activity.
- The left indicator lights yellow on the port in use and flashes yellow on the port in use if the interface is the conductor.

Note
For compliancy to EN54-16, the LBB4404/00 must be connected to an Ethernet switch of the type Belden/Hirschmann RSR20-0800M2M2T1UCCHPHH (an extended temperature version of the RSR20-0800M2M2T1SCCHPHH) in the same cabinet.

Caution
The Praesideo network interfaces do not provide extensive security measures to protect the system against malicious network attacks or broadcast data storms. Such measures would be insufficient on the long term anyway, because Praesideo systems in operation are unlikely to be updated regularly to repair security leaks. When audio connections are established on Ethernet, via CobraNet interfaces or OMNEO interfaces, these interfaces must be connected to a separate network, not accessible by others. Or setup a Praesideo specific VLAN by using Ethernet switches with VLAN capabilities to partition the network into multiple broadcast domains with one domain assigned solely to Praesideo. Because audio connections on Ethernet consume considerable network bandwidth and, unlike physically separate networks, VLANs share bandwidth, VLAN trunks may require aggregated links and/or quality of service prioritization.

7.4.4 Connecting control inputs

The CobraNet interface has 8 control inputs. The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 43.9). It also possible to supervise the cables for short-circuits and open connections (see figure 7.3 and figure 7.4). Whether a control input is actually supervised or not is defined in the configuration.

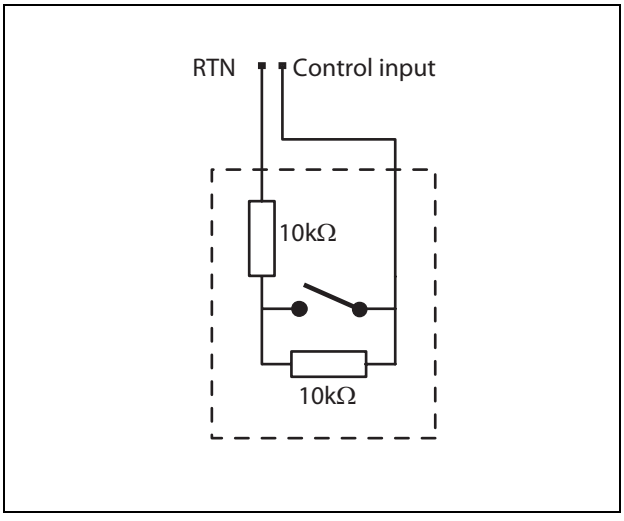


figure 7.3: Supervised control input

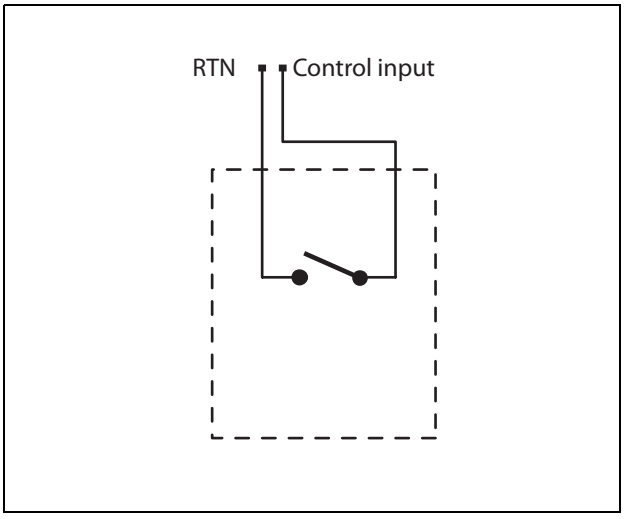


figure 7.4: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

7.4.5 Connecting control outputs

The CobraNet interface has 5 control outputs. The control outputs can be used to send signals to third party equipment to trigger actions. Each control output connection has three pins (see figure 7.5).

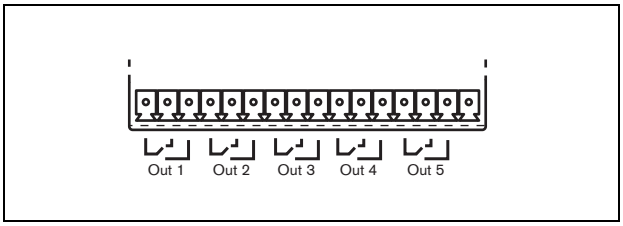


figure 7.5: Control outputs

The common (C) pin of the control output should always be connected. Whether the other pin that is connected is the normally closed (NC) or normally open (NO) depends on which action that take place when the control output is active (see table 7.1).

table 7.1: Control outputs details

Connection	Abbr.	Description
Normally closed	NC	By default, the NC contact is connected with common contact C. When the output is activated, the NC contact is opened.
Normally open	NO	By default, the NO contact is not connected with common contact C. When the output is activated, the NO contact is closed.

In the configuration, a purpose must be attached to the control output that indicates the action to be taken when it becomes active (see table 44.6).

7.5 Installation

The CobraNet interface is suitable for either table-top or 19-inch rack installation. Four feet (for table-top use) and two brackets (for rack installation) are supplied.

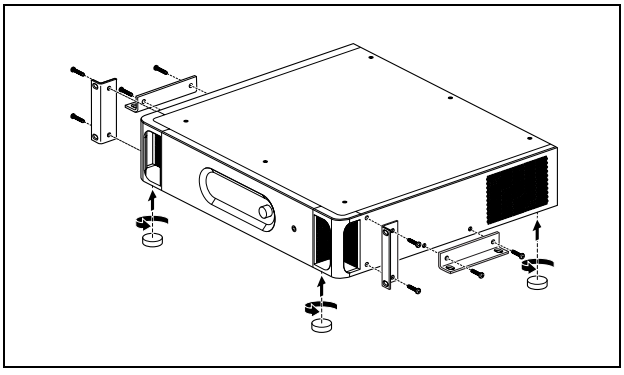


figure 7.6: Installation

Note
The center bracket positions can be used to secure the unit on a table or shelf. They can also be used to install the unit vertically to a wall.

Caution
When mounting the brackets to the unit, use the screws that are supplied with the brackets. Screws with a length of >10 mm may touch or damage internal parts of the unit.

7.6 CobraNet Configuration

The CobraNet must be configured using the *CobraNet Discovery* utility (see chapter 56). This application can be run from any PC that is connected to the CobraNet interfaces via an Ethernet network.

7.7 Using the configuration menu

7.7.1 Overview

A number of CobraNet interface settings are available via an interactive menu, using a 2x16 LCD display and a 'turn-and-push' menu button. The next figure gives an overview of the menu structure.

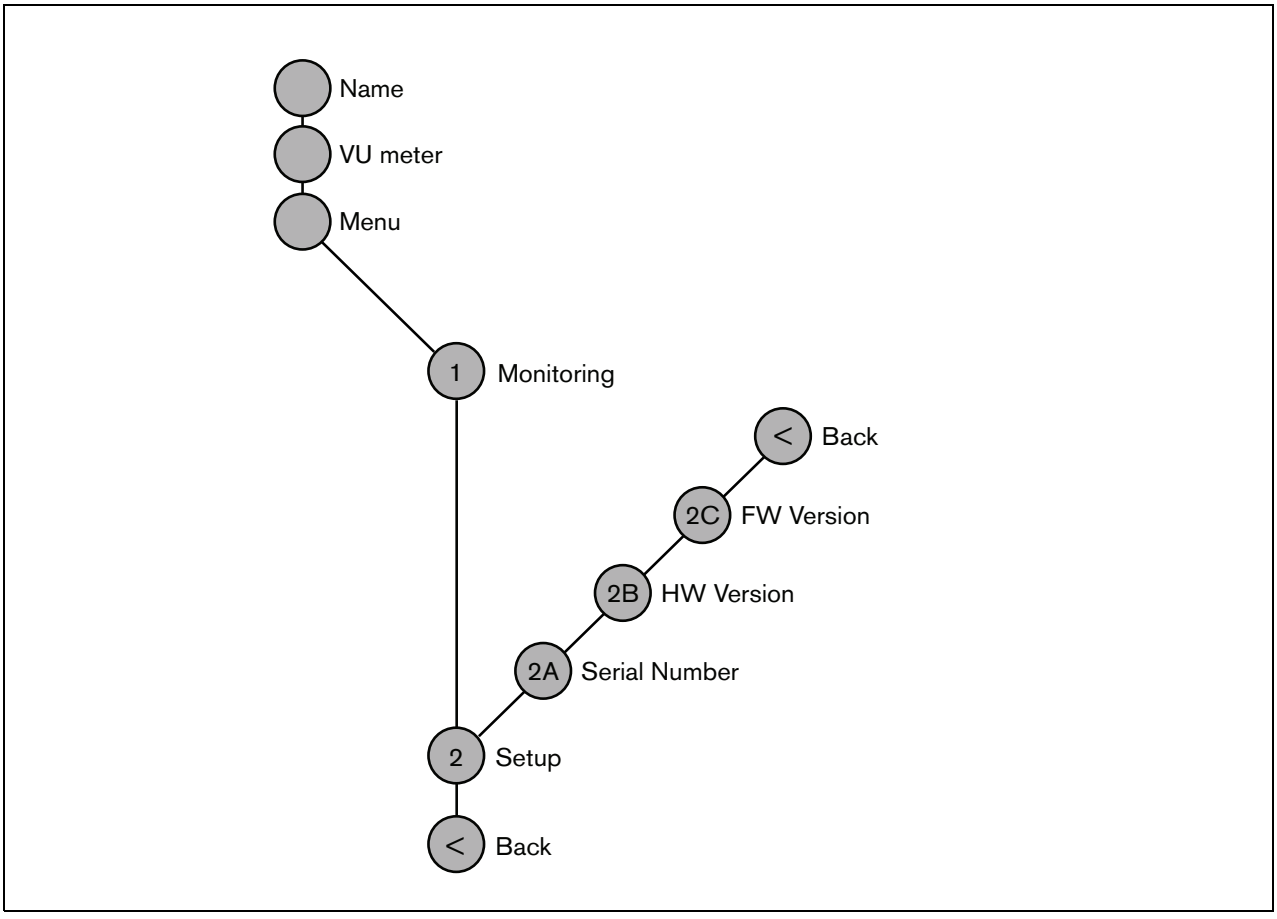


figure 7.7: Structure of the CobraNet interface front panel menu

7.7.2 Navigate through the menu

Operating the menu is always a sequence of alternating turns and pushes:

Turn the button to:
- Cycle through the menu items within a menu.
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

Push the button to:
- Confirm a chosen menu item (a blinking cursor appears).
- Go to a sub-menu (the sub-menu item character starts blinking).
- Confirm the selection of a settable option (the cursor disappears, the option value starts blinking).
- Confirm a selected value for a settable option (the value stops blinking, the cursor appears again).

Each menu is identified by a number or by a number plus a character (see figure 7.8). The item identification can be found at the start of the first line and is used to navigate to and from the sub-menus. Most menu items have one or more options. The value of an option can be changed by selecting a value from a list of available values.

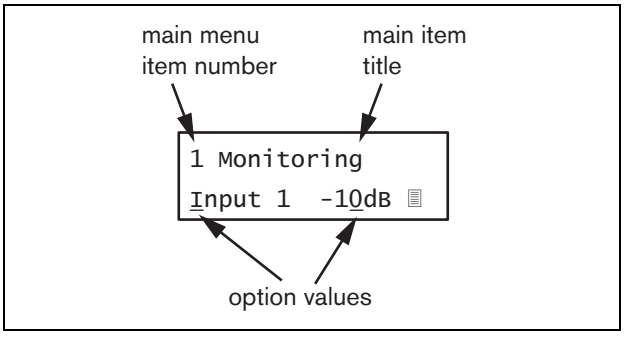


figure 7.8: Menu item screen elements

To navigate through the status screens:
1 Turn the button to move through the status screens (i.e. the *Name*, *VU meter* and *Menu* ... screens).

To navigate through the main menu:
1 Navigate in the status screens to *Menu*....
2 Push the button to go to the main menu. The menu item number starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To jump to a sub-menu:
1 Navigate to an item with three dots (e.g. *Setup*...).
2 Push the button to go to the sub-menu. The sub-menu item character starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To navigate through a sub-menu:
1 Turn the button to move the cursor to the sub-menu item character.
2 Push the button. The item character and title starts blinking.
3 Turn to select another sub-menu item character.
4 Push to confirm the selection.

To change option values:
1 Navigate to the applicable menu item.
2 Turn the button to move the cursor to the option value you want to change.
3 Push the button to activate the option. The option starts to blink.
4 Turn the button to select a new option value.
5 Push the button to confirm the new value. The option value stops blinking.
6 Turn the button to move the cursor to another settable option (when available) and repeat steps 3 to 5.

To jump back from a sub-menu to an item of the main menu:

1 Turn the button to move the cursor to the main menu item number.
2 Push the button. The item number starts blinking.
3 Turn to select another item number.
4 Push to confirm the selection.

OR

1 Turn the button to < *Back*.
2 Push to confirm.

To jump back from the main menu to the status screens:

1 Jump back to the main menu.
2 Turn the button to < *Back*.
3 Push to confirm.

Example:

Set the output that is available on the headphones output of the audio expander. (This example assumes you start from the default screen):

```
Cobranet Interf
```

1 Turn to the button to go to the *Menu ...* in the status screens:

```
Menu...
```

2 Push the button to confirm:

```
1 Monitoring
Off
```

3 Push the button to confirm:

```
1 Monitoring
Off
```

4 Turn the button to the *Monitoring* option:

```
1 Monitoring
Off
```

5 Push the button to confirm:

```
1 Monitoring
Off
```

6 Turn the button to change the audio output you want to listen to:

```
1 Monitoring
Output 3    0 dB
```

7 Push the button to confirm:

```
1 Monitoring
Output 3    0 dB
```

8 Turn to move the cursor to the menu number:

```
1 Monitoring
Output 3    0 dB
```

9 Push the button to confirm:

```
1 Monitoring
Output 3    0 dB
```

10 Turn to move to the < *Back* item:

```
< Back
```

11 Push the button to confirm:

```
Menu...
```

12 Turn the button to go to the default screen:

```
Cobranet Interf
```

7.8 Configuration and operation

7.8.1 Introduction

The next sections give descriptions of the possible configuration options. Each description is followed by the relevant menu items with detailed instructions per menu option. The default values are indicated by an asterisk (*) when applicable.

7.8.2 Start-up

When the CobraNet interface is (re)started, the display shows the name of the unit. If it shows *Load Unit Software*, the unit does not contain any firmware or contains DCN Next Generation firmware. DCN Next Generation firmware must be replaced by Praesideo firmware (see section 37.5).

7.8.3 Status screens

The status screens (see table 7.2) provide general information about the status of the CobraNet interface.

table 7.2: Status screens

Menu Item	Description
Name	Shows the name of the unit and (possibly) its fault status (see section 7.8.4)
VU Meter	Visual indication of the signal strengths on all audio inputs and audio outputs of the CobraNet interface.

7.8.4 Fault status

If there is an active fault, the *Name* screen also shows the fault status (see table 7.3). If there is more than one active fault, only the most severe fault is shown. A fault status only provides global information. The exact source of a fault can be found out using the fault events list in this manual (see chapter 46).

table 7.3: Fault status (severity: high to low)

Fault status	Description
No network	The optical network is not available.
Fault: CobraNet	Fault in the CobraNet network.
Fault: Internal	Fault in the CobraNet interface.
Fault: Input CIn	Fault in control input n. (If n = +, faults in multiple control inputs.)

7.8.5 Main menu

The *Menu ...* item (see table 7.4) provides access to the main menu.

table 7.4: Main menus

Menu item	Description
1 Monitoring	Go to the *Monitoring* submenu. See section 7.8.6.
2 Setup	Go to the *Setup* submenu. See section 7.8.7.

7.8.6 Set monitoring options

The *Monitoring* submenu is used to set which signal is sent to the monitoring headphones. It can be one of the audio inputs, one of the audio outputs or no signal at all. Furthermore, the screen provides level meters for a visual identification of the actual signal strength.

table 7.5: Monitoring submenu

Menu item	Option	Value 1	Value 2	Description
1 Monitoring	Source:			
	- *Input* n	Input nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio input n is available on the headphones output.
	- *Output* n	Output nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio output n is available on the headphones output.
	- *Off**			The headphones output is off during normal operation.

7.8.7 View version information

The *Serial Number*, *HW Version* and *SW Version* menu items are used to obtain version information about the CobraNet interface.

table 7.6: Version information menu items

Menu item	Value (read-only)	Description
2A Serial Number	e.g. *1C.0.0030C*	Shows the hexadecimal serial number.
2B HW Version	e.g. *01.00*	Shows the hardware version.
2C FW Version	e.g. *3.00.1419*	Shows the version number of the firmware. This must be the same for all units in the system.

7.9 Technical data

7.9.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm depth behind the brackets, 40 mm in front of the brackets)
92 x 440 x 400 mm (table-top, with feet)

Weight:
6 kg

7.9.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)

Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)

Air pressure:
600 to 1100 hPa

7.9.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4

Fast transients immunity:
During fast transients bursts according to EN61000-4-4, the Cobranet audio signal might be lost. After the burst, this signal restores automatically.

Electrical safety:
IEC60065 (CB-scheme)
EN60065

Approvals:
CE marking
EN54-16 and ISO7240-16

7.9.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C

MTBF:
450,000 hours
(based on real warranty return rate data)

7.9.5 System bus

Connector (rear side):
Proprietary connector

Preferred cable:
LBB4416/xx

Maximum cable length:
50 m (per system bus connector)

Data signal interface:
Plastic optical fiber

Network power consumption:
11 W

7.9.6 Control inputs

Connector (rear side):
Removable screw connector

Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)

Resistance detection (supervision enabled):

Cable short circuit
< 2.5 kΩ

Contact closed
7.5 kΩ to12 kΩ

Contact open
17.5 kΩ to 22 kΩ

Cable broken
> 27 kΩ

Resistance detection (supervision disabled):

Contact closed
< 12 kΩ

Contact open
> 17.5 kΩ

Maximum open voltage:
24 V(DC)

Internal pull-up current:
0.5 mA

External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

7.9.7 Control outputs

Connector (rear side):
Removable screw connector
Maximum cable length:
1 km
Contact type:
Relay contact, single pole, change-over contact (SPDT)
Maximum switching power:
Refer to the graph.
Contact current:
1 A
Off state (unpowered):
C-NC is closed, C-NO is open

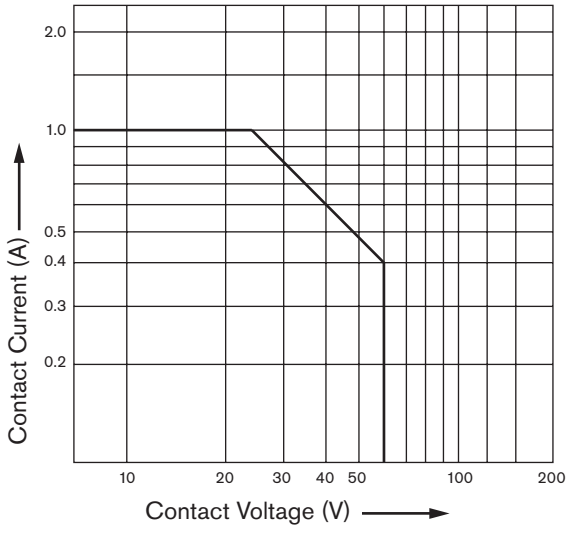


figure 7.9: Maximum switching power

7.9.8 CobraNet

Connector (rear side):
RJ45 sockets
Preferred cable:
Cat-5 or better
Network:
Ethernet 100/1000Base-T
Word length:
16-, 20-, or 24-bit
Channels:
4 in/4 out (max. 64 on CobraNet)
Sample rate:
48 kHz
Latency:
5.33 ms
Integrity assurance:
Watchdog

7.9.9 Headphones

Connector (front side):
3.5 mm stereo jack socket for headphones
Maximum output voltage:
6 dBV with volume control
Rated load impedance:
8 to 600 Ω
Signal/Noise ratio:
> 80 dB (at maximum output level)
Distortion:
< 0.5%

8 PRS-4OMI4 OMNEO Interface

8.1 Introduction

The PRS-4OMI4 OMNEO Interface is used to interface between an OMNEO or Dante network and Praesideo. The OMNEO interface can convert up to 4 audio channels from Praesideo to OMNEO and 4 audio channels from OMNEO to Praesideo at the same time. See figure 8.1 for a block diagram of the OMNEO interface.

OMNEO is an open media networking architecture, developed by Bosch Security Systems. Through the use of standard communication protocols, OMNEO offers two main components: a media program transport protocol suite that offers low latency, high-quality multichannel media stream exchange, and a robust system control protocol suite that provides reliable and secure control and monitoring for media networks of all sizes.
OMNEO operates over industry-standard IP equipment, and allows the implementation of high performance media systems using existing local area networks.

OMNEO's program transport component is the result of a partnership between Bosch Security Systems and Audinate Pty. OMNEO uses Audinate's Dante networking technology to provide standards-based, routable IP media transport. OMNEO's system control component is an open Bosch Security Systems development, named OCA, for Open Control Architecture. It includes many features for flexibility, reliability, security, and compatible growth over the years.

Because all Praesideo products use a proprietary Praesideo control protocol with the Praesideo network controller as system controller, for compatibility reasons the PRS-4OMI4 implements only the program transport component of OMNEO. The PRS-4OMI4 can be used in a similar way as the LBB4404/00 CobraNet interface, but instead of using CobraNet it is capable of audio interfacing with other devices using OMNEO or with devices using Dante. It uses the OMNEO/Dante 48 kHz sample rate mode for uncompressed digital audio with 24-bit word length. It offers additional advantages over the LBB4404/00 CobraNet interface by having a dual redundant network connection for Ethernet with built-in Ethernet switch for daisy chaining of multiple devices and support of Rapid Spanning Tree Protocol for maximum reliability.

Installing Audinate's Dante Virtual Soundcard (DVS) on a PC allows that PC to be used as audio source for a Praesideo system with the PRS-4OMI4. In that way a microphone connected to the PC (or an internal PC microphone) can be used as microphone for a Praesideo PC call station without the need for a normal Praesideo call station. Also multiple background music (BGM) streams played back from the PC via Windows Media Players can be routed into a Praesideo system via the DVS and the PRS-4OMI4.

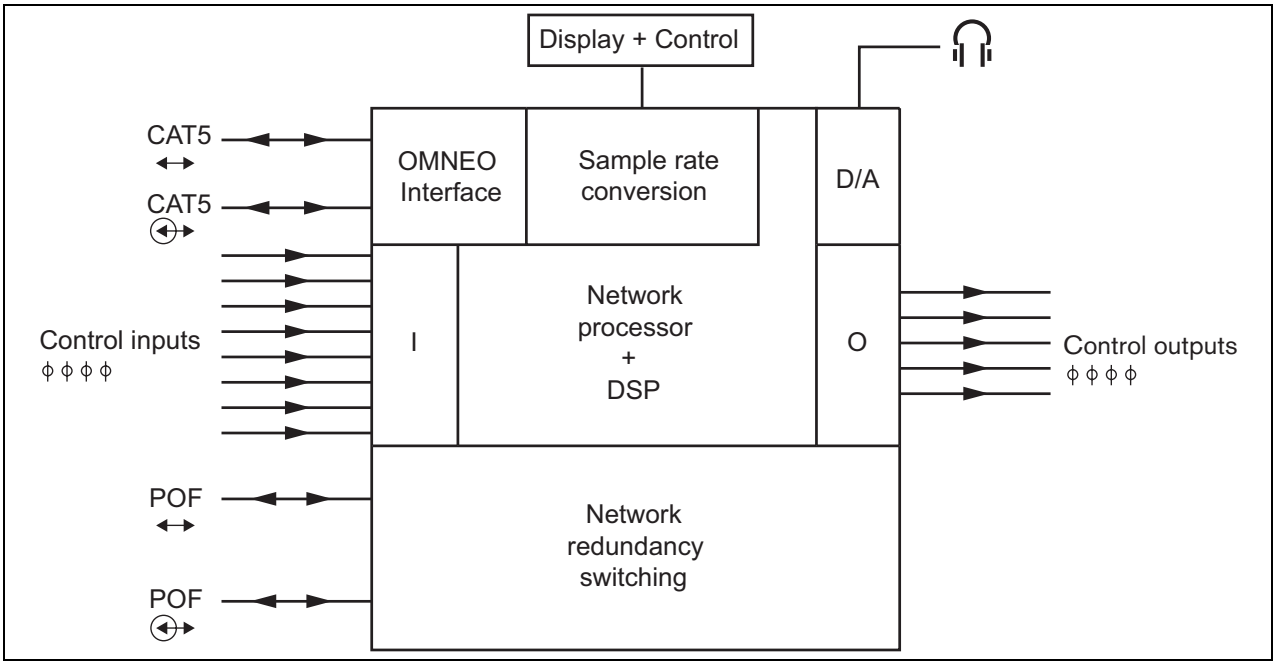


figure 8.1: Block diagram of the OMNEO interface

8.2 Controls and connectors

8.2.1 Front view

The front of the OMNEO interface (see figure 8.2) contains the following:

1 **Menu display** - A 2x16 character LCD display gives information about the OMNEO interface (see section 8.7).

2 **Menu button** - A turn-and-push button to operate the menu (see section 8.7).

3 **Monitoring headphones output** - A 3.5 mm (1/8 inch) jack socket to connect the headphones for audio monitoring purposes.

8.3 Rear view

The rear of the OMNEO interface (see figure 8.2) contains the following:

4 **System bus** - Two system bus connectors to connect the OMNEO interface to other Praesideo equipment (see section 8.4.2)

5 **OMNEO interface** - Two RJ45 sockets to connect the OMNEO interface to an Ethernet network with OMNEO or Dante audio transport (see section 8.4.3)

6 **Control inputs** - The control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 8.4.4).

7 **Control outputs** - The control outputs can be used to send signals to third party equipment to trigger actions generated by the Praesideo network (see section 8.4.5).

8.4 Connections

8.4.1 Introduction

This section gives an overview of typical system connections using the OMNEO interface.

- Connecting the Praesideo network (see section 8.4.2).
- Connecting the OMNEO network (see section 8.4.3).
- Connecting control inputs (see section 8.4.4).
- Connecting control outputs (see section 8.4.5).

8.4.2 Connecting the Praesideo network

Connect the OMNEO interface to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

This unit is powered by the network controller, via the Praesideo system bus.

8.4.3 Connecting the OMNEO network

Connect the OMNEO interface to the OMNEO/Dante network using the Ethernet connectors and Cat-5 Ethernet cables. Use either one Cat-5 connection for a normal Ethernet connection or two for a redundant connection. Each connector has two indicators:

- The left LED (as seen from the rear) is the Link Detection indicator; it lights up green for a 1 Gbit connection or orange for a 100 Mbit connection. This indication applies to the link speed on the attached cable, which is not necessarily the same as the speed of the whole network.
- The right LED blinks yellow in case of network activity.

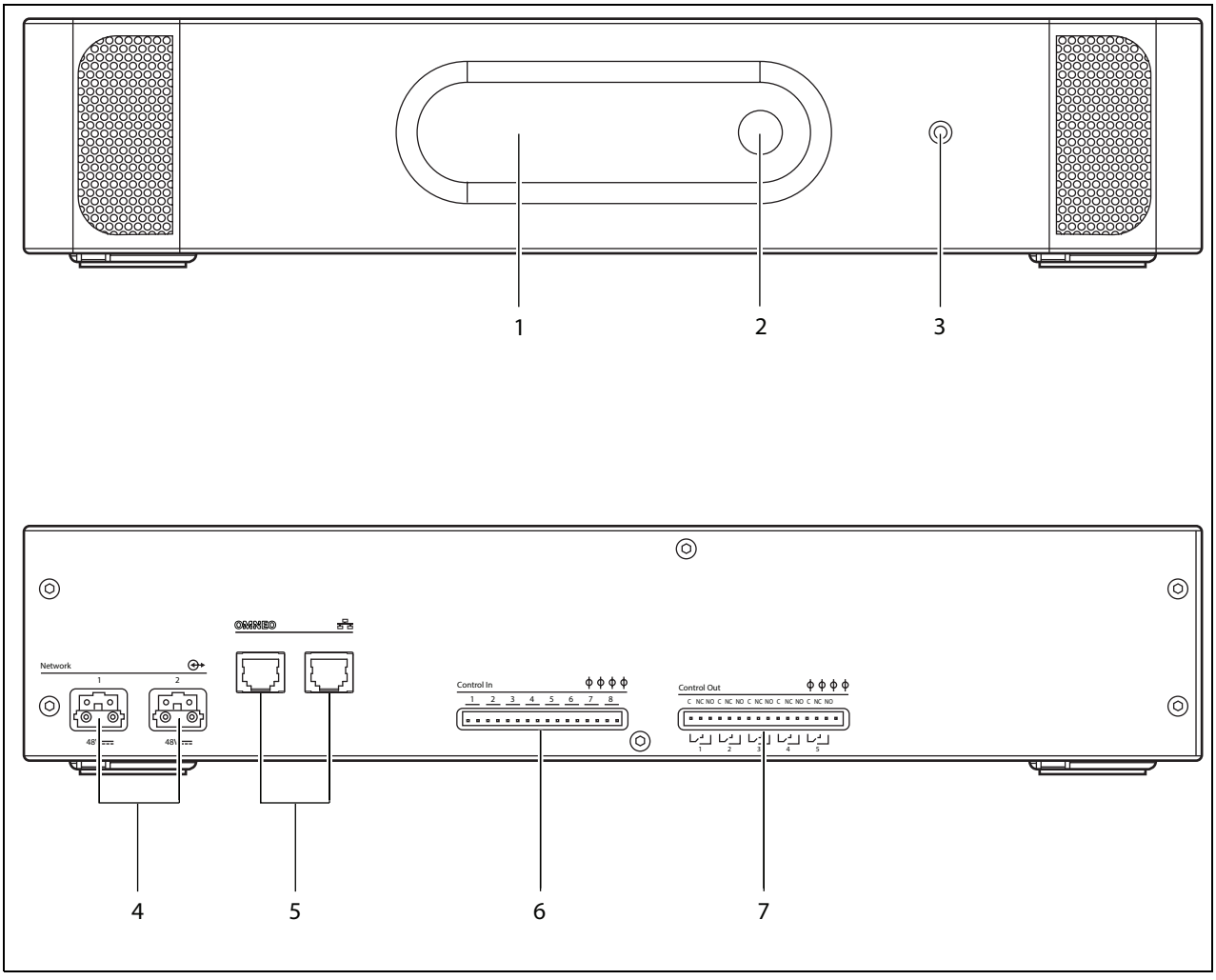


figure 8.2: Front and rear views of the OMNEO interface

8.4.4 Connecting control inputs

The OMNEO interface has 8 control inputs. The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 43.10). It also possible to supervise the cables for short-circuits and open connections (see figure 8.3 and figure 8.4). Whether a control input is actually supervised or not is defined in the configuration.

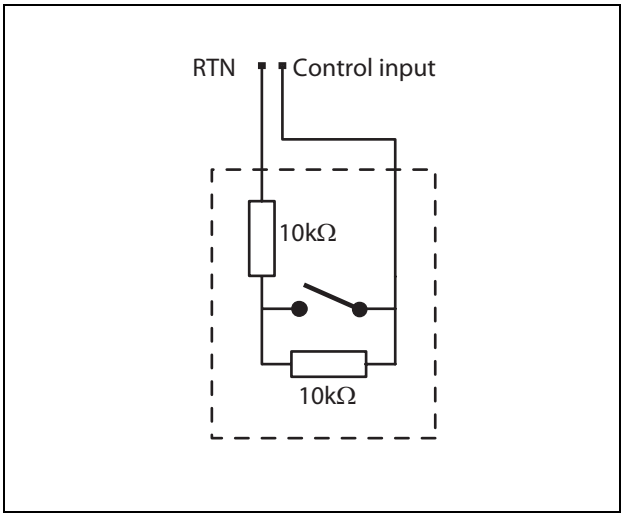


figure 8.3: Supervised control input

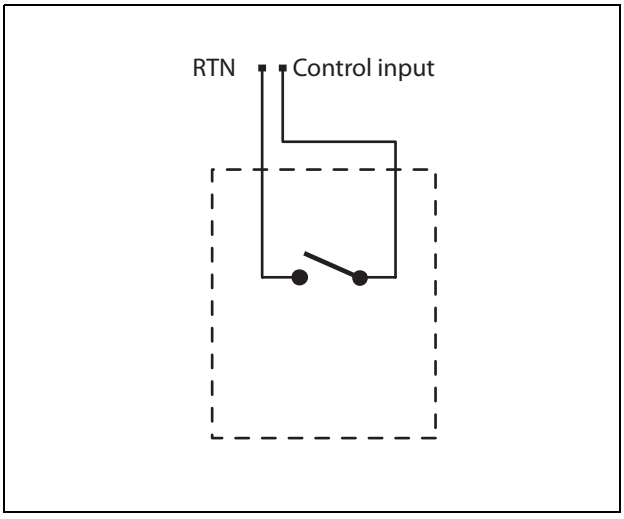


figure 8.4: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

8.4.5 Connecting control outputs

The OMNEO interface has 5 control outputs. The control outputs can be used to send signals to third party equipment to trigger actions. Each control output connection has three pins (see figure 8.5).

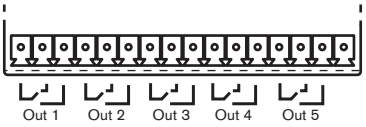


figure 8.5: Control outputs

The common (C) pin of the control output should always be connected. Whether the other pin that is connected is the normally closed (NC) or normally open (NO) depends on which action that take place when the control output is active (see table 8.1).

table 8.1: Control outputs details

Connection	Abbr.	Description
Normally closed	NC	By default, the NC contact is connected with common contact C. When the output is activated, the NC contact is opened.
Normally open	NO	By default, the NO contact is not connected with common contact C. When the output is activated, the NO contact is closed.

In the configuration, a purpose must be attached to the control output that indicates the action to be taken when it becomes active (see table 44.6).

8.5 Installation

The OMNEO interface is suitable for either table-top or 19-inch rack installation. Four feet (for table-top use) and two brackets (for rack installation) are supplied.

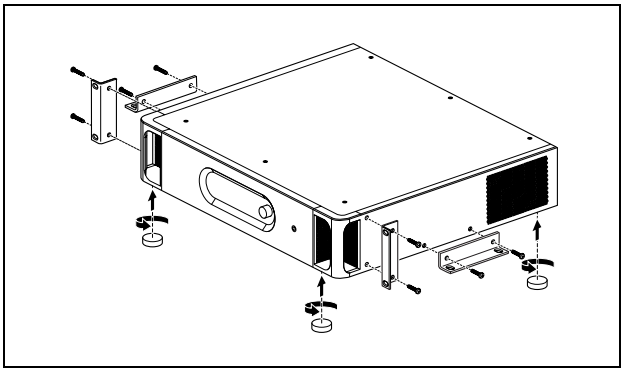


figure 8.6: Installation

Note
The center bracket positions can be used to secure the unit on a table or shelf. They can also be used to install the unit vertically to a wall.

Caution
When mounting the brackets to the unit, use the screws that are supplied with the brackets. Screws with a length of >10 mm may touch or damage internal parts of the unit.

The PRS-4OMI4 is delivered with a Snap Ferrite (Würth 742 717 22), see figure 8.7. All wires to the Control inputs contacts and coming from the Control output contacts must be fed through this ferrite by snapping the ferrite around the wire bundle.

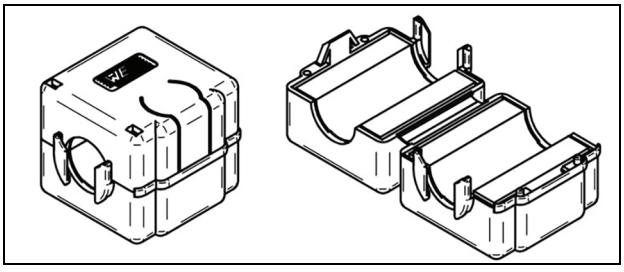


figure 8.7: Snap Ferrite

8.6 OMNEO Configuration

The OMNEO must be configured using the *Dante Controlller* utility (see chapter 57). This application can be run from any PC that is connected to the OMNEO interfaces via an Ethernet network.

8.7 Using the configuration menu

8.7.1 Overview

A number of OMNEO interface settings are available via an interactive menu, using a 2x16 LCD display and a 'turn-and-push' menu button. The next figure gives an overview of the menu structure.

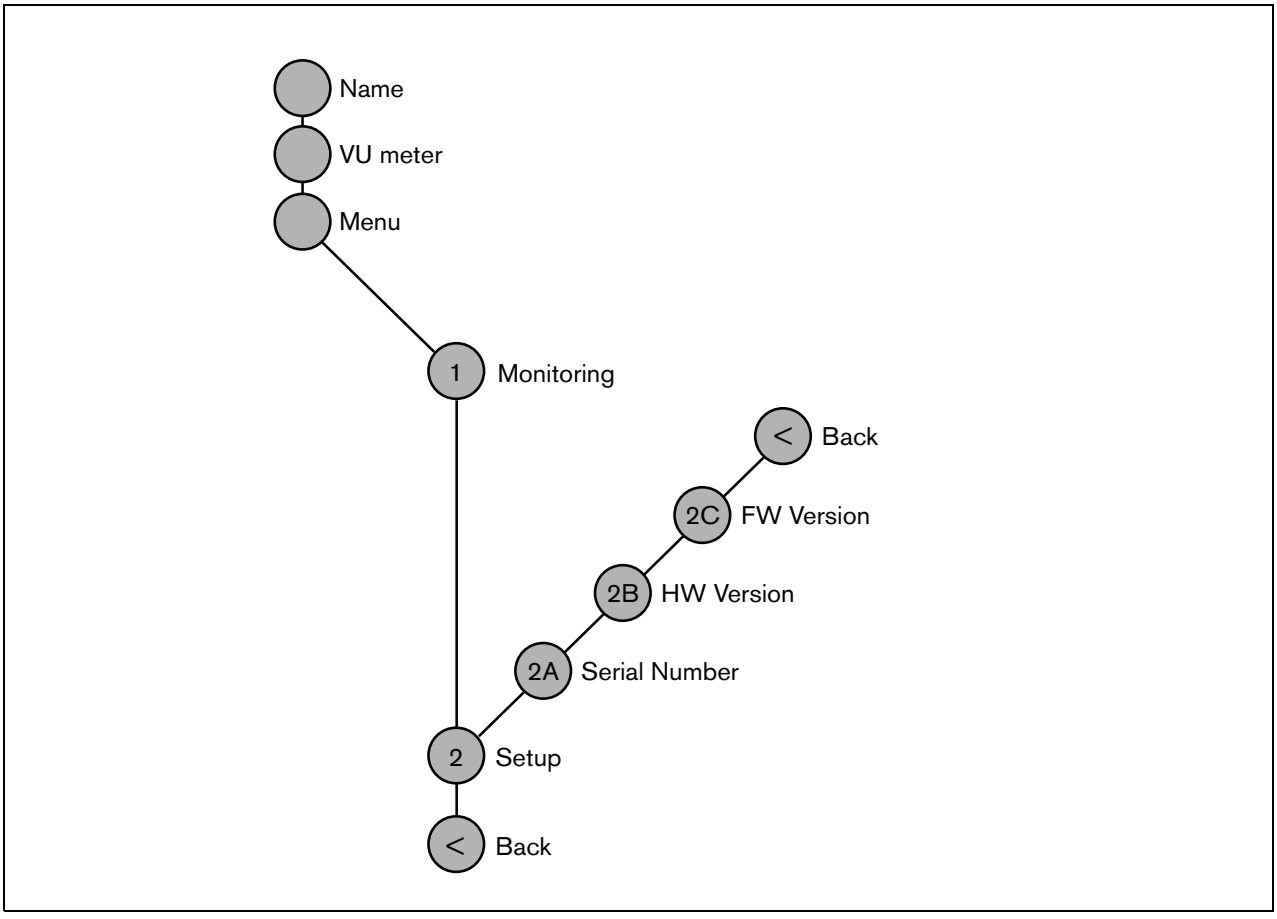


figure 8.8: Structure of the OMNEO interface front panel menu

8.7.2 Navigate through the menu

Operating the menu is always a sequence of alternating turns and pushes:

Turn the button to:
- Cycle through the menu items within a menu.
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

Push the button to:
- Confirm a chosen menu item (a blinking cursor appears).
- Go to a sub-menu (the sub-menu item character starts blinking).
- Confirm the selection of a settable option (the cursor disappears, the option value starts blinking).
- Confirm a selected value for a settable option (the value stops blinking, the cursor appears again).

Each menu is identified by a number or by a number plus a character (see figure 8.8). The item identification can be found at the start of the first line and is used to navigate to and from the sub-menus. Most menu items have one or more options. The value of an option can be changed by selecting a value from a list of available values.

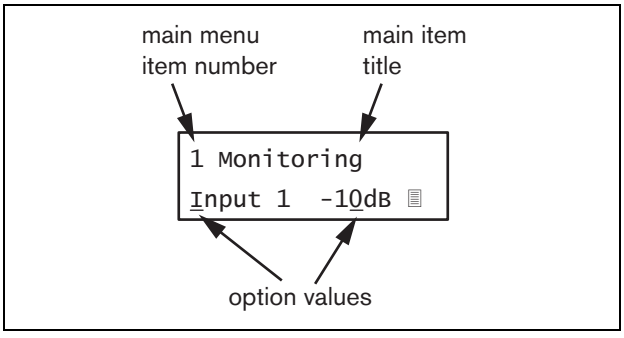


figure 8.9: Menu item screen elements

To navigate through the status screens:
1 Turn the button to move through the status screens (i.e. the *Name*, *VU meter* and *Menu ...* screens).

To navigate through the main menu:
1 Navigate in the status screens to *Menu...*.
2 Push the button to go to the main menu. The menu item number starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To jump to a sub-menu:
1 Navigate to an item with three dots (e.g. *Setup...*).
2 Push the button to go to the sub-menu. The sub-menu item character starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To navigate through a sub-menu:
1 Turn the button to move the cursor to the sub-menu item character.
2 Push the button. The item character and title starts blinking.
3 Turn to select another sub-menu item character.
4 Push to confirm the selection.

To change option values:
1 Navigate to the applicable menu item.
2 Turn the button to move the cursor to the option value you want to change.
3 Push the button to activate the option. The option starts to blink.
4 Turn the button to select a new option value.
5 Push the button to confirm the new value. The option value stops blinking.
6 Turn the button to move the cursor to another settable option (when available) and repeat steps 3 to 5.

To jump back from a sub-menu to an item of the main menu:

1 Turn the button to move the cursor to the main menu item number.
2 Push the button. The item number starts blinking.
3 Turn to select another item number.
4 Push to confirm the selection.

OR

1 Turn the button to < *Back*.
2 Push to confirm.

To jump back from the main menu to the status screens:

1 Jump back to the main menu.
2 Turn the button to < *Back*.
3 Push to confirm.

Example:

Set the output that is available on the headphones output of the audio expander. (This example assumes you start from the default screen):

```
OMNEO Interface
```

1 Turn to the button to go to the *Menu ...* in the status screens:

```
Menu...
```

2 Push the button to confirm:

```
1 Monitoring
Off
```

3 Push the button to confirm:

```
1 Monitoring
Off
```

4 Turn the button to the *Monitoring* option:

```
1 Monitoring
Off
```

5 Push the button to confirm:

```
1 Monitoring
Off
```

6 Turn the button to change the audio output you want to listen to:

```
1 Monitoring
Output 3    0 dB
```

7 Push the button to confirm:

```
1 Monitoring
Output 3    0 dB
```

8 Turn to move the cursor to the menu number:

```
1 Monitoring
Output 3    0 dB
```

9 Push the button to confirm:

```
1 Monitoring
Output 3    0 dB
```

10 Turn to move to the < *Back* item:

```
< Back
```

11 Push the button to confirm:

```
Menu...
```

12 Turn the button to go to the default screen:

```
OMNEO Interface
```

8.8 Configuration and operation

8.8.1 Introduction

The next sections give descriptions of the possible configuration options. Each description is followed by the relevant menu items with detailed instructions per menu option. The default values are indicated by an asterisk (*) when applicable.

8.8.2 Start-up

When the OMNEO interface is (re)started, the display shows the name of the unit. If it shows *Load Unit Software*, the unit does not contain any firmware or contains DCN Next Generation firmware. DCN Next Generation firmware must be replaced by Praesideo firmware (see section 37.5).

8.8.3 Status screens

The status screens (see table 8.2) provide general information about the status of the CobraNet interface.

table 8.2: Status screens

Menu Item	Description
Name	Shows the name of the unit and (possibly) its fault status (see section 8.8.4)
VU Meter	Visual indication of the signal strengths on all audio inputs and audio outputs of the OMNEO interface.

8.8.4 Fault status

If there is an active fault, the *Name* screen also shows the fault status (see table 8.3). If there is more than one active fault, only the most severe fault is shown. A fault status only provides global information. The exact source of a fault can be found out using the fault events list in this manual (see chapter 46).

table 8.3: Fault status (severity: high to low)

Fault status	Description
No network	The optical network is not available.
Fault: OMNEO	Fault in the OMNEO (Ethernet) network.
Fault: Internal	Fault in the OMNEO interface.
*Fault: Input CI*n	Fault in control input n. (If n = +, faults in multiple control inputs.)

8.8.5 Main menu

The *Menu ...* item (see table 8.4) provides access to the main menu.

table 8.4: Main menus

Menu item	Description
1 Monitoring	Go to the *Monitoring* submenu. See section 8.8.6.
2 Setup	Go to the *Setup* submenu. See section 8.8.7.

8.8.6 Set monitoring options

The *Monitoring* submenu is used to set which signal is sent to the monitoring headphones. It can be one of the audio inputs, one of the audio outputs or no signal at all. Furthermore, the screen provides level meters for a visual identification of the actual signal strength.

table 8.5: Monitoring submenu

Menu item	Option	Value 1	Value 2	Description
1 Monitoring	Source:			
	- *Input* n	Input nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio input n is available on the headphones output.
	- *Output* n	Output nr: *1* to *4*	Volume: *-31* to *0 dB*	The signal from audio output n is available on the headphones output.
	- *Off**			The headphones output is off during normal operation.

8.8.7 View version information

The *Serial Number*, *HW Version* and *SW Version* menu items are used to obtain version information about the OMNEO interface.

table 8.6: Version information menu items

Menu item	Value (read-only)	Description
2A Serial Number	e.g. *25.0.0030C*	Shows the hexadecimal serial number.
2B HW Version	e.g. *01.00*	Shows the hardware version.
2C FW Version	e.g. *3.00.1419*	Shows the version number of the firmware. This must be the same for all units in the system.

8.9 Technical data

8.9.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm depth behind the brackets, 40 mm in front of the brackets)
92 x 440 x 400 mm (table-top, with feet)

Weight:
6 kg

8.9.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)

Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)

Air pressure:
600 to 1100 hPa

8.9.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4

Electrical safety:
IEC60065 (CB-scheme)
EN60065

Approvals:
CE marking
EN54-16 and ISO7240-16

8.9.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C

MTBF:
450,000 hours
(based on real warranty return rate data)

8.9.5 System bus

Connector (rear side):
Proprietary connector

Preferred cable:
LBB4416/xx

Maximum cable length:
50 m (per system bus connector)

Data signal interface:
Plastic optical fiber

Network power consumption:
10 W

8.9.6 Control inputs

Connector (rear side):
Removable screw connector

Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)

Resistance detection (supervision enabled):

Cable short circuit
< 2.5 kΩ

Contact closed
7.5 kΩ to12 kΩ

Contact open
17.5 kΩ to 22 kΩ

Cable broken
> 27 kΩ

Resistance detection (supervision disabled):

Contact closed
< 12 kΩ

Contact open
> 17.5 kΩ

Maximum open voltage:
24 V(DC)

Internal pull-up current:
0.5 mA

External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

8.9.7 Control outputs

Connector (rear side):
Removable screw connector
Maximum cable length:
1 km
Contact type:
Relay contact, single pole, change-over contact (SPDT)
Maximum switching power:
Refer to the graph.
Contact current:
1 A
Off state (unpowered):
C-NC is closed, C-NO is open

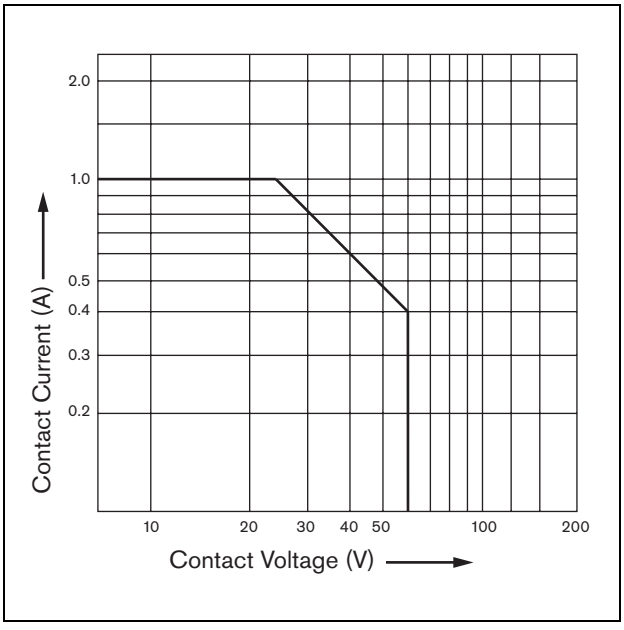


figure 8.10: Maximum switching power

8.9.8 OMNEO

Connector (rear side):
RJ45 sockets
Preferred cable:
Cat-5 or better
Network:
Ethernet 100/1000Base-T
Word length:
16-, 20-, or 24-bit
Channels:
4 in/4 out (max. 64 on Ethernet 100Base-T)
Sample rate:
48 kHz
Latency:
1 ms
Integrity assurance:
Watchdog

8.9.9 Headphones

Connector (front side):
3.5 mm stereo jack socket for headphones
Maximum output voltage:
6 dBV with volume control
Rated load impedance:
8 to 600 Ω
Signal/Noise ratio:
> 80 dB (at maximum output level)
Distortion:
< 0.5%

9 Power Amplifiers

9.1 Introduction

The PRS-1P500, PRS-2P250 and PRS-4P125 power amplifiers are the successors of the LBB4421/10, LBB4422/10 and LBB4424/10 power amplifiers. The main difference is that the efficiency of the new amplifiers is higher, so their power consumption is less for the same output power. This is especially noticeable in Idle mode and in Stand-by or Power save mode, saving valuable battery power in situations where this is allowed (not for EN54-16 compliant installations).

The main function of the Power Amplifiers is the amplification of audio signals for the loudspeakers. The amplifiers are high-efficiency class D amplifiers with switched mode power supply. The amplifiers are protected against overload, overheat and short-circuits. See figure 9.1 for a block diagram of the power amplifier. The power amplifiers have configurable audio processing functions, like parametric equalization, audio delay and the possibility for noise dependent automatic volume control (AVC).

Note
The number of inputs, spare amplifier connections, loudspeaker lines and control outputs depends on the type of power amplifier.

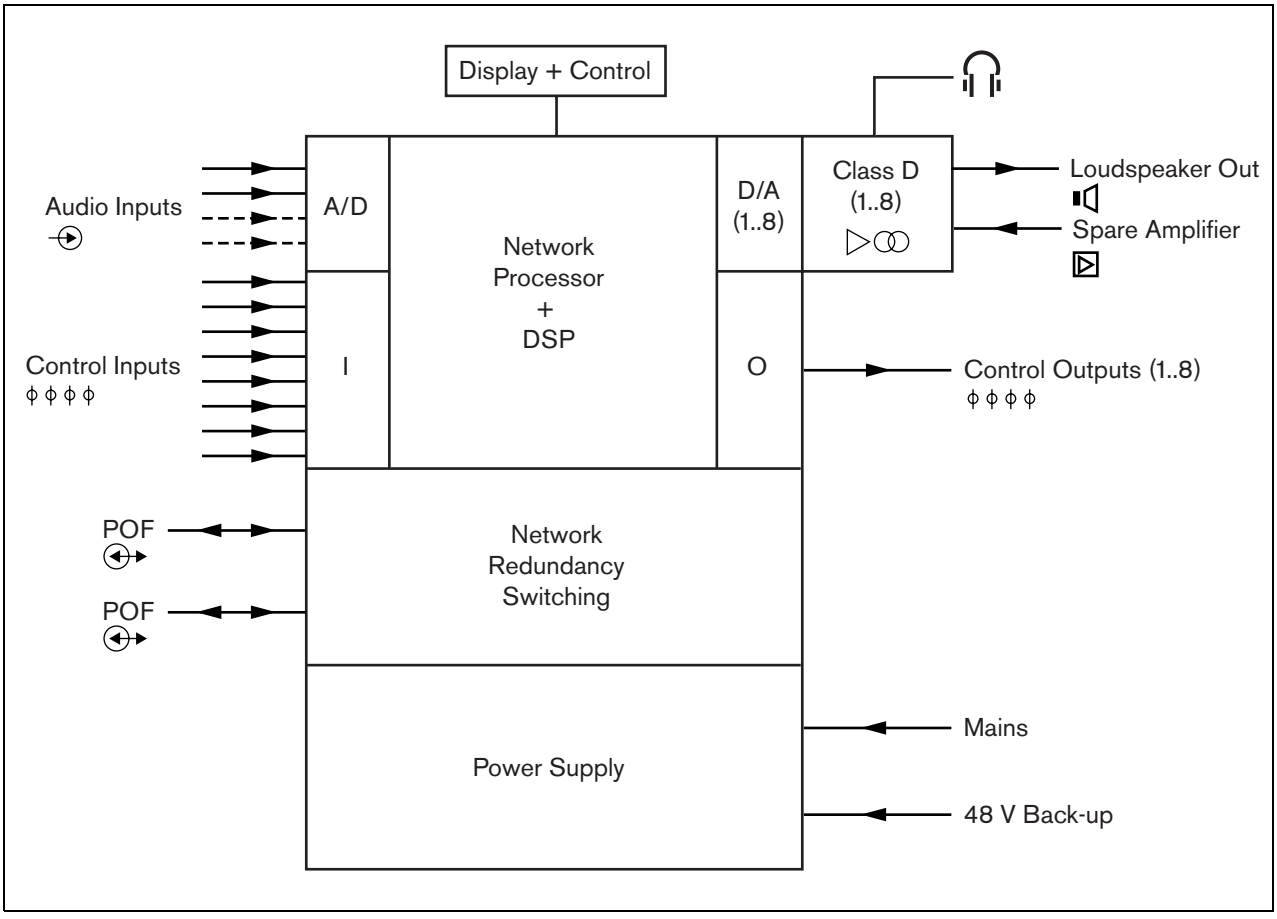


figure 9.1: Block diagram of a power amplifier

9.2 Controls, connectors and indicators

9.2.1 Front view

The front of the power amplifier (see figure 9.2) contains the following:

1 **Menu display** - A 2x16 character LCD display gives information about the power amplifier (see section 9.7).
2 **Menu button** - A turn-and-push button to navigate through the menu (see section 9.7).
3 **Monitoring headphones output** - A 3.5 mm (1/8 inch) jack socket to connect headphones for audio monitoring purposes.

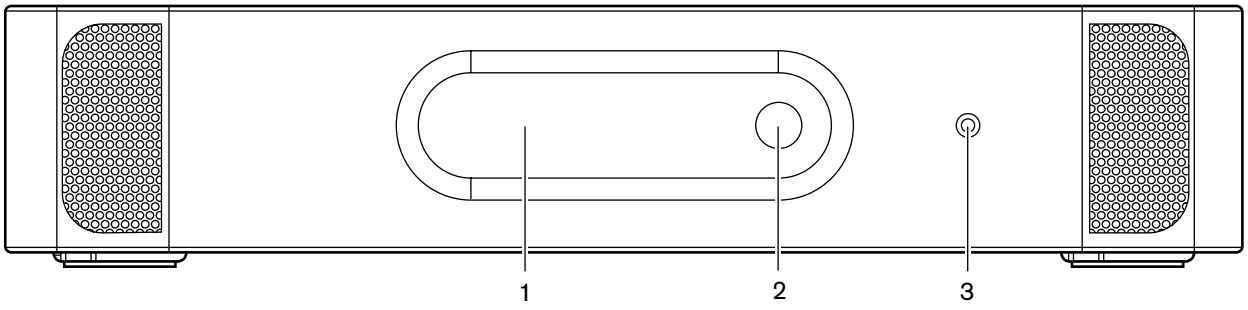
9.2.2 Rear view

The rear of the power amplifier (see figure 9.2) contains the following:

4 **Ground** - A connection to electrically ground the power amplifier.
5 **Control inputs** - The control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 9.3.7).
6 **Audio inputs** - Audio inputs for receiving audio signals from analog audio sources (see section 9.3.6).
7 **Back-up power** - A socket for connecting a back-up power supply (see section 9.3.8).
8 **Mains on/off switch** - A switch to switch the mains of the power amplifier on and off (see section 9.3.2).
9 **Fuse holder** - A fuse holder with a fuse that protects the power supply of the power amplifier (see section 9.3.2).
10 **System bus** - Two system bus connectors to connect the power amplifier to other Praesideo equipment.
11 **Amplifier channels** - Each power amplifier unit contains 1 to 8 completely separated and configurable amplifier channels. The number of amplifier channels depends on the type of power amplifier (see section 9.3.5).
12 **Mains inlet** - A mains socket to connect the power amplifier to the mains (see section 9.3.2).
13 **Signal Ground** - A switch that connects the signal ground to the safety ground (see section 9.3.4).
14 **Voltage selector** - A switch to select the local mains voltage (see section 9.3.2).

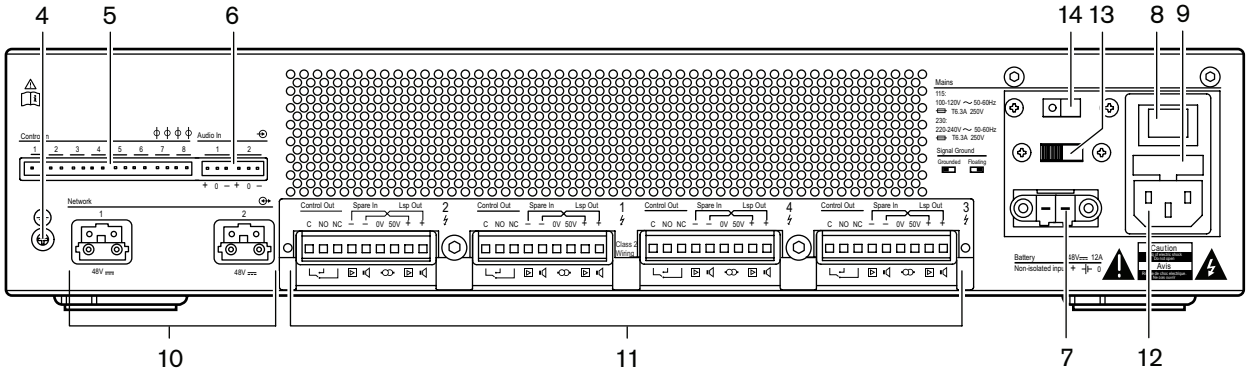
PRS-xPxxx, LBB4428/00

Power Amplifier



PRS-1P500, PRS-2P250, PRS-4P125

Power Amplifier



LBB4428/00

Power Amplifier

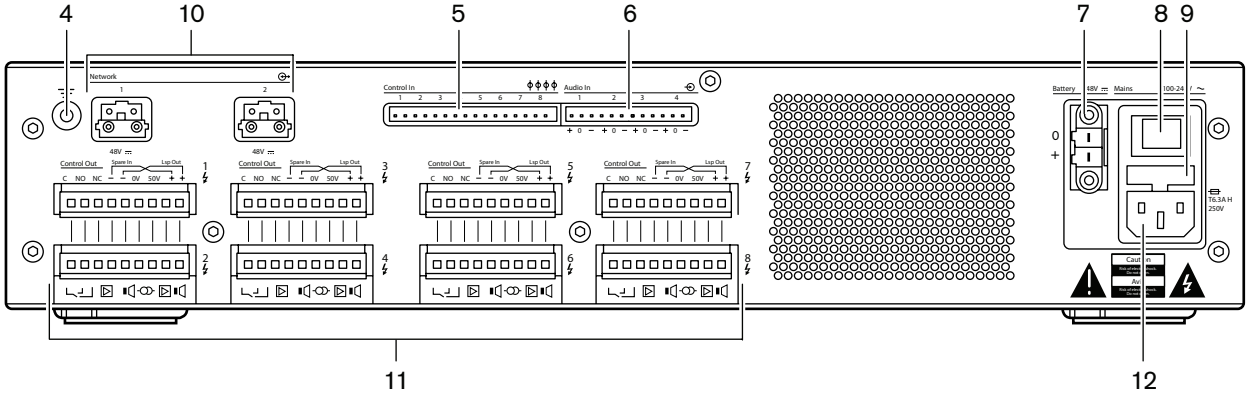


figure 9.2: Front and rear views of the power amplifier (all types)

9.3 Connections

9.3.1 Introduction

This section gives an overview of typical system connections using the power amplifier.

- Connecting the mains (see section 9.3.2).
- Connecting the network (see section 9.3.3).
- Connecting to ground (see section 9.3.4).
- Connecting the amplifier channels (see section 9.3.5).
- Connecting audio inputs (see section 9.3.6).
- Connecting control inputs (see section 9.3.7).

Connecting back-up power supply (see section 9.3.8)

9.3.2 Connecting the mains

Proceed as follows to connect the power amplifier to the mains:

1 Put the correct type of fuse in the power amplifier (see table 9.1 and table 9.2).

table 9.1: Voltage selector and fuse (PRS-xPxxx)

Selector	Mains voltage V(AC)	Fuse
115	100 - 120	T6.3A H 250V (IEC 60127 or UL 248)
230	220 - 240	T6.3A H 250V (IEC 60127)

table 9.2: Voltage range and fuse (LBB4428/00)

Voltage range	Fuse
100 - 240 V(AC)	T6.3A H 250V (IEC 60127 or UL 248)

2 Connect the mains cord to the power amplifier.
3 Connect the mains cord to a locally approved mains outlet.

9.3.3 Connecting the network

Connect the power amplifier to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

9.3.4 Ground connection

LBB4428/00 only: A ground jumper can connect the signal ground to the safety ground. This jumper is X3 on the printed circuit board. Set the jumper to connect pins 2 and 3 to connect signal ground to the safety ground. Set the jumper to connect pins 1 and 2 to isolate the signal ground.

The manufacturers setting is as a floating ground with the jumper connecting pins 1 and 2. If the audio line or microphone input of the amplifier is used and the connected audio source is not grounded, the jumper can be connected between pins 2 and 3 to reduce the susceptibility to external RF disturbances. If the audio source already has the signal ground connected to a safety ground, leave the jumper connected to pins 1 and 2 to avoid ground loops that can be a source of hum.

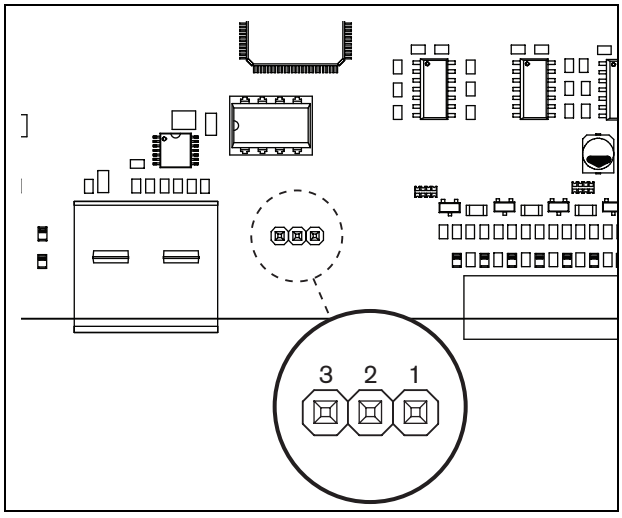


figure 9.3: Ground connector

For the PRS-1P500, PRS-2P250 and PRS-4P125: With the rear switch (13 in fig 8.2) the signal ground can be connected to safety ground.

Warning
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

9.3.5 Connecting the amplifier channels

9.3.5.1 Introduction

An amplifier channel (see figure 9.4) is a group of outgoing signals that have been processed by the same amplifier unit of the power amplifier. The number of amplifier channels depends on the type of power amplifier (see table 9.3).

table 9.3: Number of amplifier channels

Type	Amplifier channels
PRS-1P500	1
PRS-2P250	2
PRS-4P125	4
LBB4428/00	8

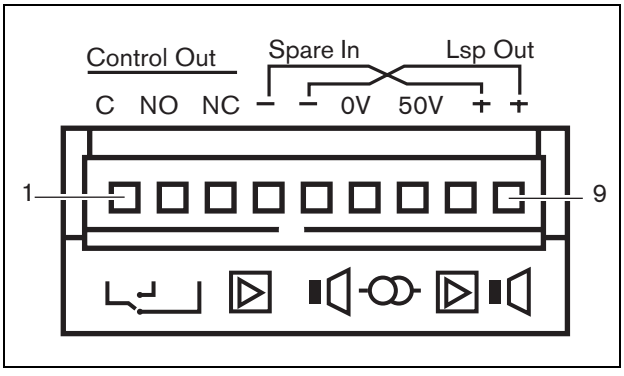


figure 9.4: Amplifier channel connector

table 9.4: Amplifier channel connector details

Pin	Description
1, 2, 3	Control outputs contacts. See section 9.3.5.4.
4, 8	Spare amplifier. See section 9.3.5.5.
5, 9	Loudspeaker line. See section 9.3.5.2.
6, 7	Fixed 50 V line. See section 9.3.5.3.

Caution
To prevent the hazard of electric shocks, switch off the power amplifiers and disconnect the back up power supplies from the power amplifiers before connecting loudspeaker lines and spare amplifier connections.

Caution
After connecting wires to the amplifier channel connectors, install the plastic safety bracket. The plastic safety bracket makes sure that the amplifier channel connectors cannot be touched.

9.3.5.2 Loudspeaker lines

Between the *Lsp Out+* and *Lsp Out-* connections, the loudspeakers must be connected. The voltage between these connections (100 V, 70 V or 50 V) depends on the position of the jumper on the output board (see figure 9.5).

It is possible to use the different voltages to reduce the volume of the loudspeaker line. For example, if all loudspeakers are suitable for 100 V, the maximum output level is 40 dBV. If the loudspeaker line voltage is set to 70 V, the maximum output level is reduced to 37 dBV (difference: -3 dB). If it is set to 50 V, it is reduced to 34 dBV (difference: -6 dB).

Caution

Check the specifications of the loudspeakers to find out which maximum voltage can be provided on the loudspeakers outputs of the power amplifiers. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

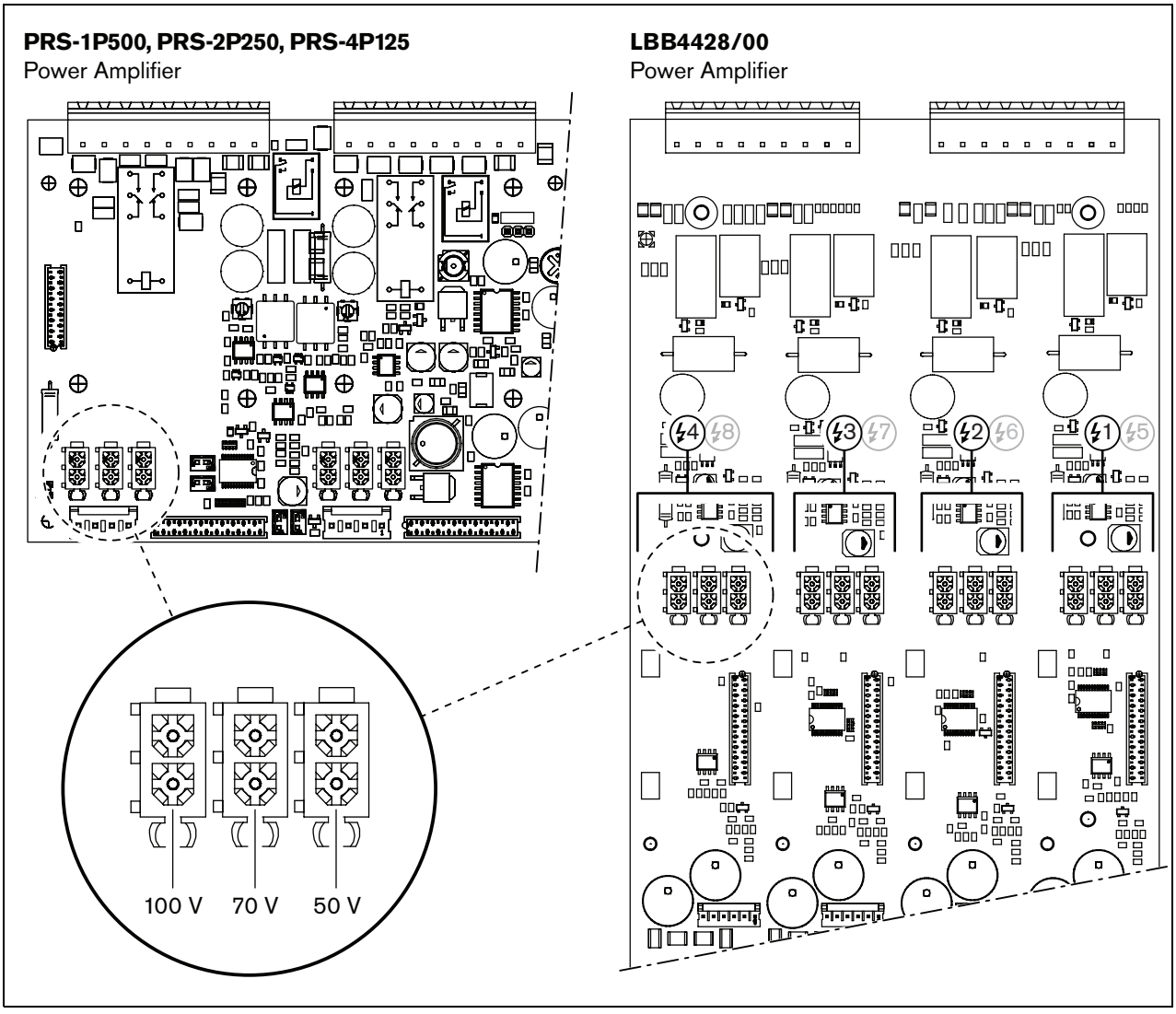


figure 9.5: Top view of the power amplifier output boards

9.3.5.3 50 V output

The 50 V output provided by the amplifier channel is actually a tap-off from the 50 V voltage for the loudspeaker line. The availability of the 50 V line does not depend on the selected loudspeaker voltage, since the tap-off is situated in front of the jumper (see figure 9.6).

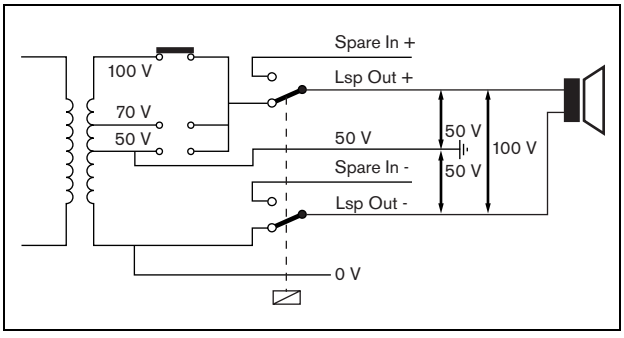


figure 9.6: 50 V output

If the 50 V is connected to ground, a 'balanced' output for the loudspeaker voltage can be created. In that case, the maximum voltage between the loudspeaker line and ground is never more than 50 V (see figure 9.6). The actual voltage between the loudspeaker line and ground depends on the position of the jumper switch.

If the 50 V is connected to ground on purpose, the ground supervision of the amplifier output should be disabled using the configuration software (see section 44.3.4).

9.3.5.4 Control outputs

Each amplifier channel has one control output. The control output can be used to send signals to third party equipment to trigger actions. Each control output has three pins (see figure 9.4). The common (C) pin of the control output should always be connected. Whether the other pin that is connected is the normally closed (NC) or normally open (NO) depends on which action you want to take place when the control output is active (see table 9.5).

table 9.5: Control outputs details

Behavior	Abbreviation	Description
Normally closed	NC	By default, the NC contact is connected with common contact C. When the output is activated, the NC contact is opened.
Normally open	NO	By default, the NO contact is not connected with common contact C. When the output is activated, the NO contact is closed.

In the configuration, a purpose must be attached to the control outputs that indicates the action to be taken when it becomes active (see table 44.6). For example, the power amplifier control outputs can be configured as a *Volume override* output to create volume overrides.

9.3.5.5 Spare amplifiers

If a power amplifier has a defect, all loudspeaker lines are switched automatically to a spare amplifier (if connected and configured). See figure 9.7 for a connection diagram. Keep the following in mind:

- The main and spare power amplifiers must be of the same type. If the main power amplifier is a PRS-4P125, the spare power amplifier must also be a PRS-4P125
- The way the loudspeaker lines are connected to the spare amplifier must be exactly the same as the way they are connected to the main amplifier. For example, if the loudspeaker lines use the fixed 50 V output of the main amplifier, they also must be connected to the fixed 50 V output of the spare amplifier.

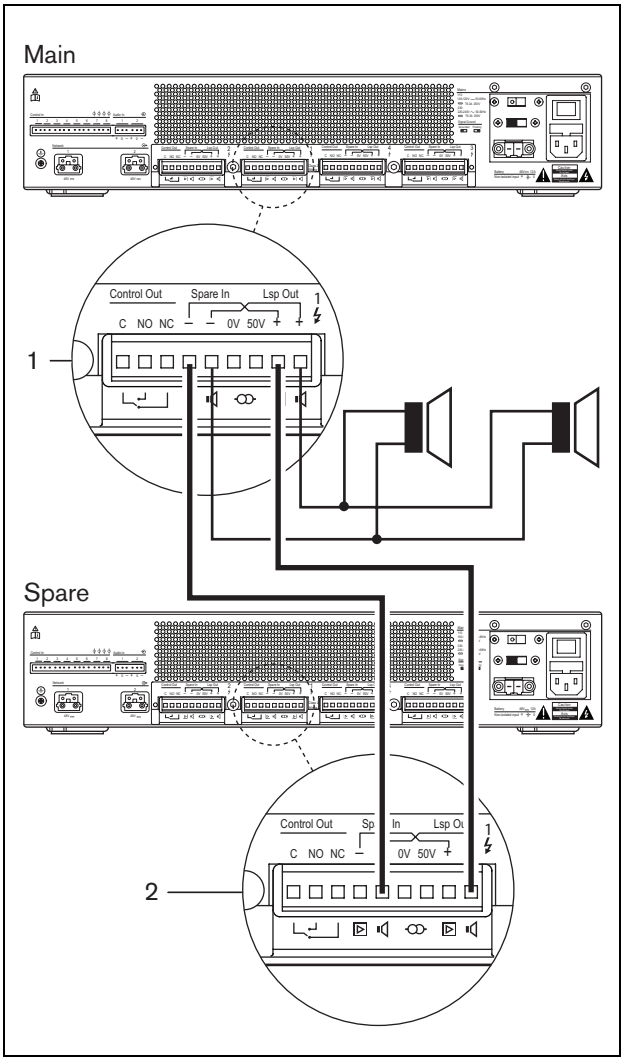


figure 9.7: Connecting a spare amplifier

Note
It is allowed to connect one spare power amplifier to more than one main power amplifier.

The actual spare switch is carried out by a relay. See figure 9.8 for the situation before spare switching and figure 9.9 for the situation after spare switching. As long as the main power amplifier (1) functions correctly, this relay is energized (see figure 9.8) and the audio is routed to the loudspeaker line (*Lsp Out+* and *Lsp Out-* terminals). The spare amplifier (2) does not route any audio, since it has no connection to any loudspeaker line.

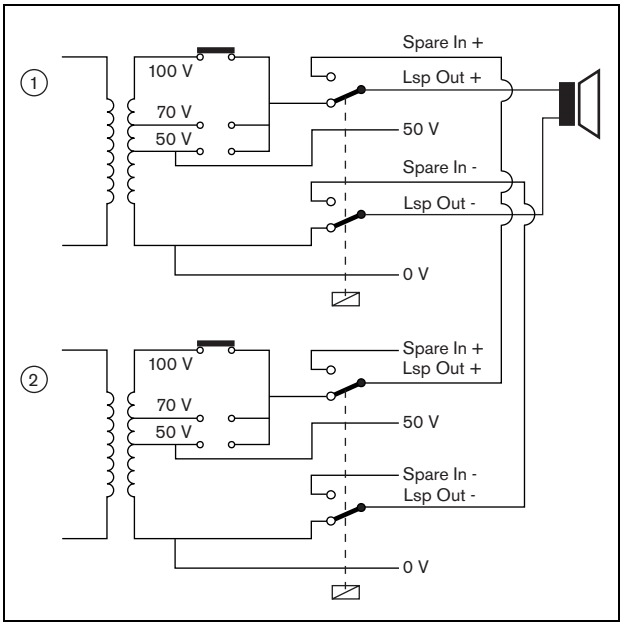


figure 9.8: Power amplifier, before spare switching

At the moment the main amplifier (1) goes down, the relay is de-energized and the switches fall into their default positions: *Spare In* - and *Spare In* + (see figure 9.9). This means that the audio output of the spare amplifier (2) is routed to the loudspeaker line through the main amplifier (1). The configuration settings (see section 44.3) of the audio outputs are transferred from the main power amplifier to the spare power amplifier. The configuration settings of the audio inputs, control inputs and control outputs are not transferred to the spare power amplifier.

If an LBB4428/00 amplifier has been taken over by a spare power amplifier, the amplifier goes to standby and audio and control inputs do not work. An AVC microphone on the input is set to OFF and the call volume goes to maximum for all the required zones.

If an PRS-1P500, PRS-2P250 or PRS-4P125 amplifier has been taken over by a spare power amplifier, the amplifier goes to stand-by; the audio inputs do not work, but the control inputs and outputs remain active.

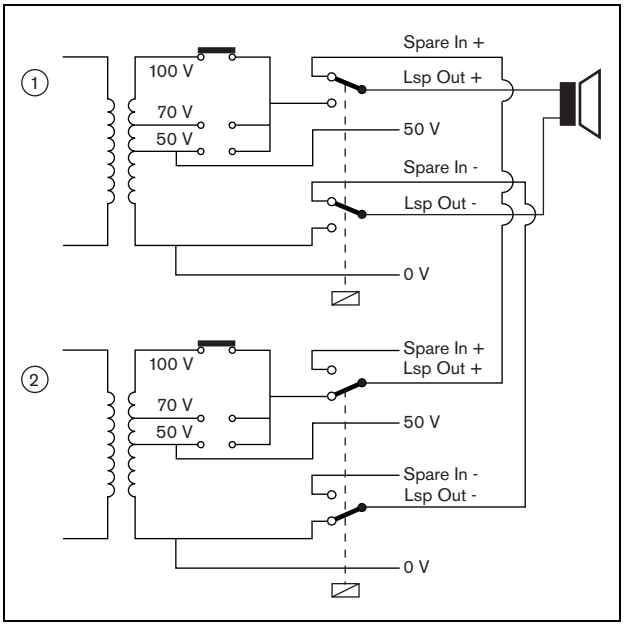


figure 9.9: Power amplifier, after spare switching

Often, for each rack of main amplifiers, one spare amplifier is used. To connect multiple main amplifiers of the same type to a spare amplifier of the same type:

- Connect the loudspeaker output of the spare amplifier to the spare inputs of the first main amplifier.
- Loop-through the spare inputs of the first main amplifier to the spare inputs of the other main amplifiers. Please note that if the number of failing main power amplifier increases, the loudspeaker load of the spare power amplifier increases. This can result in an overload of the power amplifier. Also note that the audio distributed to the loudspeaker lines of all failing power amplifiers depends on the configuration settings of the first failing power amplifier, since only the configuration settings of the first failing power amplifier are transferred to the spare power amplifier.

9.3.6 Connecting audio inputs

The number of audio inputs depends on the type of power amplifier.

table 9.6: Number of audio inputs

Type	Audio inputs
PRS-1P500	2
PRS-2P250	2
PRS-4P125	2
LBB4428/00	4

The audio inputs are used to interface with analog audio sources. Each audio input is selectable between line and microphone.

It is possible to connect unbalanced signal as well as balanced signals. Unbalanced signals can be connected to the 0 (GND) and the + or - pins (see figure 9.10). The remaining, non-connected pin do not have to be connected to the 0 pin. A balanced signal should be connected between the + and - pins of the audio input. The 0 (GND) pin can be connected to the shielding of the signal cable. However, this is not required.

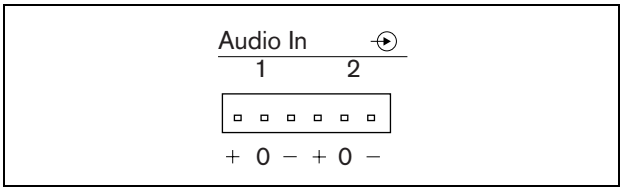


figure 9.10: Audio input connectors

9.3.7 Connecting control inputs

Each type of power amplifier has 8 control inputs. The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 44.3). It is also possible to supervise the cables for short-circuits and open connections (see figure 9.11 and figure 9.12). Whether a control input is actually supervised or not is defined in the configuration.

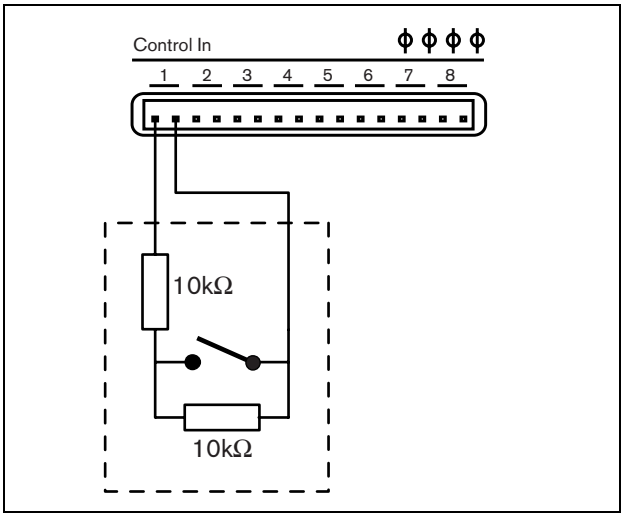


figure 9.11: Supervised control input

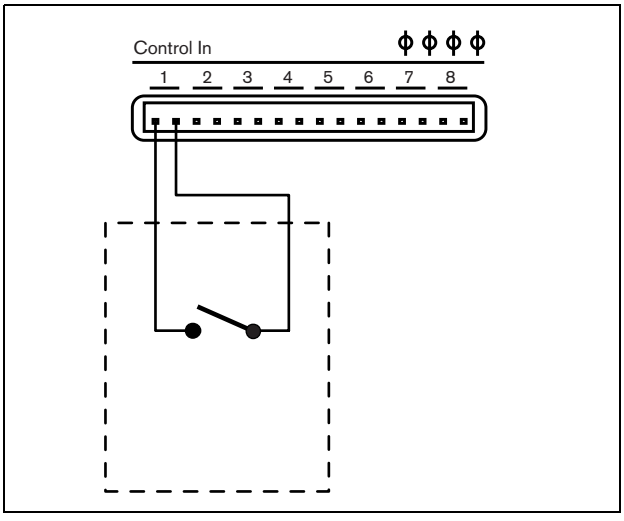


figure 9.12: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

Note
Even during amplifier faults, the control inputs on PRS-xPxxx power amplifiers stay available as long as mains or back-up power is available.

9.3.8 Connecting back-up power

Connect the back-up power supply to the back-up power connector on the back of the amplifier. Refer to figure 9.13 and figure 9.14.

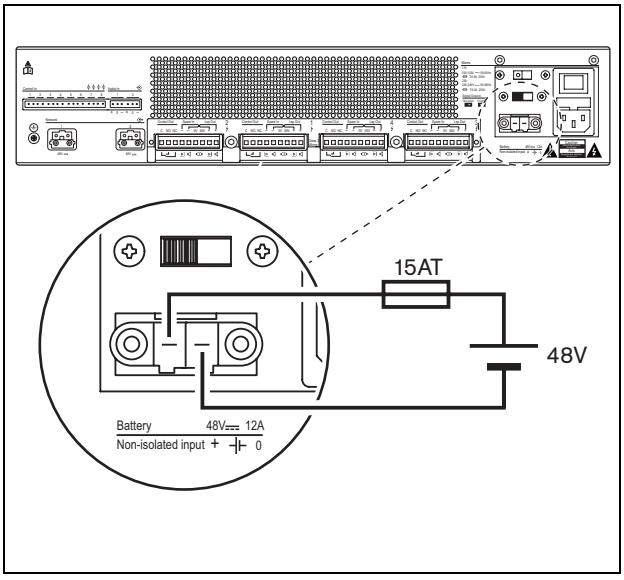


figure 9.13: Connecting power amplifier to ground (1)

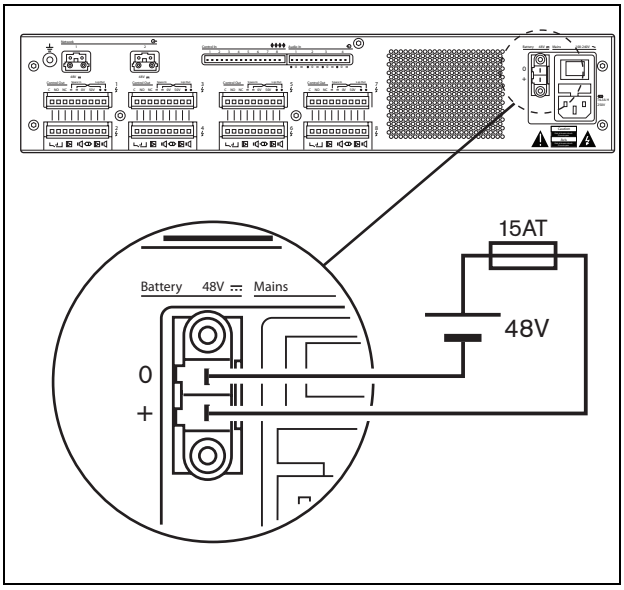


figure 9.14: Connecting power amplifier to ground (2)

Warning

Never ground the positive terminal of the battery, as this will damage the Praesideo equipment. If the back-up power supply (battery) is grounded, always connect the negative terminal (0) first and the positive terminal (+) second.
Disconnect in reverse order: disconnect the positive terminal first and the negative terminal second. This avoids excessive ground loop currents.

Warning

For safety reasons you must use an external circuit breaker. Install in accordance with the local Electrical and Building Code, e.g. for USA and Canada in accordance with NEC/CEC and for Germany in accordance with VDE0108-1.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience

If a back-up power supply is used, the PRS-xPxxx amplifiers can switch to the Power-save mode to reduce the load on the battery. This mode is not supported by the LBB4428/00. See section 45.4.

When an amplifier is set to Power-save mode due to a mains failure, the audio inputs, and control inputs and outputs are still available for use. An ambient sensing microphone will continue to operate if connected to the amplifier for AVC.

9.4 Fan control

The PRS-1P500, PRS-2P250 and PRS-4P125 amplifiers, from HW version 06/00 onwards, have a fan monitoring circuit that detects the actual fan rotation. This detection is needed for compliancy to the standards UL864 and UL1711, for use in the USA. Additionally the internal fans need to run at full speed for compliancy to these standards. A jumper on the main PCB selects between two positions:

- Normal (factory default) - The fans are temperature controlled, normally running at low speed and switching to high speed in case the temperature exceeds a certain level. Fan monitoring is not activated.
- Full speed - The fans run at full speed continuously. Fan monitoring is activated. Do not enable Switch amplifiers to standby (see section 44.4) for this selection, because in standby the fans are stopped and a fault would be generated.

The jumper is indicated on the PCB as X18; connection 1-2 selects Normal, connection 2-3 selects Full speed. See figure 9.15.

PRS-1P500, PRS-2P250 and PRS-4P125

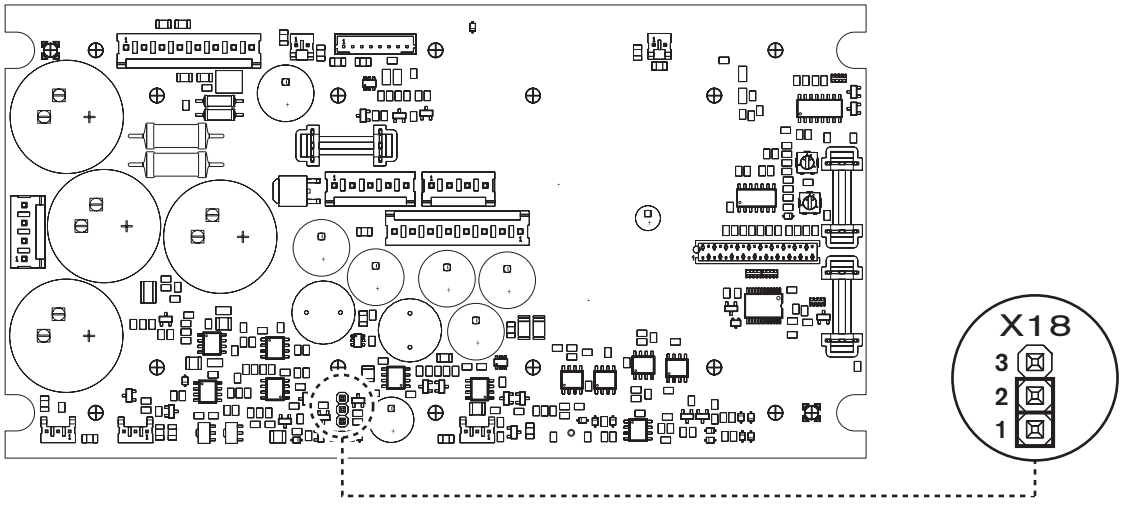


figure 9.15: Jumper X18 provides fan control for PRS-1P500, PRS-2P250 and PRS-4P125

9.5 Use with Line Isolator System

The Praesideo power amplifiers can also be used with the Bosch Line Isolator System consisting of the PM1-LISM6 master unit and slave devices PM1-LISS and PM1-LISD. Check the Installation and User Instructions of the PM1-LISM6 for detailed information. The Line Isolator System in combination with Praesideo is certified for EN54-16.

9.6 Installation

The power amplifier is suitable for either table-top or 19-inch rack installation. Four feet (for table-top use) and two brackets (for rack installation) are supplied.

Caution
Due to the weight of the power amplifiers, it requires two persons to lift and install them in a 19-inch rack.

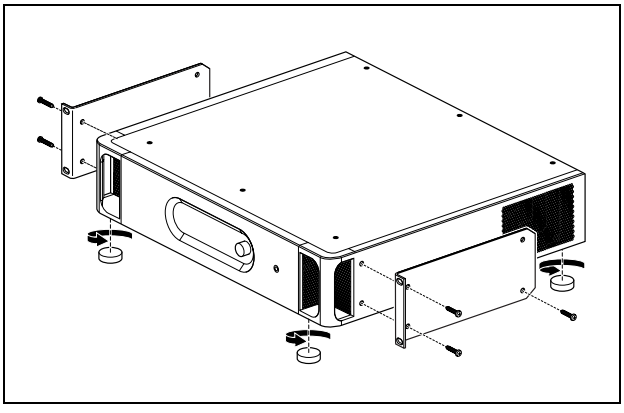


figure 9.16: Installation

Ensure there is enough space for the cool air flow to enter and the warm air flow to leave the power amplifier. Preferably, the power amplifiers are installed in a closed 19" rack that has one cool air inlet protected with a dust filter (see figure 9.17) to prevent dust from entering the equipment.

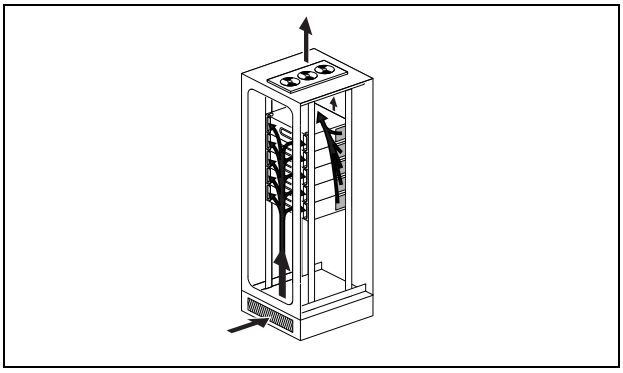


figure 9.17: Air flow in a 19" rack

Caution
When mounting the brackets to the unit, use the screws that are supplied with the brackets, four longer ones and two shorter ones. Use two screws of 7.5 mm thread length at the front side of each bracket, use a short screw of 5.2 mm thread length at the rear side of each bracket. Do not use screws with a thread length of >10 mm for the front positions or screws with a thread length of >5.7 mm at the rear postion; longer screws may touch or damage internalparts of the unit.

9.7 Using the configuration menu

9.7.1 Overview

A number of power amplifier settings are available via an interactive menu, using a 2x16 LCD display and a 'turn-and-push' menu button. The next figure gives an overview of the menu structure.

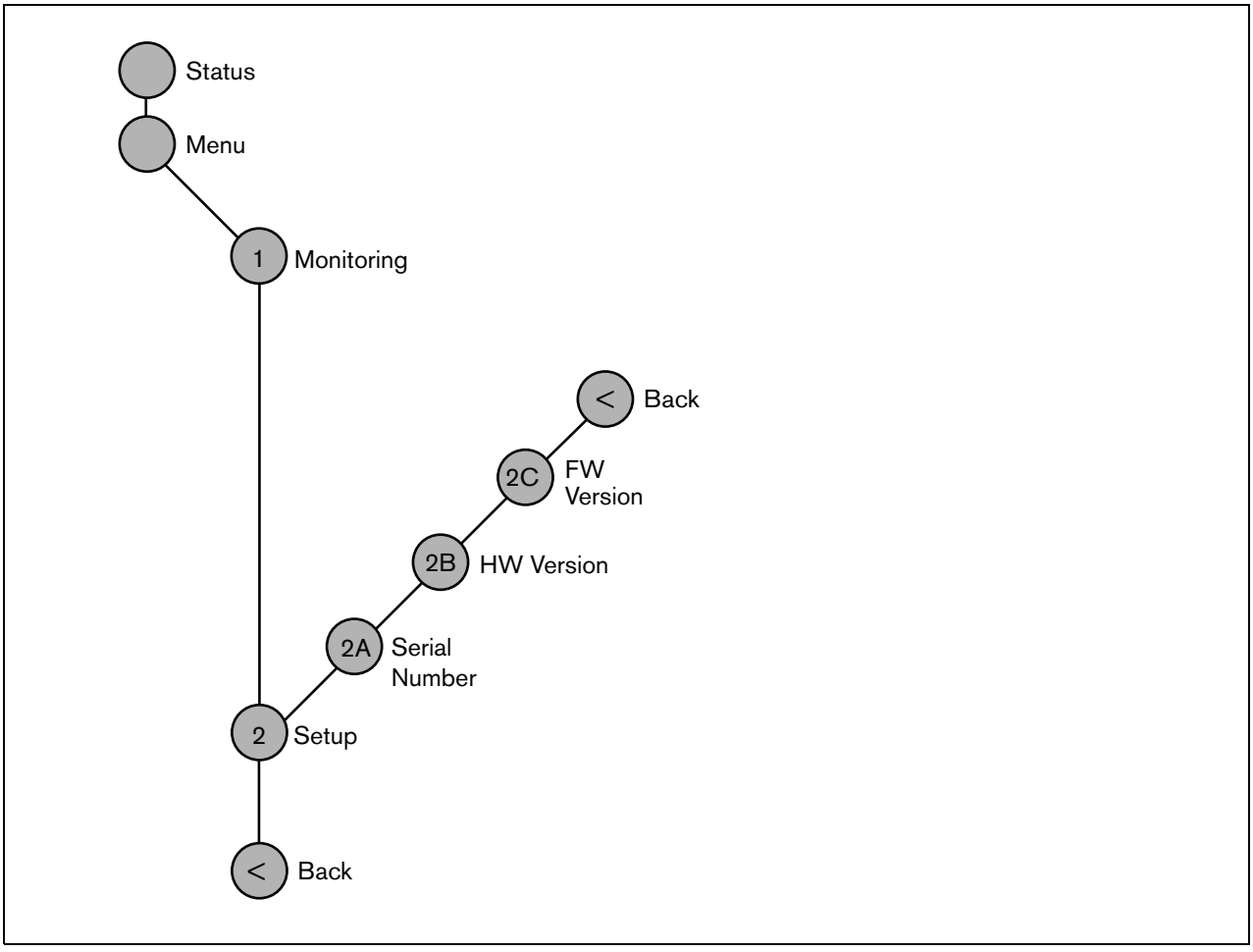


figure 9.18: Structure of the power amplifier front panel menu

9.7.2 Navigate through the menu

Operating the menu is always a sequence of alternating turns and pushes:

Turn the button to:
- Cycle through the menu items within a menu.
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

Push the button to:
- Confirm a chosen menu item (a blinking cursor appears).
- Go to a sub-menu (the sub-menu item character starts blinking).
- Confirm the selection of a settable option (the cursor disappears, the option value starts blinking).
- Confirm a selected value for a settable option (the value stops blinking, the cursor appears again).

Each menu is identified by a number or by a number plus a character (see figure 9.19). The item identification can be found at the start of the first line and is used to navigate to and from the sub-menus. Most menu items have one or more settable options. The value of an option can be changed by selecting a value from a list of available values.

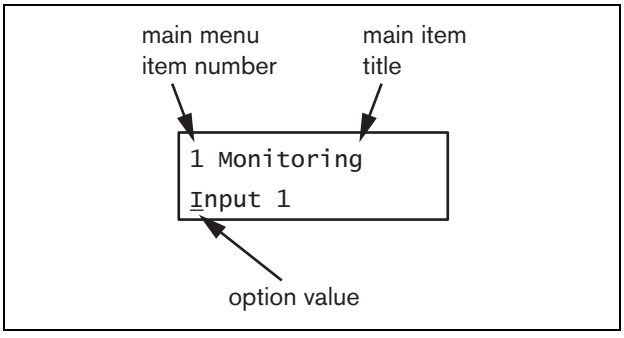


figure 9.19: Menu item screen elements

To navigate through the status screens:
1 Turn the button to move through the status screens (i.e. the *Status* and *Menu ...* screens).

To navigate through the main menu:
1 Navigate in the status screens to *Menu...*.
2 Push the button to go to the main menu. The menu item number starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To jump to a sub-menu:
1 Navigate in to an item with three dots (e.g. *Setup...*).
2 Push the button to go to the sub-menu. The sub-menu item character starts blinking.
3 Turn to select another menu item number.
4 Push to confirm the selection.

To navigate through a sub-menu:
1 Turn the button to move the cursor to the sub-menu item character.
2 Push the button. The item character and title starts blinking.
3 Turn to select another sub-menu item character.
4 Push to confirm the selection.

To change option values:
1 Navigate to the applicable menu item.
2 Turn the button to move the cursor to the option value you want to change.
3 Push the button to activate the option. The option starts to blink.
4 Turn the button to select a new option value.
5 Push the button to confirm the new value. The option value stops blinking.
6 Turn the button to move the cursor to another settable option (when available) and repeat steps 3 to 5.

To jump back from a sub-menu to an item of the main menu:

1 Turn the button to move the cursor to the main menu item number.
2 Push the button. The item number starts blinking.
3 Turn to select another item number.
4 Push to confirm the selection.

OR

1 Turn the button to < *Back*.
2 Push to confirm.

To jump back from the main menu to the status screens:

1 Jump back to the main menu.
2 Turn the button to < *Back*.
3 Push to confirm.

Example:

Set the output that is available on the headphones output of the power amplifier. (This example assumes you start from the default screen)

```
Power Amp 4x125W
1_2_3_4_
```

1 Turn to the button to go to the *Menu ...* in the status screens:

```
Menu...
```

2 Push the button to confirm:

```
1 Monitoring
Off
```

3 Push the button to confirm:

```
1 Monitoring
Off
```

4 Turn the button to the *Monitoring* option:

```
1 Monitoring
Off
```

5 Push the button to confirm:

```
1 Monitoring
Off
```

6 Turn the button to change the audio output you want to listen to:

```
1 Monitoring
Output 3
```

7 Push the button to confirm:

```
1 Monitoring
Output 3
```

8 Turn to move the cursor to the menu number:

```
1 Monitoring
Output 3
```

9 Push the button to confirm:

```
1 Monitoring
Output 3
```

10 Turn to move to the < *Back* item:

```
< Back
```

11 Push the button to confirm:

```
Menu...
```

12 Turn the button to go to the default screen:

```
Power Amp 4x125W
1_2_3_4_
```

9.8 Configuration and operation

9.8.1 Introduction

The next sections give descriptions of the possible configuration options. Each description is followed by the relevant menu items with detailed instructions per menu option. The default values are indicated by an asterisk (*) when applicable.

9.8.2 Start-up

When the power amplifier is (re)started, the display shows the name of the unit and the VU meters for the outputs. If it shows *Load Unit Software*, the unit does not contain any firmware or old firmware. By default, it is delivered without firmware. See section 37.5 for information about upgrading the firmware.

9.8.3 Status screen

The *Status* screen (see figure 9.18) shows the name of the power amplifier and provides general information about its (fault) status (see table 9.7). If there is more than one active fault, only the most severe fault is shown. A fault status only provides global information. The exact source of a fault can be found out using the fault events list in this manual (see chapter 55).

table 9.7: Status (in order of severity: high to low)

Fault status	Description
No network	The optical network is not available.
Fault: Channel n	Fault in amplifier channel n. (If n = +, faults in multiple amplifier channels.)
Fault: Line Ch n	Fault in loudspeaker line n. (If n = +, faults in multiple loudspeaker lines.)
Fault: Lsp Ch n	Fault in a loudspeaker in line n. (If n = +, loudspeakers on multiple lines are failing).
*Fault: Input CI*n	Fault in control input n. (If n = +, faults in multiple control inputs.)
*Fault: Input AI*n	Fault in audio input n. (If n = +, faults in multiple audio inputs.)
Fault: Mains	Mains power supply failure.
Fault: Battery	Back-up power supply failure.
Idle	Spare power amplifier that is not sparing at the moment.
Standby	Standby mode or disabled in system configuration.
VU meters	Fully operational.

9.8.4 Main menu

The *Menu ...* item provides access to the main menu.

table 9.8: Main menus

Menu item	Description
1 Monitoring	Go to the *Monitoring* submenu. See section 9.8.5.
2 Setup	Go to the *Setup* submenu. See section 9.8.6 (and further).

9.8.5 Set monitoring options

The *Monitoring* submenu is used to set which signal is sent to the monitoring headphones. It can be one of the audio outputs or no signal at all. It is not possible to set the volume of the audio outputs on the monitoring headphones. This means you always hear the audio output at the monitoring headphones at the same volume as it is broadcast.

table 9.9: Monitoring submenu

Menu item	Option	Value 1	Description
1 Monitoring	Source:		
	- *Output* n	Output nr: *1* to *8*	The signal from audio output n is available on the monitoring headphones output.
	- *Off**		The monitoring headphones output is off.

9.8.6 View version information

The *Serial Number*, *HW Version* and *SW Version* submenus are used to obtain version information about the power amplifier.

table 9.10: Version information menu items

Menu item	Value (read-only)	Description
2A Serial Number	e.g. *07.0.0025B*	Shows the hexadecimal serial number.
2B HW Version	e.g. *01.01*	Shows the hardware version.
2C FW Version	e.g. *3.00.1419*	Shows the version number of the firmware. This must be the same for all units in the system.

9.9 Technical data

9.9.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm depth behind the brackets, 40 mm in front of the brackets)
92 x 440 x 400 mm (table-top, with feet)

Weight:
PRS-1P500
13.7 kg
PRS-2P250
14.5 kg
PRS-4P125
16.1 kg
LBB4428/00
16.2 kg

9.9.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)

Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)

Air pressure:
600 to 1100 hPa

9.9.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4

Electrical safety:
IEC60065 (CB-scheme)
EN60065

Approvals:
CE marking
EN54-16 and ISO7240-16

9.9.4 Mean time between failures

Expected lifetime:
32,000 hours at +55 °C

MTBF:
500,000 hours
(based on real warranty return rate data)

9.9.5 System bus

Connector (rear side):
Female proprietary connector

Preferred cable:
LBB4416/xx

Maximum cable length:
50 m (per system bus connector)

Data signal interface:
Plastic optical fiber

Network power consumption:
0 W

9.9.6 Power supply

Connector (rear side):
IEC male power inlet with fuse holder

Preferred cable:
Mains cord meeting CE standard

Voltage selector:
115 V(AC) / 230 V(AC) for PRS-xPxxx

Nominal input voltage range:
PRS-xPxxx
115 V (typical): 100 - 120 V(AC) at 50 - 60 Hz
230 V (typical): 220 - 240 V(AC) at 50 - 60 Hz
LBB4428/00
100 - 240 V(AC) at 50 - 60 Hz

Input voltage limits:
PRS-xPxxx
115 V (typical): 90 - 132 V(AC) at 50 - 60 Hz
230 V (typical): 198 - 264 V(AC) at 50 - 60 Hz
LBB4428/00
90 - 264 V(AC) at 50 - 60 Hz

On/Off switch:
Located at the rear

Power factor (PF):
> 0.6 (for PRS-xPxxx)
> 0.95 (for LBB4428/00)

9.9.7 Back-up power

Connector (rear side):
2 pole for removable screw connector

Input voltage:
48 V(DC)

Input voltage range:
43.5 to 56 V(DC)

Input voltage range for rated output power:
53 to 56V (DC)

Maximum current:
12 A

9.9.8 Power consumption

Note
The power consumption on batteries depends on the connected load, signal levels and type of signal (alarm tone, duty cycle, speech). It is recommended to measure the actual current drawn from the batteries in power save mode, idle mode and alarm tone mode to check the calculated battery capacity. When calculating the battery capacity, also take into account that the capacity decreases during the lifetime of the battery. Also see section 34.3.

9.9.8.1 Power consumption PRS-1P500

Load: 20 Ω / 250 nF per channel

Stand-by/Power save:
10 W, 48 V(DC); 20 W, 120/230 V(AC)
Idle, no pilot tone:
20 W, 48 V(DC); 30 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
40 W, 48 V(DC); 50 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
180 W, 48 V(DC); 200 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
330 W, 48 V(DC); 350 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
600 W, 54 V(DC); 700 W, 120/230 V(AC)

9.9.8.2 Power consumption PRS-2P250

Load: 40 Ω / 125 nF per channel

Stand-by/Power save:
11 W, 48 V(DC); 21 W, 120/230 V(AC)
Idle, no pilot tone:
25 W, 48 V(DC); 35 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
43 W, 48 V (DC); 53 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
180 W, 48 V(DC); 200 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
330 W, 48 V(DC); 350 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
600 W, 54 V(DC); 700 W, 120/230 V(AC)

9.9.8.3 Power consumption PRS-4P125

Load: 80 Ω / 62 nF per channel

Stand-by/Power save:
13 W, 48 V(DC); 23 W, 120/230 V(AC)
Idle, no pilot tone:
35 W, 48 V(DC); 45 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
56 W, 48 V (DC); 66 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
180 W, 48 V(DC); 200 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
330 W, 48 V(DC); 350 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
600 W, 54 V(DC); 700 W, 120/230 V(AC)

9.9.8.4 Power consumption LBB4428

Load: 166 Ω / 30 nF per channel

Stand-by:
22 W, 48 V(DC), 32 W, 120/230 V(AC)
Idle, no pilot tone:
60 W, 48 V(DC); 80 W, 120/230 V(AC)
Idle, with pilot tone 7 V:
65 W, 48 V(DC), 90 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 7 V:
230 W, 48 V(DC); 260 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 7 V:
400 W, 48 V(DC); 430 W, 120/230 V(AC)
P_{max} with pilot tone 7 V:
700 W, 54 V(DC); 800 W, 120/230 V(AC)

9.9.9 Audio line inputs

Connector (rear side):
6 pole header (type ETB47-06-2-G1 (ECE)) for removable screw connector
Preferred cable:
Twisted pair, shielded
Maximum input signal level:
6 dBV
Input range:
-12 to 0 dB with respect to maximum input level
Input sensitivity setting:
Software
Frequency response:
-3 dB points at 50 Hz and 20 kHz (tolerance ± 1 dB)
Input impedance:
22 kΩ
Signal/Noise ratio:
> 87 dB (rms unweigthed)
Common mode rejection ratio:
> 40 dB at 1 kHz
Input cross-talk:
< -80 dB at 1 kHz
<-70 dB at 10 kHz at -11 dBV input level
Distortion:
< 0.1%

9.9.10 Audio microphone inputs

Connector (rear side):
6 pole header (type ETB47-06-2-G1 (ECE)) for removable screw connector
Preferred cable:
Twisted pair, shielded
Nominal input signal level:
-57 dBV
Input range:
-7 to 8 dB with respect to nominal input level
Input sensitivity setting:
Software
Frequency response:
100 Hz to 16 kHz
Input impedance:
1360 Ω
Signal/Noise ratio:
> 60 dB (rms unweigthed at -60 dBV)
Common mode rejection ratio:
> 40 dB at 1 kHz
Input cross-talk:
< -80 dB at 1 kHz at -60 dBV input level
< -70 dB at 10 kHz at -60 dBV input level
Distortion:
< 0.1%
Phantom supply:
12 V ± 1 V (max. 15 mA)

9.9.11 Loudspeaker outputs and spare inputs

Connector (rear side):
1 x 9 pole header (type ETB 43-09-2-G1 (ECE)) with removable screw connector (shared with control outputs)

Voltage:
100 V, 70 V, 50 V (jumper setting)

Max. unloaded voltage:
200 V peak

Rated load resistance:
@ 100/70/50 V output
PRS-1P500
20/10/5 Ω
PRS-2P250
40/20/10 Ω
PRS-4P125
80/40/20 Ω
LBB4428
166/83/42 Ω

Rated load capacitance:
@ 100/70/50 V output
PRS-1P500
250/500/1000 nF
PRS-2P250
125/250/500 nF
PRS-4P125
60/125/250 nF
LBB4428
30/60/120 nF

Rated output power:
@ a/b/c/d/e/f operating condition
PRS-1P500
1 x 500/425/275/185/185/125 W
PRS-2P250
2 x 250/210/150/105/105/60 W
PRS-4P125
4 x 125/105/65/60/60/30 W
LBB4428
8 x 60/50/40/30/30/15 W

Distortion:
≤ 0.3% at 1 kHz and 50% of the rated output power
< 1% at 100% of output power

Output regulation no load to full load:
<1.2 dB for 50, 70 and 100V output

Frequency response:
60 Hz to 19 kHz (-3 dB) at -10 dB with maximum capacitive load and rated load resistance

Power bandwidth:
60 Hz - 19 kHz (-3 dB, distortion < 1%) at 50% of the rated output power

Signal/Noise ratio:
> 85 dB(A) with pilot tone off

Amplifier output limiting:
Soft clipping

Ground short detection resistance:
< 50 kΩ

Acoustical noise level:
< NR35 at 1 m, fans at half speed, table-top
< NR40 at 1 m, fans at full speed, table-top

a Distortion < 1%, 1 kHz, nominal mains power or battery >53V, max. 1 minute (acc. to IEC 60268-3).

b Distortion < 1%, 1 kHz, mains power or battery >50V, max. 1 minute, ambient temperature 55 °C (acc. to EN54-16).

c Distortion < 1%, 1 kHz, battery 48V, max. 1 minute, ambient temperature 55 °C.

d Alarm tone level, distortion < 0.3%, 1 kHz, mains or battery (>43.5V), max. 30 minutes, ambient temperature 55 °C.

e Distortion < 0.3%, 1 kHz, mains or battery >43.5V, continuous, ambient temperature 30 °C.

f Distortion < 0.3%, 1 kHz, mains or battery >43.5V, continuous, ambient temperature 55 °C.

9.9.12 Derating

The graph shows the available continuous power used for emergency tones, speech, etc. as function of the ambient temperature.

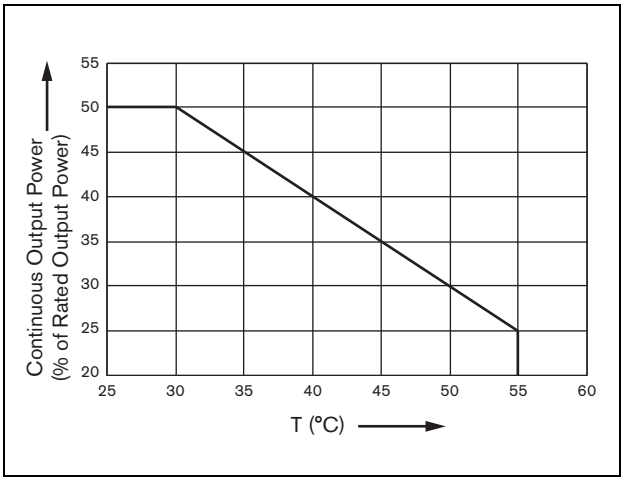


figure 9.20: Output power derating

If the amplifier is loaded with loudspeakers up to its rated output power (see section 9.9.12), you can still play music and speech for an indefinite long period of time at an ambient temperature of 55 °C, because of the crest factor (or peak-to-average ratio) of the audio signals. The crest factor of music and speech is typically 6 to 8 dB, which makes the required continuous power 25% or less of the rated output power. Alarm tones are set to -3 dB maximum by Praesideo, resulting in a required continuous power of 50% of the rated output power. This can be delivered for at least 30 minutes at 55 °C ambient or continuously at 30 °C ambient.

9.9.13 Control inputs

Connector (rear side):
16 pole header (type Phoenix MC1,5/16-G-3,81) for removable screw connector (MC1,5/16-SWT-3,81)

Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)

Resistance detection (supervision enabled):
Cable short circuit
< 2.5 kΩ
Contact closed
7.5 kΩ to12 kΩ
Contact open
17.5 kΩ to 22 kΩ
Cable broken
> 27 kΩ

Resistance detection (supervision disabled):
Contact closed
< 12 kΩ
Contact open
> 17.5 kΩ

External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

9.9.14 Control outputs

Connector (rear side):
1 x 9 pole header (type ETB 43-09-2-G1 (ECE)) with removable screw connector (shared with loudspeaker output and spare amplifier input)
Contact type:
Relay contact, single pole, change-over contact (SPDT)
Maximum switching power:
Refer to the graph.
Off state (unpowered):
C-NC is closed, C-NO is open

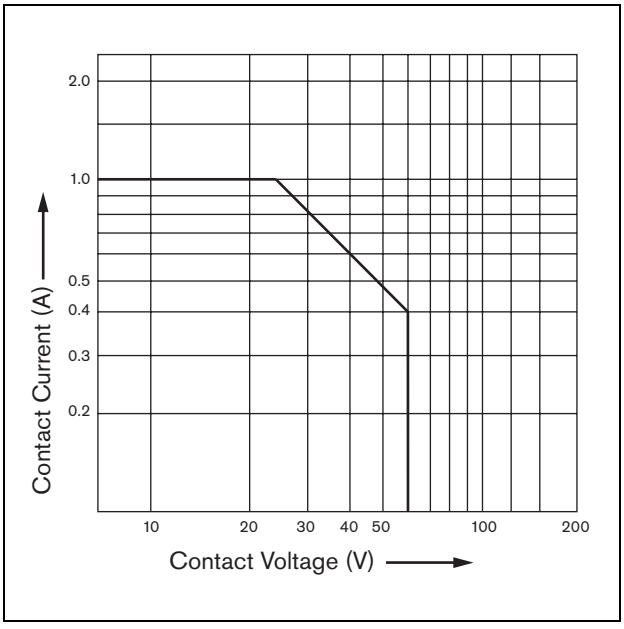


figure 9.21: Maximum switching power

9.9.15 Headphones

Connector (front side):
3.5 mm stereo jack socket for headphones
Maximum output voltage:
6 dBV without volume control
Rated load impedance:
8 to 600 Ω
Signal/Noise ratio:
> 80 dB (at maximum output level)
Distortion:
< 0.5%

10 PRS-16MCI Multi Channel Interface

10.1 Introduction

The PRS-16MCI multi channel interface is the interface between the basic amplifier channels and the Praesideo system.
It can connect up to 14 amplifier channels to the Praesideo network and 2 spare channels, providing 32 additional control inputs and 16 control outputs.
The multi channel interface gives supervision to the connected amplifier channels.
It can be used without connections to a basic amplifier. The multi channel interface then gives the Praesideo network 32 more control inputs and 16 more control outputs.

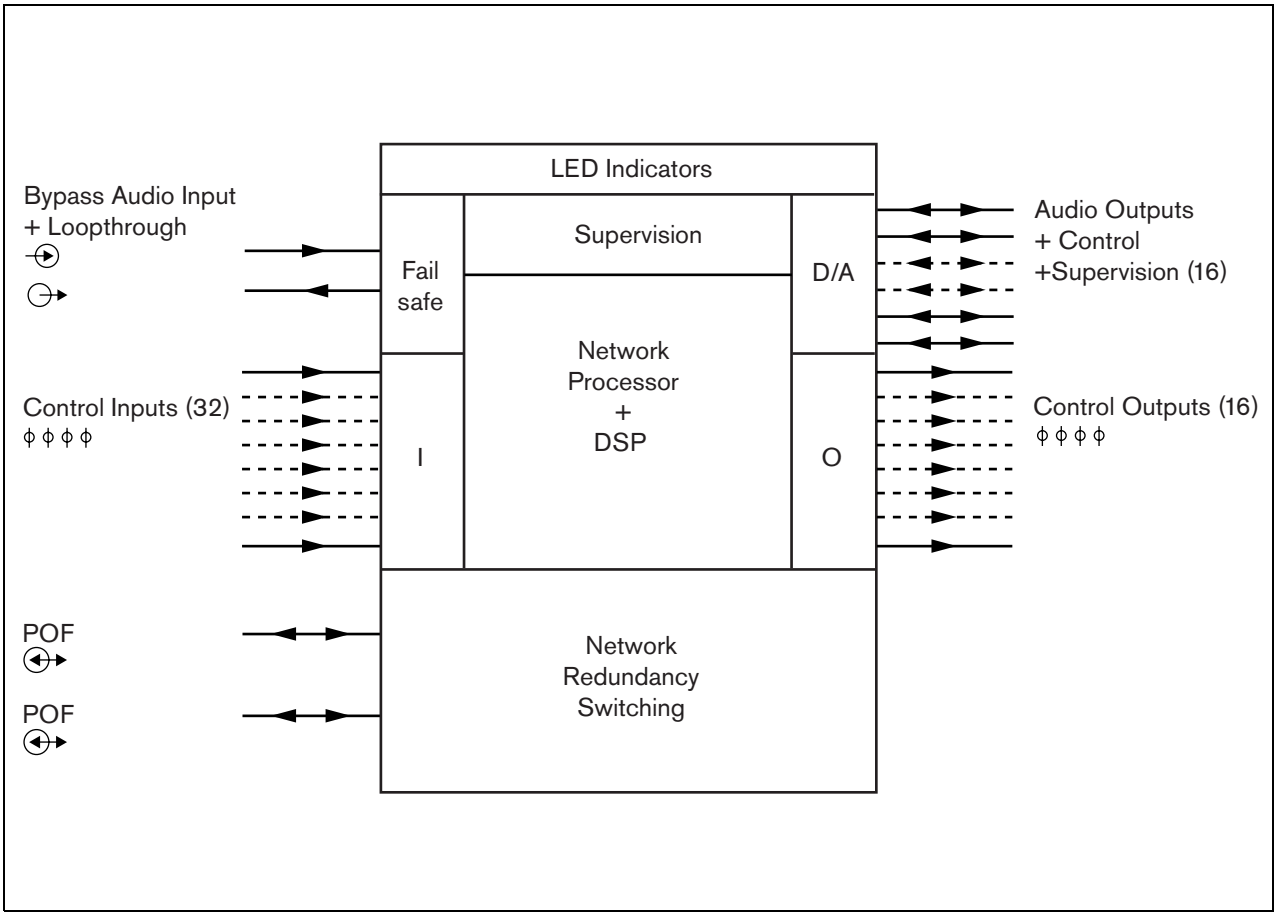


figure 10.1: Block diagram of a multi channel interface

10.2 Controls, connections and indicators

10.2.1 Front view

The front of the multi channel interface (see figure 10.2) contains the following:

1 **Amplifier channel status** - Audio channels indicators 1 to 14 gives the status of the connected amplifier channels.
2 **Spare channel status** - Audio channel indicators 15 and 16 gives the status of the spare channels.
3 **Network status** - Status of the network.

10.2.2 Rear view

The rear of the multi channel interface (see figure 10.2) contains the following:

4 **Control inputs** - 32 Control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 10.3.5).
5 **Control outputs** - 16 Control outputs can be used to send signals to trigger actions generated by the Praesideo network (see section 10.3.6).
6 **System bus** - Two system bus connectors to connect the multi channel interface to other Praesideo equipment.
7 **Bypass In** - The multi channel interface bypass input from the Network controller. See section 10.3.4.
8 **Bypass Out** - The multi channel interface bypass output to next multi channel interface.
9 **Amplifier connectors 1-14** - Connections to the basic amplifier channels to give audio and control signals and receive power and supervision information (see section 10.3.2).
10 **Amplifier connectors 15-16** - Connections to the spare basic amplifier channels.
11 **Ground** - A connector to electrically ground the unit (see section 10.3.7).

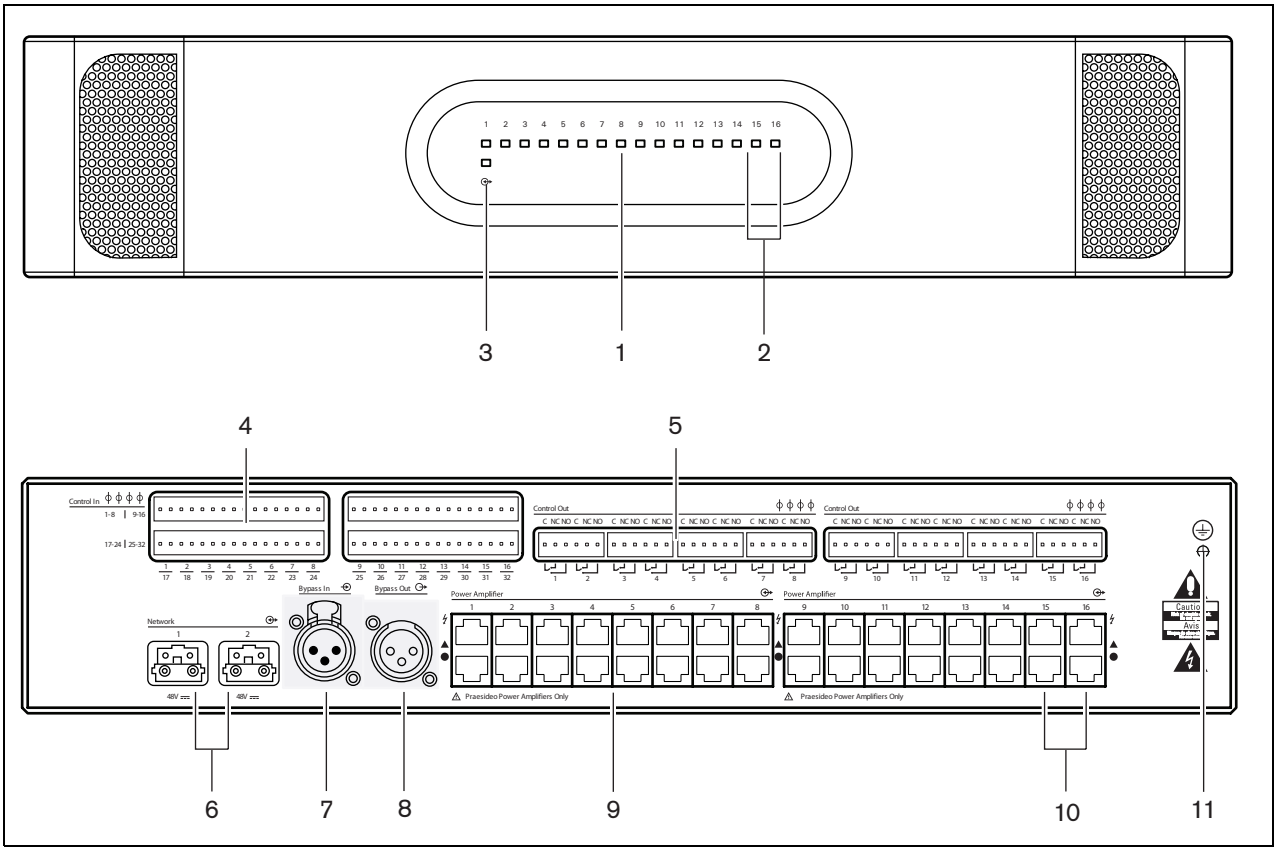


figure 10.2: Front and rear views of the multi channel interface

10.3 Connectors

10.3.1 Introduction

This section gives an overview of typical system connections using the multi channel interface.

- Connecting to the basic amplifiers (see section 10.3.2).
- Connecting to the network (10.3.3).
- Connecting the multi channel interface by-pass (see section 10.3.4).
- Connecting the control inputs (see section 10.3.5).
- Connecting the control outputs (see section 10.3.6).

10.3.2 Connecting to the basic amplifier

The double amplifier connectors 1 to 14 are used for the basic amplifier channels. The double amplifier connectors 15 and 16 are available for two spare basic amplifier channels.

The connection to the basic amplifier is made with two modular (RJ45) connections.

The connections of the basic amplifier and the multi channel interface have a triangle (top row) and a circle (bottom row) symbol.

1 Connect the triangle symbol connector of the multi channel interface to the triangle symbol connector of the basic amplifier.

2 Connect the circle symbol connector of the multi channel interface to the circle symbol connector of the basic amplifier.

Caution
Do not connect the circle symbol connector of the multi channel interface to the triangle symbol connector of the power amplifier.

Caution
Do not connect the modular (RJ45) connectors to any Telecom or Ethernet network. These connectors are dedicated for the multi channel interface and the basic amplifiers only.

table 10.1 Basic amplifier interface connections

Top row, indicated with triangle		Bottom row, indicated with circle	
Pin	**Signal**	**Pin**	**Signal**
1	Relay A Out	1	Audio Out +
2	Relay B Out	2	Audio Out -
3	Ground	3	Ground
4	DC Back-up monitor In	4	24 V supply In/ Out
5	Mains monitor In	5	Spare relay Out
6	Stand by Out	6	Mute Out
7	100 V In +	7	Overheat In
8	100 V In -	8	Ready In

Caution
Always use CAT-5 modular plugs with an empty connector crimp part (refer to figure 10.3, part A). Some (pre-)assembled CAT-5 modular plugs have a connector crimp part that is filled with plastic (refer to figure 10.3, part B). These connectors do not give a reliable connection to the modular (RJ45) connectors on the basic amplifiers and multi channel interfaces and can therefore cause unexpected fault events.

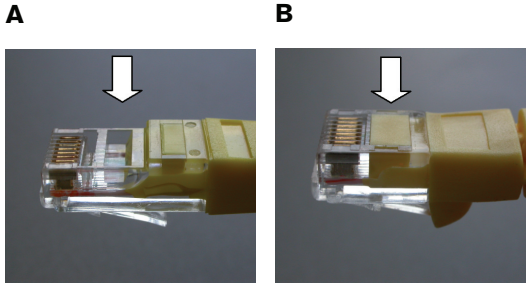


figure 10.3: (pre-) assembled CAT-5 modular plugs

10.3.3 Connecting the network

Use the system bus connectors and LBB4416 network cables to connect the multi channel interface to the Praesideo system. Both connectors are interchangeable. Normally the multi channel interface receives its power from the connected amplifiers. This is the recommended setting, but if it is not connected to an

amplifier, the multi channel interface can receive its power from the Praesideo system bus instead.
A jumper sets the source of the power supply. The location of the jumper is shown in figure 10.4. The jumper has two settings:

- Basic amplifier setting (default)
- Praesideo system bus setting

To receive power from the Praesideo system, set the jumper to Network Power Supply as shown in figure 10.5.

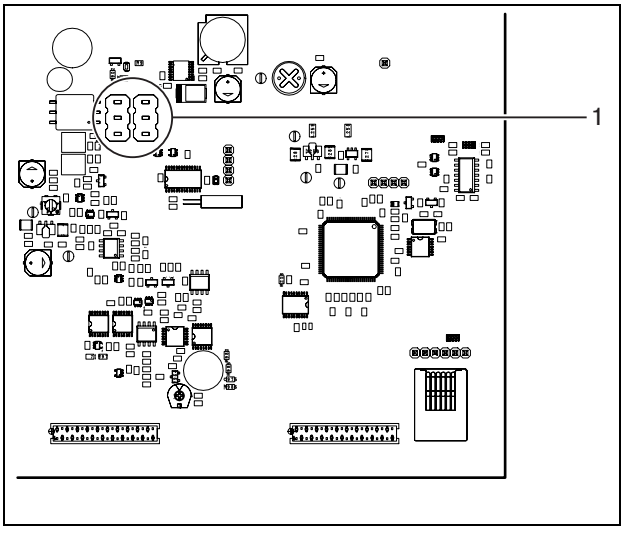


figure 10.4: Jumper location

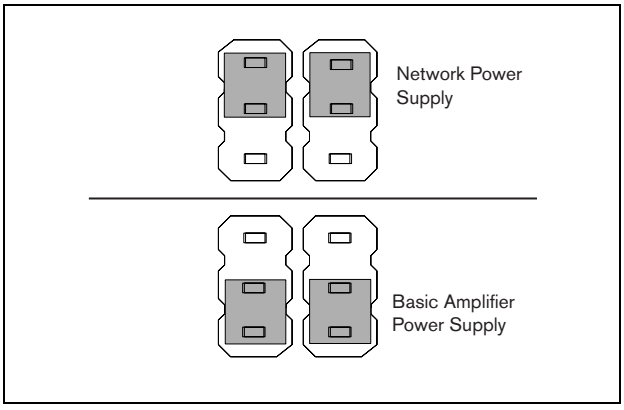


figure 10.5: Jumper settings

Warning
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

10.3.4 Connecting the multi channel interface by-pass

There are two methods to connect the bypass function of the multi channel interface.

- Bypass from the network controller. If a fatal fault in the multi channel interface occurs it will route all audio signals from a network controller output directly to all basic amplifier channels. During the bypass routing of the multi channel interface, all other functions of the multi channel interface are not supported.

Make the connection as follows:

1 Connect an Audio Out connector from the network controller to the Bypass In connector of the multi channel interface.
2 Connect the Bypass Out connector of the multi channel interface to the next multi channel interface in the Praesideo system.
3 Make sure that the audio output from the network controller is always activated as a zone as part of emergency calls.
4 For supervision of the bypass connection, configure the network controller to give a 20 kHz signal on the Audio Out of the network controller. A separate 20 kHz pilot tone detector, connected to the last by-pass out, can be used to supervise the interconnection of the bypass connections.

- Bypass from an external source. If a fatal fault in the multi channel interface occurs, an external audio output can give an audio signal directly to the basic amplifier channels. The external source can be a local microphone that goes through a pre-amplifier.

10.3.5 Connecting control inputs

The multi channel interface has 32 control inputs. The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system (see section 48.3). The control inputs can be configured to act on contact make or on contact break (see section 44.6). It is also possible to supervise the cables for short-circuits and open connections (see figure 10.6 and figure 10.7). Whether a control input is actually supervised or not is defined in the configuration.

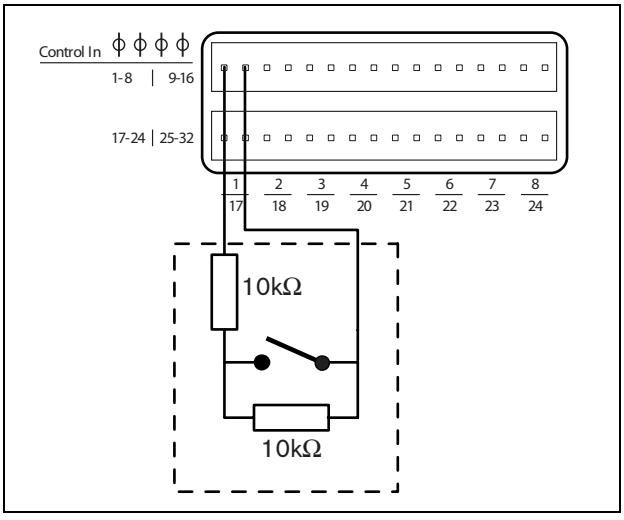


figure 10.6: Supervised control inputs 1 to 8

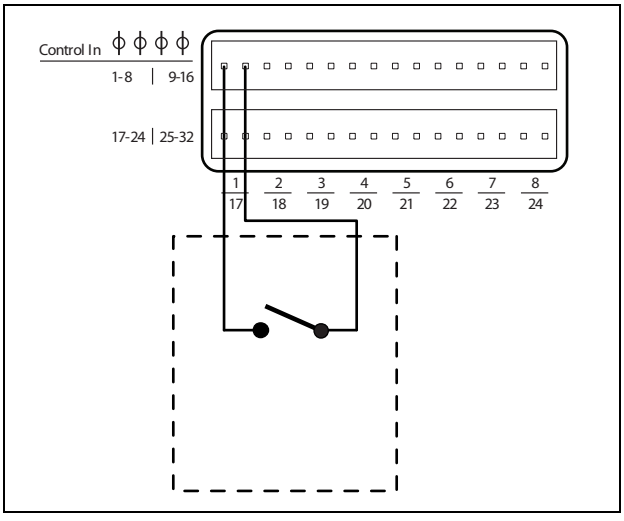


figure 10.7: Non-supervised control inputs 1 to 8

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

10.3.6 Connecting control outputs

The multi channel interface has 16 control outputs. The control outputs can be used to send signals to third party equipment to trigger actions. Each control output connection has three pins (see figure 10.8).

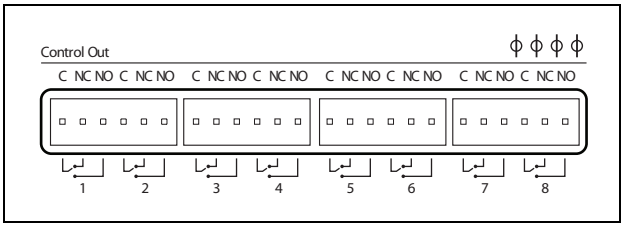


figure 10.8: Control outputs

The common (C) pin of the control output should always be connected. Whether the other pin that is connected is the normally closed (NC) or normally open (NO) depends on the required action (see table 10.2).

table 10.2: Control outputs details

Connection	Abbr.	Description
Normally closed	NC	By default, the NC contact is connected with common contact C. When the output is activated, the NC contact is opened.
Normally open	NO	By default, the NO contact is not connected with common contact C. When the output is activated, the NO contact is closed.

In the configuration, a function must be assigned to the control output that indicates when it becomes active (see table 44.6).

10.3.7 Connecting the ground

Connect the ground connection of the unit (see figure 10.2) to the 19- inch rack, which is connected to the safety ground. For good resistance to electrostatic discharges (ESD), it is important that the ground connections of the multi channel interface and the connected basic amplifiers are interconnected with short wires, directly or via the rack.

10.4 Use with Line Isolator System

The combination of Praesideo basic amplifiers and multi channel interface can also be used with the Bosch Line Isolator System consisting of the PM1-LISM6 master unit and slave devices PM1-LISS and PM1-LISD. Check the Installation and User Instructions of the PM1-LISM6 for detailed information. The Line Isolator System in combination with Praesideo is certified for EN54-16.

10.5 Installation

The multi channel interface is suitable only for 19-inch rack installation.

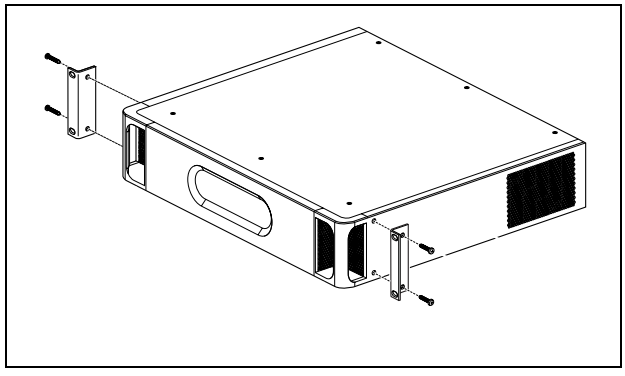


figure 10.9: Installation

Caution
When mounting the brackets to the unit, use the screws that are supplied with the brackets. Screws with a length of >10 mm may touch or damage internal parts of the unit.

10.6 Configuration and operation

10.6.1 Overview

The multi channel interface has these functions:

- Changes the Bypass mode to Normal mode after the multi channel interface starts. Refer to 10.6.2.
- Monitors the status of each basic amplifier. Refer to 10.6.3.
- Monitors the power supply to the basic amplifiers.
- Monitors the line and loudspeaker supervision devices.
- Makes the decision to make a spare amplifier available if an amplifier channel fails. Refer to 10.6.3
- Changes the basic amplifier to Power saving mode if necessary. See chapter 45.

10.6.2 Fail safe

In default or unpowered state, the Bypass In is switched to the basic amplifier channels. After power on and when the network is present, the multi channel interface goes to normal operation.

10.6.3 Multi channel interface and basic amplifier co-operation

The multi channel interface monitors the functions of the basic amplifier. Under certain conditions a fault with a basic amplifier channel will set a spare amplifier channel as a main amplifier channel.

The faulty main amplifier does not have to be in use for the spare amplifier to be used as the main amplifier. The software makes sure that the spare amplifier channel has the same setting as the main amplifier channel that it replaces. The spare amplifier channel does not become main if a main amplifier channel is disabled in the configuration.

A spare amplifier channel will not replace more than one main amplifier channel. If a spare channel is already being used as a main channel, and another main channel reports a fault, the second main channel is put on a waiting list for the spare amplifier channel. If more than two main channels are connected to the same spare channel, the first amplifier channel to report a fault will receive the spare channel.

When the first amplifier channel becomes available for use again, the spare channel takes over the functions of the second main channel until the second main channel becomes available.

10.6.4 Multi channel interface co-operation with Line Isolator System

For proper operation with the Line Isolator System, consisting of the PM1-LISM6 master unit and slave devices PM1-LISS and PM1-LISD, the multi-channel interface PRS-16MCI must have hardware version HW 04/15 or newer. Older hardware versions will generate a ground short fault. Also, the Praesideo software version should be 4.1 or higher.

10.6.5 Front panel LED indication

The front panel of the multi channel interface has LED indicators that show the status of the connected amplifier channels and the network status. See table 10.3 and table 10.4 for the description of the status LEDs.

table 10.3: Status LEDs

Channel LED	Basic amplifier channel
Green	Channel enabled in configuration, no fault
Yellow	Channel enabled in configuration, fault present (solving the fault sets the LED to green again, even if the fault was not acknowledged or reset by the operator)
Off	Channel disabled in configuration or not configured

table 10.4: Network LED

Network LED	Multi channel interface
Green	Connected to the network
Yellow	Disconnected from the network
Off	Powered off

10.7 Technical data

10.7.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm behind the brackets, 40 mm in front of the brackets)

Weight:
7 kg

10.7.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)

Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)

Air pressure:
600 to 1100 hPa

10.7.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4 (only when the power for this unit is supplied by basic amplifiers)
EN50130-4

Electrical safety:
IEC60065 (CB-scheme)
EN60065

Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

10.7.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C

MTBF:
400,000 hours
(based on real warranty return rate data)

10.7.5 Power supply

Multi channel interface power supply:
Supplied by either:
- the connected basic amplifier (default setting), or
- the Praesideo system bus (optional setting)

10.7.6 Power consumption

Power consumption (basic amplifier)
If the power is supplied by the basic amplifier:
- the power consumption of the basic amplifier is increased by 12 W
- the power consumption of the network is 0 W

Power consumption (network)
If the power is supplied by the Praesideo system bus:
- the power consumption of the network is increased by 12 W
- the power consumption of the basic amplifier is 0 W

10.7.7 Control inputs

Connector (rear side):
Removable screw connector (4 x 16 positions)

Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)

Resistance detection (supervision enabled):
Cable short circuit
< 2.5 kΩ
Contact closed
7.5 kΩ to12 kΩ
Contact open
17.5 kΩ to 22 kΩ
Cable broken
> 27 kΩ
Resistance detection (supervision disabled):
Contact closed
< 12 kΩ
Contact open
> 17.5 kΩ

Maximum open voltage:
12 V(DC)

Internal pull-up current:
0.5 mA

External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

10.7.8 Control outputs

Maximum cable length:
1 km
Contact type:
Relay contact, single pole, change-over contact (SPDT)
Maximum switching power:
Refer to the graph.
Off state (unpowered):
C-NC is closed, C-NO is open

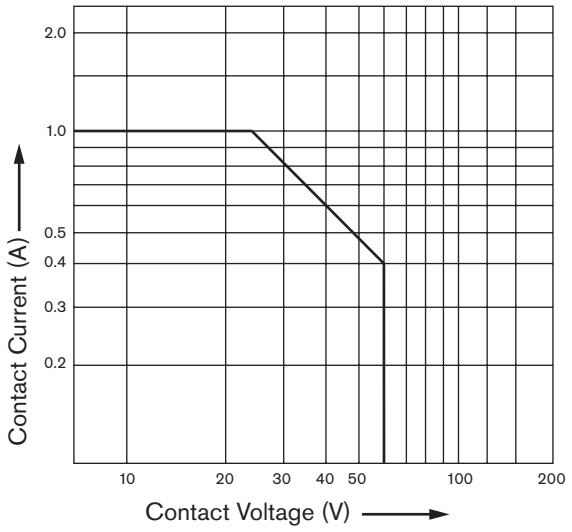


figure 10.10: Maximum switching power

10.7.9 Audio Bypass

Connector audio in:
XLR-female with locking
Input signal level:
0 dBV nominal
10 dBV maximum
Connector audio out:
XLR-male
Output signal level:
Loopthrough of the by-pass audio input

10.7.10 Basic amplifier connections

Connector (rear side):
RJ45
Preferred cable:
CAT5, unshielded twisted pairs
Maximum cable length:
3 m
Ground short detection resistance:
$< 50\ k\Omega$

11 Basic Amplifiers

11.1 Introduction

The basic amplifier is available in these versions:

- PRS-1B500: 1 channel, 500 W.
- PRS-2B250: 2 channels, 2 x 250 W.
- PRS-4B125: 4 channels, 4 x 125 W.
- PRS-8B060: 8 channels, 8 x 60 W.

The basic amplifier is a high efficiency class-D power amplifier for public address and emergency sound systems and is designed as an extension to the Praesideo system but can also work as a stand alone amplifier. If not used as a stand alone amplifier, the basic amplifier is used in conjunction with the multi channel interface which provides the audio signals and control.

The basic amplifier is completely supervised and fault events are reported via the multi channel interface to the Praesideo network controller.

Loudspeaker lines and loudspeakers connected to a basic amplifier channel can be supervised by using the LBB4441 and LBB4443 supervision boards. The multi channel interface acts as a supervision controller, so no LBB4440 is required.

In contrast to the power amplifiers, the basic amplifiers do no offer built-in audio processing functions as equalization, delay and automatic volume control.

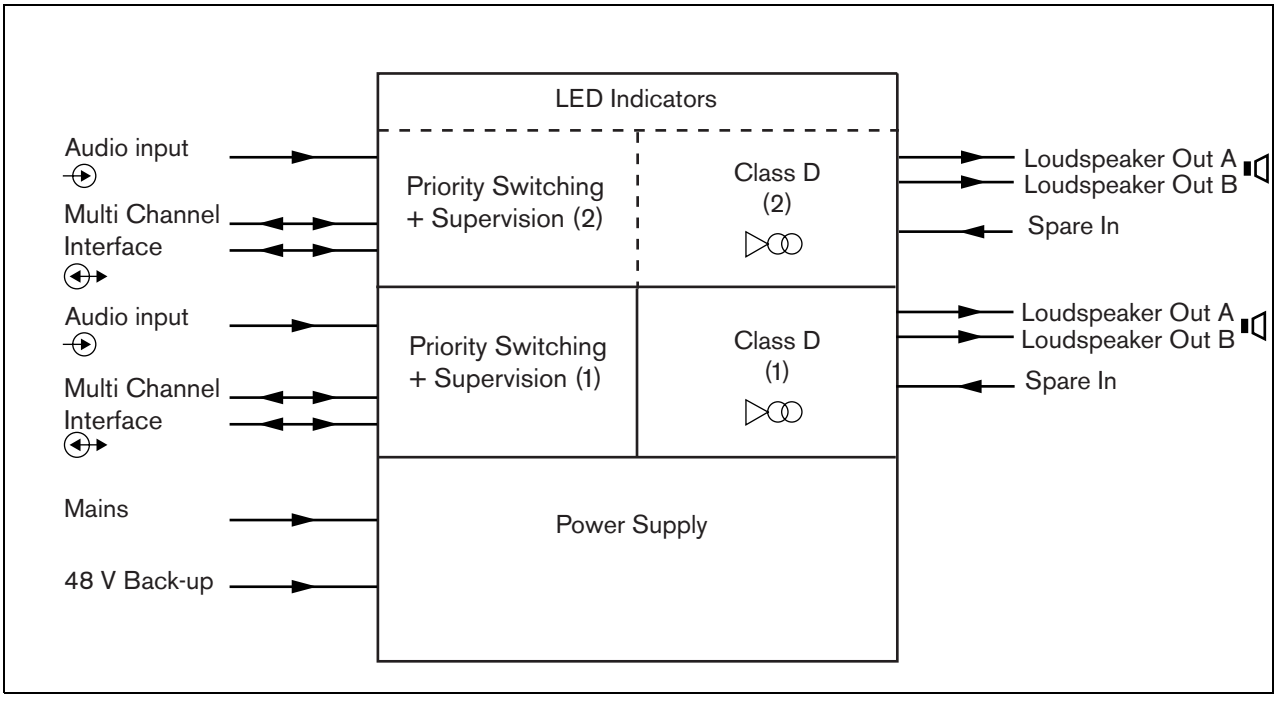


figure 11.1: Block diagram of a basic power amplifier

11.2 Controls, connections and indicators

11.2.1 Front

The front view of the basic amplifier (see figure 11.2) contains the following:

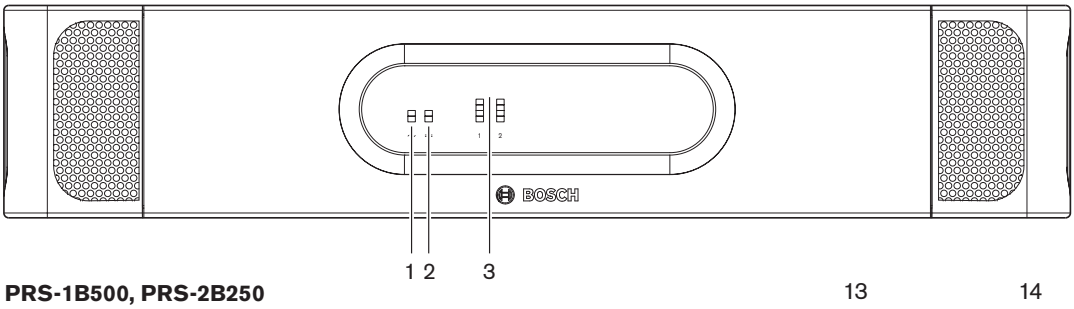
1 **Mains status** - Shows the status of the mains power connection and supply (see section 11.6).
2 **Battery status** - Shows the status of the battery back-up supply (see section 11.6).
3 **Amplifier status** - Shows the audio level and status of each audio output channel (see section 11.6).

11.2.2 Rear

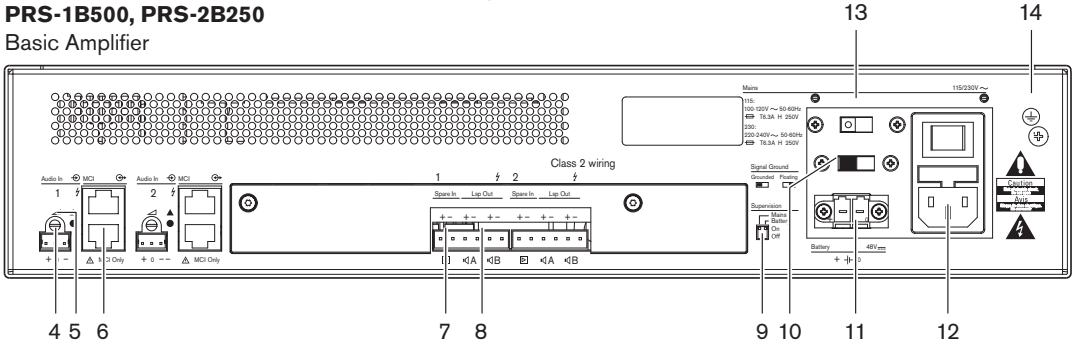
The rear of the basic amplifier (see figure 11.2) contains the following:

4 **Audio in** - Local audio input (see section 11.3.6).
5 **Sensitivity control** - Potentiometer for the local audio input volume (see section 11.3.6).
6 **MCI** - 2 x RJ45 - 8 pin Multi channel interface connection (see section 11.3.3).
7 **Spare In** - Spare switching input from a spare amplifier channel (see section 11.3.5.3).
8 **LSP out** - A and B outputs to loudspeakers (see section 11.3.5).
9 **Supervision** - Mains and battery supervision.
10 **Signal Ground** - A switch that connects the signal ground to the safety ground (see section 11.3.4).
11 **Back-up power** - A socket for connecting a back-up power supply (see section 11.3.7).
12 **Mains inlet** - A mains socket to connect the amplifier to the mains (see section 11.3.2).
13 **Voltage selector** - A switch to select the local mains voltage (see section 11.3.2).
14 **Ground** - A connector to electrically ground the unit (see section 11.3.4).

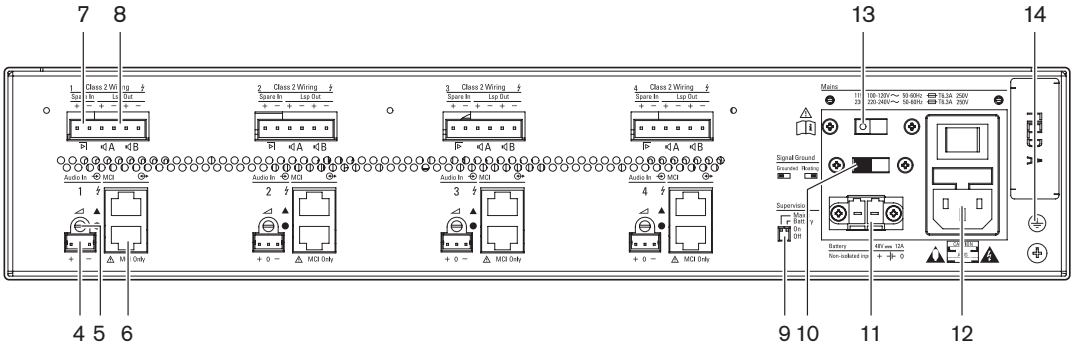
PRS-xBxxx
Basic Amplifier



PRS-1B500, PRS-2B250
Basic Amplifier



PRS-4B125
Basic Amplifier



PRS-8B060
Basic Amplifier

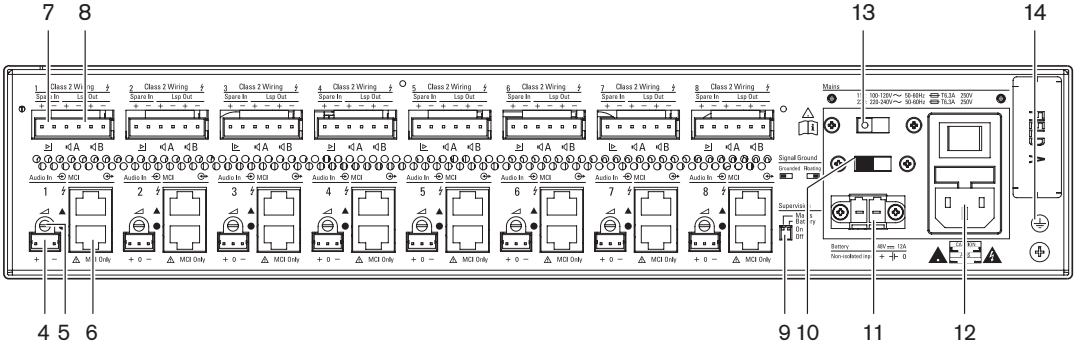


figure 11.2: Front and rear views of the basic amplifier

11.3 Connectors

11.3.1 Introduction

This section gives an overview of typical system connections with the multi channel interface and loudspeakers.

- Connecting the mains (see section 11.3.2).
- Connecting the multi channel interface (see section 11.3.3).
- Connecting to ground (see section 11.3.4).
- Connecting the amplifier channels (see section 11.3.5).
- Connecting the local audio input (see section 11.3.6
- Connecting the back-up power supply (see section 11.3.7)

11.3.2 Connecting to the mains

Proceed as follows to connect the basic amplifier to the mains:

1 Select the correct local mains voltage using the voltage selector on the rear of the basic amplifier (see table 11.1).

table 11.1: Voltage selector and fuse

Selector	Mains voltage V(AC)	Fuse
115	100 - 120	T6.3A H 250V (IEC 60127 or UL 248)
230	220 - 240	T6.3A H 250V (IEC 60127)

2 Put the correct type of fuse in the basic amplifier. The fuse is in the mains inlet. Note that the same fuse value is used for both voltage ranges.

3 Connect the mains cord to the basic amplifier.

4 Connect the mains cord to a locally approved mains outlet.

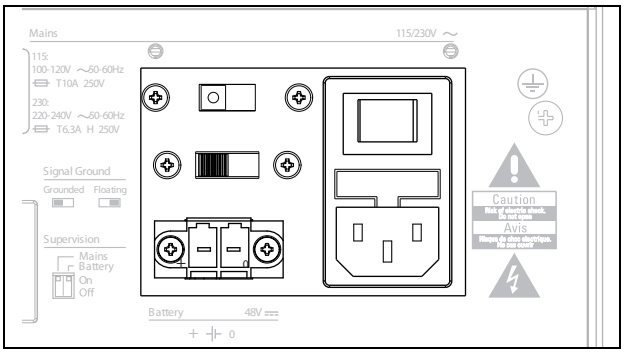


figure 11.3: Connecting mains power supply

The mains supply can be supervised by the basic amplifier (see figure 11.2, no. 9) and is available for the multi channel interface.

11.3.3 Connecting to the multi channel interface

The connection to the multi channel interface (MCI) is made with two CAT-5 connections. The MCI connections have a triangle and a circle symbol (see figure 11.5).

Caution
Do not connect the circle symbol connector of the multi channel interface to the triangle symbol connector of the power amplifier.

Caution
Always use CAT-5 modular plugs with an empty connector crimp part (refer to figure 11.4, part A). Some (pre-)assembled CAT-5 modular plugs have a connector crimp part that is filled with plastic (refer to figure 11.4, part B). These connectors do not give a reliable connection to the CAT-5 connectors on the basic amplifiers and multi channel interfaces and can therefore can cause unexpected fault events.

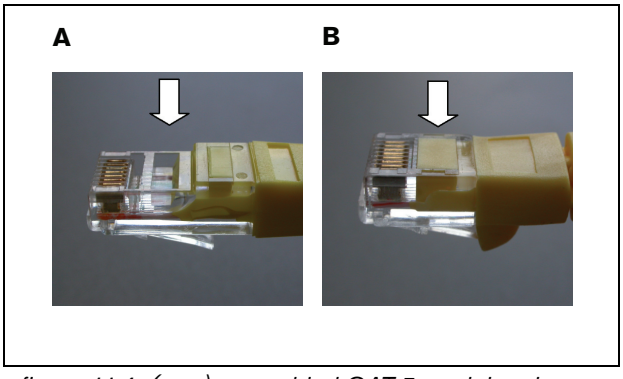


figure 11.4: (pre-) assembled CAT-5 modular plugs

Proceed as follows:

1 Connect the triangle symbol connector of the MCI to the triangle symbol connector of the basic amplifier.
2 Connect the circle symbol connector of the MCI to the circle symbol connector of the basic amplifier.

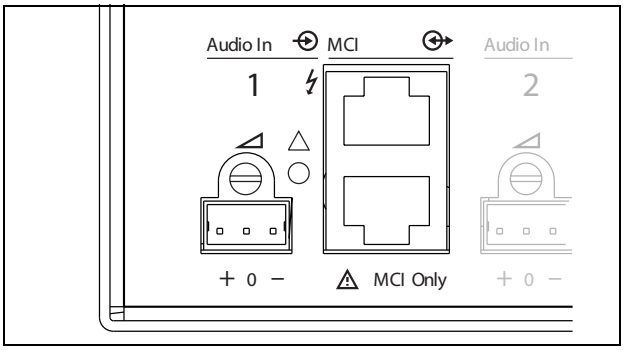


figure 11.5: MCI connections

11.3.4 Ground connection

Connect the ground connection of the unit (see figure 11.2) to the 19 inch rack, which is connected to the safety ground. For good resistance to electrostatic discharges (ESD), it is important that the ground connections of the multi channel interface and the connected basic amplifiers are interconnected with short wires, directly or via the rack. Set the signal ground switch to *Grounded* in case the audio source is not grounded to reduce susceptibility to external RF disturbances. If the audio source already has the signal ground connected to a safety ground, set the switch to *Floating* to avoid ground loops that can be a source of hum.

11.3.5 Connecting the amplifier channels

11.3.5.1 Introduction

An amplifier channel (see figure 11.6) is a group of outgoing signals that have been processed by the same amplifier unit of the basic amplifier. The number of amplifier channels depends on the type of basic amplifier.

table 11.2: Number of amplifier channels

Type	Amplifier channels
PRS-1B500	1
PRS-2B250	2
PRS-4B125	4
PRS-8B060	8

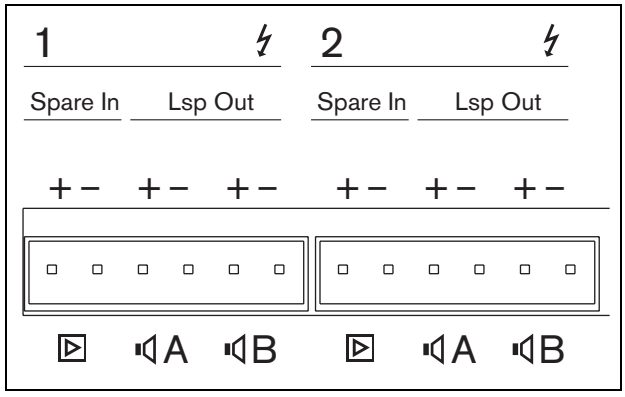


figure 11.6: Amplifier channel connectors

table 11.3: Amplifier channel connector details

Pin	Description
1, 2	Spare amplifier input. See section 11.3.5.3.
3, 4	Loudspeaker line A. See section 11.3.5.2.
5, 6	Loudspeaker line B. See section 11.3.5.2.

Caution
To prevent the hazard of electric shocks, switch off the basic amplifiers and disconnect the back up power supplies from the basic amplifiers before connecting loudspeaker lines and spare amplifier connections.

Caution
After connecting wires to the amplifier channel connectors, install the plastic safety bracket. The plastic safety bracket makes sure that the amplifier channel connectors cannot be touched.

11.3.5.2 Loudspeaker lines

Between the *Lsp Out+* and *Lsp Out-* connections, the loudspeakers must be connected. The voltage between these connections (100 V, 70 V) depends on the position of the jumper on the output board (see figure 11.7).

It is possible to use the different voltages to reduce the volume of the loudspeaker line. For example, if all loudspeakers are suitable for 100 V, the maximum output level is 40 dBV. If the loudspeaker line voltage is set to 70 V, the maximum output level is reduced to 37 dBV (difference: -3 dB).

Caution

Check the specifications of the loudspeakers to find out which maximum voltage can be provided on the loudspeakers outputs of the power amplifiers.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

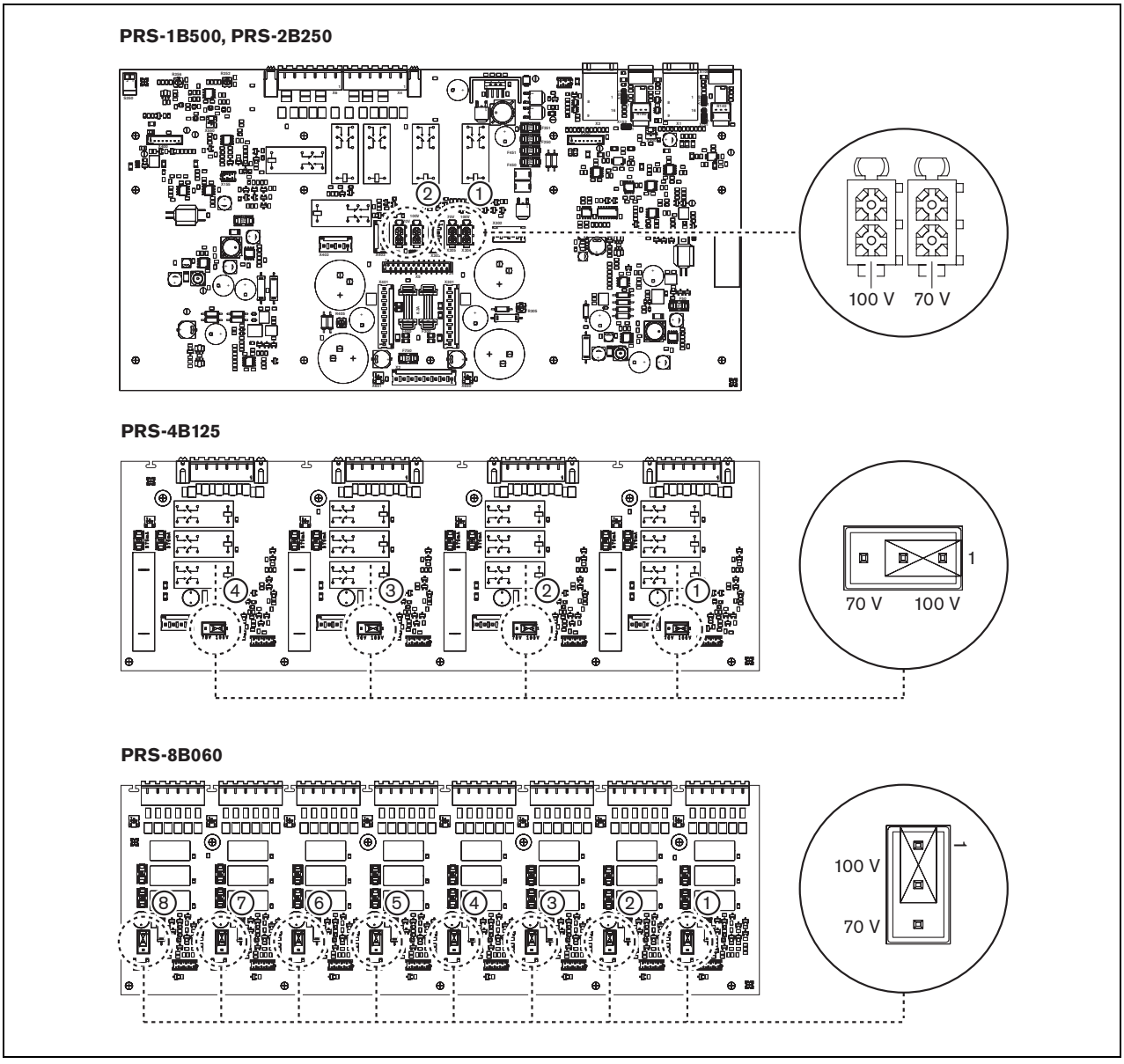


figure 11.7: Top view of the basic amplifier output boards

The loudspeaker lines can be connected in three different ways depending on the level of supervision and redundancy required.

If loudspeaker lines A and B are in the same area, connect the loudspeaker lines as shown in figure 11.8.

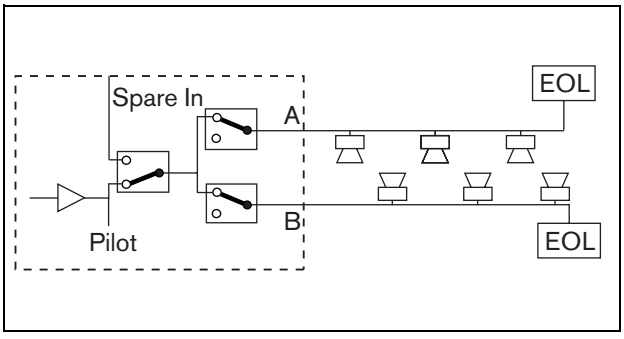


figure 11.8: Output A and B in the same area

This method has full supervision and redundancy. The A and B relays are normally closed and supervision boards (see sections 13.2.2 and 13.2.3, indicated with EOL) are connected to both the A and B groups.

- If an amplifier overload occurs, then the multi channel interface will control the A and B relays to isolate the overload and keep the other group working.
- If a line fault is detected by the supervision boards in one of the groups, the affected group will be switched off. A fault event for group A or group B will be generated.

If loudspeaker lines A and B are in different locations, connect the loudspeaker lines as shown in figure 11.9.

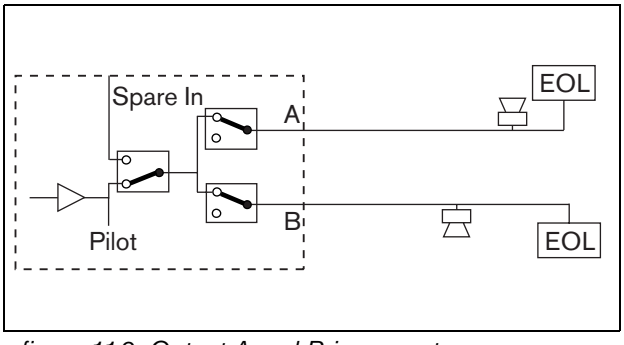


figure 11.9: Output A and B in separate areas

This method has no redundancy. Both A and B relays are normally closed.

- If a line fault is detected by the supervision boards in one of the groups, the group remains live.
- Only if an overload is detected, the affected group will be switched off. A fault event is generated.

If loudspeaker lines A and B must form a class-A loop, connect the loudspeaker lines as shown in figure 11.10

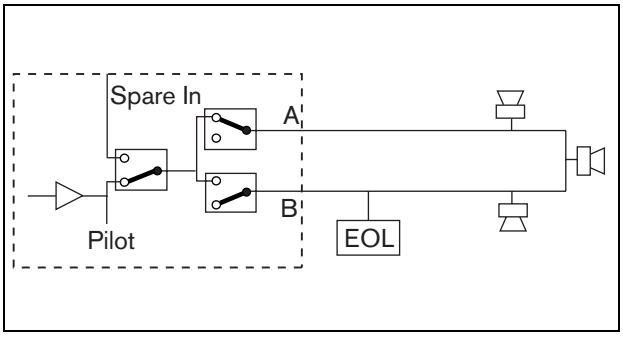


figure 11.10: Class-A loop from output A to B

Both A and B outputs use the same loudspeaker group. The A relay is normally closed and B relay is normally open.

- If a line fault occurs, detected by the supervision board (EOL), the relay B closes and a fault event is generated to indicate the switch over.
- If the cable is broken, the A output gives power to all loudspeakers that are before the break, the B output gives power to all loudspeakers to the other side of the break.
- If a short-circuit or overload causes the line fault, the amplifier generates a fault event.

11.3.5.3 Spare amplifier channel

A spare amplifier channel can be made available as a back-up channel for all channels of all basic amplifiers. The only restriction is that all the basic amplifiers must be connected to the same multi channel interface. The connection from the spare amplifier channel can be made as a loop through to all the channels of the basic amplifiers.

Make sure that the power rating of the spare amplifier channel is the same as or higher than the power rating of the main channels.

Spare and main amplifier channels can be part of the same amplifier. Use a back-up power supply to avoid that the power supply is a single-point of failure.

A supervision board connected to the last Spare In connection gives supervision to the spare channel.

If channel 2 in the figure 11.11 has a failure, the spare channel becomes active and supports all settings of channel 2. If Channel 1 in the figure 11.11 also has a failure, the spare channel does not support channel 1, but remains with channel 2.

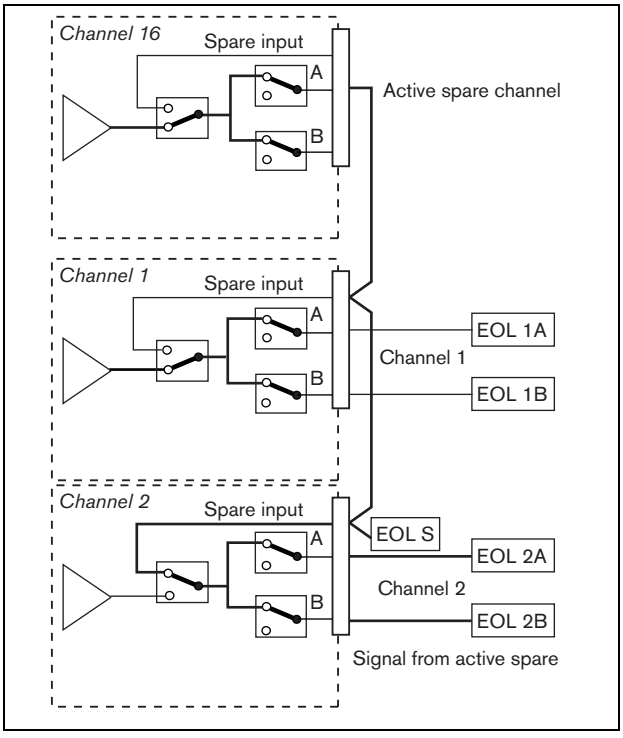


figure 11.11: Spare amplifier and loudspeaker connections

To connect the spare channel to the basic amplifier channels, proceed as follows:

1 Connect the + A Lsp Out from the spare amplifier channel to the + Spare In connection of Channel N of the basic amplifier.
2 Connect the - A Lsp Out from the Spare Amplifier channel to the - Spare In connection Channel N of the basic amplifier.
3 Make a loop through connection to all channels of the basic amplifiers that need spare channel back-up.
4 Optional: connect a supervision board to the last channel Spare In connection.

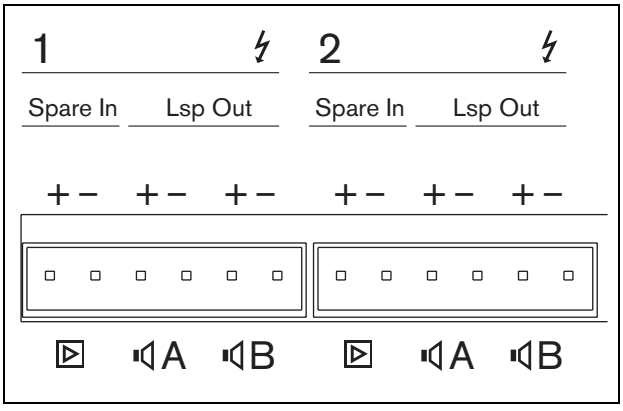


figure 11.12: Basic amplifier outputs and spare channel inputs

11.3.6 Connecting the local audio input

The basic amplifiers have a local audio input per channel for a local signal source. This input has a low priority and is controlled by the multi channel interface. The local input signal is suppressed by any signal from the Praesideo system to that channel (zone).

On the PRS-1B500 and PRS-2B250, the local audio input can be set to balanced or stereo unbalanced. This feature is not available on the PRS-4B125 and the PRS-8B060. The input has line level sensitivity, controlled with a sensitivity preset above the connector. See figure 11.5 for details about the local audio input socket and preset.

table 11.4: Audio input socket details

Socket	Balanced	Unbalanced
+	+ Signal	Right
0	Ground	Ground
-	- Signal	Left

Note
The wiring to the local audio inputs must be less than 3m in length.

11.3.6.1 Balanced inputs

The jumper settings are set to balanced as default. See table 11.4 for connections and figure 11.13 for the jumper locations.

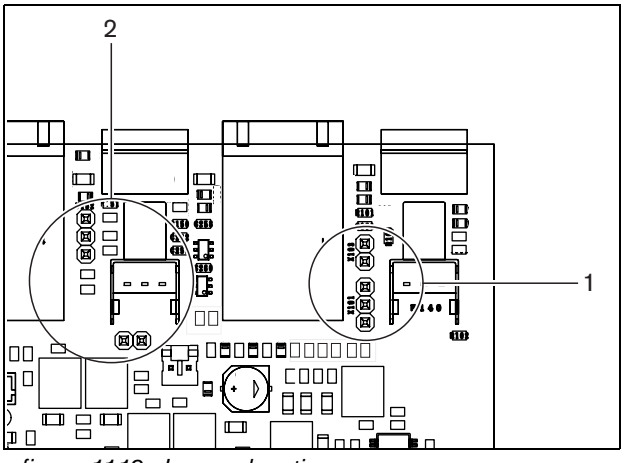


figure 11.13: Jumper location

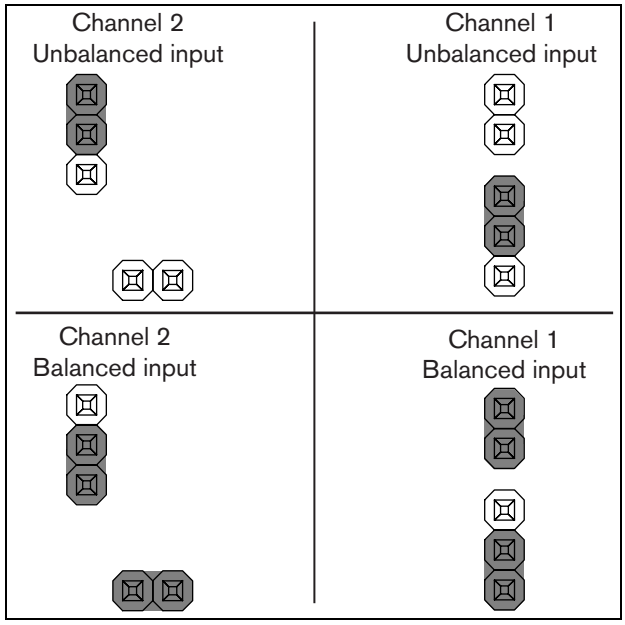


figure 11.14: Jumper setting

11.3.6.2 Stereo unbalanced input

On the PRS-1B500 and PRS-2B250, it is possible to change the balanced input into an unbalanced mixing stereo input for a e.g. CD player. Connect the right and left channels according to table 11.4. Both channels are added together into a mono signal. See figure 11.14 for the jumper settings. Use a pair of tweezers to change the jumper settings as the jumpers are difficult to reach.

11.3.6.3 Sensitivity control

Use the recessed sensitivity control to adjust the input signal from a local audio device.
Use a small screw driver to adjust the potentiometer.

11.3.7 Connecting back-up power

Connect the back-up supply to the back-up power connector on the back of the basic amplifier. Refer to figure 11.15.

Warning
For safety reasons you must use an external circuit breaker. Install in accordance with the local Electrical and Building Code, e.g. for USA and Canada in accordance with NEC/CEC and for Germany in accordance with VDE0108-1.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

Warning
Never ground the positive terminal of the battery, as this will damage the Praesideo equipment.
If the back-up power supply (battery) is grounded, always connect the negative terminal (0) first and the positive terminal (+) second. Disconnect in reverse order: disconnect the positive terminal first and the negative terminal second. This avoids excessive ground loop currents.

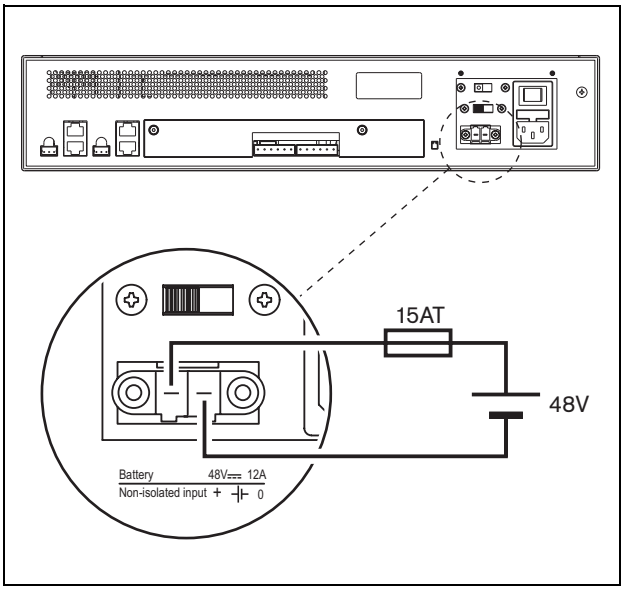


figure 11.15: Connecting back-up supply

The back-up supply can be supervised by the basic amplifier (see figure 11.2, no. 9) and is available for the multi channel interface.

11.4 Fan control

The PRS-1B500, PRS-2B250, PRS-4B125 and PRS-8B060 amplifiers, from HW version 06/00 onwards, have a fan monitoring circuit that detects the actual fan rotation. This detection is needed for compliancy to the standards UL864 and UL1711, for use in the USA. Additionally the internal fans need to run at full speed for compliancy to these standards. A jumper on the main PCB selects between two positions:

- Normal (factory default) - The fans are temperature controlled, normally running at low speed and switching to high speed in case the temperature exceeds a certain level. Fan monitoring is not activated.
- Full speed - The fans run at full speed continuously. Fan monitoring is activated. Do not enable Switch amplifiers to standby (see section 44.4) for this selection, because in standby the fans are stopped and a fault would be generated.

For the PRS-1B500, the jumper is indicated on the PCB as X652; connection 1-2 selects Normal, connection 2-3 selects Full speed. See figure 11.16.

For the PRS-2B250, the jumper is indicated on the PCB as X652 and X653 (one for each fan); connection 1-2 selects Normal, connection 2-3 selects Full speed. See figure 11.16.

For the PRS-4B125, the jumper is indicated on the PCB as X88 and X91 (one for each fan); connection 1-2 selects Normal, connection 2-3 selects Full speed. See figure 11.16.

For the PRS-8B060, the jumper is indicated on the PCB as X88 and X91 (one for each fan); connection 1-2 selects Normal, connection 2-3 selects Full speed. See figure 11.16.

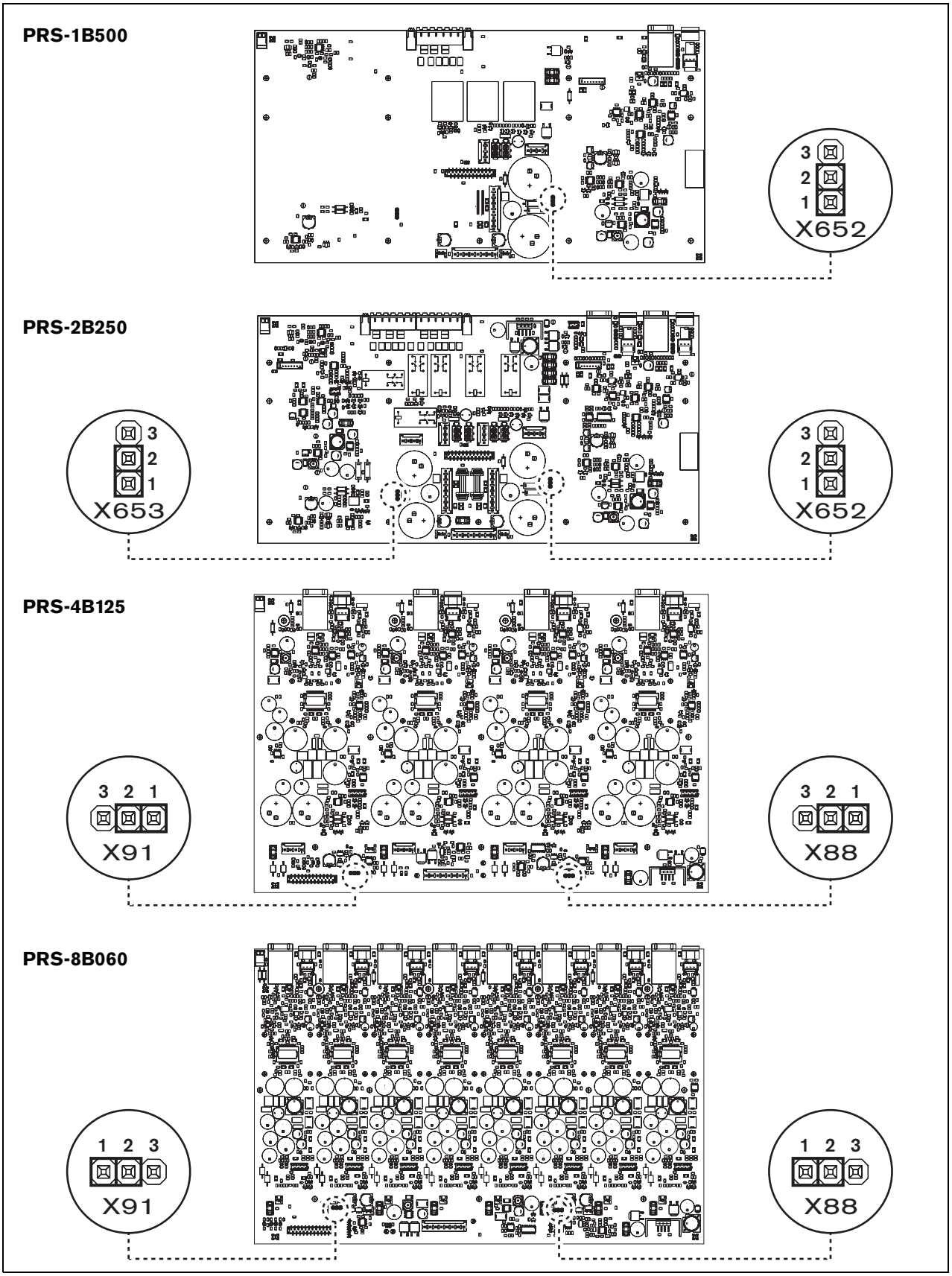


figure 11.16: Top view of the output boards for jumpers providing fan control

11.5 Installation

The basic amplifier is suitable for only 19-inch rack installation.

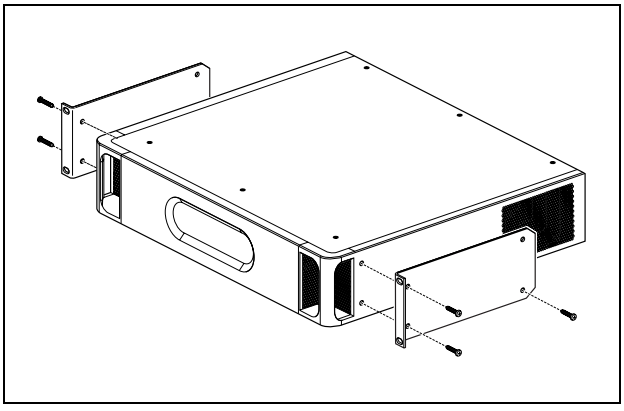


figure 11.17: Installation

Ensure there is enough space for the cool air flow to enter and the warm air flow to leave the basic amplifier.

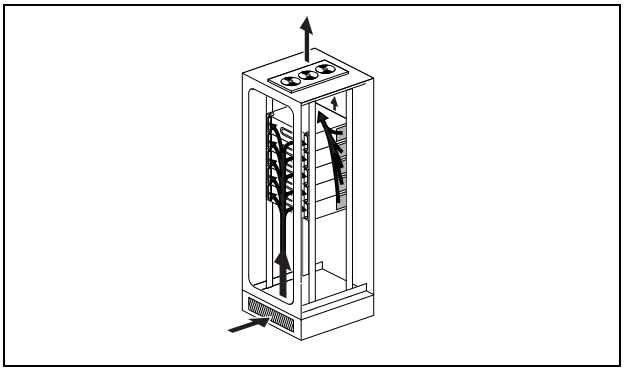


figure 11.18: Air flow in a 19" rack

Caution

When mounting the brackets to the unit, use the screws that are supplied with the brackets, four longer ones and two shorter ones. Use two screws of 7.5 mm thread length at the front side of each bracket, use a short screw of 5.2 mm thread length at the rear side of each bracket. Do not use screws with a thread length of >10 mm for the front positions or screws with a thread length of >5.7 mm at the rear postion; longer screws may touch or damage internal parts of the unit.

11.6 Operation

The front panel of the amplifier has LED indicators that show the status of the amplifier channels, battery back-up, mains supply and supervision. See the table 11.5 and table 11.6 for the descriptions of the status LEDs.

The LED indicators will show the fault status of the mains supply and battery supply if supervision is enabled with the supervision switches (9 in figure 11.2). This status is always transferred to the multi channel interface, even if the switches are in the Off-position. The switches only control the LED indicators, e.g. for stand-alone use.

table 11.5: Mains LED status

Mains LED	Mains	Mains supervision enabled
Green	Present	X
Yellow	Not present	Enabled
Off	Not present	Off

table 11.6: Battery LED status

Battery LED	DC back-up	DC back-up supervision enabled
Green	Present	X
Yellow	Not present	Enabled
Off	Not present	Off

The amplifier channel LED indicators show the status of each amplifier channel independently. Each channel has four indicators, one yellow and three green. See table 11.7 for the descriptions of the status LEDs for the amplifier channels.

table 11.7: Channel LED status

Channel LED status	Output level
Yellow	0 dB / Fault *
Green	- 6 dB
Green	- 12 dB
Green	- 20 dB

Note

The yellow channel LED indicates clipping of the signal when the green LEDs are also on, otherwise it indicates a fault situation such as overheat or a short circuit.

Note
The first green LED is normally on when the pilot tone is enabled in the multi channel interface.

11.7 Technical data

11.7.1 Physical characteristics

Dimensions (H x W x D):
88 x 483 x 400 mm (19" installation, with brackets, 360 mm depth behind the brackets, 40 mm in front of the brackets)
Weight:
PRS-1B500
12 kg
PRS-2B250
14 kg
PRS-4B125
15 kg
PRS-8B060
13.7 kg

11.7.2 Climate conditions

Temperature:
-5 to +55 °C (operating)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

11.7.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

11.7.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
430,000 hours
(based on real warranty return rate data)

11.7.5 MCI connection

Connector (rear side):
2 x RJ45
Preferred cable:
2 x CAT5 straight
Maximum cable length:
3 m

11.7.6 Power supply

Connector (rear side):
IEC male power inlet with fuse holder
Preferred cable:
Mains cord meeting CE standard
Voltage selector (rear side):
115 V(AC)/230 V(AC)
Nominal input voltage range:
115 V (typical): 100 - 120 V(AC) at 50 - 60 Hz
230 V (typical): 220 - 240 V(AC) at 50 - 60 Hz
Input voltage limits:
115 V (typical): 90 - 132 V(AC) at 50 - 60 Hz
230 V (typical): 198 - 264 V(AC) at 50 - 60 Hz
On/Off switch:
Located at the rear
Power factor (PF):
> 0.6

11.7.7 Back-up power

Connector (rear side):
2 pole for removable screw connector
Input voltage:
48 V(DC)
Input voltage range:
43.5 to 56 V(DC)
Maximum current:
12 A

11.7.8 Power consumption

Note
The power consumption on batteries depends on the connected load, signal levels and type of signal (alarm tone, duty cycle, speech). It is recommended to measure the actual current drawn from the batteries in power save mode, idle mode and alarm tone mode to check the calculated battery capacity. When calculating the battery capacity, also take into account that the capacity decreases during the lifetime of the battery. Also see section 34.3.

11.7.8.1 Power consumption PRS-1B500

Load: 20 Ω / 250 nF per channel

Stand-by/Power save:
6 W, 48 V(DC); 17 W, 120/230 V(AC)
Idle, no pilot tone:
13 W, 48 V(DC); 27 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
34 W, 48 V(DC); 52 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
208 W, 48 V(DC); 240 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
365 W, 48 V(DC); 450 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
430 W, 48 V(DC); 590 W, 54 V(DC); (nominal input level) 715 W, 120/230 V(AC)

11.7.8.2 Power consumption PRS-2B250

Load 40: Ω / 125 nF per channel

Stand-by/Power save:
6 W, 48 V(DC); 18 W, 120/230 V(AC)
Idle, no pilot tone:
21 W, 48 V(DC); 30 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
38 W, 48 V (DC); 46 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
206 W, 48 V(DC); 211 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
370 W, 48 V(DC); 378 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
440 W, 48 V(DC); 510 W, 54 V(DC); (nominal input level) 690 W, 120/230 V(AC)

11.7.8.3 Power consumption PRS-4B125

Load 80: Ω / 62 nF per channel

Stand-by/Power save:
9 W, 48 V(DC); 16 W, 120/230 V(AC)
Idle, no pilot tone:
26 W, 48 V(DC); 38 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
48 W, 48 V (DC); 62 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
210 W, 48 V(DC); 230 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
375 W, 48 V(DC); 395 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
608 W, 48 V(DC); 680 W, 54 V(DC); (nominal input level) 770/730 W, 120/230 V(AC)

11.7.8.4 Power consumption PRS-8B060

Load 166: Ω / 30 nF per channel

Stand-by/Power save:
10 W, 48 V(DC); 16 W, 120/230 V(AC)
Idle, no pilot tone:
42 W, 48 V(DC); 62 W, 120/230 V(AC)
Idle, with pilot tone 15 V:
62 W, 48 V (DC); 80 W, 120/230 V(AC)
P_{max} -6 dB with pilot tone 15 V:
220 W, 48 V(DC); 240 W, 120/230 V(AC)
P_{max} -3 dB with pilot tone 15 V:
385 W, 48 V(DC); 400 W, 120/230 V(AC)
P_{max} with pilot tone 15 V:
665 W, 48 V(DC); 700 W, 54 V(DC); (nominal input level) 760/710 W, 120/230 V(AC)

11.7.9 Audio line inputs

Connector (rear side):
3 pole header for removable screw connector
Preferred cable:
Twisted pair, shielded
Input signal level:
0 dBV nominal
18 dBV maximum
Input sensitivity setting:
< -40 to 0 dB with pre-set control
Frequency response:
-3 dB points at 50 Hz and 20 kHz (tolerance ± 1 dB)
Input impedance:
22 kΩ
Signal/Noise ratio:
> 87 dB (rms unweigthed)
Common mode rejection ratio:
> 40 dB at 1 kHz
Input cross-talk:
< -70 dB at 1 kHz

11.7.10 Loudspeaker outputs and spare inputs

Connector (rear side):
1 x 6 pole header with removable screw connector
Voltage:
100 V, 70 V (jumper setting)
Max. unloaded voltage:
200 V peak
Rated load resistance:
@ 100/70 V output
PRS-1B500
20/10 Ω
PRS-2B250
40/20 Ω
PRS-4B125
80/40 Ω
PRS-8B060
166/83 Ω
Rated load capacitance:
@ 100/70 V output
PRS-1B500
250/500 nF
PRS-2B250
125/250 nF
PRS-4B125
60/125 nF
PRS-8B060
30/60 nF
Rated output power:
@ a/b/c/d/e/f operating condition
PRS-1B500
1 x 500/400/275/180/180/125 W
PRS-2B250
2 x 250/210/150/110/110/60 W
PRS-4B125
4 x 125/105/65/60/60/30 W
PRS-8B060
8 x 60/50/40/30/30/15 W
Distortion:
≤ 0.3% at 1 kHz and 50% of the rated output power
< 1% at 100% of output power
Output regulation no load to full load:
<1.2 dB for 70 and 100V output

Frequency response:
PRS-1B500, PRS-2B250, PRS-4B125
60 Hz to 19 kHz (-3 dB) at -10 dB with maximum capacitive load and rated load resistance
PRS-8B060
80 Hz to 19 kHz (-3 dB) at -10 dB with maximum capacitive load and rated load resistance
Power bandwidth:
60 Hz - 19 kHz (-3 dB, distortion < 1%) at 50% of the rated output power
Signal/Noise ratio:
> 85 dB(A) with pilot tone off
Amplifier output limiting:
Soft clipping
Acoustical noise level:
< NR35 at 1 m, fans at half speed
< NR40 at 1 m, fans at full speed

a Distortion < 1%, 1 kHz, nominal mains power or battery >53V, max. 1 minute (acc. to IEC 60268-3).

b Distortion < 1%, 1 kHz, mains power or battery >50V, max. 1 minute, ambient temperature 55 °C (acc. to EN54-16).

c Distortion < 1%, 1 kHz, battery 48V, max. 1 minute, ambient temperature 55 °C.

d Alarm tone level, distortion < 0.3%, 1 kHz, mains or battery (>43.5V), max. 30 minutes, ambient temperature 55 °C.

e Distortion < 0.3%, 1 kHz, mains or battery >43.5V, continuous, ambient temperature 30 °C.

f Distortion < 0.3%, 1 kHz, mains or battery >43.5V, continuous, ambient temperature 55 °C.

11.7.11 Derating

The graph shows the continuous power used for emergency tones, speech, etc. as function of the ambient temperature.

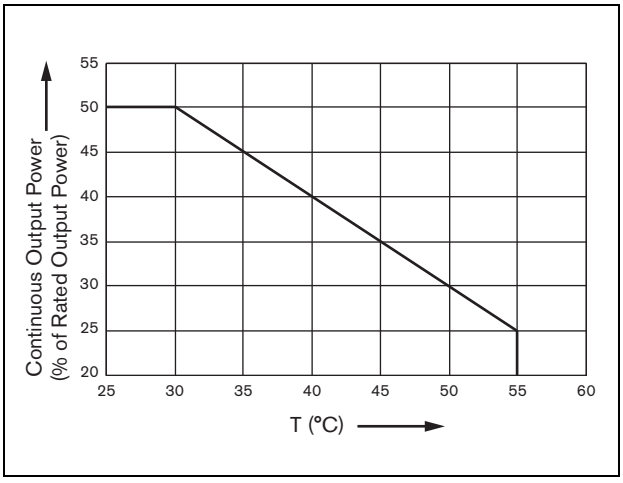


figure 11.19: Maximum switching power

If the amplifier is loaded with loudspeakers up to its rated output power (see section 11.7.10), you can still play music and speech for an indefinite long period of time at an ambient temperature of 55 °C, because of the crest factor (or peak-to-average ratio) of the audio signals. The crest factor of music and speech is typically 6 to 8 dB, which makes the required continuous power 25% or less of the rated output power. Alarm tones are set to -3 dB maximum by Praesideo, resulting in a required continuous power of 50% of the rated output power. This can be delivered for at least 30 minutes at 55 °C ambient or continuously at 30 °C ambient.

12 Single loudspeaker line supervision

12.1 Introduction

Single loudspeaker line supervision is only available for the PRS-xPxxx power amplifiers and not for the basic amplifiers.

The LBB4442/00 Line Supervision Set contains a supervision-master PCB and a supervision-slave PCB. With this set, it is possible to supervise the end of a loudspeaker line.

Note
Use multiple loudspeaker line supervision (see chapter 13) to supervise the ends of branches in loudspeaker lines and the loudspeakers themselves.

The supervision-master PCB must be installed on the output board of the amplifier channel that must be supervised, whereas the supervision-slave must be connected to the last loudspeaker in the loudspeaker line that must be supervised.

So, for each loudspeaker line, one set is needed. The supervision-slave is powered from the 20 kHz pilot tone of the power amplifier and communicates inaudibly with the supervision-master via the loudspeaker lines. No additional wiring is required. Faults in the loudspeaker lines are reported within 100 s. Communication is not affected by the audio signals on the loudspeaker lines.

The use of multi-wire cables is not recommended in combination with line supervision because crosstalk between audio channels may influence the line supervision.

Please check the Bosch Application Note on WLS Speaker Impedance Measurements for additional information on how to determine the load impedance of a set of loudspeakers and associated wiring. This is especially important if thin wiring or highly capacitive wiring (like fire resistant wiring) is used, or loudspeakers that are not made by Bosch.

Note
For the line supervision set to work correctly it is necessary to set the amplifiers to 70 V or 100 V output. The 50 V setting is not allowed.

Because certification for the EN54-16 standard has only been performed on the 100 V output of the Praesideo amplifiers, the installer shall only use the 100 V outputs of Praesideo for emergency sound systems in Europe.

12.2 Controls, connectors and indicators

12.2.1 Supervision-master

The supervision-master contains the following:

1 **Connector** - A provision to connect the supervision-master electrically to the output board of the amplifier channel (see section 12.3.1).

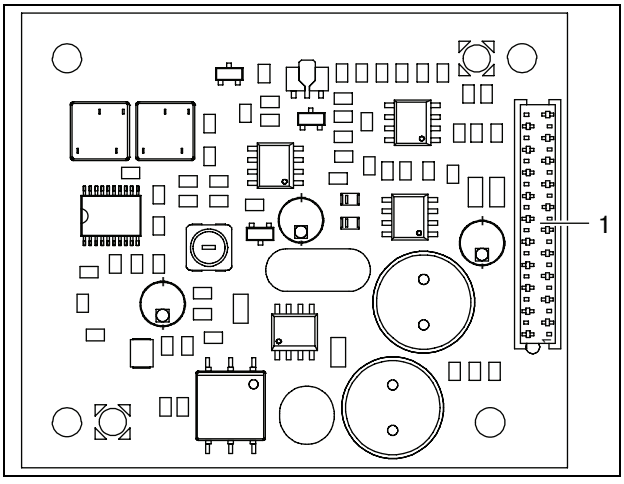


figure 12.1: Component side of supervision-master

12.2.2 Supervision-slave

The supervision-slave contains the following:

1 **Connector** - A provision to connect the supervision-slave to the loudspeaker lines.

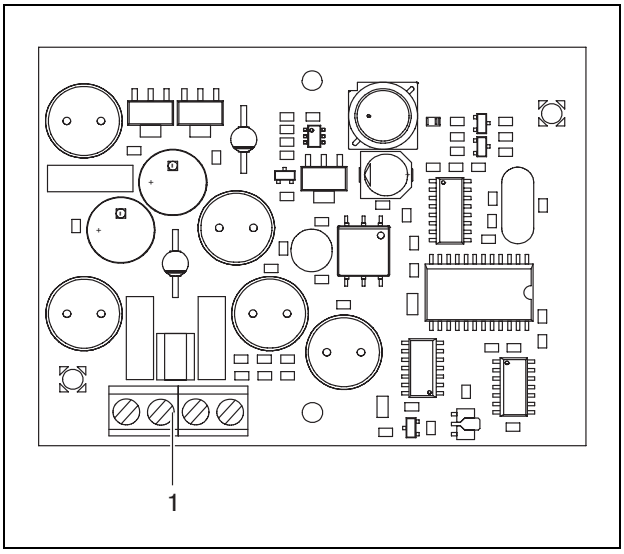


figure 12.2: Component side of supervision-slave

The supervision-slave provides a double connector that allows the supervision-slave to be put anywhere in the loudspeaker line (see figure 12.3). Usually, the supervision-slave is installed at the end of the loudspeaker line.

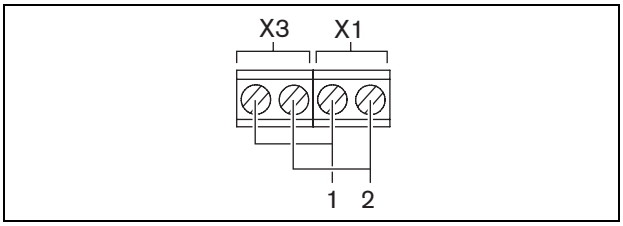


figure 12.3: Supervision-slave connector

table 12.1: Supervision-slave connector details

Connector	Pin	Signal
X1	1	Loudspeaker line +
	2	Loudspeaker line -
X3	1	Loudspeaker line +
	2	Loudspeaker line -

12.3 Installation

12.3.1 Supervision-master

Warning
To prevent the hazard of electric shocks, disconnect the mains cord and the back-up power supplies from the power amplifier before starting installing the supervision-master.

Warning
The electronics inside the power amplifier and on the supervision-master are susceptible to electrostatic discharges. Wear an anti-ESD bracelet during the installation of the supervision-master.

Note
In the spare amplifiers also single line supervision boards must be installed for those channels that have single line supervision boards in the corresponding main amplifier channels. Otherwise, a *Line supervision master mismatch* fault event is generated. Single and multiple line supervision boards are not compatible.

Proceed as follows to install the supervision-master in PRS-xPxxx Power Amplifiers:

1 Remove the lid from the power amplifier and locate the output board (see figure 12.4).
2 Snap the supervision-master on the ‘table’ bracket.
3 Fit the supplied flat cable to the connector on the output board and the supervision-master. Do not twist the flat cable and fit the polarization pin of the flat cable in the hole in the PCB next to the connector.

Proceed as follows to install the supervision-master in LBB4428/00 Power Amplifiers:

1 Remove the lid from the power amplifier and locate the output board (see figure 12.4).
2 Remove the screws of the bracket and slide it out of the holes in the output board.
3 Fit the supervision-master on the ‘slide’ bracket.
4 Slide the supervision-master and bracket assembly in the holes in the output board.
5 Tighten the screw to fix the supervision-master and bracket assembly to the output board.
6 Fit the supplied flat cable to the connector on the output board and the supervision-master. Do not twist the flat cable and fit the polarization pin of the flat cable in the hole in the PCB next to the connector.

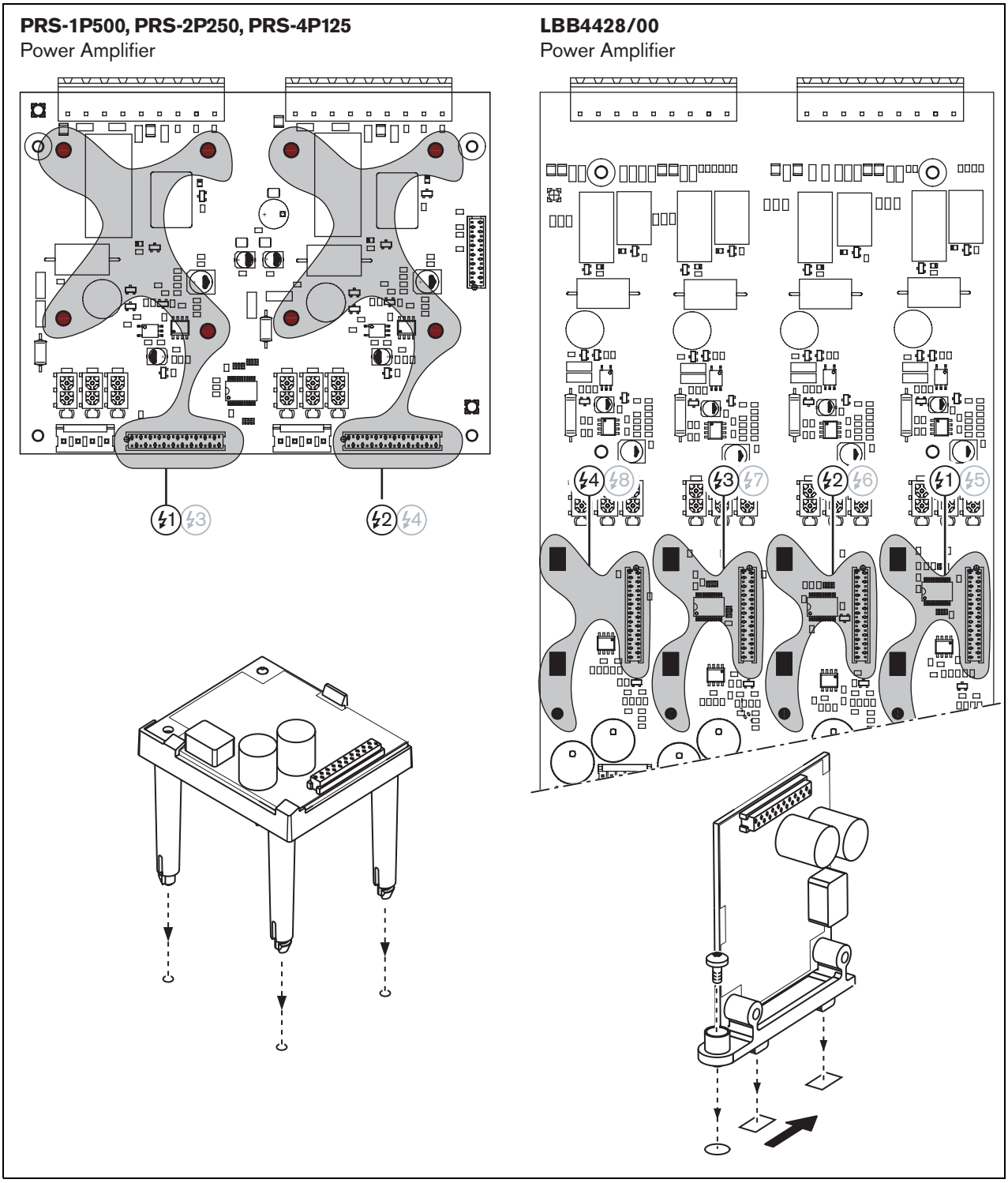


figure 12.4: Supervision-master installation

12.3.2 Supervision-slave

Warning
To prevent the hazard of electric shocks, switch the power amplifier and the back-up power supplies off, before starting installing the supervision-slave.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

Warning
The supervision-slave is susceptible to electrostatic discharges. Wear an anti-ESD bracelet during the installation of the supervision-slave.

For a correct operation of the supervision, it is important that the loudspeaker line has the characteristics that are listed in section 12.5.5. Also, the minimum total loudspeaker impedance at 70 kHz is important. This impedance depends on the quality of the transformer in the loudspeaker and the number of loudspeakers in the line. The loudspeakers of Bosch Security Systems are designed with this impedance criterion in mind.

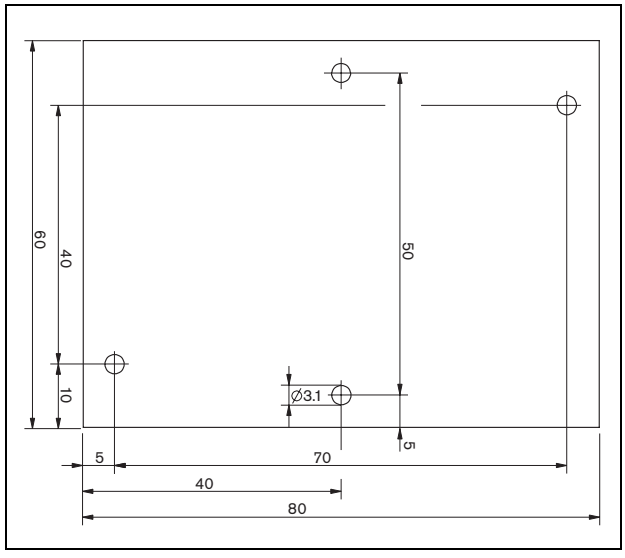


figure 12.5: Supervision-slave PCB dimensions

Proceed as follows to install the supervision-slave in the loudspeaker line:

1 Use the holes in the supervision-slave (see figure 12.5) to install it in a loudspeaker. The coils on the supervision-slave PCB must be kept at a distance of 30 mm or more from the loudspeaker magnet and a distance of 50 mm or more from the loudspeaker transformer, otherwise the magnetic fields can disturb the correct operation of the supervision-slave.
2 Connect the loudspeaker line signal to the supervision-slave PCB (see section 12.2.2).

The loudspeakers listed in table 12.2 have a provision for a supervision-slave.

table 12.2: Loudspeakers that have provision for a supervision-slave

Speaker type	Provision for mounting	Pre-wired, no provision for mounting
Ceiling speakers		
LC1-WM06E	•	
LC1-UM06E	•	
LC1-UM12E	•	
LC1-UM24E	•	
LBC 3510/40	•	
LBC 3520/40	•	
LBC 3530/40	•	
Cabinets		
LBC 3011/41	•	
LBC 3011/51	•	
LB1-UM06E	•	
LBC 3018/00	•	
Columns		
LBC 3210/00	•	
LA1-UM20E	•	
LA1-UM40E	•	
Horns/Drivers		
LBC 3403/16	•	
LBC 3404/16	•	
LBC 3405/16	•	
LBC 3406/16	•	
LH1-10M10E	•	
LBC 3482/00	•	
LBC 3483/00	•	
LBC 3484/00	•	
Sound projectors		
LP1-BC10E		•
LP1-UC10E		•
LP1-UC20E		•
LBC 3432/01	•	
LS1-OC100E	•	

Note
The installer shall only use EN54-24 compliant loudspeakers for emergency sound systems in Europe.

12.4 Technical data supervision-master

12.4.1 Physical characteristics

Dimensions (H x W x D):
60 x 50 x 17 mm

Weight:
30 g

Connection:
20 pole flatband cable and connector

Installation:
Plastic brackets for horizontal or vertical installation are delivered with the amplifier.

12.4.2 Climate conditions

Temperature:
-5 to 55 °C (operating)
-20 to 70 °C (non-operating)

Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)

Air pressure:
600 to 1100 hPa

12.4.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4

Electrical safety:
IEC60065 (CB-scheme)
EN60065

Approvals:
CE marking
EN54-16 and ISO7240-16

12.4.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C

MTBF:
3,000,000 hours
(based on real warranty return rate data)

12.5 Technical data supervision-slave

12.5.1 Physical characteristics

Dimensions (H x W x D):
80 x 60 x 16 mm
Weight:
50 g
Connection:
Screwable connector

12.5.2 Climate conditions

Temperature:
-5 to 55 °C (operating. guaranteed)
-15 to 55 °C (operating, sample tested)
-20 to 70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

12.5.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

12.5.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
3,000,000 hours
(based on real warranty return rate data)

12.5.5 Loudspeaker line characteristics

Preferred cable:
Single twisted pair, 0.75 mm^2 to 1.5 mm^2. The use of multi-wire cables is not recommended. Cross talk of communication signals affects the supervision performance.
Maximum cable length:
1 km (max. 500 m adjacent to other supervised loudspeaker cables)
Maximum cable loop resistance:
38 Ω
Maximum cable inductance:
750 µH
Minimum total loudspeaker impedance:
50 Ω @ 70 kHz (independent of amplifier power)
Maximum cable capacity:
300 nF. However, if the maximum load capacity for the power amplifier output is less than this value, the maximum load capacity of the power amplifier is leading (see section 9.9).
Loudspeaker voltage:
70 V, 100 V

Note

The load of the loudspeakers in relation to the line impedance should be such that the 20 kHz pilot tone level is not less than 8 Vrms at the position of the supervision boards.

Because certification for the EN54-16 standard has only been performed on the 100 V output of the Praesideo amplifiers, the installer shall only use the 100 V outputs of Praesideo for emergency sound systems in Europe.

13 Multiple loudspeaker line supervision

13.1 Introduction

Multiple loudspeaker line supervision is available for the amplifiers as follows:

- PRS-1P500 Power Amplifier
- PRS-2P250 Power Amplifier
- PRS-4P125 Power Amplifier
- PRS-1B500 Basic Amplifier
- PRS-2B250 Basic Amplifier
- PRS-4B125 Basic Amplifier
- PRS-8B060 Basic Amplifier

Use the LBB4440/00 Supervision Control Board, LBB4441/00 Loudspeaker Supervision Board and LBB4443/00 EOL Supervision Board for multiple loudspeaker line supervision. With these boards, it is possible to supervise up to 80 loudspeakers in a loudspeaker line including the ends of the various branches in the loudspeaker line.

Note
Multiple loudspeaker line supervision is not possible in combination with LBB4428/00 Power Amplifiers.

The LBB4441/00 Loudspeaker Supervision Boards check if loudspeakers are intact, whereas the LBB4443/00 EOL (End of Line) Supervision Boards check if the loudspeaker lines are intact. Both types of boards are powered from the 20 kHz pilot tone of the Power Amplifier and communicate inaudibly with the LBB4440/00 Supervision Control Board, which controls the communication between Praesideo and the supervision boards. No additional wiring is required Communication is not affected by the audio signals on the loudspeaker lines. Faults in the loudspeakers and loudspeaker lines can be reported within 100 s. The use of multi-wire cables is not recommended in combination with line supervision because crosstalk between audio channels may influence the line supervision.

The Power Amplifiers have one Supervision Control Board LBB4440/00 per channel. The addresses of the connected EOL and loudspeaker supervision boards must be unique for that channel.

Multiple loudspeaker line supervision for the basic amplifiers PRS-xBxxx do not need the LBB4440/00 Supervision Control Board. The basic amplifiers work in co-operation with the multi channel interface that already contains the Supervision Control Board function for all connected basic amplifiers. Use the LBB4441/00 and the LBB4443/00 Supervision boards as required. No Supervision Control Boards need to be installed into the basic amplifiers.

For basic amplifiers, the addresses in the address range are shared between all the connected amplifier channels that use the same multi channel interface.
Make sure that all EOL and loudspeaker supervision boards that are connected via the basic amplifiers to the same multi channel interface have unique addresses.

Note
For the loudspeaker supervision board or EOL supervision board to work correctly it is necessary to set the amplifiers to 70 V or 100 V output. The 50 V setting is not allowed.

Because certification for the EN54-16 standard has only been performed on the 100 V output of the Praesideo amplifiers, the installer shall only use the 100 V outputs of Praesideo for emergency sound systems in Europe.

13.2 Controls, connectors and indicators

13.2.1 Supervision control board

The supervision control board LBB4440/00 (see figure 13.1) contains the following:

X1 **Connector** - A provision to connect the supervision control board electrically to the output board of the amplifier channel.

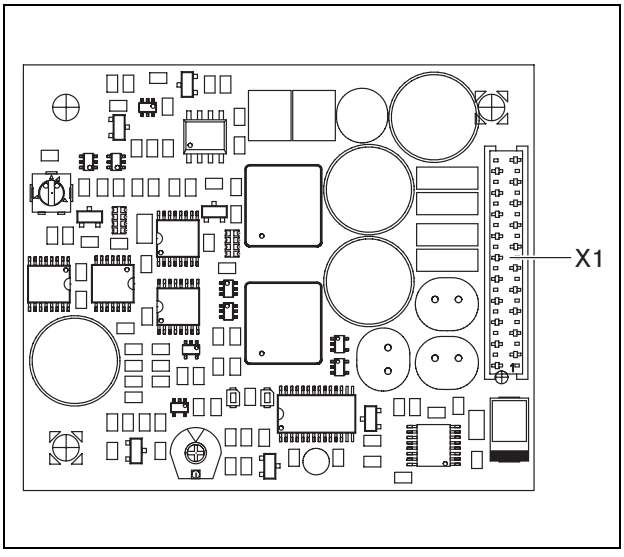


figure 13.1: Component side LBB4440/00

13.2.2 Loudspeaker supervision board

The loudspeaker supervision board LBB4441/00(see figure 13.2) contains the following:

X10 **Flying leads** - Two flying leads (30 cm) with high-temperature insulation to install the loudspeaker supervision board in a loudspeaker (see section 13.3.2).

X11 **Faston connectors** - Two faston connectors to install the loudspeaker supervision board in the loudspeaker (see section 13.3.2).

S700 **Address selector** - An address selector to set the address of the loudspeaker supervision board (see section 13.4).

S701 **Address selector** - An address selector to set the address of the loudspeaker supervision board (see section 13.4).

C540 **Capacitor** - A capacitor for factory adjustments. Do not touch this capacitor.

R441 **Resistor** - A resistor for factory adjustments. Do not touch this resistor.

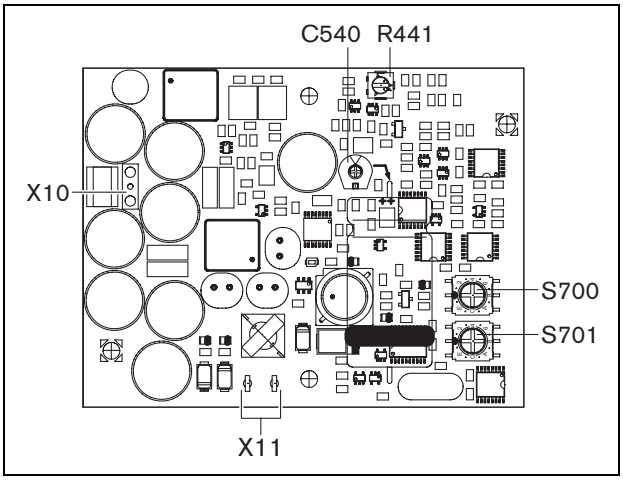


figure 13.2: Component side LBB4441/00

13.2.3 EOL supervision board

The EOL supervision board LBB4443/00(see figure 13.3) contains the following:

X10 **Flying leads** - Two flying leads (30 cm) with high-temperature insulation to install the EOL supervision board in a loudspeaker (see section 13.3.3).

S700 **Address selector** - An address selector to set the address of the EOL supervision board (see section 13.4).

S701 **Address selector** - An address selector to set the address of the EOL supervision board (see section 13.4).

C540 **Capacitor** - A capacitor for factory adjustments. Do not touch this capacitor.

R441 **Resistor** - A resistor for factory adjustments. Do not touch this resistor.

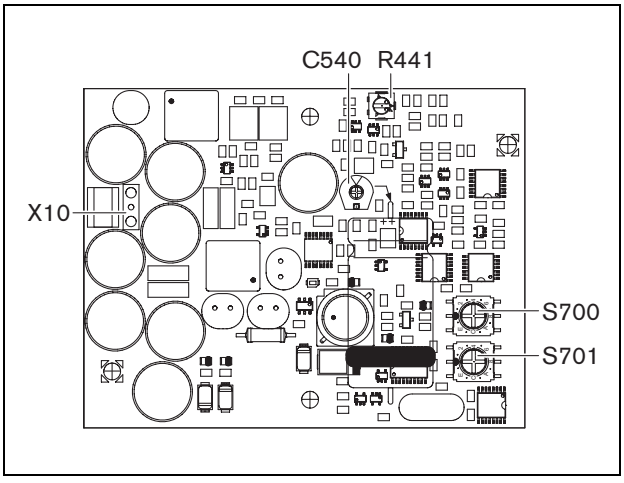


figure 13.3: Component side LBB4443/00

13.3 Installation

13.3.1 Supervision control board

Warning
To prevent the hazard of electric shocks, disconnect the mains cord and the back-up power supplies from the power amplifier before starting installing the supervision control board.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. See section 1.2 Intended audience.

Warning
The electronics inside the power amplifier and on the supervision control board are susceptible to electrostatic discharges. Wear an anti-ESD bracelet during the installation of the supervision control board.

Proceed as follows to install the supervision control board in the PRS-xPxxx Power Amplifiers:

1 Remove the lid from the power amplifier and locate the output board (see figure 13.4).
2 Snap the supervision control board on the ‘table’ bracket (see figure 13.4).
3 Fit the supplied flat cable to the connector on the output board and the supervision control board. Do not twist the flat cable and fit the polarization pin of the flat cable in the hole in the PCB next to the connector.

Note
In the spare amplifiers also multiple line supervision boards must be installed for those channels that have multiple line supervision boards in the corresponding main amplifier channels. Otherwise, a *Line supervision master mismatch* fault event is generated. Single and multiple line supervision boards are not compatible.

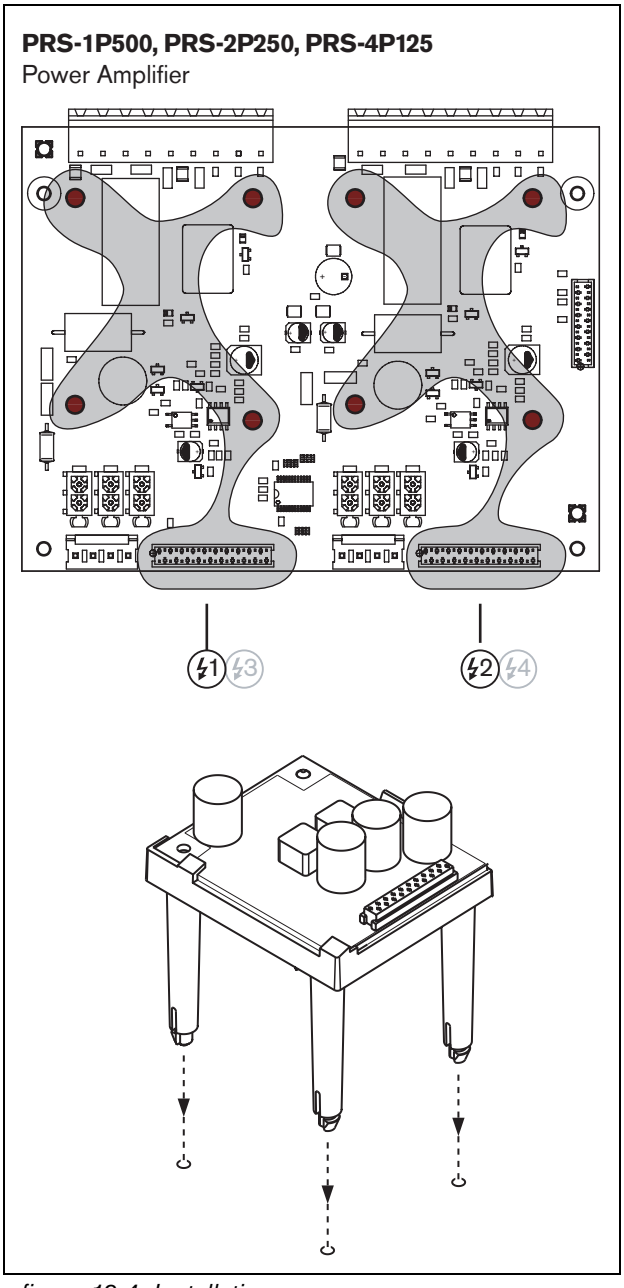


figure 13.4: Installation

13.3.2 Loudspeaker supervision board

Warning
To prevent the hazard of electric shocks, switch the power amplifier and the back-up power supplies off, before starting installing the loudspeaker supervision board.

Warning
The electronics on the loudspeaker supervision board are susceptible to electrostatic discharges. Wear an anti-ESD bracelet during the installation of the supervision board.

The loudspeakers listed in table 13.1 have a provision for installing a supervision board.

table 13.1: Loudspeakers that have a provision for installing a supervision board

Speaker type	Provision for mounting	Pre-wired, no provision for mounting
Ceiling speakers		
LC1-WM06E	•	
LC1-UM06E	•	
LC1-UM12E	•	
LC1-UM24E	•	
LBC 3510/40	•	
LBC 3520/40	•	
LBC 3530/40	•	
Cabinets		
LBC 3011/41	•	
LBC 3011/51	•	
LB1-UM06E	•	
LBC 3018/00	•	
Columns		
LBC 3210/00	•	
LA1-UM20E	•	
LA1-UM40E	•	
Horns/Drivers		
LBC 3403/16	•	
LBC 3404/16	•	
LBC 3405/16	•	
LBC 3406/16	•	
LH1-10M10E	•	
LBC 3482/00	•	
LBC 3483/00	•	
LBC 3484/00	•	
Sound projectors		
LP1-BC10E		•
LP1-UC10E		•
LP1-UC20E		•
LBC 3432/01	•	
LS1-OC100E	•	

Note
The installer shall only use EN54-24 compliant loudspeakers for emergency sound systems in Europe.

For a correct operation of the supervision, it is important that the loudspeaker line has the characteristics that are listed in section 13.6.5. Also, the minimum total loudspeaker impedance at 70 kHz is important. This impedance depends on the quality of the transformer in the loudspeaker and the number of loudspeakers in the line. The loudspeakers of Bosch Security Systems are designed with this impedance criterion in mind.
The power rating for any loudspeaker that is used with the loudspeaker supervision must be between 0.75 W and 60 W.

Please check the Bosch Application Note on WLS Speaker Impedance Measurements for additional information on how to determine the load impedance of a set of loudspeakers and associated wiring. This is especially important if thin wiring or highly capacitive wiring (like fire resistant wiring) is used, or loudspeakers that are not made by Bosch.

Proceed as follows to install the loudspeaker supervision board in a loudspeaker:

Note
See the installation instructions of the loudspeakers for more information.

Note
To install the board in, for example, a box, use the universal brackets (LBB4446/00). Connect the board to a bracket using the middle holes (see figure 13.5).

1 Set the address of the board with the S700 and S701 address selectors (see section 13.4).
2 Use the corner holes in the board (see figure 13.5) to install it in a loudspeaker. The coils on the PCB must be kept at a distance of 30 mm or more from the loudspeaker magnet and a distance of 50 mm or more from the loudspeaker transformer, otherwise the magnetic fields can disturb the correct operation of the board.

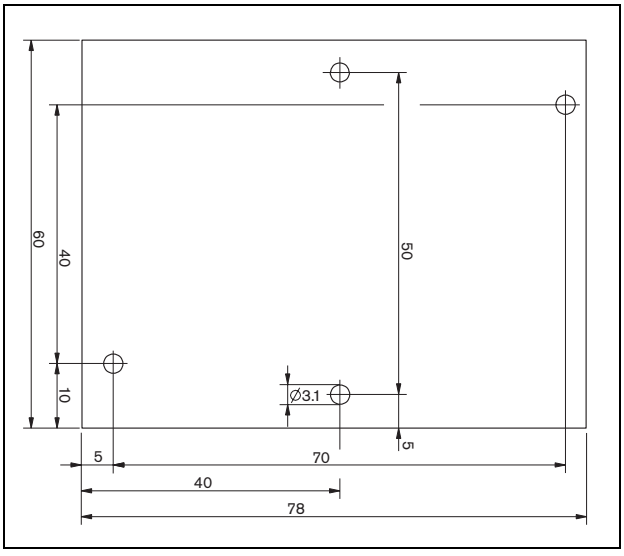


figure 13.5: Dimensions

3 Connect the board to the loudspeaker with the flying leads and the faston connectors (see figure 13.6).

Note
Use one of the faston cables inside the loudspeaker and the supplied faston cable to connect the board to the loudspeaker.

Note
The board must be connected after the ceramic terminal block with the thermal fuse. In case of a fire, the thermal fuse will act and disconnect the board from the loudspeaker line. The trip point of the thermal fuse that is connected to the ceramic block is lower than the melting point of the solder on the board to prevent short-circuits in the supervision board and the loudspeaker line.

Note
When the loudspeaker does not contain a ceramic block with a thermal fuse, use an LBC1256/00 EVAC Connection Adapter (see chapter 15).

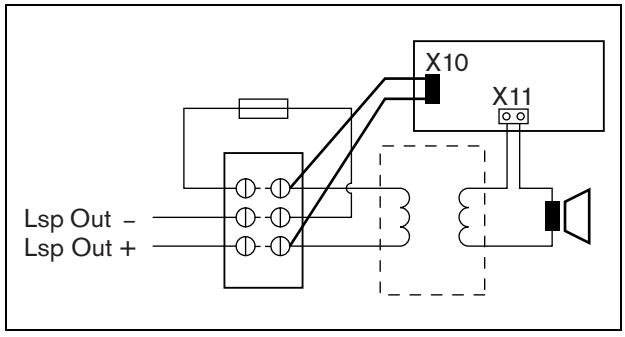


figure 13.6: Loudspeaker supervision connection

13.3.3 EOL supervision board

The procedure for installing an EOL supervision board is similar to the installation of a loudspeaker supervision board (see section 13.3.2). However, the EOL supervision board does not contain faston connectors (see figure 13.7).

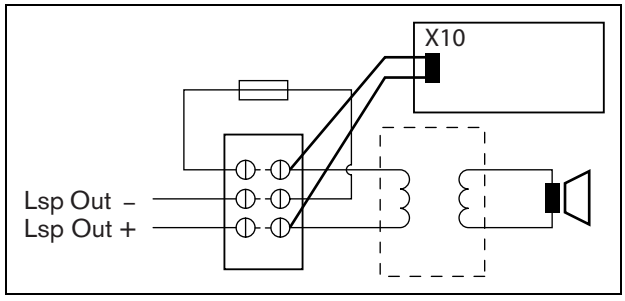


figure 13.7: EOL supervision connection

13.4 Addressing

All LBB4441/00 Loudspeaker Supervision Boards and LBB4443/00 EOL Supervision Boards must have an address for communication purposes. All LBB4441/00 Loudspeaker Supervision Boards and LBB4443/00 EOL Supervision Boards that are connected to the same amplifier channel must have a different address. Use the S700 and S701 switches to assign a (hexadecimal) address in the range of 00 to 4F to the board. The S700 switch sets the right digit, whereas the S701 switch sets the left digit of the address. Each switch has 16 hexadecimal positions (0 to F).

For example, the ID selectors in figure 13.8 show address 2C.

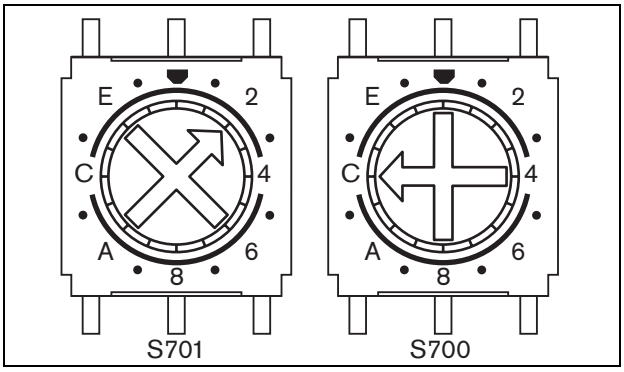


figure 13.8: ID selectors

Make sure that the maximum number of EOL and Loudspeaker Supervision boards is not exceeded.

- PRS-1P500 can have a maximum of 80 boards, of which 16 can be LBB4443/00 EOL boards or LBB4441/00 with line supervision enabled.
- PRS-2P250 can have a maximum of 40 boards per channel, of which 16 can be LBB4443/00 EOL boards or LBB4441/00 with line supervision enabled.
- PRS-4P125 can have a maximum of 20 boards per channel, of which 16 can be LBB4443/00 EOL boards or LBB4441/00 with line supervision enabled.

Note
The number of EOL supervision boards are limited to 16 per channel as the boards are polled more frequently than the loudspeaker supervision boards to comply to the standards for emergency sound systems.

- The multi channel interface can have up to 16 supervision boards connected to each basic amplifier channel of the multi channel interface. The maximum number of boards in total across all channels is 80, of which 64 can be LBB4443/00 EOL boards or LBB4441/00 with line supervision enabled. Do not to exceed the maximum number of supervision boards related to the maximum output power of the amplifier channel; see section 13.6.5.

13.5 Technical data supervision control board

13.5.1 Physical characteristics

Dimensions (H x W x D):
60 x 50 x 17 mm
Weight:
30 g
Connection:
20 pole flatband cable and connector
Installation:
Plastic brackets for horizontal or vertical installation are delivered with the amplifier.

13.5.2 Climate conditions

Temperature:
-5 to 55 °C (operating)
-20 to 70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

13.5.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

13.5.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
3,000,000 hours
(based on real warranty return rate data)

13.6 Technical data loudspeaker supervision board

13.6.1 Physical characteristics

Dimensions (H x W x D):
78 x 60 x 22 mm
Weight:
80 g
Connection:
Screwable connector

13.6.2 Climate conditions

Temperature:
-5 to 55 °C (operating, guaranteed)
-15 to 55 °C (operating, sample tested)
-20 to 70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

13.6.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

13.6.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
3,000,000 hours
(based on real warranty return rate data)

13.6.5 Loudspeaker line characteristics

Preferred cable:
Single twisted pair, 0.75 mm^2 to 1.5 mm^2. The use of multiwire cables is not recommended. Cross talk of communication signals affects the supervision performance.
Maximum cable length:
1 km (max. 300 m adjacent to other supervised loudspeaker cables)
Maximum cable loop resistance:
38 Ω
Maximum cable inductance:
750 µH
Minimum total loudspeaker impedance:
50 Ω @ 70 kHz (independent of amplifier power)
Maximum cable capacity:
300 nF. However, if the maximum load capacity for the power amplifier output is less than this value, the maximum load capacity of the power amplifier is leading (see section 9.9).
Maximum number of supervision boards (LBB4441/00 and LBB4443/00) per amplifier channel:
80 for a 500 W amplifier channel
40 for a 250 W amplifier channel
20 for a 125 W amplifier channel
10 for a 60 W amplifier channel (PRS-8B060 only)
Loudspeaker voltage:
70 V, 100 V

Note
The load of the loudspeakers in relation to the line impedance should be such that the 20 kHz pilot tone level is not less than 9 Vrms at the position of the supervision boards.

13.7 Technical data EOL supervision board

The technical data of the EOL supervision board are the same as the technical data of the loudspeaker supervision board (see section 13.6).

14 LBB4446/00 Brackets

The LBB4446/00 Brackets (see figure 14.1) are used to install supervision slave PCBs in junction boxes or in loudspeaker housings. Each set contains 10 pieces of aluminium brackets including screws and washers.

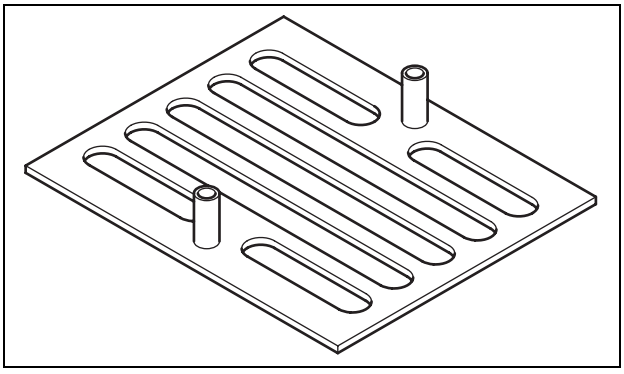


figure 14.1: Brackets

To install the supervision slave using a bracket:

1 Fix the bracket using its slots, the washers and suitable screws.
2 Attach the supervision slave to the brackets using the spacers on the brackets and the screws.

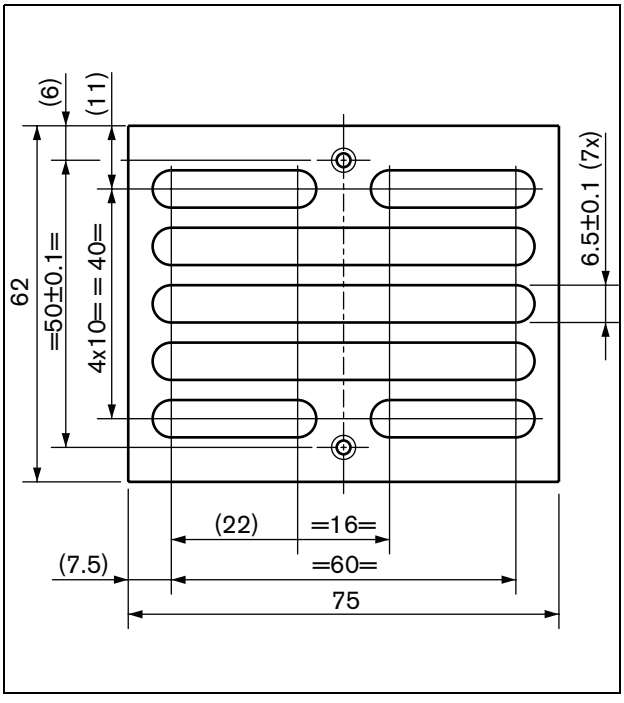


figure 14.2: Installation

15 LBC1256/00 EVAC Connection Adapter

15.1 Introduction

Using an LBC1256/00 EVAC Connection Adapter, loudspeakers that do not contain a ceramic block with a thermal fuse can be upgraded to comply to evacuation standards.

15.2 Installation

The EVAC connection adapter must be installed in an enclosure with double-sided tape (see figure 15.1). The cable between the loudspeaker and the EVAC connection block must be short to make sure that the temperature of the thermal fuse does not differ from the temperature of the cable. Otherwise, the thermal fuse will not blow before there is a short-circuit in the loudspeaker line.

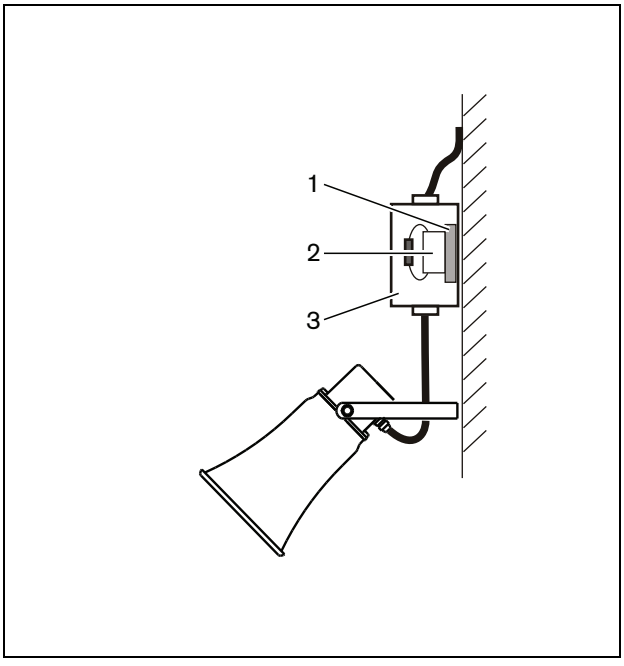


figure 15.1: Connection details

1 Double-sided tape
2 LBC1256/00
3 Enclosure

The EVAC connection block itself is a three pole screw connector to which the loudspeaker can be connected (see figure 15.2).

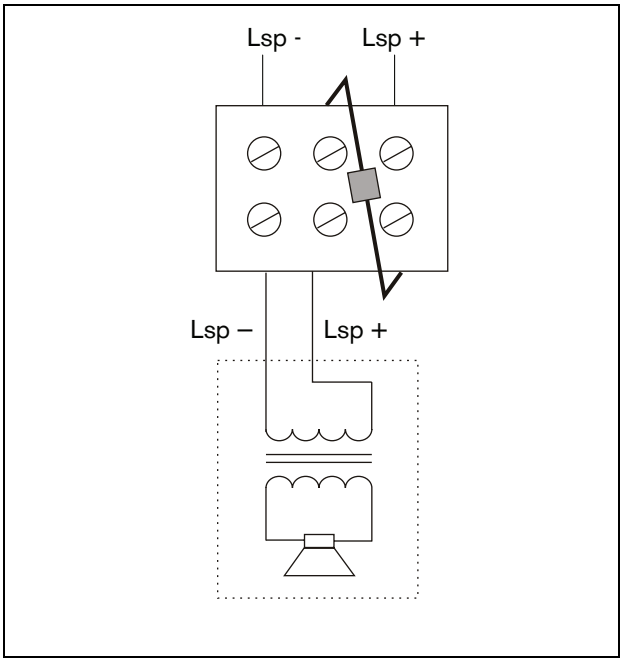


figure 15.2: Circuit diagram

15.3 Technical data

Dimensions (H x W x D):
19 x 37 x 22 mm
Weight:
40 g
Thermal fuse:
150 °C
Material:
Ceramic
Type:
3-pole screw connector
Preferred cable:
Heat-resistant cable (e.g. cable with PTFE insulation)
Pack contents:
100 pieces

16 LBB4430/00 Call Station Basic

16.1 Introduction

The LBB4430/00 Call Station Basic is used for making live speech or pre-recorded announcements to any pre-assigned zones or to execute any pre-defined actions. This call station contains a built-in limiter and speech filter for improved intelligibility. See figure 16.1 for a block diagram of the call station basic.

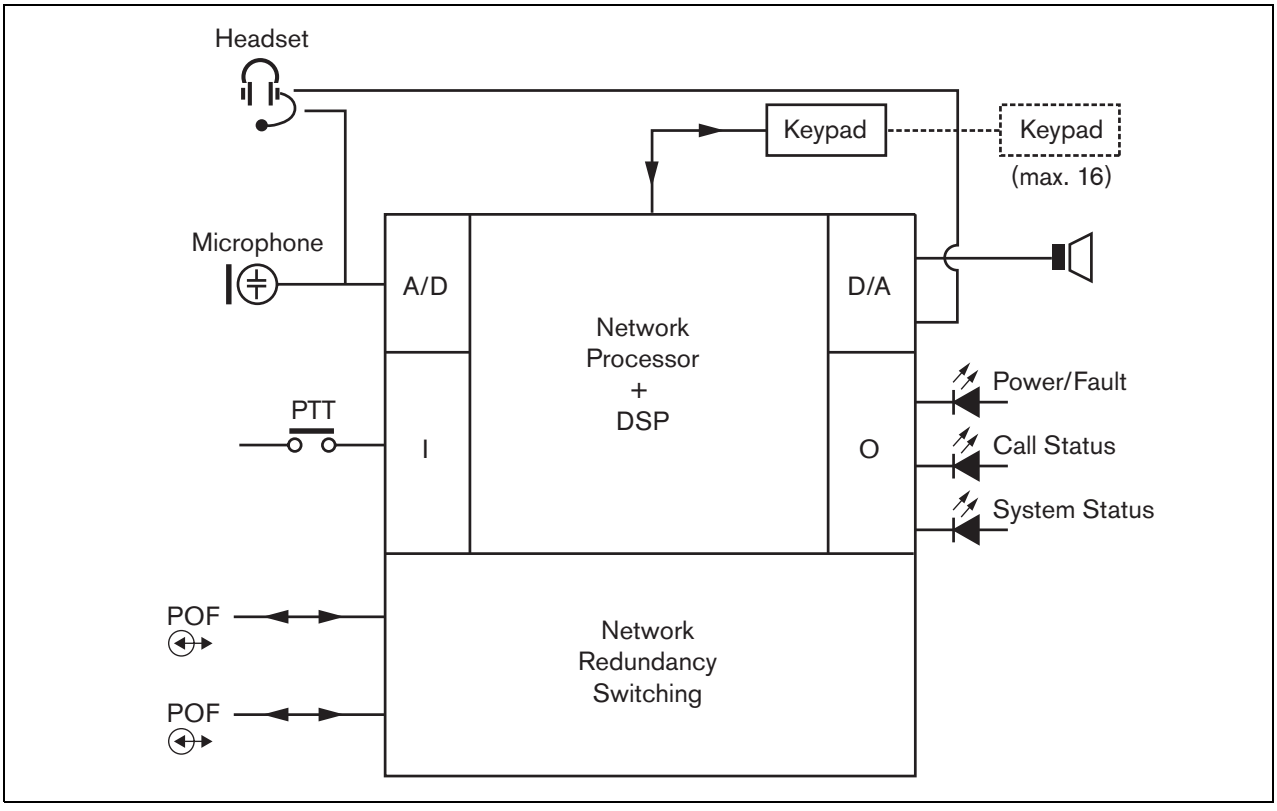


figure 16.1: Block diagram

16.2 Controls, connectors and indicators

The call station basic (see figure 16.3 and figure 16.4) contains the following:

1 **Headset connection** - A 3.5 mm (1/8 inch) jack socket to connect a headset. The loudspeaker (5) and the microphone are muted when a headset is connected (see section 16.3.3).
2 **Volume control** - A control to adjust the volume of the internal loudspeaker and the headset.
3 **Press-to-talk (PTT) key** - A key to start a call.
4 **Status LEDs** - Three bicolored status LEDs provide information about the call station basic and the status of the Praesideo system. (see section 16.5).
5 **Loudspeaker** - A loudspeaker for audio monitoring purposes. The loudspeaker and microphone are muted when a headset is connected to the headset connection (1). Chimes and messages activated by a PTT key or call activation key of the call station or one of its keypads (see section 48.3.3) are played via the loudspeaker of the call station. Calls that are recorded for time-shifted broadcasting with a call stacker can also be monitored.
6 **System bus** - Two system bus connectors to connect the call station basic to other Praesideo equipment (see section 16.3.2).
7 **Interface connector** - A flat cable connector to connect the call station basic to a keypad.

16.3 Connections

16.3.1 Introduction

This section gives an overview of typical system connections using the call station basic.

- Connecting the network (see section 16.3.2).
- Connecting a headset (see section 16.3.3).

16.3.2 Connecting the network

Connect the call station basic to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

This unit is powered by the network controller, via the Praesideo system bus.

16.3.3 Connecting a headset

The next figure shows the signals that are available on the headset connector and how they relate to the parts of a 3.5 mm connector.

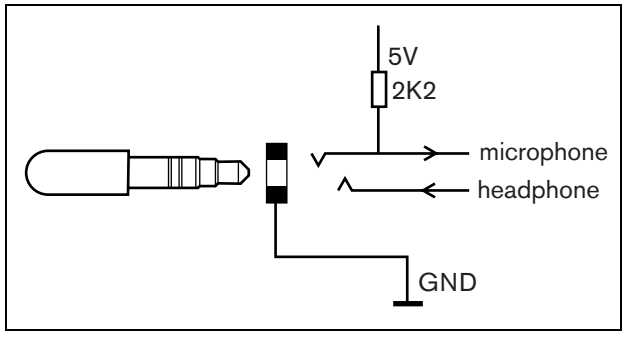


figure 16.2: Headset connector

Note
The wire of the headset may not be longer than 3 meter.

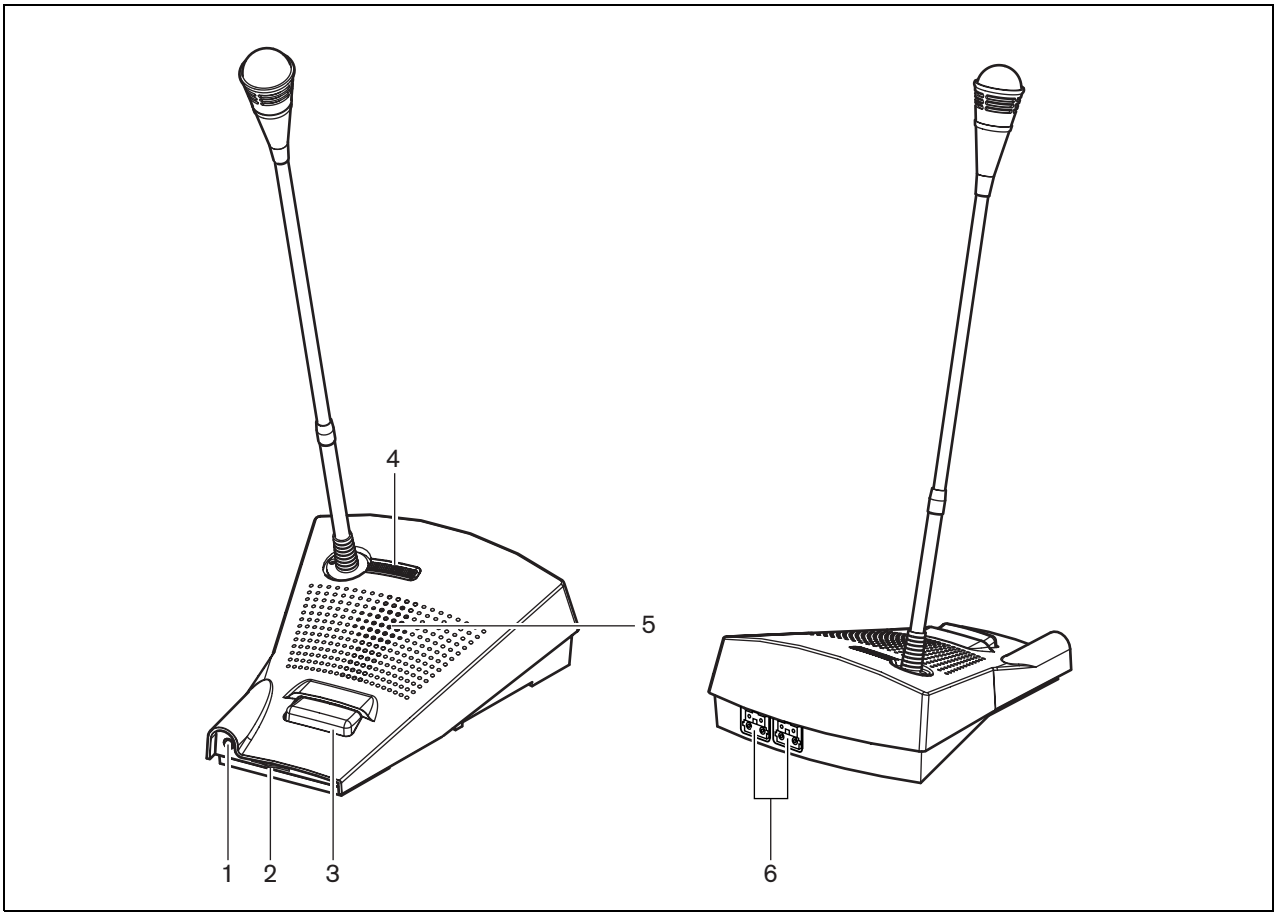


figure 16.3: Front and rear views

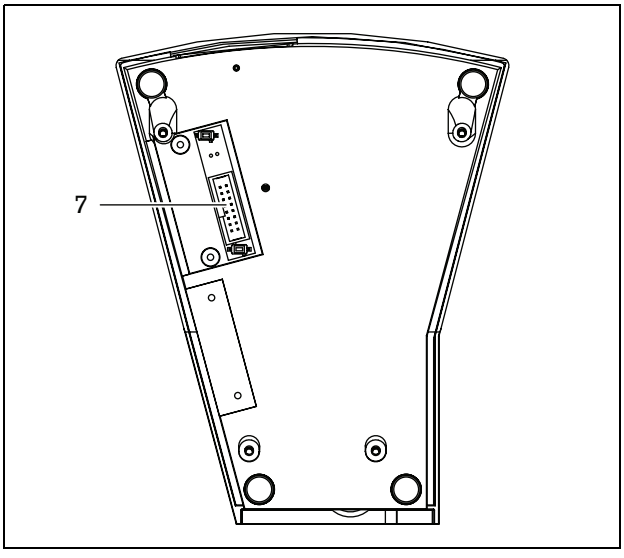


figure 16.4: Bottom view

16.4 Installation

The call station basic is suitable for table-top use. Its functionality can be expanded by connecting:

- Up to 16 call station keypads for pre-configured actions (LBB4432/00 or PRS-CSKPM).
- Up to 15 call station keypads for pre-configured actions (LBB4432/00 or PRS-CSKPM) and one numeric keypad (PRS-CSNKP).

16.5 Operation

The call station basic has three bi-color status LEDs that provide information about the call station basic and the status of the Praesideo system:

- Power/fault LED (left), see table 16.1.
- Call status LED (center), see table 16.2.
- System status LED (right), see table 16.3.

Note
By default, the call station is delivered with factory firmware, which must be upgraded (see section 37.5). If the call station contains no firmware or damaged firmware (e.g. after an interrupted firmware upgrade), all LEDs are on.

table 16.1: Power/Fault LED (left)

Color	State	Explanation
---	Off	Power not available.
Green	On	Power on and no system or call station basic faults.
Yellow	Blinking	Power on, but there is a fault in the system.
Yellow	On	Power on, but there is a fault in the call station basic or the Praesideo network is not operational.

table 16.2: Call status LED (center)

Color	State	Explanation
---	Off	No call status to display.
Green	On	Ready to talk/live announcement.
Green	Blinking	Chime on or pre-recorded message playing.

table 16.3: System status LED (right)

Color	State	Explanation
---	Off	No pre-defined or selected zones are in use or reserved by the system, and no emergency announcement is being made.
Yellow	On	Lower priority announcements are being made or are reserved to all or some of the zones which are pre-assigned to the press-to-talk key of the call station basic and selected zones of the keypad (if fitted).
Yellow	Blinking	Announcements with higher or the same priority (not emergency) are on or reserved to all or some of the zones which are pre-assigned to the press-to-talk key of the call station basic and selected zones of the keypad (if fitted).
Red	On	An emergency announcement is being made.

16.6 Technical data

16.6.1 Physical data

Dimensions (H x W x D):
90 x 160 x 200 mm
Length (goose neck):
380 mm
Weight:
0.95 kg

16.6.2 Climate conditions

Temperature:
-5 to +45 °C (operating, guaranteed)
-15 to +45 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

16.6.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

16.6.4 Mean time between failures

Expected lifetime:
50,000 hours at +45 °C
MTBF:
1,200,000 hours
(based on real warranty return rate data)

16.6.5 System bus

Connector (rear side):
Female proprietary connector
Preferred cable:
LBB4416/xx
Maximum cable length:
50 m (per system bus connector)
Data signal interface:
Plastic optical fiber
Power supply via network:
18 to 56V (DC)
No fault reporting when >20V
Network power consumption:
4.4 W (excluding keypads)

16.6.6 Microphone

Input sensitivity:
83 dB(SPL)
Input sensitivity control range:
-7 to 8 dB
Signal/Noise ratio:
> 60 dB at 85 dB(SPL)
Bandwidth:
-3 dB at 340 Hz and 14 kHz with respect to 1 kHz

16.6.7 Loudspeaker

Signal/Noise ratio:
80 dB at max. output
Sound pressure level:
85 dB(SPL) at 0.5 m and 1 kHz

16.6.8 Headset

Connector:
3.5 mm (1/8 inch) jack
Electret impedance:
1 to 10 kΩ
Microphone input sensitivity:
-47 to -32 dBV/Pa (tolerance ± 3 dB)
Signal/Noise ratio microphone:
60 dB at -38 dBV/Pa (tolerance ± 3 dB)
Earphone impedance:
32 Ω
Signal/Noise ratio earphone:
80 dB at max. output (tolerance ± 3 dB)
Cross-talk (earphone to microphone):
< 40 dB at -42 dBV/Pa and 1 kHz (tolerance ± 3 dB)
Output power:
1 mW

17 LBB4432/00 Call Station Keypad

17.1 Introduction

The LBB4432/00 Call Station Keypad is used in combination with (remote) call stations to make manual or pre-recorded announcements to any assigned zones, to select the zones or to execute pre-defined actions (see figure 17.1).

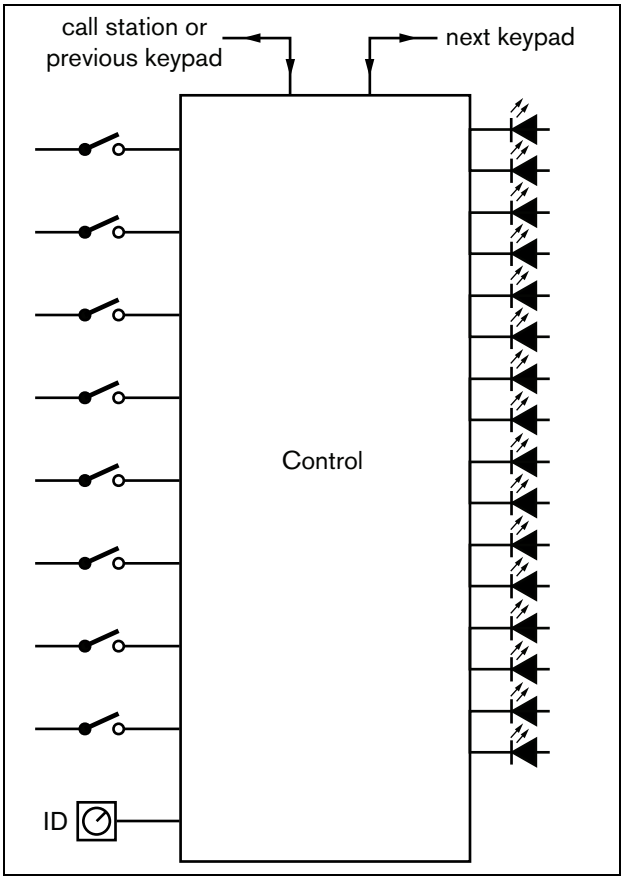


figure 17.1: Block diagram

17.2 Controls, connectors and indicators

17.2.1 Top view

The top of the call station keypad (see figure 17.2) contains the following:

1 **Paper slot** - Each programmable key (3) has a corresponding paper slot, which can contain a descriptive label to identify where the programmable key has been configured for. It can be snapped in and out of the keypad.

Note
The PRS-SW Praesideo Software DVD contains a Microsoft® Word file (*Manuals/Keypad labels.doc*), which can be used to create labels.

2 **Key indicator** - Each programmable key (3) has a corresponding key indicator (see section 17.5).

3 **Programmable key** - Each programmable key can be configured to perform a specific action when it is pressed (see chapter 48). To protect keys from being pushed accidentally (e.g. alarm or emergency keys), key covers (LBB4436/00) can be put on them.

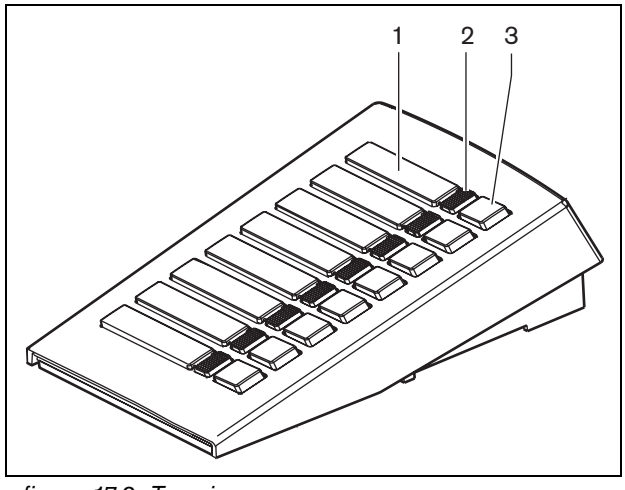


figure 17.2: Top view

17.2.2 Bottom view

The bottom of the call station keypad (see figure 17.3) contains the following:

4 **Keypad connector** - A connector to connect the keypad to the next keypad.

5 **ID selector** - A selector to identify the call station keypad to the (remote) call station (see section 17.3).

6 **Keypad connector** - A connector to connect the keypad to the previous keypad or the (remote) call station.

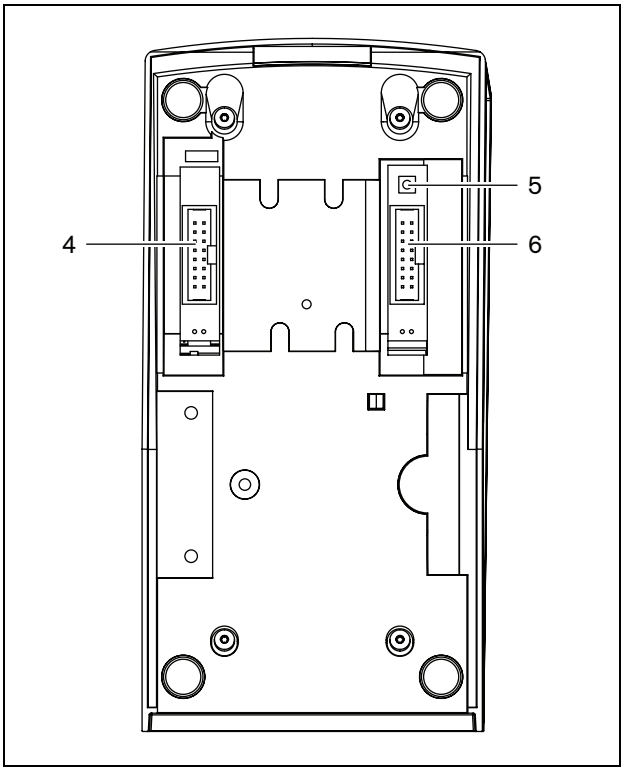


figure 17.3: Bottom view

17.3 Configuration

It is possible to connect:

- Up to 16 call station keypads for pre-configured actions (LBB4432/00 or PRS-CSKPM) to a (remote) call station.
- Up to 15 call station keypads for pre-configured actions (LBB4432/00 or PRS-CSKPM) and one numeric keypad (PRS-CSNKP) to a (remote) call station.

For a correct communication between the call station and its keypads, the correct ID must be assigned to each keypad for pre-configured actions using the ID selector (see figure 17.3, no. 5 and figure 17.4).

The ID of a keypad for pre-configured actions depends on its position in the array of keypads. The first keypad for pre-configured actions has ID 0, the next 1, and so on up to F for the sixteenth keypad for pre-configured actions.

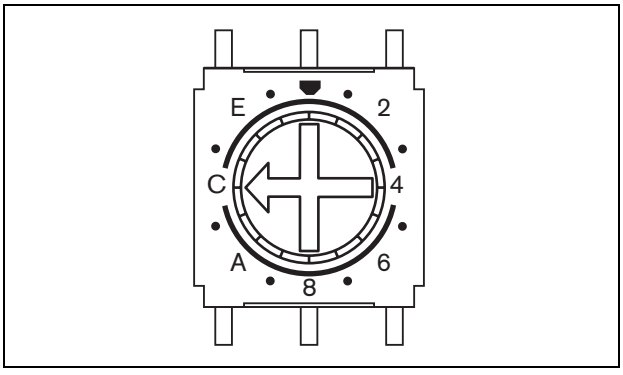


figure 17.4: ID selector

17.4 Installation

The keypad is suitable for table-top use. It can be connected to a (remote) call station or to a keypad which already has been connected to a (remote) call station. Proceed as follows (see figure 17.5):

Caution
Disconnect the system cable from the (remote) call station and back-up supplies before you are going to connect a keypad to it. Connecting a keypad to a powered (remote) call station can damage the (remote) call station.

1 Remove the lid by sliding it to the left and snapping it out of the keypad.
2 Connect the flat cable to the keypad connector and assign the correct ID to the keypad. The short flat cable is for keypad to keypad interconnection; the long flat cable (that is supplied with the call station) is for call station to keypad interconnection.
3 Slide the connecting plate into the bottom of the keypad.
4 Fasten the connection plate using three screws.
5 Put the lid back by sliding it to the right and snapping it into the keypad.

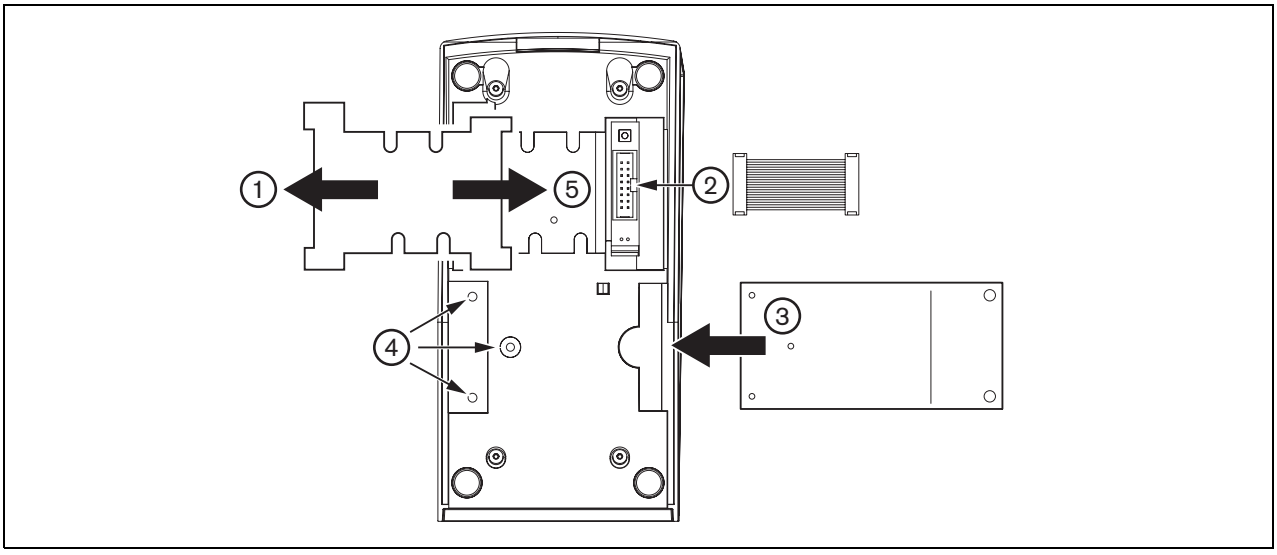


figure 17.5: Installation

17.5 Operation

The call station keypad has eight (software) programmable keys. Each key has one 2-color LED that is used for status indications (see table 17.1). However, the status indications depend on the function which has been assigned to the programmable key (see section 44.5.8 and section 48.3):

- For keys that are configured as routing selectors (e.g. *Zone selection*), the indicator is used for routing selection indication.
- For keys that are configured for functions like *Priority*, *Call macro*, etc., the indicator is used as selection indicator. It is on as long as the selection is valid.
- For keys that are configured for functions like *Cancel*, *Reset*, *Recall*, *BGM volume*, etc., the indicator is used as a key active indicator. It is on as long as the key is pressed.

table 17.1: Routing selector LED indications.

Color	Status	Explanation
Yellow	On	The selected resources are occupied by a lower-priority announcement.
Yellow	Blinking	The selected resources are occupied by a higher or equal priority announcement.
Green	On	The selected resource is available.

17.6 Technical data

17.6.1 Physical dimensions

Dimensions (H x W x D):
70 x 95 x 200 mm
Weight:
0.4 kg
Max. flat cable length:
5 m (for all keypads together)

17.6.2 Climate conditions

Temperature:
-5 to +45 °C (operating, guaranteed)
-15 to +45 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

17.6.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

17.6.4 Mean time between failures

Expected lifetime:
100,000 hours at +45 °C
MTBF:
1,200,000 hours
(based on real warranty return rate data)

17.6.5 System bus

Power supply via network:
18 to 56V (DC)
No fault reporting when >20V
Network power consumption:
1.3 W

18 PRS-CSNKP Numeric Keypad

18.1 Introduction

The PRS-CSNKP Numeric Keypad is used in combination with a basic or remote call station. The call station provides the microphone and press-to-talk key, while the numeric keypad can be used for user access, zone and zone group selection. The numeric keypad works together with call station keypads for pre-configured actions. The built-in LCD provides feedback to the user.

18.2 Compatibility

The PRS-CSNKP can be used with the PRS-CSR remote call station, the old PRS-CSRK remote call station kit and the PRS-CSRM remote call station module, but not with the (old) LBB4438/00 or LBB4439/00 remote call station (kit). It also works with the LBB4430/00 or LBB4433/00 call station (kit) and the PRS-CSM call station module.

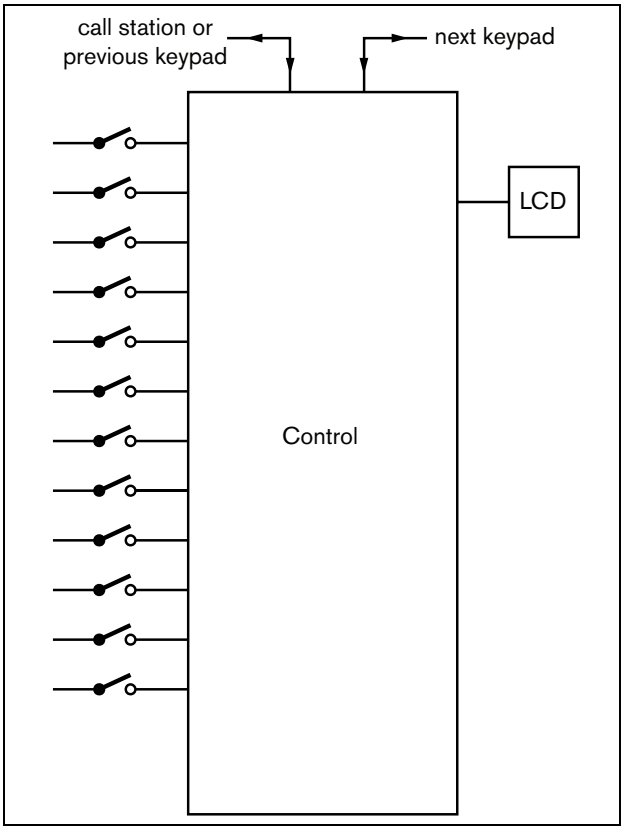


figure 18.1: Block diagram

18.3 Controls, connectors and indicators

18.3.1 Top view

The top of the numeric keypad (see figure 18.2) contains the following:

1 **Display** - An LCD display that gives information about user access and zone selection (see section 18.6).

2 **Keys** - Twelve keys to operate the (remote) call station (see section 18.6).

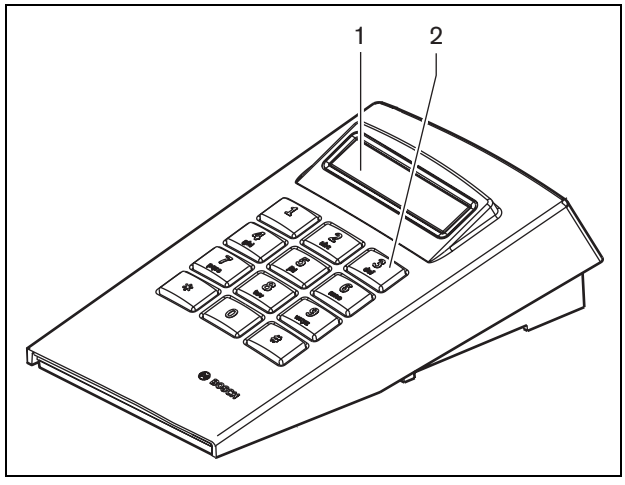


figure 18.2: Top view

18.4 Bottom view

The bottom of the numeric keypad (see figure 18.3) contains the following:

3 **Keypad connector** - A connector to connect the numeric keypad to the next call station keypad for pre-configured actions (LBB4432/00 or PRS-CSKPM).

4 **Keypad connector** - A connector to connect the numeric keypad to the previous keypad or to the (remote) call station (see section 18.5).

5 **Contrast control** - Adjusts the contrast of the LCD.

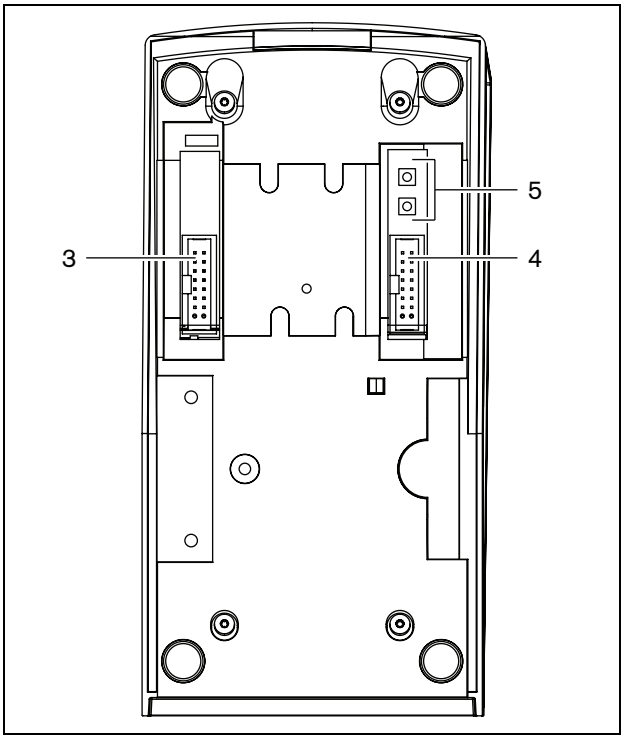


figure 18.3: Bottom view (without lid)

18.5 Installation

The keypad is suitable for table-top use. In most cases it will be connected directly to the call station, but it can also be positioned between a number of other call station keypads. Proceed as follows (see figure 18.4):

Caution
Disconnect the system cable from the (remote) call station and back-up supplies before you are going to connect a keypad to it. Connecting a keypad to a powered (remote) call station can damage the (remote) call station.

1 Remove the lid by sliding it to the left and snapping it out of the keypad.
2 Connect the flat cable from the keypad connector to the (remote) call station, or the previous keypad. The short flat cable is for keypad to keypad interconnection; the long flat cable (that is supplied with the call station) is for call station to keypad interconnection.
3 Slide the connecting plate into the bottom of the keypad.
4 Fasten the connection plate using three screws.
5 Put the lid back by sliding it to the right and snapping it into the keypad.

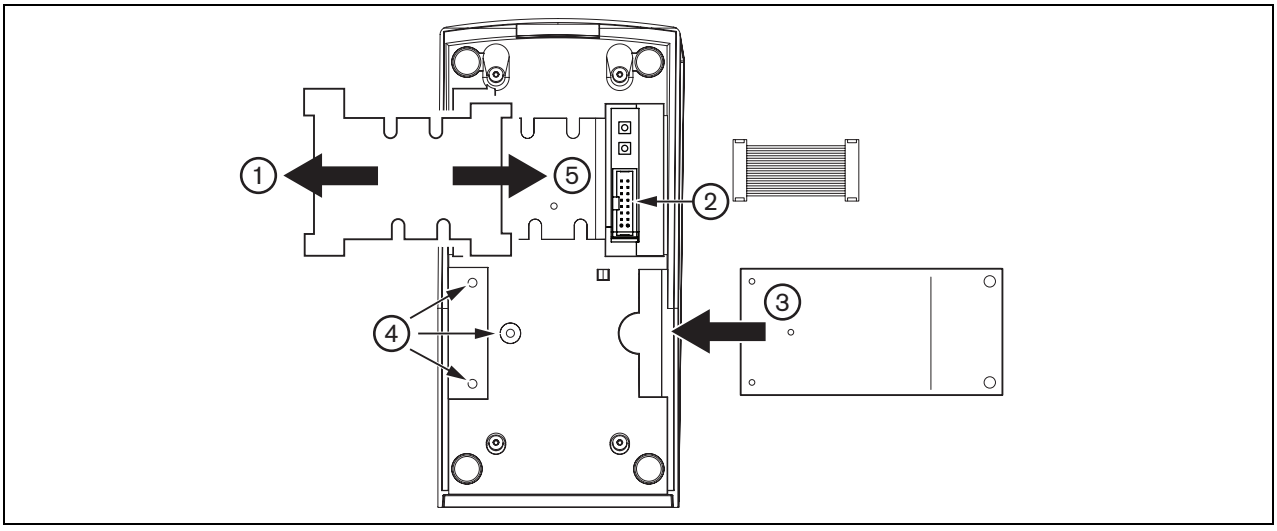


figure 18.4: Installation

18.6 Operation

18.6.1 Introduction

The call station numeric keypad has a 12-key numeric keypad, providing a telephone-like user interface with *, # and 0 .. 9 keys. The numeric keypad can be configured for the following functions:

- User access to the (remote) call station with user number and PIN, configurable for multiple users, with time-out and manual lock.
- Selecting zones and zone groups as destinations for calls; up to eight zones and/or zone groups can be entered into a string. Each zone (group) can consists of up to 16 numbers.

18.6.2 Keys

table 18.1: Keys

Symbol	Action	Description
0 .. 9	Press	Numeric input
*	Short press (< 1 s)	Delete current or last entered zone
	Long press (> 2 s)	Delete all entered zones
#	Short press (< 1 s)	Enter
	Long press (> 2 s)	Lock call station

18.6.3 Display

table 18.2: Prompts

Prompt	Action
User:	Type your user ID with the number keys and press #.
PIN:	Type your PIN (personal identification number) with the number keys and press #.
Zone:	Type the zone(s)/zone group(s) with the number keys. Press # after each zone (group).
BGM	No action. The (remote) call station is used to configure BGM settings. The numeric keypad cannot be used.

The LCD gives feedback to the user about the selections and the status of the selected zone and zone groups:

- If a zone (group) is occupied by a call with a higher priority, the zone (group) is show between parenthesis and flashing.
- If a zone (group) is occupied by a call with a lower priority, the zone (group) is shown between parenthesis.

18.7 Technical data

18.7.1 Physical dimensions

Dimensions (H x W x D):
70 x 95 x 200 mm
Weight:
0.4 kg
Max. flat cable length:
5 m (for all keypads together)

18.7.2 Climate conditions

Temperature:
-5 to +45 °C (operating, guaranteed)
-15 to +55 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

18.7.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16

18.7.4 Mean time between failures

Expected lifetime:
100,000 hours at +45 °C
MTBF:
1,200,000 hours
(based on real warranty return rate data)

18.7.5 System bus

Power supply via network:
18 to 56V (DC)
No fault reporting when >20V
Network power consumption:
1.6 W

19 PRS-CSM Call Station Module

19.1 Introduction

The PRS-CSM Call Station Module can be used to make custom-made call stations (e.g. an emergency call station). The module uses a built-in limiter and speech filter for improved intelligibility. The module has a metal housing for easy mounting and stacking in cabinets, and screw connectors for easy interconnection to microphone, loudspeaker, switch and indicators. See figure 19.1 for a block diagram of the call station module.

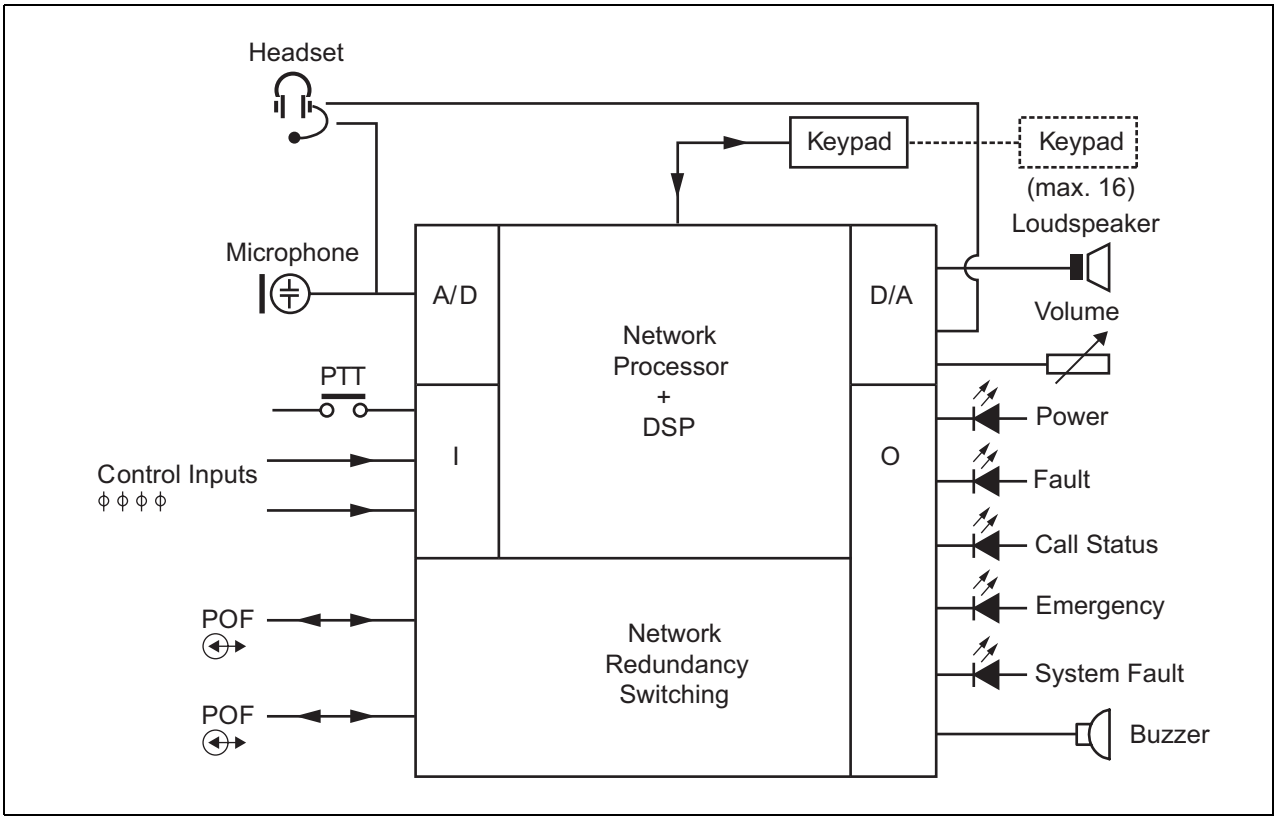


figure 19.1: Block diagram PRS-CSM

19.2 Controls, connectors and indicators

The call station module contains the following connections (see figure 19.2 and figure 19.3):

1 Back-up supply/Buzzer - Besides powering the call station module via the system network connector (7), it can also be powered externally from a back-up power supply via this connector (see section 19.2.1). On this connector also a buzzer can be connected.

2 Microphone/PTT key - The microphone input is used to connect a microphone and a Press-To-Talk (PTT) switch (see section 19.2.2).

3 Loudspeaker/Control Inputs - The loudspeaker is meant for listening to chimes, pre-recorded messages and alarms (see section 19.2.3) activated by a PTT key of the call station or one of its keypads (see section 47.3.3 of the IUI Praesideo 4.0). This connector also provides two control inputs, e.g. to accept fault outputs from a backup power supply.

4 Headset/Volume control potentiometer - This connector provides the possibility to connect a headset and a volume control potentiometer to the call station module (see section 19.2.4).This potentiometer also controls the volume of a loudspeaker connected to 3.

5, 6 Control input/outputs - The control input and five control outputs on these two connectors act in a similar way as the PTT key and LEDs on the LBB4430/00 Call Station Basic (see section 19.2.5).

7 System bus - Two system bus connectors to connect the call station module to other Praesideo equipment. Both connectors are interchangeable.

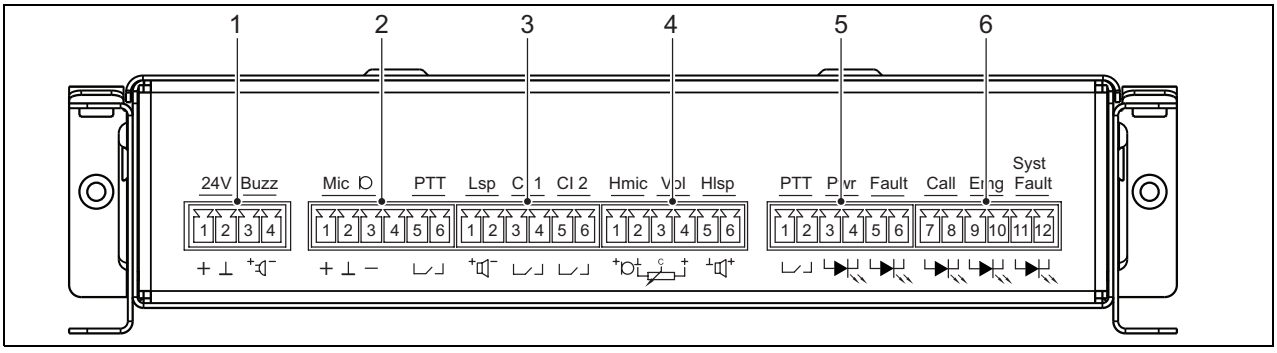


figure 19.2: PRS-CSM installer front view

Note
All cables connected to 1 to 6 must be less than 3 meter in length.

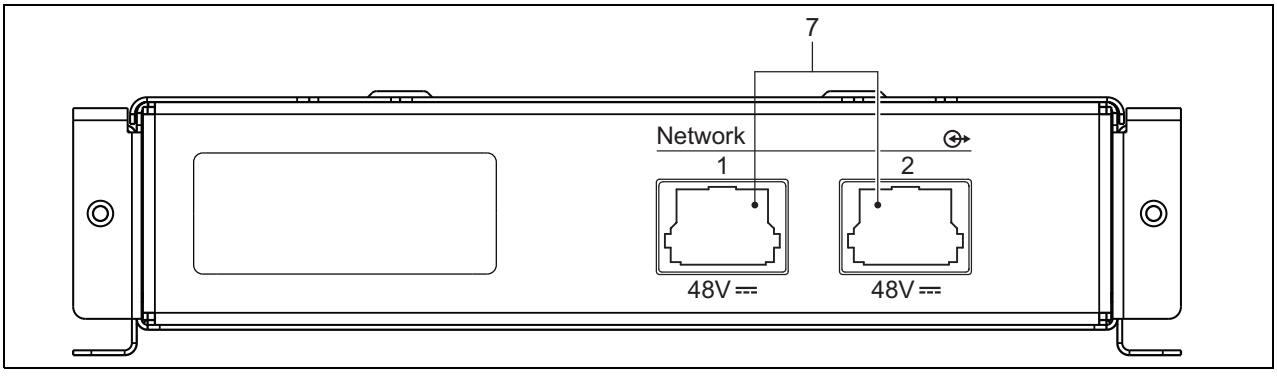


figure 19.3: PRS-CSM system front view

19.2.1 Back-up supply/Buzzer (1)

This 4-pin connector provides the input for a backup power supply and a buzzer. Typically a 24V supply is used, but a voltage in the range 18..56V is allowed. A buzzer can be connected here for fault and alarm notification. A low voltage type buzzer must be used that can operate on 3V. Suitable models are the Mallory PK-20A35EWQ or Alan Butcher Components ABI-004-RC.

table 19.1: Back-up supply/buzzer connector details

Pin	Signal
1	Back-up supply (+)
2	Back-up supply (GND)
3	Buzzer (+)
4	Buzzer (-)

19.2.2 Microphone/PTT key connection (2)

This 6-pin connector provides the connection for a microphone and a PTT key. The following dynamic microphones are suited for use with the module:

- LBB9081 Hand-held Dynamic Microphone (including resistors for switch supervision).
- LBB9082 Gooseneck Dynamic Microphone.

table 19.2: Microphone/PTT key connector details

Pin	Signal
1	Mic +
2	GND
3	Mic -
4	--- not connected ---
5	PTT input contact
6	GND

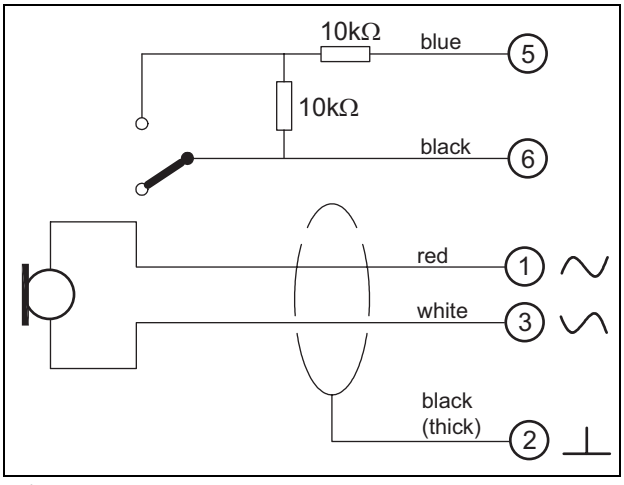


figure 19.4: LBB9081 connection diagram

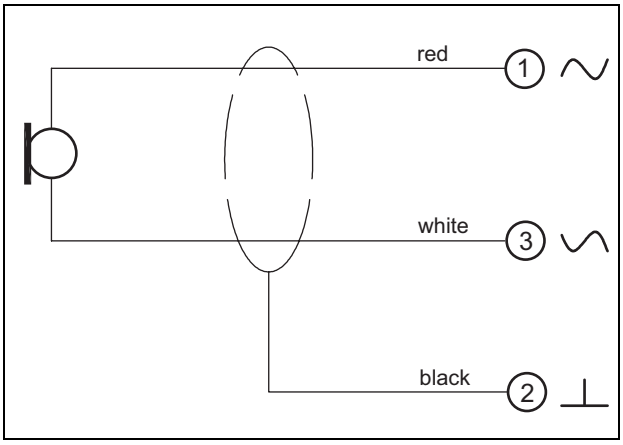
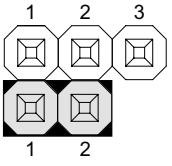
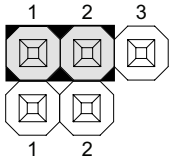


figure 19.5: LBB9082 connection diagram

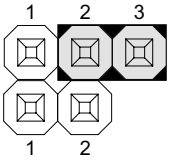
For the selection of the microphone type, a jumper on X149/X150 is used. To get access to this jumper, remove the top cover (see also section 20.3). For the location of X149 and X150 on the PCB see figure 19.13. Jumper settings:



Microphone selection via configuration webpage



Dynamic microphone



Electret microphone

19.2.3 Loudspeaker/Control Inputs (3)

This 6-pin connector provides the connection to a loudspeaker and to two control inputs.

table 19.3: Loudspeaker/ Control Input connector details

Pin	Signal
1	Speaker +
2	Speaker -
3	Control input 1
4	Return control input 1
5	Control input 2
6	Return control input 2

The control inputs can be configured to act on contact make or on contact break (see section 43.4.7 of the IUI Praesidio 4.0). It is also possible to supervise the cables for short-circuits and open connections (see *figure 19.6* and *figure 19.7*). Whether a control input is actually supervised or not is defined in the configuration.

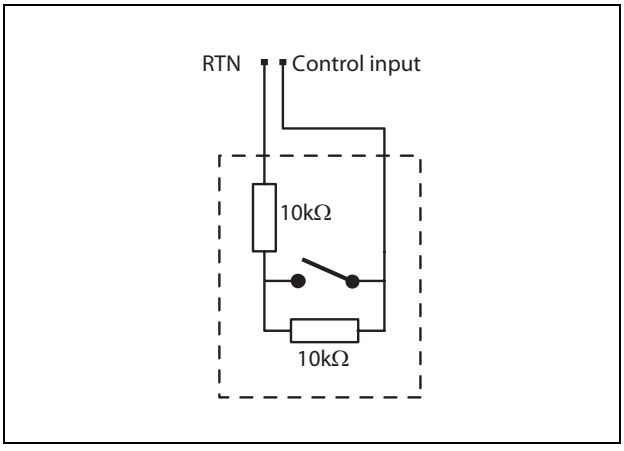


figure 19.6: Supervised control input

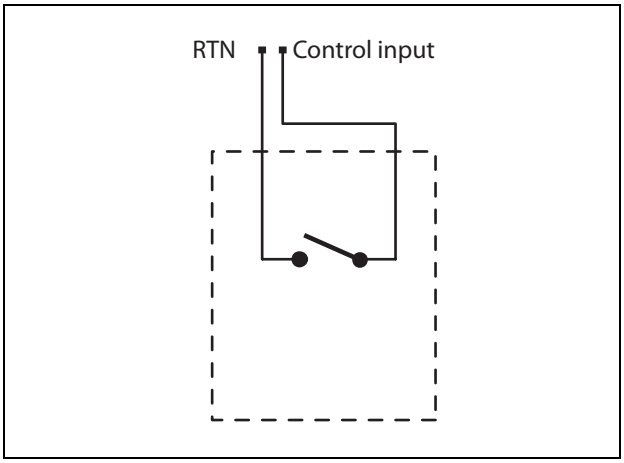


figure 19.7: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

19.2.4 Headset/Volume control (4)

This 6-pin connector provides the connection to the headset and the volume control. This volume control also controls the volume of the loudspeaker connected to connection 3.

A linear potentionmeter R (typical value: 100 kΩ) is used to create a control voltage from the supply voltage. If a volume control is not needed, pin 2 and 3 must be connected to each other. The volume level of the earphone or loudspeaker is then at its maximum.

table 19.4: Headset/Volume Control connector details

Pin	Signal
1	Headset (mic +)
2	GND (mic -)
3	Volume control voltage
4	3.3 V supply output
5	GND (earphone -)
6	Earphone +

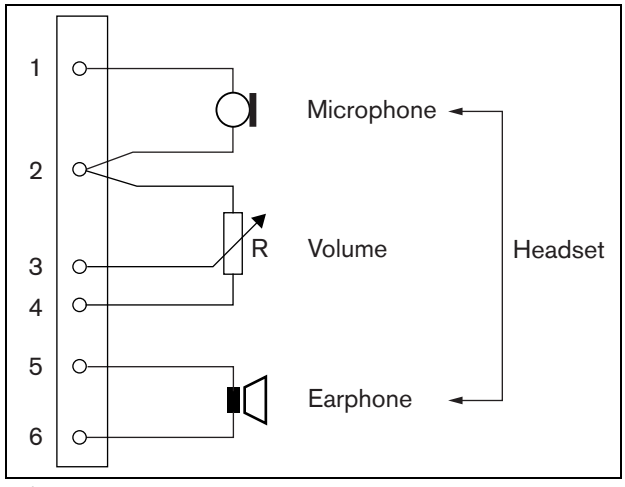


figure 19.8: Headset connection diagram

19.2.5 Control input/outputs (5, 6)

These two 6-pin connectors provide the connection of one control input for the PTT key and five control outputs for indicator LEDs.

table 19.5: Control inputs/outputs connector details

Pin	Signal
1	PTT input contact
2	GND
3	LED Power Indicator +/anode
4	LED Power Indicator -/cathode
5	LED Fault Indicator +/anode
6	LED Fault Indicator -/cathode
7	LED Call Status Indicator +/anode
8	LED Call Status Indicator -/cathode
9	LED Emergency Indicator +/anode
10	LED Emergency Indicator -/cathode
11	LED System Fault Indicator +/anode
12	LED System Fault Indicator -/cathode

The PTT input contact on this connector is in parallel with the PTT input contact on connector 2. Use only one of them.
See figure 19.9 for a connection diagram. The two resistors must be placed in the circuit, because the contact is always supervised by the system software.

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

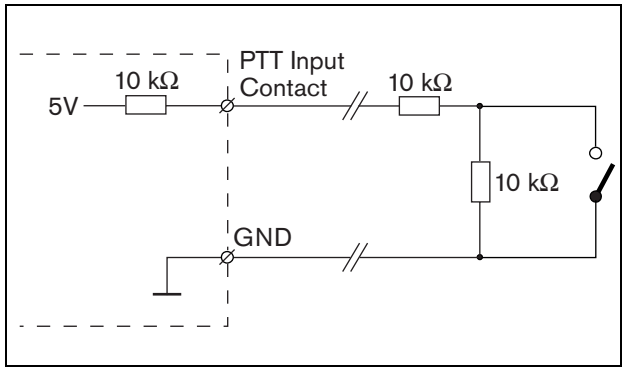


figure 19.9: Press-to-talk (PTT) key

In figure 19.10 the LED driver circuit is shown.
Typical colors for the indicator LEDs are:

- Green for power and call status indicators;
- Yellow for fault and system fault indicators;
- Red for the emergency indicator.

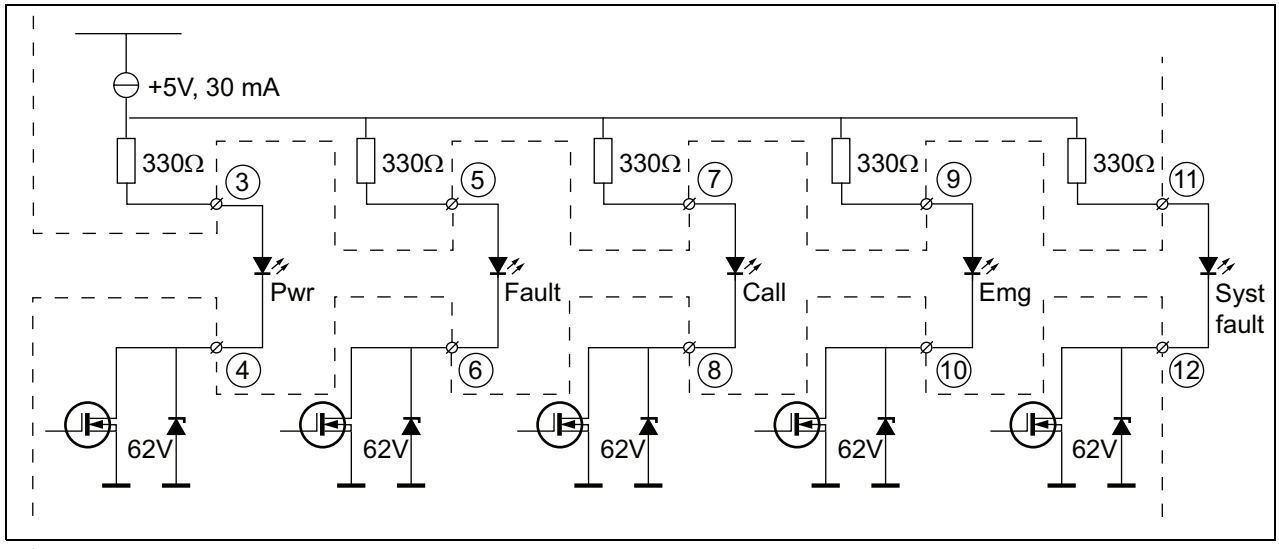


figure 19.10: Internally powered LEDs
Pwr: Power indicator
Fault: Fault indicator
Call: Call status indicator
Emg: Emergency indicator
Syst Fault: System fault indicator

It is also possible to connect an externally powered lamp or LED (see figure 19.11), or an externally powered relay (see figure 19.12). Use pin 2 of connector 5 as GND.

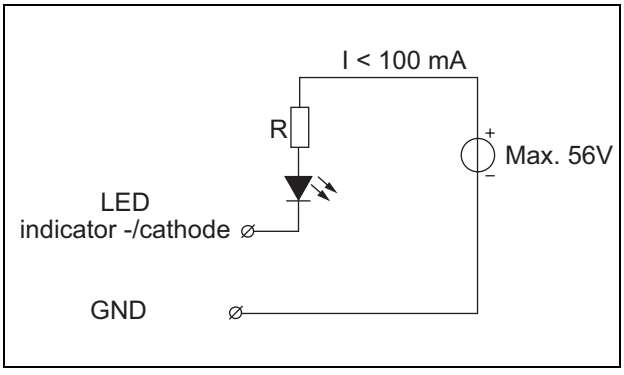


figure 19.11: Externally powered LED

The value of resistor R in figure 19.10 depends on the voltage of the external source, the forward voltage of the LED and the current flowing through the LED:

$$R = \frac{V_{source} - V_{forward}}{I}$$

For example, the voltage of the external source is 24 V, the forward voltage of the LED is 2 V and the current flowing through the LED is 10 mA, then:

$$R = \frac{24 - 2}{10 \cdot 10^{-3}} = 2200\ (\Omega)$$

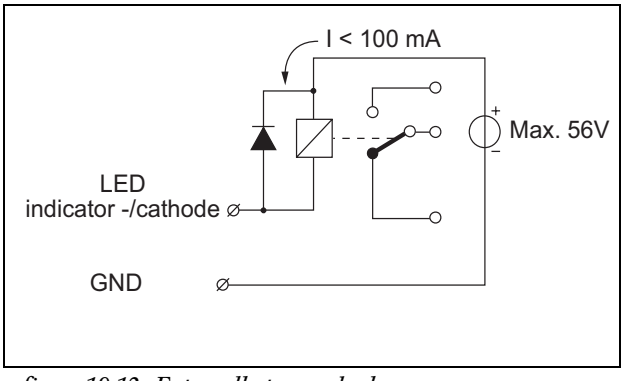


figure 19.12: Externally powered relay

19.2.6 Keypad interface (X143)

Additional keypads or keypad modules can be connected to this call station module via a 16-postion flatcable, connected to X143. This flatcable is supplied with each keypad or keypad module.
Up to 16 keypads and/or keypad modules can be connected in series (loop through). See also section 20.3

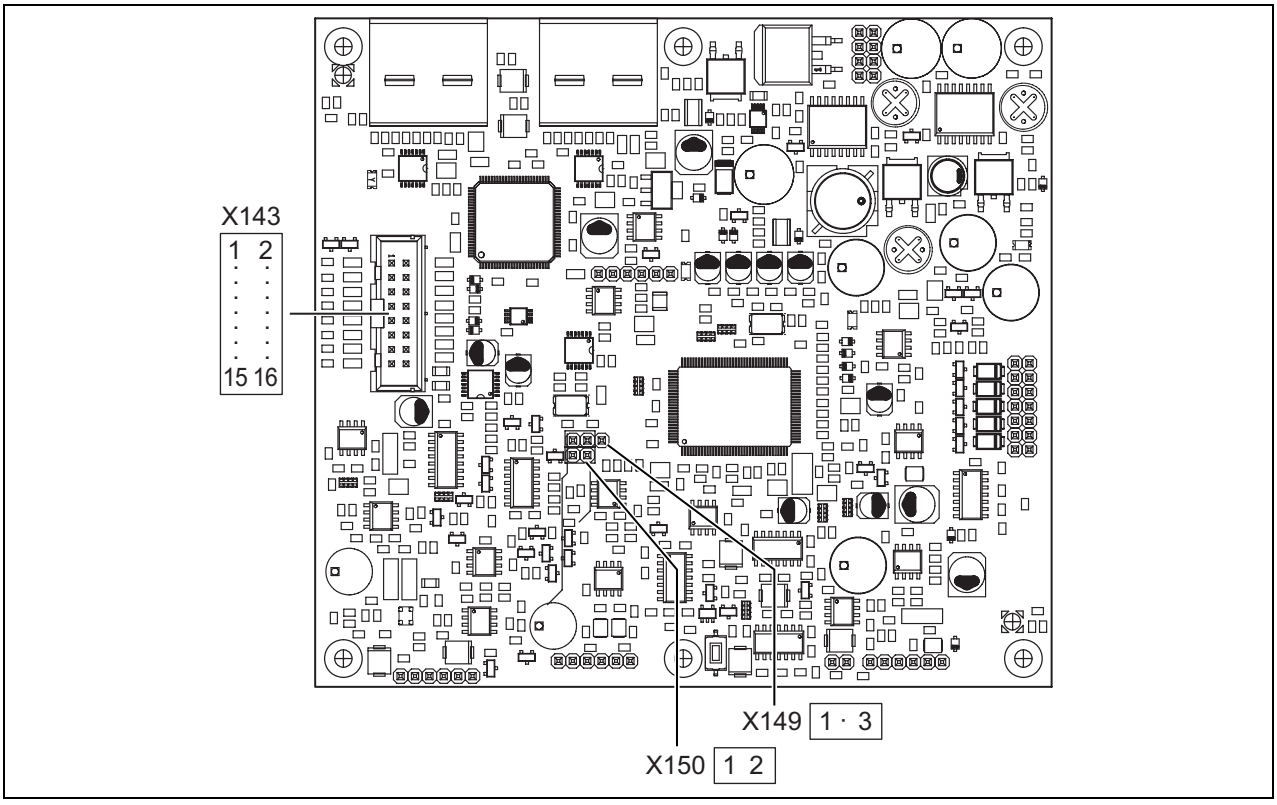


figure 19.13: Component side PCB of the PRS-CSM

19.3 Installation

The call station module is fitted with brackets and screw holes for easy installation. See figure 19.14.
Make sure to leave enough space for the cables and the connectors.
Especially the minimum bend radius of the Praesideo network cables must be observed (see section 31.6 of the IUI Praesidio 4.0).

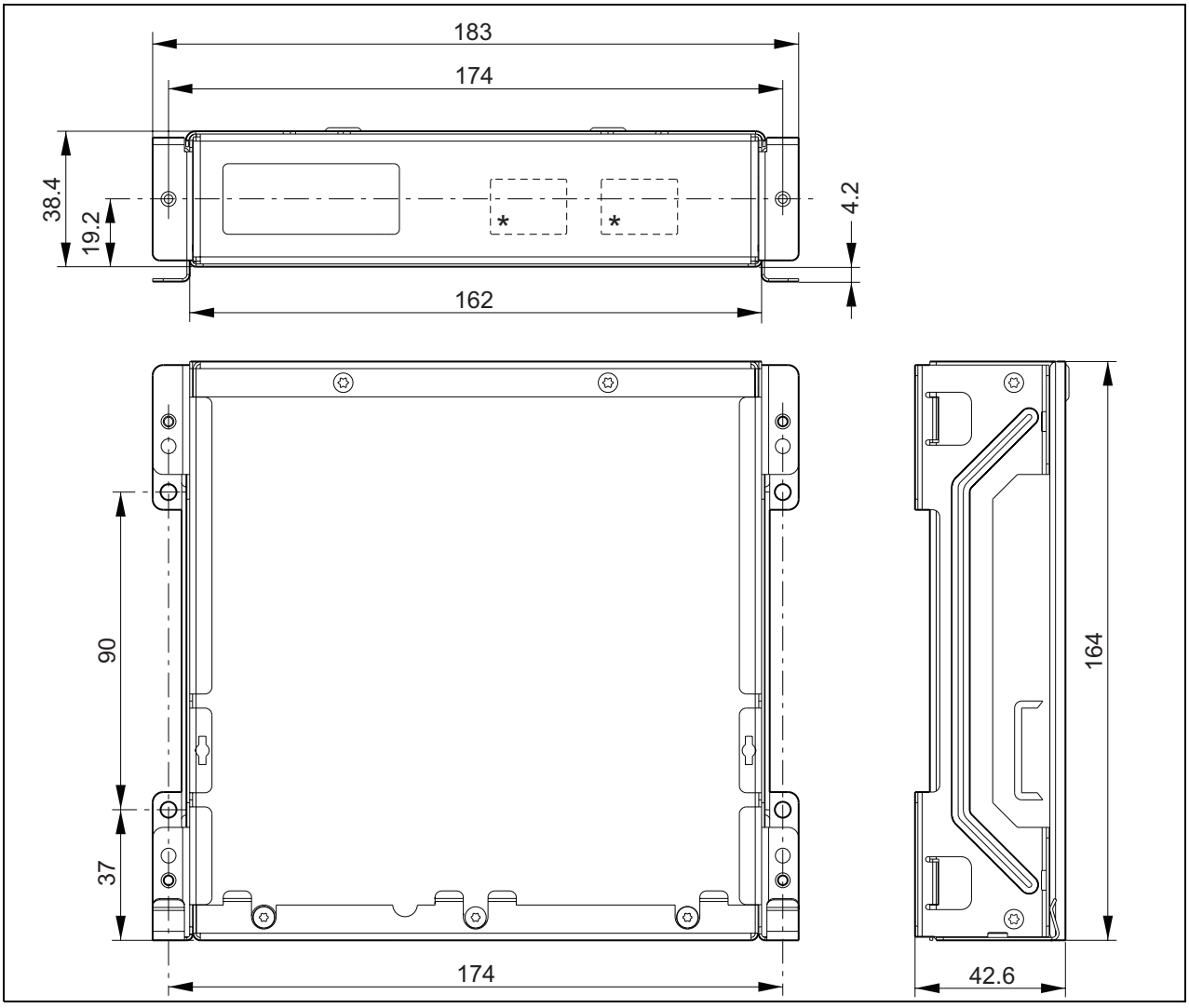


figure 19.14: PRS-CSM installation dimensions

*: the exact layout depends on the module type

19.4 Technical Data

19.4.1 Physical characteristics

Dimensions (H x W x D):
43 x 183 x 164 mm
Weight:
0.8 kg

19.4.2 Climate conditions

Temperature:
-5 to +55 °C (operating, guaranteed)
-15 to +55 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

19.4.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

19.4.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
500,000 hours
(based on real warranty return rate data)

19.4.5 System bus

Power supply via network:
18 to 56 V (DC)
No fault reporting when >20 V
Network power consumption:
6.2 W (excluding keypads)

19.4.6 Backup power supply

Backup voltage:
18 to 56 V(DC)
No fault reporting when > 20 V
Backup current:
max. 2 A (with maximum number of keypads)

19.4.7 Microphone

Microphone input sensitivity:
-55 dBV (balanced)
Input control range:
-7 to 8 dB
S/N:
min. 60 dB at rated sensitivity
Headroom:
min. 30 dB at rated sensitivity
Bandwidth:
340 to 14000 Hz (-3 dB ref. 1 kHz)
Supervision limits:
180 to 14000 Ω (dynamic microphone)
0.2 to 4.8 mA (electret microphone)

19.4.8 Loudspeaker

Impedance:
8 to 32 Ω
Signal/Noise ratio:
typical 80 dB ± 3 dB at max. output
Output power:
typical 100 mW, max. 300 mW

19.4.9 Headset

Mic. input sensitivity:
-44 dBV
Input sensitivity control range:
-7 to 8 dB
Microphone current for headset detection:
0.15 to 0.8 mA
Signal/Noise:
60 dB at rated sensitivity (microphone)
80 dB (earphone)
Earphone impedance:
min. 16 Ω (typical 32 W)
Crosstalk (earphone to microphone):
max. -40 dB
Bandwidth:
340 to 14000 Hz (-3dB ref. 1 kHz)
Output power:
0.1 to 30 mW (typical 1 mW)
Volume control voltage:
0 to 3.3 V

19.4.10 Controls

Loudspeaker and headset volume
Volume control voltage:
0 to 3.3 V
Control input 1, 2 and PTT input contact
Resistance detection (supervision enabled):
Cable short circuit
< 2.5 kΩ
Contact closed
7.5 kΩ to12 kΩ
Contact open
17.5 kΩ to 22 kΩ
Cable broken
> 27 kΩ
Resistance detection (supervision disabled):
Contact closed
< 12 kΩ
Contact open
> 17.5 kΩ
Control outputs
Output type:
open collector/drain
Internal output supply current:
max. 10 mA (per pin)
max. 30 mA
(in total max. 3 LEDs are simultaneously on)
Output voltage:
max. 56 V (per pin)
Output sink current:
max. 100 mA per output switch pin

19.4.11 Buzzer

Buzzer voltage:
3.3 V

20 PRS-CSKPM Call Station Keypad Module

20.1 Introduction

The PRS-CSKPM Call Station Keypad Module can be used to add keys and indicators to a custom-made call station based on the PRS-CSM (see section 19) or the PRS-SCRM (see section 22). The module has a metal housing for easy mounting and stacking in cabinets, and screw connectors for easy interconnection to switches and indicators. See figure 20.1 for a block diagram of the call station keypad module.

For each key input, two LEDs are available as status indicators (LED1 and LED2).

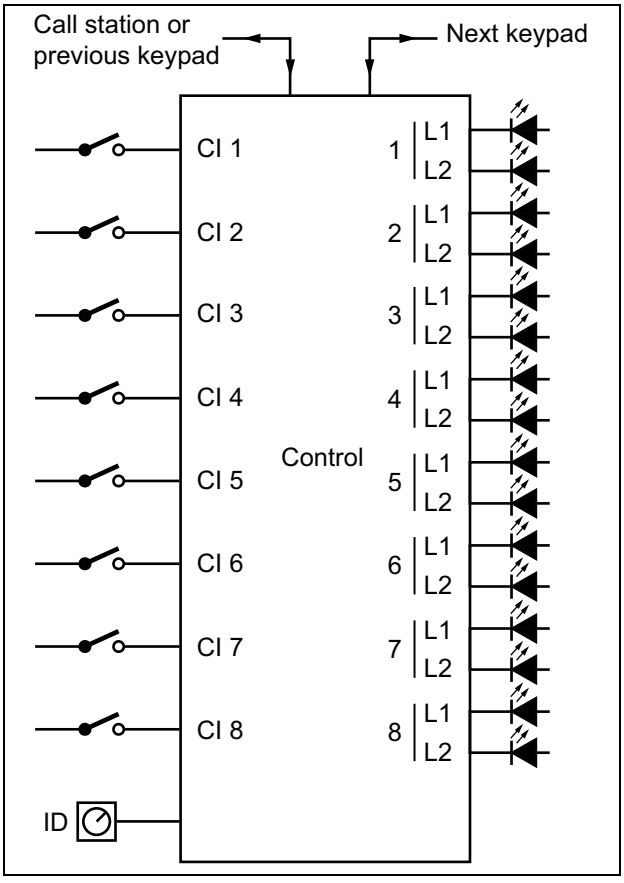


figure 20.1: Block diagram

20.2 Controls, connectors and indicators

The call station keypad module contains the connections (see figure 20.2):

1 Key inputs - The key inputs act in a similar way as the keys on the LBB4432/00 Call Station Keypad (see section 20.2.1).

2 Control outputs - The control outputs act in a similar way as the LEDs on the LBB4432/00 Call Station Keypad (see section 20.2.2).

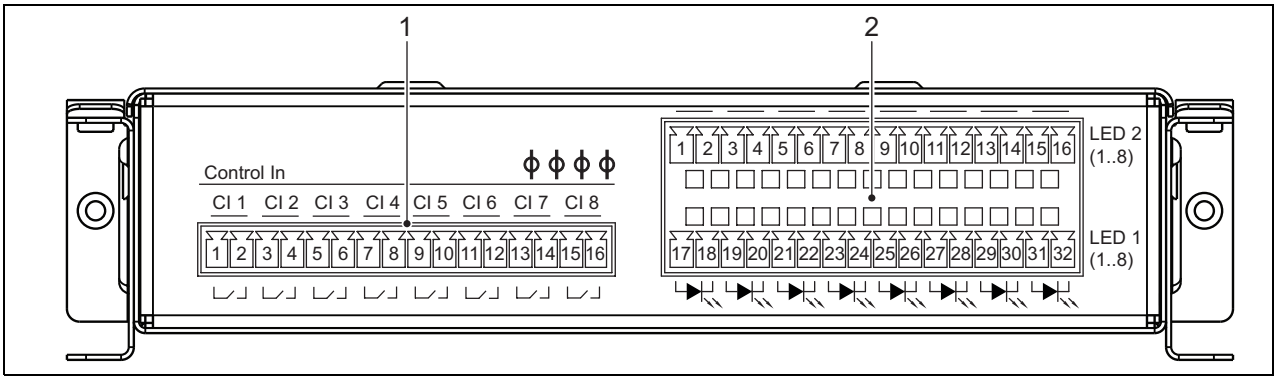


figure 20.2: PRS-CSKPM installer front view

Caution
Disconnect the system cable from the call station (module) and back-up supplies before you connect a keypad to it. Connecting a keypad to a powered (remote) call station can damage the (remote) call station.

20.2.1 Key inputs (1)

The interface for key inputs consists of a connector with 16 positions. These control inputs are not supervised.

table 20.1: Control inputs connector details

Pin	Signal
1	Key input 1, contact
2	Key input 1, return
3	Key input 2, contact
4	Key input 2, return
5	Key input 3, contact
6	Key input 3, return
7	Key input 4, contact
8	Key input 4, return
9	Key input 5, contact
10	Key input 5, return
11	Key input 6, contact
12	Key input 6, return
13	Key input 7, contact
14	Key input 7, return
15	Key input 8, contact
16	Key input 8, return

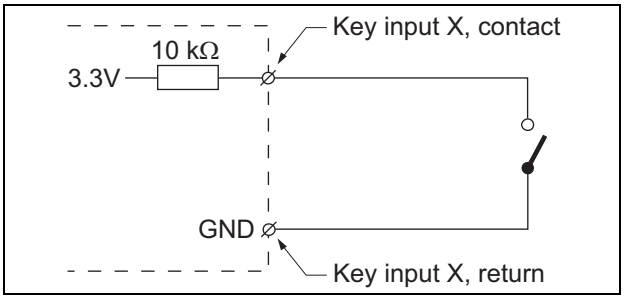


figure 20.3: Input connection diagram

20.2.2 Control outputs (2)

The interface for indicators consists of a double row connector with 2 x 16 postions.

table 20.2: X810 connector details

Pin	Signal
Top row	
1	LED 2 indicator 1 +/anode
2	LED 2 indicator 1 -/cathode
3	LED 2 indicator 2 +/anode
4	LED 2 indicator 2 -/cathode
5	LED 2 indicator 3 +/anode
6	LED 2 indicator 3 -/cathode
7	LED 2 indicator 4 +/anode
8	LED 2 indicator 4 -/cathode
9	LED 2 indicator 5 +/anode
10	LED 2 indicator 5 -/cathode
11	LED 2 indicator 6 +/anode
12	LED 2 indicator 6 -/cathode
13	LED 2 indicator 7 +/anode
14	LED 2 indicator 7 -/cathode
15	LED 2 indicator 8 +/anode
16	LED 2 indicator 8 -/cathode
Bottom row	
17	LED 1 indicator 1 +/anode
18	LED 1 indicator 1 -/cathode
19	LED 1 indicator 2 +/anode
20	LED 1 indicator 2 -/cathode
21	LED 1 indicator 3 +/anode
22	LED 1 indicator 3 -/cathode
23	LED 1 indicator 4 +/anode
24	LED 1 indicator 4 -/cathode
25	LED 1 indicator 5 +/anode
26	LED 1 indicator 5 -/cathode
27	LED 1 indicator 6 +/anode
28	LED 1 indicator 6 -/cathode
29	LED 1 indicator 7 +/anode
30	LED 1 indicator 7 -/cathode
31	LED 1 indicator 8 +/anode
32	LED 1 indicator 8 -/cathode

These outputs are used for the indication of the zone status. See sections 47.3.32 and 47.3.33 of the IUI Praesideo 4.0 for detailed information.

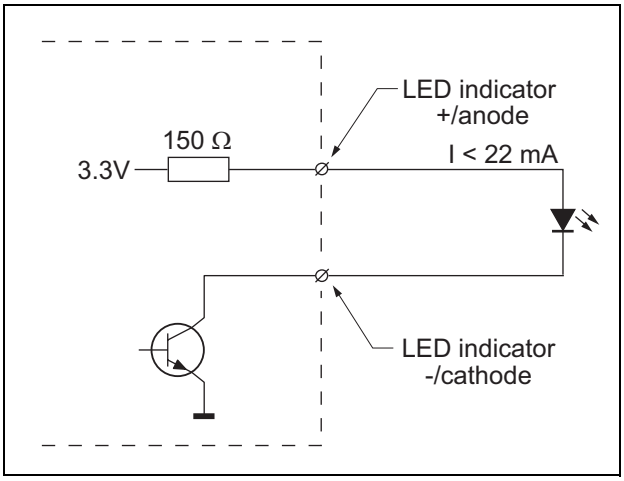


figure 20.4: Internally powered LED

By replacing the LED with an optocoupler, external loads can be switched, powered from an external power supply.

Note
The maximum total load for all control outputs together should be <64 mA.

20.2.3 Keypad interface (X5, X6)

A keypad module can be connected to a call station or a call station module, or connected to a previous keypad module. For the interconnection a 16-postion flatcable is used, supplied with the keypad module. Up to 16 keypads and/or keypad modules can be connected in series (loop through).

The connectors X5 and X6 are in parallel, so either one of them can be used as incoming or outgoing interconnection.

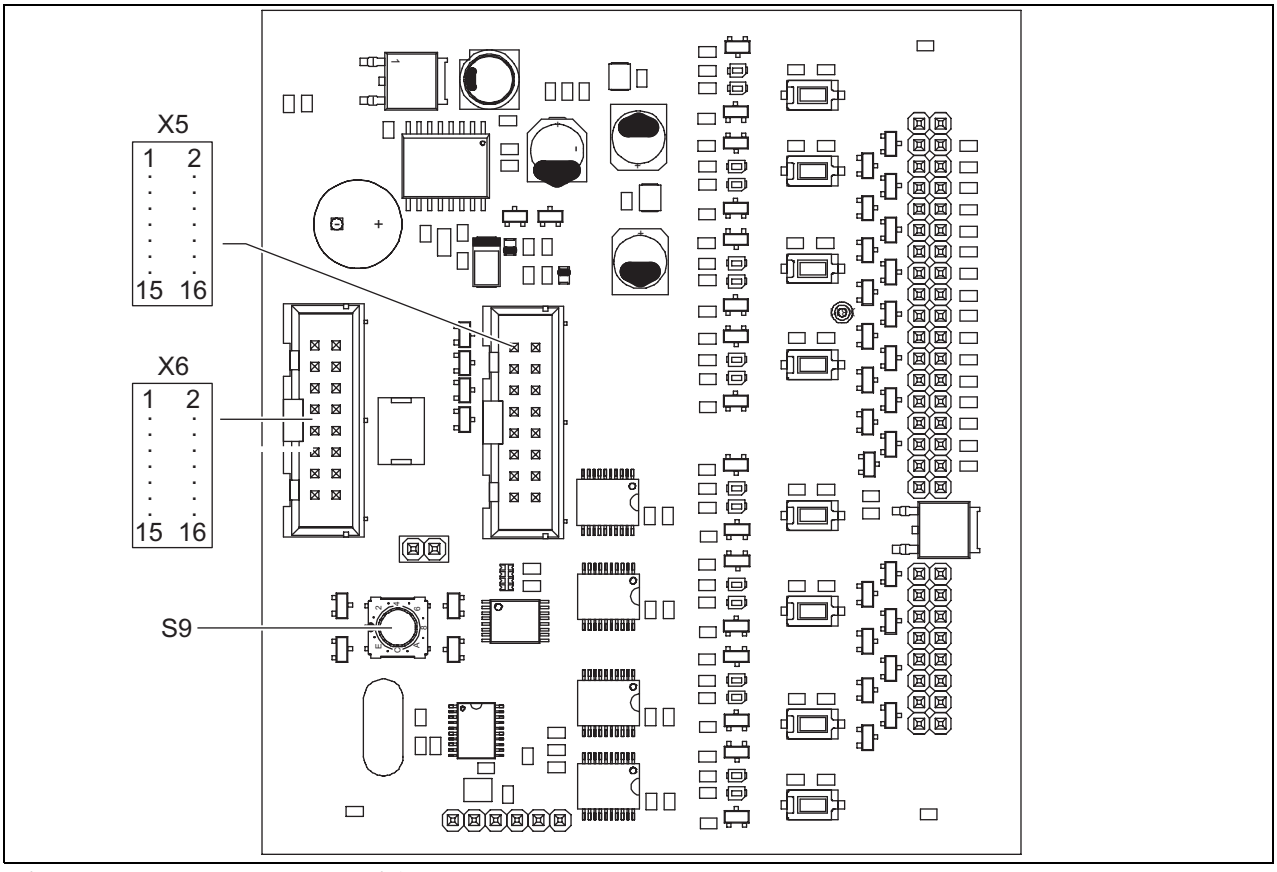


figure 20.5: Component side PCB of the PRS-CSKPM

20.2.4 ID selector (S9)

It is possible to connect:

- Up to 16 call station keypads to a (remote) call station.
- Up to 15 call station keypads and one numeric keypad (PRS-CSNKP) to a (remote) call station.

For communication between the call station and its keypads, the correct ID must be assigned to each keypad using the ID selector (see figure 20.5, no. S9 and figure 20.6).

The ID of a keypad depends on its position in the array of keypads. The first keypad has ID 0, the next 1, and so on up to F for the sixteenth keypad (hexadecimal notation).

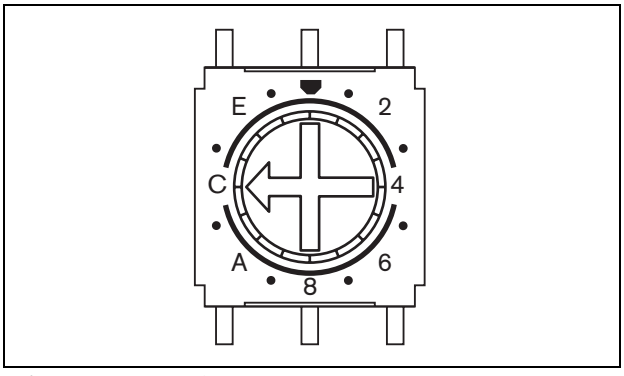


figure 20.6: ID selector

20.3 Installation

The call station module is fitted with brackets and screw holes for easy installation. See figure 20.7.

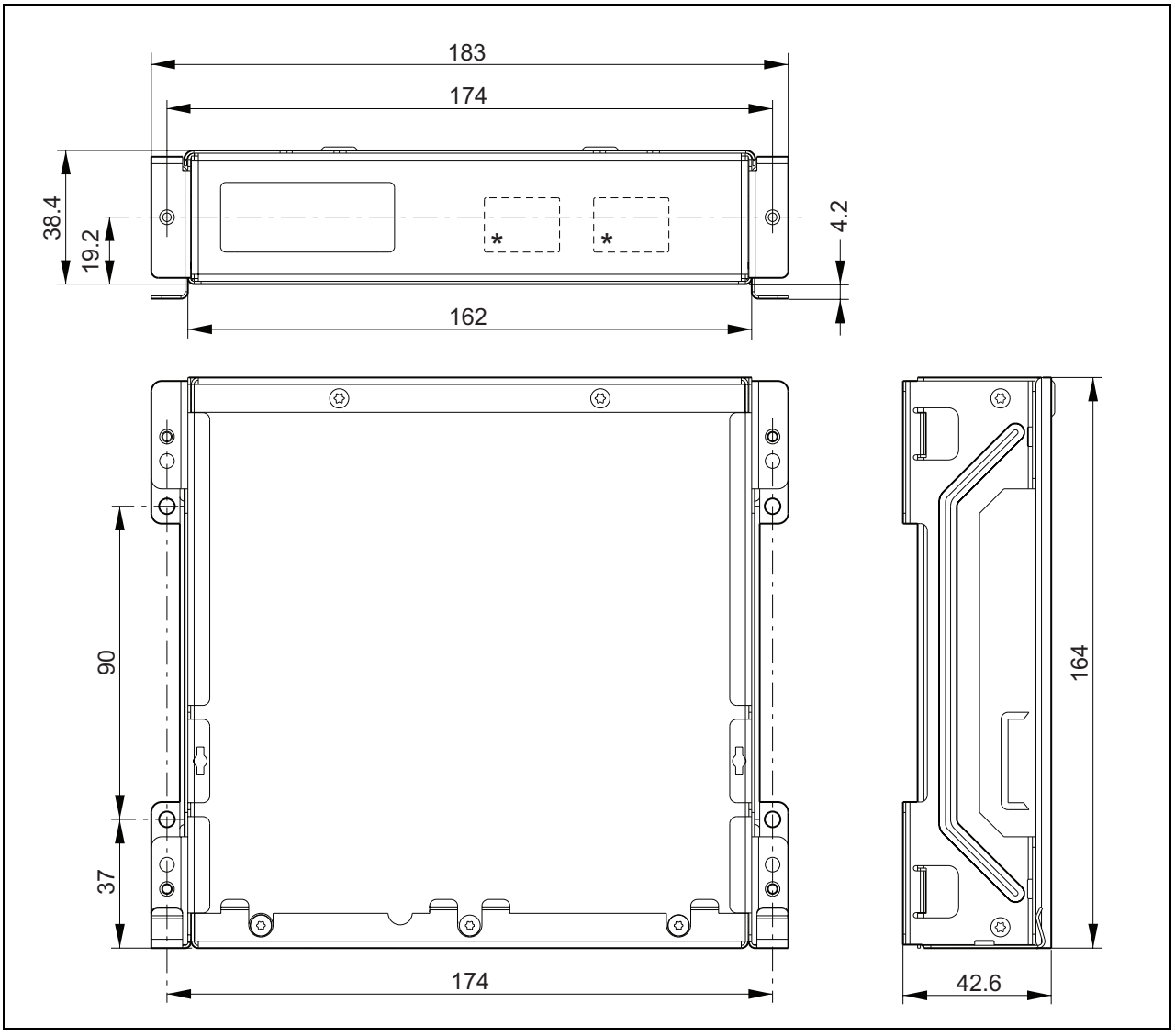


figure 20.7: PRS-CSKPM installation dimensions

* Exact layout depends on module type

20.3.1 Connecting the PRS-CSKPM to other modules

To connect a keypad module to an other module:

1 Remove the screws (A) of each module and slide the top cover (B) off (see figure 20.8).
Make sure that you keep the screws (A) for later use.

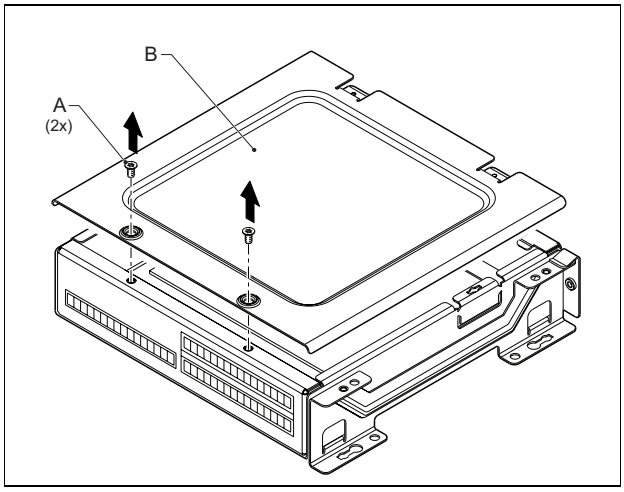


figure 20.8: Module cover removal

2 Remove the cable entry knock-outs (C) for the grommets in the modules (see figure 20.9). This depends on the way you want to position the modules (stacked, see figure 20.10 or next to each other, see figure 20.12).
3 Put the grommet (D) on the flatcables (E).
4 Connect the flatcable to the PCB.

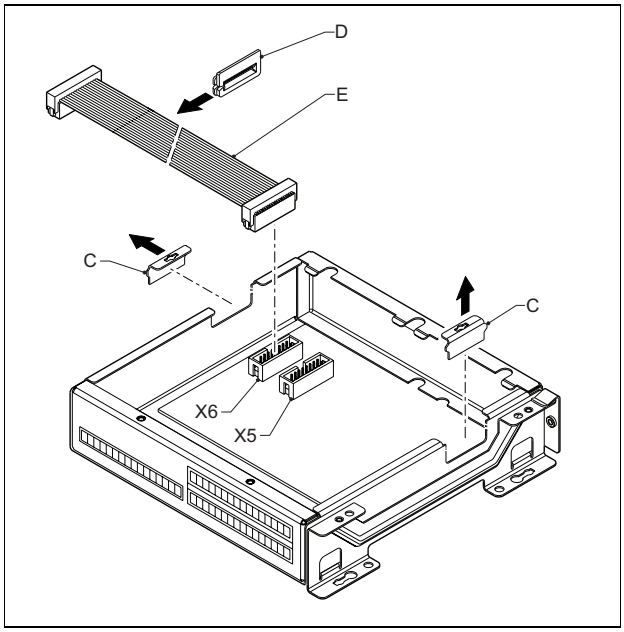


figure 20.9: Knock-out removal

5 Guide the flatcable to the other module (see figure 20.10 or figure 20.12) and insert the grommet into the knock-out hole.
6 Connect the flatcable to the other PCB.

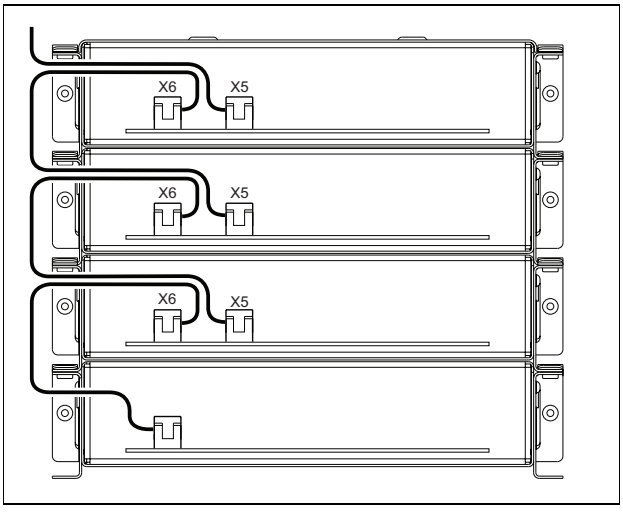


figure 20.10: Flatcable guidance (stacked modules)

7 Put the upper module on top of the lower module (see figure 20.11).
Slide the upper module into the spring clamp (F)
8 Place and tighten the screws (A)
Use the screws of the cover that you removed.
9 Install the cover on the upper module.

.

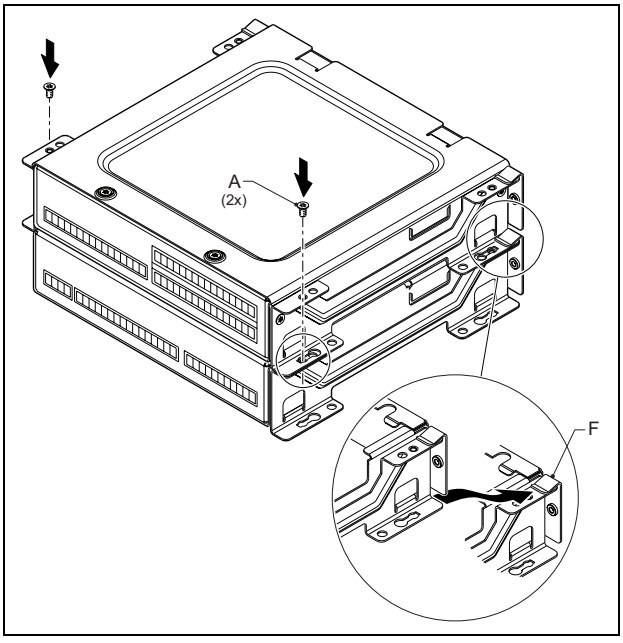


figure 20.11: Module stacking

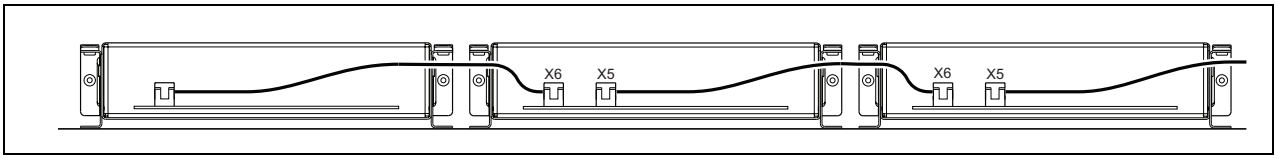


figure 20.12: Flatcable guidance (modules next to each other)

When the modules are not stacked, but mounted next to each other, put the top covers back on all modules (see figure 20.12).

20.4 Technical data

20.4.1 Physical characteristics

Dimensions (H x W x D):
43 x 183 x 164 mm
Weight:
0.8 kg
Max. flat cable length:
5 m (for all keypads together)
Max. wire length:
5 m (for all inputs and outputs)

20.4.2 Climate conditions

Temperature:
-5 to +55 °C (operating, guaranteed)
-15 to +55 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

20.4.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

20.4.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
500,000 hours
(based on real warranty return rate data)

20.4.5 System bus

Power supply via network:
18 to 56V (DC)
No fault reporting when >20V
Network power consumption:
1.2 W

21 PRS-CSR Remote Call Station

21.1 Introduction

The PRS-CSR Remote Call Station is used for making live speech or pre-recorded announcements to any pre-assigned zones or to execute any pre-defined actions. The remote call station is connected to the system through the PRS-CSI Call Station Interface with a Cat-5 cable. This makes the remote call station suitable to operate the system from remote sites. See figure 21.1 for a block diagram of the remote call station.

The PRS-CSR Remote Call Station is a successor to the LBB4438/00 Remote Call Station. You can only use the PRS-CSR in combination with the PRS-CSI Call Station Interface. You cannot use the PRS-CSR in combination with the (old) LBB4437/00 Call Station Interface. You can only use the LBB4437/00 to connect LBB4438/00 and LBB4439/00 remote call stations to the system.

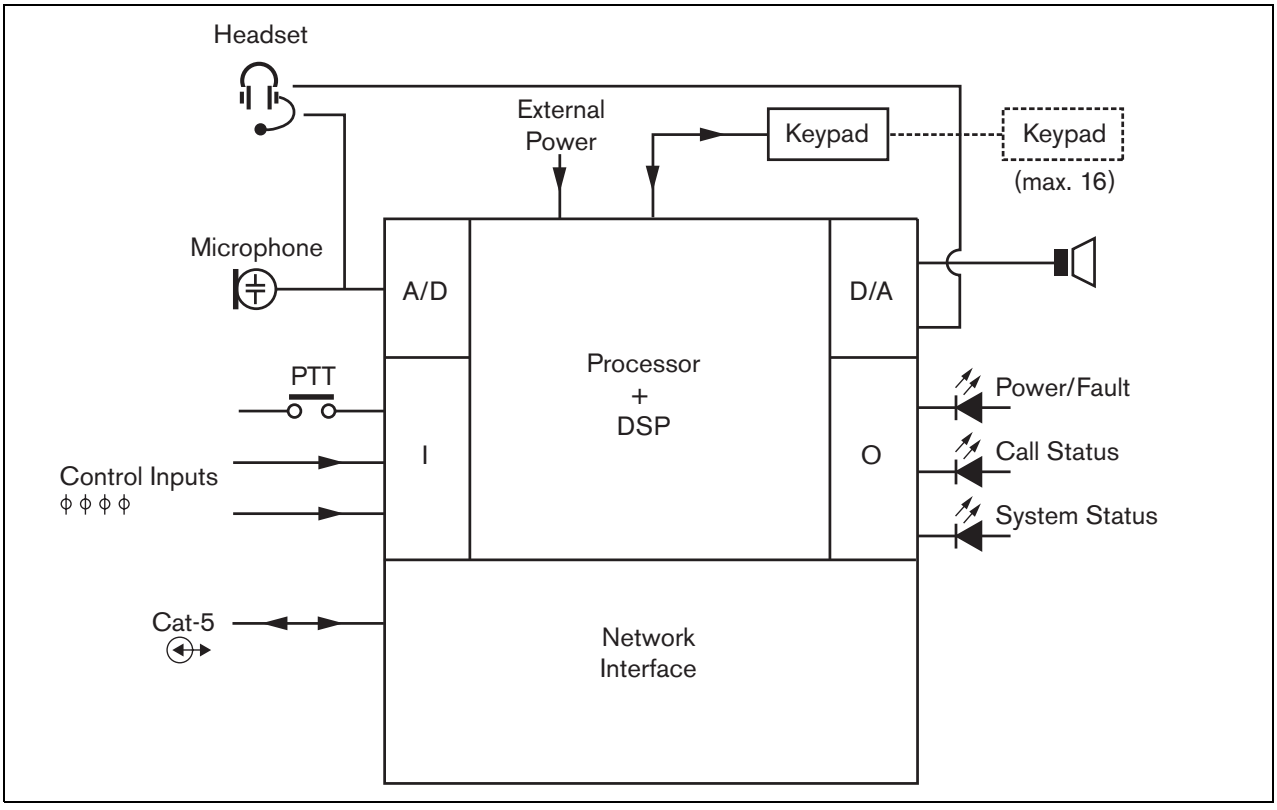


figure 21.1: Block diagram

21.2 Controls, connectors and indicators

The remote call station (see figure 21.3 and figure 21.4) contains the following:

1 **Headset connection** - A 3.5 mm (1/8 inch) jack socket to connect a headset. The loudspeaker (5) and the microphone are muted when a headset is connected (see section 21.3.3).
2 **Volume control** - A control to adjust the volume of the internal loudspeaker and the headset.
3 **Press-to-talk (PTT) key** - A key to start a call.
4 **Status LEDs** - Three status LEDs provide information about the remote call station and the status of the Praesideo system (see section 21.5).
5 **Loudspeaker** - A loudspeaker for audio monitoring purposes. The loudspeaker and microphone are muted when a headset is connected to the headset connection (1). Only chimes and messages activated by a PTT key of the call station or one of its keypads (see section 48.3.3) are played via the loudspeaker of the call station.
6 **External power supply/Control inputs** - A connection for an (optional) external power supply and control inputs (see section 21.3.4 and section 21.3.5).
7 **RJ45 connector** - A connector to connect the remote call station to a PRS-CSI Call Station Interface via a straight Cat-5 cable (see section 21.3.2).

Caution
Do not connect the connector 7 to any Telecom or Ethernet network. This connection is dedicated for PRS-CSI only.

8 **Service connector** - A connector used for manufacturing. Not for normal use.
9 **Interface connector** - A flat cable connector to connect the remote call station to a call station keypad.

21.3 Connections

21.3.1 Introduction

This section gives an overview of typical system connections using the remote call station.

- Connecting the network (see section 21.3.2).
- Connecting a headset (see section 21.3.3).
- Connecting an external power supply (see section 21.3.4).
- Connecting control inputs (see section 21.3.5).

21.3.2 Connecting the network

Connect the remote call station to the Praesideo system using a PRS-CSI Call Station Interface (see chapter 23).

21.3.3 Connecting a headset

The next figure shows the signals that are available on the headset connector and how they relate to the parts of a 3.5 mm connector.

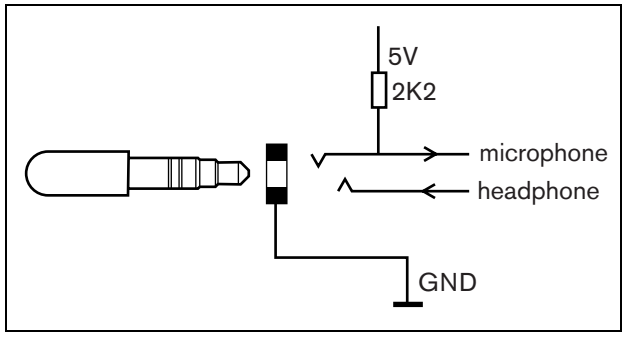


figure 21.2: Headset connector

Note
The wire of the headset may not be longer than 3 meter.

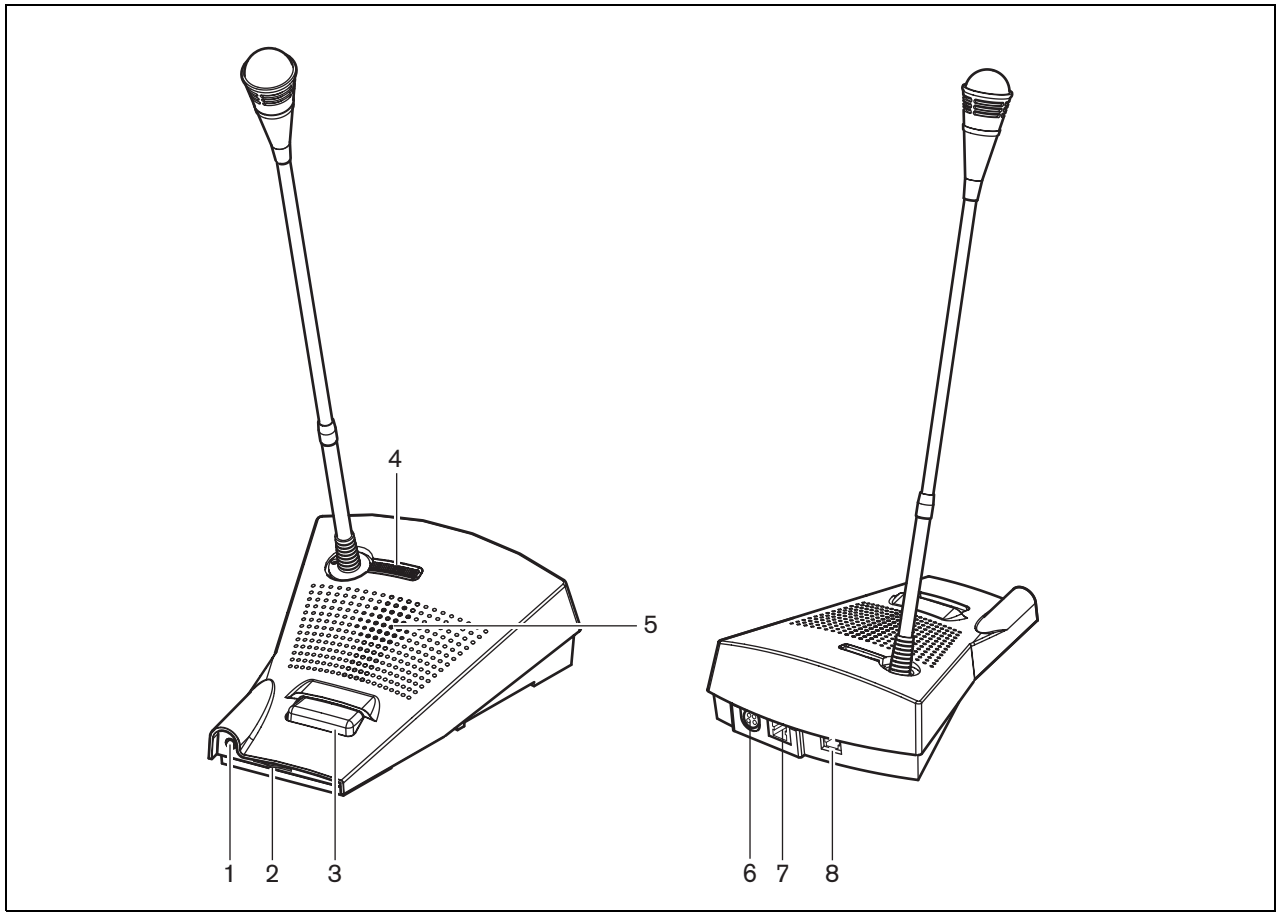


figure 21.3: Front and rear views

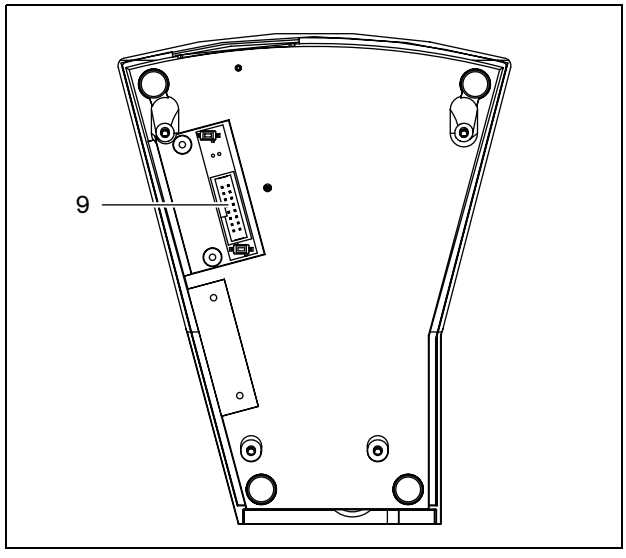


figure 21.4: Bottom view

21.3.4 Connecting a power supply

The remote call station is delivered with a separate Kycon KPPX-4P connector to connect an external power supply to the remote call station. The Kycon KPPX-4P connector has four pins (see figure 21.5):

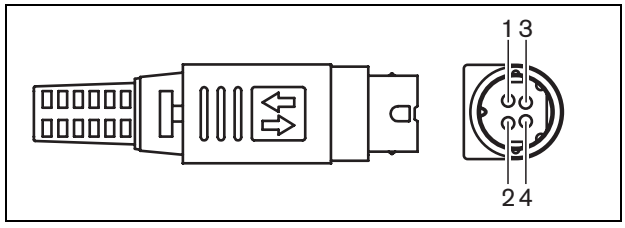


figure 21.5: Connection diagram (external view)

table 21.1: Kycon KPPX-4P connector details

Pin	Signal
1	Ground
2	External supply
3	Control input 1
4	Control input 2

Normally, the call station interface and the remote call station are powered from the network. To make sure that they receive power when the network is not available, external power supplies can be connected to the call station interface and the remote call station. See section 23.3.3 for more information.

Warning
For safety reasons, you must use a current limited external power supply complying with the 60065 standard for audio/video usage or equivalent, with a maximum output current of 5A, or you must use an external fuse (5 A max, slow) in the wiring of the Kycon KPPX-4P connector.

For application in emergency sound systems in Europe, the installer must use a power supply with EN54-4 certification.

Note
The 48 V power supplies from Mean Well, model GS120A48-R7B, GS160A48-R7B and GS220A48-R7B deliver 120 W, 160 W and 220 W respectively and already have a Kycon KPPX-4P connector. These power supplies can be connected directly to the PRS-NSP, PRS-FIN, PRS-CSR or PRS-CSI, but only when the pins 3 and 4 are cut off! Although Mean Well swapped the numbers of pins 1 and 2 in their product datasheet, the voltage polarity of the pins 1 and 2 matches the requirements of the Praesideo units. The installer must cut off pins 3 and 4 of the connector, using a wire cutter with a narrow pointed head. Then the connector does not have to be disassembled to remove the connections to pins 3 and 4; this saves a lot of time. Praesideo uses pin 3 and 4 for different functions and these may not be connected to the power supply, otherwise the Praesideo units may be damaged..

21.3.5 Connecting control inputs

The remote call station has 2 control inputs (refer to figure 21.5 and table 21.1). The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 44.5.4). The maximum length of the connected cables is 3 meter.

It is also possible to supervise the cables for short-circuits and open connections (see figure 21.6 and figure 21.7). Whether a control input is actually supervised or not is defined in the configuration.

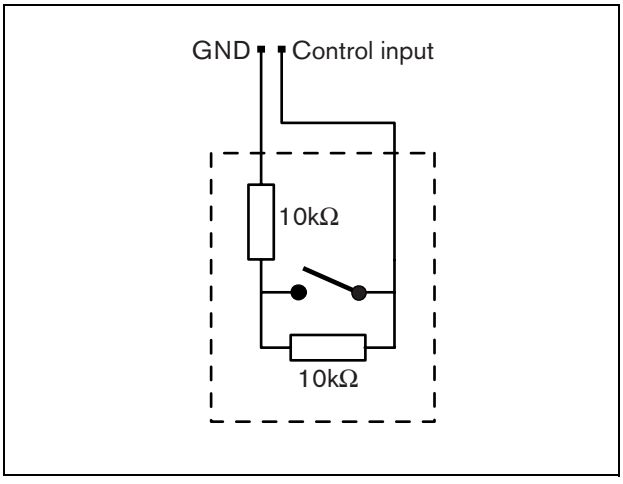


figure 21.6: Supervised control input

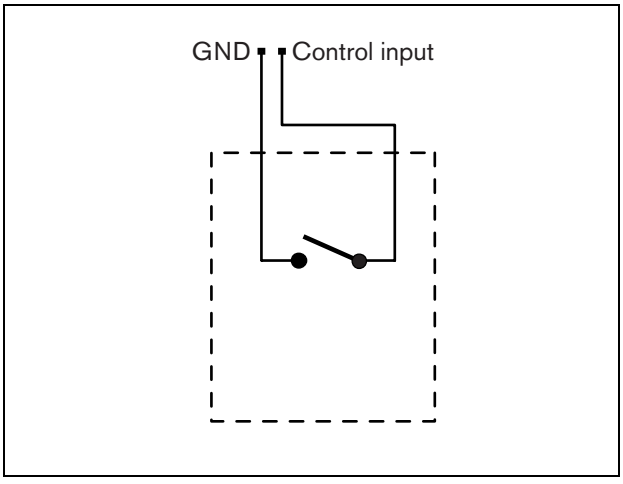


figure 21.7: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

21.4 Installation

The call station basic is suitable for table-top use. Its functionality can be expanded by connecting:

- Up to 16 call station keypads for pre-configured actions (LBB4432/00 or PRS-CSKPM).
- Up to 15 call station keypads for pre-configured actions (LBB4432/00 or PRS-CSKPM) and one numeric keypad (PRS-CSNKP).

21.5 Operation

The remote call station has three status LEDs that provide information about the remote call station and the status of the Praesideo system:

- Power/fault LED (left), see table 21.2.
- Call status LED (center), see table 21.3.
- System status LED (right), see table 21.4.

table 21.2: Power/Fault LED (left)

Color	State	Explanation
---	Off	Power not available.
Green	On	Power on and no system or remote call station faults.
Yellow	Blinking	Power on, but there is a fault in the system.
Yellow	On	Power on, but there is a fault in the remote call station or the Praesideo network is not operational.

table 21.3: Call status LED (center)

Color	State	Explanation
----	Off	No call status to display.
Green	On	Ready to talk/live announcement.
Green	Blinking	Chime on or pre-recorded message playing.

table 21.4: System status LED (right)

Color	State	Explanation
---	Off	No pre-defined or selected zones are in use or reserved by the system, and no emergency announcement is being made.
Yellow	On	Lower priority announcements are being made or are reserved to all or some of the zones which are pre-assigned to the press-to-talk key of the remote call station and selected zones of the keypad (if fitted).
Yellow	Blinking	Announcements with higher or the same priority (not emergency) are on or reserved to all or some of the zones which are pre-assigned to the press-to-talk key of the remote call station and selected zones of the keypad (if fitted).
Red	On	An emergency announcement is being made. Normal announcements can be made to the zones which are not involved.

21.6 Technical data

21.6.1 Physical data

Dimensions (H x W x D):
90 x 160 x 200 mm
Length (goose neck):
380 mm
Weight:
0.95 kg

21.6.2 Climate conditions

Temperature:
-5 to +45 °C (operating, guaranteed)
-15 to +45 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

21.6.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

21.6.4 Mean time between failures

Expected lifetime:
50,000 hours at +45 °C
MTBF:
1,200,000 hours
(based on real warranty return rate data)

21.6.5 External power supply

Connector:
Kycon KPJ-4S
Input voltage range:
18 to 56V (DC)
No fault reporting when >20V
Power consumption:
2.9 W at 48 V (excluding keypads)

21.6.6 Call station interface

Connector (rear side):
RJ45
Cable type:
Cat-5 (4x twisted pair, straight)
Maximum cable length:
1000 m
Power supply via network:
18 to 56 V(DC)
No fault reporting when >20V
Network power consumption:
2.9 W at 48 V (excluding keypads)

21.6.7 Microphone

Input sensitivity:
83 dB(SPL)
Input sensitivity control range:
-7 to 8 dB
Signal/Noise ratio:
> 60 dB at 85 dB(SPL)
Bandwidth:
-3 dB at 340 Hz and 14 kHz with respect to 1 kHz

21.6.8 Loudspeaker

Signal/Noise ratio:
80 dB at max. output
Sound pressure level:
85 dB(SPL) at 0.5 m and 1 kHz

21.6.9 Headset

Connector:
3.5 mm (1/8 inch) jack
Electret impedance:
1 to 10 kΩ
Microphone input sensitivity:
-47 to -32 dBV/Pa (tolerance ± 3 dB)
Signal/Noise ratio microphone:
60 dB at -38 dBV/Pa (tolerance ± 3 dB)
Earphone impedance:
32 Ω
Signal/Noise ratio earphone:
80 dB at max. output (tolerance ± 3 dB)
Cross-talk (earphone to microphone):
< 40 dB at -42 dBV/Pa and 1 kHz (tolerance ± 3 dB)
Output power:
1 mW

21.6.10 Control inputs

Total cable resistance:
< 1 kΩ (with line supervision)
< 5 kΩ (without line supervision)
Resistance detection (supervision enabled):
Cable short circuit
< 2.5 kΩ
Contact closed
7.5 kΩ to12 kΩ
Contact open
17.5 kΩ to 22 kΩ
Cable broken
> 27 kΩ
Resistance detection (supervision disabled):
Contact closed
< 12 kΩ
Contact open
> 17.5 kΩ
External contacts:
Voltage-free closing or breaking contacts (relay contacts, mechanical switches, mercury contacts etc.)

22 PRS-CSRM Remote Call Station Module

22.1 Introduction

The PRS-CSRM Remote Call Station Module can be used to make custom-made remote call stations (e.g. a remote emergency call station). The module uses a built-in limiter and speech filter for improved intelligibillity. The module has a metal housing for easy mounting and stacking in cabinets, and screw connectors for easy interconnection to microphone, loudspeaker, switch and indicators. See figure 22.1 for a block diagram of the remote call station module.

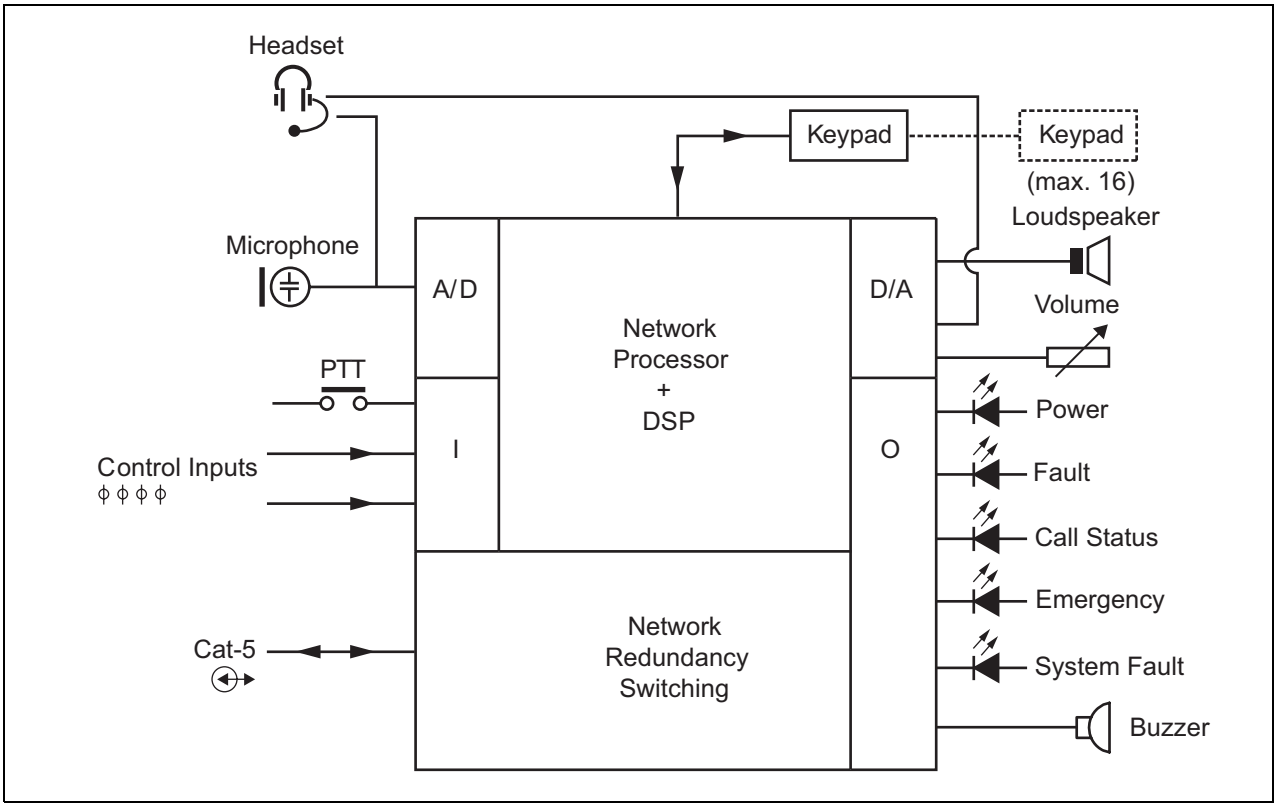


figure 22.1: Block diagram PRS-CSRM

22.2 Controls, connectors and indicators

The remote call station module contains the following connections (see figure 22.2 and figure 22.3):

1 Back-up supply/Buzzer - Besides powering the call station module via the system network connector (7), it can also be powered externally from a back-up power supply via this connector (see section 22.2.1). On this connector also a buzzer can be connected.

2 Microphone/PTT key - The microphone input is used to connect a microphone and a Press-To-Talk (PTT) switch (see section 22.2.2)

3 Loudspeaker/Control Inputs - The loudspeaker is meant for listening to chimes, pre-recorded messages and alarms (see section 22.2.3) activated by a PTT key of the call station or one of its keypads (see section 47.3.3 of the IUI Praesideo 4.0). This connector also provides two control inputs, e.g. to accept fault outputs from a backup power supply.

4 Headset/Volume control potentiometer - This connector provides the possibility to connect a headset and a volume control potentiometer to the call station module (see section 22.2.4).This potentiometer also controls the volume of a loudspeaker connected to 3.

5, 6 Control input/outputs - The control input and five control outputs on these two connectors act in a similar way as the PTT key and LEDs on the LBB4430/00 Call Station Basic (see section 22.2.5).

7 PRS-CSI connection - An RJ45 connector to connect the remote call station module to a call station interface via a straight Cat-5 cable.

8 Factory test connector.

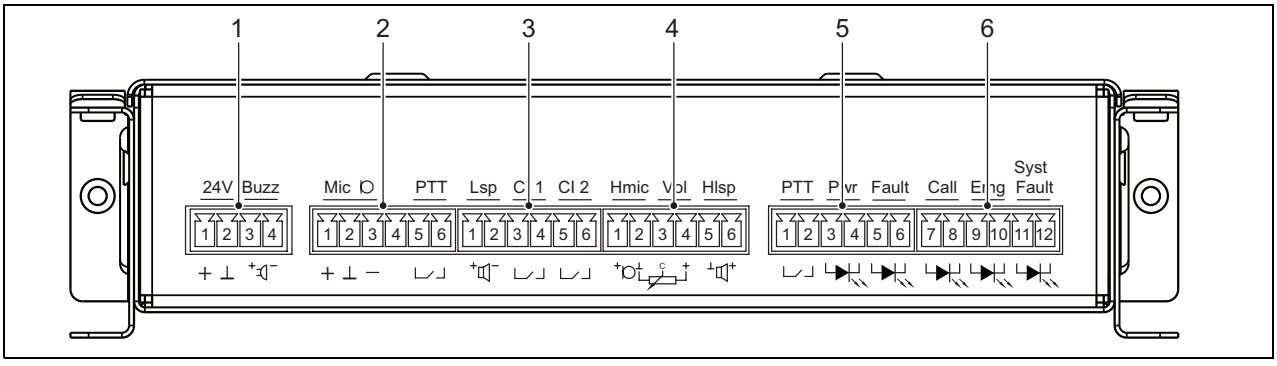


figure 22.2: PRS-CSRM installer front view

Note
All cables connected to 1 to 6 must be less than 3 meter in length.

Caution
Do not connect the connector 7 to any Telecom or Ethernet network. This connection is dedicated for PRS-CSI only.

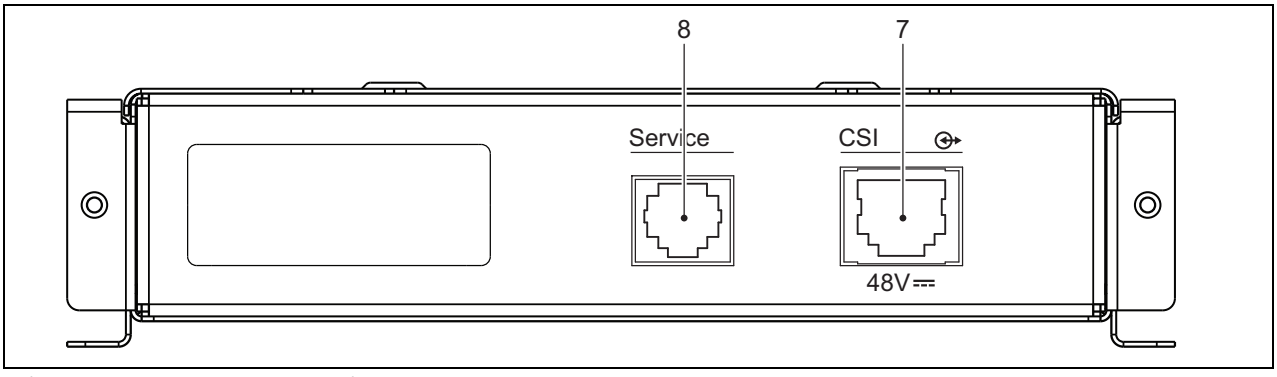


figure 22.3: PRS-CSRM system front view

22.2.1 Back-up supply/Buzzer (1)

This 4-pin connector provides the input for a backup power supply and a buzzer. Typically a 24V supply is used, but a voltage in the range 18..56V is allowed. A buzzer can be connected here for fault and alarm notification. A low voltage type buzzer must be used that can operate on 3V. Suitable models are the Mallory PK-20A35EWQ or Alan Butcher Components ABI-004-RC.

table 22.1: Back-up supply/buzzer connector details

Pin	Signal
1	Back-up supply (+)
2	Back-up supply (GND)
3	Buzzer (+)
4	Buzzer (-)

22.2.2 Microphone/PTT key connection (2)

This 6-pin connector provides the connection for a microphone and a PTT key. The following dynamic microphones are suited for use with the module:

- LBB9081 Hand-held Dynamic Microphone (including resistors for switch supervision).
- LBB9082 Gooseneck Dynamic Microphone.

table 22.2: Microphone/PTT key connector details

Pin	Signal
1	Mic +
2	GND
3	Mic -
4	--- not connected ---
5	PTT input contact
6	GND

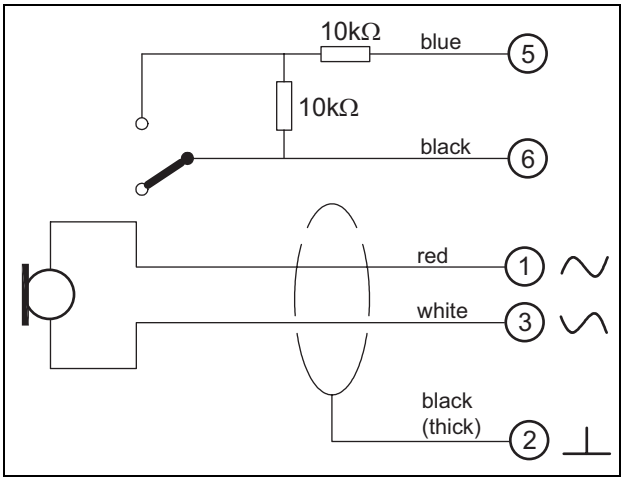


figure 22.4: LBB9081 connection diagram

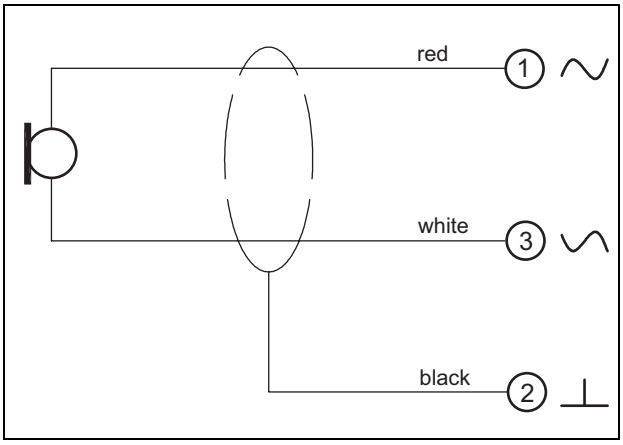
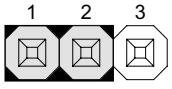
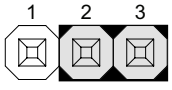


figure 22.5: LBB9082 connection diagram

For the selection of the microphone type, a jumper on X300 is used. To get access to this jumper, remove the top cover (see also section 20.3). For the location of X300 on the PCB see section 22.2.6.
Jumper settings:



Dynamic microphone



Electret microphone

22.2.3 Loudspeaker/Control inputs (3)

This 6-pin connector provides the connection to a loudspeaker and to two control inputs.

table 22.3: Loudspeaker/ Control Input connector details

Pin	Signal
1	Speaker +
2	Speaker -
3	Control input 1
4	Return control input
5	Control input 2
6	Return control input

The control inputs can be configured to act on contact make or on contact break (see section 43.4.7 of the IUI Praesideo 4.0). It is also possible to supervise the cables for short-circuits and open connections (see figure 22.6 and figure 22.7). Whether a control input is actually supervised or not, is defined in the configuration.

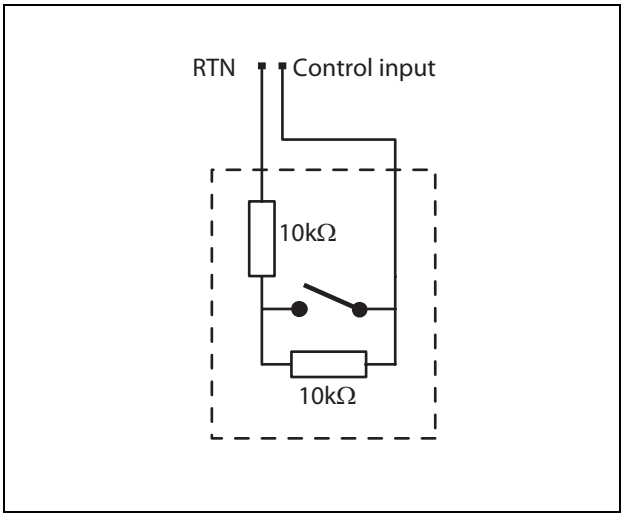


figure 22.6: Supervised control input

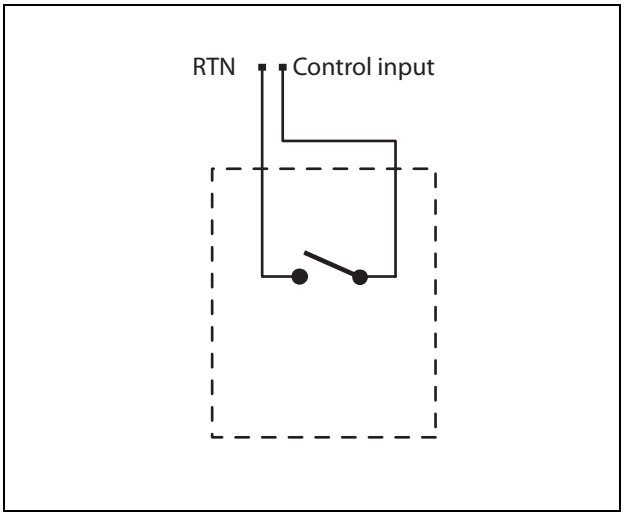


figure 22.7: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

Note
Do not combine control input wires of multiple control inputs (e.g. do not use a common return wire).

22.2.4 Headset/Volume control (4)

This 6-pin connector provides the connection to the headset and the volume control. This volume control also controls the volume of the loudspeaker connected to connection 3.
A logarithmic potentionmeter R (typical value: 100 kΩ) is used to attenuate the audio signal.
If a volume control is not needed, pin 3 and 4 must be connected to each other. The volume level of the earphone or loudspeaker is then at its maximum.

table 22.4: Headset/Volume Control connector details

Pin	Signal
1	Headset (mic +)
2	GND (mic -)
3	Audio-in from volume control
4	Audio-out to volume control
5	GND (earphone -)
6	Earphone +

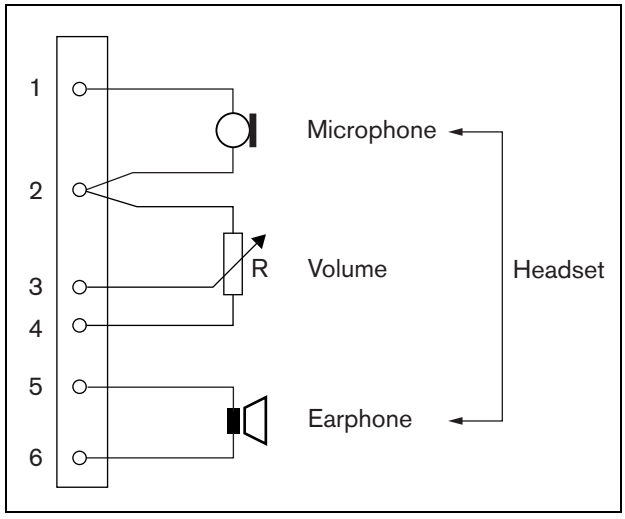


figure 22.8: Headset connection diagram

22.2.5 Control input/outputs (5, 6)

These two 6-pin connectors provide the connection of one control input for the PTT key and five control outputs for indicator LEDs.

table 22.5: Control inputs/outputs connector details

Pin	Signal
1	PTT input contact
2	GND
3	LED Power Indicator +/anode
4	LED Power Indicator -/cathode
5	LED Fault Indicator +/anode
6	LED Fault Indicator -/cathode
7	LED Call Status Indicator +/anode
8	LED Call Status Indicator -/cathode
9	LED Emergency Indicator +/anode
10	LED Emergency Indicator -/cathode
11	LED System Fault Indicator +/anode
12	LED System Fault Indicator -/cathode

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

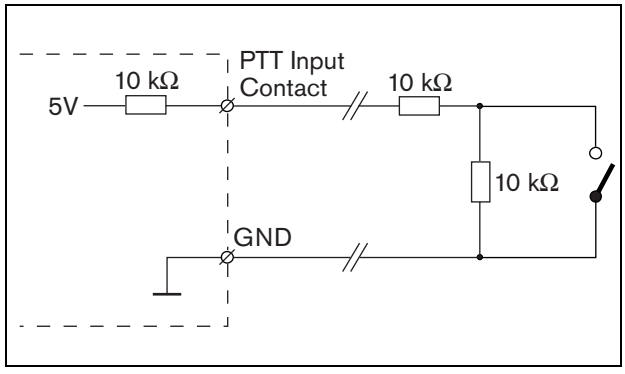


figure 22.9: Press-to-talk (PTT) key

The PTT input contact on this connector is in parallel with the PTT input contact on connector 2. Use only one of them.
See figure 22.9 for a connection diagram. The two resistors must be placed in the circuit, because the contact is always supervised by the system software.

In figure 22.10 the LED driver circuit is shown.
Typical colors for the indicator LEDs are:

- Green for power and call status indicators;
- Yellow for fault and system fault indicators;
- Red for the emergency indicator.

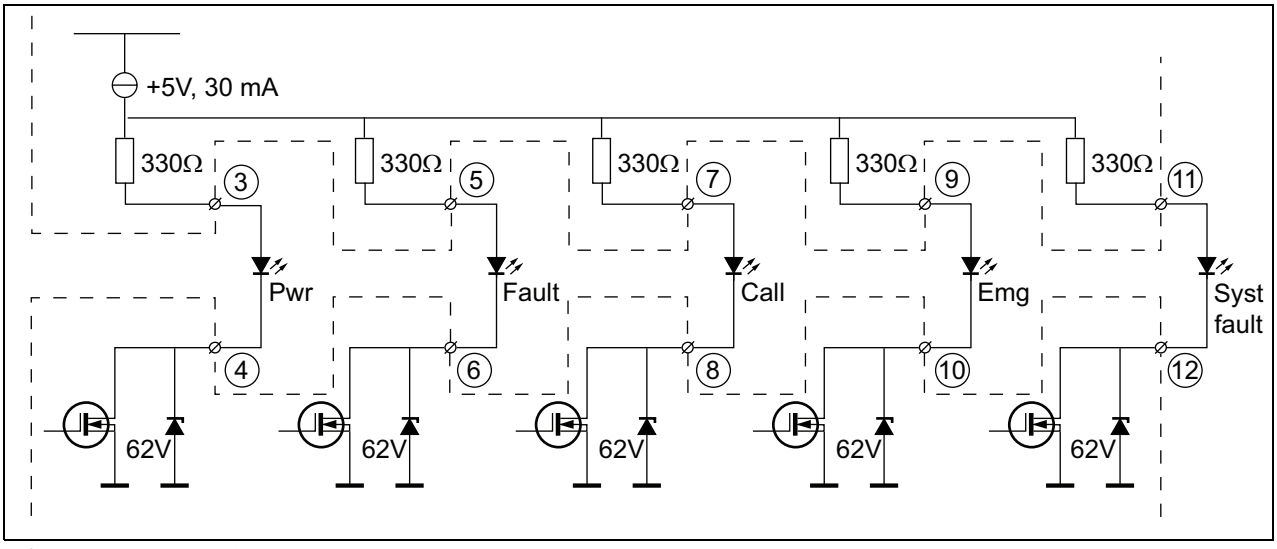


figure 22.10: Internally powered LEDs
Pwr: Power indicator
Fault: Fault indicator
Call: Call status indicator
Emg: Emergency indicator
Syst Fault: System fault indicator

It is also possible to connect an externally powered lamp or LED (see figure 22.11), or an externally powered relay (see figure 22.12). Use pin 2 of connector 5 as GND.

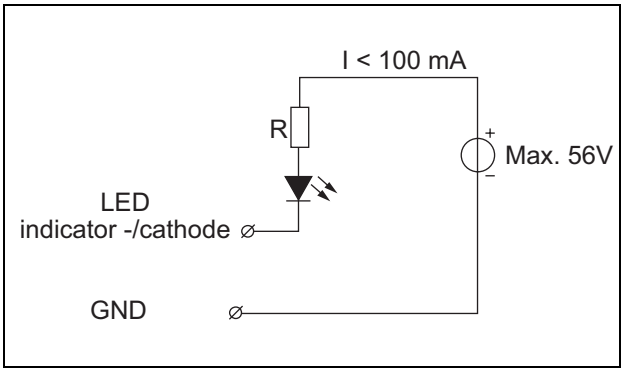


figure 22.11: Externally powered LED

The value of resistor R in figure 22.10 depends on the voltage of the external source, the forward voltage of the LED and the current flowing through the LED:

$$R = \frac{V_{source} - V_{forward}}{I}$$

For example, the voltage of the external source is 24 V, the forward voltage of the LED is 2 V and the current flowing through the LED is 10 mA, then:

$$R = \frac{24 - 2}{10 \cdot 10^{-3}} = 2200\ (\Omega)$$

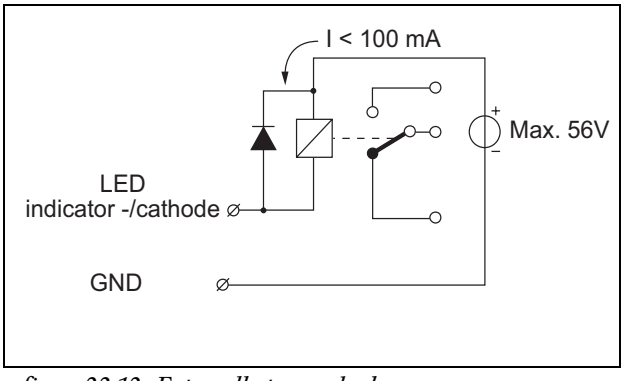


figure 22.12: Externally powered relay

22.2.6 Keypad interface (X1)

Additional keypads or keypad modules can be connected to this call station module via a 16-postion flatcable, connected to X1. This flatcable is supplied with each keypad or keypad module.
Up to 16 keypads and/or keypad modules can be connected in series (loop through). See also section 20.3.

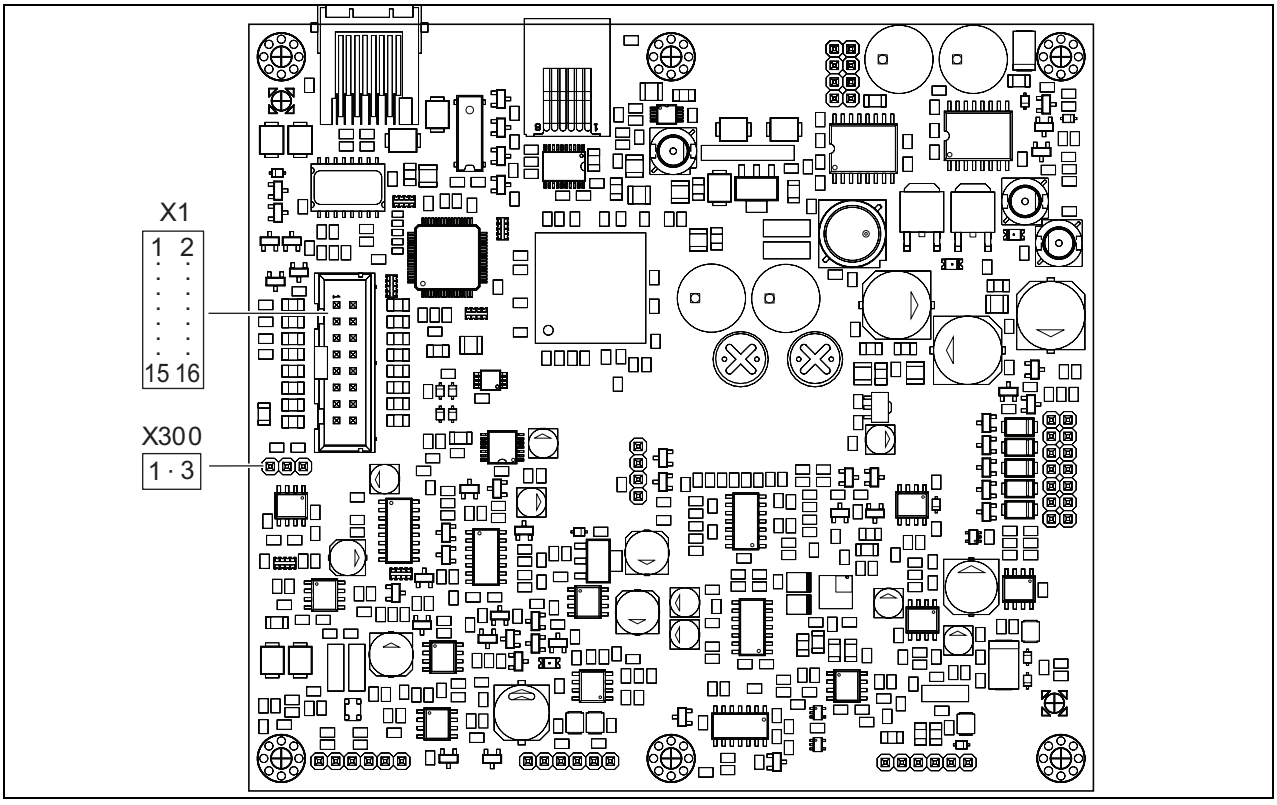


figure 22.13: Component side PCB of the PRS-CSRM

22.3 Installation

The remote call station module is fitted with brackets and screw holes for easy installation. See figure 22.14. Make sure to leave enough space for the cables and the connectors.

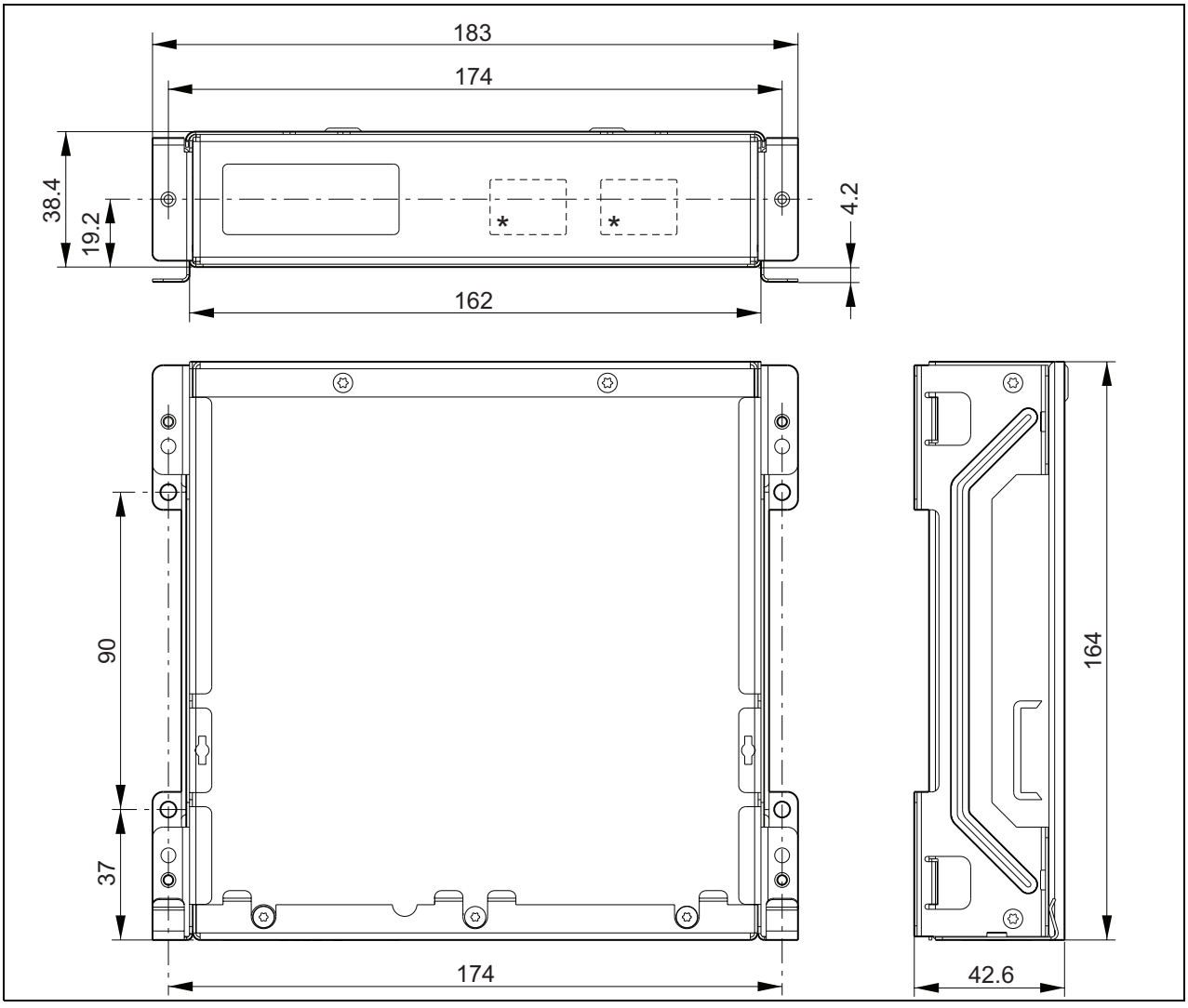


figure 22.14: PRS-CSRM installation dimensions
** the exact layout depends on module type*

22.4 Technical Data

22.4.1 Physical characteristics

Dimensions (H x W x D):
43 x 183 x 164 mm
Weight:
0.8 kg

22.4.2 Climate conditions

Temperature:
-5 to +55 °C (operating, guaranteed)
-15 to +55 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

22.4.3 Electromagnetic compatibility

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

22.4.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
500,000 hours
(based on real warranty return rate data)

22.4.5 Call station interface

Connector:
RJ45
Cable type:
Cat-5 (4x twisted pair, straight)
Maximum cable length:
1000 m
Power supply via network:
18 to 56 V(DC)
No fault reporting when >20V
Network power consumption:
4 W at 48 V (excluding keypads)

22.4.6 Backup power supply

Backup voltage:
18 to 56 V(DC)
No fault reporting when > 20 V
Backup current:
max. 2 A (with maximum number of keypads)

22.4.7 Microphone

Microphone input sensitivity:
-55 dBV (balanced)
Input control range:
-7 to 8 dB
S/N:
min. 60 dB at rated sensitivity
Headroom:
min. 30 dB at rated sensitivity
Bandwidth:
340 to 14000 Hz (-3dB ref. 1 kHz)
Supervision limits:
180 to 14000 Ω (dynamic microphone)
0.2 to 4.8 mA (electret microphone)

22.4.8 Loudspeaker

Impedance:
8 to 32 Ω
Signal/Noise ratio:
typical 80 dB ± 3 dB at max. output
Output power:
typical 100 mW, max. 300 mW

22.4.9 Headset

Mic. input sensitivity:
-44 dBV

Input sensitivity control range:
-7 to 8 dB

Microphone current for headset detection:
> 0.15 mA

Signal/Noise:
60 dB at rated sensitivity (microphone)
80 dB (earphone)

Earphone impedance:
min. 16 Ω (typical 32 W)

Crosstalk (earphone to microphone):
max. -40 dB

Bandwidth:
340 to 14000 Hz (-3dB ref. 1 kHz)

Output power:
0.1 to 30 mW (typical 1 mW)

22.4.10 Controls

Loudspeaker and headset volume

Volume control potentionmeter:
100 kΩ logarithmic (typical)

Control input 1, 2 and PTT input contact

Resistance detection (supervision enabled):

Cable short circuit
< 2.5 kΩ

Contact closed
7.5 kΩ to12 kΩ

Contact open
17.5 kΩ to 22 kΩ

Cable broken
> 27 kΩ

Resistance detection (supervision disabled):

Contact closed
< 12 kΩ

Contact open
> 17.5 kΩ

Control outputs

Output type:
open collector/drain

Internal output supply current:
max. 10 mA (per pin)
max. 30 mA
(in total max. 3 LEDs are simultaneously on)

Output voltage:
max. 56 V (per pin)

Output sink current:
max. 100 mA per output switch pin

22.4.11 Buzzer

Buzzer voltage:
3.3 V

23 PRS-CSI Call Station Interface

23.1 Introduction

The PRS-CSI Call Station Interface is used to connect the PRS-CSR Remote Call Station, the (old) PRS-CSRK Remote Call Station Kit or the PRS-CSRM Remote Call Station Module to the system. See figure 22.1 for a block diagram of the call station interface.

The PRS-CSI Call Station Interface replaces the LBB4437/00 Call Station Interface. You can only use the PRS-CSI in combination with the PRS-CSR(K/M) remote call stations. You cannot use the PRS-CSI in combination with the (old) LBB4438/00 and LBB4439/00 remote call stations.

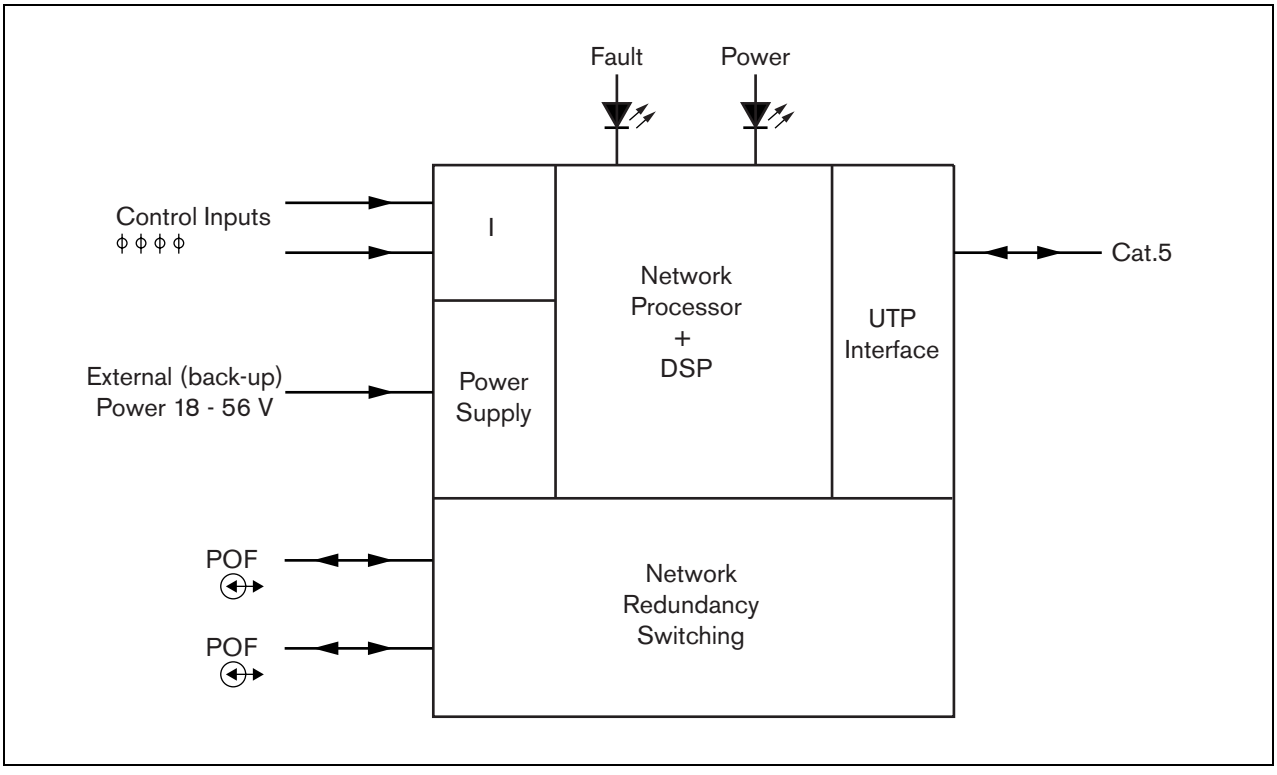


figure 23.1: Block diagram

23.2 Controls, connectors and indicators

23.2.1 Exterior

The exterior of the call station interface (see figure 23.2) contains the following:

1 **System bus** - A system bus connector to connect the call station interface to other Praesideo equipment (see section 23.3.2).
2 **System bus** - A system bus connector to connect the call station interface to other Praesideo equipment (see section 23.3.2).
3 **Lid** - A lid that provides access to the jumpers (see section 23.2.2). The rear side of the lid contains a label with explanation about the internal settings.
4 **Fault LED** - A yellow fault LED that provides information about the status of the call station interface (see section 23.5).
5 **Power LED** - A green power LED that provides information about the status of the call station interface (see section 23.5).
6 **RJ45 connector** - AA connector to connect the call station interface to a PRS-CSR Remote Call Station, (old) PRS-CSRK Remote Call Station Kit or PRS-CSRM Remote Call Station Module.
7 **External power supply** - A connection for an (optional) external power supply (see section 23.3.3).
8 **Service connector** - A connector used for manufacturing. Not for normal use.

Caution
Do not connect the connections 6 and 8 to any Telecom or Ethernet network. These connections are dedicated for PRS-CSR, (old) PRS-CSRK or PRS-CSRM and service equipment.

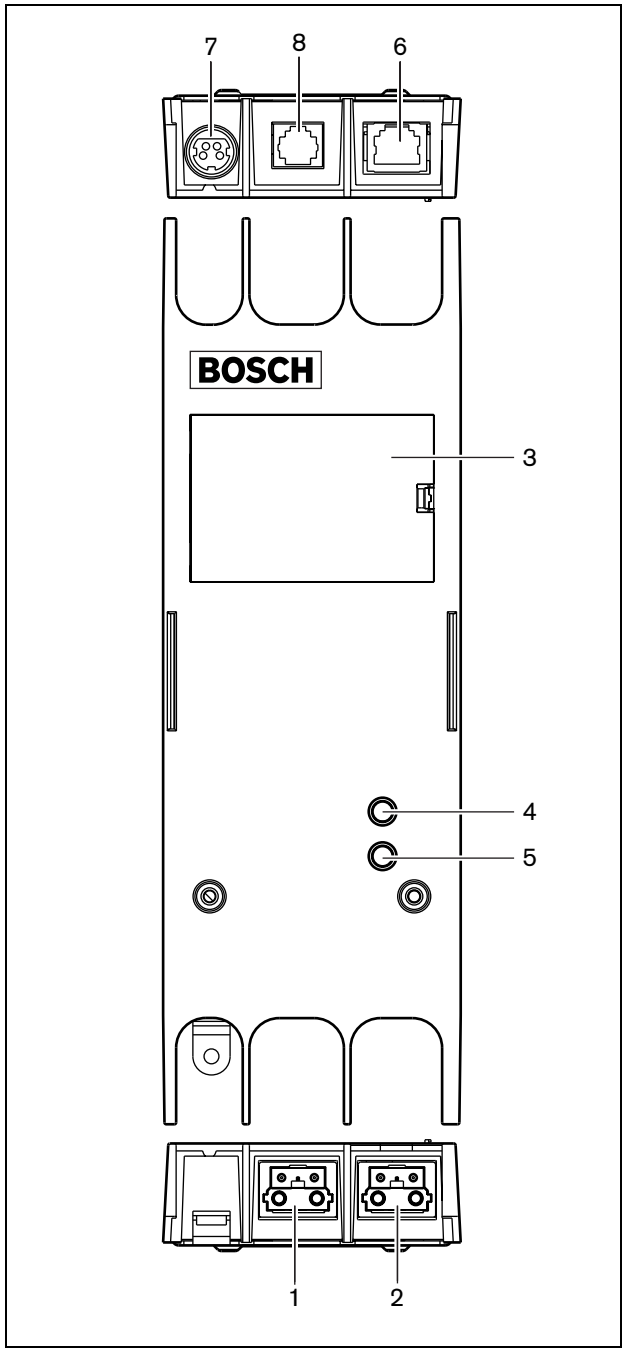


figure 23.2: Exterior

23.2.2 Interior

The interior of the call station interface (see figure 23.3 and figure 23.4) contains:

9 **Power source** - A set of jumpers that specify whether the remote call station is powered via the call station interface or uses its own external power supply. See the label at the rear side of the lid for information about the jumper settings..

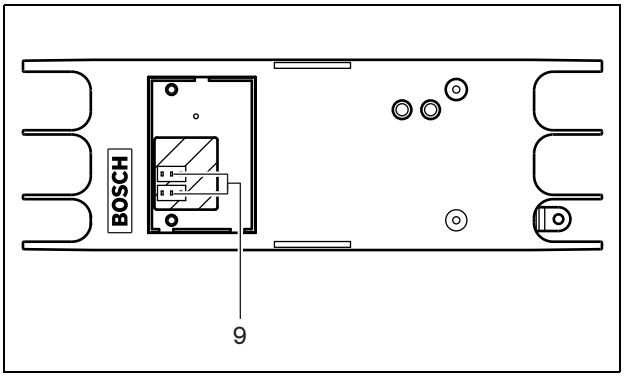


figure 23.3: Interior of the call station interface

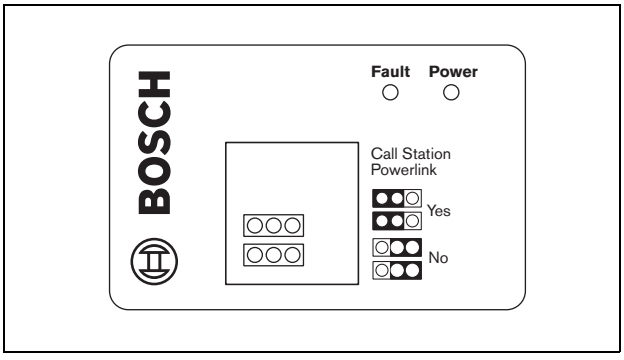


figure 23.4: Jumper identification

Note
Make sure that the jumper settings are compatible with the chosen power concept (refer to section 23.3.3).

table 23.1: Jumper settings

Power supply	Powerlink setting
Concept I	Yes
Concept II	Yes
Concept III	No

23.3 Connections

23.3.1 Introduction

This section gives an overview of typical system connections using the call station interface:

- Connecting the network (see section 23.3.2).
- Connecting the remote call station (see section 23.3.2).
- Connecting an external power supply (see section 23.3.3).

23.3.2 Connecting the network and remote call stations

Use a straight Ethernet CAT-5 cable to connect a remote call station to the call station interface, refer to table 23.2 for the RJ45 pin definitions. For information to connect the call station interface to the remote call station and to the network refer to figure 23.5.

table 23.2 Pin definition of RJ45 interface

Pin	Function	Symbol
1	Power supply	+48 V
2	Ground	0 V
3	Transmit +	SX +
4	Receive +	SR +
5	Receive -	SR -
6	Transmit -	SX -
7	Ground	0 V
8	Power supply	+48 V

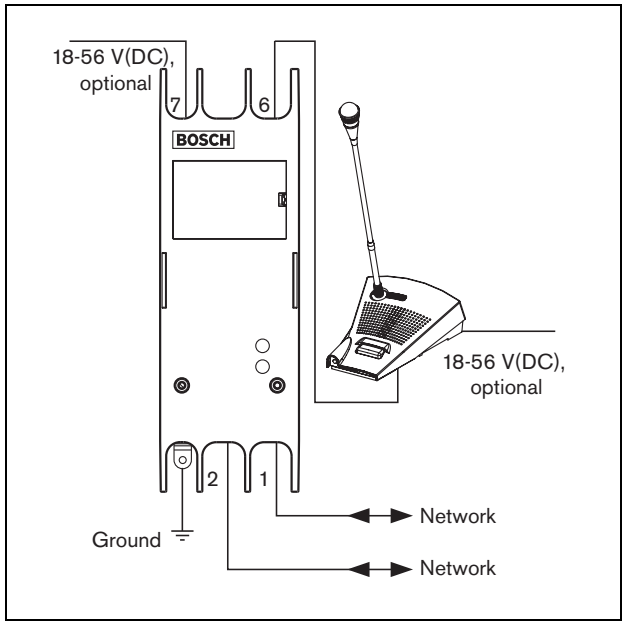


figure 23.5: Connecting the network and call stations

23.3.3 Connecting a power supply

Normally, the call station interface and the remote call station are powered from the Praesideo network. It is also possible to power the remote call station and the call station interface from external power supplies. For example, when:

- The call station interface is connected to a fiber interface without external power supply.
- The cable between the remote call station and call station interface is long and many call station keypads are connected to the remote call station.

The following power concepts are supported:

- **Concept I**
  The call station interface takes the DC power from the Praesideo network to power itself and the connected remote call station. When the voltage on the Praesideo network drops below 18 V(DC), the call station interface and the remote call station take the DC power from the external power supply of the call station interface. The Jumper settings are described in figure 23.4 and table 23.1.
- **Concept II**
  The call station interface takes the DC power from the Praesideo network to power itself and the connected remote call station. When the voltage on the Praesideo network drops below 18 V(DC), the call station interface and the remote call station take the DC power from the external power supply of the remote call station. The external power supply of the remote call station is the back-up power supply for both the remote call station and the call station interface. The Jumper settings are described in figure 23.4 and table 23.1.
- **Concept III**
  The call station interface takes the DC power from the Praesideo network to power itself. When the voltage on the Praesideo network drops below 18 V(DC), the call station interface takes the DC power from its external power supply. In this concept, the remote call station always has its own external power supply. The Jumper settings are described in figure 23.4 and table 23.1.

The remote call station and the call station interface are delivered with a separate Kycon KPPX-4P connector to connect external power supplies.

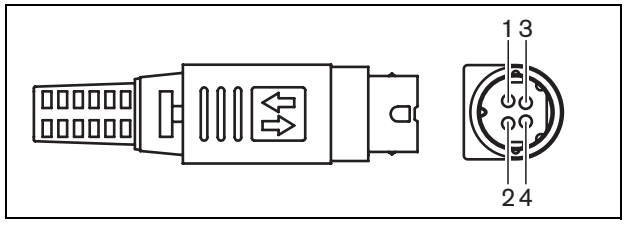


figure 23.6: Connection diagram (external view)

table 23.3: Kycon KPPX-4P connector details

Pin	Signal
1	Ground
2	Power from local power supply (max. 48 V/1.2 A)
3	Input contact 1
4	Input contact 2

Note
The pin numbers are also indicated on the inside of the connector. For detailed connector assembly instructions, see appendix B.

Warning
For safety reasons, you must use a current limited external power supply complying with the 60065 standard for audio/video usage or equivalent, with a maximum output current of 5A, or you must use an external fuse (5A max, slow) in the wiring to the Kycon KPPX-4P connector.

For application in emergency sound systems in Europe, the installer must use a power supply with EN54-4 certification.

Note
The 48 V power supplies from Mean Well, model GS120A48-R7B, GS160A48-R7B and GS220A48-R7B deliver 120 W, 160 W and 220 W respectively and already have a Kycon KPPX-4P connector. These power supplies can be connected directly to the PRS-NSP, PRS-FIN, PRS-CSR or PRS-CSI, but only when the pins 3 and 4 are cut off! Although Mean Well swapped the numbers of pins 1 and 2 in their product datasheet, the voltage polarity of the pins 1 and 2 matches the requirements of the Praesideo units. The installer must cut off pins 3 and 4 of the connector, using a wire cutter with a narrow pointed head. Then the connector does not have to be disassembled to remove the connections to pins 3 and 4; this saves a lot of time. Praesideo uses pin 3 and 4 for different functions and these may not be connected to the power supply, otherwise the Praesideo units may be damaged..

23.3.4 Connecting control inputs

The call station interface has two control inputs (refer to figure 23.6 and table 23.3). The control inputs can receive signals from third party equipment that must trigger actions in the Praesideo system. The control inputs can be configured via the configuration webpage of the remote call station (see section 44.5.4). The maximum length of the connected cables is 3 meter.

It is also possible to supervise the cables fo short-circuits and open connections (see figure 23.7 and figure 23.8). Whether a control input is actually supervised or not is defined in the configuration.

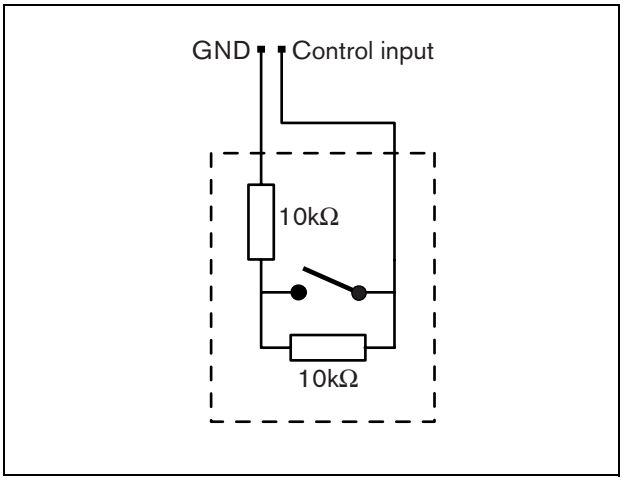


figure 23.7: Supervised control input

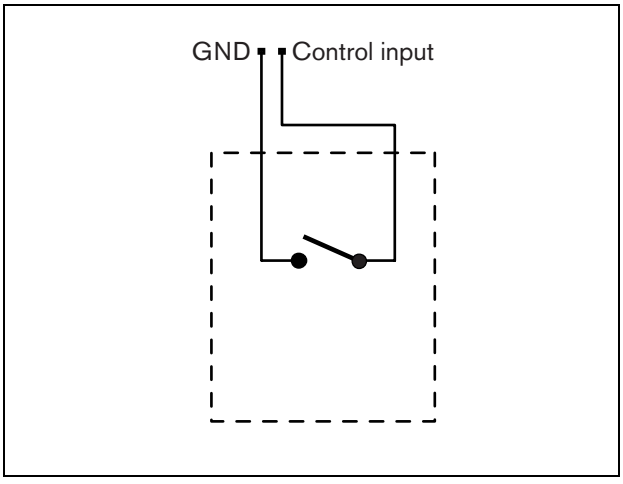


figure 23.8: Non-supervised control input

Warning
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged. Only use voltage-free contacts.

23.3.5 Connecting a ground

To reduce interference from electromagnetic fields and electrostatic discharges, we recommend to connect the housing to ground. Use the ground connector of the call station interface. Refer to figure 23.5.

23.4 Installation

The call station interface can be attached to a wall or any other flat surface using a bracket (see figure 23.9).

The distance (d) between the holes in the bracket is 40 mm.

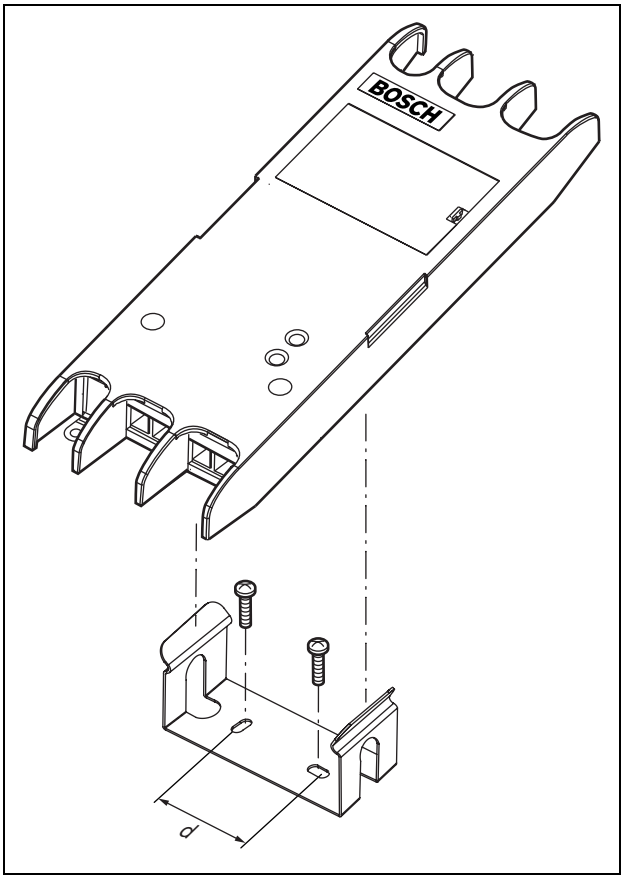


figure 23.9: Installation

Mounting of this bracket and the unit on a drywall sheet construction requires screws with a minimum screw length of 22 mm (7/8") and a minimum diameter of 2.5 mm (3/32"). Mounting was evaluated for use on a drywall surface only.

23.5 Operation

table 23.4: Status LED indications

Yellow (Fault)	Green (Power)	Status
Off	Off	No power
Flash	Off	No connection to remote call station or fault in the connection to remote call station.
On	Off	No network or network fault
Off	On	Functioning correctly

23.6 Technical data

23.6.1 Physical characteristics

Dimensions (H x W x D):
27 x 243 x 80 mm
Weight:
0.7 kg

23.6.2 Climate conditions

Temperature:
-5 to 55 °C (operating, guaranteed)
-15 to 55 °C (operating, sample tested)
-20 to 70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

23.6.3 Electromagnetic compatibility

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

23.6.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
1,500,000 hours
(based on real warranty return rate data)

23.6.5 System bus

Number of connections:
2x proprietary female connectors
Position:
Front side
Preferred cable:
LBB4416/xx
Maximum cable length:
50 m (per system bus connector)
Data signal interface:
Plastic optical fiber
Power supply via network:
18 to 56 V(DC)
No fault reporting when >20V
Network power consumption:
3.7 W at 48 V (excluding keypads)

23.6.6 External power supply

Connector:
Kycon KPPX-4P
Input voltage range:
18 to 56V (DC)
No fault reporting when >20V
Power consumption:
3.7 W at 48 V (excluding keypads)

23.6.7 Call station interface

Connector:
RJ45
Cable type:
Cat-5 (4x twisted pair, straight)
Maximum cable length:
1000 m

24 PRS-CRF Call Stacker

24.1 Introduction

The Call Stacker is a small unit that records specific calls that cannot be send to all required zones because some are occupied by a higher priority call. The unit can store up to 16 calls in high-quality format with a maximum of three minutes for each call, including chimes and pre-recorded messages. Playback of a call can start while it is still being recorded. The unit can record and/or playback up to eight calls simultaneously.

More units can be added to a system in order to increase the number of recordable calls. Units can be connected to the Praesideo network at any place.

The call stacker can also be used as time shifter to avoid acoustic feedback from a loudspeaker to the active microphone. The call is recorded and broadcast after the recording has finished. The call can be pre-monitored before broadcast with the option to cancel the call. Time shifting and call stacking can be combined.

Logging of the call and all its playbacks is supported, but the recorded calls do not survive a power down and are not supervised, so the call stacker function should not be relied upon for emergency calls.

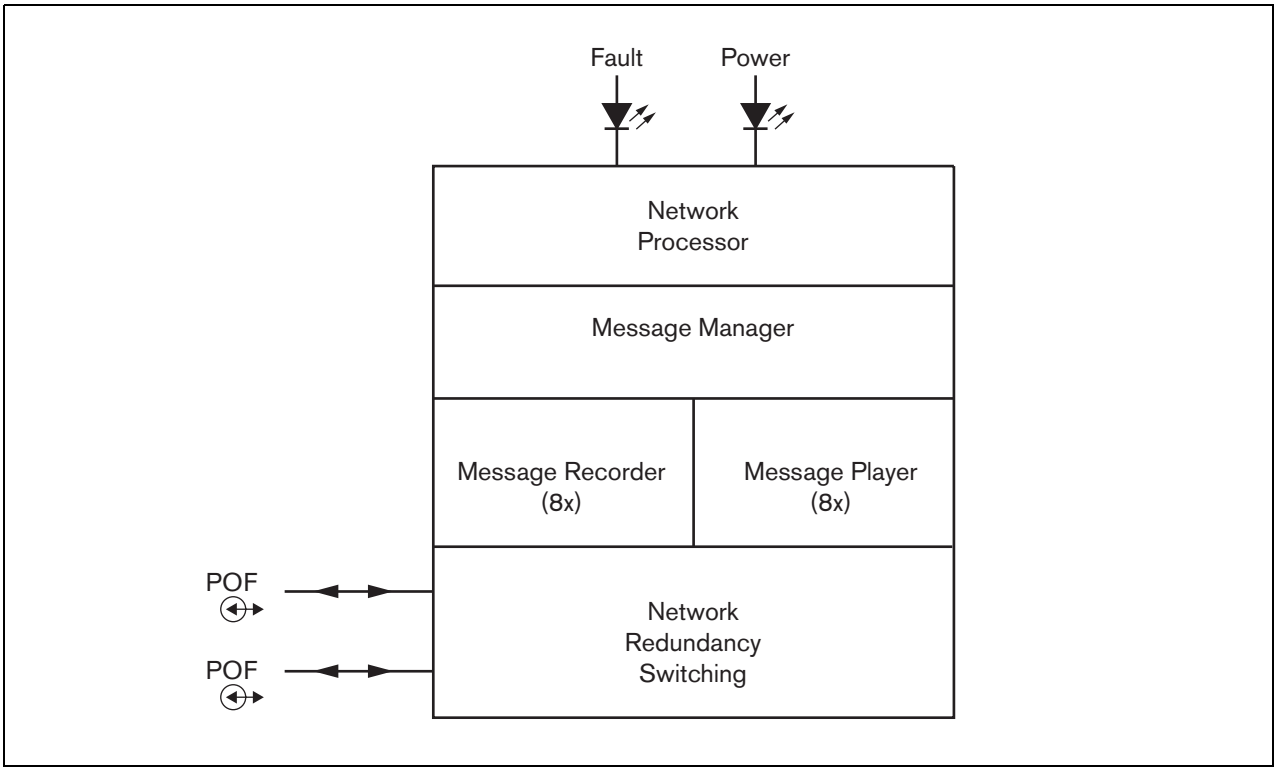


figure 24.1: Block diagram

24.2 Controls and indicators

The call stacker (see figure 24.2) contains the following:

1 **Fault LED** - A yellow fault LED that provides information about the status of the call stacker (see section 24.5).

2 **Power LED** - A green power LED that provides information about the status of the call stacker (see section 24.5).

3 **System bus** - Two system bus connectors to connect the call stacker to other Praesideo equipment (see section 24.3.1).

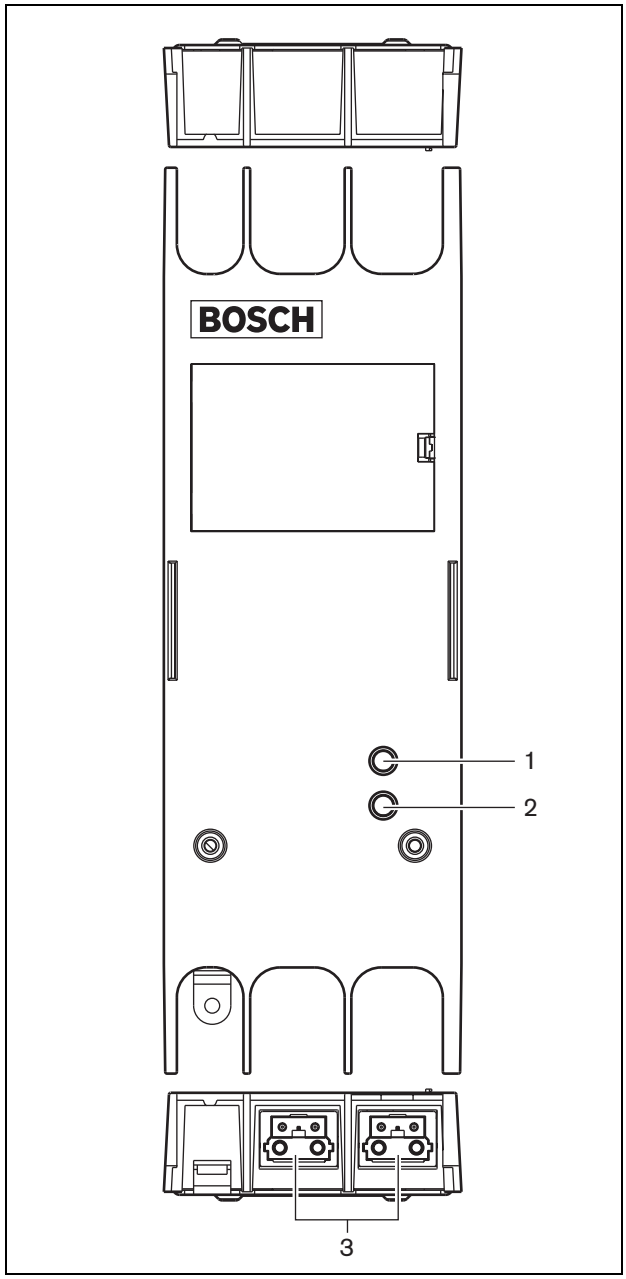


figure 24.2: Exterior

24.3 Connections

24.3.1 Connecting the network

Connect the call stacker to the Praesideo system using the system bus connectors and LBB4416 network cables. Both connectors are interchangeable.

24.4 Installation

The call stacker can be attached to a wall or any other flat surface using a bracket (seefigure 23.3). The distance (d) between the holes in the bracket is 40 mm.

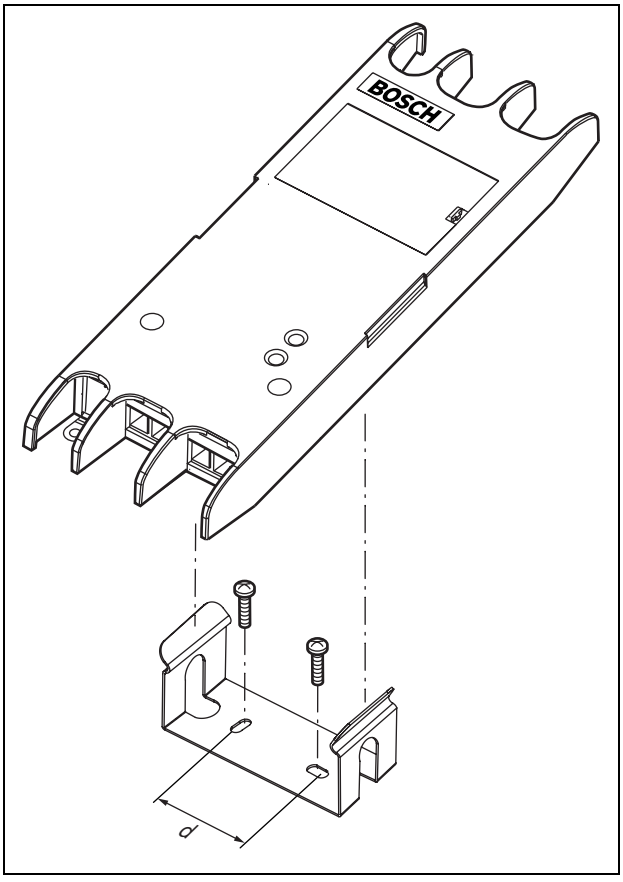


figure 24.3: Installation

Mounting of this bracket and the unit on a drywall sheet construction requires screws with a minimum screw length of 22 mm (7/8") and a minimum diameter of 2.5 mm (3/32"). Mounting was evaluated for use on a drywall surface only.

24.5 Operation

table 24.1: Status LED indications

Yellow (Fault)	Green (Power)	Status
Off	Off	No power
On	On	No network or network fault
Off	On	Functioning correctly

24.6 Technical data

24.6.1 Physical characteristics

Dimensions (H x W x D):
27 x 243 x 80 mm (without bracket)
34 x 243 x 84 mm (with bracket)
Weight:
0.7 kg

24.6.2 Climate conditions

Temperature:
-5 to +55 °C (operating, guaranteed)
-15 to 55 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

24.6.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

24.6.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
3,000,000 hours
(based on real warranty return rate data)

24.6.5 System bus

Number of connections:
2x proprietary female connectors
Position:
Front side
Preferred cable:
LBB4416/xx
Maximum cable length:
50 m
Power supply via network:
18 to 56 V(DC)
No fault reporting when >20V
Network power consumption:
4.2 W

24.6.6 Audio

Bandwidth:
20 Hz to 20 kHz (- 3 dB)
Data compression:
4:1 (subband coding)
Signal/Noise ratio:
> 85 dB
Crosstalk:
< -85 dB

25 LBB4436/00 Key Covers

The LBB4436/00 Key Covers are used to protect keys from LBB4432/00 Call Station Keypads from being pushed by accident (e.g. alarm or emergency keys). A set of LBB4436/00 Key Covers consists of 10 key covers and 10 replacement lenses.

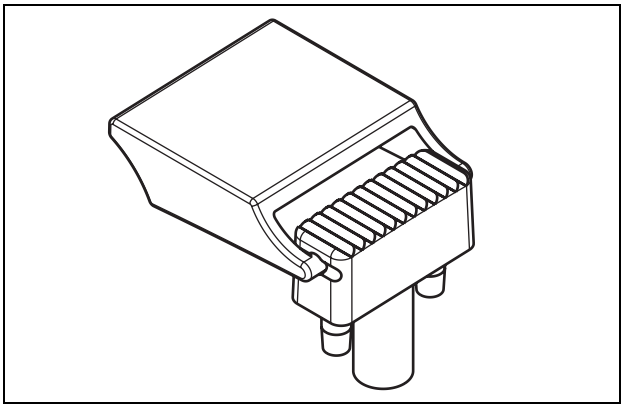


figure 25.1: Key cover

To install an LBB4436/00 Key Cover on a LBB4432/00 Call Station Keypad key:

1 Snap the key cover in the replacement lens (see figure 25.1 for the end result).
2 Remove the original lens from the LBB4432/00 Call Station Keypad using a pair of pliers.
3 Snap the key cover and replacement lens assembly in the LBB4432/00 Call Station Keypad.
4 Optionally, use cyano acrylate glue to fix the LBB4436/00 Key Cover permanently to the LBB4432/00 Call Station Keypad.

26 PRS-NSP Network Splitter

26.1 Introduction

The PRS-NSP Network Splitter is used to create short-circuit proof tap-off points in the network. A network may contain up to 10 network splitters.

This unit in metal housing is the successor of the LBB4410/00 in plastic housing.

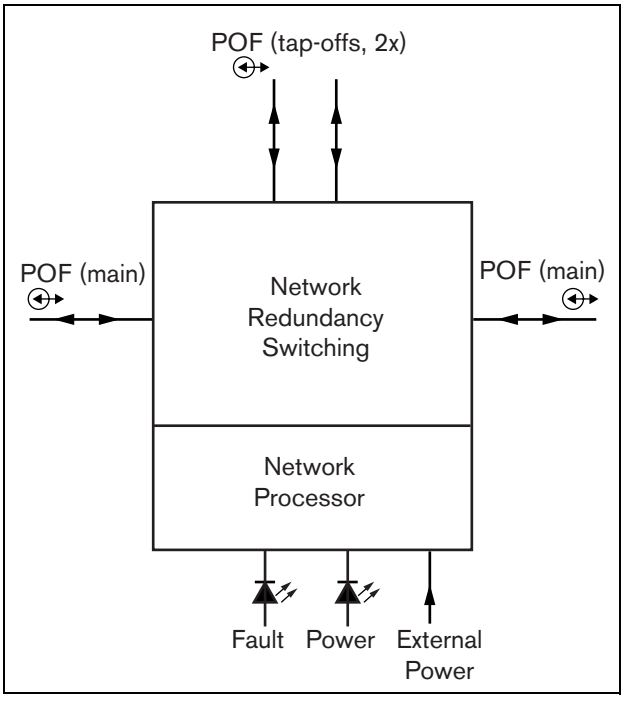


figure 26.1: Block diagram of the network splitter

Note
It is not allowed to connect more than two other network splitters to a tap-off of a network splitter that is located in the main loop of the network.

26.2 Controls and connectors

26.2.1 Exterior

The exterior of the network splitter (see figure 26.2) contains the following:

1 **External power supply** - A connection for an (optional) external power supply. The external power supply only feeds the tap-offs (see section 26.3.3).
2 **Tap-off 1** - A system bus connector for creating a tap-off. The tap-off is protected against short-circuits and has a maximum load of 2.5 A (see sections 26.2.2 and 26.3.2).
3 **System bus** - A system bus connector for looping through the main branch (see section 26.3.2).
4 **Lid** - A lid that provides access to the jumpers (see section 26.2.2). The rear side of the lid contains a label with explanation about the internal settings.
5 **Fault LED** - A yellow fault LED that provides information about the status of the network splitter (see section 26.5).
6 **Power LED** - A green power LED that provides information about the status of the network splitter (see section 26.5).
7 **Tap-off 2** - A system bus connector for creating a tap-off. The tap-off is protected against short-circuits and has a maximum load of 2.5 A (see sections 26.2.2 and 26.3.2).
8 **System bus** - A system bus connector for looping through the main branch (see section 26.3.2).

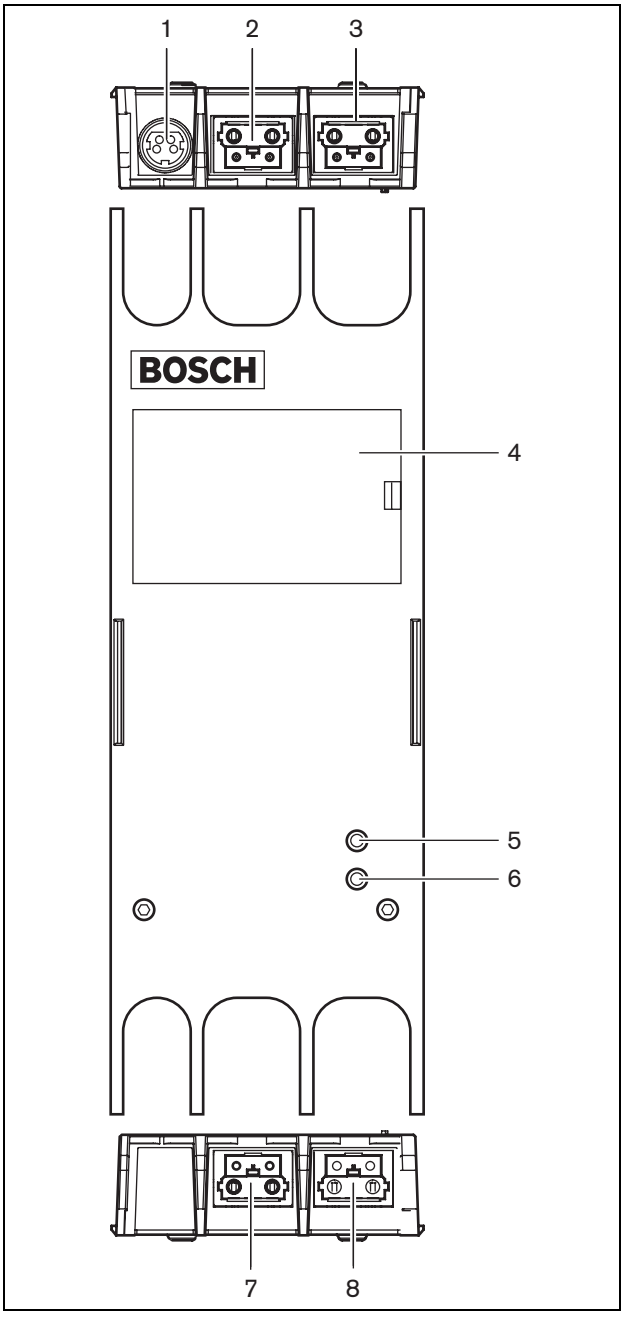


figure 26.2: Exterior of the network splitter

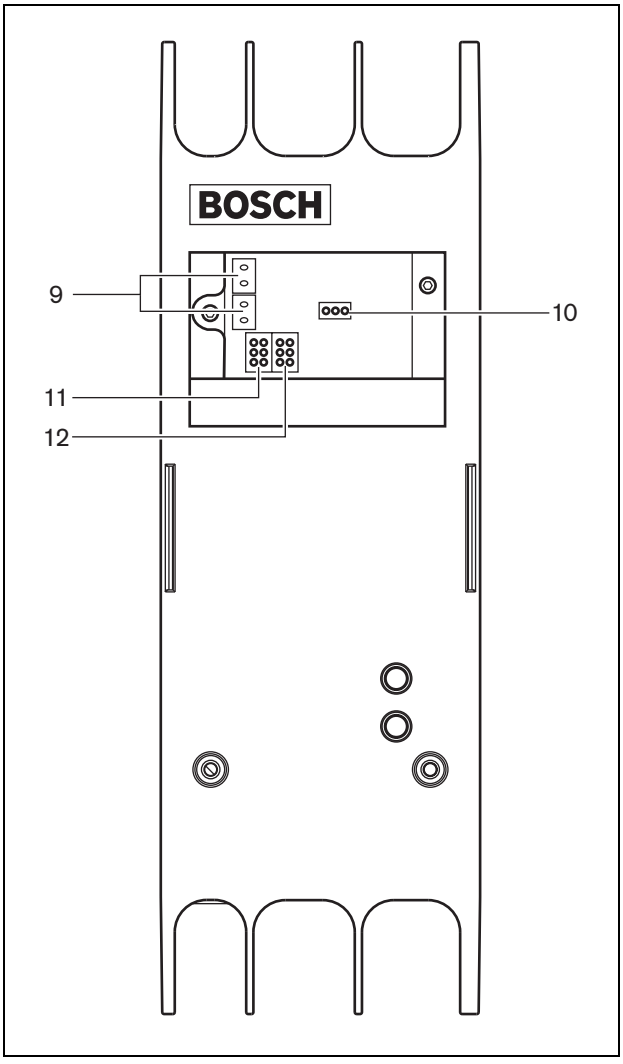


figure 26.3: Interior of the network splitter

26.2.2 Interior

The interior of the network splitter (see figure 26.3 and figure 26.4) contains the following:

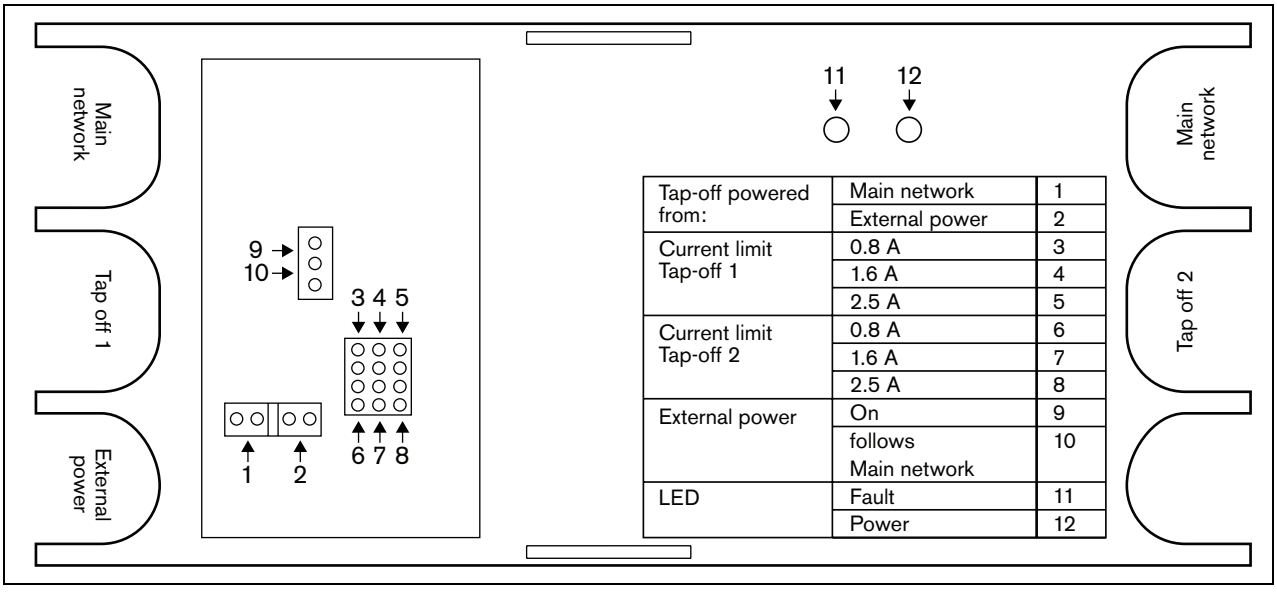
Note
The numbering in figure 26.4 differs from the numbering in figure 26.2 and figure 26.3.

9 **Tap-off power source** - A jumper that specifies whether the tap-offs are powered from the main network branch or use an external power supply connected to the network splitter. See the label at the rear side of the lid for information about the jumper settings.

10 **External power** - On. (Use this setting for Praesideo.)

11 **Tap-off 2 limiter** - A jumper that limits the current for tap-off 2. If the tap-off asks for more current than allowed, the tap-off is shut down. See the label at the rear side of the lid for information about the jumper settings.

12 **Tap-off 1 limiter** - A jumper that limits the current for tap-off 1. If the tap-off asks for more current than allowed, the tap-off is shut down. See the label at the rear side of the lid for information about the jumper settings.



Tap-off powered from:	Main network	1
	External power	2
Current limit Tap-off 1	0.8 A	3
	1.6 A	4
	2.5 A	5
Current limit Tap-off 2	0.8 A	6
	1.6 A	7
	2.5 A	8
External power	On	9
	follows Main network	10
LED	Fault	11
	Power	12

figure 26.4: Jumper identification

26.3 Connections

26.3.1 Introduction

This section gives an overview of typical system connections using the network splitter:

- Looping through the main branch (see section 26.3.2).
- Creating tap-offs (see section 26.3.2).
- Connecting an external power supply (see section 26.3.3).

26.3.2 Connecting the main branch and creating tap-offs

See figure 26.5 for information about connecting the main network and the tap-offs to the network splitter.

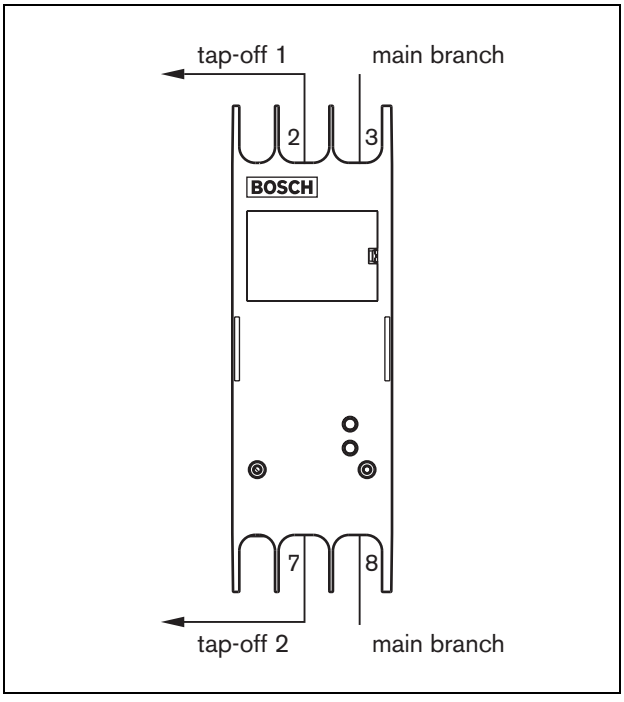


figure 26.5: Connecting the network splitter

26.3.3 Connecting a power supply

This unit is powered by the network controller, via the Praesideo system bus. But the network splitter is delivered with a separate Kycon KPPX-4P connector to connect an external power supply to the network splitter.

Note
The external power supply can only feed the tap-offs and not the main network branch. Whether it really does depends on the jumper settings inside the network splitter.

The Kycon KPPX-4P connector has four pins (see figure 26.6):

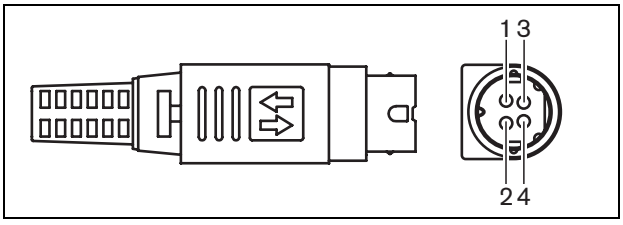


figure 26.6: Connection diagram (external view)

table 26.1: Kycon KPPX-4P connector details

Pin	Signal
1	Ground
2	Power from external power supply to the PRS-NSP (max. 48 V / 5 A)
3	Output power from the system bus (max. 48V / 2 A)
4	Not connected

Note
The pin numbers are also indicated on the inside of the connector.
For detailed connector assembly instructions, see appendix B.

Warning
For safety reasons, you must use a current limited external power supply complying with the 60065 standard for audio/video usage or equivalent, with a maximum output current of 5A, or you must use an external fuse (5A max, slow) in the wiring to the Kycon KPPX-4P connector.

For application in emergency sound systems in Europe, the installer must use a power supply with EN54-4 certification.

Note
The 48 V power supplies from Mean Well, model GS120A48-R7B, GS160A48-R7B and GS220A48-R7B deliver 120 W, 160 W and 220 W respectively and already have a Kycon KPPX-4P connector. These power supplies can be connected directly to the PRS-NSP, PRS-FIN, PRS-CSR or PRS-CSI, but only when the pins 3 and 4 are cut off! Although Mean Well swapped the numbers of pins 1 and 2 in their product datasheet, the voltage polarity of the pins 1 and 2 matches the requirements of the Praesideo units. The installer must cut off pins 3 and 4 of the connector, using a wire cutter with a narrow pointed head. Then the connector does not have to be disassembled to remove the connections to pins 3 and 4; this saves a lot of time. Praesideo uses pin 3 and 4 for different functions and these may not be connected to the power supply, otherwise the Praesideo units may be damaged..

26.4 Installation

The network splitter can be attached to a wall or any other flat surface using a bracket (see figure 26.7). The distance (d) between the holes in the bracket is 40 mm.

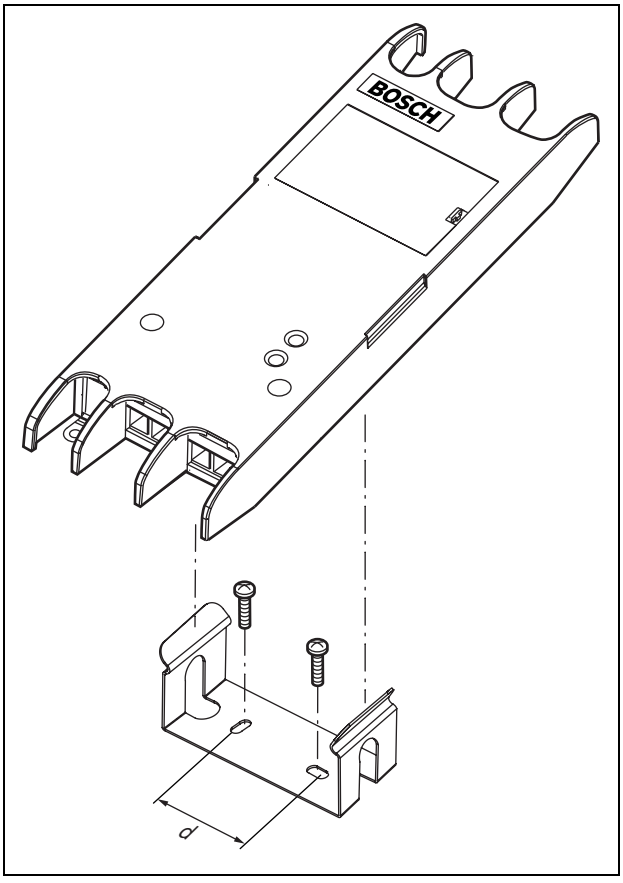


figure 26.7: Installation

Mounting of this bracket and the unit on a drywall sheet construction requires screws with a minimum screw length of 22 mm (7/8") and a minimum diameter of 2.5 mm (3/32"). Mounting was evaluated for use on a drywall surface only.

26.5 Operation

table 26.2: Status LED indications

Yellow (Fault)	Green (Power)	Status
Off	Off	No power
On	Off	No network or network fault
Off	On	Functioning correctly

26.6 Technical data

26.6.1 Physical characteristics

Dimensions (H x W x D):
27 x 243 x 80 mm (without bracket)
34 x 243 x 84 mm (with bracket)
Weight:
0.7 kg

26.6.2 Climate conditions

Temperature:
-5 to 55 °C (operating, guaranteed)
-15 to 55 °C (operating, sample tested)
-20 to 70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

26.6.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

26.6.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
3,000,000 hours
(based on real warranty return rate data)

26.6.5 System bus

Number of connections:
4x proprietary female connectors
Position:
Front and rear sides
Preferred cable:
LBB4416/xx
Maximum cable length:
50 m (per system bus connector)
Data signal interface:
Plastic optical fiber
Power supply via network:
18 to 56 V(DC)
No fault reporting when >20V
Network power consumption:
3.9 W

26.6.6 External power supply

Connector:
Kycon KPPX-4P
Input voltage:
48 V(DC)
Input voltage range:
18 to 56V (DC)
No fault reporting when >20V
Current:
5 A (peak, < 2 s)
2.5 A continuous

27 PRS-FIN, PRS-FINNA, PRS-FINS Fiber Interface

27.1 Introduction

The PRS-FIN, PRS-FINNA or PRS-FINS Fiber Interfaces are used to convert from plastic optical fiber (POF) cable to glass optical fiber (GOF) cable and vice versa for covering long distances. The following types are available:

Type	Description
PRS-FIN	Fiber Interface with control inputs (multi mode)
PRS-FINNA	Fiber Interface without control inputs (multi mode)
PRS-FINS	Fiber Interface with control inputs (single mode)

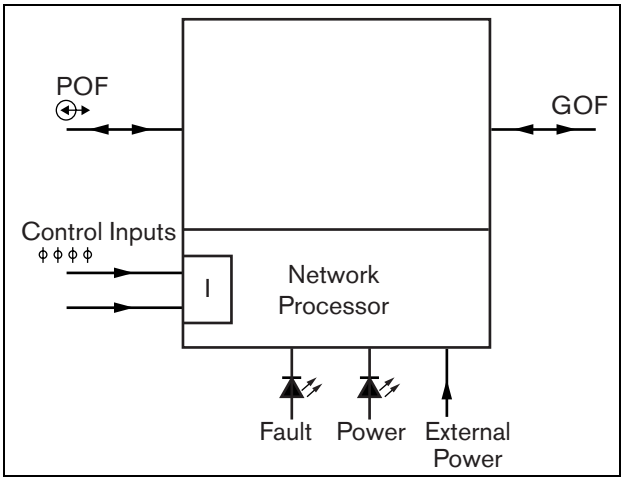


figure 27.1: Block diagram of the fiber interface

The PRS-FINNA Fiber Interface only converts from POF to GOF. It does not count as a node in the system (see table 32.2) with respect to the maximum number of nodes, 63, that can be in a system. It is intended for systems in which otherwise the maximum number of nodes would be exceeded. However, this unit does influence the maximum cable length of the system as if it was a normal node (see figure 32.5).

In emergency sound systems, do not use this type of fiber interface to power far-end units. Since it does not have any control inputs, it is not possible to supervise its external power supply (if connected). Using the PRS-FINNA Fiber Interface as a near-end fiber interface that is connected to the network controller is possible though.

These units in metal housing are the successors of the LBB4414/00, LBB4414/10 and PRS-FINMO in plastic housing.

27.2 Controls, connectors and indicators

The fiber interface (see figure 27.2) contains the following:

1 **External power supply** - A connection for an (optional) external power supply. The external power supply feeds the Praesideo network (see section 27.3.3).
2 **Control inputs** - The control inputs can be used to receive signals from third party equipment that must trigger actions in the Praesideo network (see section 27.3.4).
3 **POF connector** - A POF connector to connect the fiber interface to a POF cable (see section 27.3.2).
4 **Power LED** - A green power LED that provides information about the status of the fiber interface. (see section 27.3.5).
5 **Fault LED** - A yellow fault LED that provides information about the status of the fiber interface (see section 27.3.5).
6 **GOF connector** - A GOF connector to connect the fiber interface a GOF cable (see section 27.3.2).

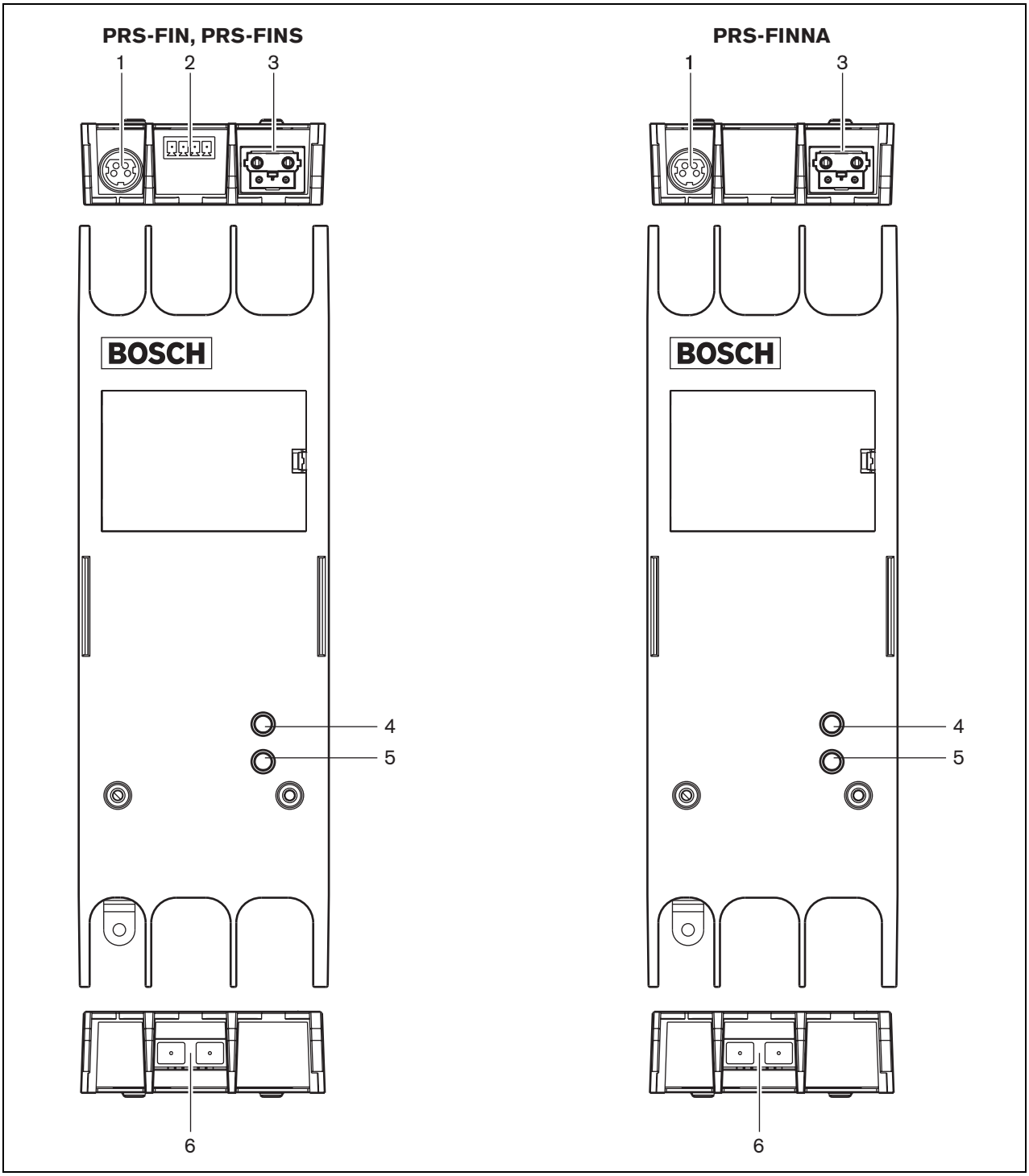


figure 27.2: Exterior of the fiber interface

27.3 Connections

27.3.1 Introduction

This section gives an overview of typical system connections using the fiber interface:

- Connecting the POF cable (see section 27.3.2).
- Connecting the GOF cable (see section 27.3.2).
- Connecting an external power supply (see section 27.3.3).

27.3.2 Connecting POF and GOF cables

Fiber interfaces convert from POF to GOF to connect two pieces of equipment that are more than 50 m apart. Usually, they are used in pairs. The first converts from POF to GOF, whereas the second converts from GOF back to POF (see figure 27.3).

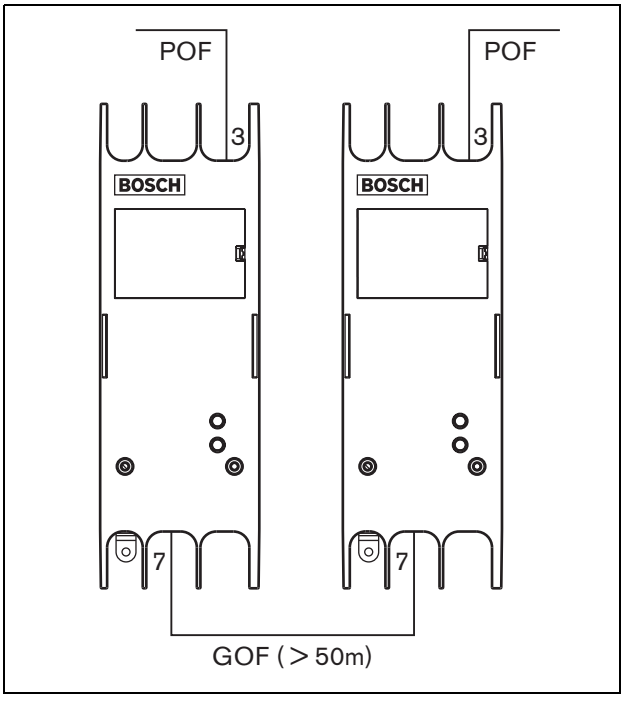


figure 27.3: Connecting the fiber interface

The GOF connector (see figure 27.4) is an SC connector, which uses invisible infra-red light (1300 nm).

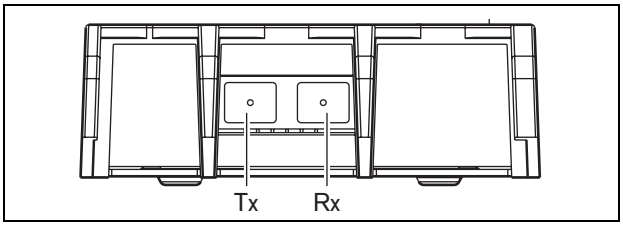


figure 27.4: GOF connector

table 27.1: GOF connector pins

Pin	Description
Tx	Transmitter
Rx	Receiver

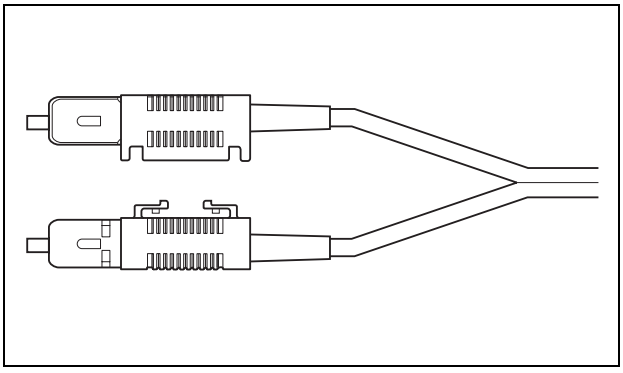


figure 27.5: SC connector

27.3.3 Connecting a power supply

This unit is powered by the network controller, via the Praesideo system bus. But the fiber interface is delivered with a separate Kycon KPPX-4P connector to connect an external power supply to the fiber interface. The Kycon KPPX-4P connector has four pins (see figure 27.6):

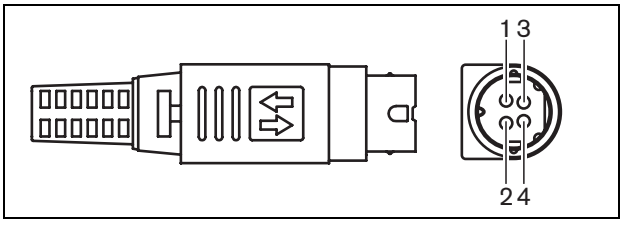


figure 27.6: Connection diagram (external view)

table 27.2: Kycon KPPX-4P connector details

Pin	Signal
1	Ground
2	Power from external power supply to the PRS-FINxx (max. 48 V / 5 A)
3	Output power from the system bus (max. 48V / 2 A)
4	Not connected

Note
The pin numbers are also indicated on the inside of the connector.
For detailed connector assembly instructions, see appendix B

Warning
For safety reasons, you must use a current limited external power supply complying with the 60065 standard for audio/video usage or equivalent, with a maximum output current of 5A, or you must use an external fuse (5A max, slow) in the wiring to the Kycon KPPX-4P connector.

For application in emergency sound systems in Europe, the installer must use a power supply with EN54-4 certification.

Note
The 48 V power supplies from Mean Well, model GS120A48-R7B, GS160A48-R7B and GS220A48-R7B deliver 120 W, 160 W and 220 W respectively and already have a Kycon KPPX-4P connector. These power supplies can be connected directly to the PRS-NSP, PRS-FIN, PRS-CSR or PRS-CSI, but only when the pins 3 and 4 are cut off! Although Mean Well swapped the numbers of pins 1 and 2 in their product datasheet, the voltage polarity of the pins 1 and 2 matches the requirements of the Praesideo units. The installer must cut off pins 3 and 4 of the connector, using a wire cutter with a narrow pointed head. Then the connector does not have to be disassembled to remove the connections to pins 3 and 4; this saves a lot of time. Praesideo uses pin 3 and 4 for different functions and these may not be connected to the power supply, otherwise the Praesideo units may be damaged..

27.3.4 Connecting control inputs

The fiber interface has two control inputs (see figure 27.7). The control inputs can be used to receive signals from third party equipment that must trigger actions within the Praesideo system. The control inputs can be configured to act on contact make or on contact break (see section 44.8).

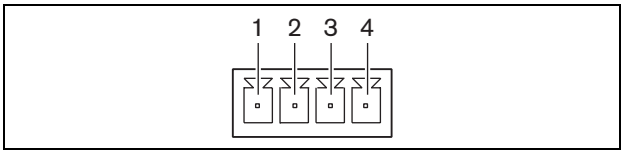


figure 27.7: Control inputs connector

table 27.3: Control inputs connector details

Pin	Signal
1	Input Contact 1
2	Input Contact 1, ground
3	Input Contact 2
4	Input Contact 2, ground

table 27.4: Control inputs technical data

Control input 1 and control input 2
Resistance detection (supervision enabled):
Cable short circuit
< 2.5 kΩ
Contact closed
7.5 kΩ to12 kΩ
Contact open
17.5 kΩ to 22 kΩ
Cable broken
> 27 kΩ
Resistance detection (supervision disabled):
Contact closed
< 12 kΩ
Contact open
> 17.5 kΩ

It is also possible to have the cables supervised for short-circuits and open connections (see figure 27.8 and figure 27.9). Whether a control input is actually supervised or not is defined in the configuration.

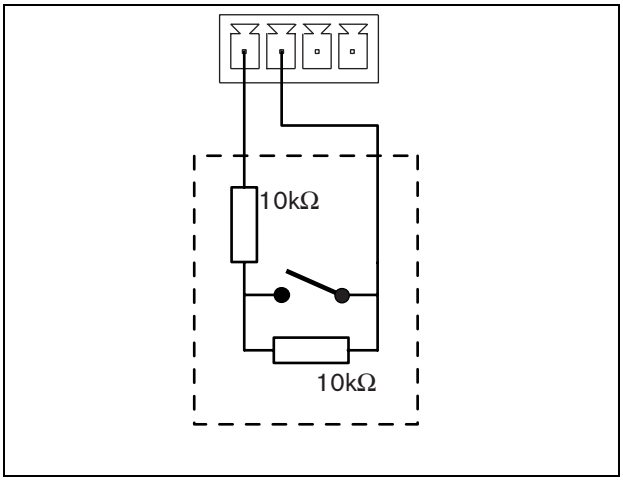


figure 27.8: Supervised control input

Caution
Do not connect DC or AC signals to the control inputs, otherwise the input circuit may be damaged.

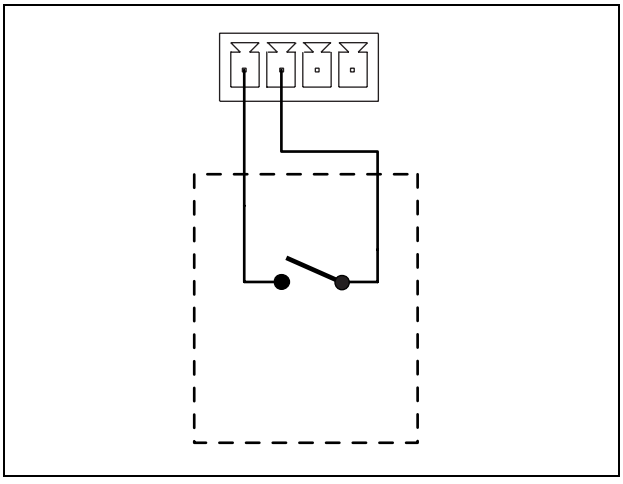


figure 27.9: Non-supervised control input

27.3.5 Operation

The two LEDs on the fiber interface provide information about the status of the fiber interface.

table 27.5: Status LED indications

Yellow (Fault)	Green (Power)	Status
Off	Off	Off; no external power available.
On	Off	Stand-by; external power to POF switched off.
On	On	Operating; external power to POF switched on.
Off	On	Operating; no external power available, but powered from the POF side.
Off	Blink	Fault, no external power available and no protocol received.
On	Blink	Fault, external power available, but no protocol received.

Note
The PRS-FINNA cannot detect if the correct protocol is received. Therefore, its green LED does not show the fault status of table 27.5.

27.4 Installation

The fiber interface can be attached to a wall or any other flat surface using a bracket (see figure 27.10). The distance between the holes in the bracket is 40 mm.

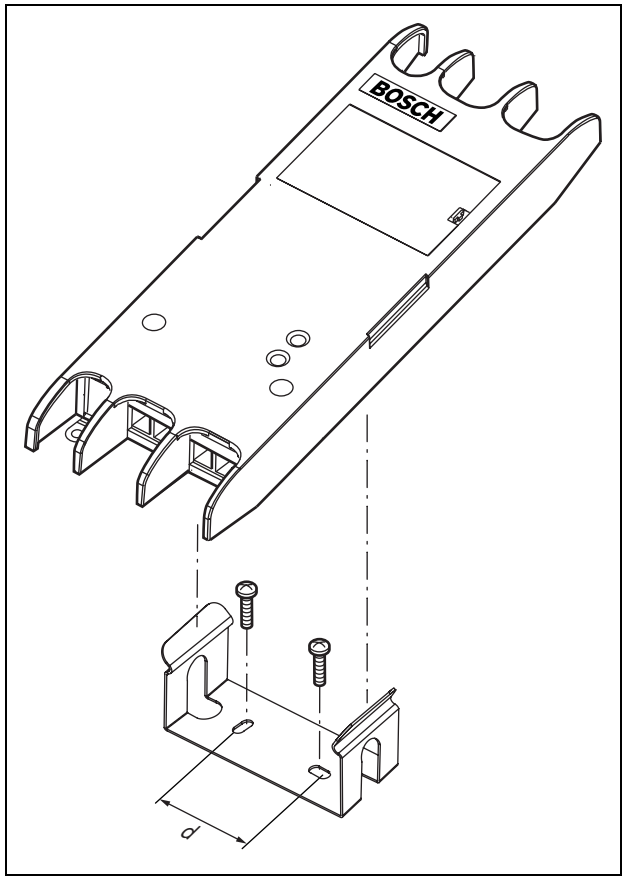


figure 27.10: Installation

Mounting of this bracket and the unit on a drywall sheet construction requires screws with a minimum screw length of 22 mm (7/8") and a minimum diameter of 2.5 mm (3/32"). Mounting was evaluated for use on a drywall surface only.

27.5 Technical data

27.5.1 Physical characteristics

Dimensions (H x W x D):
27 x 243 x 80 mm (without bracket)
34 x 243 x 84 mm (with bracket)
Weight:
0.7 kg

27.5.2 Climate conditions

Temperature:
-5 to +55 °C (operating, guaranteed)
-15 to 55 °C (operating, sample tested)
-20 to +70 °C (non-operating)
Relative humidity:
15 to 90%, non-condensing (operating)
5 to 95%, non-condensing (non-operating)
Air pressure:
600 to 1100 hPa

27.5.3 EMC and Safety

Electromagnetic compatibility:
EN55103-1/FCC-47 part 15B
EN55103-2
EN50121-4
EN50130-4
Electrical safety:
IEC60065 (CB-scheme)
EN60065
Approvals:
CE marking
EN54-16 and ISO7240-16
EN/IEC60945 except salt mist test

27.5.4 Mean time between failures

Expected lifetime:
50,000 hours at +55 °C
MTBF:
1,500,000 hours
(based on real warranty return rate data)

27.5.5 System bus

Number of connections:
1x proprietary female connector (POF)
1x industry standard SC connector (GOF)
Position:
Front and rear sides
Preferred cable:
LBB4416/xx (POF)
Maximum cable length:
50 m (POF)
Power supply via network:
18 to 56 V(DC)
No fault reporting when >20V
Network power consumption:
4.6 W

27.5.6 External power supply

Connector:
Kycon KPPX-4P
Input voltage:
48 V(DC)
Input voltage range:
18 to 56V (DC)
No fault reporting when >20V
Current:
5 A (peak, < 2 s)
2.5 A continuous

27.5.7 GOF connector

Connector:
SC
Interface:
PRS-FIN(NA): Avago AFBR-5803Z transceiver
PRS-FINS: Avago AFCT-5805BZ transceiver
Wavelength:
1300 nm
Preferred cable:
PRS-FIN(NA):
62.5/125 µm and 50/125 µm multimode GOF
PRS-FINS:
9/125 µm monomode GOF

28 LBB4416/xx Network Cables

28.1 Introduction

All LBB4416/xx Network Cables contain two plastic optical fibers for data communication and two copper cores for the power supply. All cables (except for the LBB4416/00) are supplied with the network connectors fitted.

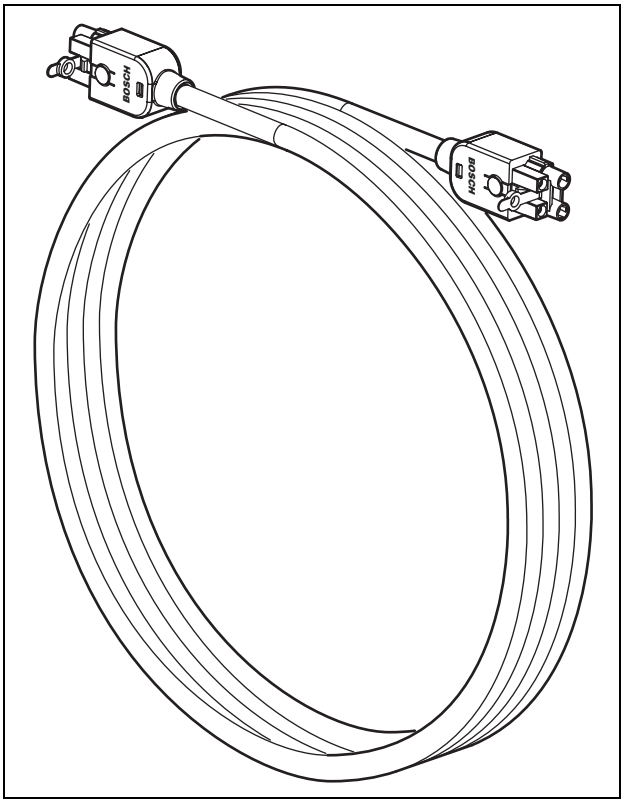


figure 28.1: Network cable

table 5.1: Network cables

Type number	Cable length
LBB4416/00	100 m
LBB4416/01	0.5 m
LBB4416/02	2 m
LBB4416/05	5 m
LBB4416/10	10 m
LBB4416/20	20 m
LBB4416/50	50 m

To connect extension cables to each other, cable couplers (LBB4419/00) can be used.

28.2 Connectors

Except for LBB4416/00, all cables are terminated with male, proprietary connectors on both ends of the cable. See figure 28.3 for connector details.

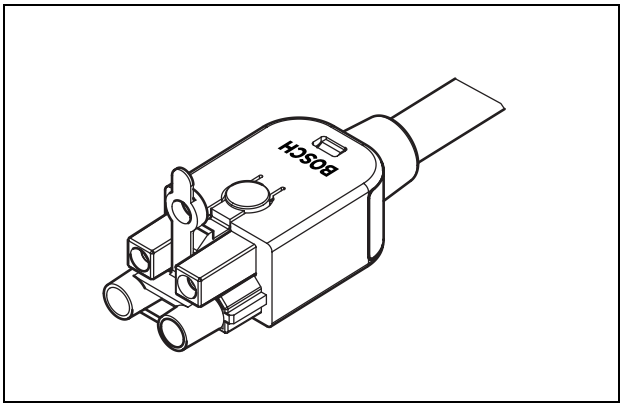


figure 28.2: Connector (with dust cap)

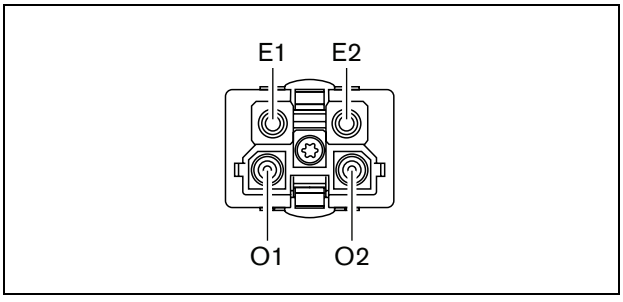


figure 28.3: Connector details

table 28.1: Connector details

Pin	Signal	Wire
E1	+48V(DC)	Copper
E2	GND	Copper
O1	Data	Optical fiber
O2	Data	Optical fiber

28.3 Wiring

See figure 28.4 for details about the wires inside the extension cables.

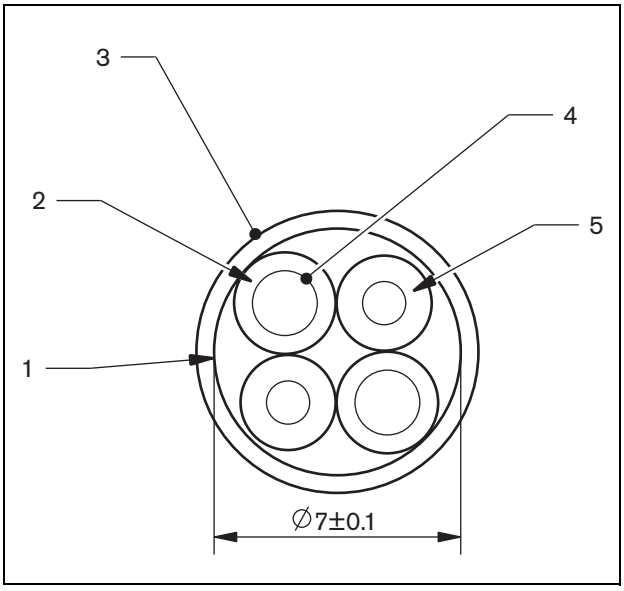


figure 28.4: Cable details

table 28.2: Cable details

Number	Signal
1	Protective cloth
2	Insulation
3	Outer sheet
4	Stranded wire
5	Optical fiber

28.4 Custom-made cables

Use LBB4418/00 Cable-connector Tool Kit to create custom-made cables out of LBB4416/00 Network Cables and LBB4417/00 Network Connectors.

28.5 Technical data

Insulation:
LSZH (low smoke/zero halogen), black
Outer diameter:
7 mm
Power supply wires (2):
Copper, stranded 1 mm^2, red and brown insulation, resistance < 0.018 Ω/m
Optical fibers (2):
• PMMA, 1 mm diameter including cladding 2 mm diameter (black) • Numeric aperture: 0.5 • optical attenuation < 0.17 dB/m @ 650 nm • bending loss < 0.5 dB (r = 20 mm, 90°), according to JIS C6861
Temperature range:
-40 to +65 °C
Pull force:
max. 150 N
UL-compliancy:
UL444 (60 °C/60 V),
Flame retardant:
according to IEC 60332-1 / 60 s
Halogen level:
according to IEC 60754-2, pH > 4.3 and conductivity < 10 uS/mm
Smoke level:
according to IEC 61034-2, light transmittance > 60%

29 LBB4417/00 Network Connectors

The LBB4417/00 Network Connectors are used to create custom-made cables in combination with LBB4416/00 Network Cable (100 m) and the LBB4418/00 Cable-connector Tool Kit.

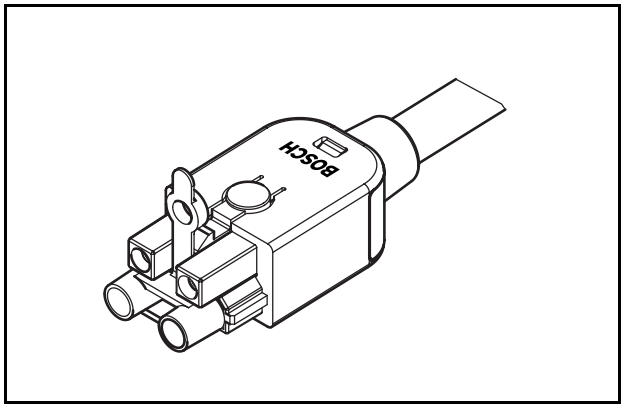


figure 29.1: Connector

The type number LBB4417/00 contains parts for 10 pieces of network connectors, which is enough for 5 extension cables.

30 LBB4418
Cable-connector Tool Kit

30.1 Introduction

The LBB4418/00 Cable-connector Toolkit is intended for creating optical network cables (see figure 30.1) out of LBB4416/00 Network Cable (100 m) and LBB4417/00 Network Connectors.

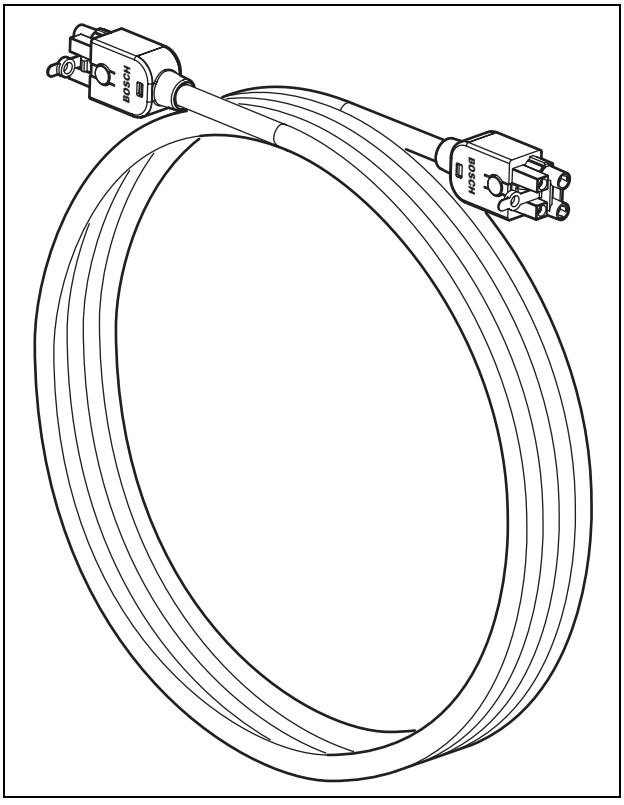


figure 30.1: Optical network cable

30.2 Toolkit contents

figure 30.2: Toolkit contents

table 30.1: Toolkit contents

No.	Description	Number
1	Spare cutting system (with Allen key)	600 004 0
2	Cable cutter	600 015 36
3	Crimping tool	642 509 3 23
4	POF positioning/crimping tool	618 071 69
5	Stripping tool	607 202 69
6	POF cutter/stripping tool	600 003 - 1 39
7	Torx screwdriver	C209 000077

Toolkit supplier:

- Rennsteig Werkzeuge GmbH
  Viernau, Thüringen, Germany
  Supplier type number: 600 100 PHI

Note
Before using the POF cutter/stripping tool (tool 6), release its blocking screw using the Torx screwdriver (tool 7).

Note
After 1,260 cuts, the POF cutter/stripping tool (tool 6) blocks automatically. In that case, replace the cutting system with the spare cutting system (tool 1) to ensure smooth cuts. Additional spare cutting systems are available as type number LBB4418/50.

Caution
Oil all tools regularly to avoid rusting.

30.3 Connector components

Each optical network connector (LBB4417/00) consists of 10 components (see figure 30.3 and figure 30.4).

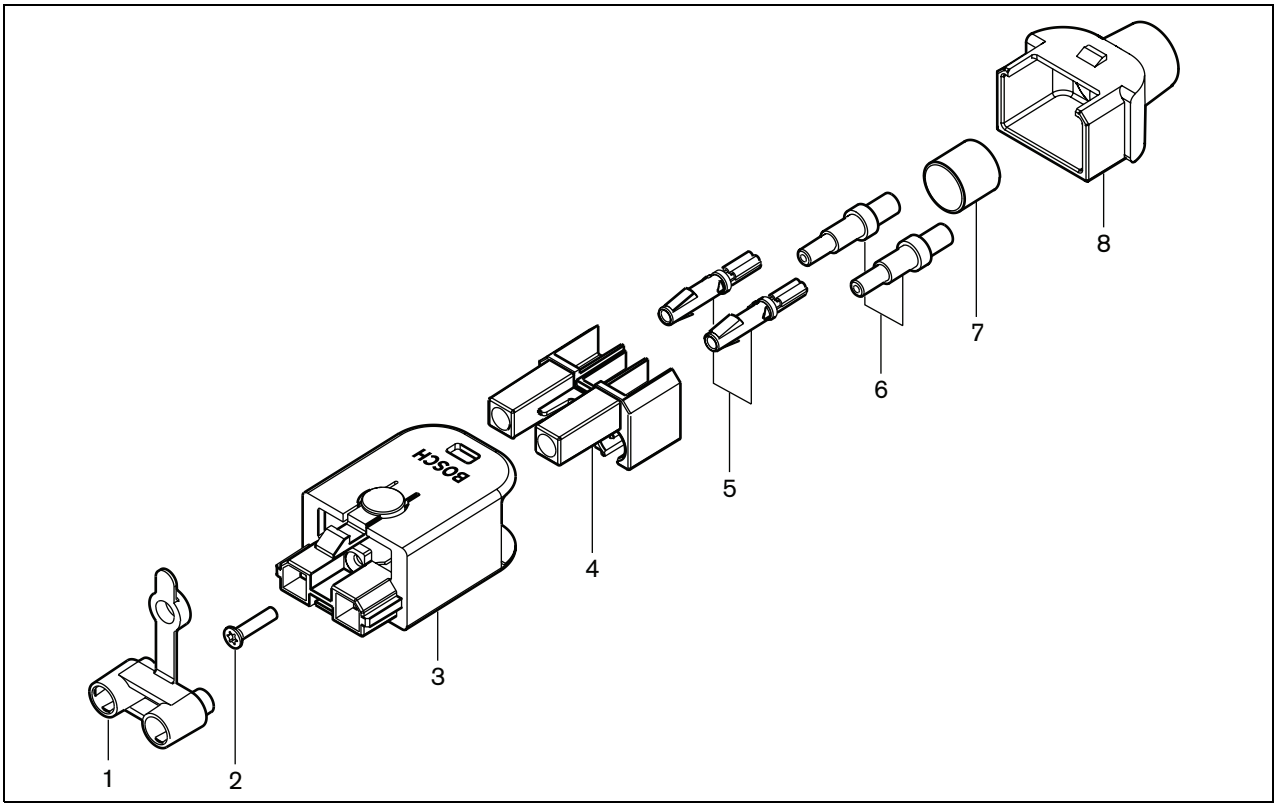


figure 30.3: Connector assembly drawing

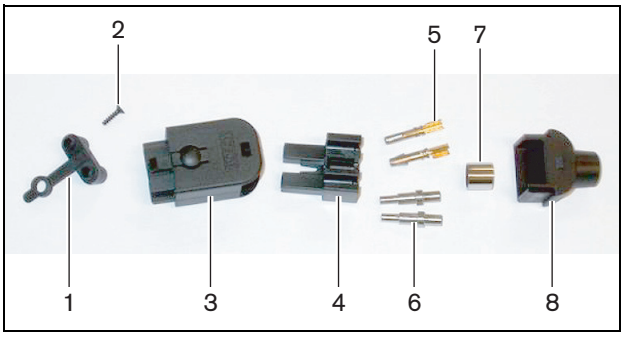


figure 30.4: Connector components

table 30.2: Connector components

No	Description
1	Dust cap
2	Torx screw
3	Front housing
4	Mounting block
5	Socket contacts
6	Ferrules
7	Crimping bush
8	Back housing

30.4 Cable-connector installation

30.4.1 Introduction

This chapter contains a step-by-step description of the cable-connector installation process. The procedure consists of the following parts:

- Preparation (see section 30.4.3).
- Crimping the bush (see section 30.4.4).
- Stripping the copper wires (see section 30.4.5).
- Installing the socket contacts (see section 30.4.6).
- Stripping the optical fibers (see section 30.4.7).
- Installing the ferrules (see section 30.4.8).
- Assembling the connector (see section 30.4.9).

30.4.2 Cable types

There are two types of optical network cables:

- Type A cables in which the plastic optical fibers are located next to each other (see figure 30.5, which shows both cable ends).
- Type B cables in which the plastic optical fibers are located opposite to each other (see figure 30.5, both cable ends are identical).

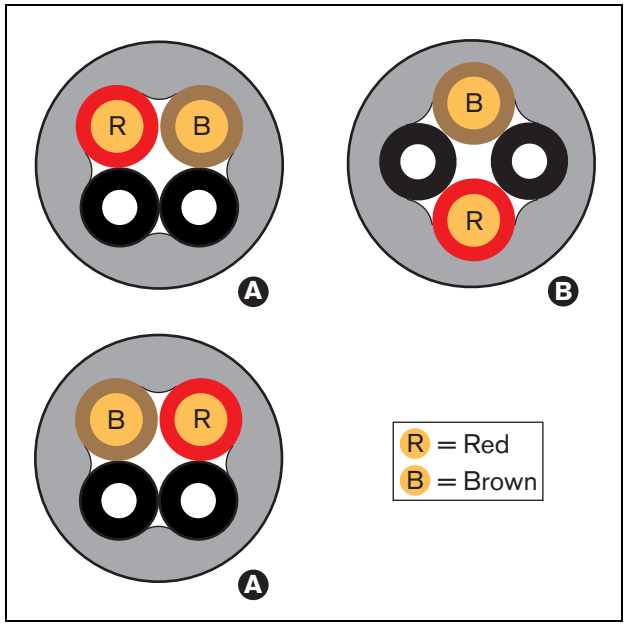


figure 30.5: Cable types

30.4.3 Preparation

Proceed as follows:

1 Cut the optical network cable to the required length using the cable cutter (tool 2).

Note
Due to light loss, the length of an optical network cable must be less than 50 m.

2 Determine the cable type (see section 30.4.2), since some steps in the cable-connector installation procedure depend on the cable type.

3 Disassemble a network connector. A network connector consists of 10 parts (see section 30.3).

4 Slide the back housing over the cable (see figure 30.6).

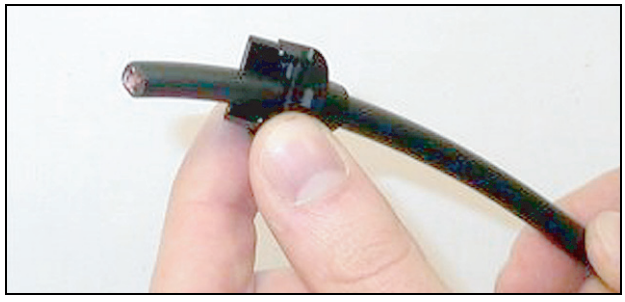


figure 30.6: Back housing on cable

5 Using the stripping tool (tool 5), strip the outer sheath of the cable by pushing the cable to the mechanical stop (see figure 30.7).

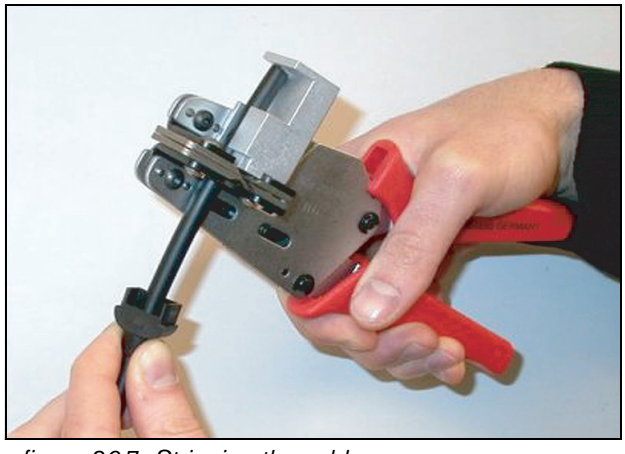


figure 30.7: Stripping the cable

30.4.4 Crimping bush

Proceed as follows:

6 Slide the crimping bush over the cable and position it at the end of the outer sheath.

Note
In the next step, the circular shape of the cable cross-section at the end of the outer sheath is transformed into a hexagonal shape using the crimping tool (tool 3) and the crimping bush. Before crimping the bush, ensure that both plastic optical fibers will be positioned parallel to a flat side of the hexagonal cross-section (see figure 30.8)

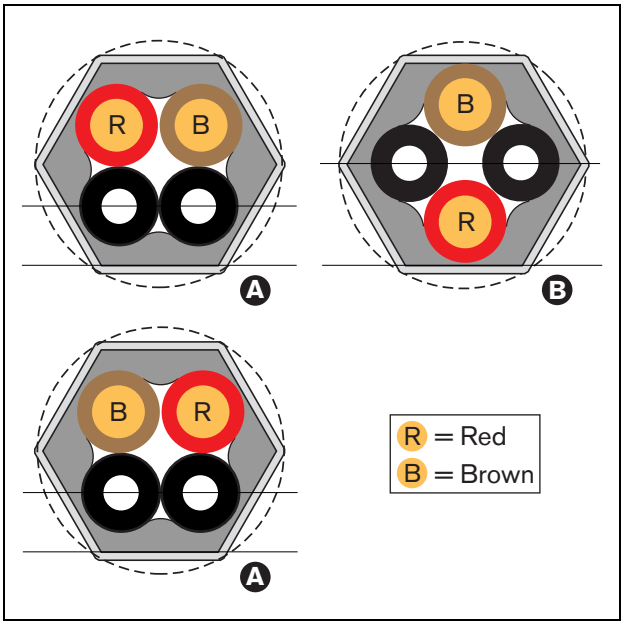


figure 30.8: Cross-section transformation

7 Crimp the bush on the outer sheath using the crimping tool (tool 3, see figure 30.9). The crimping bush will prevent the cable from rotating in the connector.

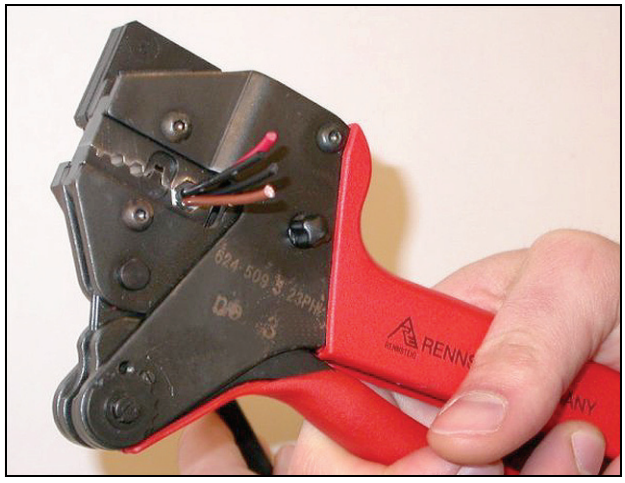


figure 30.9: Crimping the bush

30.4.5 Stripping copper wires

Proceed as follows:

8 Cut the copper wires at the required length using the cable cutter (tool 2) and the stripping tool (tool 5). To this end, position the crimping bush in position I and cut the copper wires at position II (see figure 30.10).

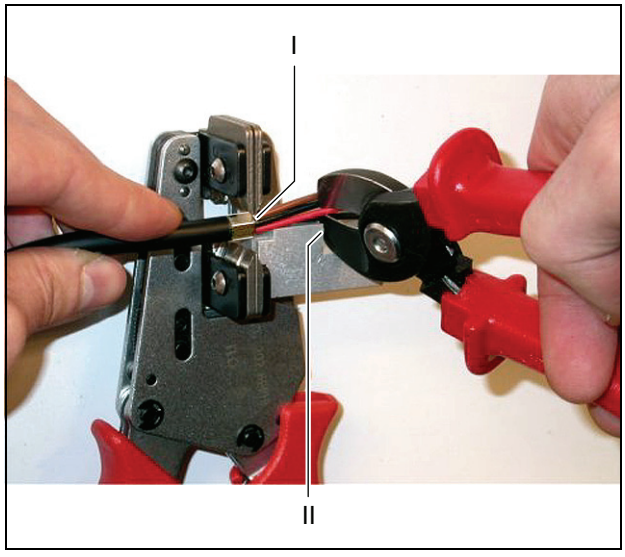


figure 30.10: Cutting a copper wire

9 Strip the red and brown insulations from the copper wires by pushing them to the mechanical stop of the stripping tool (tool 5, see figure 30.11).

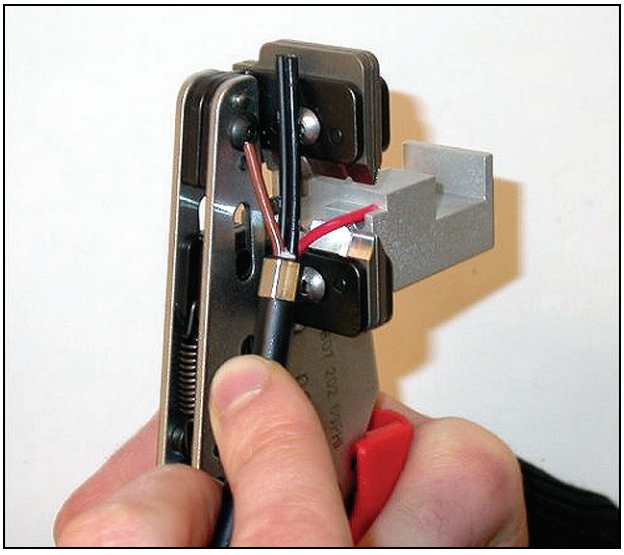


figure 30.11: Stripping a copper wire

30.4.6 Installing socket contacts

Proceed as follows:

10 Put a socket contact in the crimping tool (tool 3, see figure 30.12). The upper part of the crimping tool contains a ridge for positioning the socket contact in the tool (see figure 30.13).

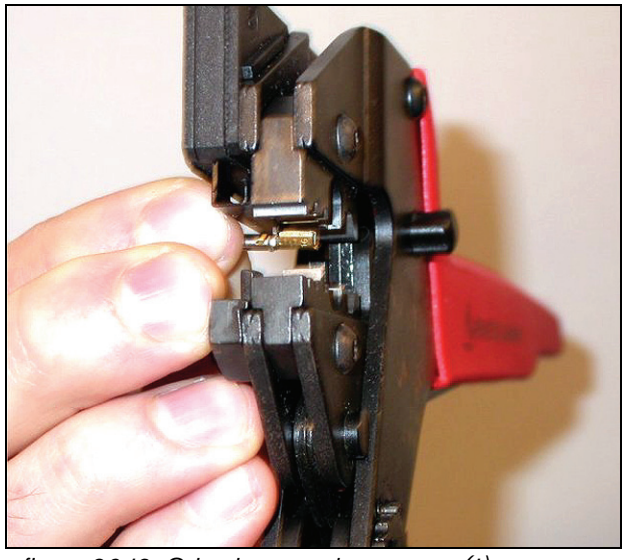


figure 30.12: Crimping a socket contact (1)

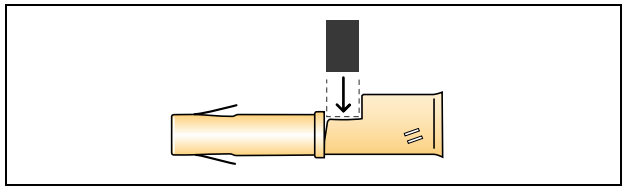


figure 30.13: Positioning a socket contact

11 Slide one of the stripped, copper wires into the contact area of the socket contact and close the crimping tool to crimp the socket contact onto the copper wire (see figure 30.14).

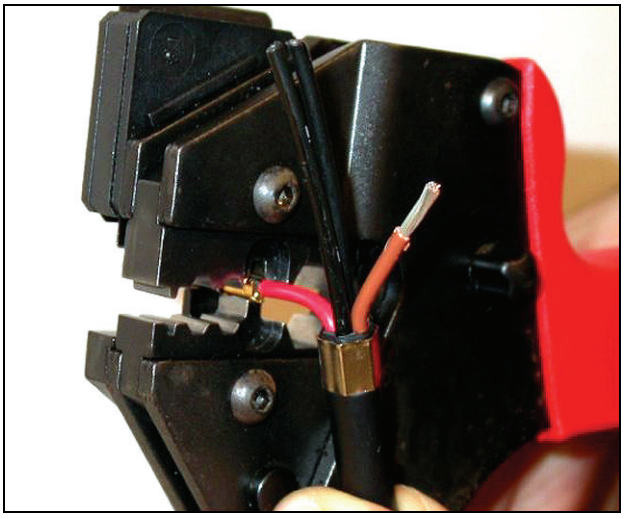


figure 30.14: Crimping a socket contact (2)

12 Repeat steps 10 and 11 for the other stripped, copper wire. See figure 30.15 for the result of this part of the cable-connector installation procedure.

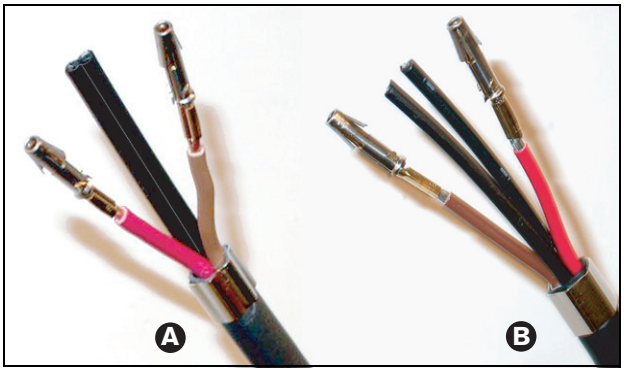


figure 30.15: Installed socket contacts

30.4.7 Stripping fibers

Proceed as follows:

13 Slide the plastic optical fibers into the POF cutter/stripping tool (tool 6). The fiber that is going to be cut-off must be put in the small guiding hole, whereas the other fiber must be put in the large guiding hole (see figure 30.16). The crimping bush must rest against the stop (see figure 30.17).

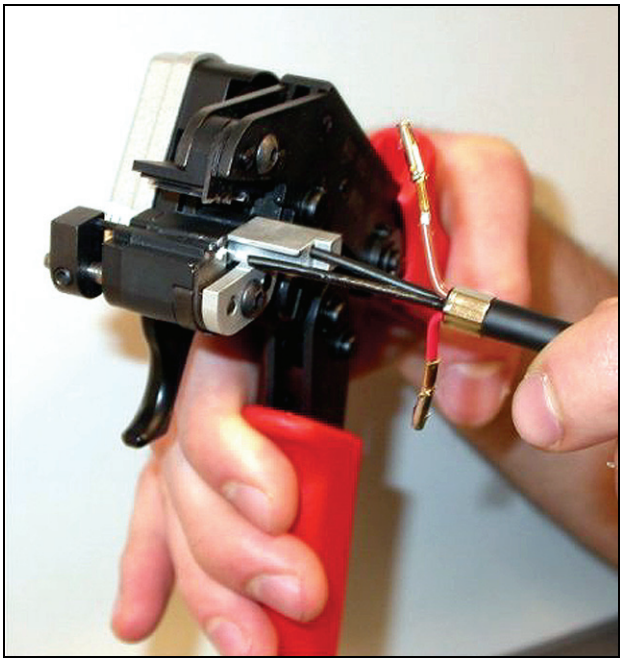


figure 30.16: Cutting a fiber (1)

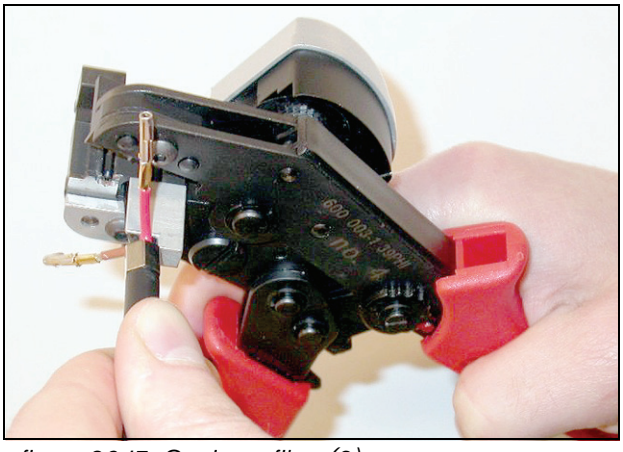


figure 30.17: Cutting a fiber (2)

14 Close the tool to fix the cable and pull the 'trigger' to cut the fiber (see figure 30.18).

figure 30.18: Cutting a fiber (3)

15 Repeat steps 13 and 14 for the other plastic optical fiber in the cable. Both fibers now have the required length.

16 Slide one of the fibers into the front part of the POF cutter/stripping tool (tool 6, see figure 30.19).

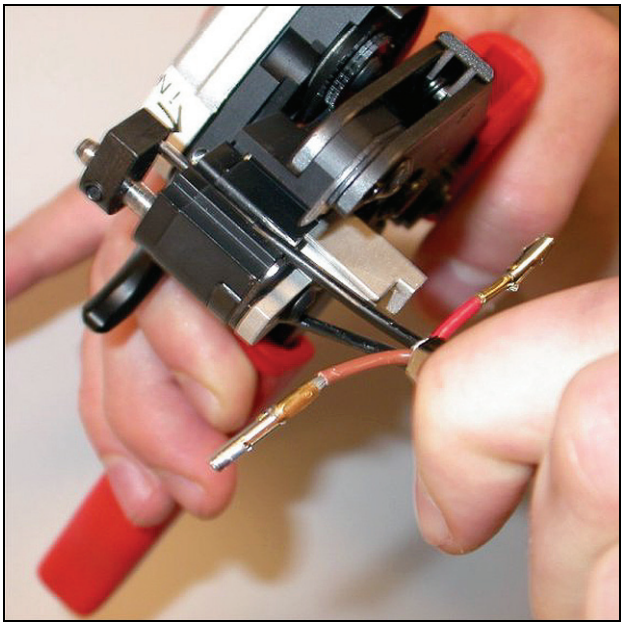


figure 30.19: Stripping a fiber

17 Close the tool and pull the fiber out to strip the sheath from it.

Note
Do not forget to remove the piece of sheath from the tool.

18 Repeat steps 16 and 17 for the other fiber in the cable. See figure 30.20 for the result of this part of the cable-connector installation procedure.

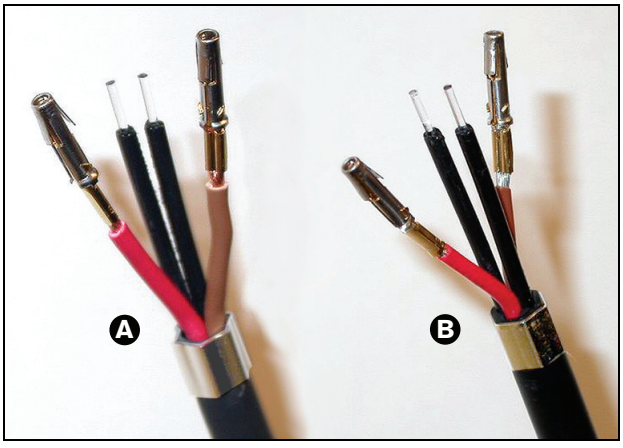


figure 30.20: Stripped optical fibers

30.4.8 Installing the ferrules

Proceed as follows:

19 Insert a ferrule into the spring-loaded stop of the POF positioning/crimping tool (tool 4, see figure 30.21).

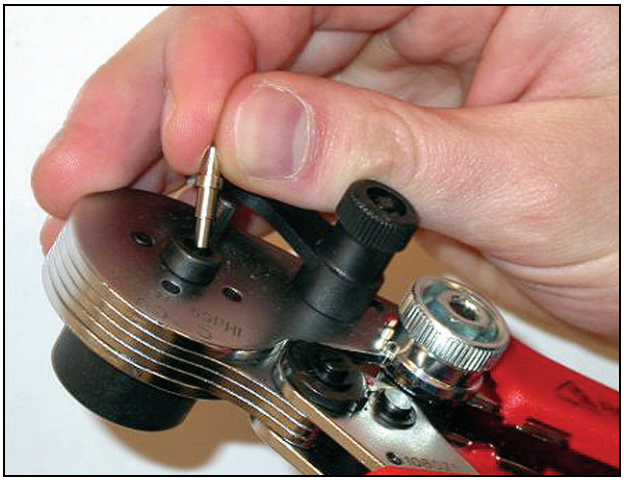


figure 30.21: Inserting a ferrule

20 Lock the ferrule with the small lever (see figure 30.22).

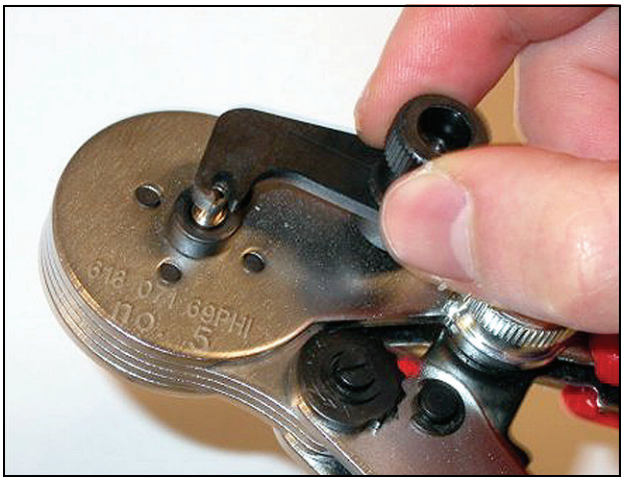


figure 30.22: Locking a ferrule

21 Insert a plastic optical fiber into the ferrule in the spring-loaded stop of the POF positioning tool (see figure 30.23).

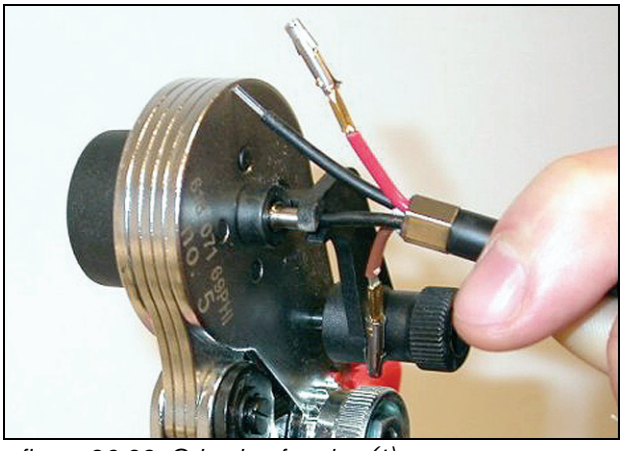


figure 30.23: Crimping ferrules (1)

22 Close the tool and open it again to crimp the ferrule on the core of the fiber.

23 Repeat steps 19 to 22 for the other fiber in the cable. The ferrules only have been crimped on the core of the optical plastic fiber. Next, the ferrules are going to be crimped on the sheaths of the fibers.

24 Put both ferrules in the crimping tool (tool 3, see figure 30.24).

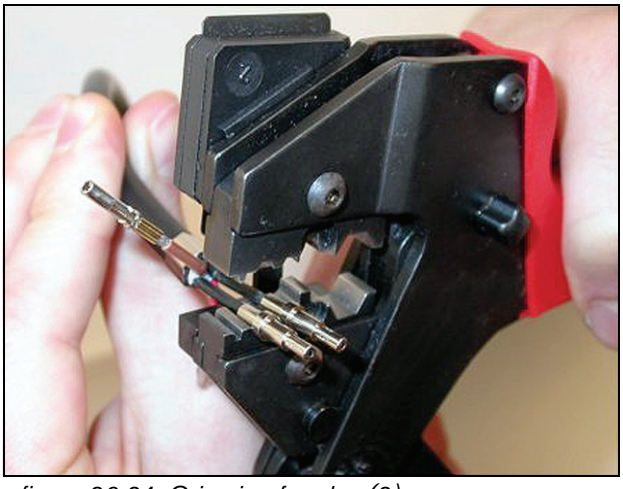


figure 30.24: Crimping ferrules (2)

25 Crimp the ferrules on the sheath using the crimping tool (tool 3, see figure 30.25). See figure 30.26 for the result of this part of the cable-connector mounting procedure.

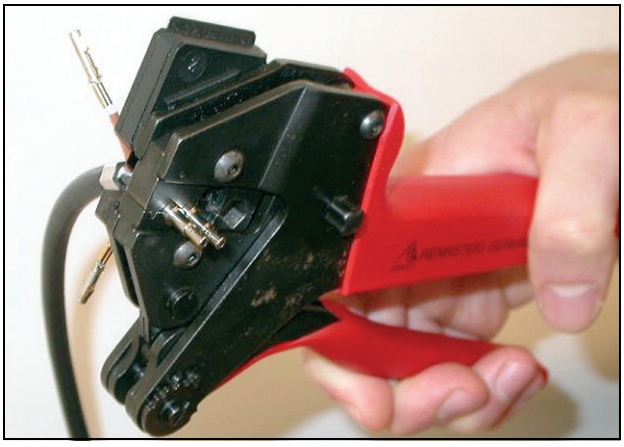


figure 30.25: Crimping ferrules (3)

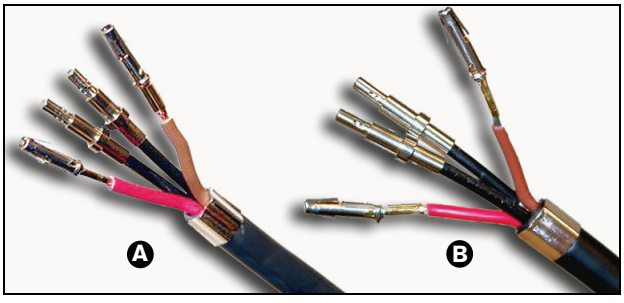


figure 30.26: Ferrules on fibers

30.4.9 Assembling the connector

Before starting to assemble the connector, position the copper wires and the plastic optical fibers for installation. The copper wires will be installed in the upper part of the connector, whereas the fibers will be installed in the lower part of the connector (see figure 30.27).

Note
When replacing a connector, always first check the wiring in the connector at the other end.

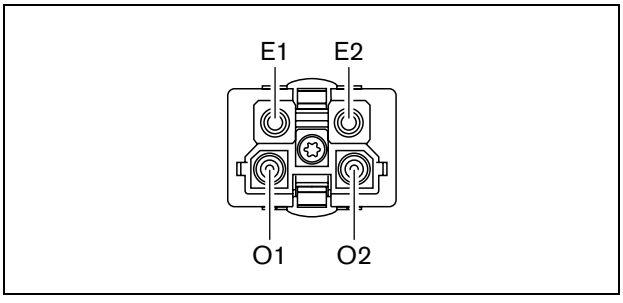


figure 30.27: Front view of connector

table 30.3: Optical network connector details

Pin	Signal	Wire
E1	+48V(DC)	Copper
E2	GND	Copper
O1	Data	Optical fiber
O2	Data	Optical fiber

Also, observe the wiring diagram (see figure 30.28). For the practical implications of this diagram, see figure 30.29 and figure 30.30).

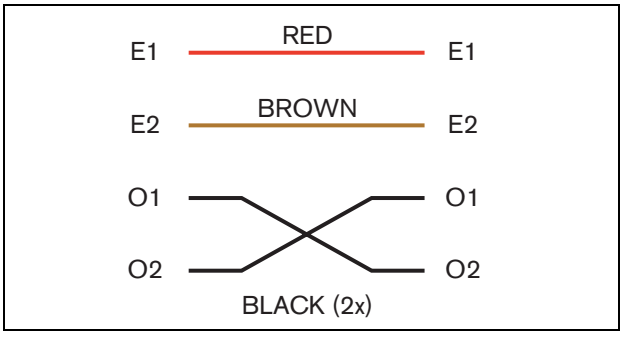


figure 30.28: Wiring diagram

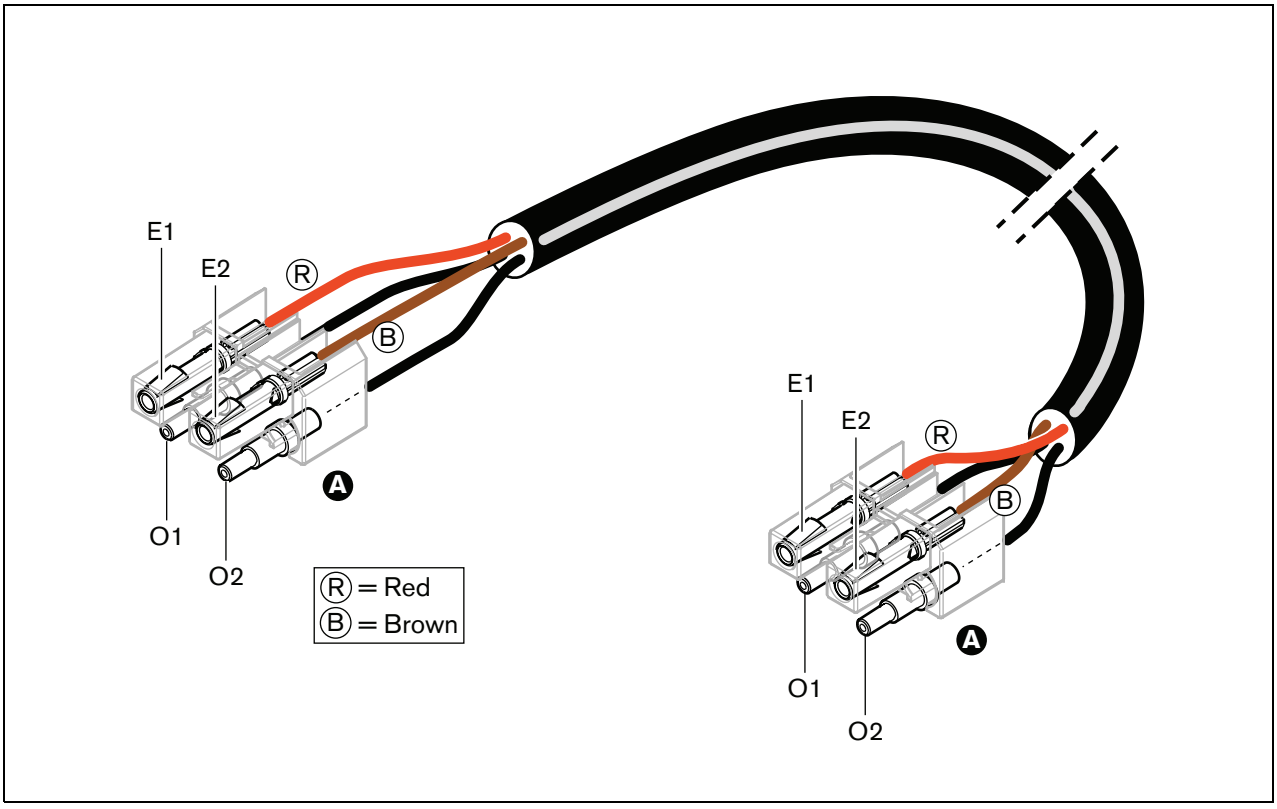


figure 30.29: Wiring diagram applied to type A optical network cables

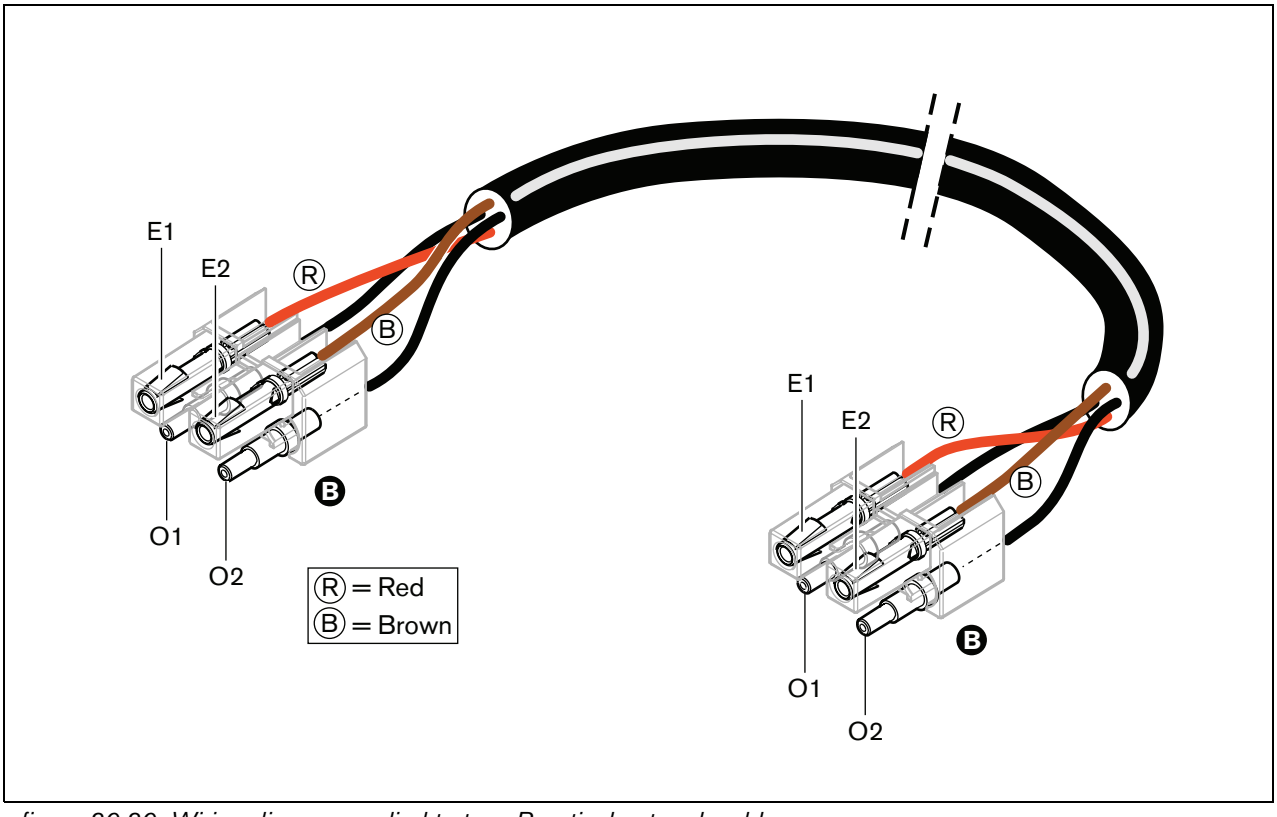


figure 30.30: Wiring diagram applied to type B optical network cables

Where applicable, the way in which the connectors must be assembled on both sides of the cables is shown in the figures. Proceed as follows:

26 Check if the copper wires and the plastic optical fibers have been positioned in the correct way (see figure 30.31).

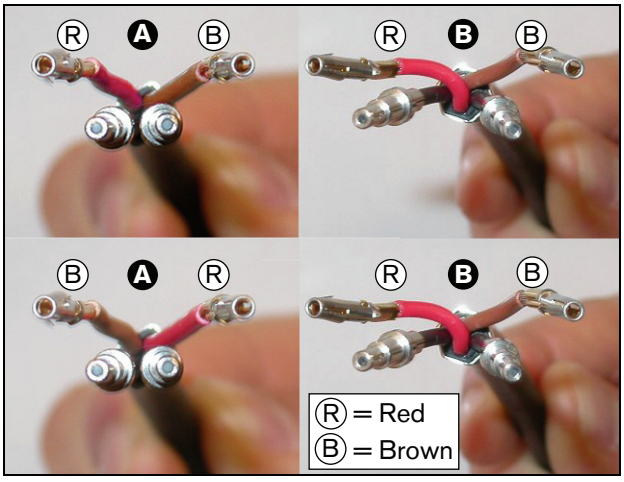


figure 30.31: Positioning the copper wires and fibers

27 Put the ferrules in the mounting block (see figure 30.32)

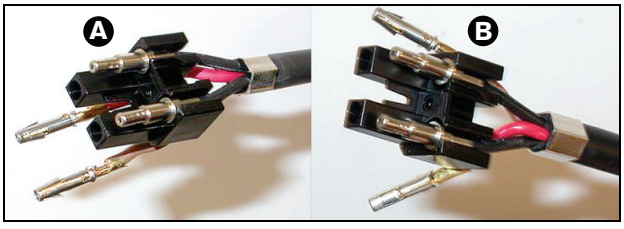


figure 30.32: Mounting block and back housing

28 Put the socket contacts in the mounting block (see figure 30.33). In one of the connectors attached to a type A cable, the red and brown copper wires must cross to meet the wiring diagram (see figure 30.28).

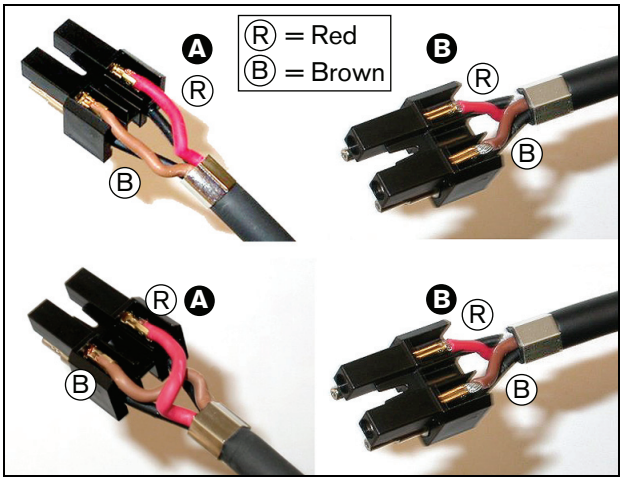


figure 30.33: Mounting block and back housing

29 Put the mounting block in the back housing (see figure 30.34)

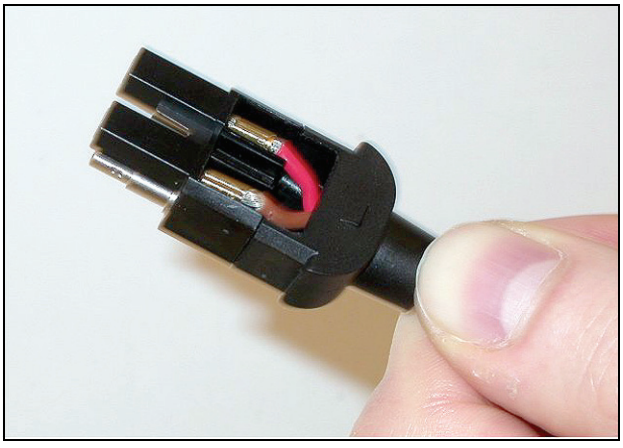


figure 30.34: Mounting block/back housing assembly

30 Click the front housing on the mounting block/back housing assembly (see figure 30.35).

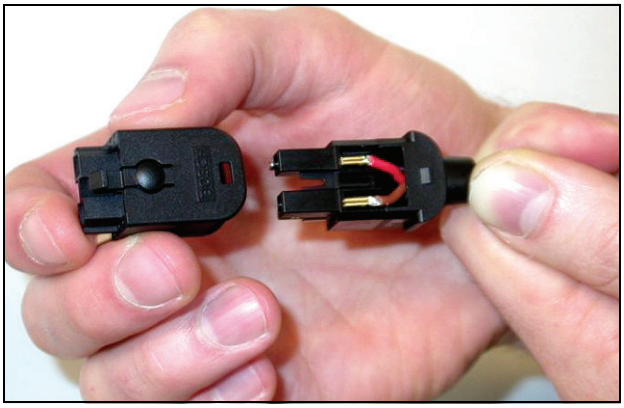


figure 30.35: Installing the front housing

31 Insert the Torx screw into the front housing (see figure 30.36).

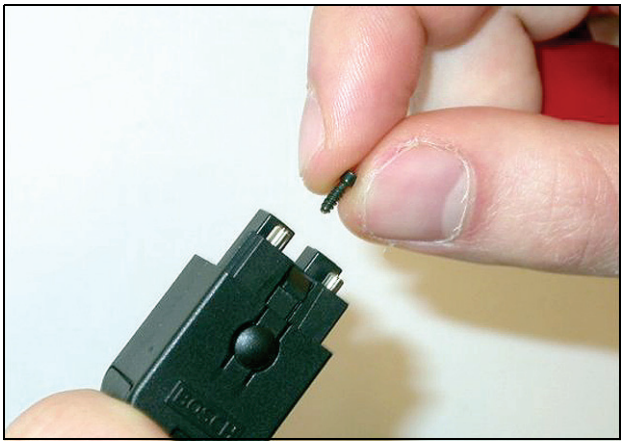


figure 30.36: Inserting the Torx screw

32 Tighten the Torx screw using the Torx screwdriver (tool 7, see figure 30.37)

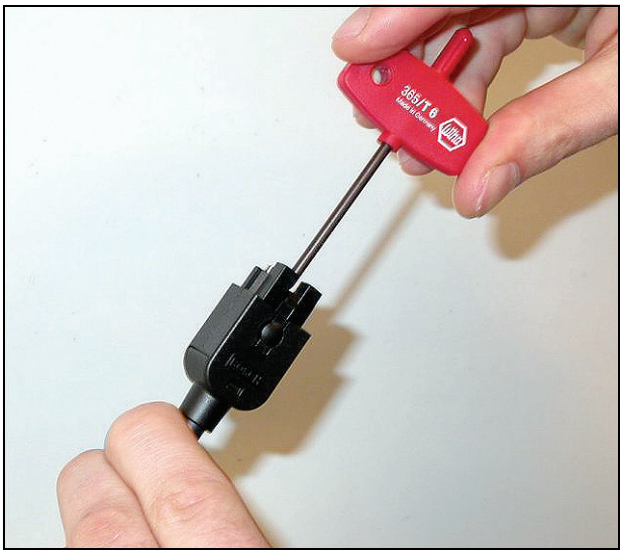


figure 30.37: Tightening the Torx screw

33 Put the dust cap on the connector to protect the plastic optical fibers (see figure 30.38).

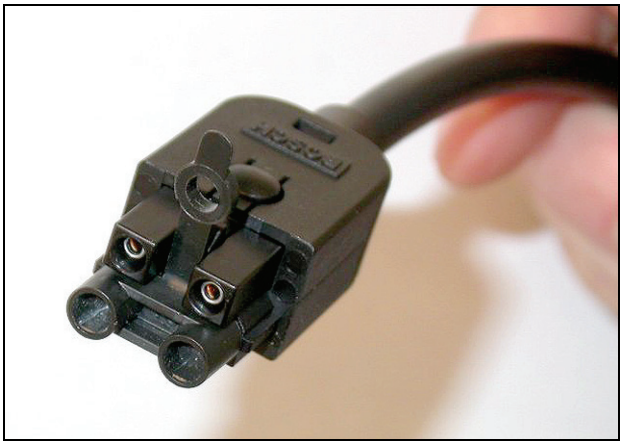


figure 30.38: Dust cap on connector

31 LBB4419/00 Cable Couplers

The LBB4419/00 Cable Couplers are used to connect extension cables to each other. However, in each cable coupler, a small a amount of light gets lost. Therefore, each cable coupler limits the maximum distance of between two pieces of equipment (normally 50 meters) with 20 meters.

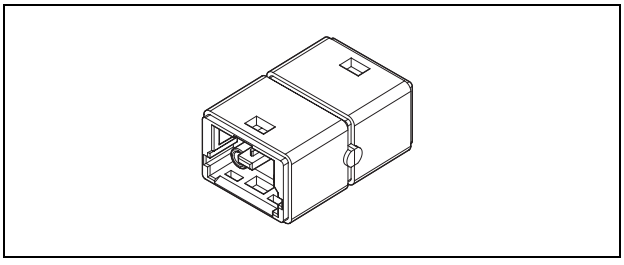


figure 31.1: Cable coupler

Cable couplers can also be used in combination with the tap-off outlets of network splitters (PRS-NSP) to create temporarily or easily detachable connections (e.g. break-out boxes).

32 Cabling

32.1 Introduction

The pieces of equipment in a Praesideo system form a daisy chain. Therefore, all units are equipped with two interchangeable system bus connectors (see figure 32.1). Use one of these connectors to connect a unit to the previous unit and the other to connect it to the next unit in the chain.

Note
Both system connectors are identical.

Because the units are daisy-chained, it is possible to add or remove equipment anywhere in the network without affecting the performance of other units, provided that the other network connection remains available.

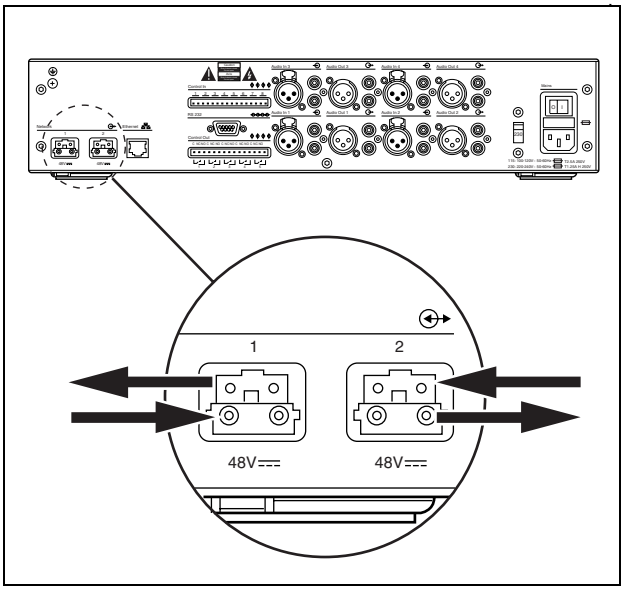


figure 32.1: Daisy chain

32.2 System bus

A system bus cable (see figure 32.2) has two plastic optical fiber (POF) 'wires' and two copper wires. The POF wires can transport up to 28 simultaneous audio channels and Praesideo control data, whereas the copper wires transport power to feed the units.

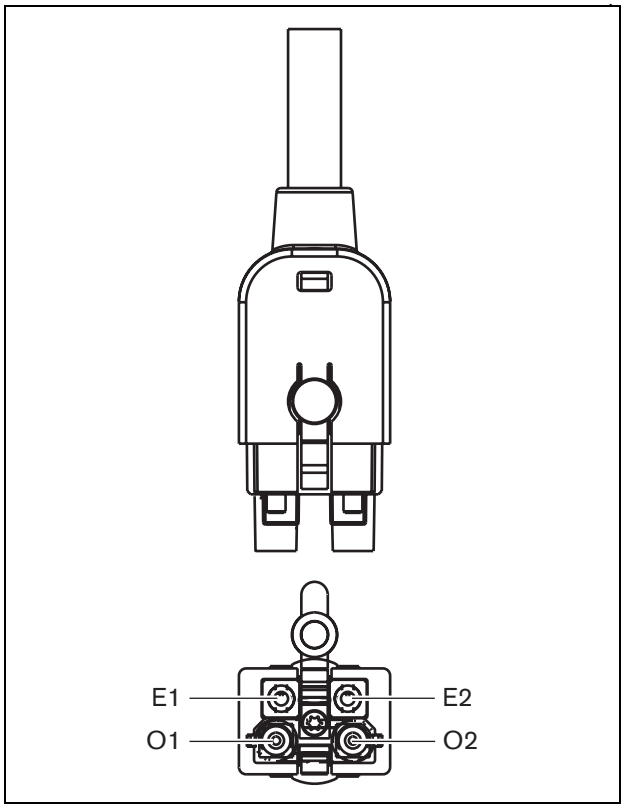


figure 32.2: System bus connector

table 32.1: System bus cable details

Number	Color	Material	Description
E1	Red	Copper	Power, + (48V)
E2	Brown	Copper	Power, - (GND)
O1	Black	POF	Data
O2	Black	POF	Data

Note
During both installation and operation, the temperature of the POF cabling may not exceed 65 °C. Higher temperatures can damage the fibers.

Note
The POF part of the system bus connectors on the Praesideo equipment are F05 and F07 compliant. This means that if only data has to be transported, industry-standard F05 or F07 connectors can be used. If only POF cabling is used between two units, no power is transported between these pieces of equipment.

32.3 Dust caps

Protect the POF parts of the system cables and connectors that are not in use with dust caps. Dust caps also block the red light from the fiber optic interface, which might be visible and disturbing.

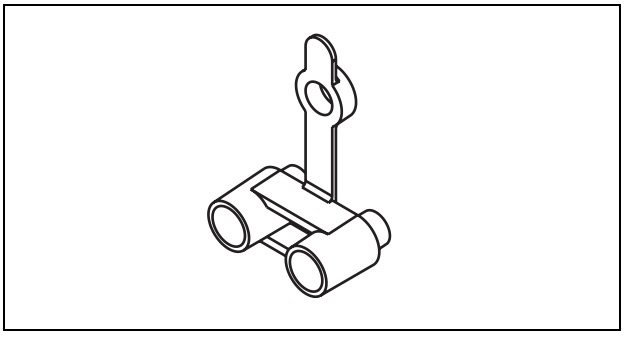


figure 32.3: Dust cap

32.4 Maximum distance

Due to light loss, the maximum length of POF cabling (and therefore also system bus cables) between two pieces of equipment is 50 m. If the distance between two units is more than 50 m, PRS-FIN(NA) or PRS-FINS Fiber Interfaces and glass optical fibers (GOF) must be used (see figure 32.4).

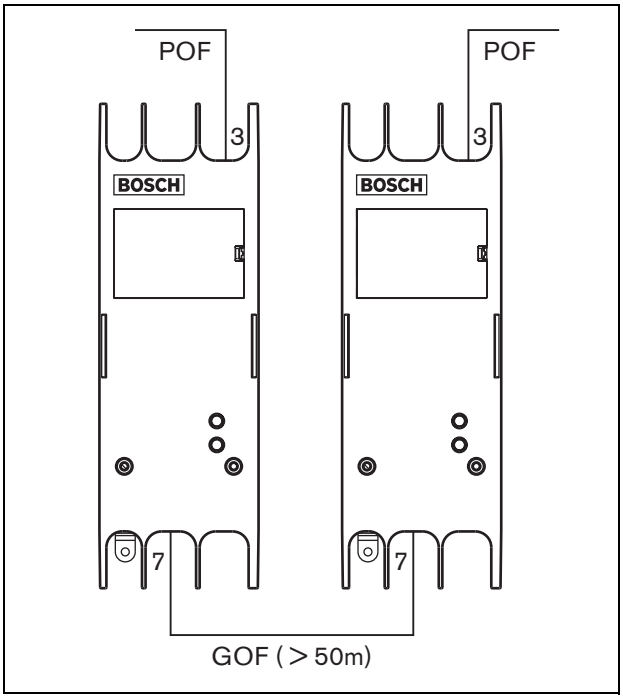


figure 32.4: Using fiber interfaces

If GOF cables are used, make sure that they:

- are multimode GOF cables (single mode GOF cables are supported by the PRS-FINS);
- have a maximum attenuation of 2 dB/km;
- are suitable for light with a wavelength of 1300 nm;
- are terminated with standard SC connectors.

Note
It is also possible to increase the distance between units above 50 m by inserting PRS-NSP Network Splitters every 50 m or less. Although no tap-off may be required, the network signal is regenerated in the network splitter to cover another 50 m.

32.5 Maximum cable length

The maximum length of all optical fibers together (both POF and GOF) in the system depends on the number of nodes in the system. Each piece of equipment has been assigned a number of nodes.

table 32.2: Nodes

Type no.	Description	Nodes
PRS-4AEX4	Audio Expander	1
LBB4404/00	CobraNet Interface	1
PRS-4OMI4	OMNEO Interface	1
PRS-NSP	Network Splitter	1
PRS-FIN(S)	Fiber Interface	1
PRS-FINNA	Fiber Interface	0/1
PRS-1P500	Power Amplifier 1x500 W	1
PRS-2P250	Power Amplifier 2x250 W	1
PRS-4P125	Power Amplifier 4x125 W	1
LBB4428/00	Power Amplifier 8x60 W	2
LBB4430/00	Call Station Basic	1
LBB4432/00	Call Station Keypad	0
PRS-CSNKP	Numeric Keypad	0
PRS-CSM	Call Station Module	1
PRS-CSKPM	Call Station Keypad Module	0
PRS-CSI	Call Station Interface	1
PRS-CRF	Call Stacker	1
PRS-16MCI	Multi Channel Interface	1
PRS-NCO3	Network Controller	3

The graph (see figure 32.5) shows the relation between the number of nodes in the system and maximum optical fiber length in the system.

Note
A system may not contain more than 63 nodes.

Note
The PRS-FINNA counts as 0 nodes for the system limit of 63 nodes, but as 1 node for the maximum optical fiber length. Therefore, the dashed part of the line is only applicable to systems with PRS-FINNA Fiber Interfaces.

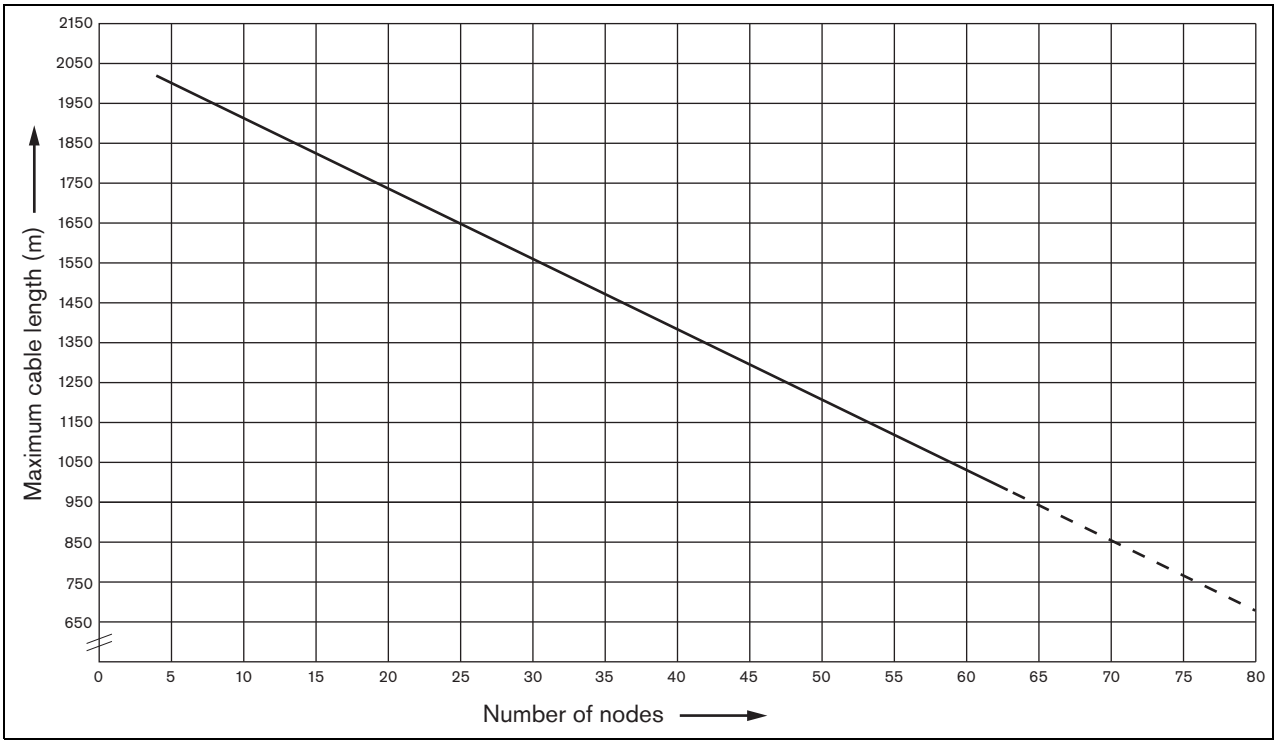


figure 32.5: Maximum optical fiber length vs. number of nodes

32.6 Bending and coiling

32.6.1 Introduction

The POF cable may be bend or coiled. However, the rules in this chapter must be observed.

32.6.2 Bending

The bend radius is 110 mm (see figure 32.6). The maximum number of bends in a POF cable is 5.

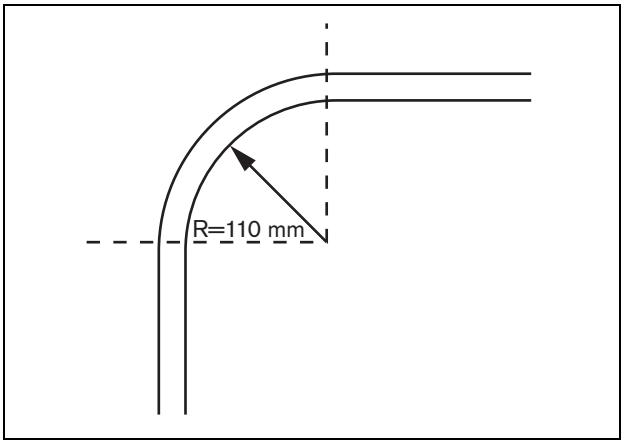


figure 32.6: Bend radius

A 180 degree bend equals two bends (see figure 32.7)

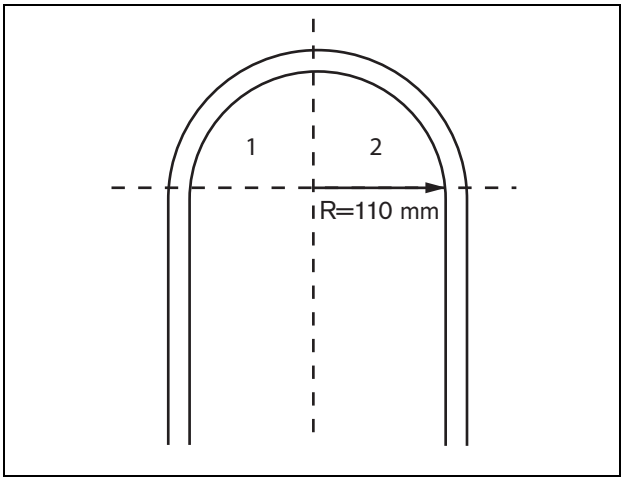


figure 32.7: U curve

32.6.3 Coiling

The minimum coiling radius is 110 mm (see figure 32.8)

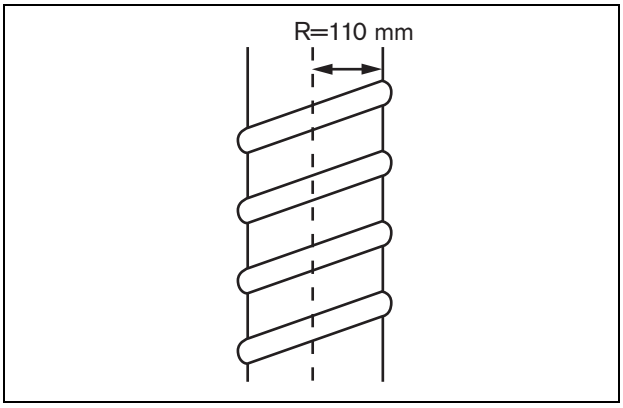


figure 32.8: Coiling radius

33 Architecture

33.1 Introduction

The exact layout of the Praesideo system depends on the number and type of units that make up the system This chapter contains some easy-to-follow examples of (strongly simplified) Praesideo systems to illustrate the possibilities.

33.2 Basic system

See figure 33.1 for an example of a basic system.

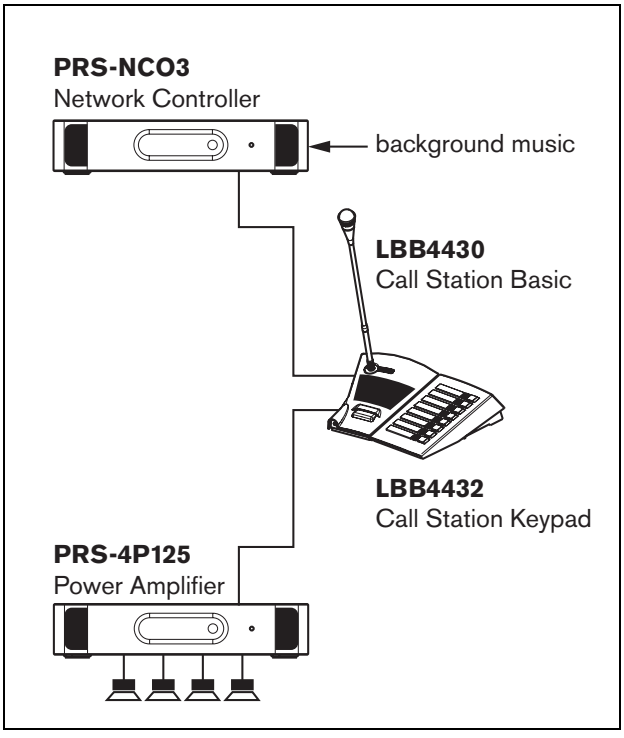


figure 33.1: Basic system

Note
In the remainder of this chapter, 'basic system' refers to the system in figure 33.1.

33.3 Redundant cabling

The basic system has no redundant cabling. If the cable between the call station basic and the power amplifier breaks, it becomes impossible to broadcast calls or background music. This can be solved by creating a redundant cabled system (see figure 33.2).

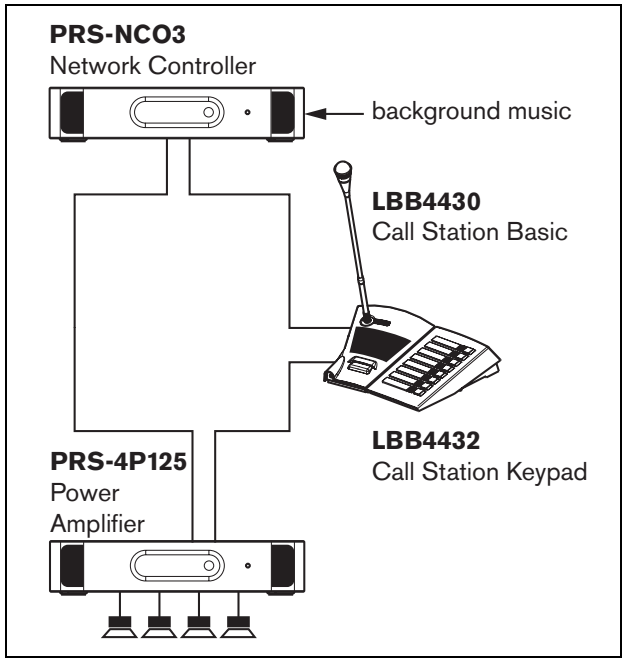


figure 33.2: Redundant cabled basic system

Note
In the remainder of this chapter, 'basic redundant system' refers to the system in figure 33.2.

The only difference between the basic system and this redundant cabled basic system is the connection between the power amplifier and the network controller. The equipment now forms a ring. If a cable breaks, the system remains functional.

33.4 Tap-offs

The network splitter makes it possible to create tap-offs (see figure 33.3). Tap-offs are never redundant, because it is not possible to create a tap-off ring. If the cable between the network splitter and the call station B breaks, call station B is not functioning anymore, hence the tap-off is not redundant.

33.5 Spare amplifiers

Besides using redundant cabling it is also possible to add spare amplifiers to the system (see chapter 9).
Spare amplifiers give back-up capacity if an amplifier has a defect.
Refer to 9.3.5.5 for information about power amplifiers.
Refer to 11.3.5.3 for information about basic amplifiers.

Caution
Do not mix spare power amplifiers with spare basic amplifiers. The amplifiers are not compatible and the configuration software does not support the assignment of a basic spare amplifier channel to a main power amplifier or a spare power amplifier to a main basic channel.

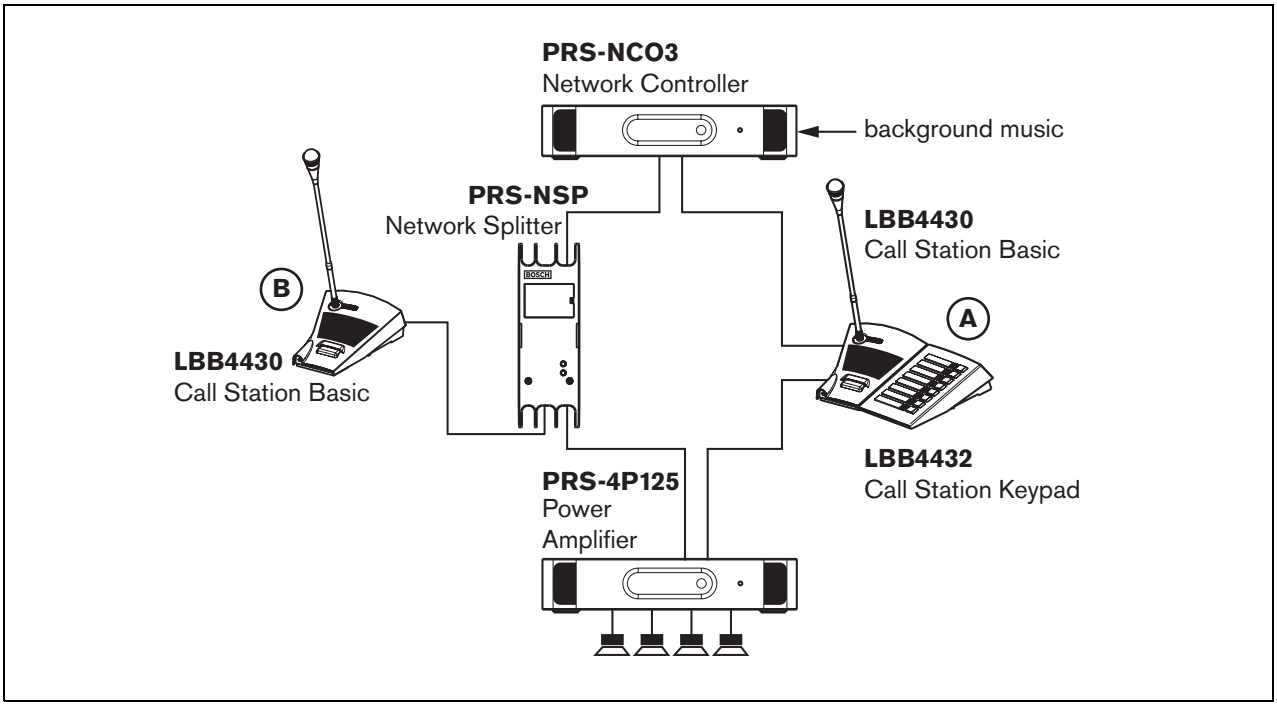


figure 33.3: Redundant basic system with tap-off

33.6 CobraNet

CobraNet is a standard for transporting multiple digital uncompressed audio channels over Ethernet. Many manufactures of public address and professional audio equipment support this standard. CobraNet has all the advantages of Ethernet: structured cabling using Cat-5 and GOF to cover long distances and cheap network components. In Praesideo systems, the LBB4404/00 CobraNet Interface is used to interface between Praesideo and CobraNet. These CobraNet interfaces can be used to:

- Connect Praesideo systems (see figure 33.4 for an example).
- Benefit from already existing Ethernet infrastructure.
- Transport audio over large distances.

PC data such as Praesideo Open Interface data can coexist with CobraNet on the same Ethernet network as long as managed Ethernet switches are used. See: http://www.cobranet.info/en/support/cobranet/design/

Because of delay variations, it is not allowed to connect more than 7 switches in series.

Fast Ethernet distance limitations apply to CobraNet installations: 100 meters over Cat-5 copper cable, 2 kilometers over multimode fiber. Proprietary Fast Ethernet via single mode fiber solutions can reach even further.

Note
The CobraNet interface does not transfer control functions. These can only be transferred over Ethernet using the Praesideo Open Interface. Network controllers are always open interface slaves, which must be controlled by an open interface master, for example a PC Call Station.

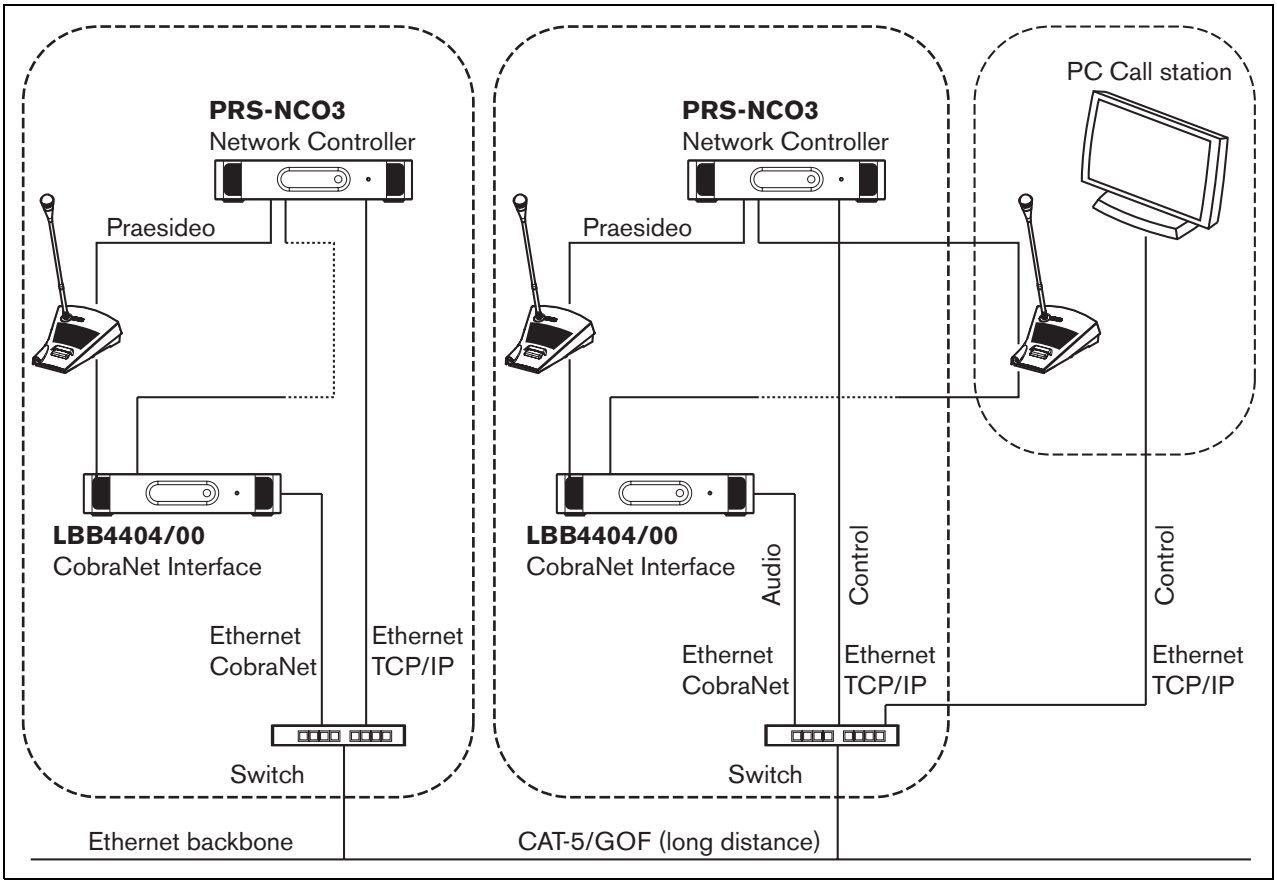


figure 33.4: Connecting systems

33.7 Fail-safe

33.7.1 Introduction

When the Praesideo system must be used as an emergency sound system, the network layout must be fail-safe. A fail-safe network allows to make calls even if the network controller fails. To achieve this, 'emergency' call stations must be put in the system. However, it is not possible to put them just anywhere in the system.

33.7.2 Rules

When creating a fail-safe layout, observe the following rules:

1 Label the call station as an 'emergency' call station using the configuration section of the web interface (see table 44.13).

2 The emergency call station must have a supervised back-up power supply. If the network controller fails, it cannot provide power to the system bus anymore. The call station, however, must remain functional and therefore it must be powered by another power source. So, connect the emergency call station to the network using a fiber interface that uses a supervised external power supply **or** use an externally powered call station kit.

3 Do not put equipment between the emergency call station(s) and the power amplifier(s) that:
- under normal circumstances uses power from the system bus **and**
- has no back-up power supply connected.

Suppose the network controller fails, then these units are not functioning anymore, because they are not connected to any power source. As a result, it is not possible for them to route signals and therefore they may not be put between the emergency call station(s) and the power amplifier(s).

4 Do **not** put the emergency call station(s) in a tap-off. The emergency call stations must be in the main network. This is the only way to ensure that calls can be made to all zones.

5 It is **not** allowed to connect local volume control systems to the loudspeakers even if they have a volume override facility. If the network controller is absent, the control outputs that activate the volume override systems are not activated anymore (even if the control outputs are located on power amplifiers or audio expanders). Furthermore, a local volume control system disturbs the operation of the line supervision. The line supervision set uses the loudspeaker line. Any volume control in the line would attenuate the 20 kHz pilot tone of the supervision-master too much for the supervision-slave to work correctly.

33.8 IP Addresses

In the Praesideo network do not use the following IP addresses for network controllers, PCs with Praesideo software (for example, Logging Server, Logging Viewer), CobraNet Interface, etc.:

- All IP addresses of which the host part is 0. For example, if the subnet mask is 255.255.255.0, do not use the address x.x.x.0.
- All IP addresses of which the host part is 255. For example, if the subnet mask is 255.255.255.0, do not use the address x.x.x.255.
- 127.0.0.1
- 14.0.0.1 - 14.0.0.254
- 24.0.0.1 - 24.0.0.254
- 39.0.0.1 - 39.0.254
- 128.0.0.1 - 128.0.255.254
- 169.254.0.1 - 169.254.255.254
- 172.16.0.1 - 172.16.15.254
- 191.255.0.1 - 191.255.255.254
- 192.0.0.1 - 192.0.255.254
- 192.88.99.1 - 192.88.255.254

You can use the following IP addresses, but remember that it is not possible to access the Internet with these addresses:

- 10.0.0.1 - 10.255.255.254
- 172.16.16.1 - 172.31.255.254
- 192.168.0.1 - 192.168.255.254
- 224.0.0.1 - 239.255.255.254

If you enter IP addresses in the Praesideo software, always omit leading zeroes, since they can cause network problems. For example, type 192.68.0.10 instead of 192.068.000.010.

34 Power Consumption

34.1 Introduction

To calculate the power consumption and power budget in an easy way, the power consumption or power supply of each unit is defined in Watt. A power load uses an amount of Watt, whereas a power source provides a number of Watts.

As long as the total number of Watt required by the power loads in the system are equal or less than the total amount of Watt provided by the power sources, normally no external power supplies are needed to feed additional power to the system.

34.2 Power consumption

See table 34.1 for a list of all power sinks in the Praesideo system.

table 34.1: Power consumption

Type no.	Description	Watt
PRS-4AEX4	Audio Expander	9.0
LBB4404/00	CobraNet Interface	11
PRS-4OMI4	OMNEO Interface	10
PRS-NSP	Network Splitter	3.9
PRS-FIN(S) PRS-FINNA	Fiber Interface	4.6
PRS-1P500	Power Amplifier 1 x 500 W	0.0*
PRS-2P250	Power Amplifier 2 x 250 W	0.0*
PRS-4P125	Power Amplifier 4 x 125 W	0.0*
LBB4428/00	Power Amplifier 8 x 60 W	0.0*
PRS-1B500	Basic Amplifier 1 x 500 W	0.0*
PRS-2B250	Basic Amplifier 2 x 250 W	0.0*
PRS-4B125	Basic Amplifier 4 x 125 W	0.0*
PRS-8B060	Basic Amplifier 8 x 60 W	0.0*
PRS-16MCI	Multi Channel Interface	0.0*/ 12
LBB4430/00	Call Station Basic	4.4
LBB4432/00	Call Station Keypad	1.3
PRS-CSNKP	Numeric Keypad	1.6
PRS-CSM	Call Station Module	6.2
PRS-CSKPM	Call Station Keypad Module	1.2
PRS-CSI	Call Station Interface	3.7
PRS-CSR	Remote Call Station	2.9
PRS-CSRM	Remote Call Station Module	4.0
PRS-CRF	Call Stacker	4.2

Note
All items with an * do not consume power supplied by the Praesideo system.

Note
The power for the multi channel interface can be supplied by a connected basic amplifier or by the system. Refer to 10.3.3.
If the multi channel interface receives power from a connected basic amplifier, the power load on the Praesideo system is 0 W.
If the multi channel interface receives power from the Praesideo system, the power load is 12 W. Refer to table 34.1.

34.3 Battery capacity calculation

An essential part of an emergency sound system is the backup power source. For compliancy with EN54-16, it is required that the power source complies with EN54-4. Often a battery pack with a charger is used as backup power source. To calculate the required battery capacity, an MS Excel sheet is provided on the distribution DVD in the Tools folder, the Praesideo Power Requirement Calculator. The accompanying application note describes how to use this program.

If the Praesideo Power Requirement Calculator is not used for battery capacity calculation, take the following into consideration:

- In case the mains power fails, the battery capacity should be sufficient to address all zones in case of an emergency.
- BGM should be stopped while the system is in the emergency state and/or is running on batteries, so the batteries are not loaded unnecessarily.
- The current consumption of the amplifiers is the main load for the batteries. Most standards require that the battery capacity is sufficient for 24 hours of idle use (no calls, no BGM), followed by emergency announcements or tones for 30 minutes to all zones. The power consumption of the amplifiers depends on the level of the output signal and the connected load. Because the amplifiers are Class D amplifiers

the power consumption scales with the output power in an almost linear way.
- The idle power consumption is specified in the amplifier section of the manual and should be divided by 48V to get the idle supply current for that amplifier, and then multiply by 24 hours to get the required battery capacity in Ah for that amplifier in idle state.
- For EN54-16 systems, the use of the amplifier power save mode is not permitted.
- During emergency calls often an alarm tone is broadcast. The maximum level of such a tone is -3dB, corresponding to half the rated output power. The -3dB power consumption of the amplifiers is also specified in the technical data section. Divide by 48V and multiply by 0.5 to get the required battery capacity in Ah for that amplifier for a maximum level alarm tone during 30 minutes. In case the amplifier is only partly loaded the battery capacity can be reduced accordingly. In case live speech or spoken messages are used instead of tones, the capacity can be halved again because the rms output level of speech is typically < -6dB for full output. In case an alarm tone has less than 100% duty cycle (i.e. contains a silence period) the capacity can be reduced accordingly. In case the output level is less than the maximum output level, again the capacity can be reduced accordingly.
- For spare amplifiers only the idle current consumption should be taken into account.
- The power consumption of all units that are powered by the network controller is given in section 34.2. Add up for all connected units, divide by 48V and multiply bij 24.5 hours to get the required battery capacity in Ah for these units.
- Take the sum of all calculated battery capacities and multiply by 1.25, as a margin to compensate for battery capacity loss due to aging of the batteries.

To reduce the risk of making errors, it is strongly recommended to use the Praesideo Power Requirement Calculator.

34.4 Power sources

By default, the only power source in the system is the network controller. Each system bus connector on the rear of the network controller provides 55 Watt.

Note
If you create a redundant ring and you do not use additional power supplies, you can connect up to 55 Watt to the network controller. This is to ensure that when there is a fault in the network close to one of the system bus connectors of the network controller, the other system bus connector can still feed the entire network.

If more power is needed, external power supplies must be used to feed the system. The following units have a provision for connecting external power supplies:
- PRS-NSP Network Splitter. An external power supply that is connected to a network splitter only adds power to the tap-offs.
- PRS-FIN(S), PRS-FINNA Fiber Interface. An external power supply that is connected to a fiber interface only adds power to the Praesideo system bus.
- PRS-CSM Call Station Module. An external power supply that is connected to a call station module only adds power to the call station module.
- PRS-CSI Call Station Interface. An external power supply that is connected to a call station interface only adds power to call station interface and optionally to the connected remote call station (module).
- PRS-CSR Remote Call Station. An external power supply that is connected to a remote call station only adds power to the remote call station and optionally to the connected call station interface.
- PRS-CSRM Remote Call Station Module. An external power supply that is connected to a remote call station module only adds power to the remote call station module and optionally to the connected call station interface.

The amount of Watt provided by an external power supply is calculated as follows:

$$P = U \cdot I$$

P = power (W)
U = DC voltage (V)
I = DC current (A)

Because all the Praesideo units have built-in switched mode power supplies, the power consumption is virtually constant and within a certain range independent of the supply voltage V. The lower V is, the higher I will be.

34.5 Cooling capacity

A simple formula is used to calculate the required cooling capacity of an air conditioner for a technical room where Praesideo equipment is installed. It is based on the fact that only power amplifiers and basic amplifiers contribute to the heat generated in a room; the contribution of other Praesideo equipment is negligible. The maximum ambient temperature for Praesideo rack-mounted equipment is 55 ºC.

Energy is power multiplied by time. The unit of energy is Joule; a Joule is the same as a Watt*second. Therefore, one Watt of dissipation inside the rack during a period of one second results in one Joule of energy.
The calculation is based on the LBB4428 amplifier, since all other amplifiers are slightly more efficient. An LBB4428 consumes 800 W during full power operation, so with an output of 480 W (8 channels of 60 W), the amplifier dissipates the difference (320 W). The theoretical energy that is produced as heat inside the unit is 320 Watt * 3600 seconds = 1,152 kJoule each hour, or 27,648 kJ each day (24 hours). In reality, however, the energy will be a lot less. The Praesideo amplifiers are only allowed to be driven:

- at full power for 1 minute,
- at half power (-3dB) for 30 minutes for emergency tones (these are generated at -3 dB level),
- continuously at quarter power (-6dB) for calls or emergency announcements, or for BGM.

The continuous quarter power limitation gives enough margin to use the amplifier well into the limiter, because the crest factor of speech is around 8..10 dB, and for music also at least 6 dB. So, this is a safe worst-case margin.

Based on this, the maximum heat energy generated in a day (24 hrs) is:
(800 W - 480 W) * 1 minute + (397 W - 240 W) * 30 minutes + (228 W - 120 W) * 1400 minutes = 320 W * 60 s + 157 W * 1800 s + 108 W * 84,000 s = 9,373,800 Ws = 9,374 kJ.
This is equivalent to a light bulb of 110 W for a single Praesideo amplifier of any type. The power dissipation of the amplifiers should be summed. To calculate in BTU (British Thermal Units), divide the amount of kJ by 1.055. To calculate in kcal, divide the amount of kJ by 4.184. To calculate the heat production per hour instead of per day, divide by 24.

So 9,400 kJ/day = 9.4 MJ/day = 2,240 kcal/day = 8,900 BTU/day = 390 kJ/hr = 93 kcal/hr.

35 Preventive maintenance

The system requires minimum maintenance. To keep the system in good condition, do the following:

35.1 Clean air inlets

The power amplifiers can collect dust as a result of the internal fans. Once a year you should use a vacuum cleaner to clean the air inlets of all units in the 19-inch racks.

35.2 Change battery

The battery on the main board of the network controller needs to be replaced before failure. Once every eight years, change the battery. The battery is a 3.0 V type CR2032. Unpower the unit before changing the battery. After replacing the battery, the time and date settings of the PRS-NCO3 will be lost and must be re-entered (see section 5.6.8).

36 PRS-SW Praesideo Software DVD

36.1 Introduction

The PRS-SW Praesideo Software DVD contains the Praesideo system software as well as the manuals and freeware audio tools.

The following table shows for all the released software versions of Praesideo which Praesideo components are supported. In general new software versions are backwards compatible and support previous version hardware products, except for previous versions of the network controller.

Software version	Network controller	Amplifiers	Call stations	Keypads	Call Stacker	Audio expander	CobraNet interface	OMNEO interface	Line/Lsp supervision	PC call station
1.00-1.30	LBB4401/00	LBB4421/00 LBB4422/00 LBB4424/00	LBB4430/00 LBB4433/00	LBB4432/00 LBB4434/00		LBB4402/00			LBB4442/00	
2.00		+ LBB4428/00								
2.10							LBB4404/00			
2.20		+ LBB4421/10 LBB4422/10 LBB4424/10 PRS-1P500** PRS-2P250** PRS-4P125**							+ LBB4440/00 LBB4441/00 LBB4443/00	
2.30-2.36			+ LBB4437/00 LBB4438/00 LBB4439/00							
3.0x	PRS-NCO-B	+ PRS-16MCI PRS-1B500 PRS-2B250								
3.10		+ PRS-4B125 PRS-8B060	+ PRS-CSI PRS-CSR PRS-CSRK	+ PRS-CSNKP	PRS-CRF					PRS-SWCS PRS-SWCSL PRS-CSC
3.20-3.61*										+ PRS-TIC
4.00	PRS-NCO3									
4.10			+ PRS-CSM PRS-CSRM	+ PRS-CSKPM		+ PRS-4AEX4				
4.30								PRS-4OMI4		

* Version 3.61 also includes support for the PRS-4AEX4.
** PRS-1P500, PRS-2P250 and PRS-4P125 with HW release 5.0 or higher need software version 3.40 or higher.

Some examples show how to read this table:

- The LBB4401/00 network controller can be used with software version 1.00 - 2.36, the PRS-NCO-B with software versions 3.00 - 3.61, the PRS-NCO3 with versions 4.00 and higher.
- The audio expander LBB4402/00 works with all software versions from 1.00 onwards. Its successor, the PRS-4AEX4, needs version 4.10 or higher, although also version 3.61 will do. These later software versions continue to support the older LBB4402/00.
- The PRS-NCO-B, the PRS-16MCI and the basic amplifiers PRS-1B500 and PRS-2B250 only work with software version 3.00 or higher. The other basic amplifiers PRS-4B125 and PRS-8B060 even need version 3.10 or higher.
- With version 3.10 also support for the PRS-CSI, PRS-CSR, PRS-CSRK, PRS-CSNKP, PRS-CRF, PRS-SWCS, PRS-SWCSL and PRS-CSC was added.
- To be able to use the PRS-4OMI4, a PRS-NCO3 is needed with at least version 4.30.

36.2 Starting the DVD

Put the PRS-SW Praesideo Software DVD in the DVD drive of the configuration PC. If autorun is enabled for the DVD drive, a screen similar to the one in figure 36.1 is opened in the web browser program. If the DVD does not start automatically:

1 Go to *Start > Run.*
2 Enter *X:\setup.exe.* (Replace X with the character of the DVD drive).

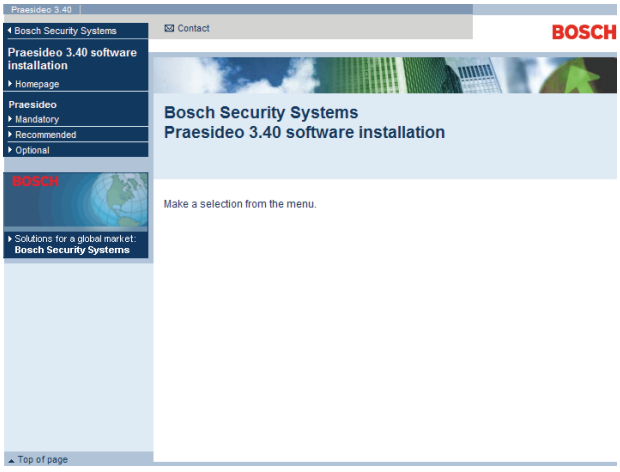


figure 36.1: Software installation page

36.3 Contents

36.3.1 Introduction

The software on the Praesideo DVD is divided in three categories:

- Mandatory packages (see chapter 37).
- Recommended packages (see chapter 38).
- Optional packages (see chapter 39).

37 Mandatory packages

37.1 Introduction

The mandatory software installation procedure consists of the following steps:

1 Installation of all mandatory software packages on the configuration PC (see section 37.2).
2 Establishing a connection between the configuration PC and the network controller (see section 37.3).
3 Transferring system files from the configuration PC to the network controller (see section 37.4).
4 Installing firmware on the network controller and other system units (see section 37.5).

37.2 Installation on PC

37.2.1 Introduction

The following mandatory software packages must be installed on the configuration PC:

- *Praesideo core* software (see section 37.2.2).
- *SVG viewer* (see section 37.2.3).
- *Windows script* (see section 37.3)

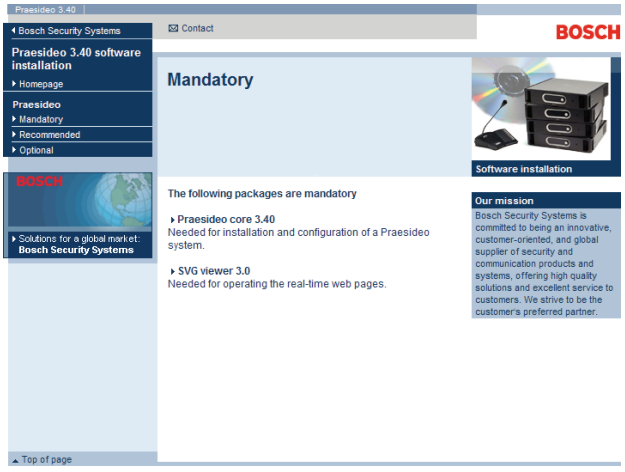


figure 37.1: Mandatory software packages page

37.2.2 Praesideo core software

The *Praesideo core* software consists of the *File Transfer Application* and all files that must be transferred to the network controller and other units in the system. Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2). A screen similar to the one in figure 36.1 appears.
2 Go to *Mandatory* > *Praesideo core x.yy.zzzz* (where *x.yy* is software release number and *zzzz* is the build number). A *File Download* window appears.
3 Click the *Run* button to start the *Praesideo core* software setup program.
4 Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

37.2.3 SVG viewer

For web browsers without native SVG support or with insufficient SVG support (many versions of Internet Explorer), the *SVG viewer* must be installed on the configuration PC to be able to operate the audio processing part of the web interface. Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2). A screen similar to the one in figure 36.1 appears.
2 Go to *Mandatory* > *SVG viewer*. A *File Download* window appears.
3 Click the *Open* button to start the *SVG viewer* setup program. Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

37.3 Establishing connection

After the mandatory software has been installed on the configuration PC (see section 37.2), the configuration PC must establish a connection with the network controller to be able to transfer the system files to the network controller and other units in the system (see section 37.4). Proceed as follows:

1 If the network controller is connected to an existing Ethernet, ask the network administrator for:
   - An IP address for the network controller.
   - A suitable subnet mask.
   - The IP address of the default gateway for the network controller.
2 Go to screen *2Ba* of the menu display of the network controller to set the IP address of the network controller. See section 5.5 for the configuration menu.
3 Go to screen *2Bb* of the menu display of the network controller to set the subnet mask of the network controller.
4 Go to screen *2Bc* of the menu display of the network controller to set the default gateway for the network controller.
5 Connect the network controller to an existing Ethernet network or directly to the configuration PC.
6 On the configuration PC, go to *Start* > *Run* and enter *cmd* to open a command prompt window.
7 Ping the network controller. For example, if the IP address of the network controller is 192.168.0.15, enter *ping 192.168.0.15*.
   - If no connection is possible, a screen similar to the one in figure 37.2 appears.
   - If a connection can be established, a screen similar to the one in figure 37.3 appears.

```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ping 192.168.0.15

Pinging 192.168.0.15 with 32 bytes of data:

Request timed out
Request timed out
Request timed out
Request timed out

Ping statistics for 192.168.0.15:
    Packets: Sent = 4, Received = 0, Loss = 4 (100% loss)

Approximate round trip in milli-seconds:
    Minimum = 0 ms, Maximum = 0 ms, Average = 0 ms
```

figure 37.2: Incorrect communication

```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ping 192.168.0.15

Pinging 192.168.0.15 with 32 bytes of data:

Reply from 192.168.0.15: bytes = 32 time<10 ms  TTL=128
Reply from 192.168.0.15: bytes = 32 time<10 ms  TTL=128
Reply from 192.168.0.15: bytes = 32 time<10 ms  TTL=128
Reply from 192.168.0.15: bytes = 32 time<10 ms  TTL=128

Ping statistics for 192.168.0.15:
    Packets: Sent = 4, Received = 4, Loss = 0 (0% loss)

Approximate round trip in milli-seconds:
    Minimum = 0 ms, Maximum = 0 ms, Average = 0 ms
```

figure 37.3: Correct communication

8 Go to *Start* > *Programs* > *Bosch* > *Praesideo* > *FT Application* to start the Praesideo *File Transfer Application*. A screen similar to the one in figure 37.4 appears.

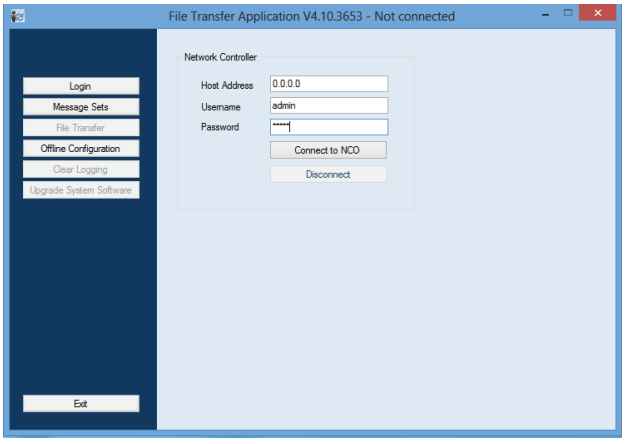


figure 37.4: Connecting to the network controller

9 Enter the IP address of the network controller in the *NCO address* field.

10 Enter the correct user name in the *Username* field and the correct password in the *Password* field.
- If no software has been transferred to the network controller before, the default user name is *target* and the default password is *password*.
- If software has been transferred to the network controller before, the default user name is *admin* and the default password is *admin*.

11 Click the *Connect to NC* button to establish a connection with the network controller. A notification appears.

37.4 Upgrade system software

A number of the system files that have been installed on the configuration PC (see section 37.2), must be transferred to the network controller. Proceed as follows:

1 Click the *Upgrade system software* button. A screen similar to the one in figure 37.5 appears.

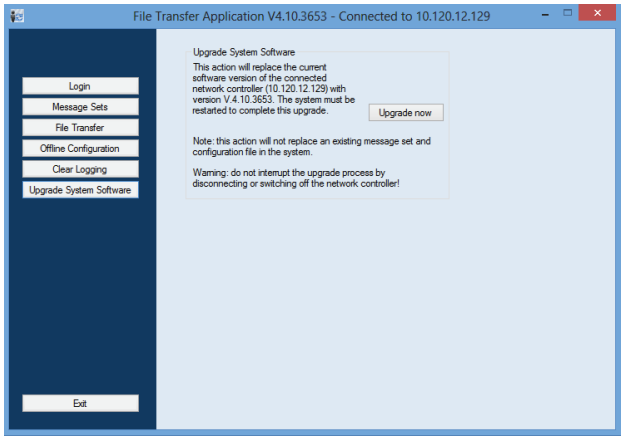


figure 37.5: File transfer screen

2 Click the *Upgrade now* button. A notification is displayed when the file transfer process is finished.

3 Switch the network controller off and then on to restart.

37.5 Upgrade firmware

After the system files have been transferred to the network controller (see section 37.4), the firmware files must be installed on all units, including the network controller. Installing new firmware will generate a fault event (*Unit Missing*), since the units are temporarily 'removed' from the network. This fault is automatically resolved and can be acknowledged and reset.

Note
All units must run the same firmware release. Do not use the system or switch units on or off while upgrading the firmware.

Proceed as follows:

1 On the configuration PC, start the web browser program.
2 Enter the IP address of the network controller in the address bar. Do not use leading zeros in the IP address. For example, if the IP address that is displayed on the network controller is 192.168.000.015, enter 192.168.0.15 in the address bar. A screen similar to the one in figure 37.6 appears.

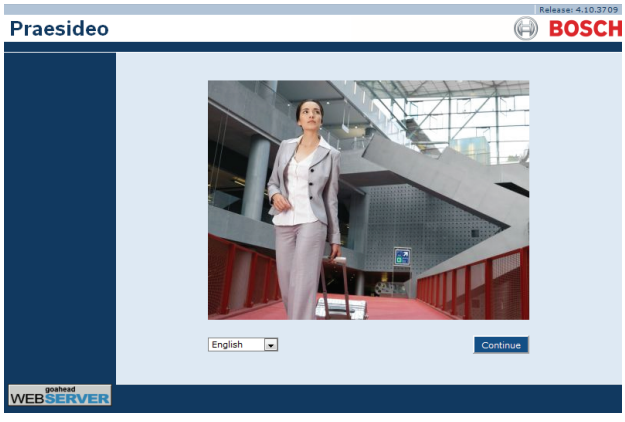


figure 37.6: Praesideo web interface home page.

Note
If the network controller and PC are connected to an existing Ethernet, which uses a proxy for normal Internet traffic, it is possible that the network controller cannot be reached. In that case, disable the proxy server in Windows LAN settings or add the name of the network controller to the hosts file in the Windows system directory and use this name for the connection.

3 Select a language for the web interface at the bottom of the page.
4 Click the *Continue* button to access the web interface. A screen similar to the one in figure 37.7 pops up.

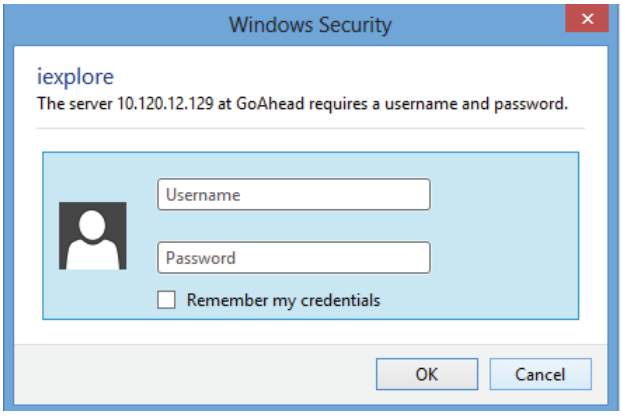


figure 37.7: Logon window

5 Enter the user name in the *User Name* field and the password in the *Password* field and click *OK* to open the web interface. A screen similar to the one in figure 37.8 appears.

Note
The default user name is *admin*, the default password is *admin.*

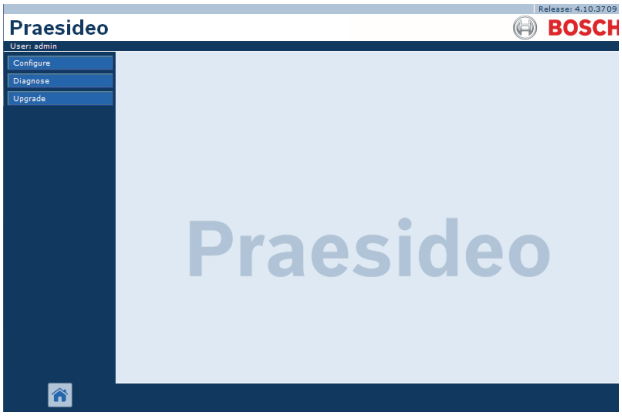


figure 37.8: Web interface start page.

6 Click the *Upgrade unit firmware* button in the navigation bar to open the *Upgrade unit firmware* menu. A screen similar to the one in figure 37.9 appears. The title of the page shows the release number of the firmware that the system expects. The release number of the firmware that is currently running is shown in the Firmware version field.

Note
It is not possible to upgrade firmware within 5 minutes upon start-up of the network controller.

7 Click the *Upgrade unit firmware* buttons in the *Upgrade unit firmware* field to upgrade the firmware of the units. The progress of the upgrading process is displayed in the *Progress* field.

Note
The PRS-FINNA Fiber Interface does not contain firmware and is not recognized in the system. Only PRS-FIN(S) Fiber Interfaces are shown in the configuration pages.

8 In case of faults, click Undefined in the navigation bar of the web interface to view a list of all units for which the firmware upgrade failed. Disconnect and connect these units again and refresh or reload the Undefined page before retrying to upgrade the software.

9 If the upgrade was not successful, try one or more of the following actions:

- Restart the network controller.
- Power off/on the unit that failed.
- Refresh the webpage
- Upgrade unit firmware for all units in the *Undefined* list.
- Upgrade unit firmware for all units with status *Incorrect version.*
- Contact your local service department.

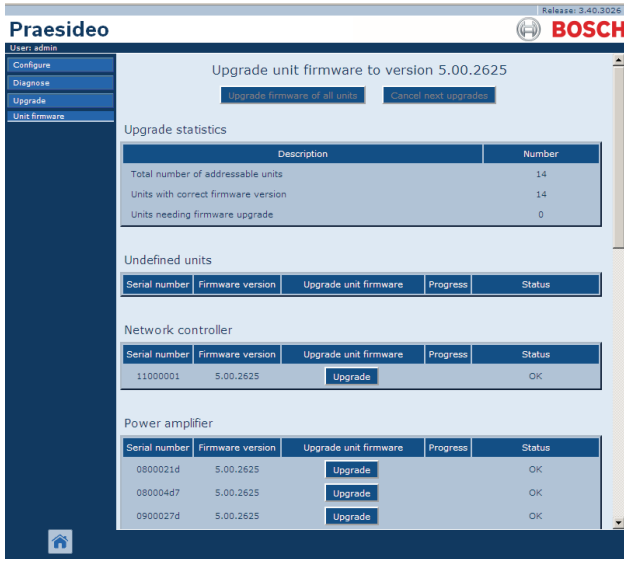


figure 37.9: Upgrade unit firmware page

37.6 Clear logging events

After the system has been configured with the configuration software (see chapter 41), the *File Transfer Application* can be used to delete all logging events from the network controller in order to deliver a system with a clean logging database to the customer. Proceed as follows:

1 Click the *Clear logging* button in the navigation bar. A screen similar to the one in figure 37.10 appears.

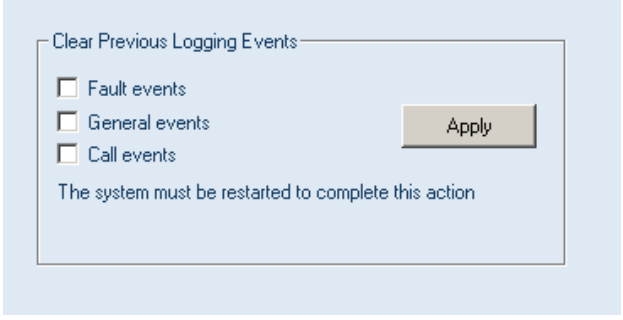


figure 37.10: Clear logging

2 If the fault events must be deleted from the network controller, put a check mark in the *Fault events* check box.
3 If the general events must be deleted from the network controller, put a check mark in the *General events* check box.
4 If the call events must be deleted from the network controller, put a check mark in the *Call events* check box.
5 Click the *Apply* button and restart the system to delete the selected type of events from the network controller.

38 Recommended packages

38.1 Introduction

There is no specific installation procedure for the recommended packages. However, it is advised to install *Adobe reader* first (see section 38.2). The recommended packages do not have to be installed on the configuration PC; they can be installed on any PC.

38.2 Adobe reader

The *Acrobat reader* must be installed to view the release notes and manuals. Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2). A screen similar to the one in figure 36.1 appears.
2 Click the *Recommended* link. A screen similar to the one in figure 38.1 appears.

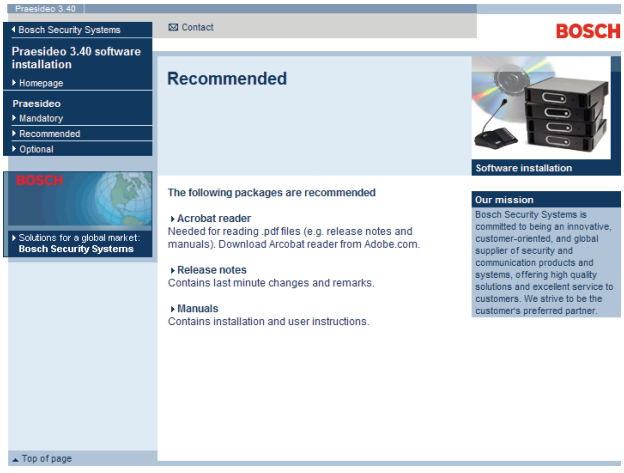


figure 38.1: Recommended software packages page

3 Click the *Acrobat reader x.x* hyperlink (where *x.x* is the version). A *File Download* window appears.
4 Click the *Open* button to start the *Acrobat reader* setup program. Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

38.3 Release notes

The release notes contain last minute changes and remarks in the *Adobe Portable Document Format* (PDF). To view the document, *Acrobat Reader* (see section 38.2) is required.

38.4 Manuals

The installation and user instructions are available as a digital document in the *Adobe Portable Document Format* (PDF). All references to pages, figures, tables, etc. in this digital document contain hyperlinks to the referenced location. To view the document, *Acrobat reader* (see section 38.2) is required.

39 Optional packages

The optional packages (see figure 39.1) can be installed on any PC that meets the requirements that are put on it by the applications themselves. See chapter 56 and further for more detailed descriptions of the optional packages.

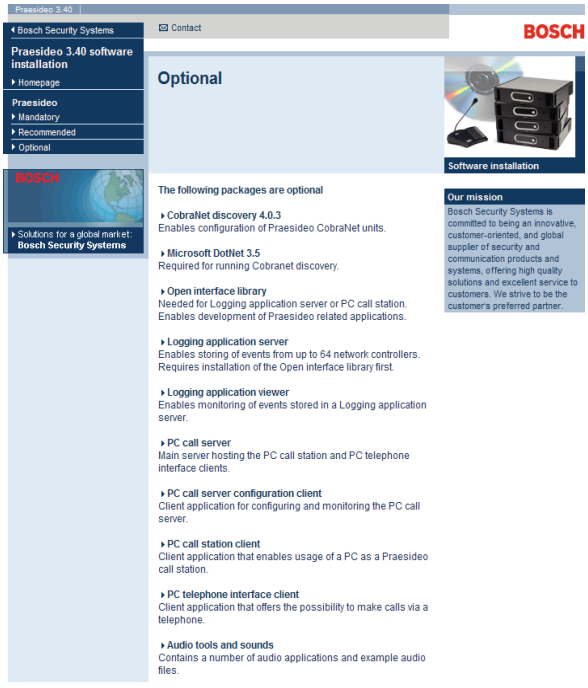


figure 39.1: Optional software packages page

40 Troubleshooting

40.1 Introduction

Several web browser settings are relevant to the proper functioning of the configuration web pages of the Praesideo system. The most important ones are the security settings and connections settings. Note that these settings can also be modified or limited by the network administrator, who is responsible for the network and/or PC that is used for configuring the Praesideo system.

40.2 Security settings

Security settings can prevent for example the execution of the SVG viewer in Internet Explorer, which is needed to display the equalizer response on the web page. The preferable solution is to add the Praesideo system to the list of the trusted sites, by entering the IP-number of its network controller. This list can be found via *Start* > *Control Panel* > *Internet Options....*> *Security* > *Sites*. Here, you can also lower the protection level for these trusted sites. The protection level for non-listed sites is not affected.

40.3 Connections

The Local Area Network settings (*Start* > *Control Panel* > *Internet Options....*> *Connections* > *LAN Settings*...) can influence the ability to fully access the Praesideo system. Because of security considerations Praesideo only accepts one connection at the same time. When a Proxy server is used, it can not be guaranteed that always the same connection will be used. Therefore the address of the Praesideo system should be defined as local address in the Proxy server configuration. This is typically done in the configuration script provided by the network administrator, or the Proxy server should be disabled altogether.

Other possible sources of problems are virus checkers, popup blockers, anti spyware software and firewalls. Try to disable this type of software during the Praesideo configuration or configure it in such a way that it accepts the Praesideo system as a trusted site.

41 Configuration software

41.1 Introduction

The network controller is equipped with a web interface. The web interface is accessible using the configuration PC connected to the network controller and can be used to configure and diagnose the Praesideo system.

Note
The web interface is not factory installed on the network controller. Putting the web interface on the network controller is part of the software installation process (see chapter 36).

41.2 Starting and logging on

Proceed as follows to log on to the web interface:

1 Start a web browser program on the configuration PC.

2 Enter the IP address of the network controller in the address bar. A screen similar to the one in figure 41.1 appears.

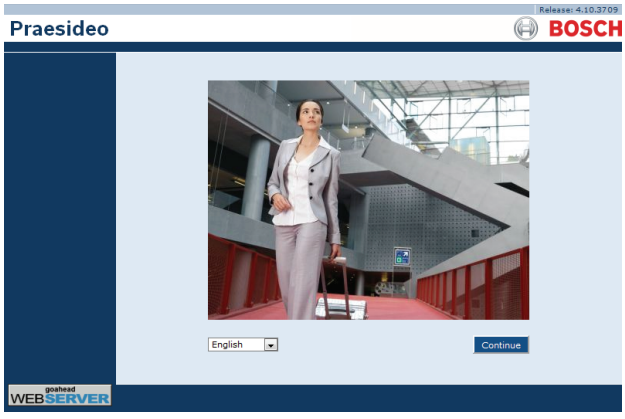


figure 41.1: Home page of the Praesideo web interface

3 Select a language for the web interface at the bottom of the page.

4 Click the *Continue* button to access the web interface. A screen similar to the one in figure 41.2 pops up.

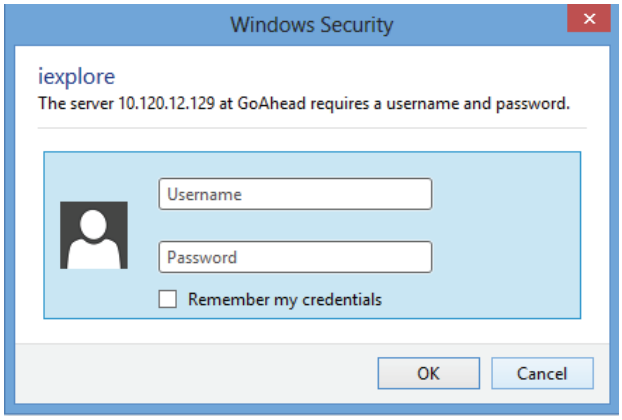


figure 41.2: Logon window

5 Enter the user name in the *User Name* field, enter the password in the *Password* field and click *OK* to open the web interface. A screen similar to the one in figure 41.3 appears.

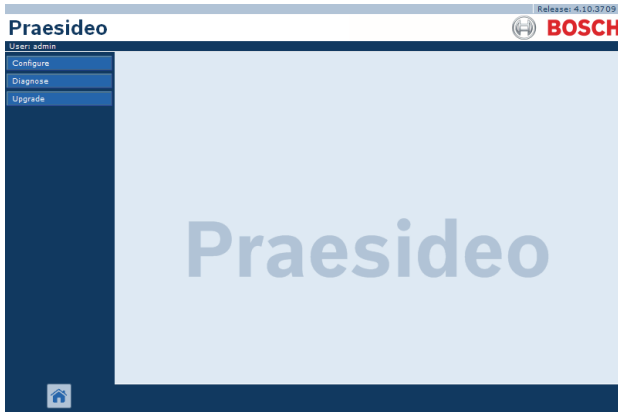


figure 41.3: Web interface elements

Note
The default user name is *admin*, the default password is *admin*. The password can be changed by adding a new user with administrator rights and then deleting the default user (see section 42.3 and 42.4).

41.3 Overview

The web interface (see figure 41.3) contains the following elements:

- **Configure** - A button that opens the configuration section of the web interface (see section 41.4).

- **Diagnose** - A button that opens the diagnostics section of the web interface (see section 51).
- **Upgrade** - A button that opens the upgrade firmware part of the web interface (see section 41.6).
- **Main frame** - A frame that displays the requested page. See chapter 42 to 49 for descriptions of the screens in the *Configure* section and chapter 51 for a description of the page in the *Diagnose* section.

41.4 Configure section

Introduction

Using the *Configure* section of the web interface, the *Praesideo* system can be configured. The order of the menu items in the *Configure* section, which is opened when the *Configure* button is clicked (see figure 41.4), represents the recommended workflow for configuring a Praesideo system.

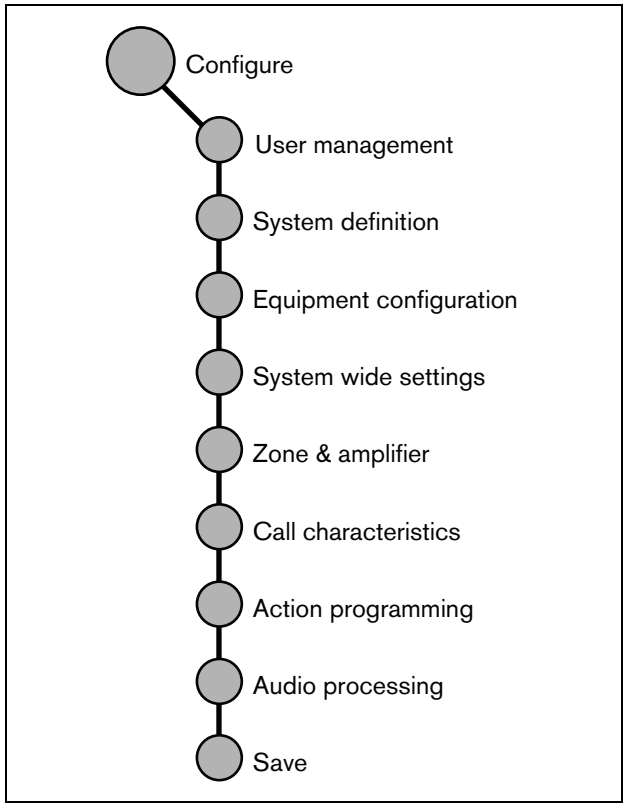


figure 41.4: Configure section

41.4.1 Overview

The *Configure* section contains the following groups of pages (see figure 41.4):

- On the *User management* pages, the accounts that provide access to the Praesideo web interface can be managed (see chapter 42).
- On the *System definition* pages, the equipment of which the system consists can be registered (see chapter 43).
- On the *Equipment configuration* pages, each piece of equipment that has been added using the *System definition* pages can be configured (see chapter 44).
- On the *System wide settings* pages, a number of general, system wide settings can be configured (see chapter 45).
- On the *Zone & amplifier* pages, the zones and amplifiers can be configured (see chapter 47).
- On the *Call characteristics* pages, call macros can be defined (see chapter 47).
- On the *Action programming* pages, the keys of the keypads and the control inputs can be configured. (see chapter 48).
- On the *Audio processing* pages, the audio processing parameters of the audio inputs and outputs in the system can be set (see chapter 49).
- On the *Save* page, the current configuration can be saved (see section 41.4.4).

41.4.2 Off-line configuration

It is possible to carry out the configuration of the Praesideo system off-line or edit the existing configuration off-line using the configuration PC:

1 Go to *Start* > *(All) Programs* > *Bosch* > *Praesideo* > *FT Application* to start the Praesideo *File Transfer* application.
2 Click the *Offline Config* button. A window appears in which the configuration file that will be used for the offline configuration, can be chosen. It is also possible to create a new, empty configuration file. The default subdirectory is **<data directory>\Bosch\Praesideo <release>\Programs\FT Application**, the default filename is **Praesideo.cfg**. The location of the **<data directory>** in an English Windows version is **Users\<user>\Documents**.

After clicking the *OK* button, a screen similar to the one in figure 41.1 appears. Logging on to the off-line version of the web interface is similar to logging on to the 'real' web interface.

Praesideo releases before version 4.3 use the standard Ethernet port 80 for the local Praesideo web server on the PC for offline configuration. Version 4.3 and later use port 9402 instead to circumvent Windows access control for port 80, introduced with Windows 8.1. In case of conflicts with another program that uses port 9402, a different port number can be specified via an FTA command line parameter, in the range 0 - 65535.

41.4.3 Submitting

Each page in the *Configure* section of the web interface contains a *Submit* button. Always click this button after making changes, otherwise the changes are lost. Clicking the *Submit* button, however, does not mean that the changes are saved (see section 41.4.4).

41.4.4 Saving

Proceed as follows to save the current configuration:

1 Go to *Configure* > *Save*. Then a (limited) confidence check on the configuration is executed automatically. Now there are three different possibilities:

- When there are no issues found, and the configuration is done on-line, three buttons are displayed to enable the user to *Save the configuration*, *Restart the system* or *Save the configuration and restart the system*. See figure 41.5. When the configuration file is saved to the network controller, the configuration is not activated until the network controller is restarted. If the new configuration must be saved and activated, click the *Save the configuration and restart the system* button.

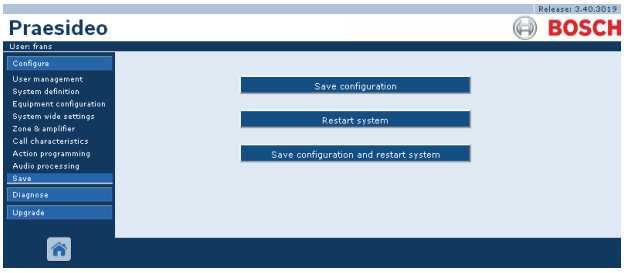


figure 41.5: Save window

- When there are no issues found, and the configuration is done off-line, only one button is displayed to enable the user to *Save the configuration*. Restarting the system is not possible when off-line. In case of an off-line configuration, by default the configuration file is saved in the *Program Files\Bosch\Praesideo\target\rfa\cfg* folder of the configuration PC, but other locations are also possible. This file can be transferred to the network controller using the *File Transfer* application.

- When there are issues found, a message is displayed indicating there are configuration issues to be resolved first. Still it is possible to ignore the errors and save the configuration anyway to continue the configuration at a later time. Only one button is displayed: *Ignore errors and save configuration*. See figure 41.6.

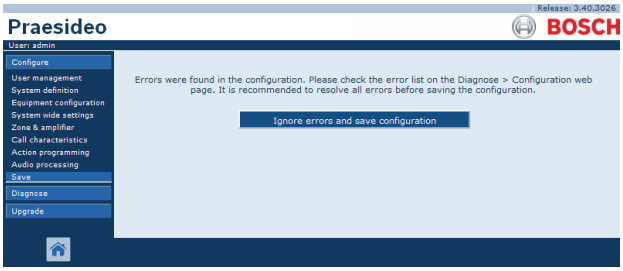


figure 41.6: Ignore errors and save configuration window

2 Click the *Save Configuration and restart the system* button to activate the new configuration. The network controller will be restarted.
The *Save Configuration and restart the system* button is used for activating a new configuration that has been made on-line. But if a new configuration file has been made off-line and has been copied to the network controller then the *Save Configuration and restart the system* button should not be used because the network controller would only reload the existing (unchanged) configuration file. Instead click the *Restart the system* button or switch the network controller off and on again, then the network controller will load the replaced configuration file.

Note
In Praesideo release 3.4 the processor reset identification has been extended for compliancy reasons. However this software modification will flag a *Processor reset* fault for all connected units when performing a *Save the configuration and restart the system*. This will happen for network controllers with a hardware release version HW 20.00 or older. These faults do not indicate a real fault, but are just the result of the restart-action and can safely be acknowledged and reset. From version HW 20.01 onwards, the network controller contains a circuit modification to prevent these unnecessary Processor reset faults.

Note
Audio processing parameters are changed immediately when the *Submit Equalizer* button on the *Audio Processing* pages is clicked. Although the changes are audible, it is important to realize that they are not automatically saved. If the changes are not saved they will be lost when the network controller is reset.

41.4.5 Allowed characters

When entering names for units, inputs, outputs, messages, zones, zone groups, etc., make sure that only the following characters are used:

- letters: A to Z and a to z
- numbers: 0 to 9
- special: # . ( ) [ ] _ - + : and <space>

Note
All other characters are not allowed.

41.4.6 Unique names

When entering names for units, inputs, outputs, messages, zones, zone groups, etc., make sure that all entered names are unique. It is not allowed to use a name for more than one item. The name must not only be unique within a group of items (e.g. unit names), but also within the complete system configuration (e.g. zone groups must have different names than zones). Names that are not unique cause inconsistencies in the configuration database. In turn, these inconsistencies can result in unpredictable system behavior.

41.4.7 Initial values

When the value of a parameter of a configuration item is <*None*>, the parameter has no value yet. For example, when the *Action programming* page of a *Call macro* key is opened for the first time (see section 48.3.7), the value in the *Call macro* field is <*None*>.

When the value of a parameter of a configuration item is <*Default*>, the parameter is set to its default value. For example, if the audio input of a call macro (see section 47.2) is <*Default*>, the configured audio input is the microphone of the call station that started the call macro.

41.4.8 Undo changes

Most pages of the *Configure* section contain a *Cancel* button. By clicking the *Cancel* button, any changes made on the pages are cancelled.

Note
Restart the network controller without saving the changes. to undo all changes.

41.4.9 Enabled items

Configuration items can be enabled and disabled with a checkbox. If a configuration item is enabled, the system is able to generate a fault event when a fault occurs. If a configuration item is disabled, the system cannot generate a fault event when a fault occurs. The web interface puts disabled configuration items in brackets in selection lists. For example, the disabled configuration item *AudioIn01* is displayed as *(AudioIn01)* in selection lists.

41.4.10 Deleting items

When a configuration item is deleted, all configuration items that are related to the deleted configuration item are also deleted. For example, when a power amplifier is deleted from the system definition (see section 43.4), all audio outputs of the power amplifier are also no longer part of the configuration.

41.4.11 Audio inputs and outputs

It is not allowed to use audio inputs and outputs for more than one purpose, since this can cause inconsistencies in the configuration database. In turn, these inconsistencies can result in unpredictable system behavior. For example:

- If an audio input is already part of a call macro (see section 47.2), it is not allowed to use the audio input in a BGM channel (see section 46.5).
- Audio outputs of a power amplifier cannot be assigned to more than one zone.

41.4.12 Downloading configuration

The configuration database can be downloaded to a PC (see chapter 57).

41.4.13 Configuration printing utility

The mandatory Praesideo software (see section 37.1) also installs a configuration printing utility. This utility can read information from configuration files of version 1.1 and higher. The configuration printing utility shows the information on screen in a formatted way to check and/or archive the configuration on paper.

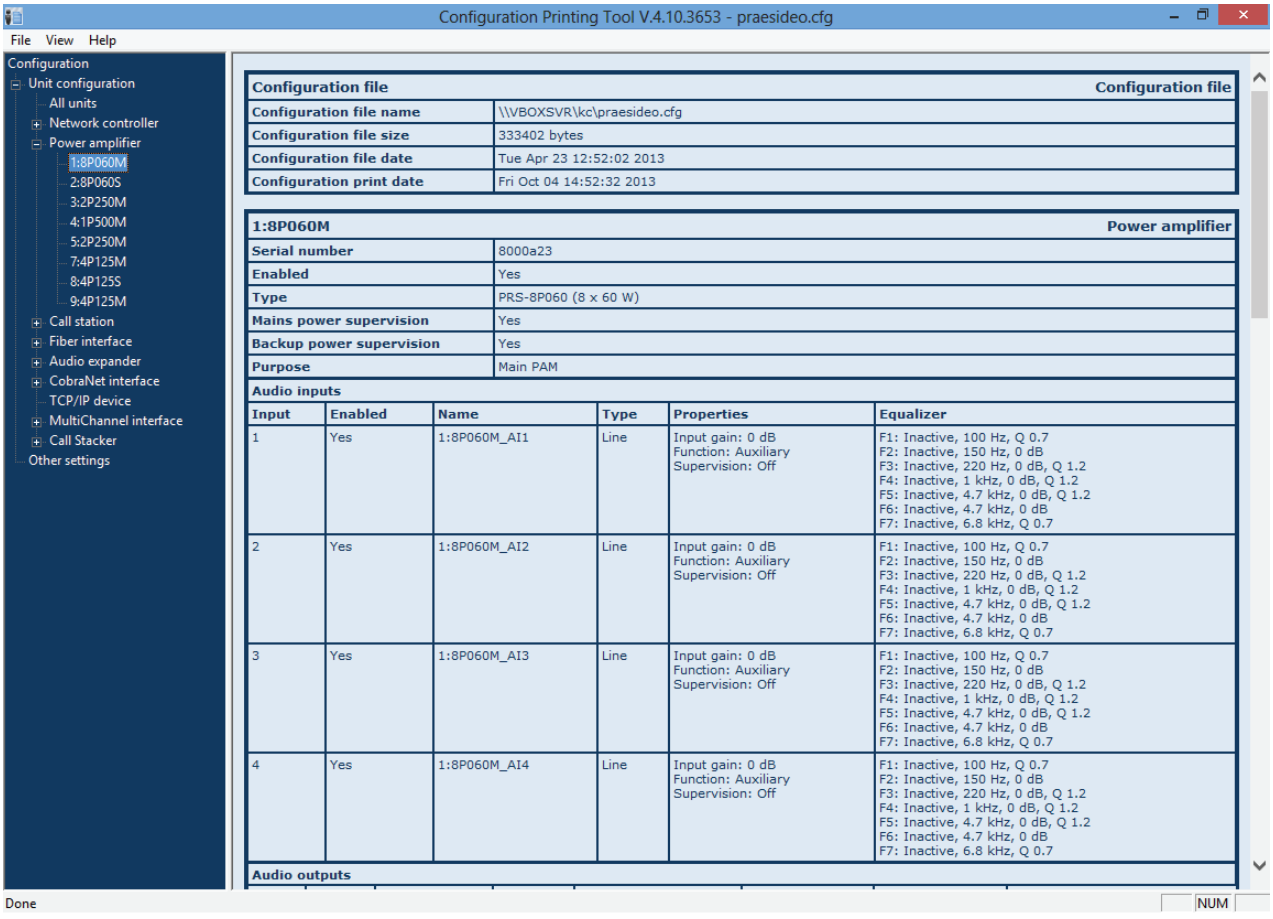


figure 41.7: Configuration printing utility

41.5 Diagnose section

Using the *Diagnose* section, the system installation and configuration consistency can be diagnosed (see chapter 51).

41.6 Upgrade section

Using the *Upgrade unit software* section, the firmware of the units in the Praesideo system can be transferred from the network controller to the units (see chapter 37.5).

42 User management

42.1 Introduction

On the *User Management* pages, the accounts can be managed that provide access to the:

- Praesideo web interface
- Praesideo Open Interface
- *File Transfer* application
- Logging Viewer
- Call stations with numeric keypad

Using the *User Management* pages, it is possible to:

- Add a user (see section 42.3).
- Delete a user (see section 42.4).

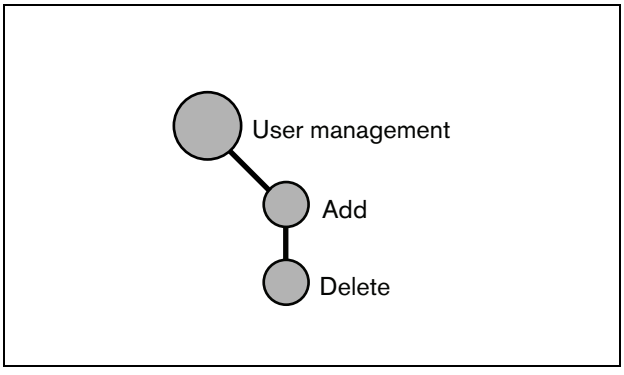


figure 42.1: User management pages

42.2 Accounts

To access the web interface, an account is needed. An account consists of a user name, a password and an authorization level. The authorization level defines to which part of the web interface access is granted. The web interface provides the following authorization levels:

- **Administrator**
  Administrators have access to all parts of the web interface including the *User Management* part.
- **Installer**
  Installers have access to all parts of the web interface except the *User Management* part.
- **User**
  Users have access to the Logging Viewer (see chapter 59).

42.3 Add a user

Proceed as follows to add a new user (i.e. create a new account):

Note
Only *Administrators* can create new accounts.

1 Go to *Configure* > *User management* > *Add*. A screen similar to the one in figure 42.2 appears in the main frame of the web interface.

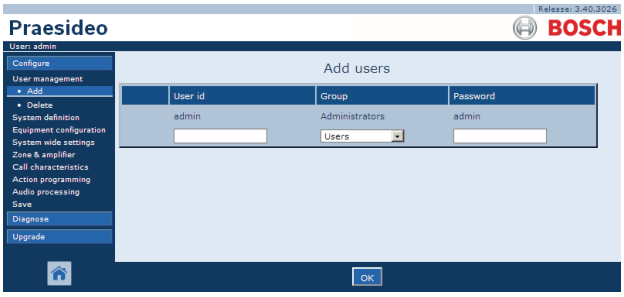


figure 42.2: Add user, step 1

2 Enter the user name for the new user in the *User id* field. It can contain up to 16 characters. For example, *johndoe* (see figure 42.3).

3 Select the authorization level for the new user in the *Group* column. The authorization level defines to which part of the Praesideo web interface access is granted (see section 42.2).

4 Enter the password for the new user in the *Password* field. It can contain up to 16 characters. For example, *password* (see figure 42.3).

Note
Use a password of at least 5 characters. It is important that a password is not easy to guess, since it safeguards unauthorized access to the system that could result in unsafe system configuration.

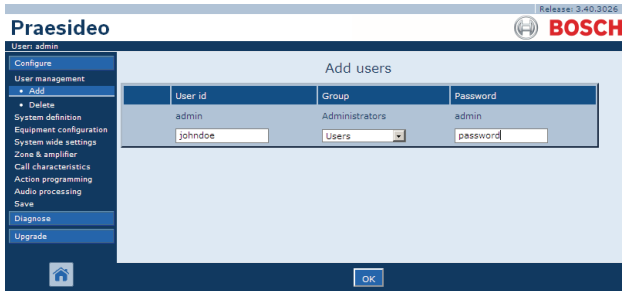


figure 42.3: Add user, step 2 - 4

5 Click the *OK* button to activate the new account. A screen similar to the one in figure 42.4 appears in the main frame of the web interface.

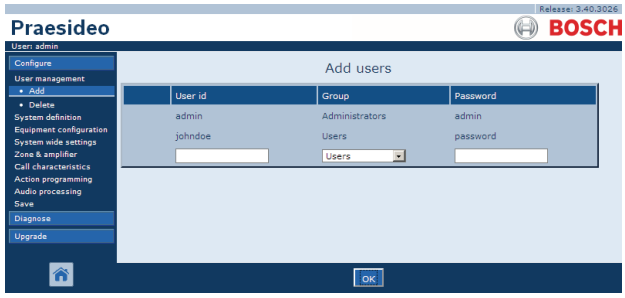


figure 42.4: Add user, step 5

Note
If the user account is used to control access to a call station that has a numeric keypad, the user name and password can only contain digits (0...9), because the keypad does not have alphabetic keys (a...z).

42.4 Delete a user

Proceed as follows to delete a user (i.e. delete an existing account):

Note
Only *Administrators* can delete existing accounts.

Note
An *Administrator* account cannot delete its own account.

Note
For security reasons, it is advisable to first create a new *Administrator* account and then delete the default Praesideo *Administrator* account (i.e. the *admin/admin* account).

1 Go to *Configure* > *User management* > *Delete*. A screen similar to the one in figure 42.5 appears in the main frame of the web interface.

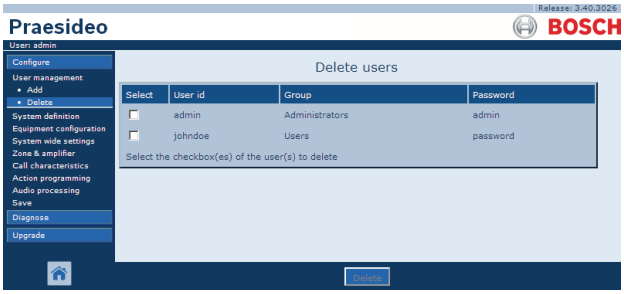


figure 42.5: Delete user, step 1

2 Check the box in front of the account that has to be deleted (see figure 42.6).

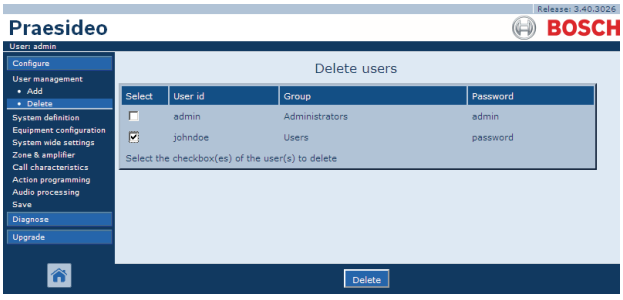


figure 42.6: Delete user, step 2.

3 Click the *Delete* button to delete the account. A screen similar to the one in figure 42.7 appears in the main frame of the web interface. This screen does not contain the deleted account anymore.

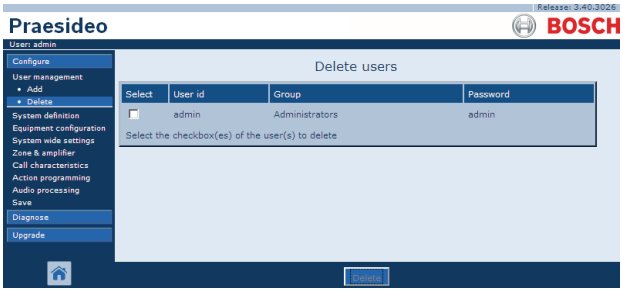


figure 42.7: Delete user, step 3

43 System definition

43.1 Introduction

On the *System definition* pages, the equipment of which the system consists can be registered. Using the *System definition* pages, it is possible to register (add) and unregister (delete) the following pieces of equipment:

- Network controller (see section 43.3).
- Power amplifiers (see section 43.4).
- Multi channel interface (see section 43.5).
- Call stations (see section 43.6).
- Call stacker (see section 43.7).
- Audio expanders (see section 43.8).
- CobraNet interfaces (see section 43.9).
- OMNEO interfaces (see section 43.10)
- Fiber interfaces (see section 43.11).
- TCP/IP devices (see section 43.12).

Note
Equipment that is not listed in the *System Definition* pages, does not have to be configured (e.g. network splitters).

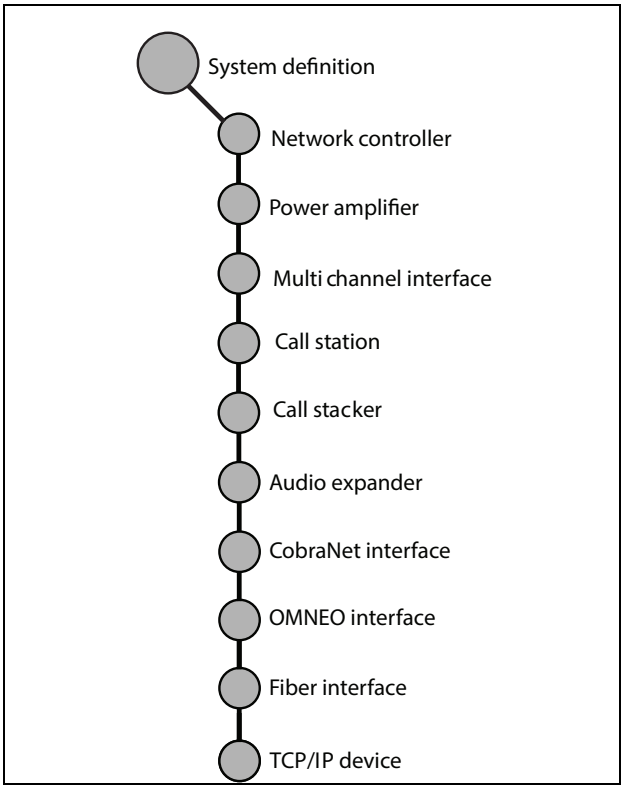


figure 43.1: System definition pages

43.2 Serial numbers

Each Praesideo unit has a serial number, which is needed to register the unit in the system. The serial number is on the unit label on the unit (see figure 43.2).

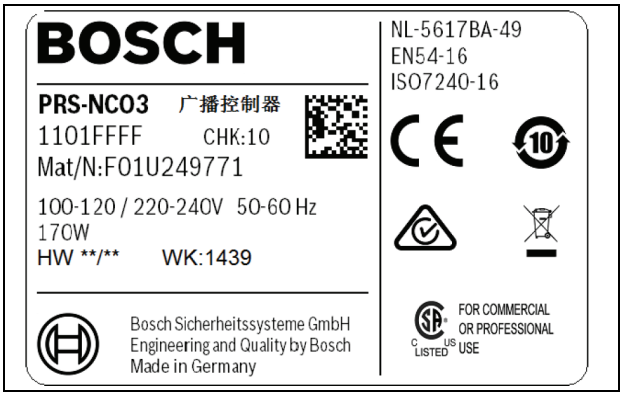


figure 43.2: Unit label

The hexadecimal serial number of a unit consists of 8 digits ranging from 0 to F. The combination of the first and second digit identifies the type of unit.

table 43.1: Serial number ranges (addressable units)

Type no.	Description	ID
PRS-NCO3	Network Controller	11
PRS-16MCI	Multi Channel Interface	1B
PRS-4AEX4	Audio Expander	12
LBB4404/00	CobraNet Interface	1C
PRS-4OMI4	OMNEO Interface	25
PRS-NSP	Network Splitter	14
PRS-FIN(S) PRS-FINNA	Fiber Interface	15
PRS-1P500	Power Amp. 1 x 500 W	0B
PRS-2P250	Power Amp. 2 x 250 W	0A
PRS-4P125	Power Amp. 4 x 125 W	09
LBB4428/00	Power Amp. 8 x 60 W	08
LBB4430/00	Call Station Basic	0C
PRS-CSM	Call Station Module	0E
PRS-CSI	Remote Call Station (Call Station Interface)	1D
PRS-CRF	Call Stacker	1F

Note
If the real serial number is not (yet) known, the temporary serial number 0 can be used for all units. In this way, most of the configuration can be done off-line already. Communication with actual units in the system is only possible when the temporary serial numbers have been replaced by the real serial numbers. Units in the configuration with the serial number 0 are ignored by the actual system in operation.

43.3 Network controller

Proceed as follows to register the network controller:

1 Go to *Configure > System definition > Network controller.* A screen similar to the one in figure 43.3 appears in the main frame of the web interface.

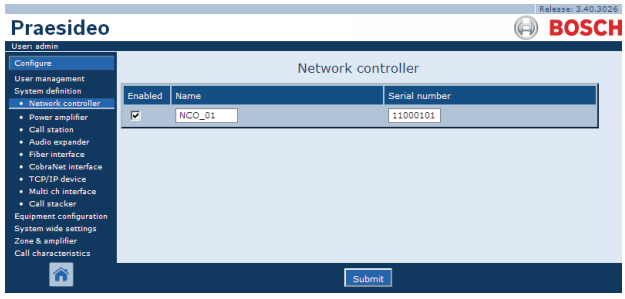


figure 43.3: Register network controller, step 1

2 Enter a name for the network controller in the *Name* field.

Note
The name is also shown on the display of the network controller.

3 Enter the hexadecimal serial number of the network controller in the *Serial number* field.

4 When the network controller is physically present, it can be enabled by ticking the *Enabled* checkbox.

Note
Praesideo checks that all entered characters are hexadecimal characters and that the serial number is 8 characters long and matches the product type, or is *0*.

5 Submit the changes. Note that the changes are not permanent until the configuration is saved. (see section 41.4.3 and section 41.4.4).

43.4 Power amplifier

43.4.1 Add a power amplifier

Proceed as follows to add a power amplifier to the system configuration:

1 Go to *Configure* > *System definition* > *Power amplifier*. A screen similar to the one in figure 43.4 appears in the main frame of the web interface.

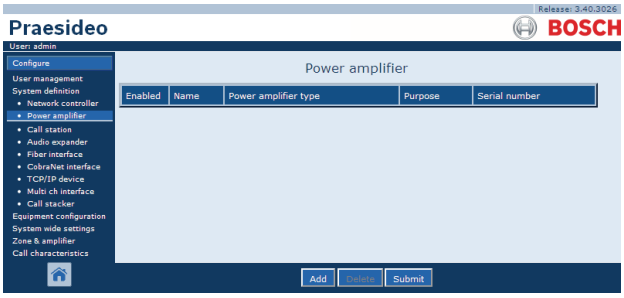


figure 43.4: Add power amplifier, step 1

2 Click the *Add* button to add a new power amplifier to the system. A screen similar to the one in figure 43.5 appears in the main frame of the web interface.

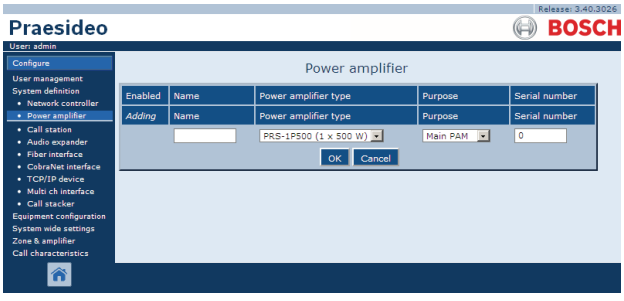


figure 43.5: Add power amplifier, step 2

3 Enter the data of the power amplifier (see figure 43.7 for an example).

- Enter a name for the power amplifier in the *Name* field. The name may consist of up to 10 characters. The name is also shown on the display of the power amplifier.
- Select the type of power amplifier from the *Type* dropdown list.
- Select the purpose of the power amplifier from the *Purpose* dropdown list (*Main PAM* for a main amplifier, *Spare PAM* for a spare amplifier).
- Enter the hexadecimal serial number of the power amplifier in the *Serial number* field. See section 43.2 for information about serial numbers.

Note
It is advised to include the name of the assigned zone(s) in the naming of a power amplifier. By doing so, error messages can be directly related to the applicable power amplifiers.

Note
Praesideo checks that all entered characters are hexadecimal characters and that the serial number is 8 characters long and matches the product type, or is *0*.

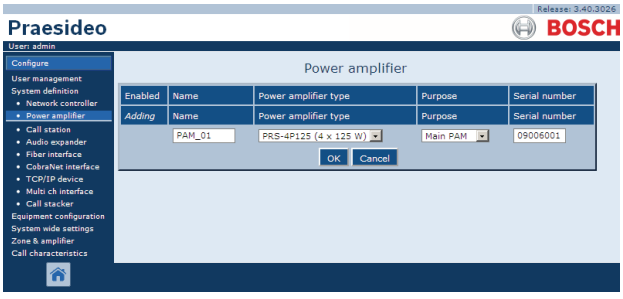


figure 43.6: Add power amplifier, step 3

4 Click the *OK* button to add the power amplifier to the list of power amplifiers in the system. A screen similar to the one in figure 43.7 appears in the main frame of the web interface.

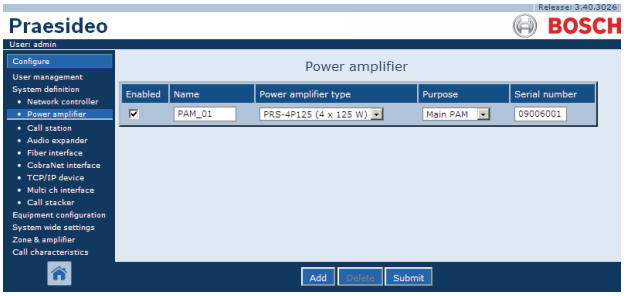


figure 43.7: Add power amplifier, step 4

5 When the power amplifier is physically present, it can be enabled by ticking the *Enabled* checkbox.

6 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

43.4.2 Delete a power amplifier

Proceed as follows to delete a power amplifier from the system definition:

Note
It is not recommended to delete a unit if its inputs or outputs are being used in for example the *Zone & Amplifier* or *Action Programming* pages. However, if a unit is deleted, all of its inputs and outputs will be removed from the configuration (e.g. from macros and zones).

1 Go to *Configure* > *System definition* > *Power amplifier*. A screen similar to the one in figure 43.8 appears in the main frame of the web interface.

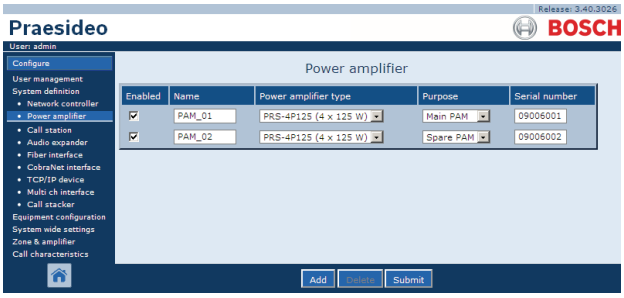


figure 43.8: Delete power amplifier, step 1

2 Click anywhere in the row of the power amplifier that has to be deleted from the system definition. The entire row is highlighted (see figure 43.9).

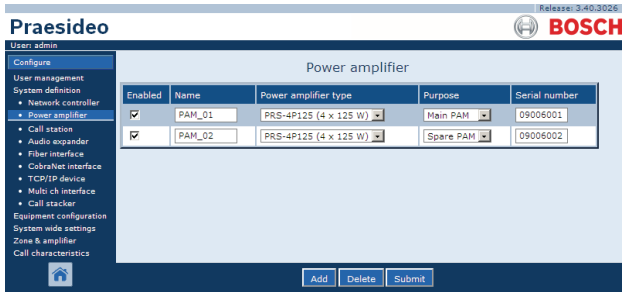


figure 43.9: Delete power amplifier, step 2

3 Click the *Delete* button. A screen similar to the one in figure 43.10 appears in the main frame of the web interface.

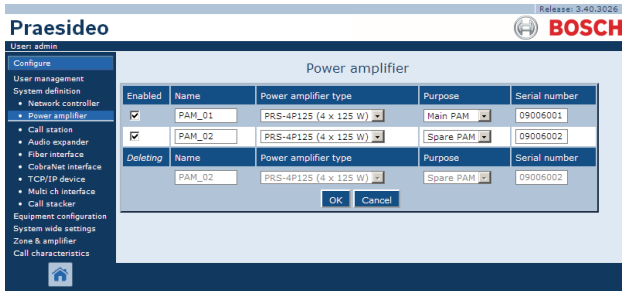


figure 43.10: Delete power amplifier, step 3

4 Click the *OK* button to delete the power amplifier from the system definition. A pop-up window asks for confirmation.

5 Click the *OK* button to confirm the pop-up message. A screen similar to the one in figure 43.11 appears in the main frame of the web interface. The deleted power amplifier is no longer listed in the table.

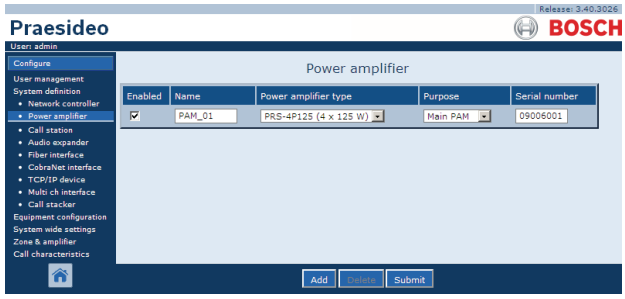


figure 43.11: Delete power amplifier, step 5

6 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

43.5 Multi Channel Interface

43.5.1 Add a multi channel interface

Adding a multi channel interface to the system definition is similar to adding a power amplifier (see section 43.4.1.). Go to *Configure* > *System definition* > *Multi ch interface*, click the *Add* button and:

- Enter a name for the multi channel interface in the *Name* field. The name may consists of up to 16 characters.
- Enter the hexadecimal serial number of the Multi Channel Interface in the *Serial number* field.

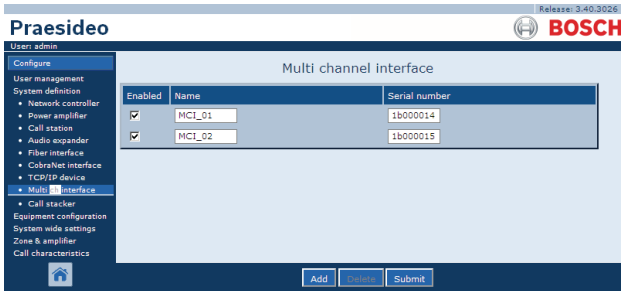


figure 43.12: Multi channel interface definition

43.5.2 Delete a multi channel interface

Deleting a multi channel interface from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *Multi ch interface,* select the multi channel interface that has to be deleted and click the *Delete* button.

43.6 Call station

43.6.1 Add a call station

Adding a call station to the system definition is similar to adding a power amplifier (see section 43.4.1). Go to *Configure* > *System definition* > *Call station*, click the *Add* button and:

- Enter a name for the call station in the *Name* field. The name may consists of up to 16 characters.
- Select the type of call station from the *Call station type* dropdown list (see table 43.2).

table 43.2: Call station types

Model	Type
LBB4430/00	*Basic*
PRS-CSM	*Basic module*
PRS-CSR	*Remote*
PRS-CSRM	*Remote module*

- If an numeric keypad is connected to the call station, tick the *Numeric keypad* box.
- Select the number of connected extensions (keypads) from the extension dropdown list.
- Enter the hexadecimal serial number of the call station in the *Serial number* field. For the remote call station or remote call station module, enter the serial number of the connected call station interface.

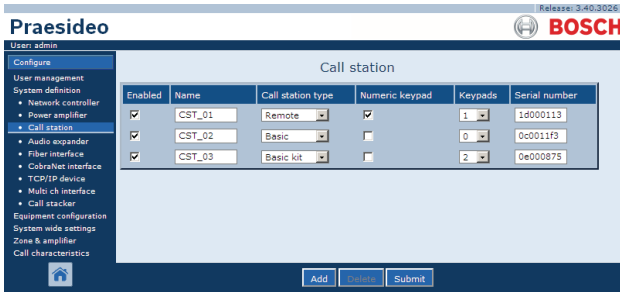


figure 43.13: Call station definition

43.6.2 Delete a call station

Deleting a call station from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *Call station*, select the call station that has to be deleted and click the *Delete* button.

43.7 Call Stacker

43.7.1 Add a call stacker

Adding a call stacker to the system definition is similar to adding a power amplifier (see section 43.4.1.). Go to *Configure* > *System definition* > *Call stacker*, click the *Add* button and:

- Enter a name for the call stacker in the *Name* field. The name may consists of up to 16 characters.
- Enter the hexadecimal serial number of the call stacker in the *Serial number* field.

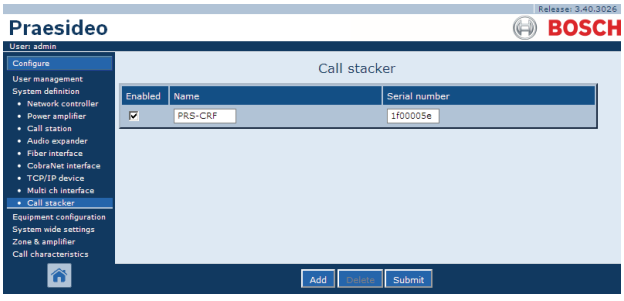


figure 43.14: Call stacker definition

43.7.2 Delete a call stacker

Deleting a call stacker from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *Call stacker*, select the call stacker that has to be deleted and click the *Delete* button.

Note
When the last call stacker is removed from a configured system, all call macros that use a call stacker for their routing and timing schemes will be updated to the default schemes.

43.8 Audio expander

43.8.1 Add an audio expander

Adding an audio expander to the system definition is similar to adding a power amplifier (see section 43.4.1). Go to *Configure* > *System definition* > *Audio expander*, click the *Add* button and:

- Enter a name for the audio expander in the *Name* field. The name may consist of up to 16 characters. The name is also shown on the display of the audio expander.
- Enter the hexadecimal serial number of the audio expander in the *Serial number* field.

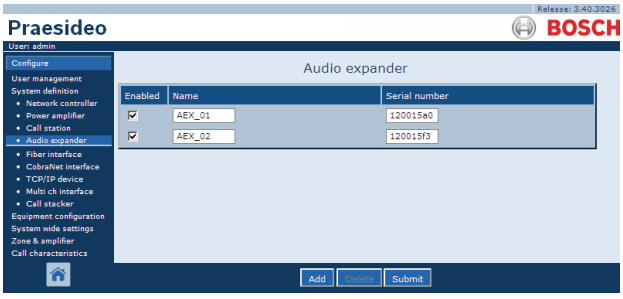


figure 43.15: Audio expander definition

43.8.2 Delete an audio expander

Deleting an audio expander from the configuration is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *Audio expander*, select the audio expander that has to be deleted and click the *Delete* button.

43.9 CobraNet interface

43.9.1 Add a CobraNet interface

Adding a CobraNet interface to the system definition is similar to adding a power amplifier (see section 43.4.1). Go to *Configure* > *System definition* > *CobraNet interface*, click the *Add* button and:

- Enter a name for the CobraNet interface in the *Name* field. The name may consist of up to 16 characters. The name is also shown on the display of the CobraNet interface.
- Enter the hexadecimal serial number of the CobraNet interface in the *Serial number* field.

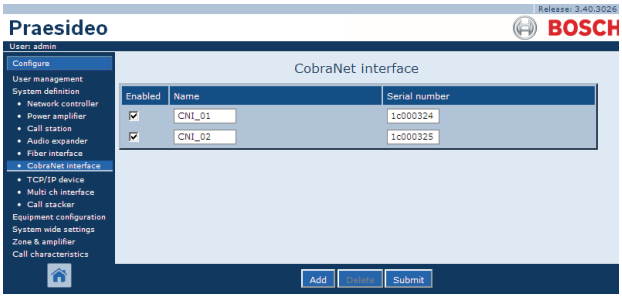


figure 43.16: CobraNet interface definition

43.9.2 Delete a CobraNet interface

Deleting a CobraNet interface from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *Cobranet interface*, select the CobraNet interface that has to be deleted and click the *Delete* button.

43.10 OMNEO interface

43.10.1 Add an OMNEO interface

Adding an OMNEO interface to the system definition is similar to adding a power amplifier (see section 43.4.1). Go to *Configure* > *System definition* > *OMNEO interface*, click the *Add* button and:

- Enter a name for the OMNEO interface in the *Name* field. The name may consist of up to 16 characters. The name is also shown on the display of the OMNEO interface.
- Enter the hexadecimal serial number of the OMNEO interface in the *Serial number* field.

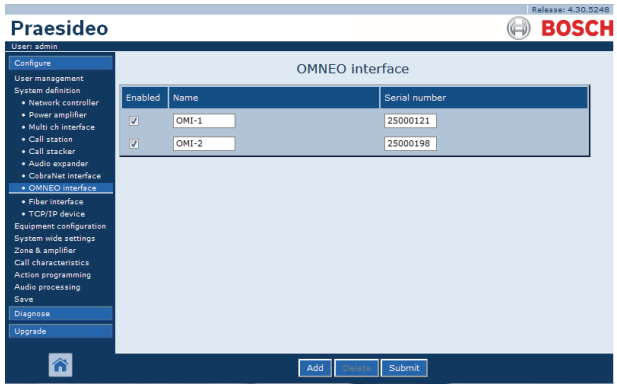


figure 43.17: OMNEO interface definition

43.10.2 Delete an OMNEO interface

Deleting an OMNEO interface from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *OMNEO interface*, select the OMNEO interface that has to be deleted and click the *Delete* button.

43.11 Fiber interface

43.11.1 Add a fiber interface

Adding a fiber interface to the system definition is similar to adding a power amplifier (see section 43.4.1). Go to *Configure* > *System definition* > *Fiber interface*, click the *Add* button and:

Note
Only PRS-FIN(S) Fiber Interfaces have to be configured. PRS-FINNA Fiber Interfaces cannot be configured.

- Enter a name for the fiber interface in the *Name* field. The name may consist of up to 16 characters.
- Enter the hexadecimal serial number of the fiber interface in the *Serial number* field.

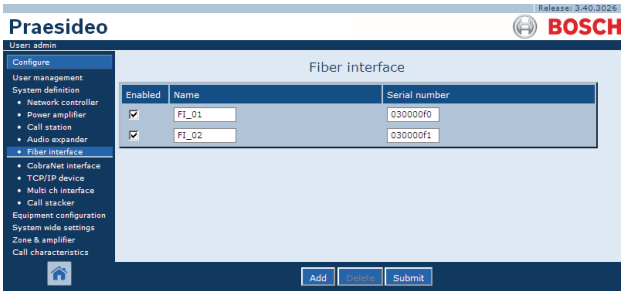


figure 43.18: Fiber interface definition

43.11.2 Delete a fiber interface

Deleting a fiber interface from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *Fiber interface*, select the fiber interface that has to be deleted and click the *Delete* button.

43.12 TCP/IP device

43.12.1 Add a TCP/IP device

TCP/IP devices can access the system through the open interface. When a TCP/IP device is added to the system definition, it becomes a part of the system and can be supervised.

Note
Supervised TCP/IP devices must be active when the system is active. Otherwise, the system generates a fault event.

Adding a TCP/IP device to the system definition is similar to adding a power amplifier (see section 43.4). Go to *Configure* > *System Definition* > *TCP/IP device*, click the *Add* button and:

- Enter a name for the TCP/IP device in the *Name* field. The name may consist of up to 16 characters.
- Enter the IP address of the TCP/IP device in the *IP address* fields.
- Use the *Connection supervision* list to specify if the connection to the TCP/IP device must be supervised (*On*) or not (*Off*).

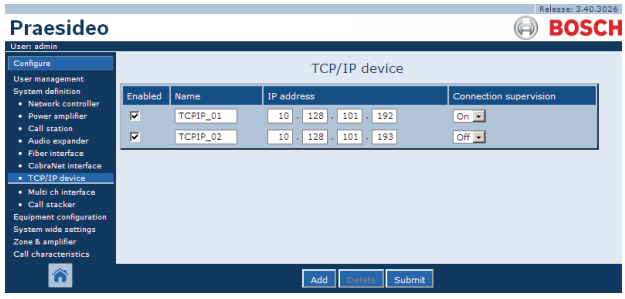


figure 43.19: TCP/IP device definition

TCP/IP devices that are not added to the system definition can also connect to the Praesideo system through the open interface when the *Access permission for non-configured TCP/IP devices* is set to *Yes* (see section 45.4). However, the connection of such a TCP/IP device to the system is not supervised.

It is not recommended to connect the network controller permanently to an Ethernet network that is also used for other purposes, like a computer network. An excess of data on the network (e.g. a so-called datastorm of broadcast messages) might overload the network controller, causing a time-out reset. Use a VLAN in this case. This is also preferred from a security point of view.

Note
A maximum of 7 TCP/IP devices with an open interface access (refer to chapter 54, Open Interface) can be used with a network controller, irrespective of being a system element, supervised or neither. TCP/IP devices can be a PC call server or a logging server. The configuration web browser uses a different port (port 80) for the connection and is not part of this limitation.

43.12.2 Delete a TCP/IP device

Deleting a TCP/IP device from the system definition is similar to deleting a power amplifier (see section 43.4.2). Go to *Configure* > *System definition* > *TCP/IP device*, select the TCP/IP device that has to be deleted and click the *Delete* button.

44 Equipment configuration

44.1 Introduction

On the *Equipment configuration* pages, each piece of equipment that has been added using the *System definition* pages can be configured. Using the *Equipment configuration* pages, it is possible to configure:

- Network controllers (see section 44.2).
- Power amplifiers (see section 44.3).
- Multi Channel Interfaces (see section 45).
- Call stations (see section 44.5).
- Audio expanders (section 44.6).
- CobraNet interfaces (see section 45).
- OMNEO interfaces (see section 44.8).
- Fiber interfaces (see section 44.8).

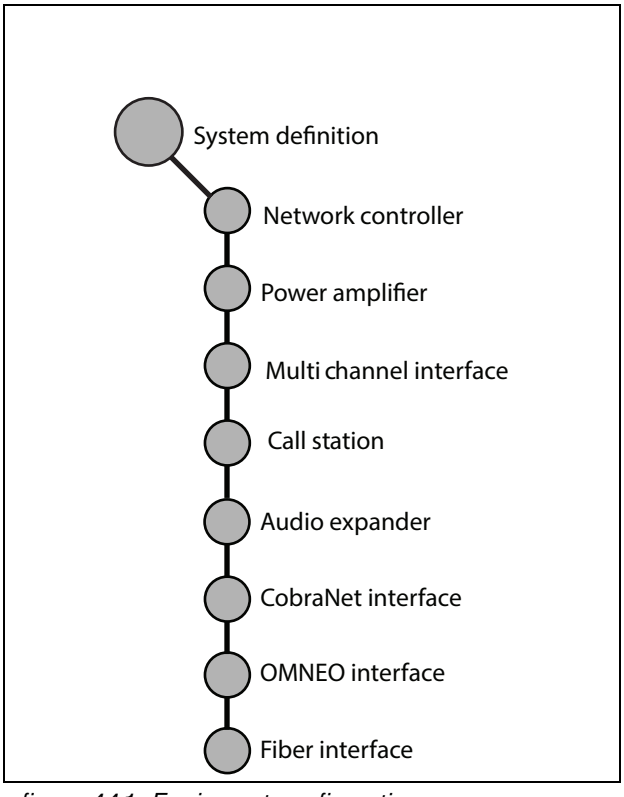


figure 44.1: Equipment configuration pages

44.2 Network controller

44.2.1 Procedure

Proceed as follows to configure the network controller:

1 Go to *Configure* > *Equipment configuration* > *Network controller*. A screen similar to the one in figure 44.2 appears in the main frame of the web interface.

figure 44.2: Configure network controller, step 1

2 Click the name of the network controller that must be configured. A screen similar the one in figure 44.3 appears in the main frame of the web interface.

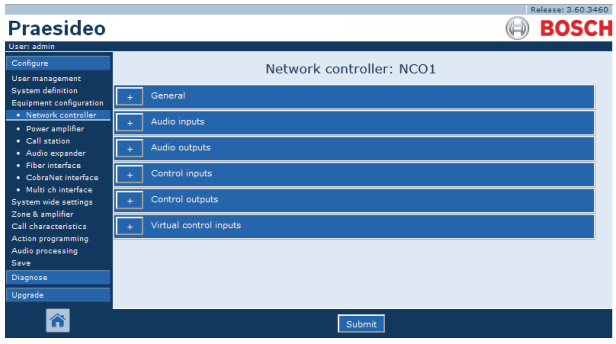


figure 44.3: Configure network controller, step 2

3 Open the *General* category to configure the power supervision settings.
(see section 44.2.2).

4 Open the *Audio inputs* category to configure the audio inputs of the network controller
(see section 44.2.3).

5 Open the *Audio outputs* category to configure the audio outputs of the network controller
(see section 44.2.4).

6 Open the *Control inputs* category to configure the control inputs of the network controller
(see section 44.2.5).

7 Open the *Control outputs* category to configure the control outputs of the network controller (see section 44.2.6).
8 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.2.2 General

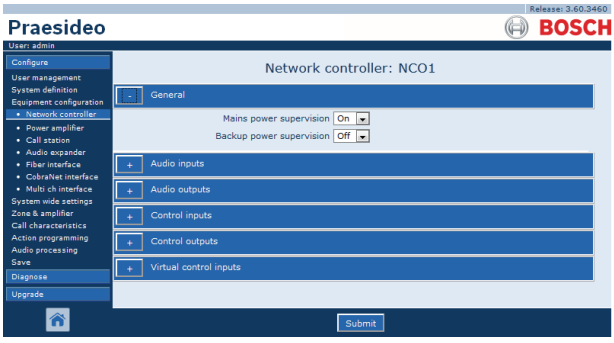


figure 44.4: Configure network controller, step 3

table 44.1: General configuration

Item	Value	Description
Mains power supervision	*On* *Off*	Specifies whether the mains power must be supervised. When *Mains power supervision* is *On* and the mains power is failing, a fault event is generated. Setting *Mains Power Supervision* to *Off* when mains power is used, results in a system that does not detect mains power failures.
Back-up power supervision	*On* *Off*	Specifies whether the back-up power must be supervised. When *Back-up power supervision* is *On* and the back-up power is failing, a fault event is generated. Setting *Back-up power supervision* to *Off* when back-up power is used, results in a system that does not detect back-up power failures.

44.2.3 Audio inputs

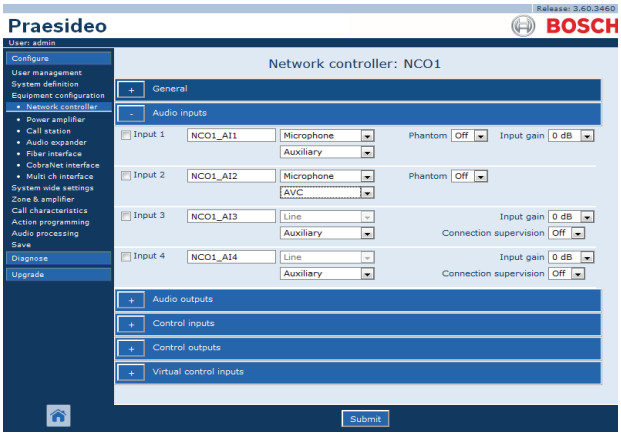


figure 44.5: Configure network controller, step 4

Caution
Only set *Phantom* to *On* for condenser microphones connected to the XLR connector of the audio input.

table 44.2: Audio inputs configuration

Item	Value	Description
Input		Unique name for the audio input. The input can be enabled and disabled using the checkbox.
Audio type	*Line* *Microphone*	Sets the type of audio source. This is either line (*Line*) or microphone (*Microphone*).
Input gain	*-8* to 7 *dB* (mic) *0* to 12 *dB* (line)	Sets the input gain for the XLR input and for the Cinch input (line only), with reference to the nominal input level.
Input function	*Auxiliary* *AVC*	Sets the microphone function. Auxiliary microphones (*Auxiliary*) can be used to make calls. AVC microphones (*AVC*) are used to measure the ambient noise level. Note that microphones that are connected to the network controller or audio expander are not supervised. If supervision is required, connect the microphone to a power amplifier.
Phantom	*On, Off*	Specifies whether the microphone receives a phantom supply (*On*) or not (*Off*). This item is only available if (2) has been set to *Microphone*. The phantom supply is only active when the microphone input is activated for a call.
Connection supervision	*On, Off*	Specifies whether the 20 kHz pilot tone detector of the input is enabled (*On*) or disabled (*Off*). This function is only available if the *Audio type* is set to *Line*. It provides cable and connection supervision if the source uses a pilot tone. The detection threshold is -40 dB relative to the input sensitivity of the line input for full output.

44.2.4 Audio outputs

figure 44.6: Configure network controller, step 4

table 44.3: Audio outputs configuration

Item	Value	Description
Output		Unique name for the audio output. The output can be enabled and disabled using the checkbox.
Level	*-18* to *12 dB*	Sets the output level for the XLR and Cinch output, with reference to the nominal output level.
Pilot tone	*On*, *Off*	Switches the 20 kHz pilot tone on (*On*) or off (*Off*). The pilot tone is used to supervise the analog audio connection to another public address system or device. The supervision and fault reporting should be done by that subsequent system or device (e.g. Bosch Intellivox loudspeaker).
Pilot tone level	*-38 to -18 dB*	Sets the level for the pilot tone, with reference to the nominal output level.

44.2.5 Control inputs

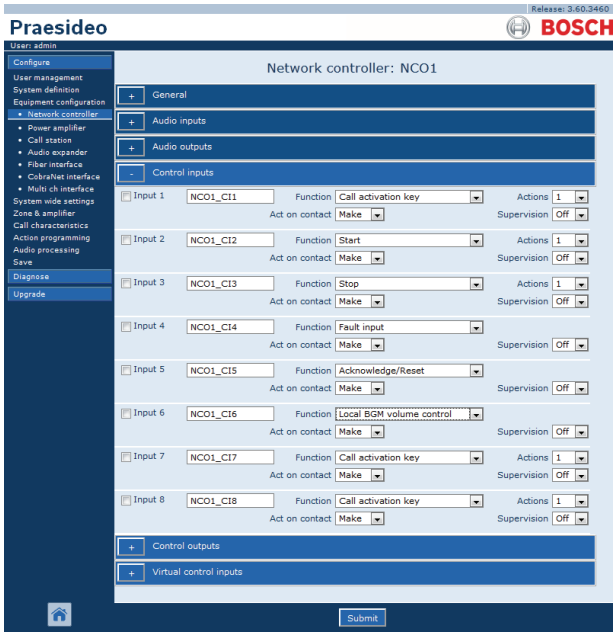


figure 44.7: Configure network controller, step 5

table 44.4: Control inputs configuration

Item	Value	Description
Input		Unique name for the control input. The input can be enabled and disabled using the enable checkbox.
Act on contact	*Break* *Make*	Sets the action of the control input. See chapter 48.
Function	Various	Sets the action of the control input. See chapter 48.
Supervision	*On, Off*	Switches supervision of the control input on (*On*) or off (*Off*).
Actions	*1..5*	Selects the number of actions for this control input if it is a *Call activation key*, *Start* or *Stop*

Multiple calls can be started or stopped from a single control input or keypad key.

- This applies to *Call activation* inputs/keys, *Start* inputs/keys and *Stop* inputs/keys.
- Up to five calls can be started/stopped by a single action, e.g. an evacuation message on one floor and alert messages on lower and higher floors.
- The sub-calls can have different priorities and zones/zone groups, but have the same activation behavior (e.g. momentary).

44.2.6 Control outputs

figure 44.8: Configure network controller, step 6

table 44.5: Control outputs configuration

Item	Value	Description
Output		Unique name for the control output. The output can be enabled and disabled using the checkbox.
Mains power fault grace time	0 h (default), 1 h, 2 h, 3 h ...8 h	Selects whether control output 5 with the fixed function *Fault alarm indicator* acts immediately on the occurrence of a mains power fault, or that activation is suspended and will only happen if the mains power fault is still present after the configured grace time. All other faults will result in an immediate activation of this *Fault alarm indicator*. The purpose of the grace time is to suspend a warning to an external service center for systems in areas where short mains failures frequently happen. The system backup power supply should at least be able to provide power during the configured grace time. The *Fault alarm buzzer* is not delayed in order to give a local warning immediately.
Function		Sets the purpose of the control output. See table 44.6.

table 44.6: Control output types

Function	Description
Switch output	The control output is activated by a *Switch trigger* control input or keypad key. See section 48.3.28.
Zone active output	The control output is activated when there is an active call in the associated zone (see section 46.2.
Volume override output	The control output is activated when there is an active call with priority 32 or higher in the associated zone. See section 46.2.
Fault alarm buzzer	The control output activates a fault alarm buzzer (e.g a connected buzzer) each time a fault is detected in the system. It can only be deactivated by acknowledging all faults.
Fault alarm indicator	The control output activates a visual fault indicator (e.g. a lamp) each time a fault is detected in the system. It can only be deactivated by resetting all faults.
System fault indicator	The control output activates a visual fault indicator (e.g. a lamp), each time a System fault is detected in the system. System faults are a special category of faults, a subset of all possible faults. System faults are: Configuration file error, Flash card data error, Flash card missing, No valid configuration file found, Processor reset.
Emergency alarm buzzer	The control output activates an emergency alarm buzzer (e.g a connected buzzer) each time a call with priority 223 or higher is started (i.e. an emergency call). It can only be deactivated by acknowledging the emergency state.
Emergency alarm indicator	The control output activates a visual emergency indicator (e.g. a lamp) each time a call with priority 223 or higher is started (i.e. an emergency call). It can only be deactivated by resetting the emergency state.

44.2.7 Virtual control inputs

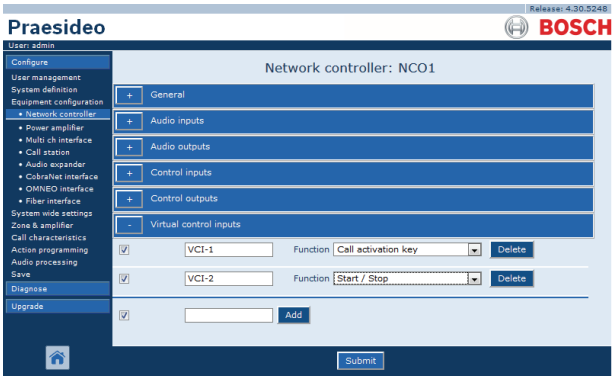


figure 44.9: Configure network controller, step 7

Virtual control inputs are control inputs that can be activated from the Open Interface, to accommodate external applications via a simple interface. These inputs do not exist as hardware inputs, but behave in a similar way. They can be activated and deactivated by Open Interface messages, causing the associated call macro to be started and stopped. In this way the external application does not need to be configured for all parameters of a call because the configuration has already been done as part of the call macro.

A virtual control input can simply be added and/or deleted. Its name can be freely chosen with a maximum of 16 characters but must be unique within the set of virtual control inputs. The maximum number of virtual control inputs that can be assigned to a network controller is 500, but values larger than 100 are not recommended because it slows down the performance of the configuration web pages. A virtual control input is enabled by default.

Virtual control inputs can be used for Call activation or to Start/Stop a call. In case of Start/Stop behavior several virtual control inputs can use the same call macro to contribute (add/remove) zones to an existing call, not restricted by the maximum number of simultaneous calls.

44.3 Power amplifier

44.3.1 Procedure

Proceed as follows to configure a power amplifier:

1 Go to *Configure* > *Equipment configuration* > *Power amplifier*. A screen similar to the one in figure 44.10 appears in the main frame of the web interface.

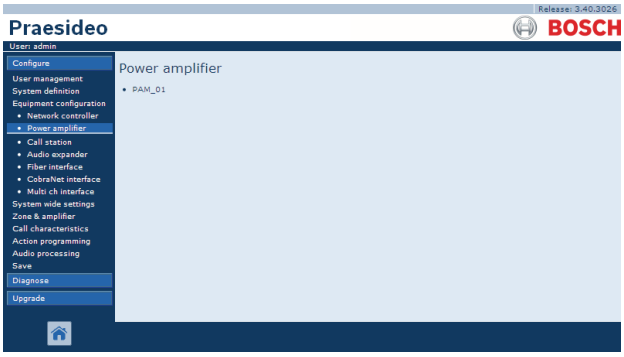


figure 44.10: Configure power amplifier, step 1

2 Click the name of the power amplifier that must be configured. A screen similar the one in figure 44.11 appears in the main frame of the web interface.

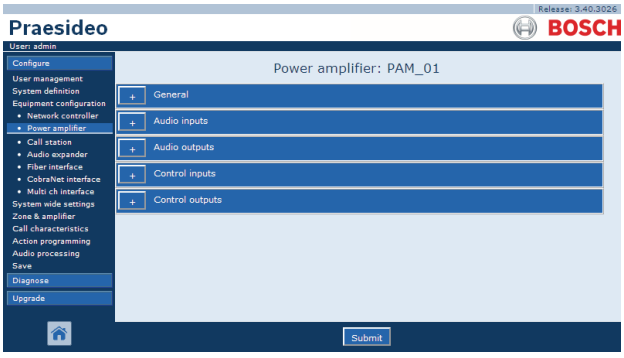


figure 44.11: Configure power amplifier, step 2

3 Open the *General* category to configure the general settings of the power amplifier (see section 44.3.2).

4 Open the *Audio inputs* category to configure the audio inputs of the power amplifier (see section 44.3.3).

5 Open the *Audio outputs* category to configure the audio outputs of the power amplifier (see section 44.3.4).

6 Open the *Control inputs* category to configure the control inputs of the power amplifier (see section 44.3.6).

7 Open the *Control outputs* category to configure the control outputs of the power amplifier (see section 44.3.7).

8 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.3.2 General

figure 44.12: Configure power amplifier, step 3

table 44.7: General configuration

Item	Value	Description
Mains power supervision	*On* *Off*	Specifies whether the mains power must be supervised. When *Mains power supervision* is *On* and the mains power is failing, a fault event is generated. Setting *Mains Power Supervision* to *Off* when mains power is used, results in a system that does not detect mains power failures.
Back-up power supervision	*On* *Off*	Specifies whether the back-up power must be supervised. When *Back-up power supervision* is *On* and the back-up power is failing, a fault event is generated. Setting *Back-up power supervision* to *Off* when back-up power is used, results in a system that does not detect back-up power failures.

44.3.3 Audio inputs

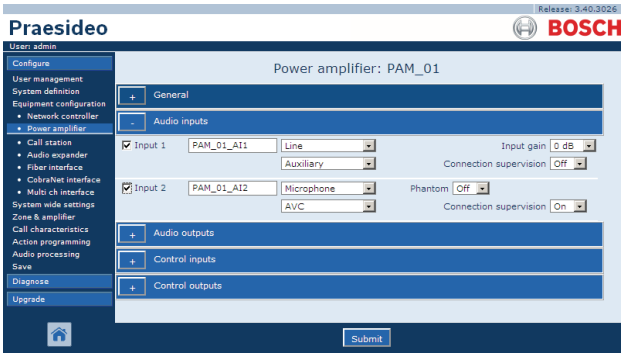


figure 44.13: Configure power amplifier, step 4

table 44.8: Audio inputs configuration

Item	Value	Description
Input		Unique name for the audio input. The input can be enabled and disabled using the checkbox.
Audio type	*Line* *Microphone*	Sets the type of audio source. This is either line (*Line*) or (*Microphone*).
Input gain	*-8* to *7 dB* (mic) *0* to *12 dB* (line)	Sets the input gain of the audio input with reference to the nominal value.
Input function	*Auxiliary* *AVC*	Sets the input function. Auxiliary inputs (*Auxiliary*) can be used to make calls. AVC inputs (*AVC*) are used to measure the ambient noise level.
Phantom	*On, Off*	Specifies whether the microphone receives a phantom supply (*On*) or not. This option is only visible if (2) is set to *Microphone*.
Supervision	*On, Off*	Switches supervision on *(On*) and off (*Off*) for the microphone. This option is only visible if (2) is set to *Microphone*. The phantom supply is only active when the microphone input is active.
Connection supervision	*On, Off*	Specifies whether the 20 kHz pilot tone detector of the input is enabled (*On*) or disabled (*Off*). This function is only available if the *Audio type* is set to *Line*. It provides cable and connection supervision if the source uses a pilot tone. The detection threshold is -40 dB relative to the input sensitivity of the line input for full output.

44.3.4 Audio outputs

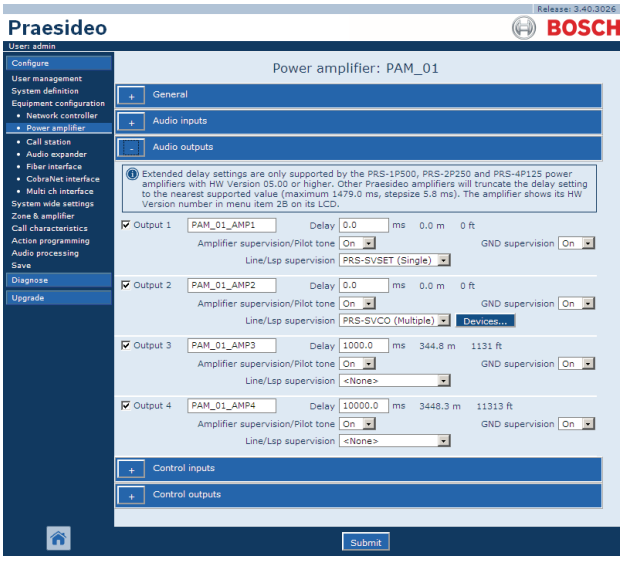


figure 44.14: Configure power amplifier, step 5

Power amplifiers that are configured as spare amplifiers do not have the Delay (distance) setting. This setting is taken over from the main amplifier that this spare amplifier replaces when it becomes active. The output configuration of a spare amplifier is only valid when it is in spare state.

When the spare amplifier takes over a main amplifier, the configuration of the main amplifier is copied.

Line/Lsp Supervision can be used to supervise the interconnection between the spare amplifier and the connected main amplifiers.

If the connected main amplifiers use Single Line/Lsp Supervision, then the spare amplifier must not use Multiple Line/Lsp Supervision, otherwise a conflict will arise between both supervision slave boards when the spare amplifiers takes over the from the main amplifier.

If the connected main amplifiers use the Multiple Line/Lsp Supervision, then the spare amplifier can also use Multiple Line/Lsp Supervision.

table 44.9: Audio outputs configuration

Item	Value	Description
Output		Unique name for the audio output. The output can be enabled and disabled using the checkbox.
Delay	*0 to 95108 ms (PRS-1P500)* *0 to 47554 ms (PRS-2P250)* *0 to 23777 ms (PRS-4P125)* *0 to 1479 ms (LBB4428/00)*	Sets the loudspeaker alignment time, also presented as distance in meters and feet.
Amplifier supervision/ Pilot tone	*On, Off*	Switches the pilot tone to on (*On,)* and off (*Off)*. The pilot tone is used to supervise the amplifier channel for failures and for supervision of the loudspeaker line and loudspeakers. If set to *On*, the pilot tone enables supervision and an internal calibration keeps the pilot tone at an optimum level. If the load on the line changes by the addition or removal of loudspeakers, the pilot tone stays at the optimum level.
GND Supervision	*On, Off*	Switches ground supervision of the loudspeaker line on (*On*) and off (*Off*). In combination with the Bosch Line Isolator System (LIS), the Ground Supervision for the amplifier channel and spare amplifier channel must be switched Off, as the Line Isolator System fulfils this function.
Line/LSP Supervision	*None* *PRS-SVSET (Single)* *PRS-SVCO (Multiple)*	Sets the type of line or loudspeaker supervision.
Configure supervision devices		Opens a screen to configure LBB4441 and LBB4443 supervision devices (see section 44.3.5).

44.3.5 Line and loudspeaker supervision

44.3.5.1 Adding supervision devices

Proceed as follows to add a supervision device to an audio output of a power amplifier:

1 Click the *Configure supervision devices* button in the *Audio Outputs* category of the applicable power amplifier (see section 44.3.4). A screen similar to the one figure 44.15 appears.

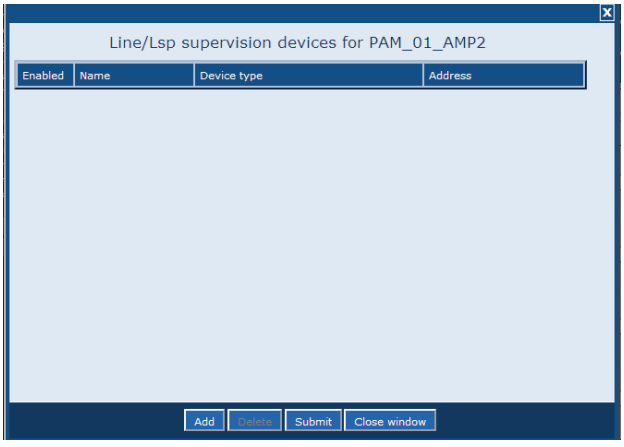


figure 44.15: Add supervision device, step 1

2 Click the *Add* button to add a new supervision device to the audio output. A screen similar to the one in figure 44.16 appears.

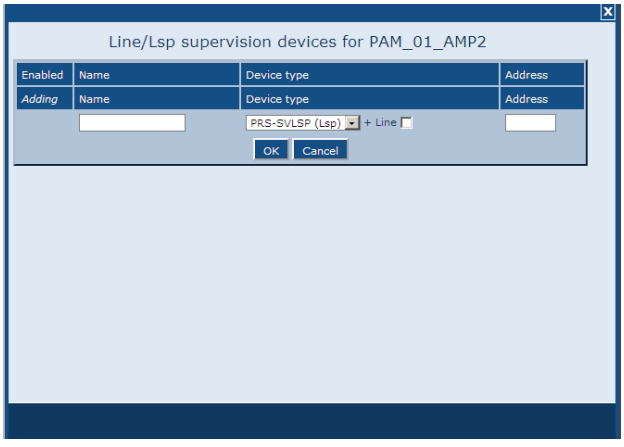


figure 44.16: Add supervision device, step 2

3 Enter the data of the supervision device (see figure 44.17 for an example).

- Enter a name for the supervision device in the *Name* field. The name may consist of up to 16 characters.
- Select the type of supervision device from the *Type* dropdown list.

Note
When you want to use an LBB4441 (PRS-SVLSP) to supervise the loudspeaker line as well, it is recommended that you install the LBB4441 in the last loudspeaker in the line. To enable loudspeaker line supervision, put a check mark in the *Line* box. The LBB4441 will then be polled more often.

- Enter the address that was assigned to the supervision device in the *Address* field (see figure 44.17).

Note
It is also possible to add multiple supervision devices of the same type at the same time by entering an address range in the Address field, e.g. 1-6.

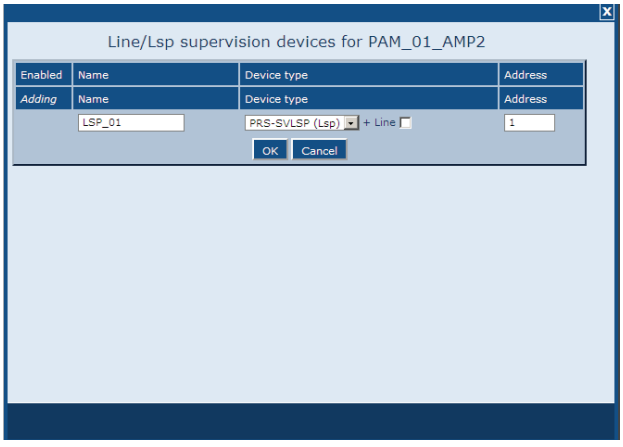


figure 44.17: Add supervision device, step 3

4 Click the *OK* button to add the supervision device to the audio output of the power amplifier. A screen similar to the one in figure 44.18 appears.

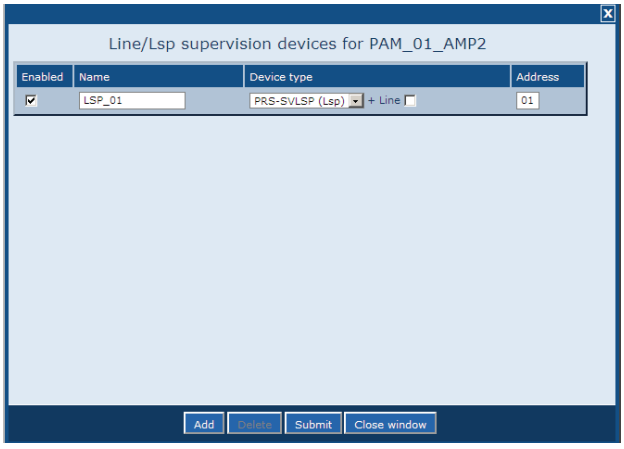


figure 44.18: Add supervision *device, step 4*

5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).
6 Click the *Close* button to close the window.

44.3.5.2 Supervision devices and spare amplifiers

It is possible to use one or more EOL Supervision boards (LBB4443) to supervise the connection from spare amplifier to main amplifiers. Note the following limitations:

- The addresses of the configured supervision boards do not conflict with the addresses of supervision boards connected to any of the assigned main power amplifiers on the same channel.
- The number of supervision boards connected to the spare amplifier plus the number of supervision boards connected to any of the assigned main power amplifiers on the same channel, does not exceed the maximum number of boards for the amplifier power rating. This applies to both the total number of supervision boards and the number of boards with enabled line supervision functionality (+Line check box). Refer to section 13.4.

44.3.6 Control inputs

figure 44.19: Configure power amplifier, step 6

The configuration page for power amplifier control inputs is similar to the configuration page for network controller control inputs (see section 44.2.5).

44.3.7 Control outputs

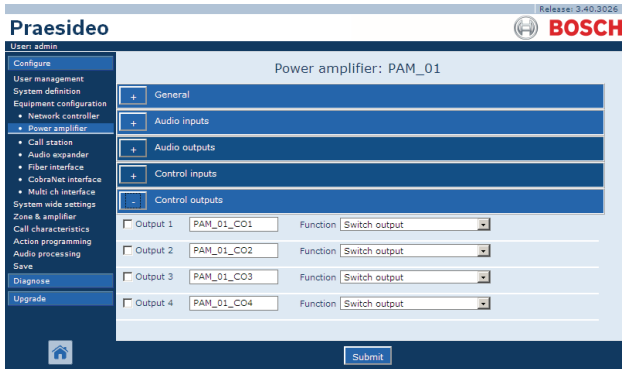


figure 44.20: Configure power amplifier, step 7

The configuration page for power amplifier control outputs is similar to the configuration page for network controller outputs of a network controller (see section 44.2.6). The number of control outputs differ per amplifier type, typically one per channel.

44.4 Multi Channel Interface

44.4.1 Procedure

This section describes the configuration of a multi channel interface. The basic amplifiers, which are connected to the multi channel interface, are not configured directly by the configuration web pages, but via the multi channel interface.

Configure the multi channel interface and connected basic amplifiers as follows:

1 Go to *Configure* > *Equipment configuration* > *Multi ch interface*. A screen similar to the one in figure 44.21 appears in the main frame of the web interface.

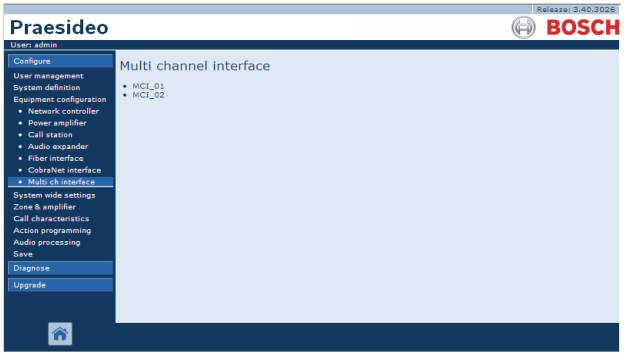


figure 44.21: Configure multi channel interface, step 1

2 Click the name of the multi channel interface to be configured. A screen similar to the one in figure 44.22 appears in the main frame of the web interface

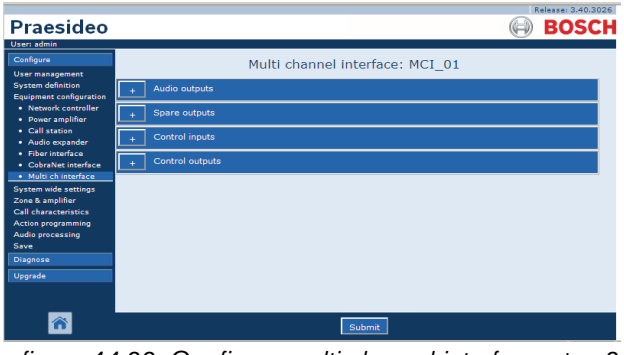


figure 44.22: Configure multi channel interface, step 2

3 Open the *Audio Outputs* category to configure the 14 main outputs of the multi channel interface. (See section 44.4.2.)

4 Open the *Spare Outputs* category to configure the 2 spare outputs of the multi channel interface. (See section 44.4.3).

5 Open the *Control Inputs* category to configure the 32 control inputs of the multi channel interface. (See section 44.4.4.

6 Open *Control Outputs* category to configure the 16 control outputs of the multi channel interface. (See section 44.4.5.

7 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.4.2 Audio Outputs

The configuration page for multi channel interface Audio outputs is similar to the configuration page for the audio outputs for the power amplifier (see section 44.3.4).

The outputs A and B refer to the outputs A and B of the basic amplifier channel that is connected to the Multi Channel Interface. See table 44.10.

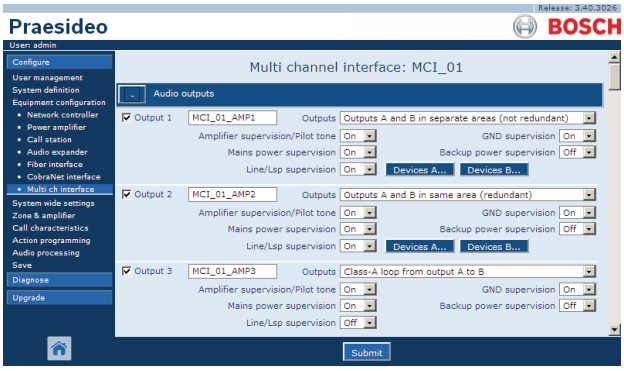


figure 44.23: Configure multi channel interface, step 3

44.4.3 Spare Outputs

Outputs 15 and 16 of the multi channel interface are dedicated for spare basic amplifier channels. See table 44.11.

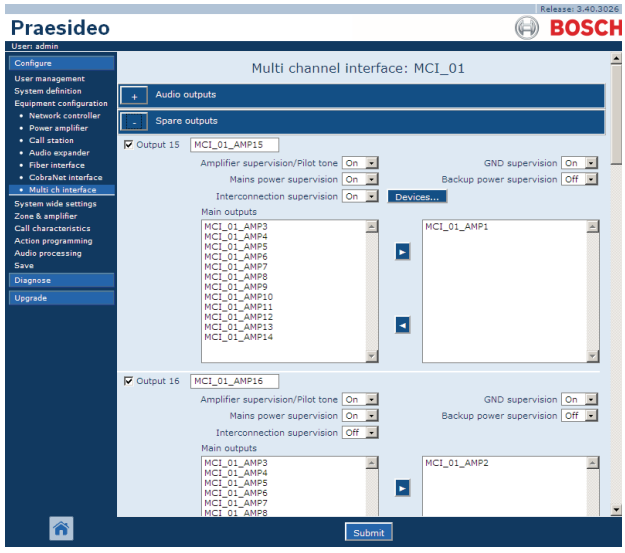


figure 44.24: Configure multi channel interface, step 4

table 44.10: Audio outputs configuration

Item	Value	Description
Output n		Unique name for the audio output. The output can be enabled and disabled using the check box.
Pilot tone	*On, Off*	Switches the pilot tone for loudspeaker monitoring on (*On*) and off (*Off*). This pilot tone is used to monitor the connected basic amplifier and the secondary side of its transformer for short-circuits. It also supervises the amplifier for failures and is used by the line supervision set.
GND supervision	*On, Off*	Switches ground supervision of the loudspeaker line on (*On*) and off (*Off*). In combination with the Bosch Line Isolator System (LIS), the Ground Supervision for the amplifier channel and spare amplifier channel must be switched Off, as the Line Isolator System fulfils this function.
Mains power supervision	*On, Off*	Specifies whether the mains power of the connected basic amplifier must be supervised. When *Mains power supervision* is *On* and the mains power is failing, a fault event is generated. Setting *Mains Power Supervision* to *Off* when mains power is used, results in a system that does not detect mains power failures.
Back-up power supervision	*On, Off*	Specifies whether the back-up power of the connected basic amplifier must be supervised. When *Back-up power supervision* is *On* and the back-up power is failing, a fault event is generated. Setting *Back-up power supervision* to *Off* when back-up power is used, results in a system that does not detect back-up power failures.
Lsp connection	*Output A and B in same area (redundant).*	The outputs A and B each have loudspeakers that cover the same area. Both outputs A and B are normally active. If a line fault occurs on either output A or B, that output will be switched off.
	Output A and B in separate areas (Not redundant).	The outputs A and B each have loudspeakers that cover different areas and are not close together. Both outputs A and B are normally active. If a line fault occurs on either output A or B, that output remains active. Only in case of an overload or short circuit on either output A or B, that output will be switched off.
	Class-A loop from output A to B.	The outputs A and B have connections to the same loudspeakers. Output A is normally active, output B is normally off. If a line fault occurs detected by a supervision board, output B becomes active too.
Line/Lsp supervision	*On, Off*	Sets the line / loudspeaker supervision for group A or group B.
Configure supervision devices A		Opens a screen to configure LBB4441 and LBB4443 supervision devices (see section 44.3.5) on group A.
Configure supervision devices B		Opens a screen to configure LBB4441 and LBB4443 supervision devices (see section 44.3.5) on group B.

table 44.11: Spare outputs configuration

Item	Value	Description
Output n		Unique name for the audio output. The output can be enabled and disabled using the check box.
Pilot tone	*On, Off*	Switches the pilot tone for loudspeaker monitoring on (*On*) and off (*Off*). This pilot tone is used to monitor the connected basic amplifier and the secondary side of its transformer for short-circuits. It also supervises the amplifier for failures and is used by the line supervision set.
GND supervision	*On, Off*	Switches ground supervision of the loudspeaker line on (*On*) and off (*Off*).
Mains power supervision	*On, Off*	Specifies whether the mains power of the connected basic amplifier must be supervised. When *Mains power supervision* is *On* and the mains power is failing, a fault event is generated. Setting *Mains Power Supervision* to *Off* when mains power is used, results in a system that does not detect mains power failures.
Back-up power supervision	*On, Off*	Specifies whether the back-up power of the connected basic amplifier must be supervised. When *Back-up power supervision* is *On* and the back-up power is failing, a fault event is generated. Setting *Back-up power supervision* to *Off* when back-up power is used, results in a system that does not detect back-up power failures.
Interconnection supervision	*On, Off*	Sets the interconnection supervision between spare basic amplifier channel and the main basic amplifier channels.
Configure supervision devices		Opens a screen to configure LBB4441 and LBB4443 supervision devices (see section 44.3.5) on group B.
Amplifier channel selection		With the < and > buttons main amplifier channels can be assigned to a spare amplifier channel.

44.4.4 Control Inputs

figure 44.25: Control inputs for multi channel interface

The configuration page for the multi channel interface control inputs is similar to the configuration page of the network controller control inputs (see section 44.2.5).

44.4.5 Control Outputs

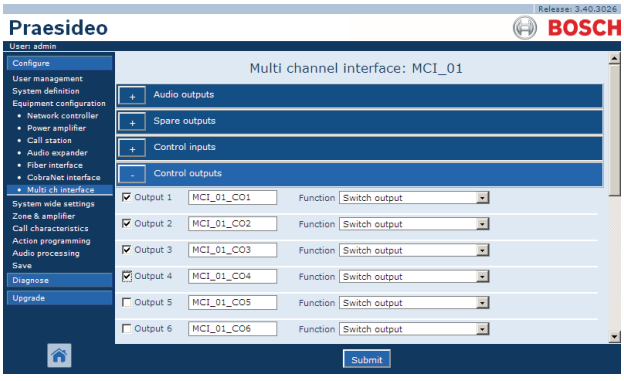


figure 44.26: Control outputs for multi channel interface

The configuration page for the multi channel interface control outputs is similar to the configuration page of the network controller control outputs (see section 44.2.6).

44.5 Call station

44.5.1 Procedure

Proceed as follows to configure a call station:

1 Go to *Configure* > *Equipment configuration* > *Call station*. A screen similar to the one in figure 44.27 appears in the main frame of the web interface.

figure 44.27: Configure call station, step 1

2 Click the name of the call station that must be configured. A screen similar the one in figure 44.3 appears in the main frame of the web interface.

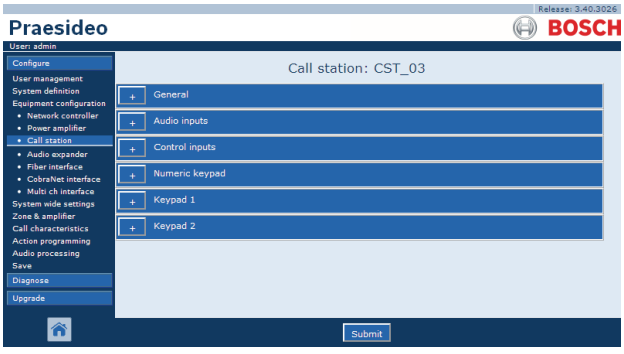


figure 44.28: Configure call station, step 2

Note
The system definition of the call station (see 43.5) determines whether a numeric keypad category and/or keypad categories are available.

3 Open the *General* category to configure the general settings of the call station.
- See section 44.5.2 for information about configuring the general settings of a basic call station (LBB4430/00)
- See section 44.5.3 for information about configuring the general settings of a call station module (PRS-CSM).
- See section 44.5.4 for information about configuring the general settings of a remote call station (PRS-CSR) or remote call station module (PRS-CSRM).

4 Open the *Audio Inputs* category to configure the audio inputs of the call station (see section 44.5.5).

5 When the call station has a numeric keypad, open the *Numeric keypad* category to configure the numeric keypad (see section 44.5.6).

6 When the call station has control inputs, open the *Control Inputs* category to configure the control inputs (see section 44.5.7). If the call station is a remote call station or a remote call station module, there is also a category for configuring the control inputs of the call station interface.

7 Open the *Keypad* categories to configure the keypads connected to the call station (see section 44.5.8).

8 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.5.2 General (LBB4430/00)

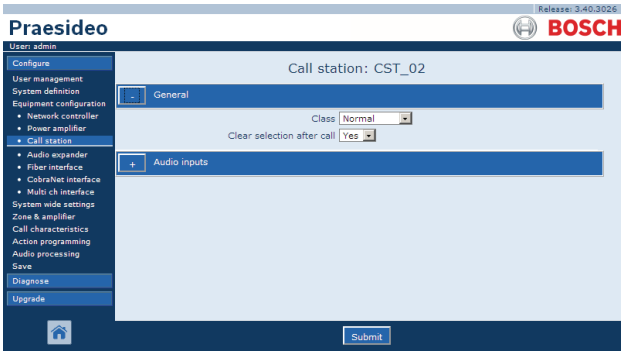


figure 44.29: Configure call station, step 3

table 44.12: General configuration settings (LBB4430/00)

Item	Value	Description
Class	*Normal* *Emergency*	Sets the priority range of the call station. This is either *Normal* for 32 to 223 or *Emergency* for 32 to 255. When *Class* is *Emergency* the call station can make fail-safe calls.
Clear selection after call	*Yes* *No*	Selects whether selections that are made on a keypad for a call (zone selection, priority selection, tone selection and message selection) will be cleared after the call has finished or will be kept for a next call.

44.5.3 General (PRS-CSM)

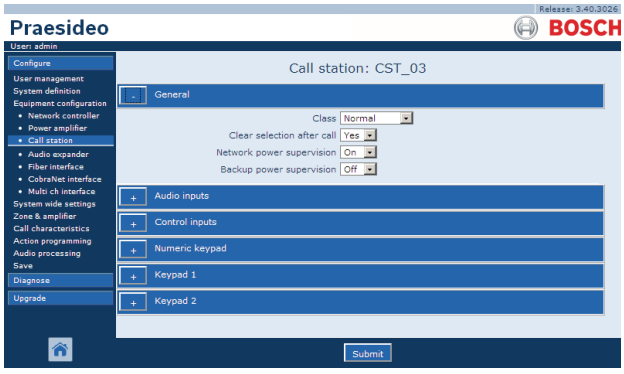


figure 44.30: Configure call station, step 3

table 44.13: General configuration settings (PRS-CSM)

Item	Value	Description
Class	*Normal* *Emergency*	Sets the priority range of the call station. This is either *Normal* for 32 to 223 or *Emergency* for 32 to 255. When *Class* is *Emergency* the call station can make fail-safe calls.
Clear selection after call	*Yes* *No*	Selects whether selections that are made on a keypad for a call (zone selection, priority selection, tone selection and message selection) will be cleared after the call has finished or will be kept for a next call.
Network power supervision	*On* *Off*	When *Network power supervision* is *On* and the network power is failing, a fault event is generated.
Back-up power supervision	*On* *Off*	When *Back-up power supervision* is *On* and the back-up power is failing, a fault event is generated.

44.5.4 General (PRS-CSR and PRS-CSRM)

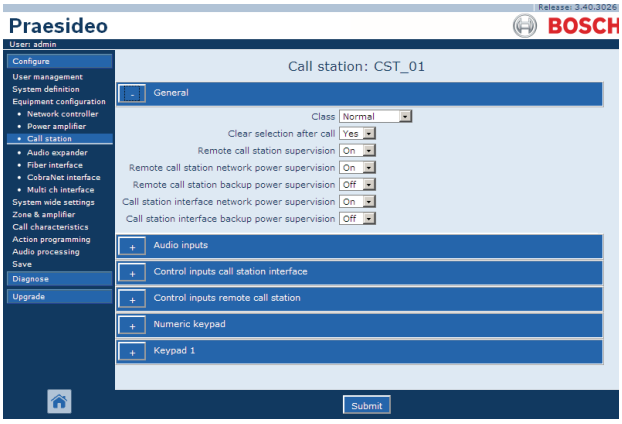


figure 44.31: Configure call station, step 1

table 44.14: General configuration settings (PRS-CSR)

Item	Value	Description
Class	*Normal* *Emergency*	Sets the priority range of the call station. This is either *Normal* for 32 to 223 or *Emergency* for 32 to 255. When *Class* is *Emergency* the call station can make fail-safe calls.
Clear selection after call	*Yes* *No*	Selects whether selections that are made on a keypad for a call (zone selection, priority selection, tone selection and message selection) will be cleared after the call has finished or will be kept for a next call.
Remote call station supervision	*On* *Off*	Selects whether the remote call station and its connection to the call station interface will be supervised or not. If set to *No*, it is possible to disconnect and remove the remote call station without generating a fault in the system. This can be convenient for call stations that would otherwise remain unattended. Emergency call stations should always be supervised.
Remote call station network power supervision	*On* *Off*	When *Remote call station network power supervision* is *On* and the network power connection between the remote call station interface and the remote call station is failing, a fault event is generated.
Remote call station back-up power supervision	*On* *Off*	When *Remote call station back-up power supervision* is *On* and the external power supply that is connected to the remote call station is failing, a fault event is generated.
Call station interface network power supervision	*On* *Off*	When *Call station interface network power supervision* is *On* and the network power connection between the call station interface and the Praesideo network is failing, a fault event is generated.
Call station interface back-up power supervision	*On* *Off*	When *Call station interface back-up power supervision* is *On* and the external power supply that is connected to the call station interface is failing, a fault event is generated.

44.5.5 Audio inputs

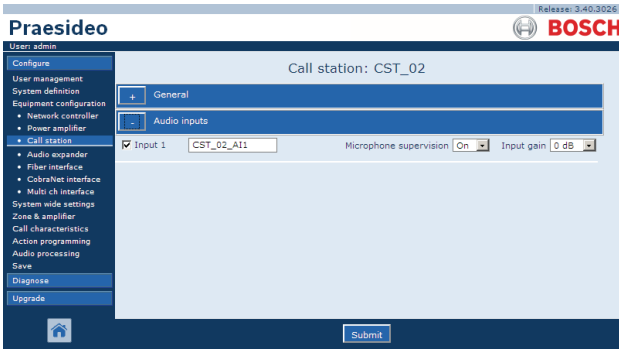


figure 44.32: Configure call station, step 4

table 44.15: Audio inputs configuration settings

Item	Value	Description
Input		Unique name for the microphone (audio input). The microphone (audio input) can be enabled and disabled using the checkbox.
Supervision	*On* *Off*	Switches supervision of the microphone on (*On*) and off (*Off*).
Input gain	*-8* to *7 dB*	Sets the input gain.

44.5.6 Numeric keypad

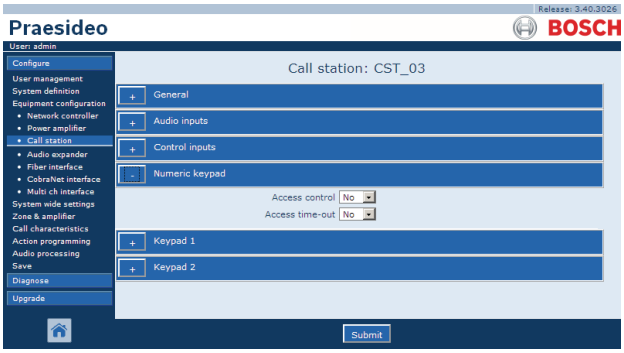


figure 44.33: Configure call station, step 5

table 44.16: Control inputs configuration settings

Item	Value	Description
Access Control	*No* *Yes*	Specifies whether the numeric keypad is used for access control (*Yes*) or not (*No*).
Access time-out	*No* *Yes*	Specifies whether the numeric keypad is automatically locked after the time-out has elapsed. The timeout period is set in the *System wide settings*. See 45.4

44.5.7 Control inputs (PRS-CSM)

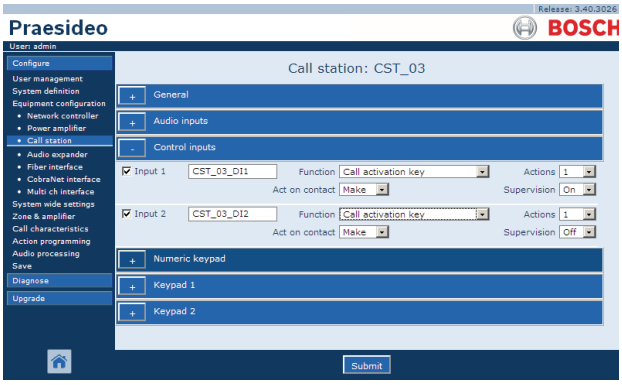


figure 44.34: Configure call station, step 6

table 44.17: Control inputs configuration settings

Item	Value	Description
Input		Unique name for the control input. The input can be enabled and disabled using the checkbox.
Act on contact	*Make* *Break*	Sets a part of the behavior of the control input. See chapter 48.
Function	Various	Sets the action of the control input. See chapter 48.
Supervision	*On* *Off*	Switches supervision of the control input on (*On*) and off (*Off*).

44.5.8 Keypad

figure 44.35: Configure call station, step 7

table 44.18: Extension (keypad) configuration settings

Item	Value	Description
Key		Unique name for the key. The key can be enabled and disabled using the checkbox.
Function	Various	Sets the action of the key. See chapter 48.

44.6 Audio expander

44.6.1 Procedure

Proceed as follows to configure an audio expander:

1 Go to *Configure* > *Equipment configuration* > *Audio expander*. A screen similar to the one in figure 44.36 appears in the main frame of the web interface.

figure 44.36: Configure audio expander, step 1

2 Click the name of the audio expander that must be configured. A screen similar the one in figure 44.3 appears in the main frame of the web interface.

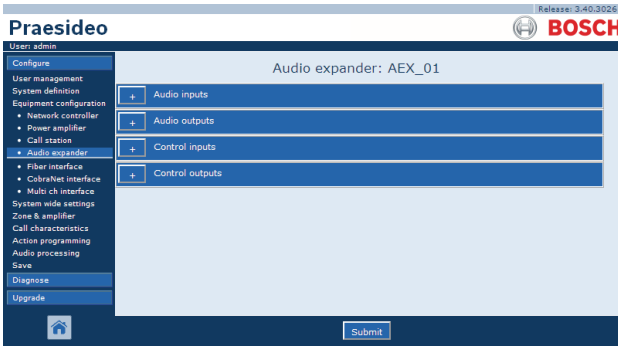


figure 44.37: Configure audio expander, step 2

3 Open the *Audio inputs* category to configure the audio inputs of the audio expander (see section 44.6.2).

4 Open the *Audio outputs* category to configure the audio outputs of the audio expander (see section 44.6.3).

5 Open the *Control inputs* category to configure the control inputs of the audio expander (see section 44.6.4).

6 Open the *Control outputs* category to configure the control outputs of the audio expander (see section 44.6.5).

7 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.6.2 Audio inputs

The configuration page for audio expander audio inputs is similar to the configuration page for network controller audio inputs (see section 44.2.3).

44.6.3 Audio outputs

The configuration page for audio expander audio outputs is similar to the configuration page for network controller audio outputs (see section 44.2.4).

44.6.4 Control inputs

The configuration page for audio expander control inputs is similar to the configuration page for network controller control inputs (see section 44.2.5).

44.6.5 Control outputs

The configuration page for audio expander control outputs is similar to the configuration page for network controller control outputs (see section 44.2.6).

44.7 CobraNet interface

Proceed as follows to configure a CobraNet interface:

1 Go to *Configure* > *Equipment configuration* > *CobraNet interface*. A screen similar to the one in figure 44.38 appears in the main frame of the web interface.

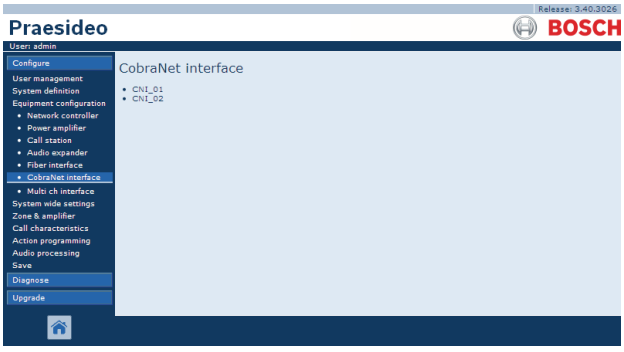


figure 44.38: Configure CobraNet interface step 1

2 Click the name of the CobraNet interface that must be configured. A screen similar to the one in figure 44.39 appears in the main frame of the web interface.

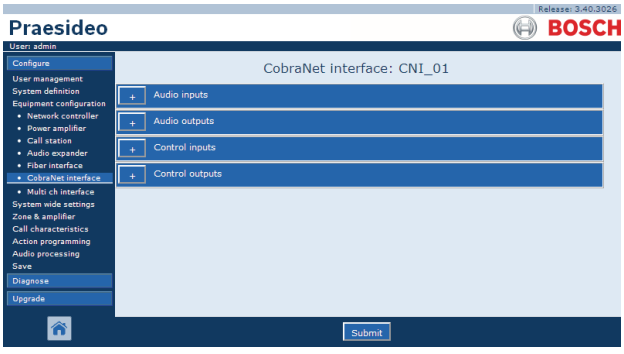


figure 44.39: Configure CobraNet interface step 2

3 Open the *Audio inputs* category to configure the audio inputs of the CobraNet interface (see section 44.7.1).

4 Open the *Audio outputs* category to configure the audio outputs of the CobraNet interface (see section 44.7.2).

5 Open the *Control inputs* category to configure the control inputs of the CobraNet interface (see section 44.7.3).

6 Open the *Control outputs* category to configure the control outputs of the CobraNet interface (see section 44.7.4).

7 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.7.1 Audio inputs

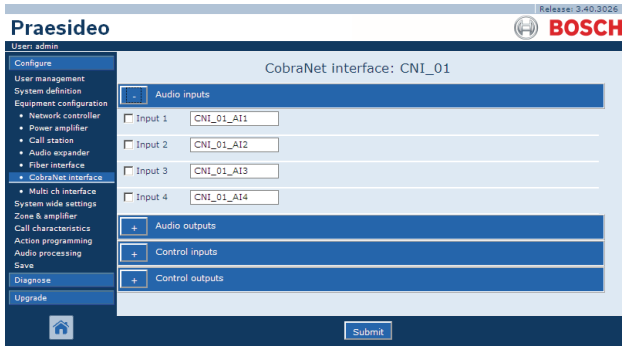


figure 44.40: Configure CobraNet interface step 3

Enter unique names for the audio inputs in the available text boxes.

44.7.2 Audio outputs

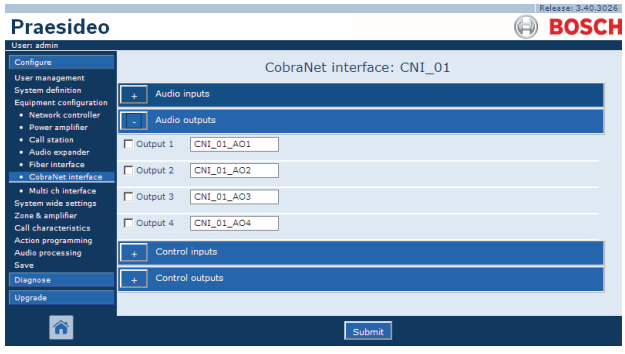


figure 44.41: Configure CobraNet interface step 4

Enter unique names for the audio outputs in the available text boxes.

44.7.3 Control inputs

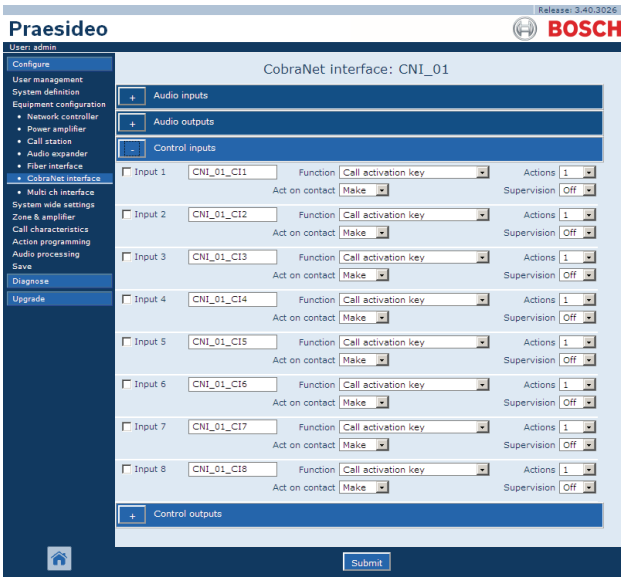


figure 44.42: Configure CobraNet interface step 5

The configuration page for CobraNet interface control inputs is similar to the configuration page for network controller control outputs (see section 44.2.5).

44.7.4 Control outputs

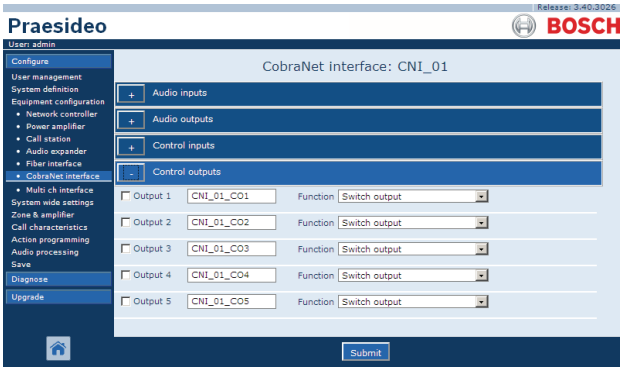


figure 44.43: Configure CobraNet interface step 4

The configuration page for CobraNet interface control outputs is similar to the configuration page for network controller control outputs (see section 44.2.6).

44.8 OMNEO interface

Proceed as follows to configure an OMNEO interface:

1 Go to *Configure > Equipment configuration > OMNEO interface*. A screen similar to the one in figure 44.44 appears in the main frame of the web interface.

figure 44.44: Configure OMNEO interface step 1

2 Click the name of the OMNEO interface that must be configured. A screen similar to the one in figure 44.45 appears in the main frame of the web interface.

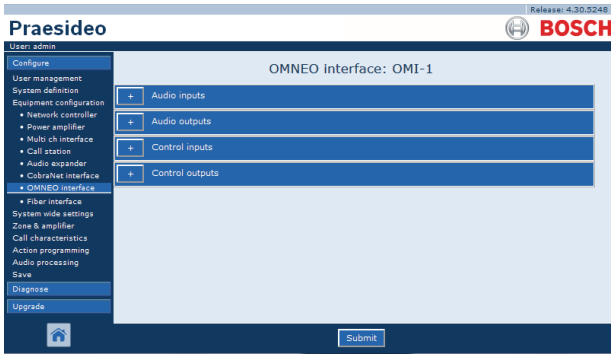


figure 44.45: Configure OMNEO interface step 2

3 Open the *Audio inputs* category to configure the audio inputs of the OMNEO interface (see section 44.8.1).

4 Open the *Audio outputs* category to configure the audio outputs of the OMNEO interface (see section 44.8.2).

5 Open the *Control inputs* category to configure the control inputs of the OMNEO interface (see section 44.8.3).

6 Open the *Control outputs* category to configure the control outputs of the OMNEO interface (see section 44.8.4).

7 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

44.8.1 Audio inputs

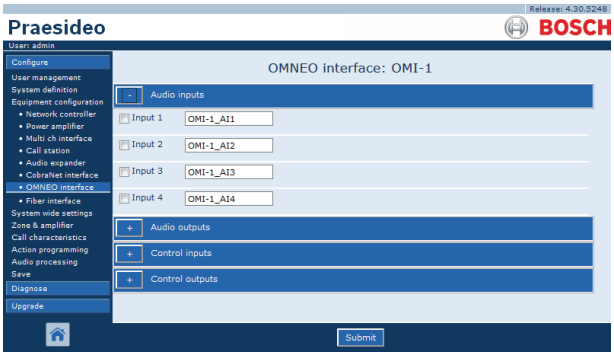


figure 44.46: Configure OMNEO interface step 3

Enter unique names for the audio inputs in the available text boxes.

44.8.2 Audio outputs

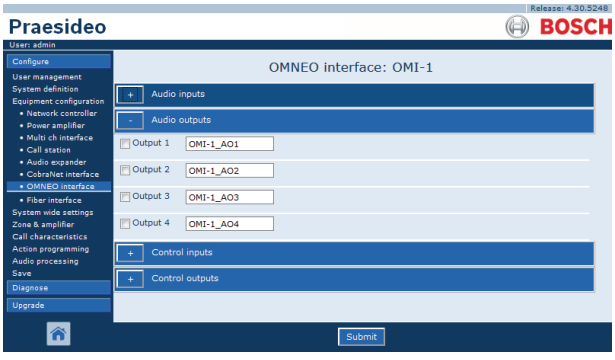


figure 44.47: Configure OMNEO interface step 4

Enter unique names for the audio outputs in the available text boxes.

44.8.3 Control inputs

figure 44.48: Configure OMNEO interface step 5

The configuration page for OMNEO interface control inputs is similar to the configuration page for network controller control outputs (see section 44.2.5).

44.8.4 Control outputs

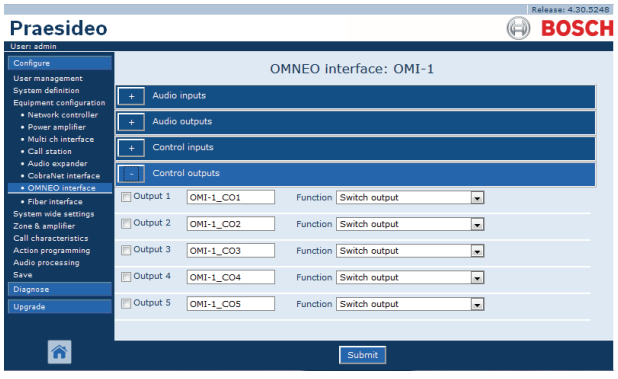


figure 44.49: Configure OMNEO interface step 6

The configuration page for OMNEO interface control outputs is similar to the configuration page for network controller control outputs (see section 44.2.6).

44.9 Fiber interface

44.9.1 Procedure

Proceed as follows to configure a fiber interface:

1 Go to *Configure* > *Equipment configuration* > *Fiber interface*. A screen similar to the one in figure 44.50 appears in the main frame of the web interface.

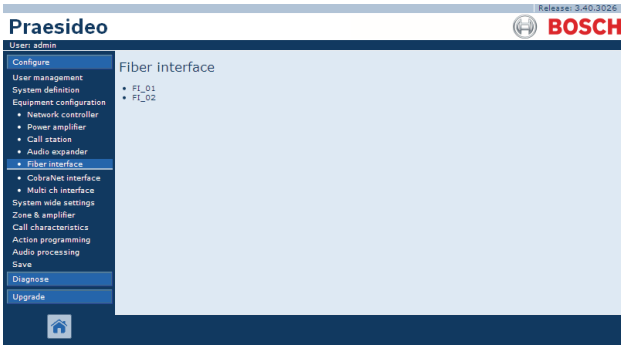


figure 44.50: Configure fiber interface step 1

2 Click the name of the fiber interface that must be configured. A screen similar the one in figure 44.51 appears in the main frame of the web interface.

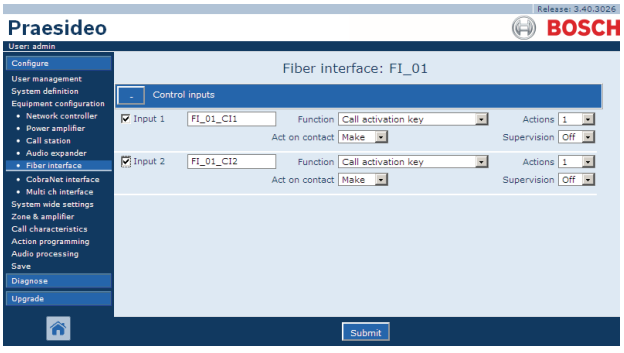


figure 44.51: Configure fiber interface, step 2

3 Configure the control inputs of the fiber interface (see section 44.9.2).

4 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and 41.4.4).

44.9.2 Control inputs

The configuration page for fiber interface control inputs is similar to the configuration page for network controller control inputs (see section 44.2.5).

45 System wide settings

45.1 Introduction

On the *System wide settings* pages, a number of general, system wide settings can be configured. It is possible to:

- Register recorded messages (see section 45.2).
- Specify system settings (see section 45.4).

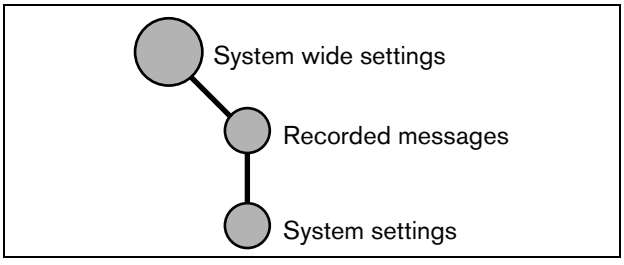


figure 45.1: System wide settings pages

45.2 Recorded messages

45.2.1 Introduction

On the *Recorded messages* page, WAV files (audio files) that have been transferred from the configuration PC to the network controller in the form of a message set, can be registered. See section 45.3 for information about creating and transferring messages sets.

45.2.2 Register a recorded message

Proceed as follows to register a recorded message:

1 Go to *Configure* > *System wide settings* > *Recorded messages*. A screen similar to the one in figure 45.2 appears in the main frame of the web interface.

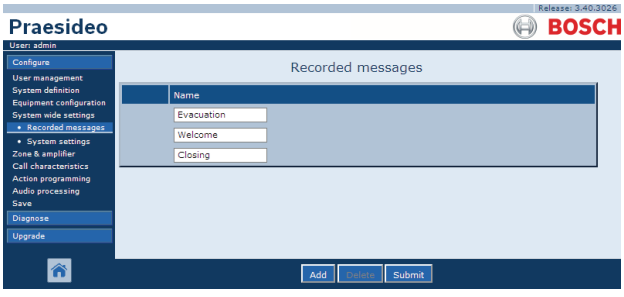


figure 45.2: Register message, step 1

2 Click the *Add* button to add a recorded message. A screen similar to the one in figure 45.3 appears in the main frame of the web interface.

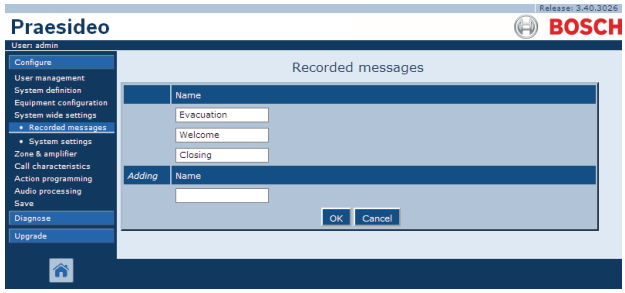


figure 45.3: Register message, step 2

3 Enter the name of the WAV file in the message set in the *Name* field (see figure 45.4 for an example).

- The name must be exactly the same as the name of the WAV file (including upper- and lowercase characters). It may consist of up to 16 characters.
- The extension *.wav* must be omitted.

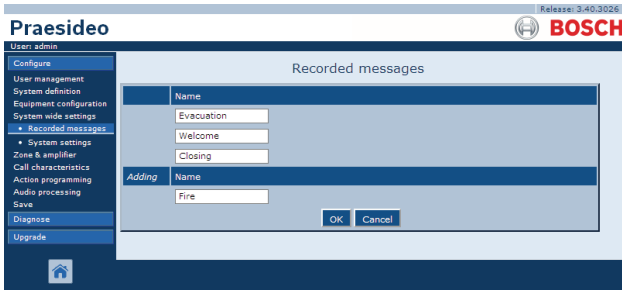


figure 45.4: Register message, step 3

4 Click the *OK* button to add the recorded message to the list of registered recorded messages. A screen similar to the one in figure 45.5 appears in the main frame of the web interface.

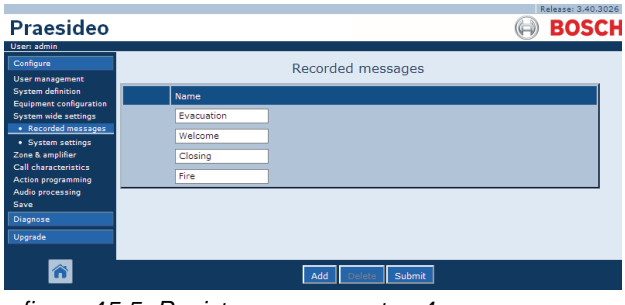


figure 45.5: Register message, step 4

5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and 41.4.4).

45.2.3 Unregister a recorded message

Proceed as follows to unregister a recorded message:

1 Go to *Configure* > *System wide settings* > *Recorded messages* to open the *Recorded messages* page. A screen similar to the one in figure 45.6 appears in the main frame of the web interface.

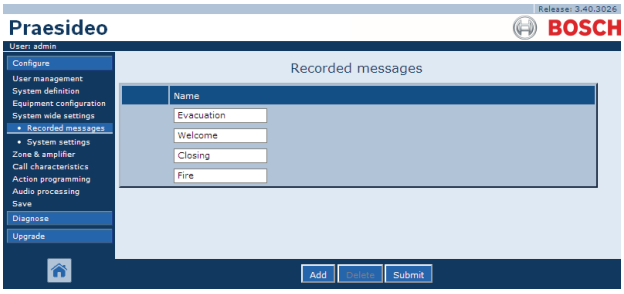


figure 45.6: Unregister a message, step 1

2 Click anywhere in the row of the recorded message that has to be deleted. The entire row becomes highlighted (see figure 45.7).

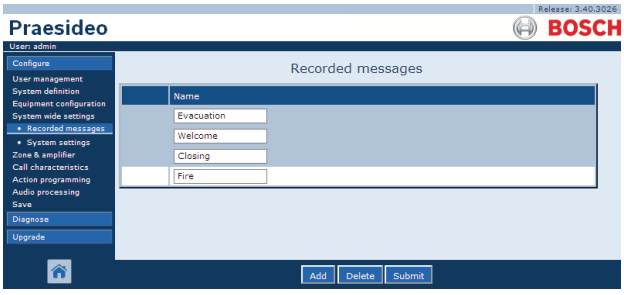


figure 45.7: Unregister message, step 2

3 Click the *Delete* button. A pop-up window asks to confirm this choice.

4 Click the *OK* button to confirm that the message must be deleted from the list. A screen similar to the one in the figure 45.8 appears in the main frame of the web interface.

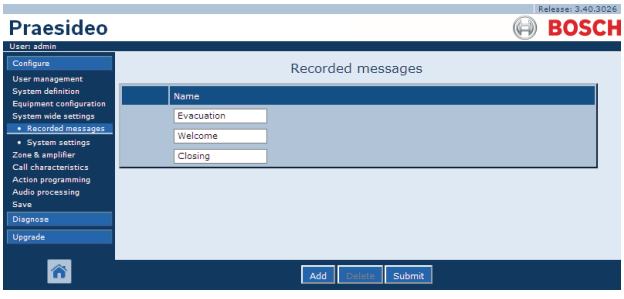


figure 45.8: Register message, step 4

5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and 41.4.4).

45.3 Message sets

45.3.1 Introduction

Message sets are files that consist of one or more mono, 16-bit, 44.1 kHz WAV (audio) files. Message set files are used to store WAV files at the compact flash card inside the network controller. The message sets can be created on a PC (see section 45.3.2) and transferred to the network controller (see section 45.3.4) using the *File Transfer* application.

A stored message set can hold up to 1024 messages. The system can play up to four messages in the set simultaneously, as part of a call. All of these calls may use the same message, if required, time-shifted or not.

45.3.2 Creating a message set

Proceed as follows to create a message set:

1 Go to *Start* > *(All) Programs* > *Bosch* > *Praesideo* > *FT Application* to start the Praesideo *File Transfer* application.

2 In the *File Transfer Application*, click the *Message Sets* button. A screen similar to the one in figure 45.9 appears.

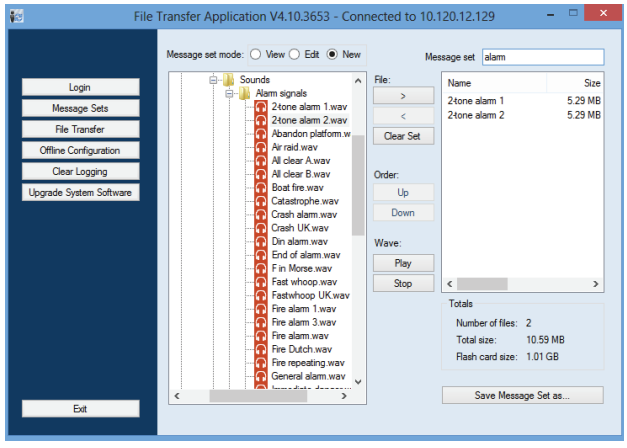


figure 45.9: Creating a message set

3 Click the *New* radio button.

Note
Using the *Message set mode* radio buttons, the message set screen of the *File Transfer* application can also be put in the *View* mode (for viewing existing message sets) or *Edit* (for editing existing message sets.

4 Browse to the WAV file that has to be added to the message set and select it.
5 Click the > button to add the WAV file to the message set.
6 Repeat steps 4 and 5 to add additional WAV files to the message set. The *Up* and *Down* buttons can be used to change the order of the messages in the set.
7 Enter a name for the message set in the *Message Set* field.
8 Click the *Save Message Set as* button to save the message set on the configuration PC. The message set has been created. For instruction about transferring the message set to the network controller, see section 45.3.4.

45.3.3 High efficiency alarm tones

Four different high-efficiency alarm tones are on the distribution DVD in the folder *\Tools\Audio Tools and Sounds\High efficiency alarm tones*. Because the tones are too complex to be generated in real time as start tone or end tone by the Praesideo system, these tones are designed as special multi-sine wav-files and should be used as messages in a call macro.
The tones are perceptually very loud and still have a limited RMS value of -6 dBFS, so they can be played back continuously without overheating the amplifiers. Also power consumption of the amplifiers will be reduced by 50% compared to normal sine alarm tones, that are scaled to -3 dBFS in Praesideo. However, although these high efficiency tones sound much louder than normal sine waves, a dBSPL measurement will not show this. This is because a normal dBSPL measurement does not take the applied psycho-acoustic factors into account. The high efficiency alarm tones are particularly useful for situations with much background noise, where a normal sine wave would be easily masked

45.3.4 Transfer a message set

Proceed as follows to transfer a message:
1 In the *File Transfer* application, first log in and then click the *File Transfer* button. A screen similar to the one in figure 45.10 appears.

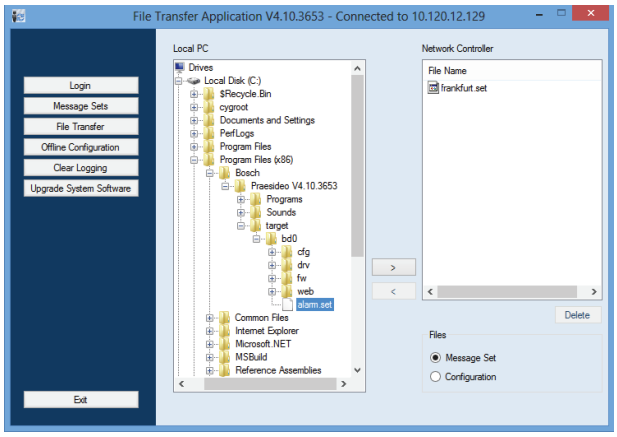


figure 45.10: Transferring a message set

2 Click the *Message Set* radio button.
3 Select the message set file in the *Local PC* box. The file is highlighted and the > button becomes available.
4 Click the > button to transfer the file from the PC to the network controller. A screen pops up that provides information about the file transfer progress.
5 When the file transfer is complete, the transferred file is visible in the *Network Controller* box.

45.4 System settings

A number of general, system wide parameters can be set using the *System wide settings* page (see figure 45.11).

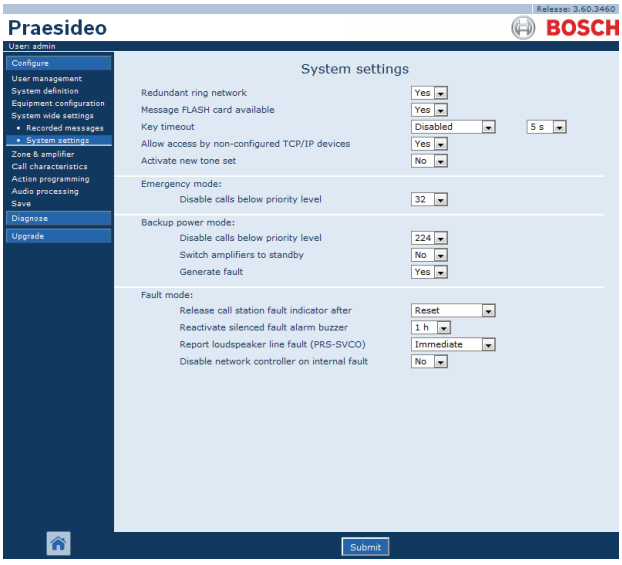


figure 45.11: System settings

- **Redundant ring network** - Specifies whether the Praesideo network forms a redundant ring (*Yes*) or not (*No*). If set to yes, cable breaks are reported.
- **Message FLASH card available** - Specifies whether the network controller contains a compact flash card (*Yes*) or not (*No*). If set to yes, the availability of the flash card is monitored.
- **Key timeout** - After this time, the selection that was made using a (remote) call station is automatically cancelled if the selection has not been executed. The *key timeout* also determines the timeout for locking the call stations when the call stations are used with a numeric pad and the access timeout has been set (see section 44.5.6).
- **Allow access by non-configured TCP/IP devices** - Specifies whether TCP/IP devices that are not part of the system definition can access the system (*Yes*) or not (*No*). If set to *No*, all TCP/IP devices that access the system must be added to the system definition (see section 43.12).
- **Activate new tone set** - Imports a new tone set into the configuration. If the system has been upgraded from a previous software version, select *Yes*. New software versions include tones that are not available in other versions or tones that have improved tone characteristics. New installations will automatically use the new tone set.
- **Emergency Mode: disable calls below priority level** - Calls with a priority lower than the specified priority are disabled if the system is in the emergency mode. The system is automatically put in the emergency mode when an emergency call is started.
- **Back-up Power mode**:
  - **Disable calls below priority level** - BGM and calls with a priority lower than the specified priority are disabled if the system is in the back-up power mode. Use the *Back-up power mode* action to put the complete system in the back-up power mode. See section 48.3.26. Individual power amplifiers and basic amplifiers go to back-up power mode if the mains power of that unit disappears. Then BGM and calls with a priority lower than the specified priority are only routed to amplifiers (zones) that are not in back-up power mode.
  - **Switch amplifiers to standby** - Power save mode. During use of the back-up power supply, the amplifiers are set to standby if Yes is selected here. When a call that has a higher priority level than that set in the **Disable calls below priority level** field, the required amplifiers are made active, and the call is broadcast. The Power-save mode extends the period of time that the battery back-up power supply is able to provide power to the Basic and power amplifiers. Power save mode is only available during the time that the back-up power supply is in use.
  - **Generate fault** - In some cases the backup power mode is enforced, for instance by a control input action, to save power and not because of a fault. The fault reporting can be disabled here.

Note
When Power-save mode is set, a spare amplifier that is not in use also goes to Power-save mode. A main or spare amplifier that is in Power-save mode is not supervised and will not report any faults.
Any faults that do occur during Power-save mode are secondary faults, the mains failure is the primary fault. In most cases, it is allowed that secondary faults are not reported.

- **Release call station fault indicator after** - The yellow power/fault LED (see table 16.1) is released after a fault has been acknowledged or after a fault has been reset. It is not necessary to resolve a fault before acknowledging it.
- **Reactivate silenced fault alarm buzzer** - A timeout period can be configured after which a fault alarm buzzer is reactivated when the faults have been acknowledged but not yet resolved and reset.
- **Report loudspeaker line fault (PRS-SVCO)** - Specifies whether LBB4440 Supervision Control Boards that are used for line supervision (see also section 44.3.5) must report faults immediately (*Immediate report*) or must check again before reporting faults (*Recheck before fault reporting*). When the system must comply to evacuation standards, select *Immediate report* to make sure that faults are reported within 100 s. In systems with long loudspeaker lines and many supervision boards, the chance of getting a false (not valid) supervision fault event can be reduced by rechecking before the fault will be reported. Then the system is less sensitive to disturbances in the communication caused by external noise sources or crosstalk between wires.
- **Disable network controller on internal fault** - This function is intended for systems that contain a redundant network controller. If an internal fault in the master network controller occurs (e.g., a flash card error), the master network controller is disabled and the spare network controller takes over the tasks of the disabled network controller. If the system contains only one network controller, select *No*.

46 Zone & amplifier

46.1 Introduction

On the *Zone & amplifier* pages, the zones and amplifiers can be configured. It is possible to:

- Configure zones (see section 44.2).
- Configure zone groups (see section 46.3).
- Assign spare amplifiers to main amplifiers (see section 46.4).
- Configure BGM channels (see section 46.5).

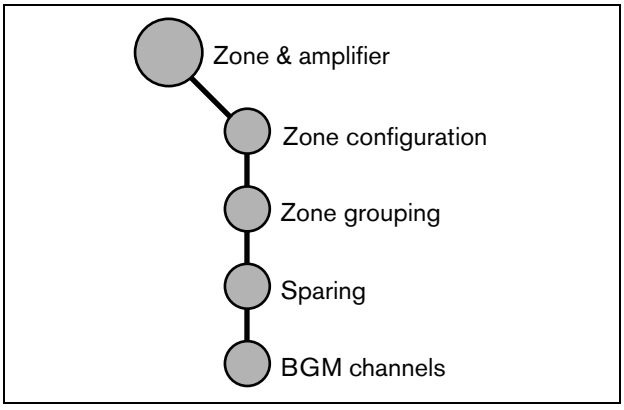


figure 46.1: Zone & amplifier pages

46.2 Zone configuration

46.2.1 Introduction

On the *Zone configuration* page, zones can be built. A zone is a group of audio outputs that, for example, go to the same geographical area. For example, consider multi-channel interfaces PRS-MCI with basic amplifiers that are part of a Praesideo system on an airport:

- Audio outputs (*MCI_01_AMP1*) and (*MCI_01_AMP2*) go to departure hall 1.
- Audio outputs (*MCI_02_AMP1*) and (*MCI_02_AMP2*) go to departure hall 2.

Then, a zone can be created called *Departure 1* to group the loudspeaker lines that go to departure hall 1 and a zone called *Departure 2* to group the loudspeaker lines that go to departure hall 2.

Note
An audio output cannot be part of more than one zone. After an audio output has been assigned to a zone, it is not allowed to assign the audio output to another zone (group).

To control external devices during the audio phase of a call, it is possible to include *Zone active output* and *Volume override output* control outputs in a zone. A *Zone active output* control outputs is activated when a call starts and deactivated when a call ends in the zone of which it is part. A *Volume override output* control output performs the same action for calls with priority 32 or higher.

Note
A control output cannot be part of more than one zone. After a control output has been assigned to a zone, it is not allowed to assign the control output to another zone.

46.2.2 Overview

The *Zone configuration* page (see figure 46.2) contains the following:

- **Name** - Shows the name of the zone
- **Available outputs** - Shows the available audio and control outputs. Use the dropdown list to choose the types of outputs that are shown.
- **Assigned outputs** - Shows the outputs assigned to the zone shown in (1).
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Volume settings** - Open the *Volume settings* category to configure the volume settings of the zone (see section 46.2.4).
- **AVC settings**- Open the *AVC settings* category to configure the AVC settings of the zone (see chapter 50).
- **Add** - Using this button a new zone can be added to the system configuration.
- **Delete** - Using this button an existing zone can be deleted from the system configuration.
- **Submit** - Using this button changes are submitted to the network controller.
- **Rename** - Using this button an existing zone can be renamed. Automatically this name is replaced everywhere in the configuration where this zone is used.

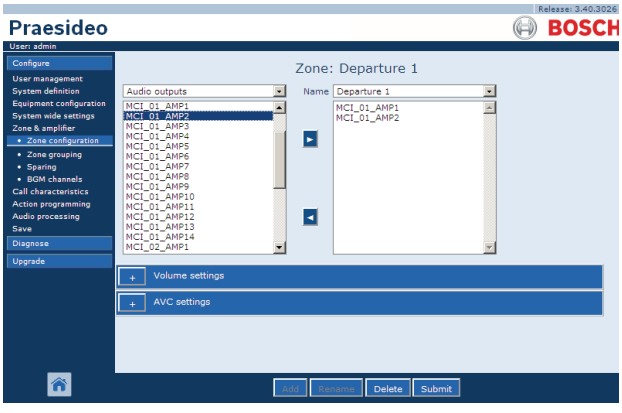


figure 46.2: Zone configuration, overview

Note

A zone can contain audio outputs as well as control outputs.

A zone cannot be empty, but e.g. even a single control output assigned to a zone is a valid configuration.

Audio output names and control output names between brackets indicate that these outputs are not yet enabled in the configuration.

Disabled outputs can be assigned but will not work.

Note

A zone with only a control output assigned to it allows a call to activate an external alarm (e.g. a siren) in a zone.

46.2.3 Create a zone

Proceed as follows to create a new zone:

1 Go to *Configure > Zone & amplifier > Zone configuration*. A screen similar to the one in figure 46.3 appears in the main frame of the web interface.

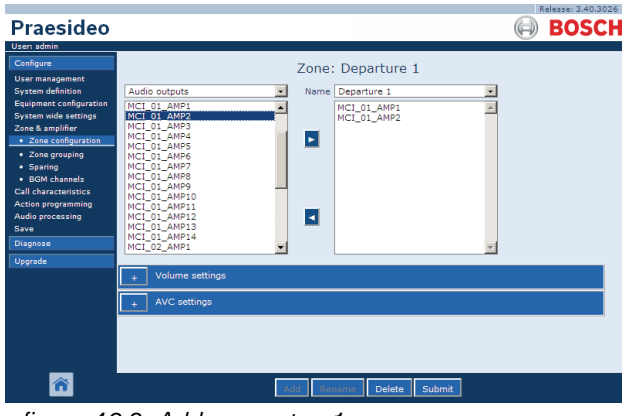


figure 46.3: Add zone, step 1

2 Click the *Add* button and enter a name for the new zone in the textbox at the bottom of the page. For example, *Departure 2* (see figure 46.4). It may consist of up to 16 characters.

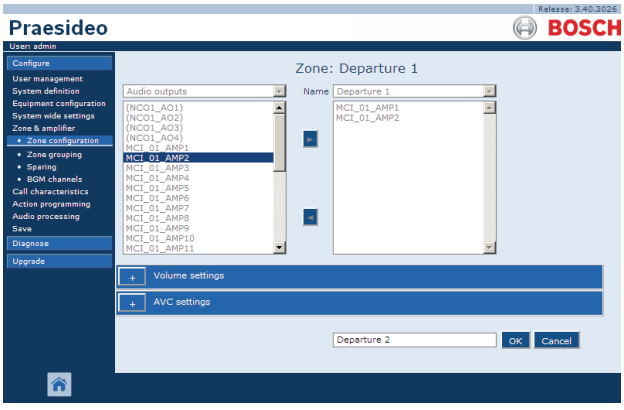


figure 46.4: Add zone, step 2

3 Click the *OK* button.
4 Select the output that must be added to the zone from the left box. For example, *MCI_02_AMP1*.
5 Double click the selected output or click the > button to add the output to the zone (see figure 46.5).

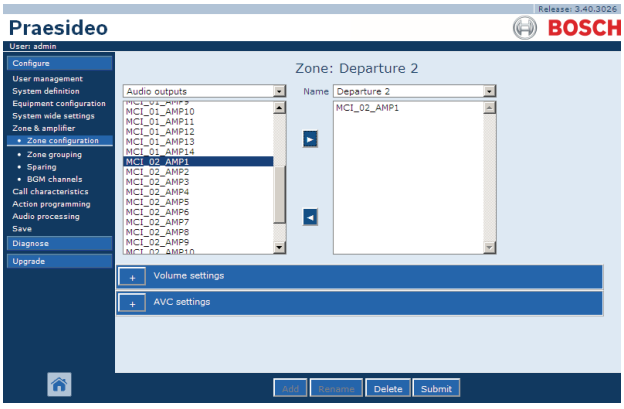


figure 46.5: Add zone, step 5

6 Repeat steps 4 and 5 to add additional outputs to the zone.
7 Open the *Volume settings* category to do the volume settings (see section 46.2.4).
8 Open the *AVC settings* category to do the AVC settings (see chapter 50).
9 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

46.2.4 Volume settings

In the *Volume settings* category (see figure 46.6) of the zone configuration page, it is possible to:

- Set the maximum BGM volume (*Maximum BGM volume*). It is not possible to adjust the BGM volume, for example from a call station keypad, to a higher level than the maximum BGM volume.
- Set the initial, start-up BGM volume (*Initial BGM volume*).
- Schedule BGM volume attenuation (*scheduled BGM volume adjustment*). These functions can be used to automatically decrease the BGM volume during certain periods of time (for example, in the evening). During the periods of time that both functions are active, the attenuations add up.
- Schedule call volume attenuation (*scheduled call volume adjustment*). With this function the call volume can be automatically decreased during a certain period of time (for example, in the evening).

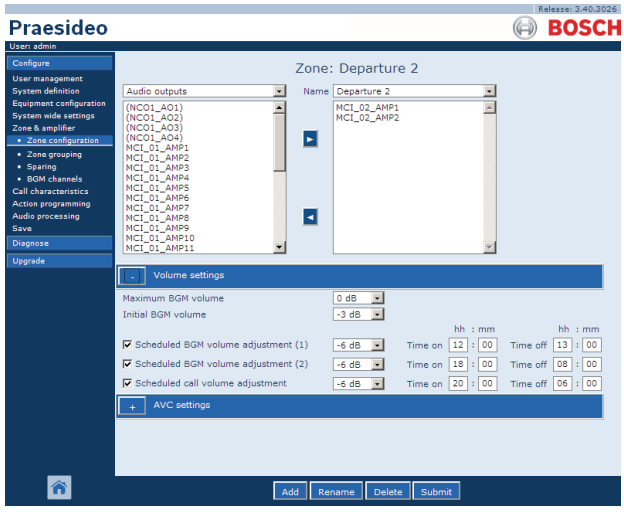


figure 46.6: Volume settings

46.2.5 Delete a zone

Proceed as follows to delete a zone:

1 Go to *Configure > Zone & Amplifier > Zone configuration*. A screen similar to the one in figure 46.7 appears.

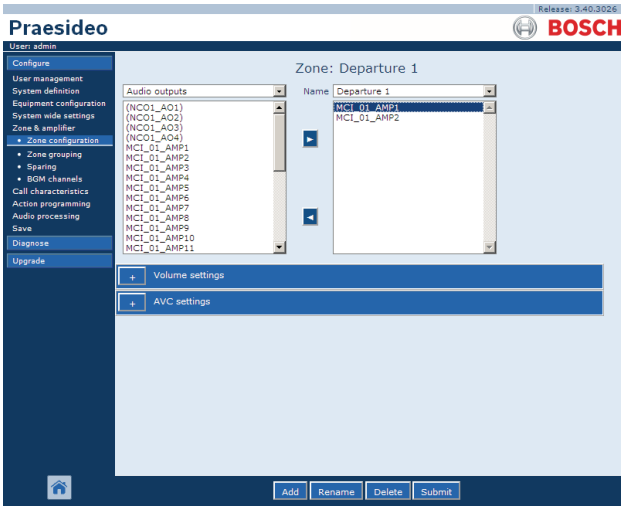


figure 46.7: Delete zone, step 1

2 Select the zone that must be deleted from the *Name* dropdown list. For example, *Departure 2*.

3 Click the *Delete* button to delete the zone. A pop-up window asks to confirm this choice.

4 Click the *OK* button to confirm that the zone has to be deleted. The deleted zone is no longer available in the *Name* dropdown list. It will also be removed from all occasions where it i used in the configuration.

5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

46.2.6 Rename a zone

Proceed as follows to rename a zone:

1 Go to *Configure > Zone & Amplifier > Zone configuration*.

2 Select the zone that must be renamed from the *Name* dropdown list.

3 Click the *Rename* button to rename that zone. A screen similar to the one in figure 46.8 appears.

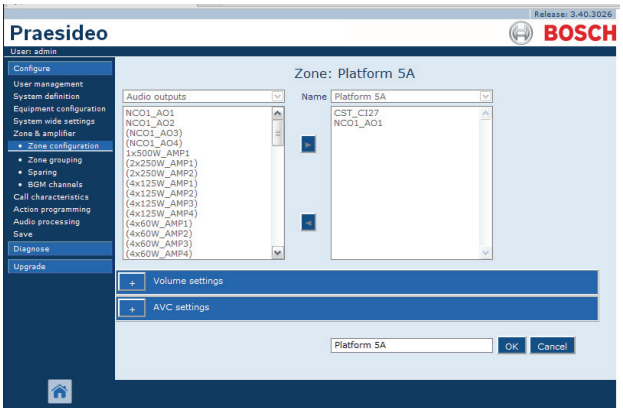


figure 46.8: Rename a zone, step 3

4 Change the name in the *edit* field (the name may consist of up to 16 characters) and click the *OK* button. The name of the zone will be changed on all occasions where it is used in the configuration.

5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

46.3 Zone Grouping

46.3.1 Introduction

On the *Zone grouping* page, zone groups can be built. A zone group is a group of zones that, for example, go to the same geographical area.

For example, Consider a small airport with four zones: *Departure 1*, *Departure 2, Arrival 1* and *Arrival 2*. The zones *Departure 1* and *Departure 2* contain loudspeaker lines that go to departure hall 1 and departure hall 2 respectively. The zones *Arrival 1* and *Arrival 2* contain loudspeaker lines that go to arrival hall 1 and arrival hall 2 respectively.

Then, a zone group can be created called *Departure Halls* to group the zones that go to the departure halls and a zone group called *Arrival Halls* to group the zones that go to the arrival halls.

46.3.2 Overview

The *Zone grouping* page (see figure 46.9) contains the following:

- **Name** - Shows the name of the zone group.
- **Available zones** - Shows the available audio zones. Zones can be created at the *Zone configuration* page (see section 46.2).
- **Assigned zones** - Shows the zones that have been assigned to the zone group shown in (1)
- **Add/Remove buttons** - Using the > and < buttons, selected zones can be added to or removed from *Assigned zones*.
- **Add** - Using this button a new zone group can be added to the system.
- **Delete** - Using this button an existing zone group can be deleted from the system.
- **Submit** - Using this button changes are submitted to the network controller.
- **Rename** - Using this button an existing zone group can be renamed. Automatically this name is replaced everywhere in the configuration where this zone group is used.

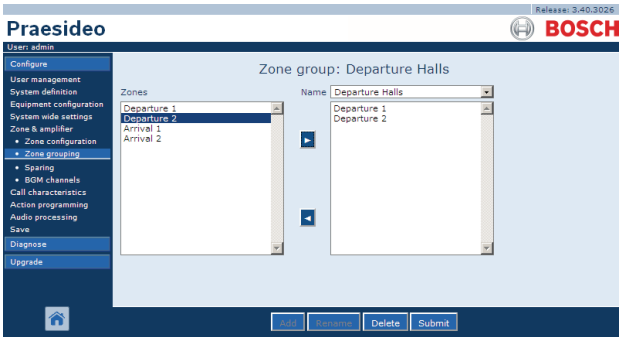


figure 46.9: Zone grouping, overview

46.3.3 Add a zone group

The procedure for creating a zone group is similar to the procedure for creating a zone (see section 46.2.3).

46.3.4 Delete a zone group

The procedure for deleting a zone group is similar to the procedure for deleting a zone (see section 46.2.5).

46.3.5 Rename a zone group

The procedure for renaming a zone group is similar to the procedure for renaming a zone (see section 46.2.6).

46.4 Sparing

46.4.1 Introduction

The sparing function is used to automatically replace defective main amplifiers with a spare amplifiers when it is useful. A spare amplifier replaces a complete main amplifier, even if the main power amplifier is a multi-channel unit and only one channel is defect. A spare amplifier can be connected to more than one main amplifier. However, only the first defective main amplifier will be replaced by the spare amplifier.

Note
See section 9.3.5 about connecting spare amplifiers.

On the *Spare power amplifier* page, main amplifiers can be assigned to spare amplifiers. For example, consider a small airport with four LBB4424/10 Power Amplifiers (4 x 125 W). Two of these power amplifiers are main amplifiers (*PAM_01* and *PAM_03*), whereas the other power amplifier are spare amplifiers *(PAM_02* and *PAM_04)*. Then, *PAM_04* can be configured as spare amplifier for *PAM_03*.

46.4.2 Overview

The *Spare power amplifier* page (see figure 46.10) contains the following:

- **Name** - Name of the spare amplifier to which a main amplifier must be assigned.
- **Main amplifiers** - List of main amplifiers that can be assigned to a spare amplifier.
- **Assigned amplifiers** - List of main amplifiers assigned to the selected spare amplifier.
- **Add/Remove buttons** - Using the > and < buttons, selected main amplifiers can be added to or removed from *Assigned amplifiers*.
- **Submit** - Using this button changes are submitted to the network controller.

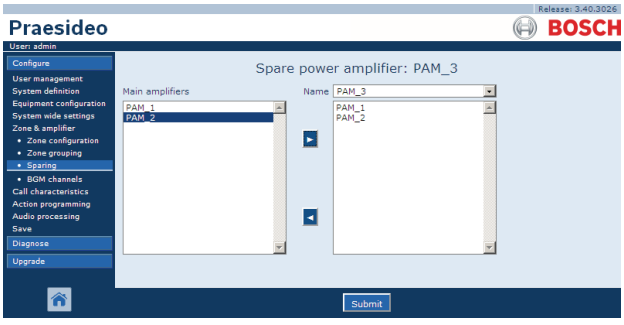


figure 46.10: Sparing, overview

46.4.3 Procedure

Proceed as follows to assign a main amplifier to a spare amplifier:

1 Go to *Configure > Zone & amplifier > Sparing*. A screen similar to the one in figure 46.11 appears in the main frame of the web interface.

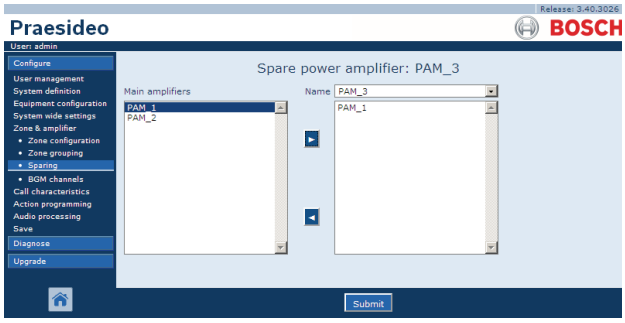


figure 46.11: Sparing, step 1

2 Select the spare amplifier to which the main amplifier must be assigned from the *Power Amplifier* dropdown list. For example, *PAM_04* (see figure 46.12).

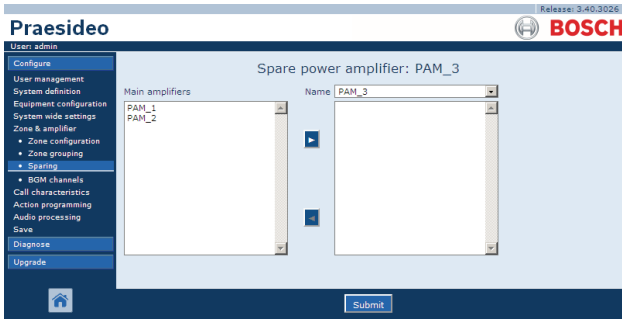


figure 46.12: Sparing, step 2

3 Select the main amplifier that must be assigned to the spare amplifier from the left box (see figure 46.13).

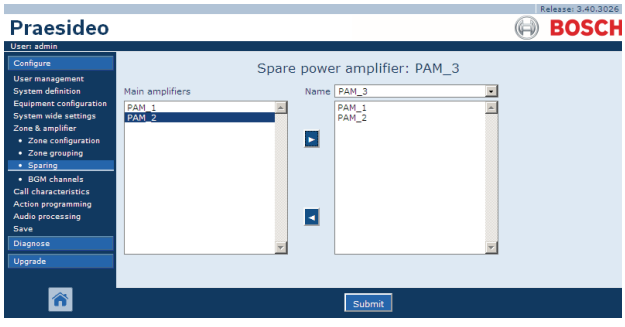


figure 46.13: Sparing, step 3

4 Double click the selected main amplifier or click the > button to assign the main amplifier to the spare amplifier. A screen similar to the one in figure 46.14 appears in the main frame of the web interface.

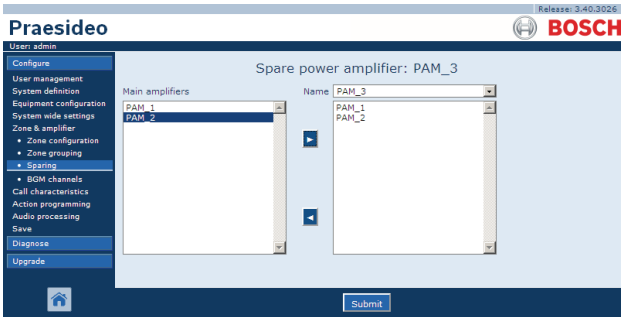


figure 46.14: Sparing, step 4

5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

46.5 BGM Channels

46.5.1 Introduction

At the *BGM channels* page, background music (BGM) channels can be built. A BGM channel refers to an audio input in the system. Optionally, default zones and or default zone groups can be connected to the channel. When the system is switched on, then the specified BGM is routed to the connected zones and zone groups. You can specify a routing limit to a BGM channel. If the the *Limit routing* checkbox is unticked, all available zones or zone groups can be made part of the default routing for the BGM channel. With *Limit routing* enabled, you can make a sub-set of available zones and zone groups and the BGM channel can not be routed outside this subset. This function can be used for routing of e.g. a licensed BGM channel to specific subscribers. In this case the default zones for this BGM channel at power on is again a sub-set of the specified routing limit. Also, zones and zone groups that are not part of the routing limit can not be added to the BGM channel selection via call station keys.
The maximum number of BGM channels is 28, but if a BGM channel uses an audio input on a certain unit, and all the zones within the routing limit are part of that particular unit only, none of the 28 system bus channels will be used for this BGM channel (with the following small exception for the LBB4428/00: audio outputs 1 to 4 and audio inputs 1 and 2 are considered a unit, just as audio outputs 5 to 8 and audio inputs 3 and 4 comprise another unit. In this case, cross-feeding the BGM channels will occupy a bus channel).
This allows for many local audio channels that will not be routed over the Praesideo network.

Note
When a zone or zone group is already connected to a BGM channel, do not connect another BGM channel to it. Connecting zones and zone groups to multiple BGM channels can cause inconsistencies in the configuration database when the system is switched on. In turn, these inconsistencies can result in unpredictable system behavior. The routing of BGM channels can be changed with call station keypads after the system has started up (see chapter 48).

Note
Each BGM channel must have a unique audio input.

46.5.2 Overview

The *BGM channels* page (see figure 46.15) contains the following:

- **Name** - Name of the background music channel.
- **Type** - Select between zones and zone groups as available destinations.
- **Available destinations** - The left column lists the available zones and zone groups.
- **Limit routing** - Tick the checkbox to apply a routing limit to the selected BGM channel or get access to all destinations.
- **Allowed destinations** - The center column lists the zones and zone groups that are allowed to receive the BGM channel. This list is not visible if the *Limit routing* checkbox is unticked.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Allowed destinations* and *Assigned destinations*.
- **Assigned destinations** - The right column lists the zones and zone groups that are assigned to the selected BGM channel at system startup.

- **Audio input** - Sets the audio input that provides the background music. The same audio input may not be assigned to different channels.
- **BGM fade in time** - Sets how quickly the BGM returns to its original volume after a call override.
- **Add** - Using this button a new BGM channel can be added to the system.
- **Delete** - Using this button an existing BGM channel can be deleted from the system.
- **Submit** - Using this button changes are submitted to the network controller.
- **Rename** - Using this button an existing BGM channel can be renamed. Automatically this name is replaced everywhere in the configuration where this BGM channel is used.

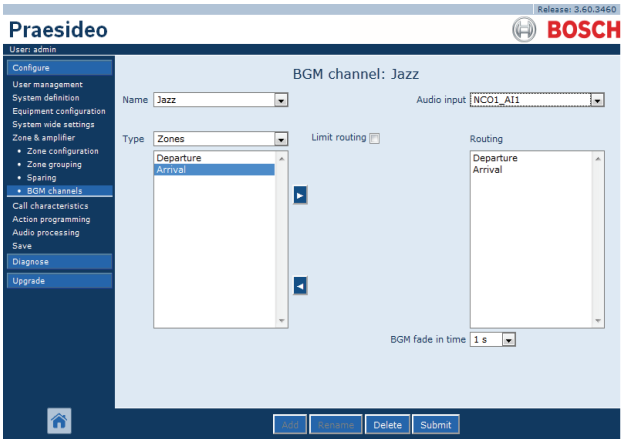


figure 46.15: BGM channels, overview

46.5.3 Add a BGM channel

The procedure for creating a BGM channel is similar to the procedure for creating a zone (see section 46.2.3).

46.5.4 Delete a BGM Channel

The procedure for deleting a BGM channel is similar to the procedure for deleting a zone (see section 46.2.5).

46.5.5 Rename a BGM Channel

The procedure for renaming a BGM channel is similar to the procedure for renaming a zone (see section 46.2.6).

47 Call characteristics

47.1 Introduction

Using the *Call characteristics* pages, call macros can be defined (see section 44.2).

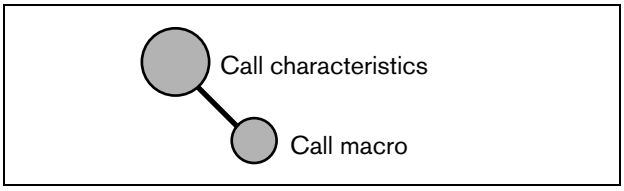


figure 47.1: Call characteristics pages

47.2 Call macro

47.2.1 Introduction

On the *Call macro* page, call macros can be defined. Call macros are used to make calls.

47.2.2 Create a call macro

Proceed as follows to create a new call macro:

1 Go to *Configure* > *Call characteristics* > *Call macro*. A screen similar to the one in figure 47.2 appears in the main frame of the web interface.

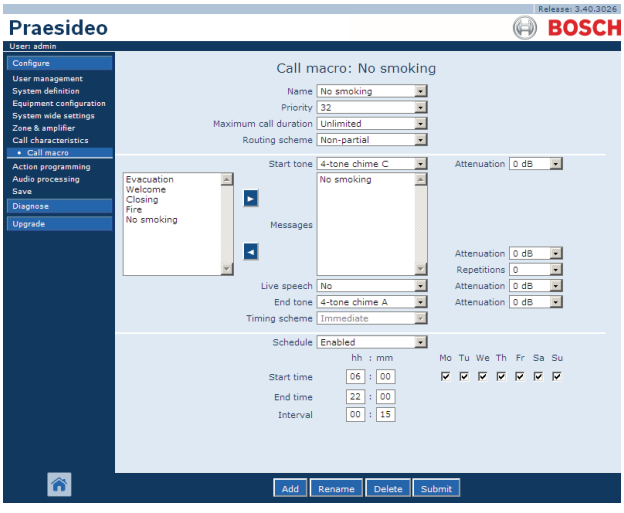


figure 47.2: Add call macro, step 1

2 Click the *Add* button to add a new call macro. A screen similar to the one in figure 47.3 appears in the main frame of the web interface.

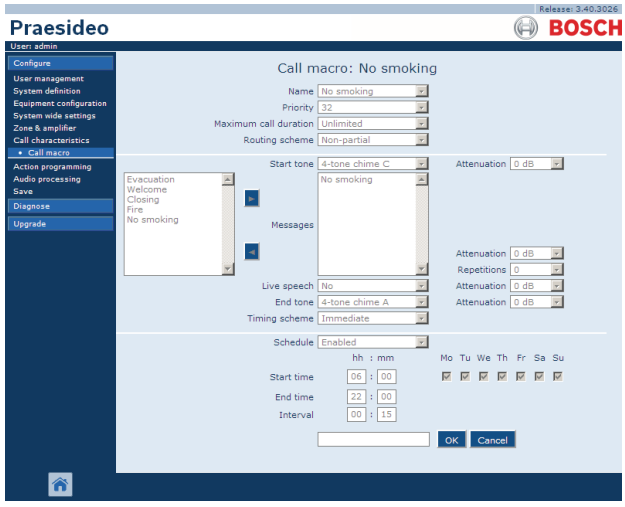


figure 47.3: Add call macro, step 2

3 Enter the name of the new call macro in the *Name* field (see figure 47.4 for an example). It may consist of up to 16 characters.

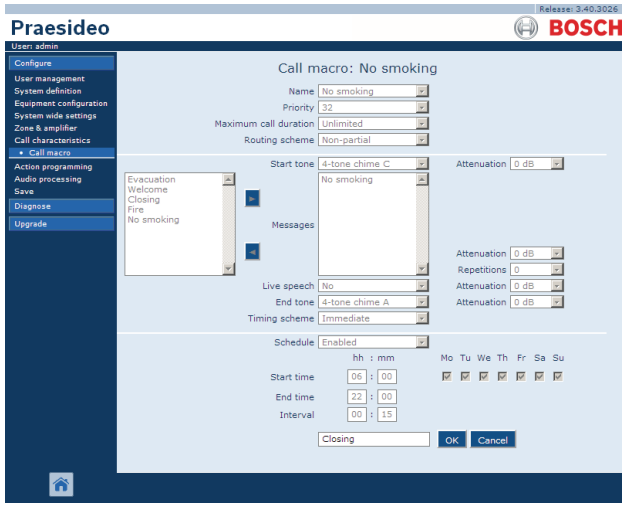


figure 47.4: Add call macro, step 3

4 Click the *OK* button to add the call macro to the list of call macros in the system. A screen similar to the one in figure 47.5 appears in the main frame of the web interface.

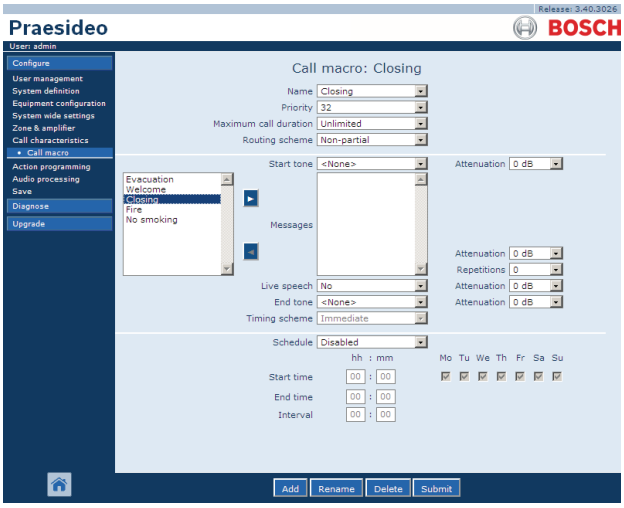


figure 47.5: Add call macro, step 4

5 Configure the contents of the call macro:

- Select the priority of the call macro from the *Priority* list.
- Select the routing scheme of the call macro from the *Routing Scheme* list (see section 3.2.4 for more information). If the routing scheme is set to *Stacked*, the *Time out (min.)* and *Forward on release of* controls appear. *Time out* sets the maximum time the call will be kept in memory for later broadcast. After this time it is deleted. *Forward on release of* gives the option to select whether a stacked call is forwarded to each zone individually when it is available again, or to all remaining zones at once.
- If the call must use a start tone, select a tone from the *Start tone* dropdown list. See appendix A for a list of available tones and chimes. Adjust the attenuation to set the volume of the tone.
- If the call must contain recorded messages, select them in the left box and click the > button to add them to the *Messages* box of the call macro. Use the *Repetitions* box to specify how many times the recorded messages must be repeated. See section 45.2 for information about recorded messages. Adjust the attenuation to set the volume of the messages.
- If the call must contain live speech, set the *Live speech* option to *Yes*. If the call does not contain live speech, set it to *No*. Adjust the attenuation to set the volume of the live speech.
- If the call must use an end tone, select a tone from the *End tone* dropdown list. See appendix A for a list of available tones and chimes. Adjust the attenuation to set the volume of the tone.
- If *Live speech* is set to *Yes*, use the *Audio input* list to specify the input that must be inserted. Select *Default* if the live speech is originating from a call station.
- If *Schedule* is set to *Enabled*, call scheduling is enabled. Enter the start time of the first call in the *Start time* field and the interval period in the *Interval* field. After the *End time*, the call will not be repeated. Specify also the days on which the call scheduling is active.
- If *Live speech* is set to *Yes*, use the *Timing scheme* list to specify the timing scheme of the call (see section 3.2.5).
- The timing scheme can be used to select *Immediate* broadcast of a call. If a call stacker is included in the system, and *Live speech* is set to *Yes*, *Time-shifted* broadcast or time-shifted with *Pre-monitor* is also possible. A time-shifted call is broadcast upon completion of the original call or after the local pre-monitor phase has finished.

Note
When *Live speech* is set to *Yes*, call scheduling is not possible and the fields for call scheduling are not visible. When *Live speech* is set to *No* the timing scheme is fixed to *Immediate*.

- The maximum duration of a call can be configured by selecting one of the following options from the *Maximum call duration* droplist: 10 s, 20 s, 40 s, 1 min, 2 min, 5 min, 10 min, 20 min, 30 min and Unlimited (default).
  A maximum call duration avoids blocking of zones by a high priority call that was started but not stopped, either by accident or because it contains e.g. infinitely looping messages.

Note
The *Maximum call duration* cannot be configured when the *Routing scheme* is set to *Stacked* or when the *Schedule* is enabled.

6 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

47.2.3 Delete a call macro

Proceed as follows to delete a call macro:

1 Go to *Configure* > *Call characteristics* > *Call macro* to open the *Call macro* page.
2 Select the call macro that has to be deleted from the *Name* dropdown list.
3 Click the *Delete* button to delete the call macro. A pop-up window asks to confirm this choice.
4 Click the *OK* button to confirm that the call macro must be deleted. The deleted call macro is no longer available from the *Name* dropdown list.
5 Submit the changes. Note that the changes are not permanent until the configuration is saved (see section 41.4.3 and 41.4.4.

48 Action programming

48.1 Introduction

On the *Action programming* pages, the keys of the keypads and the control inputs can be configured. The process of configuring a key or control input consists of two steps:

1 Assigning a behavior (see section 48.2).
2 Assigning an action (see section 48.3).

48.2 Behavior

48.2.1 Introduction

The behavior specifies how the control input deals with incoming signals or how the key reacts when it is pressed. The following behaviors are available:

- Momentary on break or make (see section 48.2.2).
- Single shot on break or make (see section 48.2.3).
- Toggle on break or make (see section 48.2.4).

48.2.2 Momentary behaviors

48.2.2.1 Momentary

If the behavior is momentary, the action coupled to the control input or key is active during the time the external contact is closed.

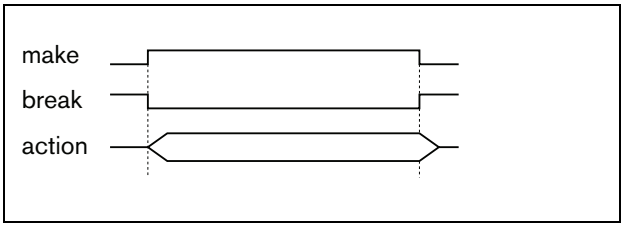


figure 48.1: Momentary behavior

48.2.2.2 Momentary with immediate abort

If the behavior is momentary with immediate abort, the action coupled to the control input or key is active during the time the external contact is closed. For an example, see figure 48.2. When the external contact is opened, the action is immediately aborted.

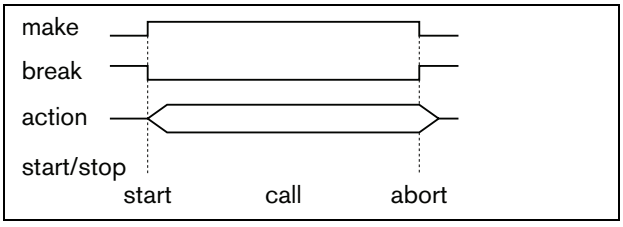


figure 48.2: Momentary with immediate abort

48.2.2.3 Momentary with phase completion and abort on repress

If the behavior is momentary with phase completion and abort on repress, the action coupled to the control input or key is active during the time the external contact is closed. For an example, see figure 48.3. When the external contact is opened, the action is stopped after the completion of the current phase

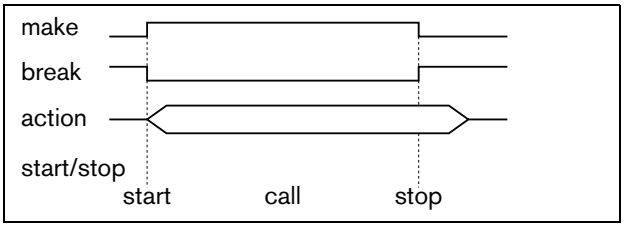


figure 48.3: Momentary with phase completion and abort on repress (1)

When the external contact is closed again while the action is still running, the action is immediately aborted. For an example, see figure 48.4.

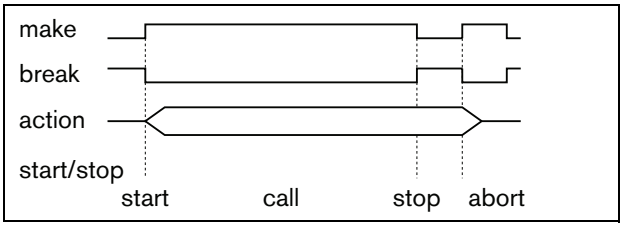


figure 48.4: Momentary with phase completion and abort on repress (2)

48.2.3 Single shot behaviors

48.2.3.1 Single shot

If the behavior is single shot, the action is started when the external contact closes. The action can be stopped with a single shot with immediate abort (see section 48.2.3.2) or single shot with phase completion (see section 48.2.3.3).

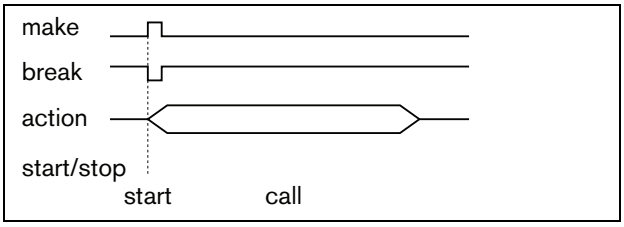


figure 48.5: Single shot

Usually, the single shot behavior is used for triggering events (for example, to cancel a selection) and actions with a significant duration (for example, a call).

48.2.3.2 Single shot with immediate abort

If the behavior is single shot with immediate abort, the action is stopped when the external contact closes. This type of behavior is used for stopping actions that were started with a single shot action (see section 48.2.3.1)

48.2.3.3 Single shot with phase completion

If the behavior is single shot with phase completion, the action is stopped when the external contact closes. This type of behavior is used for stopping actions that were started with a single shot action (see section 48.2.3.1)

48.2.4 Toggle behaviors

48.2.4.1 Toggle

If the behavior is toggle, the action coupled to the control input or key is started when the external contact closes and stopped when the external contact closes again (see figure 48.6).

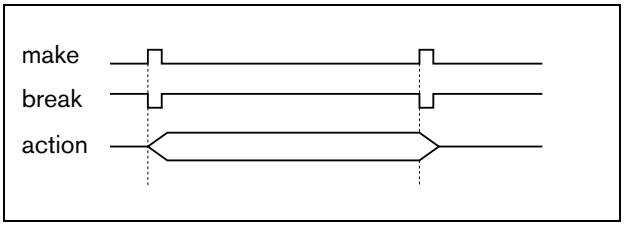


figure 48.6: Toggle

48.2.4.2 Toggle with immediate abort

If the behavior is toggle with immediate abort, the action coupled to the control input or key is started when the external contact closes and immediately aborted when the external contact closes again. For an example, see figure 48.7.

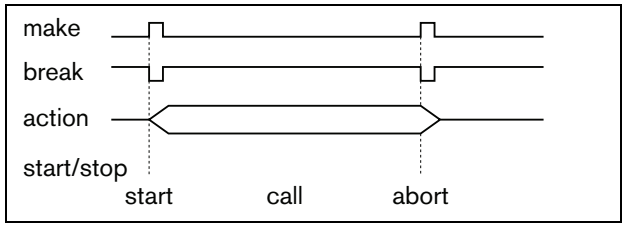


figure 48.7: Toggle with immediate abort

48.2.4.3 Toggle with phase completion and abort on repress

If the behavior is toggle with phase completion and abort on repress, the action coupled to the control input or key is started when the external contact closes. For an example, see figure 48.8. When the external contact closes again, the action is stopped after the completion of the current phase.

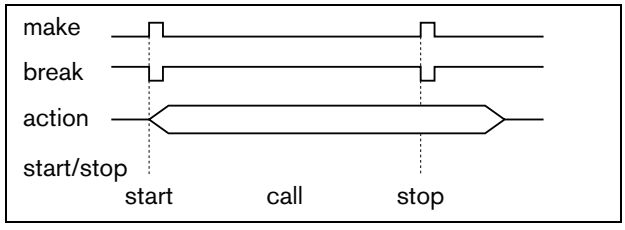


figure 48.8: Toggle with phase completion and abort on repress (1)

When the external is closed a third time while the action is still running, the action is immediately aborted. For an example, see figure 48.9.

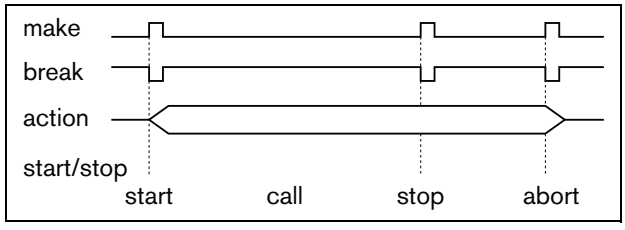


figure 48.9: Toggle with phase completion and abort on repress (2)

48.3 Actions

48.3.1 Introduction

The action determines which action is triggered if the control input or key becomes active. The behavior that can be assigned to a control input or key, depends on the action type, since some combinations of actions and behaviors are not useful (see section 48.3.2).

Note
The *Action programming* pages for a call station basic or call station toolkit always contain a *General* section and up to 16 *Keypad* sections. In the *General* section, the properties of the PTT key of the call station can be defined. This key always has the *Press-to-talk* (PTT) action.

48.3.2 Overview

table 48.1: Actions

Action	Description, see:	Momentary	Momentary with immediate abort	Momentary with phase completion and abort on repress	Single shot	Single shot with immediate abort	Single show with phase completion	Toggle	Toggle with immediate abort	Toggle with phase completion and abort on repress
PTT	48.3.3		•	D	•				•	•
Call activation key	48.3.4		D	•	•				•	•
Start	48.3.5	D			•			•		
Stop	48.3.6					D	•			
Call macro	48.3.7	•						D		
Priority	48.3.8	•						D		
Tones	48.3.9	•						D		
Recorded message	48.3.10	•						D		
Zone selection	48.3.11	•						D		
Cancel selection	48.3.12				D					
Recall	48.3.13				D					
Cancel last	48.3.14				D					
Cancel all	48.3.15				D					
BGM source	48.3.16	D						•		
BGM volume control	48.3.17				D					
BGM on/off	48.3.18				D					
Local BGM source	48.3.19				D					
Local BGM volume control	48.3.20				D					
Local BGM on/off	48.3.21				D					
Fault input	48.3.22	D						•		
Zone line fault input	48.3.23	D						•		
Acknowledge/Reset	48.3.24				D					
Indicator test	48.3.25	D								
Back-up power mode	48.3.26	D						•		
Synchronize time	48.3.27				D					
Switch trigger	48.3.28	D								
Switch output	48.3.29	not applicable								
Zone active output	48.3.30	not applicable								
Volume override output	48.3.31	not applicable								
System fault	48.3.32	not applicable								
Zone status	48.3.33	not applicable								
Zone priority status	48.3.34	not applicable								

Legend:

D : Default

• : Other possible behaviors

48.3.3 Press-to-talk (PTT)

Using the *PTT* (Press-to-talk) action, a call with a predefined priority based on a call macro can be started in one or more predefined zones or zone groups. When the activator of a *PTT* action is released, the call is stopped after completion of the running phase of the call. See figure 48.10 for an overview of the *Action programming* page for a *PTT* key. Configuring a *PTT* action is similar to configuring a *Call activation key* action (see section 48.3.4).

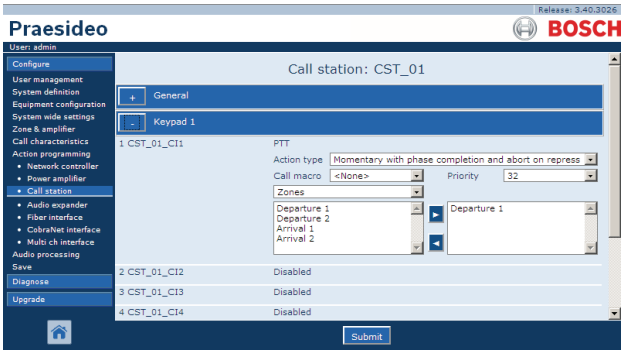


figure 48.10: PTT (Press-to-talk) key

The *PTT* keys of call stations and call station keypads are linked to the status LEDs (see section 16.3 and 19.2.5). Only one *PTT* key can be active at the same time.

48.3.4 Call activation key

Using the *Call activation key* action, a call with a predefined priority based on a call macro can be started in one or more predefined zones or zone groups. It is also possible to activate a predefined control output. When the activator of a *Call activation key* action is released, the call is aborted. See figure 48.11 for an overview of the *Action programming* page for a *Call activation key*.

If more than one action (up to a maximum of 5) is configured for a *Call activation key*, see section 44.2.5, then also multiple sets of *Call macro*, *Priority* and *Zones* can be configured here.

Note
This action can also be assigned to control inputs and virtual control inputs (of the network controller).

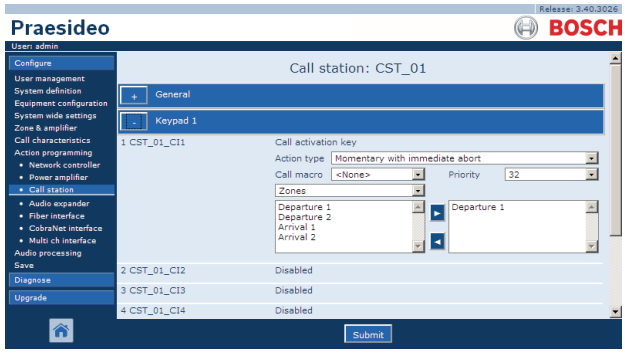


figure 48.11: Call activation key

- **Action type** - Sets the type of action.

Note
If the system contains call stackers, use the action type *Toggle with abort on repress* or *Momentary with abort on repress*, since calls are automatically deleted from the call stackers when they are aborted immediately.

- **Call macro** - Assigns a call macro to the key or control input.
- **Priority** - Sets the priority of the call. The ranges of priorities offered depends on the type of call station (normal: 32 to 223, emergency: 32 to 255). When the priority of the Call activation key action must be the same as the priority of the call macro, set Priority to <Default>.
- **Available outputs** - Shows the available zones, zone groups and control outputs. Use the dropdown list to choose the type of outputs that are shown.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the outputs that have been assigned to the key or control input.

48.3.5 Start

The *Start* action is intended for making emergency calls for phased evacuation. The *Start* action starts a call, based on a call macro, in a pre-defined zone or zone group. The priority of the call is the same as the priority of the call macro and cannot be changed. See figure 48.12 for an overview of the *Action programming* page for a *Start* key.

If more than one action (up to a maximum of 5) is configured for a *Start* key or control input, see section 44.2.5, then also multiple sets of *Call macro* and *Zones* can be configured here.

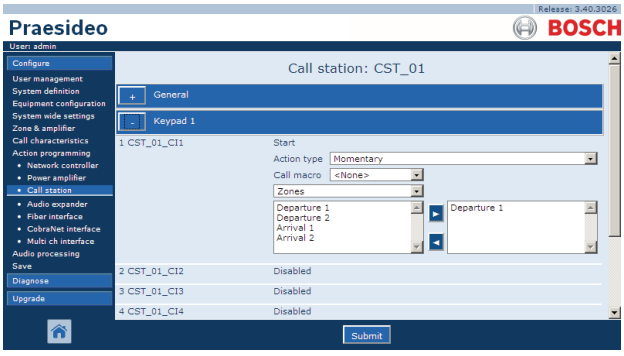


figure 48.12: Start action key

Typically, there will be multiple *Start* actions that use the same call macro, but address other zones or zone groups. In case of a phased evacuation, the different *Start* actions then can be used to expand the area in which the call is running.

When the activator of a *Start* action is released, the running call is stopped in the zones or zone groups that are associated to the action. In case of a phased evacuation, releasing the different *Start* actions can be used to reduce the area in which the call is running.

Note
This action can also be assigned to control inputs.

A combined Start/Stop action can be assigned to virtual control inputs of the network controller.

48.3.6 Stop

The *Stop* action is intended for aborting emergency calls for phased evacuation. The *Stop* action aborts all calls that are based on the defined call macro. See figure 48.13 for an overview of the *Action programming* page for a *Stop* key.

If more than one action (up to a maximum of 5) is configured for a *Stop* key or control input, see section 44.2.5, then also multiple *Call macros* can be configured here.

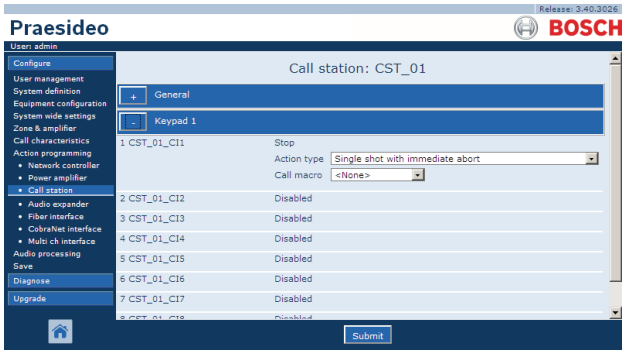


figure 48.13: Stop action key

Note
This action can also be assigned to control inputs.

A combined Start/Stop action can be assigned to virtual control inputs of the network controller.

48.3.7 Call macro

Using a *Call macro* key, a call macro can be selected. See figure 48.14 for an overview of the *Action programming* page for a *Call macro* key.

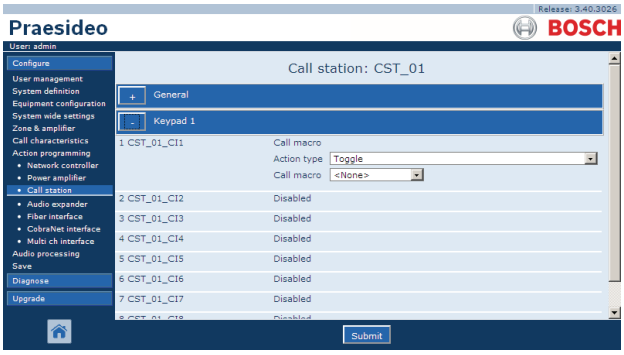


figure 48.14: Call macro key

48.3.8 Priority

Using the *Priority* key, a priority can be selected. See figure 48.15 for an overview of the *Action programming* page for a *Priority* key.

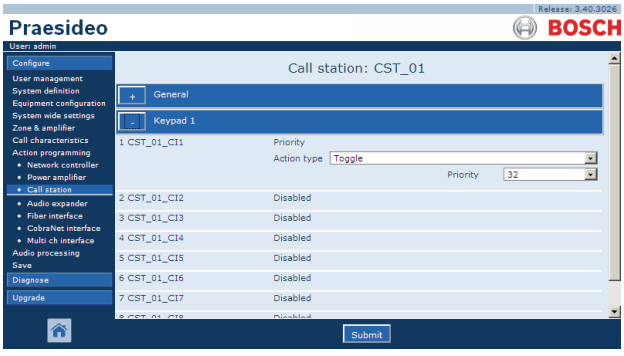


figure 48.15: Priority key

48.3.9 Tones

Using a *Tones* key, a tone can be selected. See figure 48.16 for an overview of the *Action programming* page for a *Tones* key.

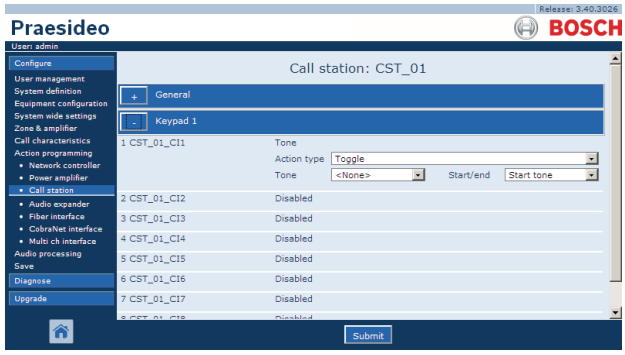


figure 48.16: Tones key

Note
For information about available tones, see appendix A.

48.3.10 Recorded message

Using the *Recorded message* action, a recorded message can be selected. See figure 48.17 for an overview of the *Action programming* page for a *Recorded message* key.

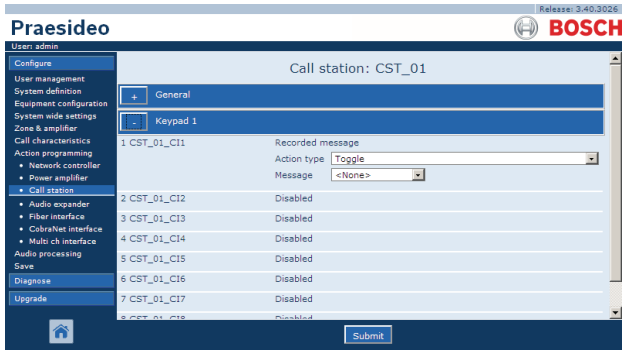


figure 48.17: Recorded message key

48.3.11 Zone selection

Using a *Zone selection* key one or more zones and/or one or more zone groups can be selected. See figure 48.18 for an overview of the *Action programming* page for a *Zone selection* key.

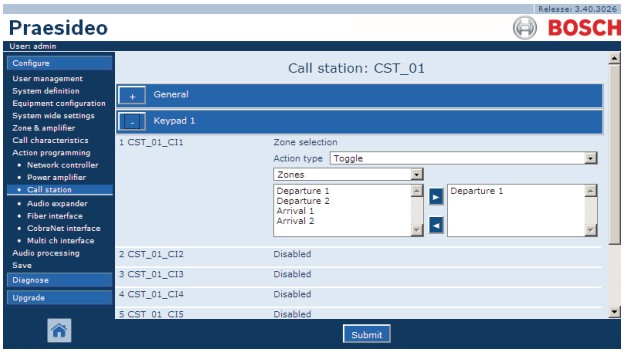


figure 48.18: Zone selection

- **Action type** - Sets the type of action.
- **Available outputs** - Shows the available zones, zone groups and control outputs. Use the dropdown list to choose the type of outputs that are shown.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the outputs that have been assigned to the key.

Note
For information about creating zones and zone groups, see section 46.2.

48.3.12 Cancel selection

The *Cancel selection* action is used to cancel selections that have been made. See figure 48.19 for the *Action programming* page for a *Cancel selection* key.

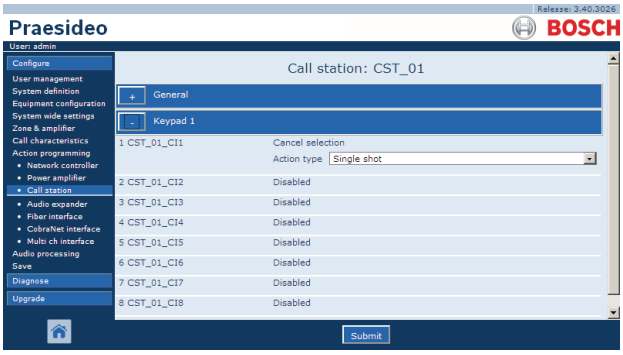


figure 48.19: Cancel selection key

48.3.13 Recall

The *Recall* action is used to recall selections that have been made. See figure 48.20 for the *Action programming* page for a *Recall* key.)

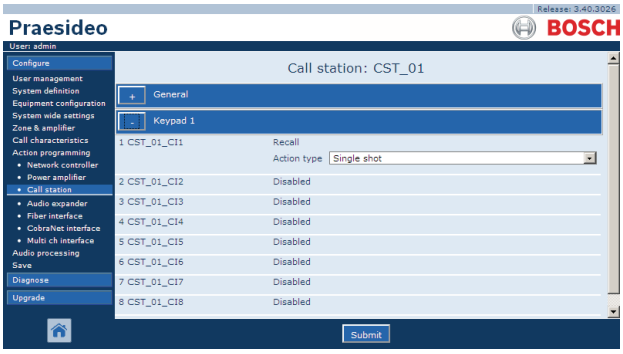


figure 48.20: Recall key

48.3.14 Cancel last

The *Cancel last* action key is intended for cancelling the last stacked call that originated from the call station. See figure 48.21 for an overview of the *Action programming* page for a *Cancel last* key.

The *Cancel last* function only works during the broadcast replay phase, after the pre-monitor phase. To cancel a call during the pre-monitor phase, configure the key that starts the call with the *abort on repress* option, and use that key.

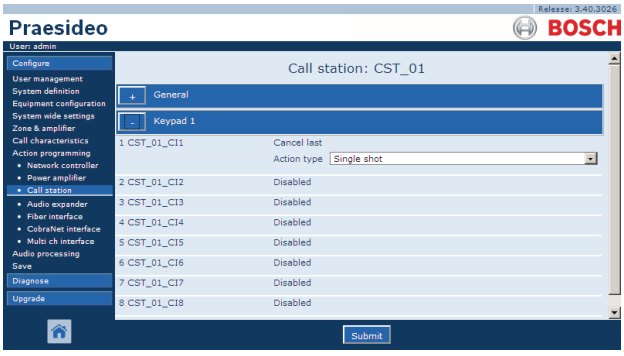


figure 48.21: Cancel last action key

48.3.15 Cancel all

The *Cancel all* action key is intended for cancelling all stacked calls that originated from the call station. See figure 48.22 for an overview of the *Action programming* page for a *Cancel all* key.

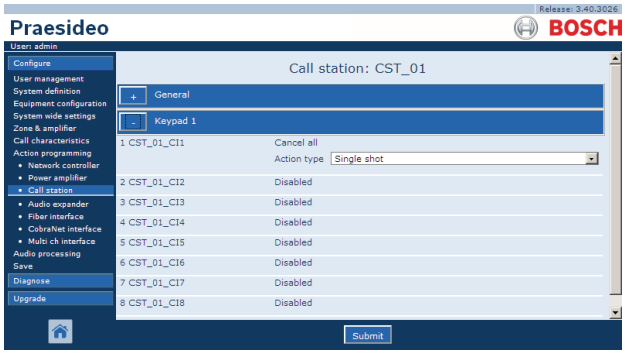


figure 48.22: Cancel all action key

48.3.16 BGM source

Using the *BGM Source* action, a BGM source can be selected. When a *BGM Source* key is pushed, the LEDs of the zone selection keys of the same call station show the zones in which the selected BGM channel is playing. Push the zone selection keys to add or remove zones. See figure 48.23 for an overview of the *Action programming* page for a *BGM Source* key.

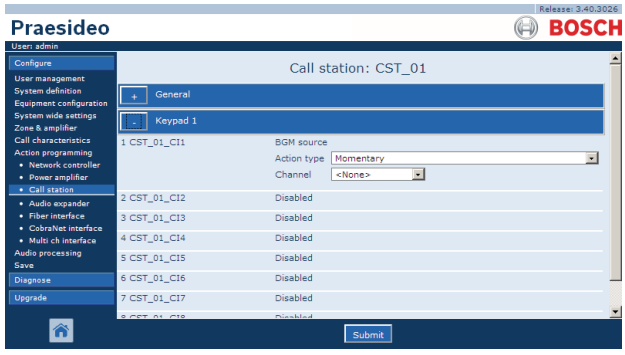


figure 48.23: BGM source key

48.3.17 BGM volume control

Using a *BGM volume control* action, the background music volume can be controlled. The stepsize of the volume change is 3 dB. See figure 48.24 for an overview of the *Action programming* page for a *BGM volume control* key.

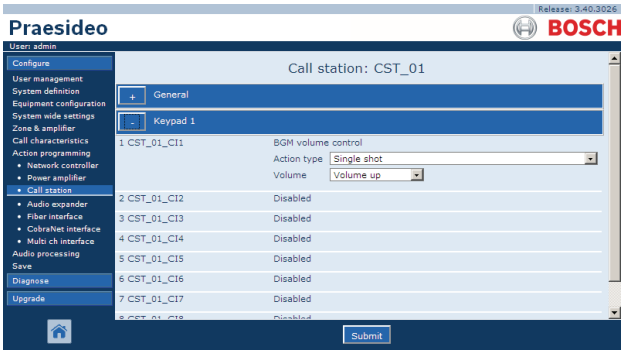


figure 48.24: BGM volume control key

The BGM volume in a certain zone can be changed by selecting the zone using a zone key (see section 48.3.11) and then pressing a *BGM volume control* key. If a *BGM source* key is pressed, then the indicators of all zones assigned to that source (if present) will light. In these zones, the volume can be changed. It is also possible to add zones to or remove zones from the selection before changing the volume. If a BGM source selection partly influences a zone group, the indicator of that zone group will be yellow instead of green.
If a BGM source key is pressed and a numeric display is connected to the same call station, its LCD will show "*BGM*", and the numeric keypad cannot be used (see 18.6.3).

48.3.18 BGM on/off

The *BGM on/off* action is used to turn background music on or off in preselected zones. See figure 48.25 for an overview of the *Action programming* page for a *BGM on/off* key.

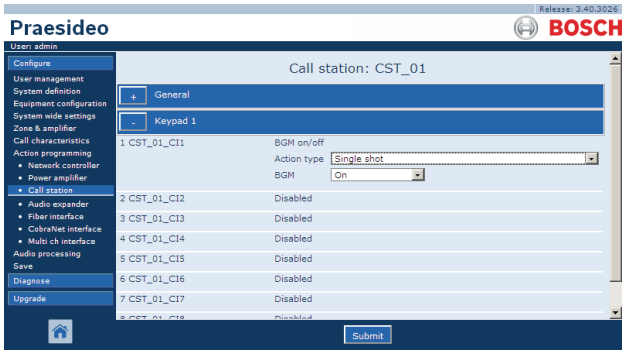


figure 48.25: BGM on/off key

48.3.19 Local BGM source

The *Local BGM source* action is used to step through all available BGM sources in the assigned zone (groups) including an inserted 'BGM off' position. See figure 48.26 for an overview of the *Action programming* page for a *Local BGM source* key.

Note
This action can also be assigned to control inputs.

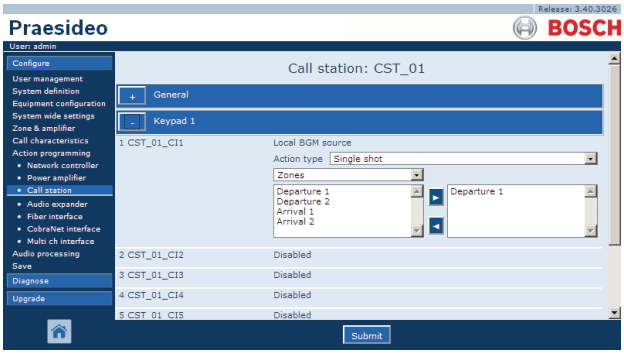


figure 48.26: Local BGM source key

- **Action type** - Sets the action type.
- **Available outputs** - Shows the available zones and zone groups. Use the dropdown list to choose the type of outputs that are shown.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the outputs that have been assigned to the key.

48.3.20 Local BGM volume control

The *Local BGM volume control* action is used to control the volume of the BGM in the assigned zone (groups). It can be changed in steps of 3 dB between -96 dB and 0 dB. See figure 48.26 for an overview of the *Action programming* page for a *Local BGM volume control* key.

Note
This action can also be assigned to control inputs.

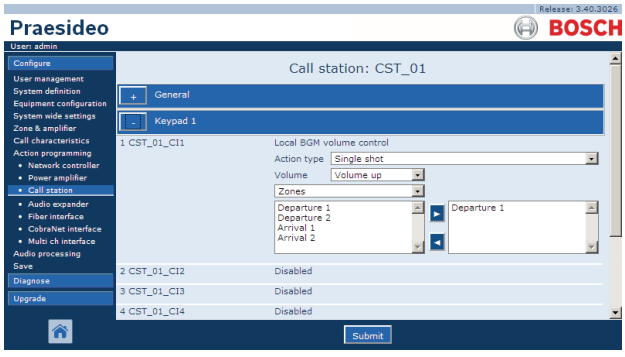


figure 48.27: Local BGM volume control key

- **Action type** - Sets the action type.
- **Volume control** - Sets the type of volume control. To increase the volume, select *Volume up*. To decrease the volume, select *Volume down*.
- **Available outputs** - Shows the available zones and zone groups. Use the dropdown list to choose the type of outputs that are shown.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the outputs that have been assigned to the key.

48.3.21 Local BGM on/off

The *Local BGM on/off* action is used to turn background music on or off in predefined zones. See figure 48.28 for the *Action programming* page for a *Local BGM on/off* key. The *Local BGM on/off* action combines the *Zone selection* (see section 48.3.11) and *BGM on/off* actions (see section 48.3.18). See figure 48.28 for an overview of the *Action programming* page of for a *Local BGM on/off* key.

Note
This action can also be assigned to control inputs.

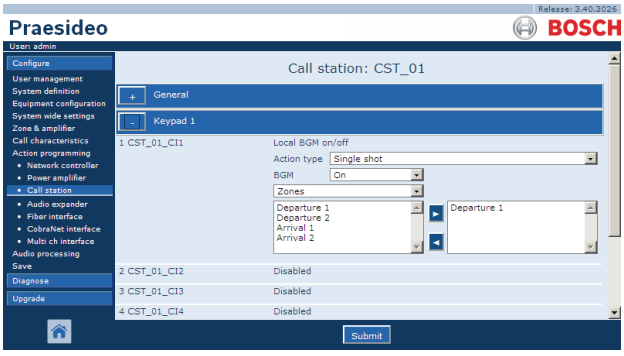


figure 48.28: Local BGM on/off key

- **Action type** - Sets the action type.
- **BGM control** - Sets the BGM control:
  - *On* to switch BGM on
  - *Off* to switch BGM off
  - *Toggle* to toggle BGM on and off
- **Available outputs** - Shows the available zones and zone groups. Use the dropdown list to choose the type of outputs that are shown.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the outputs that have been assigned to the key.

48.3.22 Fault input

Using the *Fault input* action, a customized message can be logged and the system is put in the fault state. See figure 48.29 for an overview of the *Action programming* page for a *Fault input* key.

If the key is set to Acknowledge, then the indicator functions as fault or emergency buzzer. If the key is set to Reset then the indicator functions as fault or emergency indicator.

Note
This action can also be assigned to control inputs.

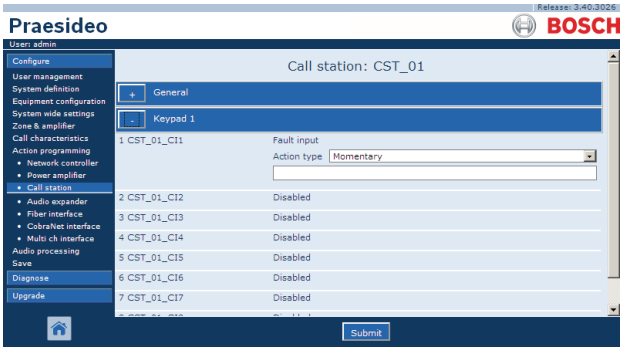


figure 48.29: Fault input key

48.3.23 Zone line fault

The *Zone line fault* action generates an external line fault upon activation by the (external) line isolator master PM1-LISM6, which is part of the Line Isolator System for isolation of malfunctioning loudspeaker segments of a loudspeaker loop, to enable continued operation of the other loudspeakers in the loop. This fault is coupled to certain zones that are being supervised by the line isolator master. This fault is similar to an Amplifier loudspeaker line failure, which is detected by the amplifier itself.

It is advised to give the control input for this function a proper name, such as the name of the zone-loop that is supervised. The Bosch line isolator system provides a fault contact per loop, so every loop can have a name derived from the zone name.

In the configuration multiple zone names can be coupled to Zone line fault, just to be capable of combining multiple fault contacts for different loops on a single control input. These zone names will show up in the fault log in case of a fault. Preferably only a single zone should be configured for each Zone line fault input. Zone selection is done via two table boxes, the left one showing the available zones, the right one the selected zones.

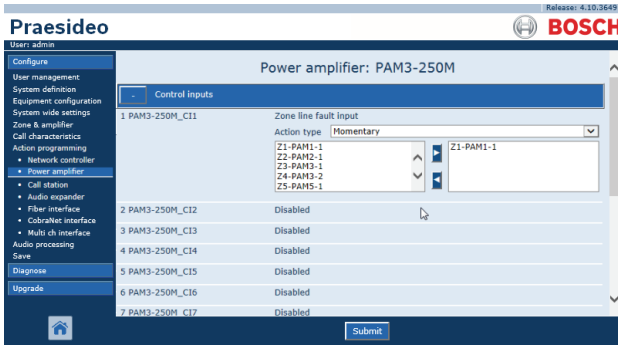


figure 48.30: Zone line fault action

Note
This fault is aggregated to the level of a zone fault, so when multiple zones are configured for a single Zone line fault input, this fault will show up for all zones in the selection, even though most likely only one zone-loop is in error. This is another reason to better limit each input to a single zone fault.

48.3.24 Acknowledge/Reset

Using the *Acknowledge/Reset* action, faults can be acknowledged and reset. See figure 48.31 for an overview of the *Action programming* page for a *Acknowledge/Reset* key.

It is possible to select fault or emergency status for this action, and to select whether the action should acknowledge, reset, or simultaneously acknowledge and reset this status.

In case of *Emergency Reset* selection, an additional setting becomes available: *Reset aborts active emergency calls: Yes/No*. The default setting is *No*. This way, the emergency state cannot be reset as long as emergency calls are still ongoing; this is the preferred way of operation and is even mandatory for EN54-16 and other standards. The setting *Yes* is more a kind of engineers' reset in technical rooms to force a reset after a building has been evacuated and the system must be silenced. NB The default setting from Praesideo version 3.3 onwards differs from previous versions, where an *Emergency Reset* would abort running calls.

If the key is set to Acknowledge, then the indicator functions as fault or emergency buzzer. If the key is set to Reset then the indicator functions as fault or emergency indicator.

Note
This action can also be assigned to control inputs.

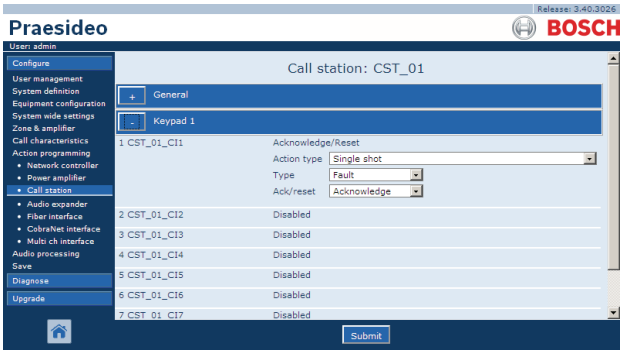


figure 48.31: Acknowledge/Reset key

48.3.25 Indicator test

The *Indicator test* action can be configured for a key on a call station keypad or keypad module. When activated all indicators on that call station and all its connected keypads are switched on to visually check the indicators. Bi-color indicators alternate between both colors. The call station loudspeaker will sound a single tone chime, with priority 223. If a numeric keypad is connected to the call station, its LCD shows a testpattern to visually check all pixels.

Make sure that outputs of keypad modules that are used for different purposes than visual indicators will not cause unexpected behavior when activated by the *Indicator test*.

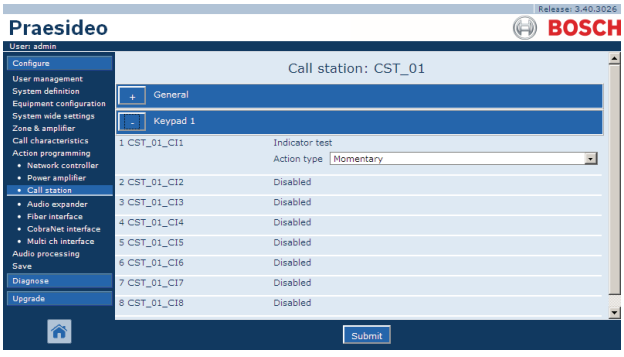


figure 48.32: Indicator test key

Note
Outputs of keypads that are configured as *zone active output*, *volume override output* or *switch output* are excluded from the *Indicator test*, as they are typically used to drive external relays instead of panel indicators.

48.3.26 Back-up power mode

The *Back-up power mode* action is used to put the system in the back-up power mode. In this mode, all calls below a specified priority (see section 45.4) are aborted. See figure 48.33 for an overview of the *Action programming* page for a *Back-up power mode* key.

Note
This action can also be assigned to control inputs.

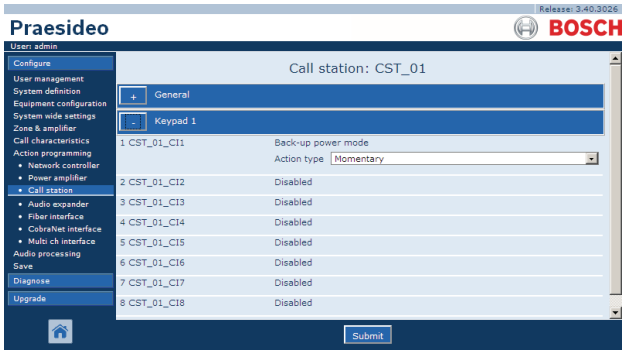


figure 48.33: Back-up power mode key

48.3.27 Synchronize time

The *Synchronize time* action is used to set the internal clock of the network controller to the nearest minute to synchronize the clock with a master. See figure 48.34 for an overview of the *Action programming* page for a *Synchronize time* key.

Note
This action can also be assigned to control inputs.

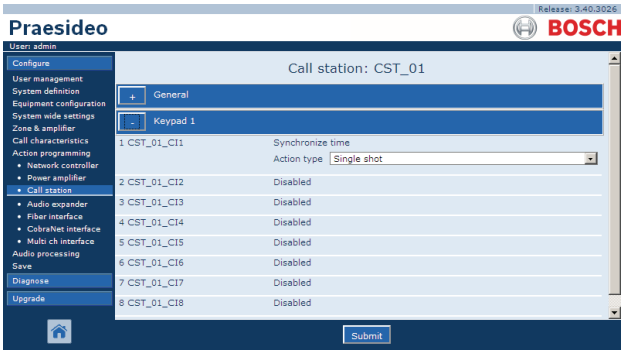


figure 48.34: Synchronize time key

48.3.28 Switch trigger

The *Switch trigger* action is intended for activating *Switch output* control outputs or *Switch output* keypad keys (see section 48.3.29). See figure 48.35 for an overview of the *Action programming* page for a *Switch trigger* key.

Note
This action can also be assigned to control inputs.

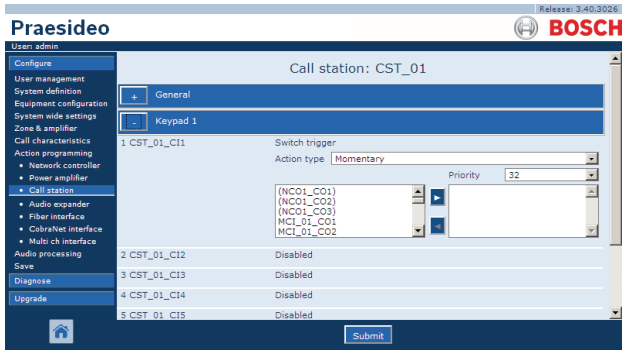


figure 48.35: Switch trigger key

- **Action type** - Sets the action type.
- **Priority** - Sets the priority of the activated output.
- **Available outputs** - Shows the available *Switch output* control outputs and keypad keys.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the *Switch output* control outputs and keypad keys that have been assigned to the key.

48.3.29 Switch output

The *Switch output* action is intended for control outputs and call station keypads or call station keypad modules. The key/input itself is not used by this action; only the indicator/output attached to the key is activated. The *Switch output* action is activated using a *Switch trigger* action (see section 48.3.28). See figure 48.36 for the *Action programming* page for a *Switch output* key.

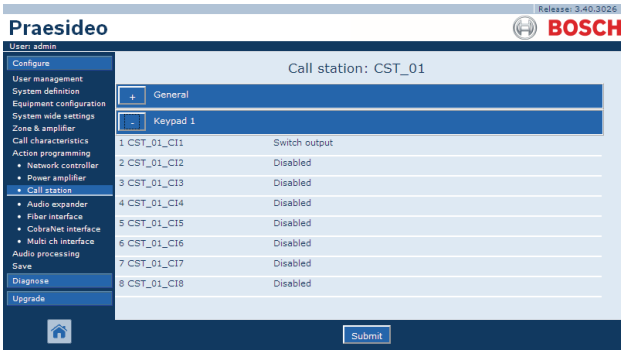


figure 48.36: Switch output key

48.3.30 Zone active output

The *Zone active output* action is intended for control outputs and call station keypads or call station keypad modules. The key/input itself is not used by this action; only the indicator/output attached to the key is activated. A *Zone active output* key can be assigned to a zone (see section 46.2) and becomes active when a call or BGM is sent to the zone. See figure 48.37 for an overview of the *Action programming* page for a *Zone active output* key.

48.3.31 Volume override output

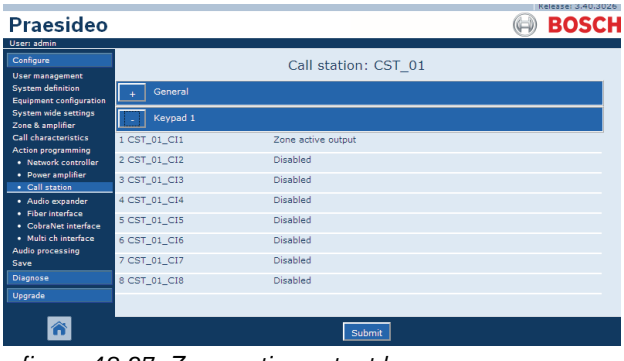


figure 48.37: Zone active output key

The *Volume override output* action is intended for control outputs and call station keypads or call station keypad modules. The key/input itself is not used by this action; only the indicator/output attached to the key is activated. A *Volume override output* key can be assigned to a zone (see section 46.2) and becomes active when a call with a priority equal to or higher than 32 is sent to the zone. See figure 48.38 for an overview of the *Action programming* page for a *Volume override output* key.

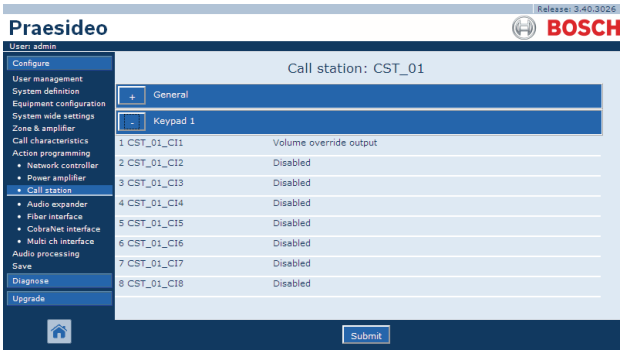


figure 48.38: Volume override output key

48.3.32 System fault

The *System fault* action is intended for control outputs and call station keypads or call station keypad modules. The key/input itself is not used by this action; only the second output or yellow indicator attached to the key is activated while a system fault is present. System faults are:

- Configuration file error
- Flash card data error
- Flash card missing
- No valid configuration file found
- Processor reset

48.3.33 Zone status

The *Zone status* action is intended for PRS-CSKPM Call Station Keypad Modules. The key/input itself is not used by this action; only the indicators/outputs attached to the key is activated. The *Zone status* action activates the indicators/outputs belonging to the key if certain conditions are met. It serves two purposes:

1 If a call is made to at least one of the configured zones or zone groups with a priority higher than or equal to the configured priority, then the second output for this key indicator (normally a yellow LED) is activated on an PRS-CSKPM Call Station Keypad Modules. If it is used to indicate an emergency call in these zones or zone groups, then a red LED should be connected to this output. Preferably a dedicated indicator per emergency zone is used. The color red for this purpose is defined in most

emergency sound system standards, e.g. EN54-16. If the defined priority is set to 224 the *Zone status* indicator lights if an emergency call (priority equal to or higher than 224) is made to that zone or zone group. See figure 48.32 for an overview of the *Action programming* page for a *Zone status* key.

2 If a fault is present in the zone that is configured for this action, then the first output for this key indicator (normally a green LED) is activated on an PRS-CSKPM Call Station Keypad Module (flashing). This indicates that one or more fault events are present for units or connections that are associated with that zone. A yellow LED should be connected to this output. This color is defined in most emergency sound system standards, e.g. EN54-16. A zone fault is a fault that causes that (part of) a zone cannot be reached for calls anymore. This indication is the collection of 16 different faults that may cause a problem to reach a zone completely, like line faults, overheat and overload faults. If a fault is internally solved by e.g. a spare amplifier that takes over a defect amplifier, this will not result in a zone related fault but only in a more specific fault about the reason for the spare amplifier switching. Also in case of redundant loudspeaker line configuration, a single GroupAFault or GroupBFault will not contribute to the zone fault status, since the zone is still addressable with a level of -3 dB. This assumes that the loudspeakers in that zone are evenly divided between group A and group B. The zone fault status is de-activated when all faults that contribute to that zone fault status have been resolved, even if they are not yet reset.

The following faults contribute to the *Zone fault* status (see section 55, the *Fault events list* for details):

- Amplifier failure
- Amplifier failure or overload (for LBB4428/00 only)
- Amplifier initialization failure
- Amplifier loudspeaker line failure (for single loudspeaker line supervision)
- Amplifier loudspeaker line failure (for multiple loudspeaker line supervision)
- Amplifier missing
- Amplifier overheat: muted
- Amplifier overload
- Amplifier short circuit
- Class-A switchover
- Group A fault
- Group A or B line fault
- Group B fault
- Incompatible hardware version
- Pilot tone calibration failure
- Unit missing
- Zone line fault
  (generated by the Line Isolator System)

Loudspeaker faults are excluded from the list of zone related faults that will activate the zone fault indicator, so loudspeaker end-of-line supervision must be used instead or additionaly to comply to EN54-16. This is because in Praesideo loudspeaker faults are not assigned to a specific amplifier output or zone, but only to the loudspeaker itself, wherever it is.

It is also possible to configure this *Zone status* function on an LBB4432/00 Call Station Keypad, but then the second LED will turn on for the active priority call, which is yellow. For a zone fault the first LED will flash, which is green. In most cases these colors are not acceptable, so better use an PRS-CSKPM with dedicated indicators. Also, on an LBB4432/00 keypad these indicators cannot be combined with the *Zone selection* key, which has its own bi-color indicator. On a custom panel, using the PRS-CSKPM Call Station Keypad Modules, the indicators and switch of a *Zone selection* key and the *Zone status* indicators can be grouped together to give a clear overview of the selection.

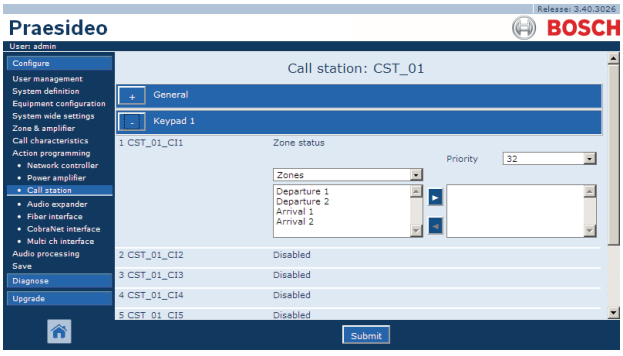


figure 48.39: Zone status key

- **Priority** - The action is activated if the priority is equal to or higher than this specified priority.

- **Available outputs** - Shows the available zones, zone groups and control outputs. Use the dropdown list to choose the type of outputs that are shown.
- **Add/Remove buttons** - Using the > and < buttons, selected outputs can be added to or removed from *Assigned outputs*.
- **Assigned outputs** - Shows the outputs that have been assigned to the key.

48.3.34 Zone priority status

The *Zone priority status* action is intended for PRS-CSKPM Call Station Keypad Modules. The key/input itself is not used by this action; only the indicator/output attached to the key is activated. The *Zone priority status* action activates the indicator/output belonging to the key if there is a call made to the zone with a priority equal to the defined priority. The purpose of this function is to be able to build a custom display with zone indicators that will show in which zones a call with a specific priority is busy. In this way the indicators can show whether a certain emergency or alert message is running in a zone by setting the defined priority to the priority of that message.

See figure 48.40 for an overview of the *Action programming* page for a *Zone priority status* key. Configuring a *Zone priority status* key is similar to configuring a *Zone status* key (see section 48.3.33).

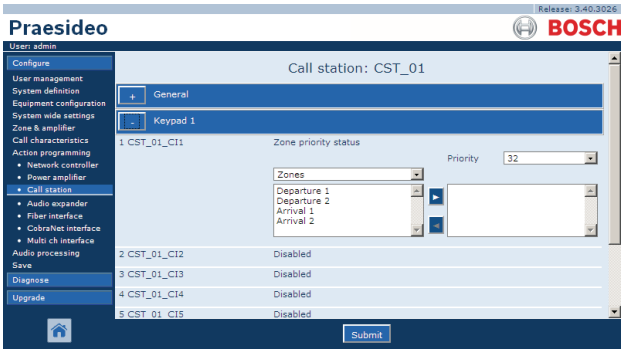


figure 48.40: Zone priority status key

49 Audio processing

49.1 Introduction

On the *Audio Processing* pages, the audio processing parameters of all normal audio inputs and outputs in the system can be set (see section 49.2). Audio inputs that are configured as AVC inputs must be calibrated using the *Audio Processing* pages (see section 49.3).

Audio processing parameters are changed immediately when the *Submit Equalizer* button on the *Audio Processing* pages is clicked. Although the changes are audible, it is important to realize that they are not automatically saved. If the changes are not saved they will be lost when the network controller is reset. See section 41.4.4 for information about saving configuration settings.

49.2 Audio processing parameters

49.2.1 Equalizer

See figure 49.1 for an overview of an equalizer options of normal audio inputs and outputs.

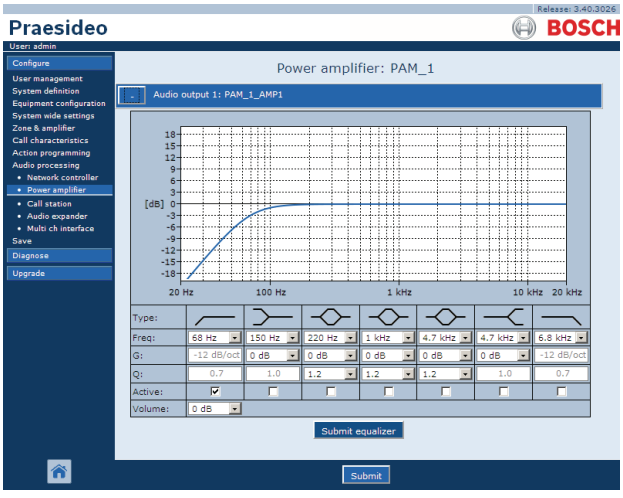


figure 49.1: Audio processing - overview

From left to right in figure 49.1:

- **High-pass filter** - A high-pass filter with a fixed quality factor and slope.
- **Shelving filter** - A shelving filter for low frequencies with a fixed quality factor.
- **Full parametric section** - Three full parametric sections with adjustable quality factors, gains and frequencies.
- **Shelving filter** - A shelving filter for high frequencies with a fixed quality factor.
- **Low-pass filter** - A low-pass filter with a fixed quality factor and slope.

49.2.2 Equalizer setting

Proceeds as follows to configure a filter:

1 Select the frequency of the filter from the *Freq* dropdown list. The list of available frequencies varies per section, offering a resolution of 24 frequencies per decade.
2 Select the gain of the filter from the *G* dropdown list. The range of available gains is from -20 dB to +12 dB in steps of 1 dB.
3 Select the quality factor of the filter from the *Q* dropdown list. The range of available quality factors varies per section. For the fully parametric sections it ranges from 0.2 to 10.
4 Put a check mark in the *Active* box of the filter to enable the filter.
5 Click the *Submit Equalizer* button to submit the changes. The changes are immediately applied to the audio input or output.

49.2.3 Volume setting

For the audio outputs, a parametric equalizer and a volume button is available to change the volume of the audio output. The multi channel interface does not provide an equalizer for each output, but does provide a volume control button for each enabled output to control the volume of connected basic amplifiers.

49.2.4 Spare power amplifiers

Spare power amplifiers do not provide volume and equalizer settings for the outputs. These settings are automatically set to the same position as the main amplifier that is replaced by the spare amplifier.

Spare power amplifiers do have general purpose audio inputs with an equalizer or with an AVC calibration button depending on the configured input function. These audio inputs remain active also when the spare power amplifier replaces a failing main power amplifier.

49.3 AVC calibration

The *Audio Processing* page of an audio input that has been configured as an AVC input shows a *Start AVC calibration* button (see figure 49.2) after:

1 The audio input has been set to *AVC*.
2 The system has been restarted.

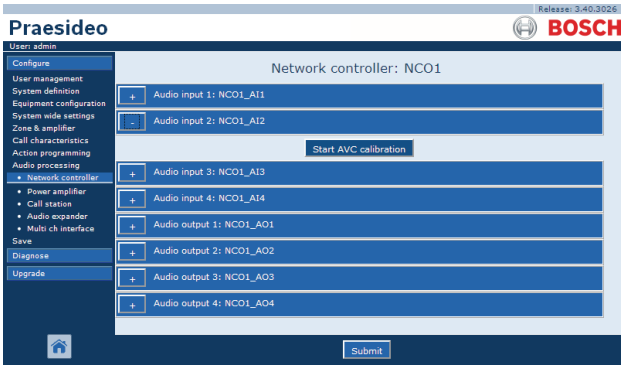


figure 49.2: AVC calibration button

The *Start AVC calibration* button starts the AVC calibration (see chapter 50).

Note
Do not forget to submit the changes. The changes are not permanent until the configuration is saved (see section 41.4.3 and section 41.4.4).

Note
The AVC calibration requires the *Wobble* tone to be present in the tone set. If necessary, use *Activate new tone set* (see section 45.4).

50 Automatic volume control

50.1 Introduction

Automatic volume control (AVC) improves the intelligibility of calls and the audibility of BGM in noisy environments. It changes the call volume in a zone to compensate for ambient noise. The ambient noise is measured by sensing microphones that can be connected to any of the audio inputs on the power amplifiers. Although it is possible to connect the ambient sensing microphone to other inputs of the system, only the power amplifier inputs provide microphone supervision. Furthermore, the other inputs have a built-in audio limiter that will interact with the AVC, when the signal levels are relatively high, such as when coming from an electret microphone..

50.2 Sensing microphones

50.2.1 Introduction

When AVC is enabled in a zone, a sensing microphone continuously measures the ambient noise. The system uses an averaging filter to derive the average ambient noise level from the signal of the sensing microphone.

Note
Between the start of a call and the end of a call, the AVC function does not process the signal of the sensing microphone.

50.2.2 Type

Use sensing microphones with high-quality cables, because sensing microphones are often installed in locations that are hard to reach. It is not required to use high-quality microphones. The choice for a directional or omni-directional microphone depends on the local situation.

50.2.3 Supervision

The connections between the system and the sensing microphones can be supervised (see section 44.3.3). When the sensing microphone of a zone fails, all calls in the zone are distributed at the maximum volume to comply with evacuation standards. When the sensing microphone of a zone fails, the attenuation of BGM is set to AVC range (see figure 50.1). To prevent undesired supervision faults, make sure that:

- The supply current for condenser microphones is between 0.5 mA and 5 mA.
- The microphone impedance of dynamic microphones is between 120 Ω and 1300 Ω.

50.2.4 Installation

To make sure that the sensing microphone measures the correct ambient noise level, install it in a place which has a typical ambient noise level. Furthermore:

- Keep the cables of the sensing microphones and high-power cables (e.g. mains cables) separated. Interference can disturb the ambient noise measurement.
- Do not install the sensing microphone near an expected noise source. A loud and very local noise can disturb the ambient noise measurement.
- Do not install the sensing microphone near an air vent or air conditioning. Airflows can disturb the ambient noise measurement.
- Do not attach the sensing microphone to any part of a building. The vibrations of buildings can disturb the ambient noise measurement.

50.3 Connection

Sensing microphones can be connected to the unit that contains the audio outputs of the AVC zone or to another amplifier. When the sensing microphone is connected to another amplifier and it is used in combination with an AVC zone, it permanently occupies a digital channel. As a result, the number of digital audio channels that are available for calls decreases.

Note
Spare amplifiers cannot take over the sensing microphone from a failing main amplifier when the signal of the sensing microphone is not routed over the optical network.

50.4 Configuration

Before configuring AVC in a zone:

- Make sure that the ambient sensing microphone is correctly connected to the system.

- Make sure that all loudspeakers are connected to the system, set at the correct power level, are aimed (if necessary) and are working.
- Adjust the nominal output level of all audio outputs in the zone to the level required to have the correct speech intelligibility at maximum ambient noise level.
- Make sure that the the audio delay setting of the applicable power amplifier outputs is set to a value < 2 s. After the calibration the audio delay can be set back to the correct value. Very long delay settings, e.g. for tunnel applications, may cause wrong calibration results.

Proceed as follows to configure AVC:

1 Go to the *AVC settings* category of the *Zone Configuration* page. A screen similar to the one in figure 50.1 appears in the main frame of the web interface.

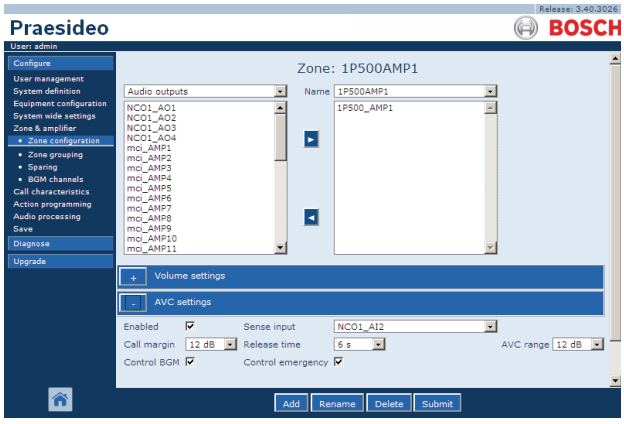


figure 50.1: AVC settings

2 Put a check mark in the *Enabled* checkbox to enable AVC for calls. The ambient noise level that is used to adjust the volume of the call, is measured just before the start of the call.

Note
The AVC settings only apply to the audio outputs of power amplifiers. It is not possible to apply AVC to the audio outputs of basic amplifiers or other units.

3 Normally the *AVC* works for calls. When the *AVC* should also work for *BGM*, put a checkmark in the *BGM* box. The ambient noise level that is used to adjust the volume of the BGM, is measured continuously.

4 By default *AVC* also works for the emergency calls, but if *Control Emergency* is disabled then emergency calls will be broadcast at maximum (configured) level.

Note
When AVC is enabled for BGM, make sure that the sensing microphone is not near the loudspeakers. If the sensing microphone is near the loudspeakers, the BGM itself is seen as ambient noise and the volume level of the BGM will increase to the maximum volume level (feedback).

5 Choose the audio input to which the sensing microphone is connected from the *Sense input* dropdown list.

6 Select the call margin from the *Call margin* dropdown list. This is the threshold level of the AVC function. When the ambient noise level is below the call level by more than the call margin, the AVC starts attenuating the call.

Note
A value of 12 dB is a practical value. A higher value results in a bigger difference between the volume levels of the calls and the ambient noise. However, this requires more (or bigger) loudspeakers and power amplifiers to reach the high call volume when the volume level of the ambient noise is high.

7 Select the release time from the *Release time* dropdown list. This is the time between the end of the call and the start of the ambient noise measurement.

Note
A value of 6 s is a practical value. A short release time combined with a long reverberation time can cause a high call volume level.

8 Select the attenuation range from the *AVC range* dropdown list.

Note
A value of 12 dB is a practical value. A higher value will result in lower call volume levels when the ambient noise volume level decreases.

9 Go to the *Audio processing* page of the audio input to which the sensing microphone is connected. A screen similar to the one in figure 50.2 appears.

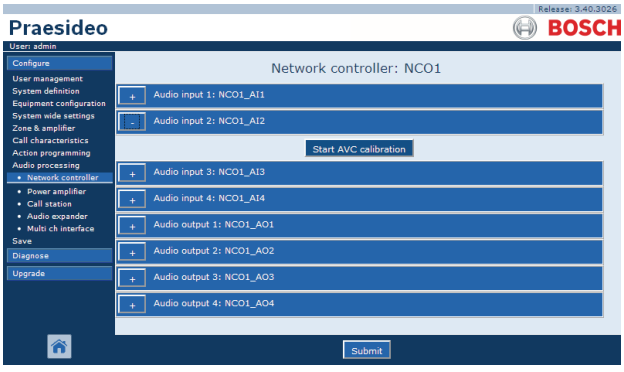


figure 50.2: AVC calibration button

10 Click the *Start AVC calibration* button to start the calibration of the AVC. This results in a loud wobble tone (duration: 15 s) in the zones that use this audio input to measure the ambient noise level. After the wobble tone, there will be a silence (duration: 15 s). Then a notification appears with the calibration result. The zone is not available for calls during calibration, because all audio outputs in the zone are used to distribute the calibration tone.
Temporarily reset extremely long audio delay settings (> 2 s) of the power amplifiers to a low value to avoid that the wobble tone is not yet present when calibration of the AVC starts.

Note
During the calibration, the system uses one digital audio channel of the optical network to distribute the calibration tone. This temporarily decreases the number of available digital audio channels in the system.

The following messages can appear during or after calibration:

- *AVC calibration running*
  Displayed during the calibration process.
- *AVC calibration completed, range = x dB*
  Displayed after successful calibration. The range shows the available AVC range in this situation. The sum of the AVC range and the call margin that is configured for a zone should be less than the indicated available range.
- *AVC calibration failed: sensing signal too high*
  Input overloaded by a ambient sensing signal that is too high. Use a less sensitive microphone, use an attenuation pad, or choose a different sensing location.
- *AVC calibration failed: available range too small*
  The difference between the measured ambient sensing signal with and without calibration tone is less than 6 dB. The available Praesideo output level is too low compared to the existing ambient noise at the sensing location.
- *AVC calibration failed: ambient sensing input or its unit is defect or disabled*
  AVC calibration and AVC is not possible with a defect or disabled audio input for the ambient sensing signal.
- *AVC calibration failed: no AVC output is available*
  AVC calibration and AVC is not possible without a zone being configured for AVC using this audio input for sensing. The calibration tone cannot be broadcast.

Note
The AVC calibration requires the *Wobble* tone to be present in the tone set. If necessary, use *Activate new tone set* (see section 45.4).

51 Diagnose installation

51.1 Introduction

With the *Installation* page in the *Diagnose* section of the web interface (see figure 51.1), the system installation can be diagnosed.

figure 51.1: Installation page

51.2 Cable length margin

The cable length margin can be checked if the network controller has hardware version 20.00 or higher. As is indicated in section 32.5, the maximum cable length depends mainly on the number of nodes in the system. For a system loop a certain maximum data delay is permitted for proper operation. Most of the delay is the propagation delay of the cable, but each node introduces some additional delay that depends somewhat on the temperature of the unit. A higher unit temperature causes more delay and reduces the maximum cable length. The network controller measures the data delay and calculates the remaining time. This time margin is then converted to the Cable length margin, the length of cable that can be added to the system. Due to the temperature dependance this margin will change with temperature, dependent on the number of nodes in the system. Therefore an additional quality indication is given: Safe, Critical or Unstable.

Safe means no action required, there is sufficient margin. In a Critical situation the margin should be checked at the highest expected temperature to make sure that there is still a margin left. In an Unstable situation, the system size should be reduced by decreasing the number of nodes or the length of the cable.

When a redundant loop topology is used, the cable length should be checked with the shortest link between two nodes removed. This is the worst case situation.

51.3 Number of nodes

The number of connected addressable nodes can be checked if the network controller has hardware version 20.00 or higher. See table 32.2 for the number of nodes per unit. The maximum number of nodes is 63.

51.4 Optical network

Proceed as follows to diagnose the optical network:

1 Check the optical power margin of all network connections by reducing the optical level to *Half power*.
2 Check for fault events with reduced level. If no relevant faults are present, then resume normal operation by restarting the network controller. Otherwise, check for critical connections.

Note
Although it is possible to resume normal operation by selecting *Full power*, it is strongly recommended to restart the network controller. In case the power margin is nearly critical, the unit may not accept the *Full power* command anymore.

51.5 Loudspeaker supervision

Proceed as follows to diagnose the loudspeaker supervision:

1 Check the supervision of all loudspeakers and loudspeaker lines by reducing the levels of the communication (*Communication*) or the pilot tone (*Pilot tone*).
2 Check for fault events with reduced level. If no relevant faults are present, then resume normal operation by restarting the network controller.

Note
This diagnose option only works for amplifiers with multiple loudspeaker line supervision boards installed and configured (see section 13).

Note
Checking takes up to 100 s for systems with loudspeaker lines in the *Immediate fault report* mode (see section 45.4). In the *Recheck before fault reporting* mode or with individual loudspeaker supervision, checking may take up to 300 s.

51.6 Device information

The *Device information* page in the *Diagnose* section (see figure 51.2) can be used to check the hardware version of the connected devices, their firmware version and other relevant information. Because some system functions are only supported for devices using relatively new hardware and firmware, this page may be a convenient source of information. For units with a front panel LCD, most of this information is also availbale from the LCD, but for units without LCD this page provides the relevant information.

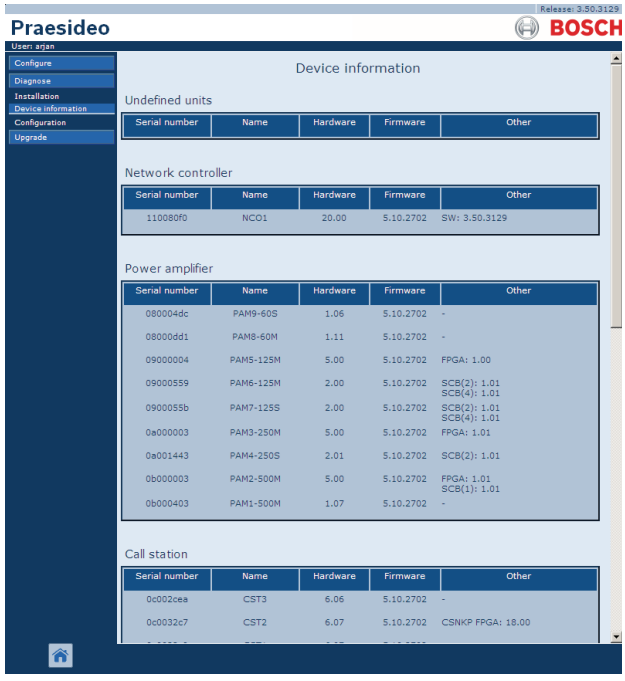


figure 51.2: Check device information

51.7 Check configuration

The *Configuration* page in the *Diagnose* section can be used to check the system configuration for inconsistencies. Inconsistencies can cause strange or unexpected system behavior.

The *Configuration* page shows the following errors:

- Outputs that are assigned to more than one zone.
- Inputs that are assigned to multiple BGM channels.
- Zones and zone groups that are assigned to multiple BGM channels.
- Control outputs (other than configured as *switch outputs*) that are assigned to a *switch trigger* input, a *call activation* input, a *PTT* input or a *call start* input.
- Control outputs (other than configured as *zone active* or *volume override output* outputs) that are assigned to a zone.
- Main amplifiers that are assigned to more than one spare amplifier.
- Main and spare amplifiers are not compatible types.

The web interface prevents most inconsistencies from occurring by refusing to accept incorrect user data during configuration, but some inconsistencies can still occur. The *Configuration* page will display but not solve any remaining inconsistencies. The installer should modify the configuration.

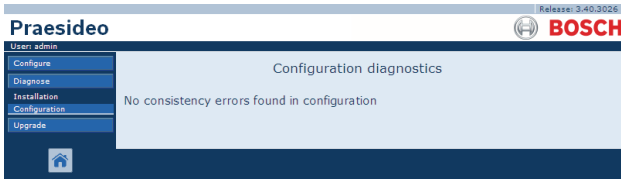


figure 51.3: Check configuration page

52 Overview

52.1 Introduction

52.2 General events

General events contain information about special situations. For example, the connection of a unit to the system. See chapter 53 for a list of all general events.

52.3 Call events

Call events contain information about calls in the system. For example, the start of a call. See chapter 54 for a list of all call events.

52.4 Fault events

52.4.1 Introduction

Fault events contain information about faults in the system. For example, an overload of a power amplifier. See chapter 55 for a list of all fault events.

52.4.2 Status

Each fault event has a status (see table 52.1).

table 52.1 Fault event statuses

Status	Description
New	The fault event is a new fault event. All fault outputs are activated.
Acknowledged	The new fault event is acknowledged. If all faults in the system have been acknowledged, all fault alarm buzzer outputs are deactivated.
Resolved	The acknowledged fault event is resolved.
Reset	The resolved fault event is reset. If all faults in the system have been reset, all Fault alarm indicator outputs are deactivated.

Note
A fault output is a control output that has been configured as an *Fault alarm buzzer* or as a *Fault alarm indicator* (see table 44.6).

52.4.3 Acknowledging fault events

52.4.3.1 Introduction

New fault events can be acknowledged:

- Using the network controller (see section 52.4.3.2).
- Using control inputs or keys (see section 52.4.3.3).
- Using the open interface (see section 52.4.3.4).
- Using the *Logging Viewer* (see chapter 59).

Note
When all faults are acknowledged, the *Fault alarm buzzer* outputs are deactivated.

52.4.3.2 Network controller

New fault events can be acknowledged using the *Faults...* menu of the network controller (see section 5.6.5). Using this menu it is possible to acknowledge individual fault events as well as all new fault events in the system.

52.4.3.3 Control input or key

New fault events can be acknowledged using control inputs or keys to which an *Acknowledge/Reset* action has been assigned (see section 48.3.23). However, such a control input or key acknowledges all new fault events in the system. It is not possible to acknowledge individual faults using a control input or key.

52.4.3.4 Open interface

New fault events can be acknowledged using the open interface (see the Open Interface Programming Instructions).

52.4.4 Resolving fault events

Before acknowledged fault events can be reset, they first must be resolved. Most fault events are automatically resolved by the system when the fault situation no longer exists. Others need to be resolved manually.

Manual resolving is needed for faults whose presence is not checked again after they occurred (for example, an amplifier overload). After solving the problem, the fault status of these fault events must be manually set to *Resolved*. This is done by resetting the fault, after which the system checks the presence of the fault again. If the fault is not present anymore, the status of the fault event is set to *Resolved* and then to *Reset*. If the fault is still present, a new fault event is created.

The information about the fault events (see chapter 55) describes how the fault events are resolved.

52.4.5 Resetting fault events

52.4.5.1 Introduction

Resolved fault events can be reset:

- Using the network controller (see section 52.4.5.2).
- Using control inputs or keys (see section 52.4.5.3).
- Using the open interface (see section 52.4.5.4).
- Using the *Logging Viewer* (see chapter 59).

Note
When all faults are reset, the *Fault alarm indicator* outputs are deactivated.

52.4.5.2 Network controller

Resolved fault events can be reset using the *Faults...* menu of the network controller (see section 5.6.5). Using this menu it is possible to reset individual fault events as well as all resolved fault events in the system.

52.4.5.3 Control input or key

Resolved fault events can be reset using control inputs or keys to which an *Acknowledge/Reset* action has been assigned (see section 48.3.23). However, such a control input or key resets all resolved fault events in the system. It is not possible to reset individual faults using a control input or key.

52.4.5.4 Open interface

Resolved fault events can be reset using the open interface (see the Open Interface Programming Instructions).

53 General events list

General events in alphabetical order:

Event message:
Amplifier resumes operation
Originator:
Main power amplifier that resumes operation.
Extra information:
Serial number and name of the spare power amplifier.
Description:
Logs the switch of a spare power amplifier to a main power amplifier.
Recommended action:

Event message:
Amplifier spare switch
Originator:
Main power amplifier that stops operating.
Extra information:
Serial number and name of the spare power amplifier.
Description:
Logs the switch of a main power amplifier to a spare power amplifier.
Recommended action:
Check the fault events of the main power amplifier and try to solve these faults.

Event message:
Call logging events discarded due to logging queue overflow
Originator:

Extra information:

Description:
The logging of call events is suspended due to an overflow of the input queue inside the network controller. This event is not shown on the display of the network controller.
Recommended action:
Make less overriding calls.

Event message:
Device connected via Open Interface
Originator:
Open interface client that connects.
Extra information:

Description:
Logs the connection of an open interface client to the system.
Recommended action:

Event message:
Device disconnected via Open Interface
Originator:
Open interface client that disconnects
Extra information:

Description:
Logs the disconnection of an open interface client from the system.
Recommended action:

Event message:
Emergency state acknowledge
Originator:
Open interface client or unit that acknowledged the emergency state.
Extra information:

Description:
Logs the acknowledgement of the emergency state.
Recommended action:

Event message:
Emergency state active
Originator:
Open interface client or unit that activated the emergency state.
Extra information:

Description:
Logs the activation of the emergency state.
Recommended action:

Event message:
Emergency state reset
Originator:
Open interface client or unit that reset the emergency state.
Extra information:

Description:
Logs the reset of the emergency state.
Recommended action:

Event message:
Logging of call events resumed
Originator:

Extra information:

Description:
The logging of call events is resumed. This event is not shown on the display of the network controller.
Recommended action:

Event message:
Logging Server started
Originator:

Extra information:

Description:
Indicates startup of logging Server
Recommended action:

Event message:
Logging Server stopped
Originator:

Extra information:

Description:
Indicates shutdown of logging Server
Recommended action:

Event message:
Network connections set to half optical power
Originator:

Extra information:

Description:
Logs the start of the half power mode of the optical network.
Recommended action:

Event message:
Network connections reset to full optical power
Originator:

Extra information:

Description:
Logs the end of the half power mode of the optical network.
Recommended action:

Event message:
System restarted
Originator:
Network controller that is started.
Extra information:

Description:
Logs the start-up of a network controller.
Recommended action:

Event message:
Unit connect
Originator:
Unit that connects.
Extra information:
This general event is not applicable to open interface clients.
Description:
Logs the connection of a unit to the system.
Recommended action:

Event message:
User login
Originator:
Unit on which the log-in occurred.
Extra information:

Description:
Logs the user ID of the user who has logged in to the system via a numeric keypad with *Access control*.
Recommended action:

Event message:
User login failed
Originator:
Unit on which the log-in occurred.
Extra information:

Description:
Logs when a log-in attempt via a numeric keypad with *Access control* has failed.
Recommended action:

Event message:
User logout
Originator:
Unit on which the log-out occurred.
Extra information:

Description:
Logs the user ID of the user who has logged out from the system via a numeric keypad with *Access control*.
Recommended action:
---

54 Call events list

Call events in alphabetical order:

Event message:
Call change
Originator:
Control input, Open Interface client or unit, that caused the change..
Extra information:
Name(s) of the output(s) that were removed from the routing and the name(s) of the output(s) that were added to the routing.
Description:
Logs a change in the routing of a call.
Recommended action:

Event message:
Call end
Originator:
Control input, Open Interface client or unit, that caused the end of the call.
In case of an overruled call, or in case of lost resources, or when the system decides to end the call, the network controller is the originator.
Extra information:
In case the call has been stopped by the originator, then it is shown which phase of the call was completed.
In case the call has been aborted, then it is shown in which phase of the call this happened and by whom.
Description:
Logs the end of a call.
Recommended action:

Event message:
Call start
Originator:
Control input, key, open interface client or unit that started the call
Extra information:
In case the call is a replay, reference is made to the original call by means of the Call ID of the original call. The macro name for the call is displayed, followed by the priority of the call, the routing scheme, the timing scheme, the name of the start chime, the names of the messages, the number of message repetitions, 'Speech' if the call has live speech, the name of the end chime and finally the routing of the call.
Description:
Logs the start of a call. Please note that a premonitored call is always non-partial even if the broadcast call is partial, because it is only sent to the monitor loudspeaker.
Recommended action:

Event message:
Call timeout
Originator:
The network controller.
Extra information:
List of zones to which the stacked call was not delivered.
Description:
Logs the timeout of a stacked call.
Recommended action:
----

55 Fault events list

Fault events in alphabetical order:

Event message:
Amplifier failure
Originator:
Amplifier channel in which the fault occurred.
Extra information:
The LBB4428/xx Power Amplifier combines the messages *Amplifier failure* and *Amplifier overload*.

Resetting of faults may take up to 20 seconds for the LBB4428/00 Power Amplifier, because of the re-calibration of the pilot tone. The LED of a fault reset key on a call station keypad is not switched off until the re-calibration is finished.
Description:
Logs the failure of an amplifier channel. This fault event can only occur when the amplifier channel is enabled with the configuration software.
Resolve:
When the unit disconnects or when the fault is resolved manually.
Recommended action:
- Check the amplifier output load or disconnect the loudspeaker lines.
- Switch the amplifier off and on again.
- Acknowledge and reset the fault.
- If the fault is persistent, replace the amplifier.

Event message:
Amplifier Fan Fault
Originator:
Amplifier in which the fault occurred.
Extra information:
This fault cannot be generated by LBB4428/00 amplifiers.
Description:
Logs when a fan in a power amplifier is not rotating anymore.
Resolve:
When the power amplifier disconnects or when the fault is no longer present.
Recommended action:
Check if all fans of the power amplifier operate correctly.

Event message:
Amplifier ground short
Originator:
Amplifier channel in which the fault occurred.
Extra information:

Description:
Logs the short-to-ground of an amplifier channel. This fault event can only occur when the amplifier channel is enabled with the configuration software.
Resolve:
When the fault disappears or when the unit disconnects.
Recommended action:
Check the cabling of the loudspeaker line and its insulation. This event can, for example, be generated when uninsulated parts of the cabling are in contact with the housing of the unit or the 19” rack.

Event message:
Amplifier loudspeaker line failure
Originator:
Amplifier channel in which the fault occurred.
Extra information:

Description:
Logs the end-of-line failure of an amplifier channel (detected by LBB4442/00). This fault event can only occur when the amplifier channel is enabled with the configuration software.
Resolve:
When the fault disappears or when the unit disconnects.
Recommended action:
Check the cabling of the loudspeaker line. If necessary, repair it.

Event message:
Amplifier missing
Originator:
Amplifier channel of a basic amplifier in which the fault occurred.
Extra information:

Description:
Logs the absence of an amplifier channel (based on missing battery and mains power supply).
Resolve:
When the fault disappears or when the unit disconnects.
Recommended action:
Check whether both CAT-5 cables between the multi channel interface and the basic amplifier channel are correctly connected.

Event message:
Amplifier initialization failure
Originator:
Power amplifier channel in which the fault occurred.
Extra information:

Description:
Logs the inability of a power amplifier to return from the standby mode.
Resolve:
When the fault disappears or when the power amplifier disconnects.
Recommended action:
Switch the power amplifier off and on again.

Event message:
Amplifier overheat
Originator:
Amplifier channel in which the fault occurred.
Extra information:
This fault event cannot be generated by LBB4428/xx Power Amplifiers.
Description:
Logs the overheat (> 85 °C) of an amplifier channel. The system decreases the audio level with 3 dB. This fault event can occur even when the power amplifier is disabled with the configuration software.
Resolve:
When the fault disappears or when the power amplifier disconnects. If this fault is acknowledged/reset, any *Redundant Supply 24V* in the same amplifier channel will also be acknowledged/reset.
Recommended action:
Check if the fans of the power amplifier operate correctly. Also check the ambient temperature of the rack. If necessary, use forced cooling.

Event message:
Amplifier overheat: (amplifier channel) *muted*
Originator:
Amplifier channel in which the fault occurred.
Extra information:
This fault event cannot be generated by LBB4428/xx Power Amplifiers.
Description:
Logs the overheat (> 90 °C) of an amplifier channel. The system mutes all amplifier channels in the power amplifier. This fault can occur even when the power amplifier is disabled with the configuration software.
Resolve:
When the power amplifier disconnects or when the fault is resolved automatically.
Recommended action:
Check if the fans of the power amplifier operate correctly. Also check the ambient temperature of the rack. If necessary, use forced cooling.

Event message:
Amplifier overload
Originator:
Amplifier channel in which the fault occurred.
Extra information:
This fault event cannot be generated by LBB4428/xx Power Amplifiers.
Description:
Logs the overload of an amplifier channel. This fault event can only occur when the power amplifier is enabled with the configuration software.
Resolve:
When the power amplifier disconnects or when the fault is resolved manually.
Recommended action:
- Decrease the number of loudspeakers connected to the amplifier channel **OR**
- Decrease the loudspeaker line voltage. (This influences the maximum volume of the loudspeakers connected to the line).

Event message:
Amplifier short circuit
Originator:
Amplifier channel in which the fault occurred.
Extra information:
This fault event cannot be generated by LBB4428/xx Power Amplifiers.
Description:
Logs a short-circuit of an amplifier channel. This fault event can only occur when the power amplifier is enabled with the configuration software.
Resolve:
When the fault disappears or when the unit disconnects.
Recommended action:
Check the cabling of the loudspeaker line. If necessary, repair the short circuit.

Event message:
Back-up power supply failure
Originator:
Unit in which the fault occurred.
Extra information:

Description:
Logs the failure of the back-up power supply of a unit. This fault can only occur when the back-up supply of the unit is enabled with the configuration software.
Resolve:
When the back-up power supply returns or when the unit disconnects.
Recommended action:
Check the back-up power supply and its connections to the unit that generated the event. If necessary, repair them.

Event message:
Backup power supply failure remote call station
Originator:
Remote call station that detects the backup power supply failure.
Extra information:

Description:
Logs a failure of the backup power supply of a remote call station.
Resolve:
When the call station interface disconnects or when the fault is no longer present.
Recommended action:
Connect the backup power supply or disable the backup power supervision in the configuration.

Event message:
Call station audio path fault
Originator:
Call station in which the fault occurred.
Extra information:

Description:
Logs an audio path fault of a call station.
Resolve:
When the call station disconnects or when the fault is resolved manually.
Recommended action:
Replace the call station.

Event message:
Class-A switchover
Originator:
Output channel of multi channel interface, connected to a basic amplifier channel in which the fault occurred.
Extra information:

Description:
Logs the occurrence that, in class-A mode the second (B) relay has closed.
Resolve:
When the unit disconnects or when the fault is resolved manually.
Recommended action:
Check the loudspeaker connections in the loop from output A to output B.

Event message:
Cobranet interface fault **OR**
Cobranet network fault
Originator:
Unit in which the fault occurred.
Extra information:
Error code reported by the CobraNet interface
Description:
Internal fault in the LBB4404/00 CobraNet Interface or CobraNet network fault. Most common faults are network faults, such as reception and transmission faults due to collisions, excessive network delay or broadcast traffic. Other faults could be related to the configuration.
Resolve:
When the error is no longer present or when another CobraNet error occurs on the same unit)
Recommended action:
- Make sure that the CobraNet interface is not connected to the Ethernet via a hub. Only use (managed) Ethernet switches. Repeater networks cause collisions.
- Make sure that the Ethernet network does not contain any loops.
- Check the Ethernet connections and the lengths of the Ethernet cables.
- If the Ethernet is also used to transport computer data, configure a high priority on the switch for the port that is used for CobraNet.
- Check if the bundle and channel numbers have been assigned correctly. Also check that at least one CobraNet device has a conductor priority unequal to zero.
- Check for each bundle number if it is not used by more than one transmitter.
- (Temporarily) disconnect other devices connected to the network to check if these are causing faults by transmitting corrupt packets.

For specialists only: the fault code is a reference to the CobraNet fault description, which can be found in the Error Code Reference part of the CobraNet Technical Datasheet. This datasheet can be downloaded from:
http://www.cobranet.info/sites/default/files/CobraNet_Programmer_Manual_PM25.pdf

Event message:
Configuration file error
Originator:

Extra information:
This fault event can only occur when the network controller is started. This fault event aggregates to a System fault.
Description:
Logs a consistency fault in the configuration file. (The default configuration file will be loaded.)
Resolve:
Immediately after acknowledgement.
Recommended action:
- Open the configuration file with the *Configuration Printing Tool* and check for errors.
- Create a new configuration file using the information that is shown by the *Configuration Printing Tool*.

Event message:
Configuration file version mismatch
Originator:

Extra information;
Version of the configuration file, version of the system software.

This fault event can only occur when the network controller is started and the version number of the configuration file is 1.4 or higher.
Description:
Logs the mismatch of the version number of the configuration file and the version number of the system software.
Resolve:
Immediately after acknowledgement.
Recommended action:
- Open the configuration file with the *Configuration Printing Tool* and check for errors.
- Create a new configuration file using the information that is shown by the *Configuration Printing Tool*.

Event message:
Control input line failure: (control input)
Originator:
Control input in which the fault occurred.
Extra information:
This fault event cannot be generated by LBB4430/00 Call Stations Basic and open interface clients.
Description:
Logs the failure of a supervised control input.
Resolve:
When the fault disappears or when the unit disconnects.
Recommended action:
Check the control input and the cables that are connected to it. If necessary, repair them.

Event message:
External line fault
Originator:
Control input that received the Zone line fault.
Extra information:
Name of the zones.
Description:
Logs the activation of an external line fault input.
Resolve:
When the input is deactivated or when the unit disconnects (in case the event occurred on a unit).
Recommended action:
Check the loudspeaker lines of the indicated zone(s).

Event message:
Fault input

Originator:
Control input, key or open interface client that generated the fault event.

Extra information:
Description that is entered with the configuration software.

Description:
Logs the activation of a control input or key that was configured as a *Fault input*, or an open interface client that generated a *reportFault* command.

Resolve:
- If the fault was generated by a control input or key: when the *Fault Input* is deactivated or when the unit disconnects.
- If the fault was generated by an open interface client: when the open interface client reports that the error is resolved or when the open interface client disconnects.

Recommended action:
The recommended action depends on the purpose for which the specified control input, key or open interface client was configured.

Event message:
Flash card data error

Originator:
Unit in which the fault occurred.

Extra information:
This fault event aggregates to a System fault.

Description:
Logs a fault in the checksum of the flashcard. This fault event can only occur when the availability of a flash card is enabled with the configuration software and the flashcard is not missing.

Resolve:
When the fault disappears.

Recommended action:
- Replace the message set on the flashcard using the *File Transfer* application **OR**
- Replace the flashcard.

Event message:
Flash card missing

Originator:
Unit in which the fault occurred.

Extra information:
This fault event aggregates to a System fault.

Description:
Logs the absence of the flash card. This error can only occur when the availability of a flash card is enabled with the configuration software.

Resolve:
When the fault disappears and the network controller restarts.

Recommended action:
Check if a flashcard has been installed in the unit. If so, re-connect the flash card or replace it and restart the network controller.

Event message:
Group A fault

Originator:
Output channel of multi channel interface, connected to a basic channel in which the fault occurred.

Extra information:

Description:
Logs the failure in group A for audio outputs with A/B switching or class-A wiring.

Resolve:
When the unit disconnects or when the fault is resolved manually.

Recommended action:
Check the loudspeaker connections on the Group A output of the basic amplifier channel.

Event message:
Group A or B line fault
Originator:
Output channel of multi channel interface, connected to a basic amplifier channel in which the fault occurred.
Extra information:

Description:
Logs a loudspeaker line fault in group A/B wiring mode while busy determining whether a Group A fault or Group B fault must be generated.
Resolve:
When the unit disconnects, or when the fault is no longer present, or when the actual cause of the fault is known (and a Group A fault or Group B fault has been generated).
Recommended action:
Wait for *Group A fault* or *Group B fault* and check the corresponding loudspeaker lines.

Event message:
Group B fault
Originator:
Output channel of multi channel interface, connected to a basic amplifier channel in which the fault occurred.
Extra information:

Description:
Logs the failure in group B for audio outputs with A/B switching or class-A wiring.
Resolve:
When the unit disconnects or when the fault is resolved manually.
Recommended action:
Check the loudspeaker connections on the Group B output of the basic amplifier channel.

Event message:
Incompatible hardware version
Originator:
Unit in which the fault occurred.
Extra information:
The version number of the installed hardware and the lowest version number that is required to use the configured functionality.
Description:
Logs the mismatch of the version number of the unit hardware and the required hardware version number. The mismatch depends on the configured functionality of the unit. This fault event only occurs when the configured functionality cannot be handled by the hardware. Typically, this event occurs when multiple loudspeaker line supervision is used in combination with /00 Power Amplifiers.
Resolve:
When the unit disconnects.
Recommended action:
- Use a newer version of the unit that caused the fault **OR**
- Downgrade to a lower software version

Event message:
Invalid Firmware version
Originator:
Unit that has an invalid firmware version.
Extra information:
Current firmware version number of the unit and the minimal required version number of the firmware.
Description:
Logs the mismatch of the firmware version number of the unit and the minimal required firmware version number.
Resolve:
When the unit is upgraded.
Recommended action:
Update firmware. This action is available in the configuration web pages.

Event message:
Keypad mismatch

Originator:
Call station in which the fault occurred.

Extra information:
KP: keypad, NKP: numeric keypad.

Description:
Logs the mismatch of the number of configured and detected (numeric) keypads.

Resolve:
When the fault disappears or when the call station disconnects.

Recommended action:
Make sure that the number of configured (numeric) keypads is equal to the number of (numeric) keypads that are connected to the call station.

Event message:
Line input failure

Originator:
Audio input that did not receive the pilot tone.

Extra information:
This fault can only occur on a network controller, audio expander or power amplifier.

Description:
Logs the failure of a connection or cable to a supervised audio line input on a unit.

Resolve:
When the error is no longer present or when the unit disconnects.

Recommended action:
Check the audio connection to the line input that has reported the fault. Check the source of the audio signal and the level of the pilot tone.

Event message:
Line supervision master mismatch

Originator:
Amplifier channel in which the fault occurred.

Extra information:

Description:
Logs the mismatch between the installed line supervision devices and the configured line supervision devices. This fault event can only occur when the amplifier channel is enabled with the configuration software.

Resolve:
When the installed and configured line supervision devices match.

Recommended action:
Disable wireless line supervision for the specified amplifier channel with the web interface or install supervision-masters for all channels that use wireless line supervision.

Event message:
Loudspeaker failure
Originator:
Amplifier channel in which the fault occurred.
Extra information:
Address(es) and name(s) of loudspeaker supervision board(s). The system cannot attach the *Resolved* status to this event immediately after the fault has been resolved, because the system first must establish a communication link with the supervision board. This can take up to 300 s. When this fault event is reset before the system has attached the *Resolved* status to it, the status of the fault event becomes *Reset*. Then, the same fault event is raised again with status *New*.
Description:
Logs the supervision failure of one or more LBB4441/00 Loudspeaker Supervision Boards. This fault can only occur when the amplifier channel and supervision boards are enabled with the configuration software.
Resolve:
When the power amplifier disconnects or when the fault is resolved manually.
Recommended action:
Check the loudspeaker connected to the loudspeaker supervision board that has reported the fault. Also check the loudspeaker line and the loudspeaker supervision board itself.

Event message:
Loudspeaker line failure
Originator:
Amplifier channel in which the fault occurred.
Extra information:
Address(es) and name(s) of end of line supervision board(s). The system cannot attach the *Resolved* status to this event immediately after the fault has been resolved, because the system first must establish a communication link with the supervision board. This can take up to 100 s. When this fault event reset before the system has attached the *Resolved* status to it, the status of the fault event becomes *Reset*. Then, the same fault event is raised again with status *New*.
Description:
Logs the supervision failure of one or more LBB4443/00 End of Line (EOL) Supervision Boards. This fault can only occur when the amplifier channel and supervision boards are enabled with the configuration software.
Resolve:
When the power amplifier disconnects or when the fault is resolved manually.
Recommended action:
Check the loudspeaker line connected to the EOL supervision board that has reported the fault. Also check the loudspeaker and the EOL supervision board itself.

Event message:
Mains power supply failure
Originator:
Unit in which the fault occurred.
Extra information:

Description:
Logs the failure of the mains power supply.
Resolve:
When the mains power returns or when the unit disconnects.
Recommended action:
Check the mains power supply and its connections to the unit that generated the event.

Event message:
Messages missing
Originator:
Unit in which the fault occurred.
Extra information:
Name(s) of message(s) that are present in the configuration, but are not present on the flash card.
Description:
Logs the mismatch of the configured and detected messages in the flashcard. Can only occur when the availability of a flash card is enabled with the configuration software and restart the network controller.
Resolve:
When the fault disappears.
Recommended action:
Check the file names. (These are case-sensitive.) If the message names appear to be correctly configured, upload the message set again and restart the network controller.

Event message:
Memory error
Originator:
Unit in which the fault occurred.
Extra information:
Whether the flash memory is defective, whether the EEPROM memory is defective.

This fault event cannot be generated by open interface clients.
Description:
Logs a memory fault.
Resolve:
When the fault disappears or when the unit disconnects. An EEPROM memory fault resolves immediately after acknowledge.
Recommended action:
- Restart the network controller **OR**
- Switch off the unit in which the fault occurred **OR**
- Replace the unit in which the fault occurred.

Event message:
Microphone failure
Originator:
Audio input in which the fault occurred.
Extra information:
This fault event can only be generated by call stations and power amplifiers.
Description:
Logs the failure of a microphone on or connected to a unit.
Resolve:
When the fault disappears or when the unit disconnects.
Recommended action:
Check the microphone and its connections to the system. If necessary, repair them.

Event message:
Network power supply failure remote call station
Originator:
Remote call station that detects the network power supply failure.
Extra information:

Description:
Logs a failure of the network power supply of a remote call station.
Resolve:
When the call station interface disconnects or when the fault is no longer present.
Recommended action:
Connect the network power supply or disable the network power supervision in the configuration.

Event message:
No valid configuration file found; a new configuration file will be created.
Originator:
This fault event aggregates to a System fault.
Extra information:
This fault event can only occur when the network controller is started.
Description:
Logs the absence/corruption of the configuration file (default configuration loaded).
Resolve:
Immediately after acknowledgement.
Recommended action:
Check the version number of the configuration file. A version lower than 1.4 is not supported anymore. Reconfigure the system.

Event message:
OMNEO interface fault **OR**
OMNEO network fault
Originator:
Unit in which the fault occurred.
Extra information:
Fault code reported by the OM-1 module. The code itself is for internal use only.
Description:
Internal fault in the OMNEO Interface or an OMNEO network error. Most common faults are network faults, such as reception and transmission faults due to collisions, excessive network delay or broadcast traffic. Other faults could be related to the configuration.
Resolve:
When the fault is no longer present or when another OMNEO interface fault or OMNEO network fault occurs on the same unit (whatever happens first).
Recommended action:
Make sure that the OMNEO interface is not connected to the Ethernet via a hub. Only use (managed) Ethernet switches. Repeater networks cause collisions.

- Make sure that the Ethernet network does not contain any loops, unless the network uses a Rapid Spanning Tree Protocol.
- Check the Ethernet connections and the lengths of the Ethernet cables.
- If the Ethernet is also used to transport computer data, configure a high priority on the switch for the port that is used for OMNEO.
- Make sure that the Ethernet switches are properly configured, especially for RSTP.

Event message:
Pilot tone calibration failure

Originator:
Amplifier channel in which the fault occurred.

Extra information:

Description:
Logs the failure of the pilot tone calibration of an amplifier channel. This fault can only occur when the amplifier channel is enabled with the configuration software.

Resolve:
When the fault disappears or when the unit disconnect.

Recommended action:
Switch the unit that generated the event off and on again to allow it to re-calibrate. If this does not solve the fault, there is a failure in the loudspeaker line connected to the specified amplifier channel (e.g. line supervision master/slave mismatch, loudspeaker line failure).

Event message:
Processor reset

Originator:
Unit in which the fault occurred.

Extra information:
The type of processor that caused the reset. This fault event aggregates to a System fault.

Description:
Logs the watchdog reset of a processor.
This fault event can only be generated by units that are started up. It cannot be generated by open interface clients.

Resolve:
Immediately after acknowledgement.

Recommended action:
- In case this fault occurs for all connected units when performing the action *Save the configuration and restart the system*, this is probably caused by using a network controller with HW version 20.00 or older in combination with Praesideo release 3.4 or later. See the Note in section 41.4.4. Just acknowledge and reset these faults.
- Check for network faults. For example, units that are reported to be missing or using the half power mode (see section 51.4). Critical network connections can be found by using the half power mode in *Diagnose\Installation*
- Make sure that all units contain the correct firmware.
- Check for faults that tell you that the configuration file is corrupt (for example, *Configuration file error* or *Configuration file version mismatch*). Especially check for missing audio equalizer settings that show up as question marks; then create a new configuration file.
- Check for faults that tell you that the flash card is corrupt.
- Then switch the unit off and on again or disconnect and reconnect the unit.

Event message:
Redundant ring broken
Originator:

Extra information:

Description:
Logs a break in the redundant ring.
Resolve:
When the redundant ring is restored.
Recommended action:
- Restore the redundant ring **OR**
- On the *System wide settings* pages of the configuration software, set *Redundant ring network* to *No*.

Event message:
Redundant supply 24V
Originator:
Amplifier channel in which the fault occurred.
Extra information:

Description:
Logs the occurrence of a redundant power fault. If this fault occurs, a redundant 24V internal power supply of a basic amplifier (BAM) has failed. The BAM is capable of functioning with the remaining 24V internal power supply. Note that all BAM channels will report this fault. This fault is masked by an active *Amplifier Overheat Mute* fault, but both may be present if the occurrence is: *Redundant Supply 24V* followed by an *Amplifier Overheat Mute* fault.
Resolve:
When the fault is restored. If this fault is acknowledged/reset, any *Amplifier Overheat Mute* fault in the same amplifier channel will also be acknowledged/reset.
Recommended action:
Check the CAT-5 connections between the multi channel interface and indicated basic amplifier channel.

Event message:
Remote call station connection failure
Originator:
Call station interface that detects the connection failure with the remote call station.
Extra information:

Description:
Logs a connection failure between a call station interface and a remote call station.
Resolve:
When the call station interface disconnects or when the fault is no longer present.
Recommended action:
- Check the connection between the call station interface and the remote call station.
- Make sure that all PRS-CSR(K) remote call stations are connected to PRS-CSI Call Station Interfaces.
- Make sure that all LBB4438/00 and LBB4439/00 remote call stations are connected to LBB4437/00 Call Station Interfaces.

Event message:
SCB failure / Supervision Control Board failure
Originator:
The multi channel interface or the power amplifier output in which the fault occurred.
Extra information:

Description:
Logs the failure of a supervision control board, that is part of a multi channel interface or that is mounted in a power amplifier.
Resolve:
When the fault is no longer present and the unit has been switched off and on again.
Recommended action:
Replace the failing supervision control board of the power amplifier channel or replace the multi channel interface.

Event message:
Unit missing
Originator:
Unit that is missing
Extra information:
The network controller detects missing units within 1 minute and missing Open Interface clients within 10 minutes.
Description:
Logs the absence of a configured unit.
Resolve:
When the unit reconnects.
Recommended action:
Disable the configured unit with the configuration software or connect the missing unit to the system.

Event message:
Unit not configured
Originator:
Unit that is not configured.
Extra information:
This fault event cannot be generated by open interface clients.
Description:
Logs the connection of a unit that is not configured.
Resolve:
When the unit disconnects.
Recommended action:
Check the serial number and type of the unit that generated the event. Use the configuration software to configure and enable the unit.

Event message:
Unknown unit type
Originator:
Unit that was not recognized by the network controller.
Extra information:
This fault event cannot be generated by open interface clients.
Description:
Logs the connection of a unit of an unknown type.
Resolve:
When the unit disconnects.
Recommended action:
If the unit is not needed, disconnect it from the system. If the unit is needed, upgrade to a software version that supports the unit type. If the current software version supports the unit type, the unit is broken and must be repaired.

56 CobraNet Discovery

56.1 Introduction

The Praesideo CD-ROMs prior to version 3.3 contained a CobraNet Discovery program to assign IP addresses to connected CobraNet Interface units, and a program called CNConfig to change the value of CobraNet parameters of connected CobraNet devices. From version 3.3 onwards, Praesideo is delivered with a later version of CobraNet Discovery that is also able to change the value of CobraNet parameters, making CNConfig redundant. Therefore it is not delivered anymore with Praesideo. CobraNet Discovery is in English only.

This manual applies to CobraNet Discovery Version 3.4.5. CobraNet Discovery runs on a Windows PC and communicates with a CobraNet network through the PC's standard Ethernet network interface card (NIC). CobraNet Discovery's primary role is to discover and monitor status of CobraNet devices. It can also be used to assign IP addresses to devices, update firmware, control and monitor the configuration of devices and generate status reports.

At the moment of this release, the latest version of the CobraNet Discovery tool is version 4.0.5, which is included on the installation DVD. Check http://www.cobranet.info/downloads/disco for the latest version.

Note
Basic understanding of CobraNet networks and technology is assumed to configure CobraNet devices. The Praesideo DVD contains some documents about CobraNet technology in the folder *\Manuals.* More information can be found on *www.cobranet.info*, where you can also find the latest version of CobraNet Discovery. This website is maintained by Cirrus Logic, the owner of CobraNet.

56.2 Installation

CobraNet Discovery 3.4.5 is supported and tested under Windows NT 4.0, 2000, XP and Vista. Operation under Windows 95, 98 and ME is not supported. Version 4.0.5 supports Windows 7, Vista and XP. The PC running CobraNet Discovery must contain a properly configured Ethernet network interface card.
Because Discovery installs and uses a device driver to send and receive CobraNet packets, administrative privileges are required to install and run Discovery.

Install CobraNet Discovery on a PC, following the Installshield Wizard. If previous versions of Discovery were installed before, you may have to select the option *Remove all installed features* first and then restart the setup program.
Warning messages concerning removal of read-only files during un-installation may be safely ignored. Some previous versions of Discovery erroneously installed system files in a read-only mode.
The Discovery installation creates a default program folder *C:\Program Files\Cirrus Logic\CobraNet Discovery,* in which you can also find specific Discovery release notes and a more extensive manual.

Note
On networks with more than 20 CobraNet devices it may be necessary to add a "[configuration]Age To Die = 30000" entry in your cndisco.ini file to stabilize the Discovery display. This file is located in the program folder.

Note
CobraNet Discovery 4.0.5 does not officially support Windows 8. Nevertheless, it may be possible to run CobraNet Discovery under Windows 8 by taking some measures.
CobraNet Discovery 4.0.5 uses Microsoft .NET Framework 3.5 and refers to the Windows 7 setup on the Microsoft website to install this framework. Under Windows 8 no installation is needed, but the .NET Framework 3.5 just needs to be enabled in the Control Panel. Choose Control Panel from the Start screen, then choose Programs, then choose Turn Windows features on or off, then select the .NET Framework 3.5 (includes .NET 2.0 and 3.0) check box.
In addition, on a PC that is maintained by a corporate update server, ask your administrator to enable the policy to use Windows Update instead of Windows Server Update Services (WSUS). For more details, see http://msdn.microsoft.com/en-us/library/hh506443(v=vs.110).aspx

56.3 Network adapter configuration

Network adaptors on home or business PC networks are normally configured to obtain an IP address automatically from the network to which they are connected. These address services are typically provided by an internet gateway or a server computer on the network. Although some sophisticated audio networks may have these services, a dedicated CobraNet network typically will not. Therefore, your network adaptor should be manually assigned an IP address in most cases.

56.3.1 IP address assignments

It is recommended to assign the following IP addresses for CobraNet networks.

- 192.168.100.1 through 192.168.100.199 - CobraNet devices (Default IP addresses assigned by CobraNet Discovery)
- 192.168.100.200 through 192.168.100.219 - Network switches and infrastructure.
- 192.168.100.220 through 192.168.100.254 - Computers

When following the above recommendations, your computer should be assigned an unused IP address in the range 192.168.100.220 through 192.168.100.254. See also section 33.8 about IP address limitations.

56.3.2 Manually assigning an IP address

1 From Control Panel, open *Network Connections*.
2 Right click on the Ethernet adaptor you will be using for connection to the CobraNet network and select *Properties*.
3 Find *Internet Protocol (TCP/IP)* in the list of services.
4 Press *Properties* button.
5 In the *Internet Protocol (TCP/IP) Properties* dialog, select *Use the following IP address*.
6 Enter *IP Address*.
7 Enter 255.255.255.0 for *Subnet mask*.
8 Leave *Default gateway* blank.
9 Settings in the second half of the dialog box are unimportant for Discovery operation. It is fine to leave *Preferred DNS server* and *Alternate DNS server* fields blank.
10 Click *OK* on all dialogs to save settings. On Windows NT and 2000, you may be directed to reboot before new settings will take effect.

Note
To restore settings to automatic assignment at a later time, return to the Internet *Protocol (TCP/IP) Properties* dialog and select *Obtain and IP address automatically*.

56.4 Operation

Make sure that the PC on which you installed CobraNet Discovery is connected to the CobraNet network, and is not behind a firewall. On the PC, go to *Start* > *Programs* > *CobraNet Discovery* > *CobraNet Discovery*. Upon starting the program the PC shows the CobraNet Discovery window (refer to figure 56.1 for an example). Only one CobraNet Discovery program can be active at one time.

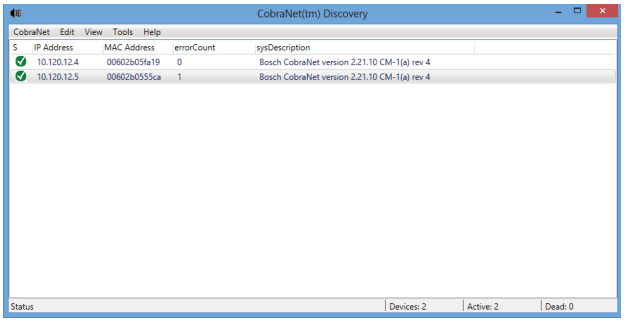


figure 56.1: CobraNet Discovery main window

The Discovery window is a dynamic display of devices found on the network. When a CobraNet device is added to the network, the device is added to the list. If a device is removed from the network or powered down, its status will change to off line but it will remain on the list until the display is manually reset with the *Display Refresh (F5)* operation or the application is restarted. If Discovery is started for the first time the devices do not show a valid IP address yet. Columns in the discovery window may be resized by dragging the boundaries between columns in the column heading area. Columns may be reordered by dragging the text area in the column heading area.
The discovery window contains default columns *S (Status), MAC Address* and *IP Address*, that are always present and cannot be hidden or removed.
The information in these columns is obtained by passively monitoring communications on the network.

56.4.1 S (Status)

Displays device status. A green checkmark indicates that the device is active. A red cross indicates that the device is not communicating or is no longer connected to the network. Devices with an inactive status will be removed from the list by a Display Refresh (F5) operation.

56.4.2 MAC Address

Displays the globally unique (Ethernet MAC) address for each discovered device. Ethernet MAC addresses are assigned to devices at manufacture and do not change.

56.4.3 IP Address

Displays the network (IP) address assigned to each device. CobraNet devices initially have an IP address of 0.0.0.0. by default. CobraNet Discovery will assign unique IP addresses to each device when *Enable Auto Assignment* is checked in the Options dialog (see 56.7). Once an IP address has been assigned to a device, information in the SNMP columns (described below) will be updated.

56.4.4 SNMP columns

Additional columns may be added to the Discovery window by right-clicking on the column header and/or by using the *Column Chooser* dialog. These columns correspond to SNMP variables. The variables specified are monitored on the CobraNet devices and updated in real time in the Discovery display.
SNMP variables on CobraNet devices are described in detail in the CobraNet Programmer's Reference Manual. All SNMP variables described therein are available for monitoring by entering the specified Object Identifier (OID) in the Add dialog from Column Chooser.
Some of the SNMP variables available for monitoring in a default CobraNet Discovery installation are documented below.

sysDescription
Displays the full name and firmware version of each discovered device.

errorCount
Displays the number of errors that have occurred on the device since the CobraNet Discovery application was started or the display manually reset. Some errors result from normal operation, i.e. re-routing audio, disconnecting/reconnecting Ethernet cables.

errorCode
Reason for the last error reported. errorCode values are documented in the Error Codes section at the back of the CobraNet Programmer's Reference Manual.

ifInErrors
Count of physical errors and packet data detected by the Ethernet receiver. Physical errors are most frequently the result of bad wiring.

Rx1 through Rx4
Bundle receiver status. CobraNet devices typically have four bundle receivers. These four variables show the status of each receiver.
Three metrics are displayed separated by slashes *(/)*. The three values are as follows:
- Bundle number (*rxBundle*)
- Receive status (*rxStatus*). Shows 1 if audio data is being received, or 0 if not. The most common reason for not receiving is that there is no transmitter sending that bundle.
- Receive dropouts (*rxDropouts*). Counts the transitions from receiving to not receiving. Ongoing dropouts may indicate network problems although dropouts also occur when audio is intentionally re-routed.

Tx1 through Tx4
Bundle transmitter status. CobraNet devices typically have four bundle transmitters. These four variables show the status of each transmitter.
Three metrics are displayed separated by slashes (*/*). The three values are as follows:
- Bundle number (*txBundle*)
- Number of receivers being served by this transmitter (*txReceivers*).
- Transmit dropouts (*txDropouts*). Counts the transitions from transmitting to not transmitting. Ongoing dropouts may indicate network problems although dropouts also occur when audio is intentionally interrupted and re-routed.

56.5 Menus

The Discovery window contains a menu bar by which additional functionality is accessed.

56.5.1 CobraNet

- **Update Firmware...**
  Updates the firmware on the selected CobraNet device(s). Discovery will first upload the existing firmware in order to identify it from a database of known firmware versions. The *Firmware Update* dialog is then displayed.
  Firmware updates are conducted from binary files located in the Database location.
  CobraNet Discovery does not ship with firmware files. Firmware must be obtained from the respective CobraNet equipment manufacturer. For the Praesideo CobraNet Interface the latest firmware version can be found on the Praesideo DVD in *\Tools\CobraNet\Discovery\Firmware*.
- **New IP Address...**
  Assigns a new IP address to the selected device. This may be used to assign IP addresses when *Auto Assignment* is disabled or to override the IP address assignments given by the Auto Assign mechanism.
- **Close**
  Closes and exits the application.

56.5.2 Edit

- **Copy**
  Copies the contents of the Discovery window to the clipboard as comma separated values. Information may then be pasted into a text editing program, saved with a .csv file extension, and then opened in a spreadsheet application.
- **Select all**
  Selects (highlights) all devices in the Discovery window. Selected devices are eligible for *Update Firmware, New IP Address* and *Report* operations.

56.5.3 View

- **Refresh**
  Clears all data from the list and restarts the discovery process. This causes all counter values to be reset to 0. Any non-communicating devices (those with a red X in their S column) will be removed from the discovery window.
- **Column Chooser...**
  Opens the *Column Chooser* dialog.

56.5.4 Tools

- **Options...**
  Opens the Options dialog used to set options for configuring the CobraNet Discovery program.
- **Configure**…
  Opens the Configuration dialog used to control and configure CobraNet interfaces. See the *CobraNet Control and Configuration* section (56.10).
- **Report**…
  This is used to generate .cvs spreadsheet compatible report files showing current status and configuration of one or more CobraNet interfaces. See the *Report Functions* section (56.9).

56.5.5 Help

- **About CobraNet Discovery**…
  Displays CobraNet Discovery copyright and version information.

56.6 Firmware Update dialog

This dialog box is invoked from the CobraNet menu bar. This function is seldom used for Praesideo CobraNet Interfaces, as the unit is delivered with the latest firmware installed. Therefore this function is not described here. For more information, please check the dedicated CobraNet Discovery user manual that can be found in the CobraNet Discovery program folder after installation (English only).

56.7 Options dialog

The Configuration dialog box is invoked by selecting *Tools* > *Options* from the menu bar. This dialog contains all of the controls required to customize the CobraNet Discovery application.

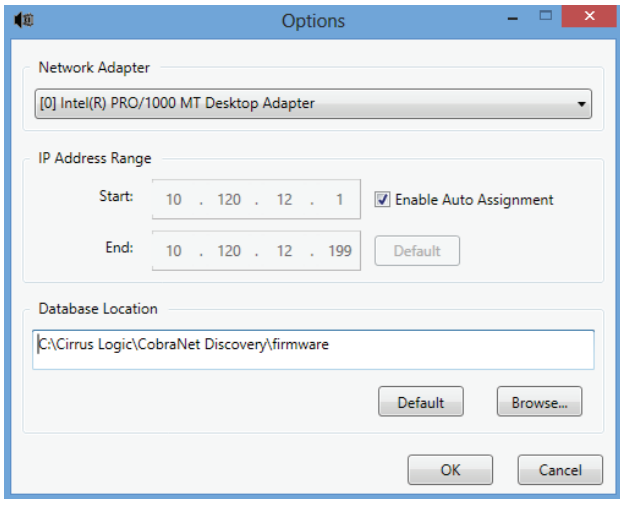


figure 56.2: Configuration dialog

56.7.1 Network adapter

Displays the Network Interface Card (NIC) used to connect to the CobraNet network. For PCs containing multiple NICs, this list box selects the card to serve as the network adapter used in the discovery process.

56.7.2 IP address range

Enable Auto Assignment must be (temporarily) disabled to adjust the IP address range.

- **Enable auto assignment**
  When checked, CobraNet Discovery assigns IP addresses to all discovered devices according to the specified IP address range.
- **Start**
  The first IP address to be assigned when Automatic Assignment is enabled.
- **End**
  The last IP address to be assigned when Automatic Assignment is enabled.
- **Default**
  Pressing this button will detect the IP address of the selected network adapter and sets Start and End accordingly.

56.7.3 Database location

This window displays the path to the directory where CobraNet firmware files reside. By default, the firmware sub-directory created during the CobraNet Discovery installation process will be displayed in this window. The firmware files obtained from CobraNet equipment manufacturers must be manually placed in this directory.

- **Default**
  Pressing this button returns the Database Location path statement to the default firmware directory. This button is unavailable when Database Location already specifies the default location. For a default installation of Discovery, the default location is *C:\Program Files\Cirrus Logic\CobraNet Discovery\firmware.*
- **Browser...**
  Specify an alternate firmware database location using a file browser interface.

56.8 Column Chooser dialog

The Column Chooser dialog box is invoked from the *View* menu or by right-clicking on the column header and selecting *More...* The Column Chooser allows SNMP variables to be added to and/or removed from the Discovery window and the SNMP polling list.

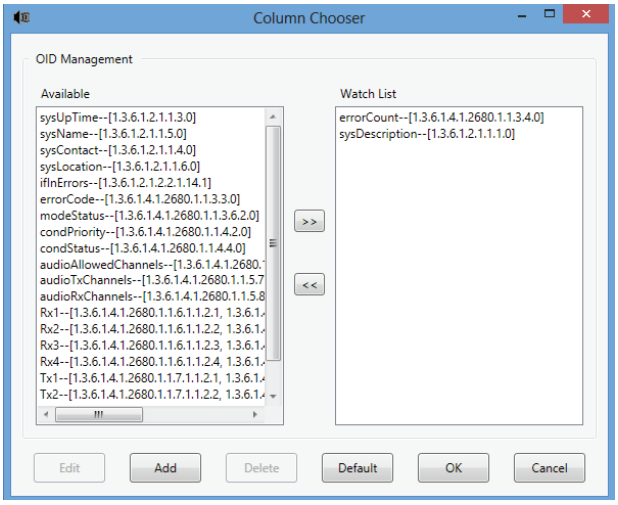


figure 56.3: Column Chooser dialog

56.8.1 Available OID

A number of commonly-monitored SNMP variables are displayed by default in the *Available OID* window.

56.8.2 IWatch list OID

This window displays the list of SNMP variables to be monitored. Each of these will be shown as its own column in the discovery window. Variables may be added to this list by selecting the desired variable in the *Available OID* window and then clicking the > button. Similarly, variables may be removed from this list by selecting the desired variable in the *Watch List OID* window and clicking the < button.

56.8.3 Add

Allows SNMP variables other than those shown by default in the *Available OID* window to be added to the list of available OIDs. When Add is invoked a secondary dialog with the following controls is displayed.

- **Object ID**
  Enter the full system object identifier (OID) of the variable to be monitored.
- **Column name**
  Enter the desired name to be displayed in the column header for the OID specified.

56.8.4 Edit

Edit an OID specification previously created with Add. The same secondary dialog is shown with Object ID and Column Names pre-filled with current values. Note that an item can only be selected for editing when displayed in the Available OID pane.

56.8.5 Delete

Allows previously-added, custom SNMP variables to be removed from the list of *Available OID*s. To delete a variable from the *Available OID* list, simply select the variable and press the *Delete* button. Note that the default SNMP variables can not be deleted.

56.8.6 Default

Clicking this button moves all of the default SNMP variables shown in the *Available OID* window into the *Watch List OID* window.

56.9 Report functions

The report function can be selected in two ways. Select one or more CobraNet devices on the main Discovery screen, then select *Report…* from the *Tools* menu in the main menu bar or right click and select *Report* from the pop-up menu.
A dialog will be displayed which allows selection of the directory in which the report file(s) will be saved. Report files are saved in Comma Separated Value (.csv) format, which can be opened using most spreadsheet applications. The report file contains all information required to determine the current configuration and status of a CobraNet interface. The report generator automatically creates the file names based on either the device's sysName or, if none exists, its MAC address.

After selecting a save directory, press the *Write* button to begin generating report(s). The report data is read from each CobraNet device via SNMP, labeled, formatted and saved in a .csv file.
A report for a single device can also be optionally generated from the main Configuration Dialog.

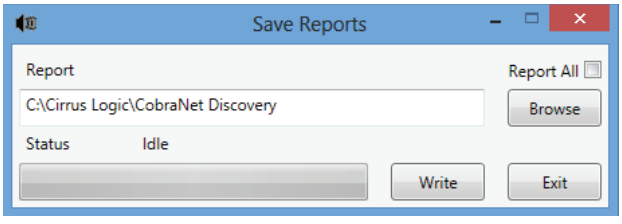


figure 56.4: Report function dialog

56.10 CobraNet Control and Configuration

56.10.1 Introduction

CobraNet Discovery can be used to change configuration settings in a CobraNet device. One CobraNet device at a time may be configured. Select the device to be configured in the main CobraNet Discovery window. Then either right click and select *Configure…* or select *Configure…* from the *Tools* menu. You may also double click on the device to invoke the Configuration dialog.

The configuration dialogs allow the user to read and, where appropriate, change configuration variables used in defining the functionality of a CobraNet device. Unlike the main CobraNet Discovery window, the variable values displayed are not periodically updated. The variables are read once using SNMP when the dialog is invoked. Each dialog will have one or more of the following buttons:

- **Cancel**
  Exit the dialog without writing any changed values to the CobraNet device.
- **OK**
  Exit the dialog. For dialogs that allow changing values, any values that were changed will be written to the CobraNet device as the dialog is exited.
- **Apply**
  Write any variables changed within the dialog to the CobraNet device.
- **Refresh**
  Re-read all values displayed within the dialog.

56.10.2 CobraNet Configuration dialog

This dialog shows each transmitter and receiver in the device along with its bundle number assignment and transmission or reception status. A non zero value in the *Status* column indicates that the transmitter or receiver is receiving or sending a bundle. In addition to transmitter and receiver information, the dialog will also display the *IP address* currently assigned to the device as well as its conductor status: the *Conductor* check box will be checked if the device is the conductor for the network.

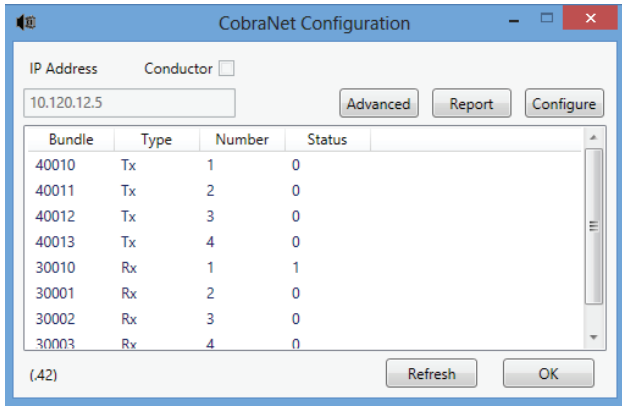


figure 56.5: CobraNet device configuration dialog

Six actions are supported from the main Configuration dialog:

- Press the *Configure* button with a transmitter (Tx) highlighted to launch the Transmitter Configuration dialog.
- Press the *Configure* button with a receiver (Rx) highlighted to launch the Receiver Configuration dialog.
- Press the *Report* button to launch the single Report Generation dialog.
- Press the *Advanced* button to launch the Advanced dialog.
- Press the *SNMP* button to launch the Generic SNMP R/W dialog. This Button is not displayed by default and must be enabled using the Disco Options applet.
- Single click on a *Bundle* number to edit/change the number.

You may also double click on a *Tx* or *Rx* line to invoke the configuration dialog for that transmitter or receiver.

56.10.3 Transmitter Configuration

The Transmitter configuration dialog is launched from the main Configuration dialog by highlighting the line containing the transmitter information and then pressing the *Configure* button, or by double clicking on the line containing the transmitter information.

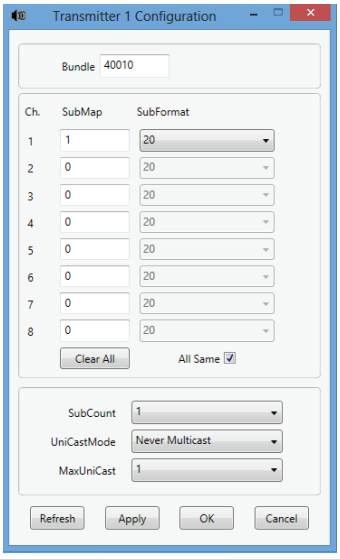


figure 56.6: Transmitter configuration dialog

The Transmitter configuration dialog provides access to the most useful configuration variables associated with a transmitter. Please refer to the CobraNet Programmer's Reference Manual for more detailed and up to date information regarding the meaning and usage of these variables. This manual is in the folder *\Manuals\CobraNet* on the Praesideo DVD.

- **Bundle**
  Allows assigning a bundle number to this transmitter.
- **SubMap**
  Defines the audio routing channel assigned to a bundle channel. The *Clear All* button can be pressed to assign a value of 0 (transmit nothing) to all channels in the bundle. The Praesideo CobraNet interface transmitter channels 1..4 correspond to SubMap numbers 1..4.
- **SubFormat**
  Normally the txSubFormat value contains information defining the sample size, sample rate and transmission latency. As sample rate and sample latency must be in agreement with the current value of the modeRateControl variable (settable from the Advanced dialog) this dialog only allows setting the sample size and will insure that the sample rate and latency portion of this variable will be in agreement with the value of modeRateControl. Typically the sample size will be the same for all channels in a bundle so the *All Same* option can be checked to assign the same value to all channels.
- **SubCount**
  This variable can be used to limit the number of channels that will be transmitted in the bundle. The default value is equal to 8 but can be set to any value from 0 to 8 in order to minimize bandwidth utilization when desired.
- **UnicastMode**
  This value can be used to override or modify the normal unicast versus multicast implications of the assigned bundle number. The normal default value is *Never Multicast*. The available options are:
  - *Always Multicast*
    All bundles are sent multicast regardless of Bundle number.
  - *Multicast over 1*
    If more than one receiver is set to receive this bundle, it will be multicast, else it will be unicast.
  - *Multicast over 2*
    If more than two receivers are set to receive this bundle, then it will be multicast, else it will be unicast or multi-unicast.
  - *Multicast over 3*
    If more than three receivers are set to receive this bundle, then it will be multicast, else it will be unicast or multi-unicast.
  - *Multicast over 4*
    If more than four receivers are set to receive this bundle, then it will be multicast, else it will be unicast or multi-unicast.
  - *Never Multicast*
    Only a single bundle will be sent unicast.
- **MaxUnicast**
  This value can be set to limit the number of multi-unicast bundles sent by this transmitter. The default for this value is 1 with allowed values of 1 through 4.

56.10.4 Receiver Configuration

The Receiver configuration dialog is launched from the main Configuration dialog by highlighting the line containing the receiver information and then pressing the *Configure* button, or by double clicking on the line containing the receiver information.

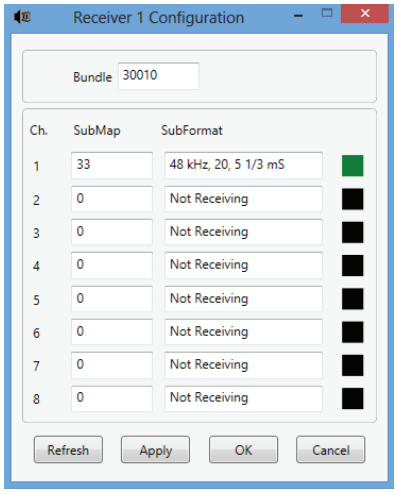


figure 56.7: Receiver configuration dialog

This Receiver configuration dialog provides access to the most useful configuration variables associated with a receiver. Please refer to the CobraNet Programmer's Reference Manual for more detailed information regarding the meaning and usage of these variables.

- **Bundle**
  Allows assigning a bundle number to this receiver
- **SubMap**
  Defines the audio routing channel assigned to an audio channel within the bundle. The Praesideo CobraNet interface receiver channels 1..4 correspond to SubMap numbers 33..36.
- **SubFormat**
  Status: read only. This show the status of the audio received in a bundle. This will indicate *Not Receiving* or will show the current sample rate, sample size and transmission latency of the received audio. The colored squares to the right of the rxSubFormat display provide further status.
  - **Green**
    Indicates audio is being received and properly decoded.
  - **Black**
    Indicates no audio is being received on this channel.
  - **Red**
    Indicates audio is being received but cannot be processed. This is usually due to receipt of audio data that is formatted incompatibly with the current operating mode of this receiving device, i.e. the sample rate and/or latency settings of the transmitting device are different than those of the receiving device. If latency setting are incompatible, it is normal to see the colored indicators alternate between black and red with periodic presses of the *Refresh* button.

56.10.5 Advanced Configuration

The Advanced dialog allows setting more advanced variables not usually associated with bundle management and which apply to the CobraNet device globally. Care should be used when changing variables in this dialog. Please refer to the CobraNet Programmer's Reference Manual for more detailed information regarding the meaning and usage of these variables.

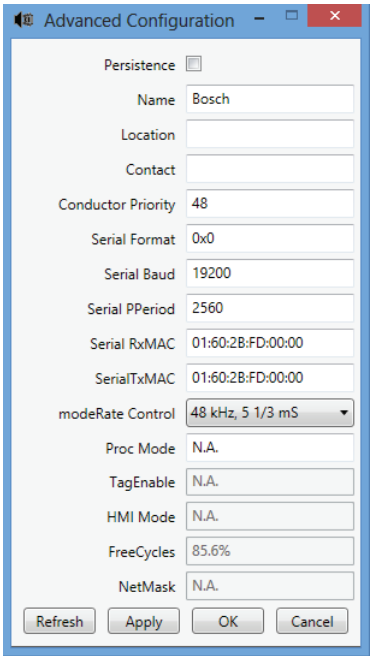


figure 56.8: Advanced configuration dialog

Not all of variables that can be displayed in the Advanced dialog are supported in all versions of CobraNet firmware. Variables that are not supported will be displayed as *N.A.* with a grey background color. Variables that are supported but are read only and can not be changed are also displayed with a grey background color.

56.11 DiscoOptions

DiscoOptions is an executable applet installed with CobraNet Discovery and used to alter the operational parameters of the Configuration functions.

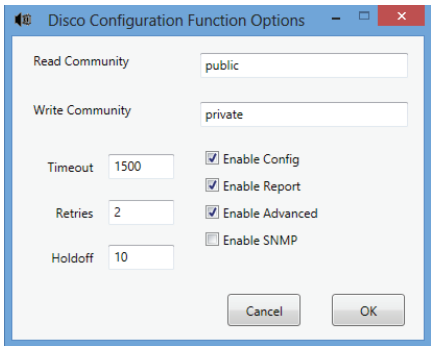


figure 56.9: Discovery configuration dialog

56.11.1 General usage

This applet provides a convenient way of changing the operational parameters used by the Configuration functions. The applet can be launched at any time, but the values are only read by the Configuration dialog when it is launched. Therefore, this applet should be used when the Configuration dialog is not active.
The default values will allow proper operation in most cases and should not require changing except in specialized or extreme cases.
It may be useful to increase the Timeout or Retries values when accessing devices on a very busy network or devices that themselves are heavily loaded.
Changes are saved only when *OK* is pressed. Pressing *Cancel* or closing the dialog will exit without saving changes.

56.11.2 DiscoOptions dialog fields

- **Read Community**
  The SNMP read community. It should never have to be changed. Default: public
- **Write Community**
  The SNMP write community. It should never have to be changed. Default: private
- **Timeout**
  The amount of time to wait for an SNMP response before aborting the operation. This value is specified in milliseconds. The minimum allowable value is 150 (.15 seconds) and all values are automatically rounded to the nearest 10 mS by the program. Default: 1500
- **Retries**
  The maximum number of times an SNMP operation will be retried in the event of a failure. Default: 2
- **Holdoff**
  The time in milliseconds to wait between SNMP accesses. CobraNet interfaces require a holdoff period. The default value of 10 should not have to be changed except in very rare instances when the device being accessed is very heavily loaded. The value should NEVER be set below 10. A value above 80 will be automatically reduced to 80. Default: 10
- **Enable Config**
  Check this box to enable the Configuration functions in general. The Configuration dialog can not be launched from the main CobraNet Discovery dialog when this box is unchecked. Default: Checked
- **Enable Report**
  Check this box to activate (make visible) the *Report* button in the Configuration dialog. Default: Checked
- **Enable Advanced**
  Check this box to activate (make visible) the *Advanced* button in the Configuration dialog. Default: Checked
- **Enable SNMP**
  Check this box to activate (make visible) the *SNMP* button in the Configuration dialog. Default: Unchecked

57 OMNEO Configuration with Dante Controller

57.1 Introduction

For the setup and configuration of the OMNEO interface PRS-4OMI4 information and tools are available on the Praesideo Installation DVD on three locations:

- In the list of optional packages Dante Controller can be selected. This is a link to the Audinate website where the latest version of the Dante Controller can be downloaded. For compliancy to the Audinate license agreement the Dante Controller program itself is not on the DVD. At the moment of Praesideo release 4.3, the latest version of Dante Controller is Dante Controller v3.5.6.2 (Windows). This program is used for configuration and routing of the OMNEO and/or Dante audio channels.

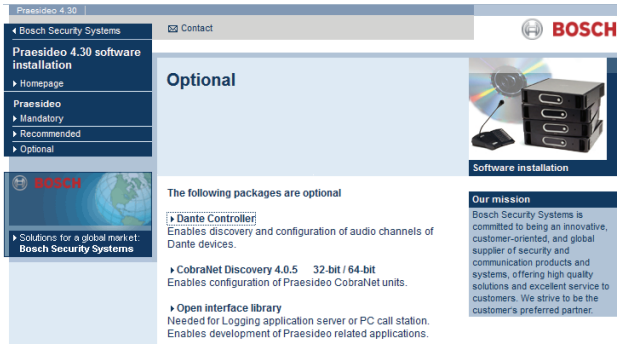


figure 57.1: Optional packages Dante Controller

- In de folder \Manuals, the User Guides are available for the Dante Controller and the Dante Virtual Soundcard.
- In the folder \Tools\PRS-4OMI4 configuration tools installation programs (installers) are available to change the factory firmware of the OMNEO interface. With the factory installed firmware the built-in Ethernet switch is programmed for loop-through Ethernet cabling. By replacing the factory firmware it is possible for the PRS-4OMI4 to support Rapid Spanning Tree Protocol (RSTP) for redundant Ethernet connections with automatic recovery from link failures.

57.2 Dante Controller

Dante Controller is a software application provided by Audinate which allows users to configure and route audio around Dante networks. It is available for Windows and OS X.

Once you install Dante Controller on your PC or Mac and connect it to a network, you can use Dante Controller to:

- View all Dante-enabled audio devices and their channels on the network
- View Dante-enabled device clock and network settings
- Route audio on these devices, and view the state of existing audio routes
- Change the labels of audio channels from numbers to names that suit you
- Customize the receive latency (latency before play out)
- Save audio routing presets
- Apply previously saved presets
- Edit presets offline, and apply as configurations for new network deployments
- View and set per device configuration options
- View network status information, including multicast bandwidth across the network and transmit and receive bandwidth for each device
- View device performance information, including latency statistics and packet errors
- View clock status information for each device, including frequency offset history and clock event logs

57.3 Installing or updating Dante Controller

To install Dante Controller you will need to be logged on with administrator privileges. You do not need to uninstall a previous version before installing the update. Since Dante Controller v3.4.0 for Windows the Apple Bonjour service is no longer used for device discovery by Dante Controller for Windows, the Audinate 'Dante Discovery' service is now used instead. Dante Discovery is installed automatically with Dante Controller for Windows.

To install Dante Controller:

- Ensure you are logged on to your computer as an administrator.

- Navigate to and double-click the downloaded Dante Controller installer file.
- Read the license agreement. If you agree to the terms, select the 'I agree' checkbox and click Install. If you do not agree to the terms, click Close.
- Confirm / acknowledge any Windows security prompts that are displayed.
- After installation the PC needs to reboot.

This section of the Praesideo manual acts as a quick guide to Dante Controller. More detailed information can be found in the Dante Controller User Guide.

The following minimum PC requirements apply:

- 1 GHz processor or better
- Microsoft® Windows® 7 SP1 and above, Windows 8, or Windows 8.1
- 1 GB RAM
- Wired Ethernet network connection: 100 base-T or 1000 base-T. Wi-Fi network connections are not supported.

57.4 Network view and routing

Start up Dante Controller. Dante Controller will show all connected Dante devices on the network, including the OMNEO interfaces PRS-4OMI4. The Routing tab of the Dante Controller Network View shows the connected devices with all inputs and outputs. As an example see figure 57.2 shows three connected PRS-4OMI4 devices, each with four inputs (Dante Receivers) and four outputs (Dante Transmitters). By clicking on cross-point the connections are set up.

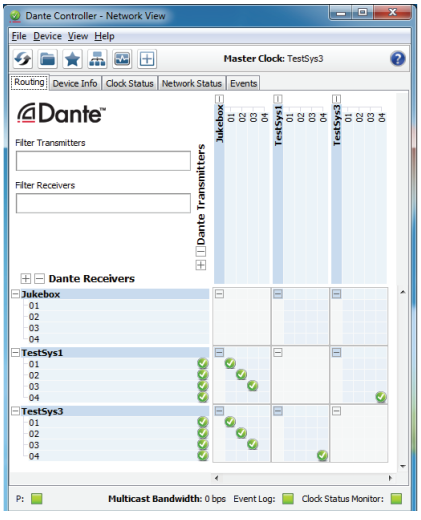


figure 57.2: Network view dialog

The tab Device Info shows details of the connected devices, see figure 57.3.

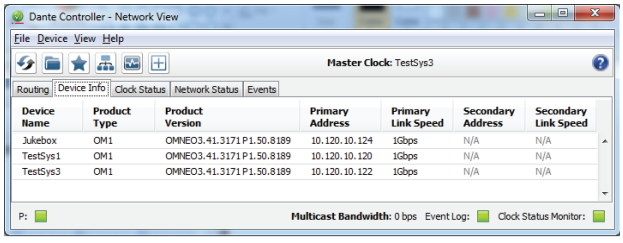


figure 57.3: Network view dialog - Device Info

The tab Clock Status shows the clock status and which device is the Master, see figure 57.4.

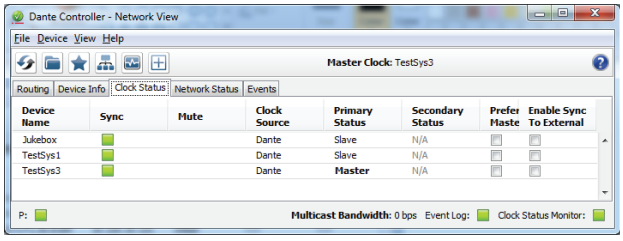


figure 57.4: Network view dialog - Clock Status

The tab Network Status shows for each device: Network speed, occupied Transmit and Receive bandwidth, selected Latency Setting, and more, see figure 57.5.

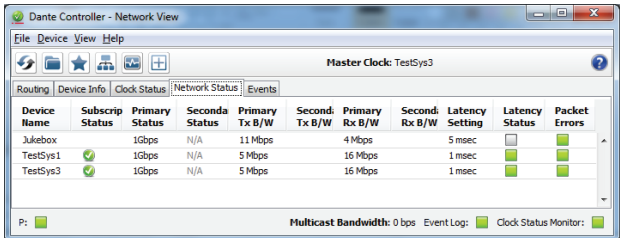


figure 57.5: Network view dialog - Network Status

The tab Events shows recent changes to connected devices, see figure 57.6.

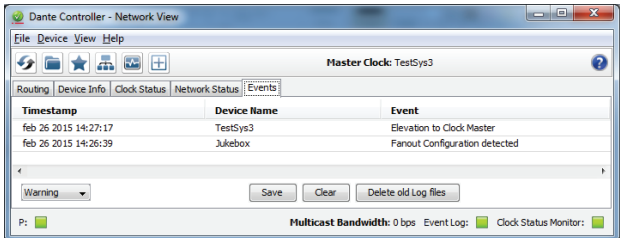


figure 57.6: Network view dialog - Events

By double-clicking on a device in the Routing overview, or clicking Device from the menu and selecting a device, the Device View opens, see figure 57.7. In tab Device Config the Latency can be optimized to the network topology and speed. Make sure that Cat-5E or Cat-6 cables are used in case of a Gbps-network. On 100 Mbps networks also Cat-5 can be used.

The sample rate is always 48 kHz for the PRS-4OMI4. Other options in this view are not yet supported.

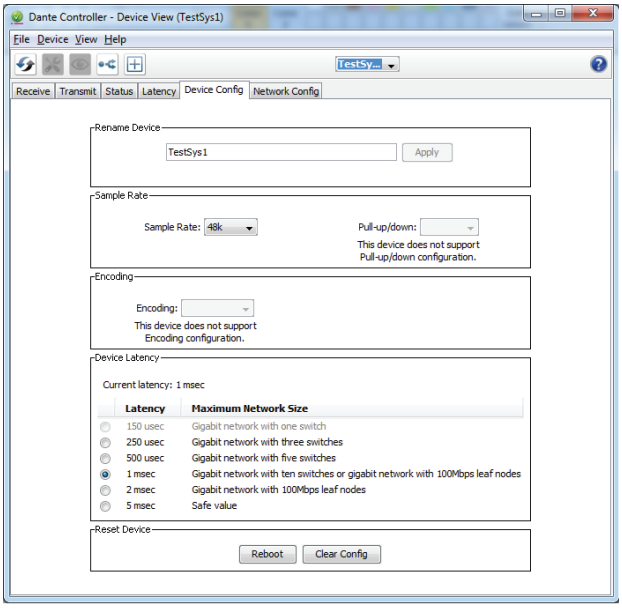


figure 57.7: Device view dialog - Device Configuration

The tab Network Config shows the IP-settings of the device and whether the device supports RSTP for network redundancy, see figure 57.8. Factory setting is non-RSTP. It requires a new firmware upload to change this, see section 57.5.
The tab Status shows device information, including software version information and the occupied interface network bandwidth, see figure 57.9.

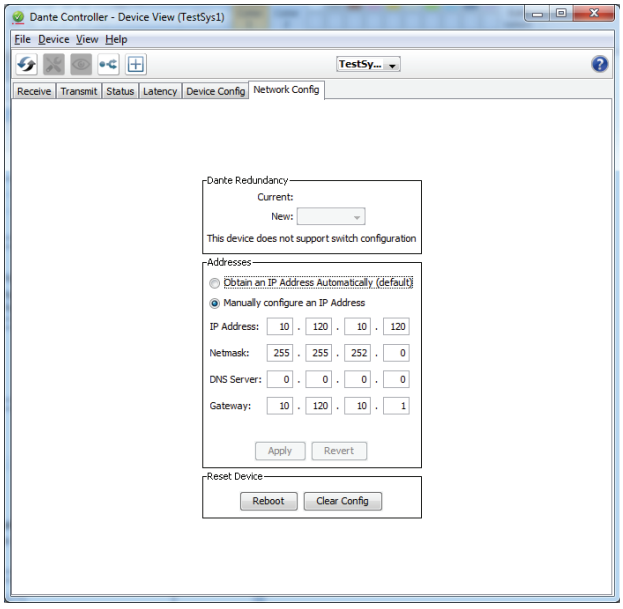


figure 57.8: Device view dialog - Network Configuration

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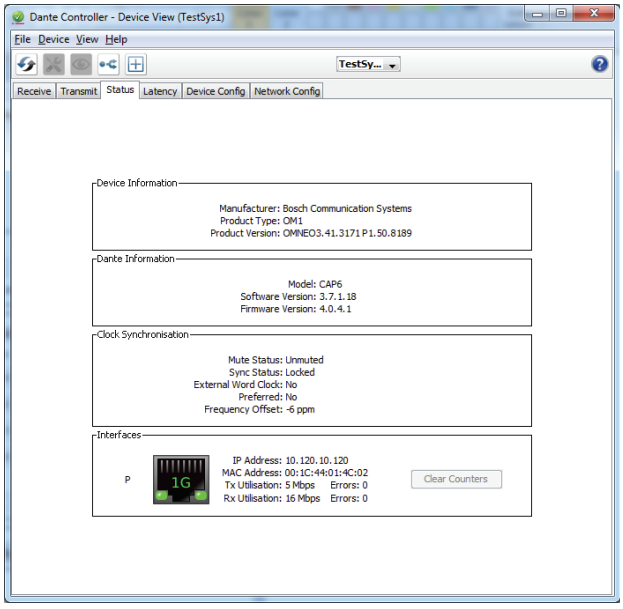

figure 57.9: Device view dialog - Status

Note
PRS-4OMI4 devices that have been part of a Bosch Conference system (DCNm) use different audio encoding with encryption. These devices cannot be used in a Praesideo system.

57.5 Updating OMNEO firmware

On the distribution DVD of Praesideo, in the folder *\Tools\PRS-4OMI4 configuration* tools installation programs (installers) are available to change the factory firmware of the OMNEO interface. With the factory installed firmware the built-in Ethernet switch is programmed for loop-through Ethernet cabling. By changing the factory firmware it is possible for the PRS-4OMI4 to support Rapid Spanning Tree Protocol (RSTP) for redundant Ethernet connections with automatic recovery from link failures. Check with your system administrator whether RSTP is supported by the network.

The following installer files are present:

- SetupOMNEOFirmwareUploadTool.msi
- SetupOMNEOFirmwareUploadTool64.msi
- PRS-4OMI4 Network Firmware V4.30.xxxx.msi

For a Windows 32-bit operating system run *SetupOMNEOFirmwareUploadTool.msi*, for a Windows 64-bit operating system run *SetupOMNEOFirmwareUploadTool64.msi*. This will install the OMNEO Firmware Upload Tool. You need Windows Administrator rights for this.
Then run *PRS-4OMI4 Network Firmware V4.30.xxxx.msi*. This installer will copy two firmware files to the right location for the Firmware Upload Tool to find them, this is in *\ProgramData\Bosch\OMNEO\Firmware*.

Now start the Firmware Upload Tool, a splash screen like figure 57.10 appears with a Network adapter selector box, see figure 57.11.

figure 57.10: OMNEO Firmware Upload Tool

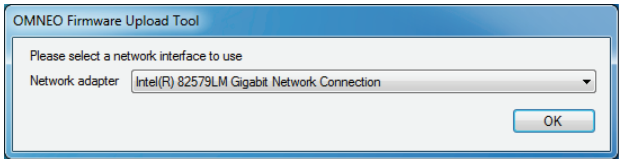

figure 57.11: Network adapter selection dialog

Select the Network adapter of the PC where the OMNEO network is connected to. Then the main window appears, showing the connected OMNEO devices, see figure 57.12.

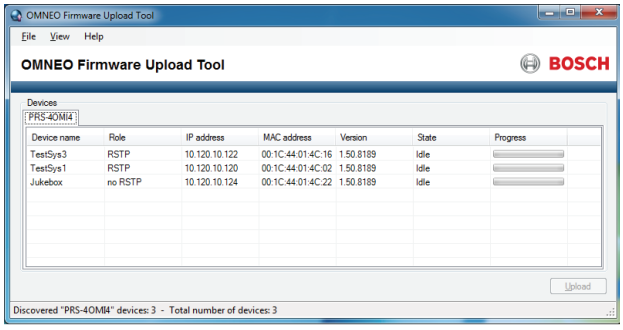

figure 57.12: Connected OMNEO devices dialog

The Role column shows whether the OMNEO network adapter in each device is supports RSTP for use in an RSTP network. Which columns are shown in this overview can be changed via View in the menu bar, see figure 57.13.

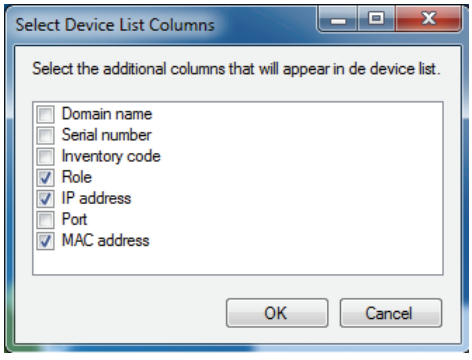

figure 57.13: Select device list columns dialog

Select the device that needs different firmware, see figure 57.14. Multiple devices can be selected for simultaneous upload in a single action, using the Ctrl and/or Shift key.

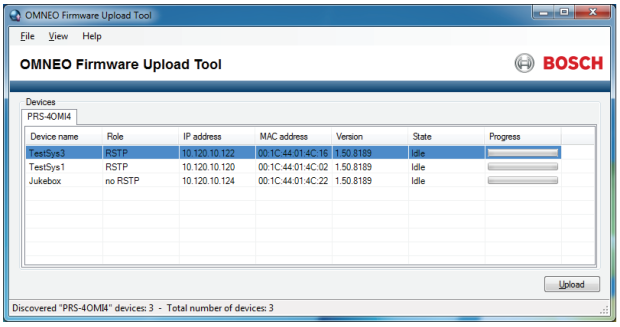

figure 57.14: Connected OMNEO devices selection

Press the Upload button, nothing happens yet as still the firmware image file must be selected. A window appears to select the firmware image file, see figure 57.15. The default folder for the firmware images is *\ProgramData\Bosch\OMNEO\Firmware*, where the installer stored these files in a previous step. The image folder location can be changed via *File > Options...* in the main menu, see figure 57.16. Here also the maximum number of concurrent uploads can be selected. The *Manage security keys* function in this window is not available.

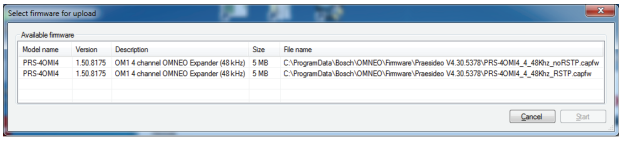

figure 57.15: Firmware image file Selection

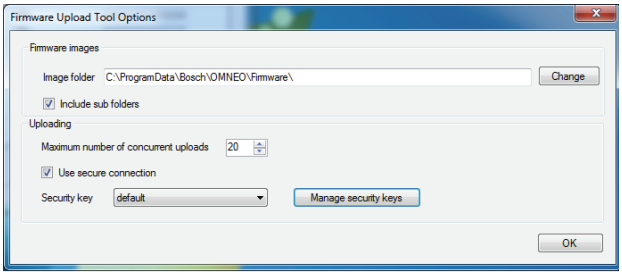

figure 57.16: Firmware image folder location

Select the file that ends with *_RSTP.capfw* for operation on a redundant RSTP network, or the file that ends with _noRSTP.capfw for non-RSTP operation, supporting loop through of multiple devices via the two Ethernet ports (daisy chaining). Then press Start the in the main window. The progress bars show the progress of the upload for each device.

More detailed function descriptions of the Firmware Upload Tool can be found via Help in the main window.

57.6 RSTP networks

The Rapid Spanning Tree Protocol implementation which is used by OMNEO devices uses the following default protocol timers:

- Hello_Time = 9 seconds
- Forwarding_delay = 30 seconds
- Max_age = 22 seconds

The Mdelay_while (or Edge_delay_while) is set to 1.5 times the hello time with a minimum of 3 seconds, to prevent that an edge port is detected while this is not the case.

Although the OMNEO devices are pre-configured with these settings, any standard Ethernet switch in the network has to be configured with these settings. These settings are different from the RSTP default to support 20 daisy-chained devices. Changing the Ethernet switch settings is usually done via the configuration interface of the switch. If this is not available, the switch probably does not support RSTP; check the switch specifications. Different settings will lead to longer conversion times (multiple seconds) when the network topology changes. During the conversion no communication is possible. The default protocol timers of the OMNEO network adapter device can be changed, however this is not advised. The bridge priority cannot be changed and is set low, so the device will never become an RSTP root bridge.

Sometimes devices still reset when a network loop is created, even though the devices contain firmware that supports RSTP. This might be caused by a data storm on the network. Managed switches normally open up a port for communication when another RSTP enabled switch is detected on the port or after 30 seconds if no such switch is detected. Sometimes a switch can be configured to open a port immediately (the switch will close the port when it finds a loop later on); in that case the network might be flooded temporarily when connecting a network cable. The solution is to disable the "fast mode" in the network switch. In Cisco switches, use the "no igmp portfast" command on a switch port.

On switches and routers use the following settings:
- Hello_Time = 9 sec
- Forwarding_delay = 30 sec
- Max_age = 22 sec
- Prio= 32768
- Auto Edge= Disabled
- Fast mode = Disabled (for Cisco switch: no igmp portfast)

57.7 Dante Virtual Soundcard

A Dante Virtual Soundcard (DVS) can be bought from Audinate. It is available as a download from their website: https://www.audinate.com/products/software/dante-virtual-soundcard. DVS is not a product from Bosch Security Systems and will not be supported by Bosch Security Systems. It is only presented here as an option to use with the PRS-4OMI4.

This program turns the PC on which it is installed into a multi-channel Dante enabled audio device. This means that for instance the built-in PC-microphone, or a microphone connected to a PC audio input, or a USB-microphone connected to one of the USB ports can be used as microphone for a Praesideo PC call station. In that case the PRS-4OMI4 receives that microphone signal via Dante and its corresponding Praesideo input should be configured as audio source for calls started from PC call station. No separately cabled Praesideo basic call station is needed then as the audio source.

A DVS can also be used in combination with multiple music/media players on a PC to create background music streams or message streams into Praesideo.

Warning
After a PC reboot, DVS does not always resume operation automatically and may need manual user intervention.

58 Logging Server

58.1 Introduction

With the *Logging Server*, the events generated by a maximum of 64 systems can be logged. Typically, the *Logging Server* runs on a PC that is connected to all systems of which the events are logged. The *Logging Server* stores the events in a database.

58.2 Requirements

The *Logging Server* can run on any PC that meets the following minimum requirements:

- Operating system:
  Microsoft® Windows 7, 8 or 8.1
- Network connection: 100 base-T
- 1 GB RAM
- Free disk space: depends on the amount of events that must be stored, but it is recommended to have at least 10 GB of free disk space.
- It is good practice to keep the PC updated with the latest Windows updates. This makes sure that the PC contains the most recent version and service packs of the Microsoft® Jet 4.0 database, which is used by the *Logging Server*. (See http://support.microsoft.com/common/international.aspx).

58.3 Installation

Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2).

2 Click *Optional* > *Logging Application Server*. A *File Download* window appears.

3 Click the *Open* button to start the setup program of the *Logging Server*. A screen similar to the one in figure 58.1 appears.

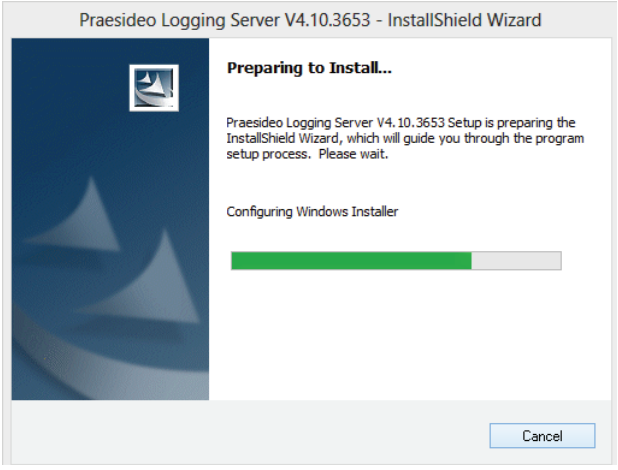

figure 58.1: Logging server setup

4 Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

The interface for the Logging Server is available in different languages. During installation of the Logging Server a number of language file folders have been installed in:

\Program Files\Bosch\Praesideo\Programs\Logging Server.

The language file folders have names according to the international 2-letter language code (ISO 639), for example; 'en' for English, 'ru' for Russian.

5 Check this folder to see if your language is available. If a language folder exists for the language of the installed Windows operating system, then that is the language of the Logging Server. If a different language is needed and a language folder exists for that language, proceed as follows:

6 Add a language parameter to the Logging Server program. The parameter is the 2-letter language abbreviation, e.g. " fi", i.e. a space followed by the language code. For the Logging Server, go to the startup folder to add the parameter:
Start > *Programs* > *Startup* > *Logging Server*.

7 Right click on the Logging Server, select properties and select the tab shortcut.
8 Add the " fi" parameter to the target description that ends with .exe", so after the double quote.
9 If the Logging Server has not been installed for automatic startup and is not in the startup folder, then create a shortcut for the program file, right click on the shortcut (can be on the desktop too), click properties and select the tab shortcut.
10 Add the " fi" parameter to the target description that ends with .exe", so after the double quote. Use the shortcut to start up the program. Of course, replace " fi" with the language abbreviation of your choice.

58.4 Start

The PC automatically starts the *Logging Server* when Windows is started. To indicate that the *Logging Server* has been started and operates correctly, an icon appears in the system tray of the taskbar of Windows (see figure 58.2).

figure 58.2: Logging Server icon (correct operation)

When the *Logging Server* has been started and faults have occurred in the communication between Praesideo and the logging system, the icon has a red cross (see figure 58.3).

figure 58.3: Logging Server icon (faults)

When the PC does not automatically start the *Logging Server*, proceed as follows to start it manually:
1 Go to *Start* > *Programs* > *Bosch* > *Praesideo*.
2 Click *Logging Server*. A new icon appears in the system tray of the taskbar of Windows (see figure 58.2 and figure 58.3).

58.5 Main window

58.5.1 Opening the main window

Proceed as follows:

1 Double click on the *Logging Server* icon (see figure 58.2). A screen similar to the one in figure 58.4 appears.

Note
When server authentication (see section 58.7.5) is enabled, the *Logging Server* asks for a user name and a password.

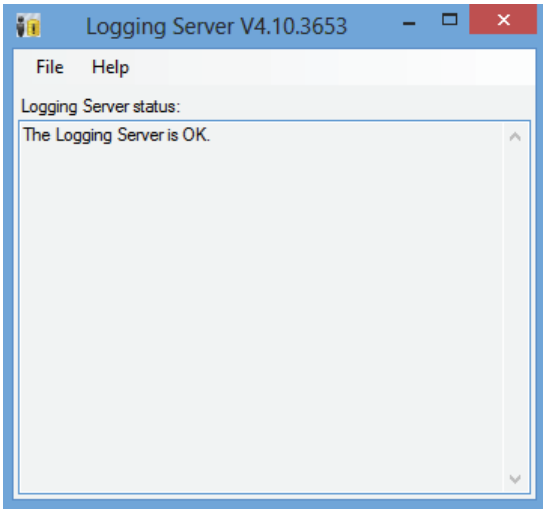

figure 58.4: Main window

58.5.2 Status messages

The main window displays the status of the *Logging Server*.

Message:
The Logging Server is OK.
Description:
The *Logging Server* operates correctly.
Recommended action:

Message:
Logging Server has no connection with <system>
Description:
There is no connection with the specified system.
Recommended action:
Make sure that the specified system is running and that the specified system has an Ethernet connection with the *Logging Server*.

Message:
Network controller <system> *refused connection due to incorrect user name or password.*
Description:
It is not possible to connect to the specified system, because the network controller authentication failed.
Recommended action:
Make sure the specified system knows the user name and password of the *Logging Server* (see section 58.7.5.3).

Message:
The Logging Server options are changed. Restart the Logging Server to use the changed settings.
Description:
The configuration settings of the *Logging Server* were changed. The changed settings are not used until the *Logging Server* is restarted.
Recommended action:
Restart the *Logging Server* to use the new settings.

58.6 Stop

Proceed as follows:

1 Open the main window (see section 58.5.1)

2 Go to *File > Exit*. The cross in the upper right hand corner of the main windows does not stop the *Logging Server*.

Message:

The Logging Server database has reached its critical size. Please decrease the logging expiration periods.

Description:

The database has reached its critical size.

Recommended action:

Enable and decrease the logging expiration periods to move events to the overflow files (see section 58.7.3) or flush the database (see section 58.7.4.4).

Message:

The Logging Server overflow files have reached their critical size. Please clear or delete the overflow files.

Description:

One or more overflow files have reached the critical size.

Recommended action:

The overflow files are comma separated value (*.csv) files. They can be opened in an editor (e.g. Windows Wordpad, Microsoft® Excel). When an overflow file reaches its critical size, use an editor to delete data from the overflow file and decrease its size.

58.7 Configuration

58.7.1 Introduction

1 Open the main window (see section 58.5.1).

2 Click *File > Options*. A screen similar to the one in figure 58.5 appears.

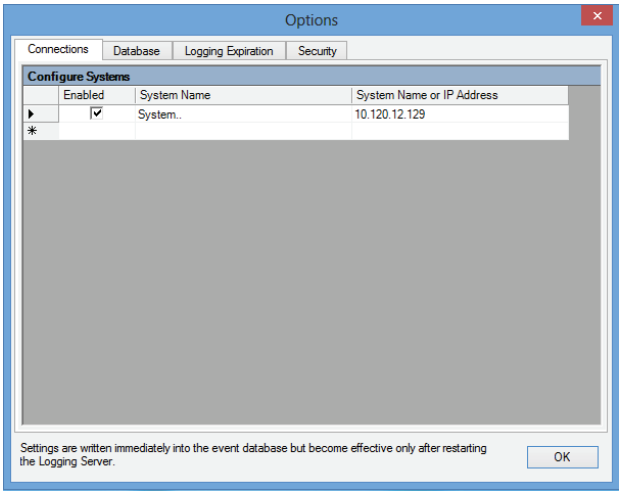

figure 58.5: Options window

3 Go to the *Connections* tab to define the connections to the systems of which the events must be logged (see section 58.7.2).

4 Go to the *Logging Expiration* tab to specify the expiration periods of the logged events (see section 58.7.3).

5 Go to the *Database* tab to define the properties of the logging database (see section 58.7.4).

6 Go to the *Security* tab to change the security settings of the logging server (see section 58.7.5).

58.7.2 Connections

58.7.2.1 Introduction

The *Logging Server* can log the events generated by up to 64 systems. The connections to the systems must be defined on the *Connections* tab.

58.7.2.2 Add a system

Proceed as follows:

1 Click in the *Enabled* field of the row that is marked with an asterisk (*). A new row is added to the list of systems (see figure 58.6).

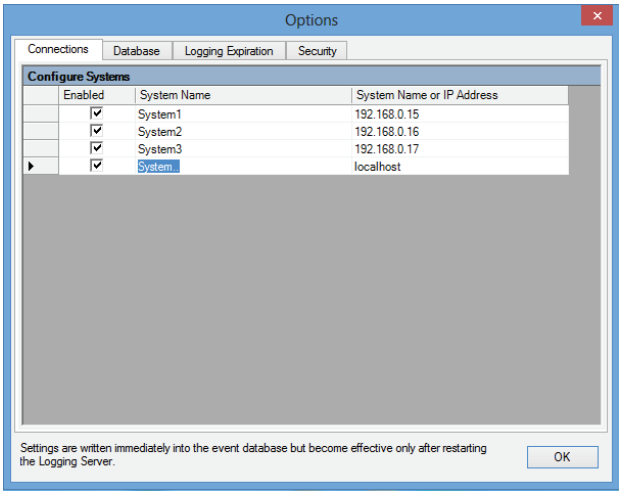

figure 58.6: Add a system (1)

2 Click the *System Name* field and enter the name of the system to which the *Logging Server* must connect. The name may consist of up to 16 characters. For example, *System 4* (see figure 58.7).

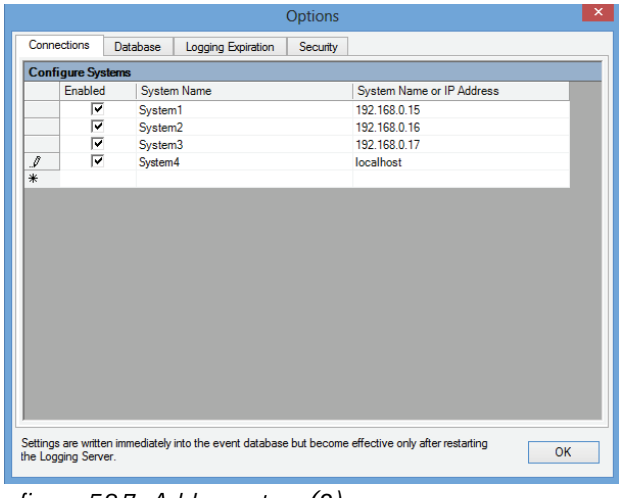

figure 58.7: Add a system (2)

3 Click the *System Name or IP Address* field and enter the IP address or the name of the network controller of the system to which the *Logging Server* must connect. For example, *192.168.0.18* (see figure 58.8).

Note
If the name of the network controller is used, the IP address of the network controller must be stored in the Windows hosts file (WINNT\system32\drivers\etc.). This file can be edited with Notepad.

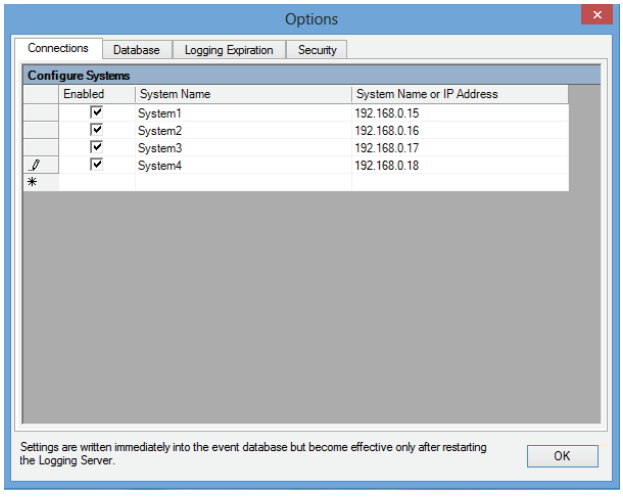

figure 58.8: Add a system (3)

58.7.2.3 Disable event logging for a system

To disable the event logging for a system, remove the check mark from its *Enabled* check box.

58.7.2.4 Delete a system

Proceed as follows:

1 Click the field in front of the row that contains the system. For example, *System 4* (see figure 58.9).

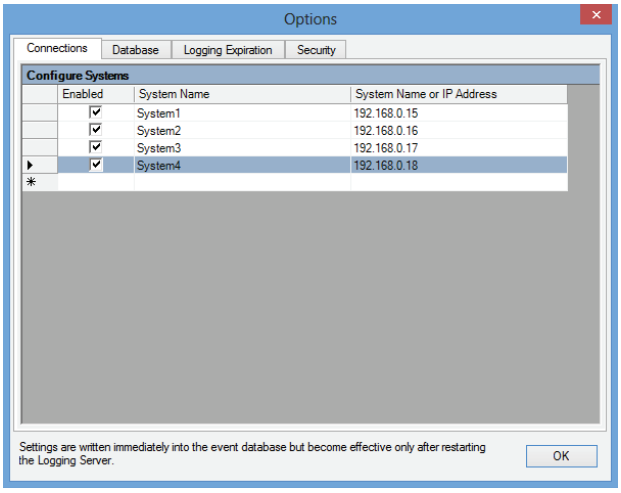

figure 58.9: Delete a system (1)

2 On the keyboard of the PC on which the *Logging Server* is running, press the *Del* key. The system is removed from the list (see figure 58.10 for an example).

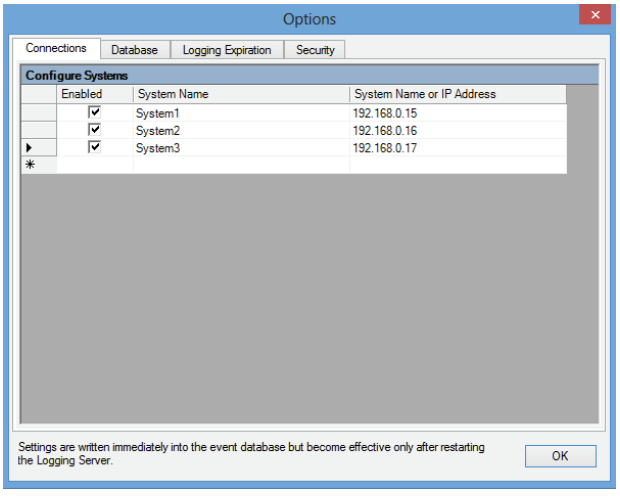

figure 58.10: Delete a system (2)

58.7.3 Logging expiration

58.7.3.1 Overview

On the *Logging Expiration* tab (see figure 58.11), the expiration periods of the logged events can be defined.

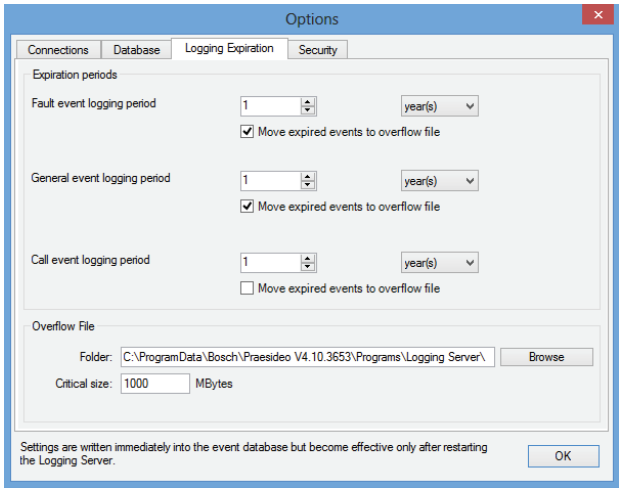

figure 58.11: Logging Expiration tab

58.7.3.2 Expiration periods

When expired events must automatically be moved to an overflow file, put a check mark in the *Move expired events to overflow file* field. Use the controls in the *event logging period* rows to define the logging periods. All fault that are older than the logging period are moved to an overflow file.

58.7.3.3 Overflow file

The overflow files contain the expired events. Use the controls in the *Overflow File* block to define:

- The location of the overflow files. This can either be entered in the *Folder* field or selected from the file system with the *Browse* button.
- The critical size of the overflow files in the *Critical size* field. When the critical size is reached, the *Logging Server* displays the following message (see section 58.5.2): *The Logging Server overflow files have reached their critical size. Please clear or delete the overflow files.* When the overflow files have been deleted or reduced in size, the Logging Server must be restarted to remove this message.

Note
The overflow files are comma separated value files (**.csv*).

58.7.4 Database

58.7.4.1 Overview

On the *Database* tab (see figure 58.12), the properties of the logging database can be defined.

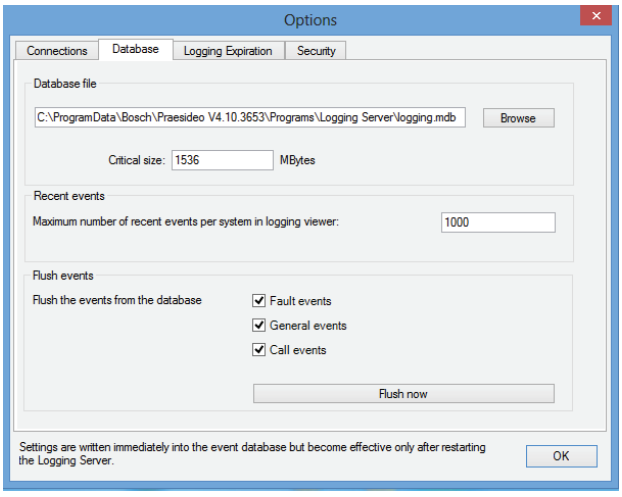

figure 58.12: Database tab

58.7.4.2 Recent events

Use the *Recent events* block to define the number of recent events that is displayed in the *Logging Viewer* (see section 59.6.2.3).

58.7.4.3 Database file

Use the controls in the *Database file* block to define:

- The location of the logging database. This can be entered in the upper text box.

Note
For experts only: the logging database is a Microsoft® Access file, which also can be opened with Microsoft® Access. If for any reason the database becomes corrupted and the Logging Server is not able to access the database, the database can be repaired with Microsoft® Access.
Close the Logging Server application.
Open the database with Microsoft® Access.
Select: Tools > Database utilities > Compact and Repair database.

- The critical size of the logging database. When the critical size is reached, the *Logging Server* displays the following message (see section 58.5.2): *The Logging Server database has reached its critical size. Please decrease the logging expiration periods.*

It is possible to make a back-up of the logging database (even if the Logging Server is running). When a back-up is made of a running Logging Server, it is advised to wait for a moment at which a low number of events is expected (i.e. when there are almost no running calls). Events that occur while the back-up is made will not be copied to the logging database. However, events that occurred during the back-up process can be viewed with the standard Windows Event Viewer (*Start* > *Settings* > *Control Panel* > *Administrative Tools* > *Event Viewer*).

58.7.4.4 Flush events

Use the controls in the *Flush events* block to flush events from the logging database. Proceed as follows:

1. If the fault events must be flushed from the logging database, put a check mark in the *Fault events* check box.
2. If the general events must be flushed from the logging database, put a check mark in the *General events* check box.
3. If the call events must be flushed from the logging database, put a check mark in the *Call events* check box.
4. Click the *Flush now* button to flush the selected types of events from the logging database.
   - If the *Move expired events to overflow file* field of the selected type of events on the *Logging Expiration* tab (see section 58.7.3) contains a check mark, the selected type of events are flushed to an overflow file.
   - If the *Move expired events to overflow file* field of the selected type of events on the *Logging Expiration* tab (see section 58.7.3) does not contain a check mark, the selected type of events are deleted from the database.

Note
When the database is flushed and the *Logging Server* is started again, the database is filled with the events that are retrieved from the enabled network controllers. Each enabled network controller keeps an internal list of up to 200 events of each type. Use the *File Transfer* application to clear the internal list (see section 37.6).

58.7.5 Security

58.7.5.1 Overview

On the *Security* tab (see figure 58.13), the security settings can be defined.

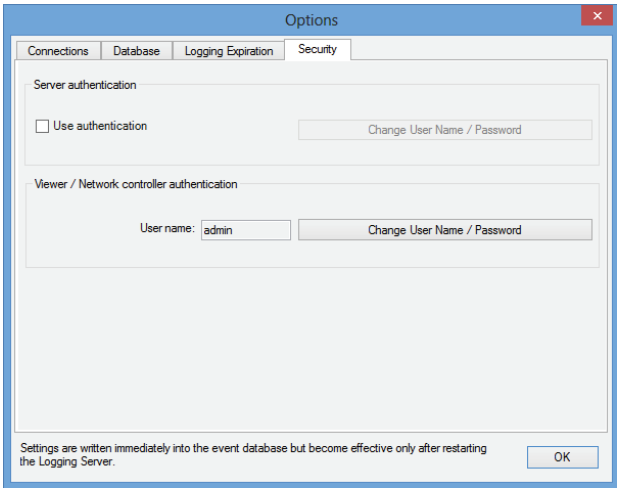

figure 58.13: Security tab

58.7.5.2 Server authentication

Use the controls in the *Server authentication* block to:

- Enable and disable server authentication with the *Use authentication* box. When server authentication is enabled, a user name and password must be entered to get access to the main window (see section 58.5.1).
- Set the password and user name to get access to the *Logging Server* with the *Change User Name/Password* button. A password and user name can only be set when server authentication is enabled. The password must have at least five (5) characters. The user name must have at least four (4) characters.

58.7.5.3 Viewer/Network controller authentication

Use the controls in the *Viewer/Network controller authentication* block to set the password and user name that:

- Gives a *Logging Viewer* access to the *Logging Server* (see section 59.6.2.5).
- Gives the *Logging Server* access to all connected network controllers.

Note
Make sure that all systems have an account (see section 41.2) that contains the user name and password in the *Viewer/Network controller* block. Otherwise, the *Logging Server* cannot connect to the systems.

59 Logging Viewer

59.1 Introduction

With the *Logging Viewer*, the events logged by the *Logging Server* in a database, can be viewed. Typically, the *Logging Viewer* runs on a PC that is connected to the PC on which the *Logging Server* (see chapter 57) runs. The database is located at the same PC as the *Logging Server*.

59.2 Requirements

The *Logging Viewer* can run on any PC that meets the following minimum requirements:

- Operating system:
  Microsoft® Windows 7, 8 or 8.1
- Network connection: 100 base-T
- 1 GB RAM

59.3 Installation

Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2).

2 Click *Optional* > *Logging Application Viewer*. A *File Download* window appears.

3 Click the *Open* button to start the setup program of the *Logging Viewer*. A screen similar to the one in figure 59.1 appears.

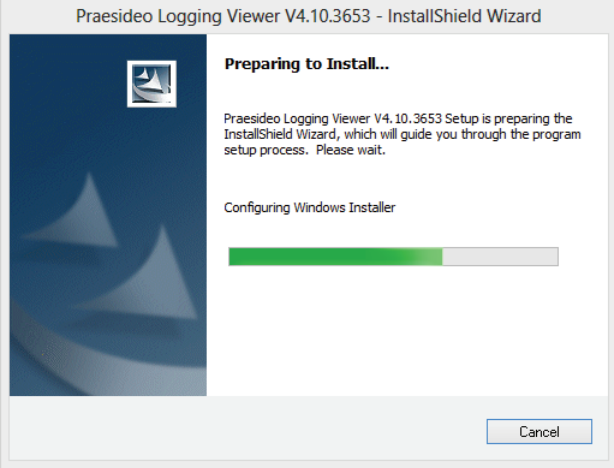

figure 59.1: Logging viewer setup

4 Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

The Logging Viewer is able to show its user interface and the logging events in different languages. During installation of the Logging Viewer a number of language file folders have been installed in: *\Program Files\Bosch\Praesideo\Programs\Logging Viewer*. The language file folders have names according to the international 2-letter language code (ISO 639), e.g. 'en' for English, 'ru' for Russian.

5 Check this folder to see if your language is available. If a language folder exists for the language of the installed Windows operating system, then the Logging Viewer is in that language. If a different language is needed and a language folder exists for that language, proceed as follows:

6 Add a language parameter to the Logging Viewer program. The parameter is the 2-letter language abbreviation, e.g. " fi", i.e. a space followed by the language code. For the Logging Viewer create a short cut for the program file, then right click on the short cut (can be on the desktop too), click properties and select the tab short cut.

7 Add the " fi" parameter to the target description that ended with .exe", so after the double quote. Use the short cut to start up the program. Of course, replace " fi" with the language abbreviation of your choice.

59.4 Start

Proceed as follows:

1 Go to *Start* > *Programs* > *Bosch* > *Praesideo*.

2 Click *Logging Viewer*. A screen similar to the one in figure 59.4 appears.

- When the *Logging Viewer* has been started and faults have occurred, its icon shows the fault condition (see figure 59.2).

figure 59.2: Logging Viewer icon (faults)

Note
In Windows the taskbar buttons should be configured to 'Never combine' similar taskbar buttons. Otherwise the fault condition will not be shown in the tasbar.

59.5 Configuration

Proceed as follows to configure the *Logging Viewer*:

1 Go to *File* > *Options*. A screen similar to the one in figure 59.3 appears.

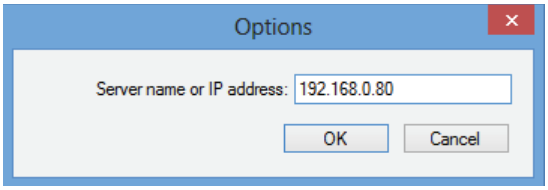

figure 59.3: Options window

2 Enter the IP address of the PC on which the *Logging Server* is running to which the *Logging Viewer* must connect.
A server host name can be used instead of an IP address if the IP address was automatically provided by a DNS server, or if the IP address of the PC is stored in the Windows host file (*WINNT\system32\drivers*\etc.). This file can be edited using Notepad.

Note
If the name of the PC is used, the IP address of the PC must be stored in the Windows hosts file (WINNT\system32\drivers\etc.). This file can be edited with Notepad.

Note
If the *Logging Viewer* is installed on the same PC as the *Logging Server*, it is allowed to use *Localhost* as server name in the *Options* window.

59.6 Operation

59.6.1 Overview

The *Logging Viewer* (see figure 59.4) contains the following:

- **Menu bar** - A menu bar that provides access to the menus of the *Logging Viewer* (see section 59.6.2).
- **Show button** - A button to select between showing all fault events, irrespective of status, or just the active fault events, that have not been reset. This button is only available in the Fault Events tab.
- **Block buttons** - Two buttons to select the next and previous blocks of events (see section 59.6.4).
- **Logging Status button** - A button that opens a window that shows the status of the *Logging Viewer* (see section 59.6.3). When the *Logging Server* or *Logging Viewer* does not operate correctly, the button is red.
- **Tabs** - Use the tabs to select the type of events that are shown by the *Logging Viewer*. See chapter 52 for information about the events.

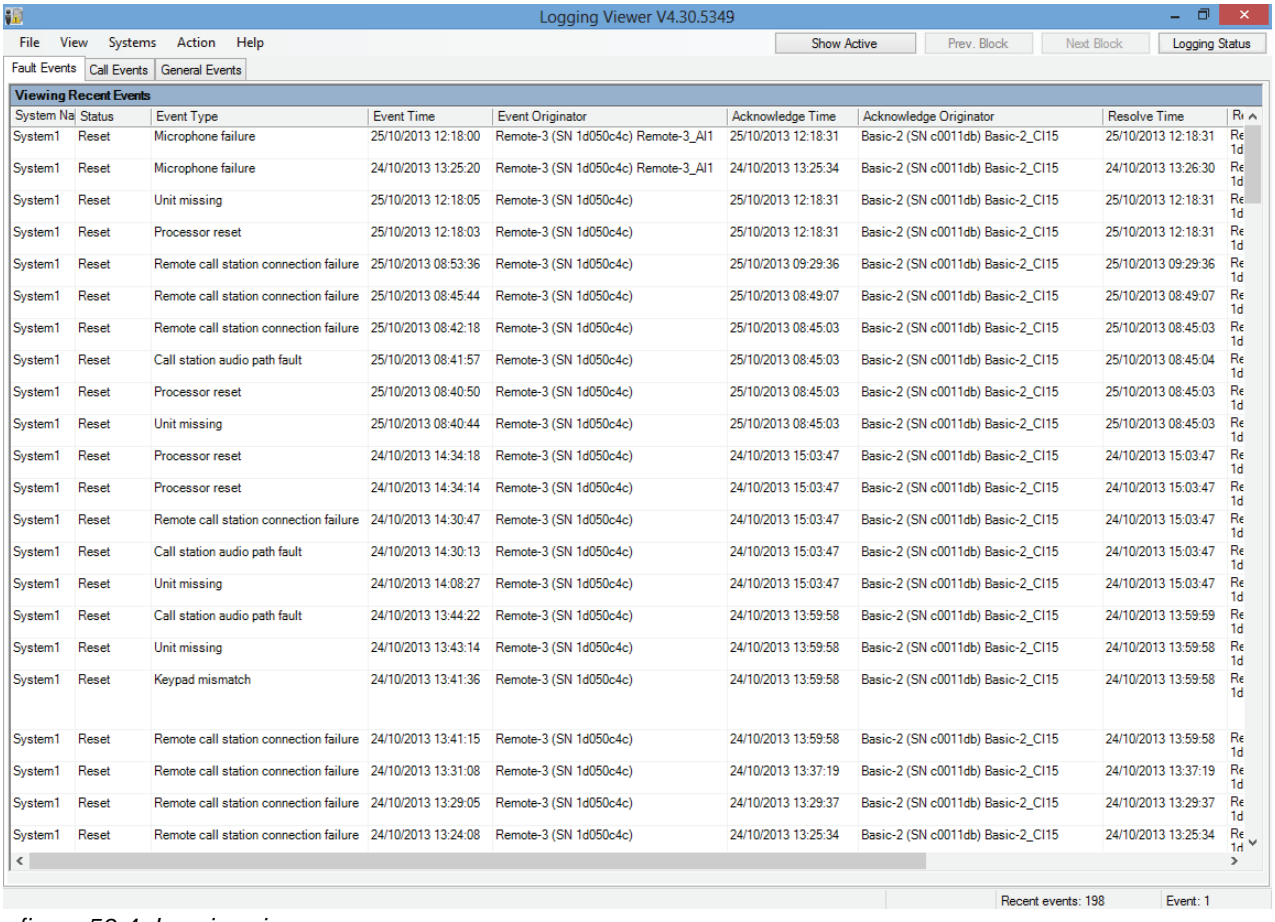

figure 59.4: Logging viewer

59.6.2 Menu bar

59.6.2.1 Introduction

The menu bar contains the following menus:

- The *File* menu (see section 59.6.2.2)
- The *View* menu (see section 59.6.2.3).
- The *System* menu (see section 59.6.2.4).
- The *Action* menu (see section 59.6.2.5).
- The *Help* menu (see section 59.6.2.6).

59.6.2.2 File

The items in the *File* menu are used to export and print events and to configure the *Logging Viewer*. It contains the following items:

- *Options*
  Opens the *Options* window that is used to configure the *Logging Viewer* (see section 59.5).
- *Export*
  Exports all events in the current event view to a comma separated values file (*.csv*). This file can be opened with, for example, Microsoft® Excel.
- *Print*
  Prints all events in the current event view or prints a selected block of successive events. (To select a block of events: click the first event and then hold the <Shift> key and click the last event.)
- *Exit*
  Closes the *Logging Viewer*.

59.6.2.3 View

The items in the *View* menu are used to set the event viewing options. It contains the following items:

- *Recent*
  Shows all recent events. The number of displayed recent events is defined by the *Logging Server* window (see section 58.7.4.2).
- *Historical*
  Shows historical events. These are retrieved from the logging database (see section 58.7.4). When this item is selected, a calendar appears in which a start date (*Start Date*) and an end date (*End Date*) can be selected. When the number of historical events is greater than 10000, the *Logging Server* delivers the events in blocks to the *Logging Viewer*. Use the *Next Block* and *Prev Block* buttons to scroll through the blocks (see section 59.6.4).
- *Refresh*
  Refreshes the list of events.

Note
New events are only shown in the *Recent* view. The *Historical* view does not show new events.

59.6.2.4 System

The items in the *System* menu are used to select the system from which the events are displayed. The list of available systems is generated by the *Logging Server* to which the *Logging Viewer* is connected (see section 58.7.2). When *All* is selected, the events from all systems are displayed, including events from disabled systems and events from non-configured systems. Events generated by the *Logging Server* itself can be selected separately.

59.6.2.5 Action

The items in the *Action* menu are used to acknowledge and reset fault events. It contains the following items:

- *Acknowledge All Fault Events*
  Acknowledges all new fault events in all systems that are connected to the *Logging Server*. The user must log on to the *Logging Server* to acknowledge fault events.
- *Reset All Fault Events*
  Resets all acknowledged fault events in all systems that are connected to the *Logging Server*. The user must log on to the *Logging Server* to reset fault events.
- *Log Off*
  Logs the user off from the *Logging Server*.

59.6.2.6 Help

The item in the *Help* menu provides version information about the *Logging Viewer*.

59.6.3 Logging status button

The *Logging Status* window displays the status of the *Logging Viewer*.

Message:
The Logging Server and Viewer are OK.
Description:
The *Logging Server* and *Logging Viewer* operate correctly.
Recommended action:

Message:
Logging Server has no connection with <system>
Description:
There is no connection with the specified system.
Recommended action:
Make sure that the specified system is running and that the specified system has an Ethernet connection with the *Logging Server*.

Message:
The Logging Viewer has lost contact with the Logging Server
Description:
There is no connection with the *Logging Server*.
Recommended action:
Make sure that the *Logging Server* is running and that the *Logging Server* has an Ethernet connection with the *Logging Viewer*.

Message:
The Logging Server options are changed. Restart the Logging Server to use the changed settings.
Description:
The configuration settings of the *Logging Server* were changed. The changed settings are not used until the *Logging Server* is restarted.
Recommended action:
Restart the *Logging Server* to use the new settings.

Message:
The Logging Server database has reached its critical size. Please decrease the logging expiration periods.
Description:
The database has reached its critical size.
Recommended action:
Enable and decrease the logging expiration periods to move events to the overflow files (see section 58.7.3) or flush the database (see section 58.7.4.4).

Message:
The Logging Server overflow files have reached their critical size. Please clear or delete the overflow files.
Description:
One or more overflow files have reached the critical size.
Recommended action:
The overflow files are comma separated value (*.csv*) files. They can be opened in an editor (e.g. Windows Wordpad, Microsoft® Excel). When an overflow file reaches its critical size, use an editor to delete data from the overflow file and decrease its size.

59.6.4 Blocks

When the current view is the *Historical* view (see section 59.6.2.3) and the number of historical events is greater than 10000, the *Logging Server* delivers the events in blocks to the *Logging Viewer*.

- If a next block is available, the *Next Block* button is enabled. The next block contains events that are newer than the events that are currently displayed.
- If a previous block is available, the *Prev Block* button is enabled. The previous block contains events that are older than the events that are currently displayed.

60 PC Call Server

60.1 Introduction

The PC Call Server is a Windows service, connected to one or more configured network controllers. It handles all operational requests from *PC Call Station Clients* and/or a *PC Telephone Interface Client*. The *PC Call Server* is configured by the *PC Call Server Configuration Client*, which for security reasons runs on the same computer as the *PC Call Server*. The *PC Call Server* does not have a user interface of its own.

Note
Make sure that the software versions of the Praesideo system and the versions of the PC Call Server, PC Call Station Client and PC Telephone Interface Client are always the same. It is advised to update to the latest version.

60.2 Requirements

The *PC Call Server* can run on any PC that meets the following minimum requirements:

- Operating system:
  Microsoft® Windows 7, 8 or 8.1
- Network connection: 100 base-T
- 1 GB RAM

60.3 Installation

1 Start the PRS-SW Praesideo Software DVD (see section 36.2).
2 Click *Optional* > *PC call server*. A *File Download* window appears.
3 Click the *Open* button to start the setup program of the *PC Call Server*. A screen similar to the one in figure 60.1 appears.

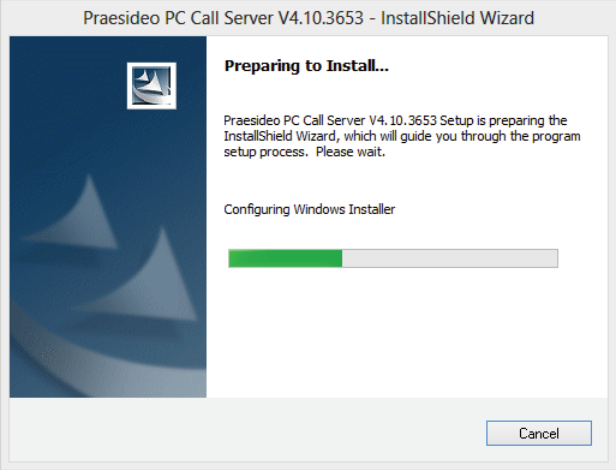

figure 60.1: PC Call Server setup program

4 Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

Note
After installation, the *PC Call Server* will automatically be registered to the Windows Firewall to allow incoming and outgoing network traffic. If the PC uses a different firewall than the standard Windows firewall, the *PC Call Server* must be manually registered to that firewall as exception to avoid that the firewall blocks the network traffic without notice. Blocked network traffic causes the application to malfunction.

Note
Make sure that the Windows options *Network discovery* and *File sharing* are activated on the system where the PC Call Server is running. If not, the connection from a PC Call Server Configuration Client, a PC Call Station Client or a PC Telephone Interface Client may fail.
In Windows these options can be set via *Start* > *Control Panel* > *All Control Panel Items* > *Network and Sharing Center* > *Change advanced sharing settings*. Then select *Turn on network discovery* and select *Turn on file and printer sharing*.

60.4 Start

The PC automatically starts the *PC Call Server* as a service when Windows is started.
Important events will be logged to the Windows event log:

- Startup and shutdown of the service
- Error messages about license validity
- Abnormal (fatal) errors that cause the service to shut down

60.5 Configuration

Use the *PC Call Server Configuration Client* (see chapter 61) to configure the *PC Call Server*.

60.6 Firewall

The PC Call Server and the related programs PC Call Station Client and PC Telephone Interface Client use port TCP 9452. In case a firewall is used, this port should be enabled. If needed, this port number can also be changed by editing the XML file *<application name>.exe.config*, for each application separately. These files are in the install path of the applications.

61 PC Call Server Configuration Client

61.1 Introduction

With the *PC Call Server Configuration Client*, you can configure the *PC Call Server* (see chapter 60).
You must have Administrator rights to run this application.

61.2 Requirements

The *PC Call Server Configuration Client* can run on any PC that meets the following minimum requirements:

- Operating system:
  Microsoft® Windows 7, 8 or 8.1
- Network connection: 100 base-T
- 1 GB RAM

61.3 Installation

Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2).
2 Click *Optional > PC call server configuration client.* A *File Download* window appears.
3 Click the *Open* button to start the setup program of the *PC Call Server Configuration Client.* A screen similar to the one in figure 60.1 appears, but now for the PC Call Server Configuration Client.
4 Follow the instructions that are displayed on screen. A notification is displayed when the installation is finished.

61.4 Start

Proceed as follows:

1 Go to *Start > Programs > Bosch > Praesideo Vxx.yy.zzzz.*
2 Click *PC Call Server Configuration Client.* A screen similar to the one in figure 61.1 appears.

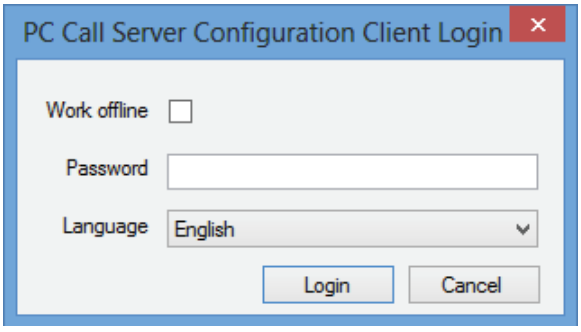

figure 61.1: PCCstConfig Login

3 Check or uncheck the *Work offline* checkbox.
   - If checked, the application does not connect to the *PC Call Server.* All items that require a connection to the *PC Call Server* are unavailable.
   - If unchecked, the application connects to the *PC Call Server* that is running on the local system.
4 Type your password in the *Password* field. A password does not have to be entered for first time use.
5 Choose the language in which the application presents itself from the *Language* list.
6 Press the *OK* button. The main configuration screen appears that provides the status information of the configured network controllers. When no configuration is made yet, this screen is empty.

61.5 Configuration

61.5.1 Overview

The *PC Call Server Configuration Client* contains the following:

1 **Menu bar** - A menu bar that provides access to the menus of the *PC Call Server Configuration Client* (see section 61.5.2).
2 **Connections tab** - Shows the status of the connections to the network controllers, including name, host name or IP address, software version, license status and connection status.

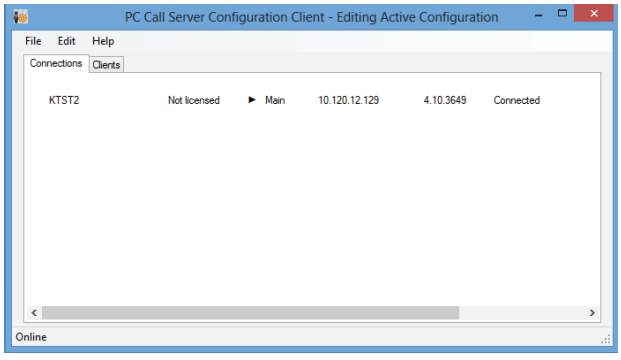

figure 61.2: Connections tab

3 **Clients tab** - Shows the status of the connections from the *PC Call Station Clients* to the *PC Call Server*, including login name or user of the clients, the host name or IP address of the work station from which the client connects, the connection status and the date/time at which the client connected and (if applicable) disconnected.

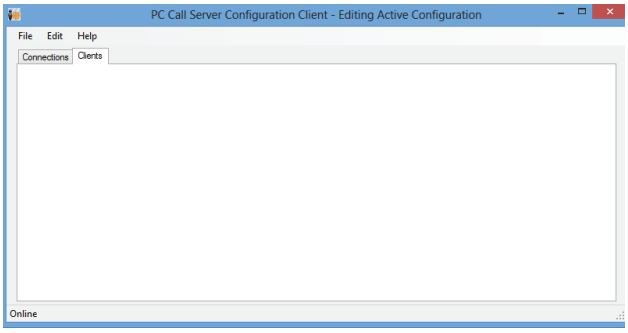

figure 61.3: Clients tab

61.5.2 Menu bar

The menu bar contains the following menus:

- The *File* menu (see section 61.5.3).
- The *Edit* menu (see section 61.5.4).
- The *Help* menu (see section 61.5.5).

61.5.3 File

The items in the *File* menu are used to make and save configuration files. It contains the following items:

- *New*
  Creates a new configuration file.
- *Open...*
  Opens an existing configuration file.
- *Make active*
  Activates the current configuration file.
- *Save*
  Saves the current configuration file.
- *Save as...*
  Saves the current configuration file with another name.
- *Exit*
  Closes the application.

61.5.3.1 Workflow

To configure the *PC Call Server* with the *PC Call Server Configuration Client*:

1 Create a new configuration file or open an existing one.
2 Execute all *Edit* menu items in the order in which they appear in the *Edit* menu. The order reflects the configuration workflow.
3 Save the configuration file (*File* > *Save*).
4 Make the configuration file active (*File* > *Make active*).

61.5.4 Edit

The items in the *Edit* menu are used to configure the *PC Call Server*. It contains the items that must be configured.

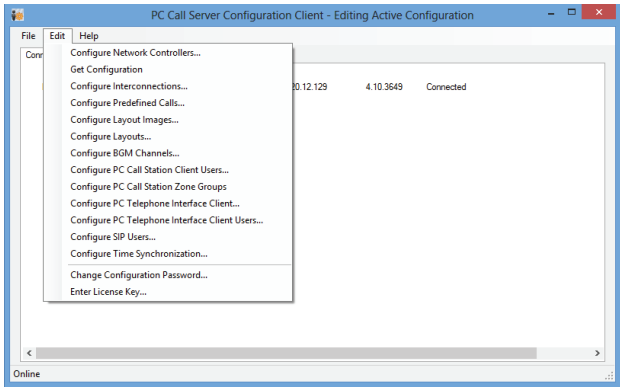

figure 61.4: Edit menu

61.5.4.1 Configure Network Controllers…

This item configures the network connections between the PC Call Server and the different network controllers. This option is not available when working offline.
The PC Call Server can control double redundant network controllers. Use the checkbox *Redundant control* to select this option. Now it is possible to select a second network controller as a spare for every main network controller.
Only one name is used for a pair of redundant network controllers as identification, as only one is active. If the main network controller fails, the spare network controller will take over the control of the system or subsystem and the PC Call Server will now control that system via the spare network controller instead of the main network controller.

A maximum of 32 active network controllers can be controlled. That means that in case of redundant sets 32 master controllers and 32 slave controllers can be addressed, since only one of each set needs to be controlled. For every master network controller a slave controller can be added without additional license. The actual limit of 32 active network controllers is not a hard limit but performance related.

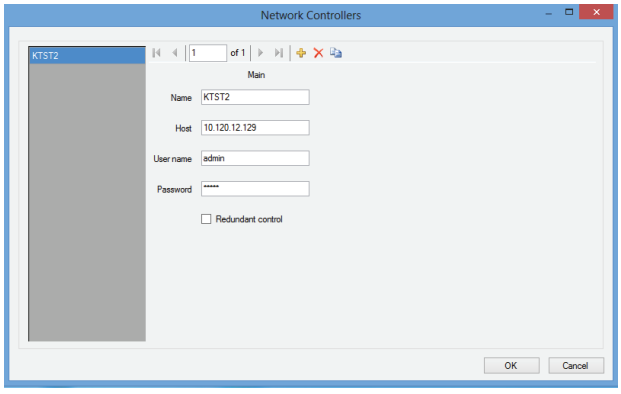

figure 61.5: Configure network controllers

figure 61.6: Add new, Delete and Copy to new icons

Use the *Add new* icon to add a network controller, or pair of network controllers, see figure 61.6. Fill in the unique name and IP-address or host name of the network controller and a valid user name and password for that network controller. Use the *Delete* icon to delete the network controller from the list of network controllers. The *Copy to new* icon creates a new copy of the current network controller for subsequent editing. The Application Note 'Redundant Network Controller' provides information on how to connect a redundant network controller, the spare NCO, to a Praesideo system in order to maintain full functionality when the main NCO fails. Use the following procedure to set up a Praesideo system with main and spare network controllers:

- The main NCO and spare NCO must have different IP addresses and/or host names.
- Make sure that the main NCO and the spare NCO use the same software version, compatible with the PC Call Station Server.
- Create a new system configuration in the main NCO; ignore the spare NCO for the moment.
- Copy the configuration file to the connected PC and transfer this configuration file from the PC to the spare NCO.
- Update the configuration of the spare NCO by changing the serial number of the NCO to the serial number of the spare NCO.
- Make sure that all prerecorded messages used in the configuration are present on the main NCO and on the spare NCO.
- Remember that later changes to the configuration file of the main NCO should be repeated for the spare NCO.
- For logging purposes, connect the 'Fault alarm buzzer' control output of the main NCO to a control input of the spare NCO, configured as 'Fault input' with a customized message, e.g. 'Main NCO Failure'.
- For the Main NCO, set 'Disable network controller on internal fault' in 'System settings' to Yes.
- Do a 'Save configuration and restart the system' operation on each NCO after making configuration changes to that NCO.
- Important: In case of changes to the spare NCO configuration only, do a 'Save configuration and restart the system' operation on both the spare and the main NCO.

61.5.4.2 Get Configuration

This item retrieves the relevant configuration data from the configured network controllers, such as the names of zones, messages, tones, inputs, etc. The progress of the data retrieval is shown. When the transfer is completed you can accept or reject the data. This data is needed for further configuration. A warning is shown if the tone set and message set are not the same on all network controllers because this will limit the choice of tones and messages for the connected clients, see section 61.5.4.4. This option is not available when working offline.

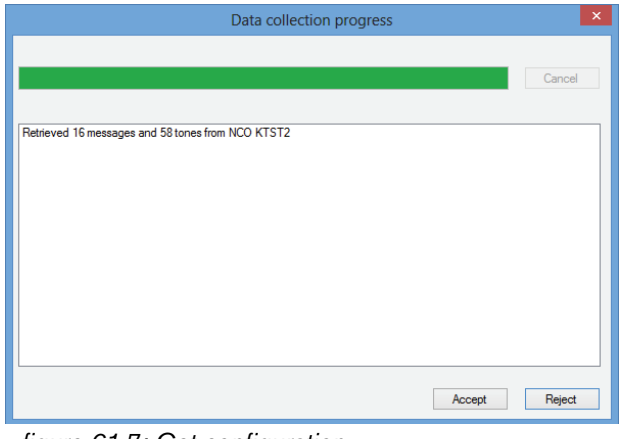

figure 61.7: Get configuration

61.5.4.3 Configure Interconnections…

This item configures the interconnections between the different network controllers.

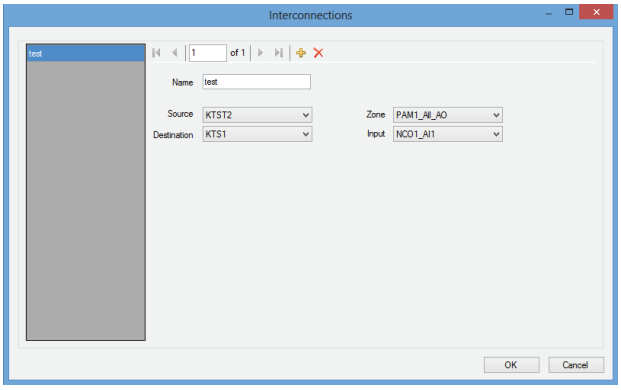

figure 61.8: Configure interconnections

These interconnections are the actual hardware connections for audio transfer between the systems, and are needed to transfer a call from one Praesideo subsystem to another. A connection is not necessarily between network controllers but uses a configured zone in one system as a source and an audio input in another system as a destination. Zones can be line outputs on e.g. a network controller or audio expander and inputs can be line inputs on such units interconnected via XLR cables, but it is also possible to use inputs and outputs of CobraNet interfaces, interconnected via Ethernet. It is not possible (and useful) to make interconnections between inputs and outputs within the same subsystem.
Use the *Add new* and *Delete* icons to create new interconnections and give them a unique name for reference purposes.
These interconnections are only used for normal calls and emergency calls, not for BGM.
Outputs (zones) that are used for interconnections cannot be selected anymore as zone outputs for layout configuration, see section 61.5.4.7.
Inputs that are used for interconnections cannot be selected anymore as audio input for live speech, see section 61.5.4.4.

61.5.4.4 Configure PC Call Station Zone Groups…

This item configures the special PC Call Station zone groups.

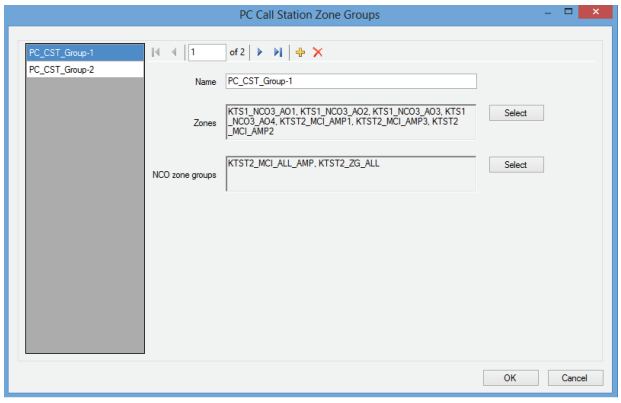

figure 61.9: Configure PC Call Station zone groups

PC Call Station zone groups exist only on the PC Call Station, not on the connected NCOs. Normal zones or zone goups that have been defined on an NCO can be added to such a group. This allows a PC Call Station zone group to contain zone groups from different NCOs, even a multi-NCO All Call zone group is possible. PC Call Station zone groups can be configured for predefined calls, just like normal zones and NCO zone groups.

61.5.4.5 Configure Predefined Calls…

This item configures the predefined calls that can be made from the *PC Call Station Clients*.

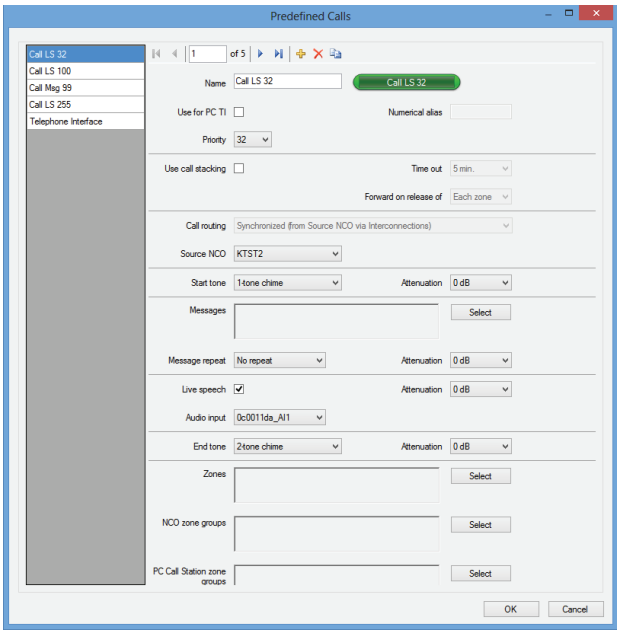

figure 61.10: Configure predefined calls

Use the *Add new, Delete* and *Copy to new* icons to create new predefined calls and give them a unique name for reference purposes. This name will appear on the screen button of the *PC Call Station Client* for selecting this predefined call. It is also shown here in a copy of a *PC Call Station Client* button to check whether the name fits.

The checkbox *Use for PC TI* defines whether this predefined call can also be used by the *PC Telephone Interface Client*. If this checkbox is checked, then a *Numerical alias* must be entered for this predefined call. This field only accepts numbers and the number must be unique. This way users can call in to Praesideo, using a telephone, and select a predefined call with the numeric keypad of the telephone. See section 63.6.

Predefined calls are similar to call macros in Praesideo, including the possibility to use a call stacker to record calls for automatic playback to temporarily occupied zones. A time out period can be configured after which a recorded (stacked) call will not be played back anymore, even if the occupied zones become available again to receive that recorded call. Also it can be configured whether the recorded call should be played back into every zone as soon as it is free or only once when all previously occupied zones are free.

Each call must have a priority and can have a start tone, end tone, messages that can be repeated, and a live speech phase. The level of the tones, messages and live speech can be adjusted for each predefined call individually. The available tones and messages depend on what information was retrieved from the network controllers. It is important that all network controllers in the system have the same tone set and message set, because only tones and messages will be available for selections that exist on all configured and connected network controllers. In case of live speech an audio input must be selected on a unit in one of the systems, controlled by the network controller that has been selected as *Source NCO*. This can be a line or microphone input on a unit, but also the microphone of a call station. Make sure that the selected input or source is enabled in the web page configuration of its network controller.

With *Call routing* it is possible to select whether a call without Live speech will play tones or messages from a single network controller (the Source NCO) and use the interconnections between subsystems to distribute these tones and messages to other subsystems. This gives the best synchronization between outputs, without echoes. But the default option is to generate these tones and messages in every network controller independently, leaving the subsystem interconnections available for other calls. This is more efficient and preferred in case there is no acoustic spillover between zones. Calls with live speech always use a single network controller as source, including playback of tones and messages.

Then a set of zones, zone groups or special PC Call Station zone groups can be selected for that predefined call. These zones are automatically selected upon selection of that predefined call in the *PC Call Station Client*, but before starting that call it is also possible to add zones or remove zones from that call. It is also allowed to keep the list of zones and zone groups empty in the predefined call and only select zones on the fly on the *PC Call Station Client*.

The appearance of the actual button on the screen of the *PC Call Station Client* depends on whether it is a normal call or an emergency call (priority above 223).

61.5.4.6 Configure Layout Images…

This item configures the layout images that are used as background for the different tabs in the *PC Call Station Clients*, on which the zone icons and zone group icons are positioned. This way a synoptic layout can be made where zones and zone groups can be easily selected. Use the *Add new* and *Delete* icons to create new layout images and give them a unique name for reference. The same image can be used more than once as a layout. The image is not scaled to the dimensions of the window, but scroll bars appear if it does not fit.

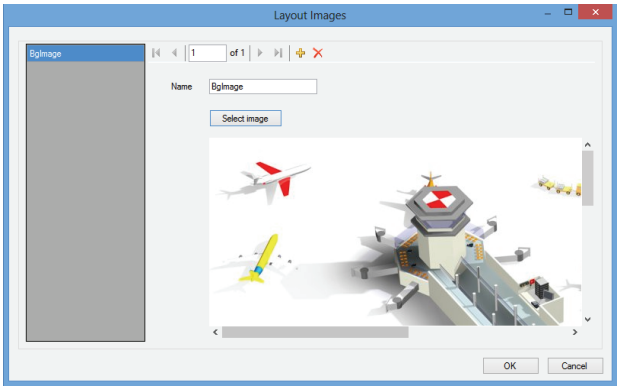

figure 61.11: Configure layout images

61.5.4.7 Configure Layouts…

This item configures the position of the zone and zone group icons on the layout images.

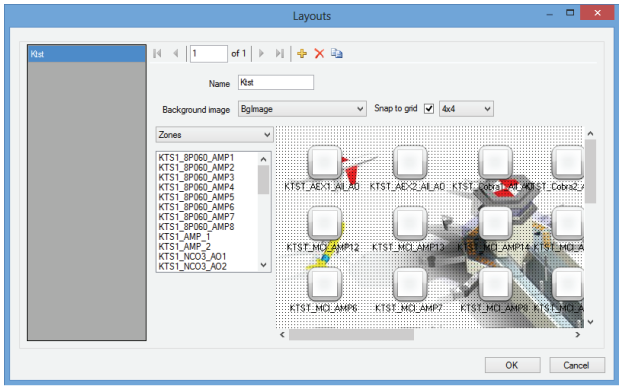

figure 61.12: Configure layouts

Use the *Add new*, *Delete* and *Copy to new* icons to create new layouts and give them a unique name for reference. This name will appear on the tab in the zone selection pane of the *PC Call Station Client* for selecting this layout. Create zone icons and zone groups icons on the layout by dragging zones or zone groups from the list into the layout with the mouse. The icons can be aligned on a grid. You can give them a name that differs from the default name, which is a combination of the network controller name and the zone name in Praesideo, by clicking on the label below the icon. The name can also be deleted if the destination is clear already from the layout image. It is possible to place the same zone or zone group icons several times. Delete an icon by right-clicking on it and then clicking on *Remove*, or by selecting it and pressing the *Delete* key. Multiple icons can be selected by pressing the Ctrl-key when selecting icons. To select all occurrences of the same icon, right-click on one of the icons and select *Select all occurrences* to expand the selection to include all icons that are a copy of the currently selected icon.

61.5.4.8 Configure BGM Channels…

This item configures the background music channels that can be selected from the *PC Call Station Client*.

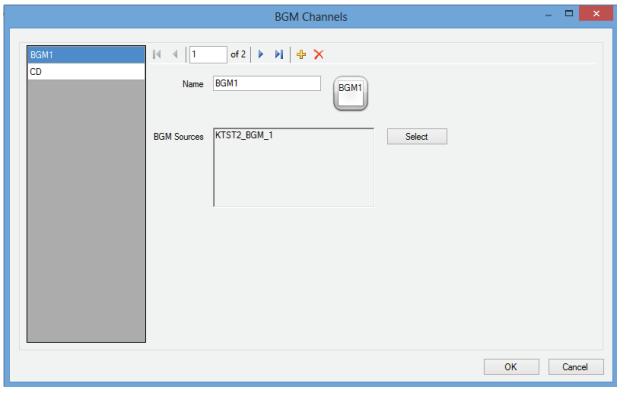

figure 61.13: Configure BGM channels

Use the *Add new* and *Delete*, icons to create new BGM channels and give them a unique name for reference purposes. This name will appear on the BGM selection buttons of the *PC Call Station Client*. In this configuration window, it is also shown in a copy of the screen icon, to check if the text fits.

Use the *Select* button to assign Praesideo BGM channels on different network controllers to this channel as sources. BGM audio is not transferred between network controllers via the configured interconnections, so in every subsystem with its own network controller a single audio input should be assigned for that BGM channel and configured on that network controller. Because BGM channels are typically fixed and not dynamic, it is possible to use fixed interconnections via XLR cables between subsystems for BGM transfer or use CobraNet interfaces for that purpose. These connections are then configured in Praesideo via the configuration web pages as usual.

61.5.4.9 Configure PC Call Station Client Users…

This item configures the rights for all *PC Call Station Client* users of the system.

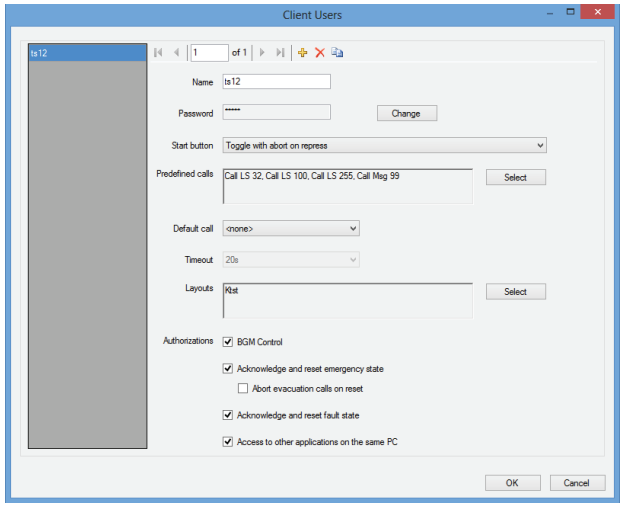

figure 61.14: Configure PC Call Station Client users

Use the *Add new*, *Delete*, and *Copy to new* icons to create users and give them a unique name for reference purposes. This name is used by the user to log in to a *PC Call Station Client*. A password can be created for each user. Here you can configure the *Start* button behavior for each user separately. The options are:

- *Toggle with abort on repress*
- *Toggle without abort on repress*
- *Momentary with abort on repress*
- *Momentary without abort on repress*

Note that for the toggle action the key activation is performed on a mouse up event (mouse button release). For momentary actions the key activation is performed on both mouse down (mouse button click) and mouse up events.

For each user a list of predefined calls and layouts can be selected from the list of created predefined calls and layouts. This way some users can be given a wider range of choices than others. Press *Select* to open the predefined call selection window to make a selection of predefined calls. Use the Add and Remove buttons for this, or just drag items from the list of available calls to the list of selected calls. The order of the selected predefined calls in the list determines the order in which these calls are shown on the screen of the *PC Call Station Client*. The order can be changed by dragging and dropping predefined calls in the right-hand column to a different position, using the mouse.

A *Default call* can be selected from the list of predefined calls or <none>. The default call is automatically selected on expiry of the configured *Timeout*. A timeout period between 10 s and 60 s can be selected. The timeout timer is (re)started every time a predefined call is selected or when a zone or zone group in the zone selection pane is selected. While a selected predefined call is being made, the timeout timer will not expire, but it will expire 5 s after completion of the call. This allows the user to quickly select the previous call again in case something was forgotten. The timeout behavior is only applicable to the *Predefined call* tab and is not influenced by selecting the *BGM* tab for BGM control, nor by BGM selections.
Selecting layouts per user is done in a similar way. The order of the selected layouts in the list is the order of the layout tabs in the *PC Call Station Client* view.

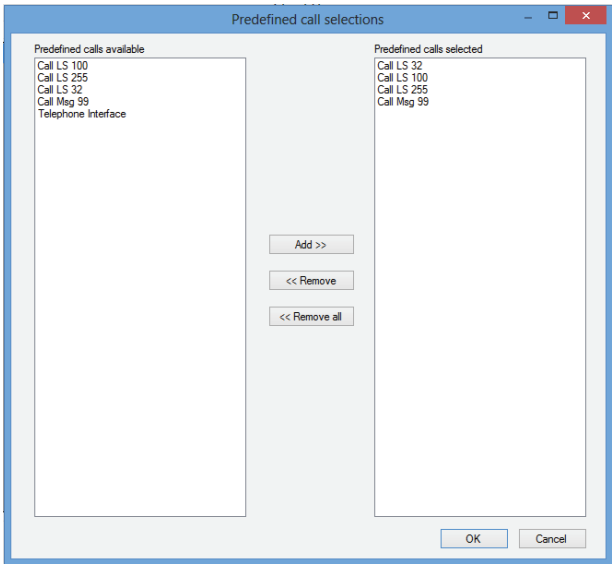

figure 61.15: Selection of predefined calls

Additionally, you can give the user the authorization to control BGM, to acknowledge and reset the emergency state as well as the fault state, and to access other applications on the same PC the *PC Call Station Client* is running on. In case this access to other applications is disabled, the *PC Call Station Client* will run full screen, the task bar will be hidden and the application will try to run its main window on top of other applications.

In case authorization is given to acknowledge and reset the emergency state, an additional setting becomes available: *Abort evacuation calls* on *reset*. The action is disabled by default. This way, the emergency state cannot be reset as long as emergency calls are still ongoing; this is the preferred way of operation and is even mandatory for EN54-16 and other standards. When enabled, the emergency state reset becomes a kind of engineers' reset to force a reset after a building has been evacuated and the system must be silenced.

61.5.4.10 Configure PC Telephone Interface Client...

The general settings of the *PC Telephone Interface Client*, that can be installed with the *PC Call Server*, can be configured and managed via this menu. Even if the *PC Telephone Interface Client* is not installed, this menu is still available but can be ignored.

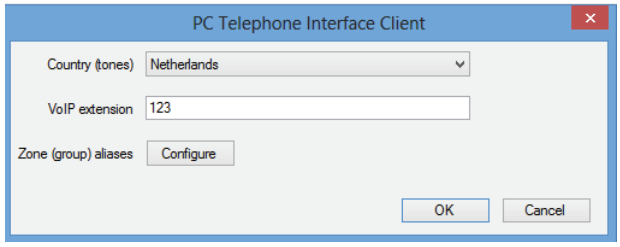

figure 61.16: PC Telephone Interface Client configuration

Select which country must be used as reference for the telephone tones used. These tones will be based on what is common for that country (busy tone, et cetera). If the PC Telephone Interface Client is not installed this list is empty.
Enter the VoIP extension number; this is the telephone number that VoIP users should call to reach the *PC Telehone Interface Client*. This extension has a maximum length of 10 digits and may only contain numbers. This VoIP extension number should match the VoIP extension in the PSTN configuration. See section 63.8.3.
Pressing *Configure* for the *Zone (group) aliases* brings up a window (see figure 61.17) where numerical aliases can be assigned to zones and zone groups. This way users can call in to Praesideo, using a telephone, and select zones or zone groups with the numeric keypad of the telephone, even while the original zone and zone group names are alphanumeric.

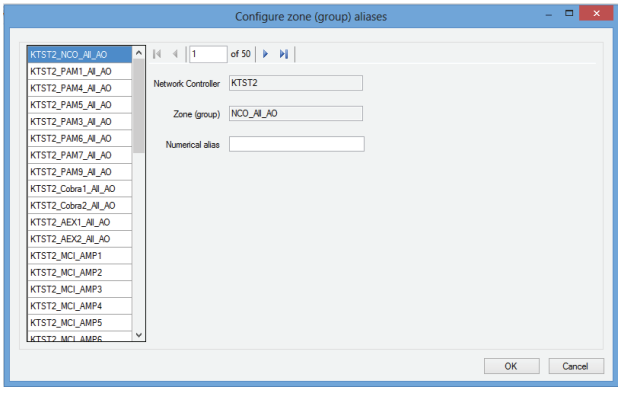

figure 61.17: Zone (group) alias configuration

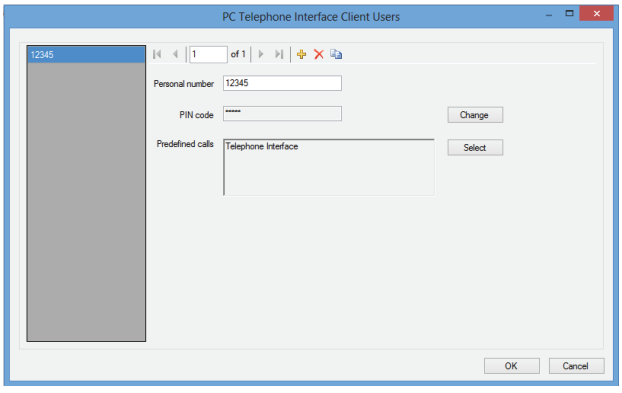

figure 61.18: PC Telephone Interface Client user configuration

The list of available zones and zone groups shows all zones and zone groups that are known to the PC Call Server. The names of these items consist of the configured name of the NCO and the zone name, using the format <Network Controller name>_<Zone (group) name>. This list is read-only; therefore the navigation bar does not have *Add, Delete* and *Copy to new* buttons. The bar is only used for navigation through the list.
The *Network Controller* and *Zone (group)* fields are read-only text fields that show the name of the zone or zone group that is currently selected and the network controller where it is defined.
The *Numerical alias* field is a text field with a maximum length of 16 digits that contains a number that should uniquely identify the zone or zone group. The field only accepts numbers (other characters are ignored when typed) and may be left empty.
Even if the original zone (group) name was already numerical, still the Numerical alias should be filled in.

61.5.4.11 Configure PC Telephone Interface Client Users…

In this window the PC Telephone Interface Client users can be configured and managed.

The *Personal number* (similar to a user name) should uniquely identify the user, who wants to access the Praesideo system with a telephone. Only numbers, up to 16 digits, are accepted. Each user with a personal number must have a PIN code (similar to a password). The *PIN code* may not be empty. This code can be added or changed via the *Change* button. The maximum length of the PIN code is 16 digits, all numerical.
Pressing the *Select* button brings up a selection window to create a list of predefined calls for this user. This way the access rights can be made different for different users (callers). The user can only make calls via telephone based on one of the predefined calls that are configured for this user. Only predefined calls that have been configured for use by the *PC Telephone Interface Client* with a *Numerical alias* (see section 61.5.4.4) can be selected.

61.5.4.12 Configure SIP Users…

In this window the SIP users of the PC Telephone Interface Client, using a VoIP connection (Voice over IP) can be configured and managed. SIP (Session Initiation Protocol) is a communication protocol for VoIP.

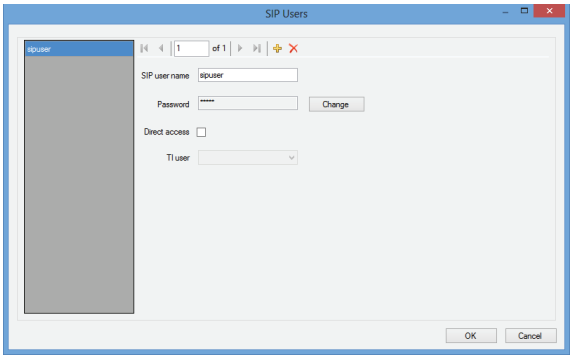

figure 61.19: SIP user configuration

Enter the *SIP user name* for this SIP account; up to 20 alphanumerical characters are accepted. Then a password should be added. A password can be added or changed via the *Change* button. The maximum length of the password is 16 alphanumerical characters. An empty password is also allowed (i.e. no password).
This SIP user name and password should match those in the PSTN configuration. See section 63.8.3. Checking the checkbox *Direct access* allows the user of this SIP account to access the Praesideo system without having to enter a personal number and PIN code. Identification is then based on the SIP user name (and password, if entered).
In practice many different users may use the same SIP account for access to the Praesideo system. Differentiation between user rights is then best accomplished by using the personal numbers and PIN codes of the users, with *Direct access* disabled. If *Direct access* is enabled, then a *TI user* (Telephone Interface user) must be selected from the list of configured users. The predefined calls associated with this user are then valid for all users with direct access to the system via this SIP account. See section 61.5.4.11.

61.5.4.13 Configure Time Synchronisation…

In this item you can enable (default) or disable time synchronization of the connected and configured network controllers. It uses the *PC Call Server* time as master.

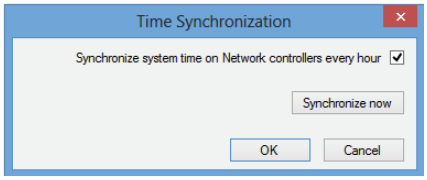

figure 61.20: Configure time synchronization

Pressing the *Synchronize now* button (only enabled when the client has a connection with the *PC Call Server*) will result in an immediate time synchronization of all connected network controllers.

61.5.4.14 Change Configuration Password…

This item allows you to change the configuration password. After installation of the *PC Call Server* the default password is empty. The maximum length of the password is 16 characters, there is no minimum. You should fill in the old password and a new password, which has to be confirmed. This option is not available when working offline.

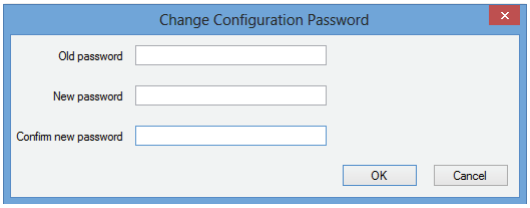

figure 61.21: Change configuration password

61.5.4.15 Enter License Key…

In this item you can enter the license key to enable the full functionality of the application. This option is not available when working offline.

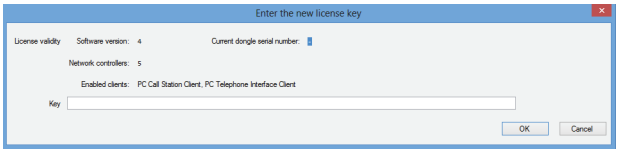

figure 61.22: Enter license key

The license key identifies the number of network controllers that can be controlled and the major software version number of the *PC Call Server* (that matches the Praesideo core release).
The license key window shows the current software version number ("-" when no valid key has been entered in the past), the number of licensed network controllers ("0" when no valid key has been entered in the past) and the serial number of the dongle that is currently attached to the PC ("-"when no valid dongle is attached).

You can get the required license key from the Bosch Security Systems registration website after registration of the *PC Call Server* authorization number, the authorization number for additional network controllers (if the system contains more than one network

controller), the authorization number of the *PC Call Station Client* and/or the authorization number of the *PC Telephone Interface Client*. This key is linked to the unique serial number of the dongle that comes with the *PC Call Server*. That number is shown in this window and needs to be entered on the registration website to make the link. The application is only fully functional if the correct dongle is present in a USB port of the *Call Server* PC. Unlicensed *PC Call Station Clients* can only monitor ongoing calls in the system without the possibility to make calls. If the dongle is removed from a licensed system, a count down timer starts, and calls cannot be started anymore from a *PC Call Station Client* after that time. An unlicensed *PC Telephone Interface Client* can not be used to make calls using a telephone. It will only give a (voice) response to the caller that there is no valid license.
The figure 61.23 shows an example of one of these certificates with authorization number.

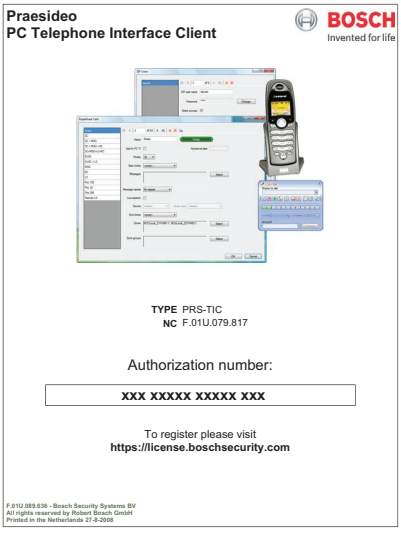

figure 61.23: Certificate

61.5.5 Help

61.5.5.1 Help

Shows the online help function.

61.5.5.2 About

The *About* box shows the software version and the registered licenses.

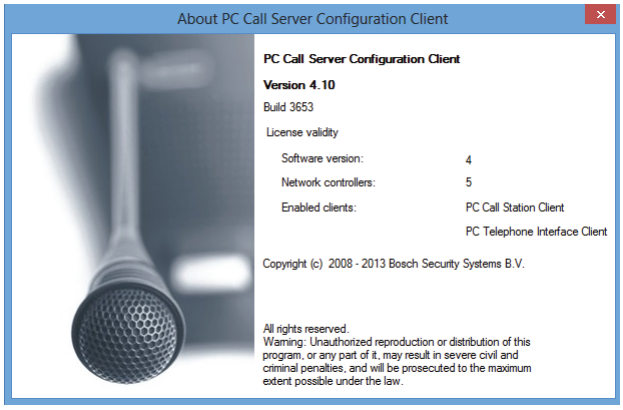

figure 61.24: PC Call Server Configuration Client

61.5.6 Customization

The shape and color of the icons in all different states of selection and occupancy can be customized. The same can be done for the selection buttons and indicators in all operating states. Also a logo, specific for the customer site, can be added to the *PC Call Station Client* screens.
This information is stored in a file *PCCstImages.png* which is located in both the folders *C:\Program Files\Bosch\Praesideo Vx.yy.zzzz\Programs\PCCstConfgurationClient\Resources* and *C:\Program Files\Bosch\Praesideo Vx.yy.zzzz\Programs\PCCstCallClient\Resources*.
The first instance of this file is used for generating example buttons and icons in the *PC Call Server Configuration Client*. The second instance of this file is used for the *PC Call Station Client* icons, buttons and logos. Different *PC Call Station Clients* on different PCs connected to the same *PC Call Server* can have a different GUI (Graphical User Interface) by using diffferent versions of the *PCCstImages.png* file for each PC. During installation of *PC Call Station Clients* on different PCs, the default file is installed on each PC, even if the version of this file on the *PC Call Server* was already modified.
The *PCCstImages.png* file can be edited in any good drawing program that supports transparancy, e.g.

Paint.NET (http://www.getpaint.net/), which is excellent for this purpose and completely free.

Note
Administrator rights are needed to modify these files, as they are stored in the Program Files folder.

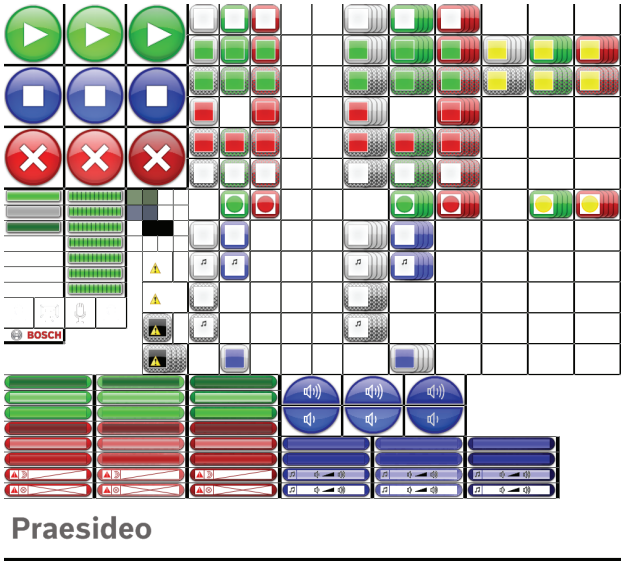

figure 61.25: PCCstImages.png

figure 61.26: PCCstImages.png references

The table 61.1 describes the function of each item in this file, with reference to figure 61.26.

table 61.1: Item list of PCCstImages

1A-C	Start button (normal, hot, pressed)
2A-C	Stop button (normal, hot, pressed)
3A-C	Abort button (normal, hot, pressed)
4A-C	Progress indicator (done, skip, open)
5A-G	Progress indicator (active-looped)
6A	Background color of selection pane Call
6B	Background color of control pane Call
6C	Background color of layout pane Call
7A	Background color of selection pane BGM
7B	Background color of control pane BGM
7C	Background color of layout pane BGM
8A	Color of button text
8B	Color of zone icon caption text
8C	Color of zone icon text BGM
10	Start tone icon for progress bar
11	Message icon for progress bar
12	Live speech icon for progress bar
13	End tone icon for progress bar
14	Bosch logo in layout pane
15A-C	Business call button inactive (normal, hot, pressed)
16A-C	Business call button selected (normal, hot, pressed)
17A-C	Business call button active (normal, hot, pressed)
18A-C	Emergency call button inactive (normal, hot, pressed)
19A-C	Emergency call button selected (normal, hot, pressed)
20A-C	Emergency call button active (normal, hot, pressed)
21A-C	Emergency state acknowledge button (normal, hot, pressed)
22A-C	Emergency state reset button (normal, hot, pressed)
23A-C	BGM volume up button (normal, hot, pressed)
24A-C	BGM volume down button (normal, hot, pressed)
25A-C	BGM channel button selected (normal, hot, pressed)
26A-C	BGM channel button (normal, hot, pressed)
27A-C	BGM volume button selected (normal, hot, pressed)
28A-C	BGM volume button (normal, hot, pressed)
29	Customer logo
30A-C	Zone status: free (unselected, selected for business call, selected for emergency call)
30F-H	Zone group status: free (unselected, selected for business call, selected for emergency call)
31A-C	Zone status: occupied by other business call (unselected, selected for business call, selected for emergency call)
31F-H	Zone group status: occupied by other business call (unselected, selected for business call, selected for emergency call)
32A-C	Zone status: occupied by other business call, no control possible (unselected, selected for business call, selected for emergency call)
32F-H	Zone group status: occupied by other business call, no control possible (unselected, selected for business call, selected for emergency call)

table 61.1: Item list of PCCstImages

33A/C	Zone status: occupied by other emergency call (unselected, selected for emergency call)
33F/H	Zone group status: occupied by other emergency call (unselected, selected for emergency call)
34A-C	Zone status: occupied by other emergency call, no control possible (unselected, selected for business call, selected for emergency call)
34F-H	Zone group status: occupied by other emergency call, no control possible (unselected, selected for business call, selected for emergency call)
35A-C	Zone status: free, no control possible (unselected, selected for business call, selected for emergency call)
35F-H	Zone group status: free, no control possible (unselected, selected for business call, selected for emergency call)
36B/C	Zone status: running own call (business, emergency)
36G/H	Zone group status: running own call (business, emergency)
37A/B	Zone status: BGM (unselected, selected)
37F/G	Zone group status: BGM (unselected, selected)
38A/B	Zone status: local BGM (unselected, selected)
38F/G	Zone group status: local BGM (unselected, selected)
39A	Zone status: BGM, no control possible
39F	Zone group status: BGM, no control possible
40A	Zone status: local BGM, no control possible
40F	Zone group status: local BGM, no control possible
41B	Zone status: occupied by selected BGM channel
41G	Zone group status: occupied by selected BGM channel
42A	Zone status: no status available due to communication error
42F	Zone group status: no status available due to communication error
43A	Zone status: icon overlay for zone fault
43F	Zone group status: icon overlay for zone fault
44F-H	Zone group status: partially occupied by other call, some control possible (unselected, selected for business call, selected for emergency call)
45F-H	Zone group status: partially occupied by other call, no control possible (unselected, selected for business call, selected for emergency call)
46G/H	Zone group status: running own partial call (business, emergency)

The file *PCCstImageDef.xml*, see figure 61.27, which is located in the folders *C:\Program Files\Bosch\Praesideo Vx.yy.zzzz\Programs\PCCstConfgurationClient* and *C:\Program Files\Bosch\Praesideo Vx.yy.zzzz\Programs\PCCstClient* contains information about the actual position and size of the buttons, icons and indicators in the *PCCstImages.png* file. Making changes to this xml-file allows for changing the size or position of individual items of the *PCCstImages.png* file because it is used as a reference for the coordinates of the actual items in the *png*-file. The files *PCCstImageDef.xml* and *PCCstImages.png* in the same path belong to each other.

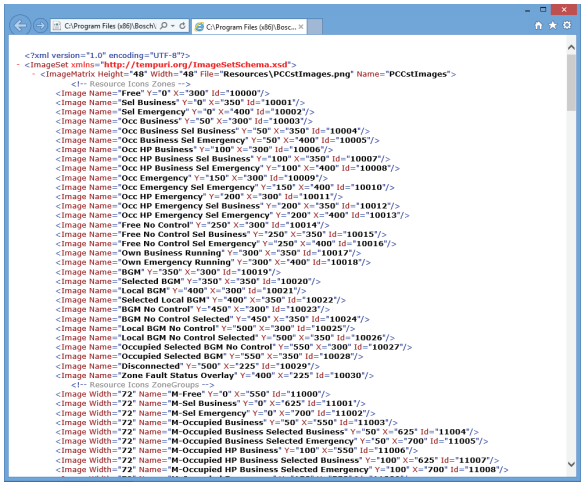

figure 61.27: PCCstImageDef.xml

62 PC Call Station Client

62.1 Introduction

With the *PC Call Station Client*, you can connect to the *PC Call Server* (see chapter 60) and start calls or control the background music (BGM). The *PC Call Station Client* acts as an operator panel on a PC, similar to a normal call station. It offers some functions that are not available on normal call stations, such as:

- The possibility to make calls to zones in different subsystems, each having its own network controller.
- Easy control of multiple simultaneous calls (without live speech).
- Accurate information about the status of the zones.
- Easy localization of zones on the screen using a graphical background with multiple tabs.
- Accurate information about the BGM channel and volume setting of BGM in each zone.

62.2 Requirements

The *PC Call Station Client* can run on any PC that meets the following minimum requirements:

- Operating system:
  Microsoft® Windows 7, 8 or 8.1
- Network connection: 100 base-T
- 1 GB RAM

62.3 Installation

Proceed as follows:

1 Start the PRS-SW Praesideo Software DVD (see section 36.2).
2 Click *Optional* > *PC call station client* (see chapter 39). A *File Download* window appears.
3 Proceed in the same way as for the *PC Call Server Configuration Client* (see section 61.3).

It is possible to install and use multiple *PC Call Station Clients* on different PCs simultaneously, all network connected. There are no hard limits to the maximum number of *PC Call Station Clients*, although the response times will depend on the network speed and the capabilities of the server PC.

62.4 Licensing

In order to use the *PC Call Station Client*, a license must be obtained. By purchasing the PRS-CSC, one gets a registration code that must be registered for the system it is intended for. Registration is done via the Bosch registration website, where the application is coupled to the *PC Call Server* and its dongle. See section 61.5.4.12.

62.5 Start

Proceed as follows:

1 Go to *Start* > *Programs* > *Bosch* > *Praesideo Vxx.yy.zzzz*.
2 Click *PC Call Station Client*. A screen similar to the one in figure 62.1 appears.

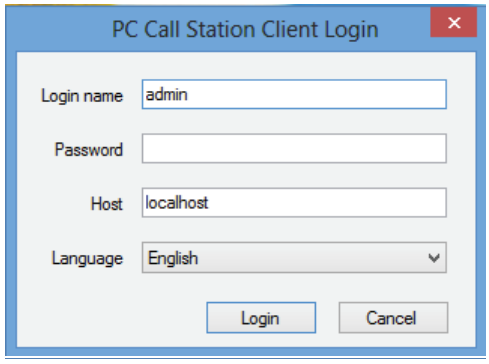

figure 62.1: PC Call Station Client Login

3 Type your login name in the *Login Name* field.
4 Type your password in the *Password* field.

Note
The login name and password are configured with *Configure Client Users* item in the *Edit* menu of the *PC Call Server Configuration Client*.

5 Type the IP address or host name of the PC that is running the *PC Call Server* in the *Host* field.
6 Choose the language in which the application shows from the *Language* list.
7 Press the *OK* button. A screen similar to the one in figure 62.2 appears.

Note
When using the PC Call Station Service on a PC with multiple network interfaces, the communication between the PC Call Station Client and the server may not always work correctly. This can be either a real physical network interface or a logical one by running a virtual machine. Such communication problems are probably solved by editing the file *PCCstService.exe.config* of the PC Call Station Server. This file is typically located in *C:\Program Files (x86)\Bosch\Praesideo Vx.yy.zzzz\Programs\PCCstService*, where x.yy.zzzz is the version of the PC Call Station server. Replace the text **'useIpAddress="true"'** with **'machineName="12.34.56.78"'** where 12.34.56.78 is the IP address of the network interface that should be used by the PC Call Station Client. You need Administrator rights to make this change.

Note
When the *PC Call Station Client* becomes disconnected from the *PC Call Server*, a new login is required after fixing the problem.
But when the *PC Call Station Client* starts up while it is disconnected from the *PC Call Server* (e.g. the network cable was disconnected or its network switch was powered off), a warning is given. After fixing the problem, the *PC Call Station Client* must be closed now and restarted in order to reconnect; there was not yet a remote connection established that can be restored.

62.6 User Interface

62.6.1 Overview

The *PC Call Station Client* screen is divided in several areas (panes):

1. **Call/BGM selection pane** - A pane that allows you to select predefined calls or BGM channels. There are two tabs in this pane, one for selection of Predefined calls and one for selection and control of BGM channels.
2. **Zone selection pane** - A pane that allows you to select zones and zone groups. It shows the status of the zones and zone groups using icon representations.
3. **Control pane** - A pane that allows you to control the predefined call or BGM channel that you selected from the Call/BGM selection pane.
4. **Acknowledge/reset pane** - In this pane the emergency and fault status is shown and can be acknowledged and reset, but only if this option has been configured for this user.
5. **Status bar** - Shows the status of the *PC Call Station Client*.

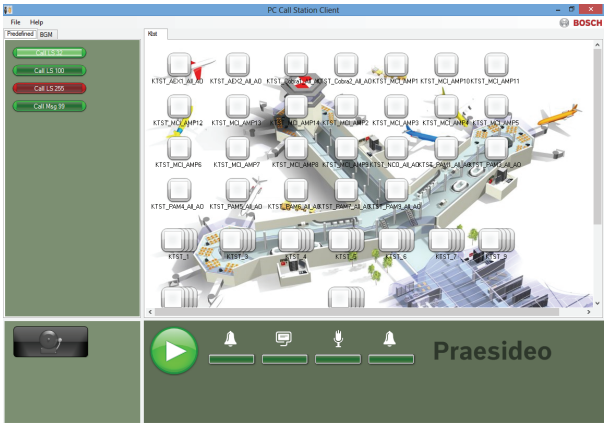

figure 62.2: Predefined calls tab

62.6.2 Make a call

Use the following procedure to make a call:

1. Select tab *Predefined* to get a list of predefined calls for this user.
2. Select a predefined call from this list in the call selection pane.
3. Optionally add zones to or remove zones from the selection in the zone selection pane. The selection may also contain zone groups.

4 Start the call with the *Start* button in the control pane. The button changes into a stop button so that the call can be stopped. While the call runs, its progress is shown in the progress bar in the control pane: start tone, message(s), live speech and end tone. A predefined call does not need to contain all of these elements.
5 Stop the call. A call without live speech will finish even if not stopped.
6 If the button has been configured for *abort on repress* operation, it is possible to abort the call now. The difference between stopping and aborting a call is that a running message or tone is completed before a call stops while it is aborted immediately in case a call aborts.

The status bar may show a warning to the user in case of licensing/dongle problems.

62.6.2.1 Predefined call selection buttons

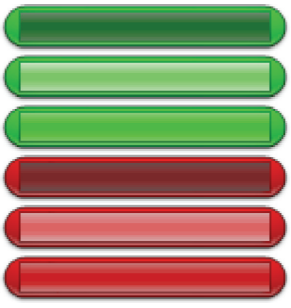

figure 62.3: Selection buttons

The figure 62.3 shows the (default) different appearances of the predefined call selection buttons. From top to bottom: Business call inactive, Business call selected, Business call active, Emergency call inactive, Emergency call selected, Emergency call active.
Even if a selected call is activated, its button still shows the selected state until another button is selected. Then it changes to the active state for as long as the call lasts.

62.6.2.2 Call activation buttons

figure 62.4: Call activation buttons

The figure 62.4 shows the (default) different appearances of the call activation button in the control pane. From left to right: Start, Stop, Abort.

62.6.2.3 Call progress bar

figure 62.5: Call progress icons

The figure 62.5 shows the (default) different call progress icons. From left to right: Start or end tone, Message(s), Live speech. These icons are displayed above the progress bar elements to inform the user about the phase the call is in. When the progress bar reaches the Live speech icon, the microphone is switched on for the user to make a live announcement.

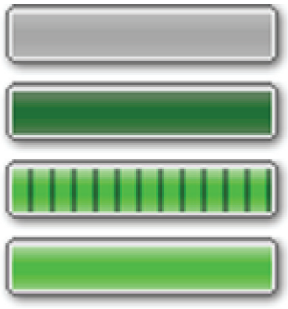

figure 62.6: Call progress bar elements

The figure 62.6 shows the different states the call progress bar elements can have. From top to bottom: Phase to skip, Phase to be done, Phase is running, Phase completed.
Which phase of a predefined call will be skipped is defined in the predefined call itself, e.g. with or without messages, see section 61.5.4.4.

Multiple calls without live speech can be started to run simultaneously. By selecting on of the active predefined call buttons, the progress of that selected call is shown.

62.6.2.4 Zone status icons

Zone and zone groups are represented by icons in the zone selection pane. The border of a zone icon indicates its selection status, while the inside indicates its call status. Layered copies of a zone icon are used to indicate a zone group, see figure 62.7. Status indications

are the same as for an idividual zone. The number of layers is fixed and does not represent the number of included zones.

figure 62.7: Zone and zone group icons

figure 62.8: Selected zone

The figure 62.8 shows how a zone icon appears on the screen upon selection of that (free) zone by the *PC Call Station Client*. Selection is indicated by a color change of the selection border.
From left to right: Unselected, Selected by a business call, Selected by an emergency call.

figure 62.9: No control of zone

The figure 62.9 shows how a zone icon changes upon selection of that (free) zone by the *PC Call Station Client* and no control is possible or allowed for that zone. Normally this happens when it is occupied by a higher priority call (in which case it is also filled with color, see figure 62.12), but in case a required audio interconnection to the subsystem with this zone is not available, see section 61.5.4.3, no control is possible either. Such a zone can be selected but will not be addressed when the call is started. No control is indicated by cross hatching of the selection border.
From left to right: Unselected and no control possible, Selected by a business call and no control possible, Selected by an emergency call and no control possible.

figure 62.10: Disconnected zone

The figure 62.10 shows how a zone appears on the screen when the network controller it belongs to is disconnected form the *PC Call Server*. This is a fault condition, although it does not mean that this zone cannot be addressed by e.g. a call station which is directly connected to the Praesideo network of that zone. This icon only indicates that this zone cannot be addressed by the *PC Call Station Clients*.

figure 62.11: Zonefault

The figure 62.11 shows how a zone and zone group appear on the screen when a fault exists in this zone or zone group. A warning triangle is visible on top of the normal icon. This is a fault situation that causes that (part of) a zone cannot be reached for calls anymore. See section 48.3.33 for more details.

figure 62.12: Zone addressed by call

The figure 62.12 shows how a zone appears on the screen when a selected internal call is running in that zone, i.e. a predefined call that was started from this *PC Call Station Client* and is still selected. A zone with a running, internal and selected call is indicated by a color filled circle.
From left to right: Internal business call selected and running, Internal emergency call selected and running.

figure 62.13: Occupied zone

The figure 62.13 shows how a zone appears on the screen when it is occupied by an external call, i.e. a call that was not started as the currently predefined call from this *PC Call Station Client*. A running external call is indicated by a color filled square. In this case the selected predefined call of the *PC Call Station Client* has a higher priority than the active call in the occupied zone, otherwise the selection border would have been

cross hatched, see figure 62.9, to indicate that this zone cannot be taken over.
From left to right: Unselected and not occupied, Occupied by external business call, Occupied by external emergency call.

Zone groups and PC Call Station zone groups can have a partial status. This means that not all zones of a zone group have the same status. Some can be available for a call, while others are occupied by a lower or higher priority call. This is indicated by a yellow square or circle inside the icon.
A yellow square means that a zone group is partly occupied. If the border is also hatched none of the zones can be addressed. If the border is solid at least one zone is still addressable. A yellow circle means that an internal business or emergency call is running, but not to all zones of that group. By adding separate zone icons to the same view, it is possible to see what the individual zone status is. The figure 60.14 shows in the first line from left to right: Zone group unselected and partly occupied, Zone group selected for business call and partly occupied, Zone group selected for emergency call and partly occupied. The second line shows the same, but now no control is possible for any of the zones in the zone group. The third line shows zone groups in which an internal business call or an emergency call is active, but not to all zones in that group.

figure 62.14: Partial status

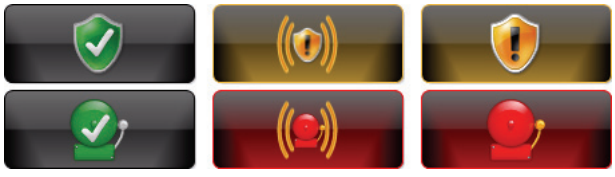

figure 62.15: Acknowledge and reset

Figure 60.15 shows from left to right the button appearances for the no fault and no emergency state, the fault present and emergency present state (unacknowledged), and the fault present and emergency present state (acknowledged). As long as a fault or emergency state has not been acknowledged, the *PC Call Station Client* will activate an attention tone, that is silenced after acknowledgment of that state.
The repeating attention tones are installed on the PC as Fault alarm.wav and Emergency alarm.wav and can be replaced by other tones with the same file name.

62.6.3 Change BGM settings

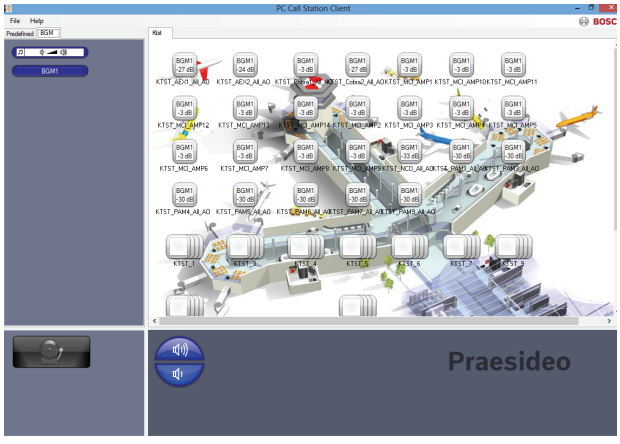

figure 62.16: BGM tab

Use the following procedure to make changes to the BGM settings (only for authorized users):

1 Select tab *BGM* to get a list of BGM channels and the button to change the BGM volume.
2 Select a BGM channel from the list. Now, all zones and zone groups, where this BGM channel is active, are indicated by their icon appearance in the zone control pane.
3 Add zones to or remove zones from the selection for that BGM channel in the zone selection pane. The selection may also contain zone groups, but this is not advised (see the note in section 62.6.3.3).
4 Use the volume up and down buttons in the control pane to change the volume simultaneously for all zones where this BGM channel is active. The volume setting for each zone is indicated in the zone icon.
5 To change the volume of individual zones, unrelated to a BGM channel, select the volume button in the Call/BGM selection pane instead of one of the BGM channels. Then select a zone in the zone selection

pane, and finally adjust the volume using the volume up and down buttons in the control pane.

62.6.3.1 BGM selection buttons

figure 62.17: Selection buttons

The figure 62.17 shows the (default) different appearances of the BGM selection buttons.
From top to bottom: BGM channel selected, BGM channel, BGM volume mode button selected, BGM volume mode button.

62.6.3.2 BGM volume buttons

figure 62.18: Volume up and down buttons

The figure 62.18 shows the (default) different appearances of the BGM volume control buttons in the control pane.
From top to bottom: BGM volume up, BGM volume down.

62.6.3.3 BGM zone status icons

figure 62.19: Zone with selected BGM channel

The figure 62.19 shows how a zone icon appears in the zone selection pane when this zone is playing the BGM channel that is currently selected.

figure 62.20: Selected zone

The figure 62.20 shows how a zone icon appears in the zone selection pane upon selection of that zone. Selection is indicated by a color change of the selection border. The name of the active BGM channel in that zone is shown inside the icon, together with the actual volume setting of that zone. If the BGM channel is a local BGM channel, not distributed via the PC Call Station Client, its name is unknown and a musical note is displayed inside the icon instead of the name of the BGM channel.
From left to right: Unselected, Unselected with local BGM, Selected.

figure 62.21: No control of zone

The figure 62.21 shows how a zone icon appears on the screen when the user is not authorized to control BGM, see section 61.5.4.9. No BGM control is now possible for these zones, which is indicated by cross hatching of the selection border.
From left to right: Unselected zone and no control possible, Unselected zone with local BGM and no control possible.

Note
Zone group icons on the layout do not provide information about BGM channels or volume settings for zones that are part of that zone group because the channel and volume setting can be completely different for the individual zones in that group. Nevertheless, a zone group (with all its zones) can be added to a selected BGM channel, so these zones will get that BGM channel, but this will not be shown. Likewise, if at least one zone of that zonegroup was already playing the selected BGM channel, selecting that zone group (again) will remove that BGM channel from the zones of that zone group, but this will not be clear from the icon appearance. Because of this limitation it is advised to control BGM via individual zones and not via zone groups

63 PC Telephone Interface Client

63.1 Introduction

The Praesideo *PC Telephone Interface Client* allows users to call in to a Praesideo system using a telephone. The telephone keypad is used for caller identification, predefined call selection and zone and/or zone group selection. The predefined call contains information about priority, start and end tones, prerecorded messages and initially selected zones. The user can then add other zones via the telephone keypad. The call may also include live speech, which will be recorded when spoken into the telephone.

The *PC Telephone Interface Client* is a software client of the Praesideo *PC Call Server*. It is installed on the same PC as the *PC Call Server* and is also configured as part of the *PC Call Server* configuration.

The *PC Telephone Interface Client* handles incoming telephone calls from VoIP telephones (softphones or hardphones), but also from POTS telephones (either local or remote telephones) via an additional voice gateway, such as the Linksys SPA3102. The PC running the *PC Telephone Interface Client* sends the live speech part of a call to the Praesideo system via an analog audio link from the PC soundcard.

VoIP telephones can also call in to the PC Telephone Interface Client via a WAN or via the Internet.

63.2 Requirements

The *PC Telephone Interface Client* can run on any PC that meets the following minimum requirements:

- Operating system:
  Microsoft® Windows 7 (Windows 8 and 8.1 cannot be used for the PRS-TIC, due to its dependency on AsteriskWin)
- Network connection: 100 base-T
- 1 GB RAM

Note
To avoid call interruptions, do not run other processor-demanding applications on the PC of the *PC Telephone Interface Client*.

63.3 Installation

Proceed as follows:

1. Start the PRS-SW Praesideo Software DVD (see section 36.2).
2. Click *Optional > PC telephone interface* (see chapter section 39). A *File Download* window appears.
3. Proceed in the same way as for the *PC Call Server Configuration Client* (see section 61.3).

63.4 Licensing

In order to use the *PC Telephone Interface Client*, a license must be obtained. By purchasing the PRS-TIC, one gets a registration code that must be registered for the system it is intended for. Registration is done via the Bosch registration website, where the application is coupled to *PC Call Server* and its dongle. See section 61.5.4.15.

63.5 Start

Similar to the *PC Call Server*, the PC automatically starts the *PC Telephone Interface Client* as a service when Windows is started. Important events will be logged to the Windows event log:

- Startup and shutdown of the service
- Error messages about license validity
- Abnormal (fatal) errors that cause the service to shut down

63.6 Operation

Making calls via the PC Telephone Interface Client requires the user to follow a voice response menu. The *PC Telephone Interface* uses predefined calls defined in the *PC Call Server* to select call properties. These calls are always partial. The live speech phase of a *PC Telephone Interface* call is recorded first and broadcast after the call has been completed successfully.

The soundcard audio output of the PC running the *PC Telephone Interface* is coupled to an audio input of the Praesideo system if calls with live speech will be made. Make sure that all predefined calls with live speech that are to be used by telephone have this audio input configured as live speech input.

This means that predefined calls that are to be used by both *PC Call Station Clients* and *PC Telephone Interface Clients* should not contain live speech, since these clients use different Preaesideo audio inputs for live speech. If this predefined call should contain live speech, then two almost identical versions of this predefined call (with different names) should be configured for the *PC Call Server*, one for the *PC Call Station Client* with e.g. a call station microphone as input, the other for the *PC Telephone Client* with a line input configured as live speech source and connected to the PC soundcard output.

Configure port number 5060 for the PC Telephone Interface Client for direct access via a softphone, like ZoIPer (www.zoiper.com).

63.7 Voice response menu

A voice response menu guides the caller to enter the data, required to make a call. For this purpose a number of different gsm-files are available in English. The gsm-file format is typically used for this kind of telephone applications. It is a compressed sound file format. The user or installer can replace these sound files with files that are more convenient for the intended users, e.g. in the local language, more talkative or more condensed. For this purpose sound file editors and converters are available on the Praesideo distribution DVD. With these editors (e.g. WavePad, Audacity) a recording can be made in the uncompressed wav-file format. Then these files can be normalised to maximum level and/or optimised in other ways for good intelligibility. It is recommended to use a high pass filter to remove frequencies below 300 Hz, as these low frequencies severely decrease intelligibility of the gsm-files. Finally the files must be converted (using SoX or WavePad) to the gsm-file format at 8kHz sample rate. The names as indicated in table 63.1 should be used, because the *PC Telephone Interface Client* expects to find these. Do not translate or change these file names.

Command line conversion from wav-file format to gsm-file format via SoX is as follows:

sox.exe "<Source filename>.wav" -r 8000 "<Destination filename>.gsm"

Because the telephone interface is based on the Asterisk telephony platform, which is designed to run on Linux, a Cygwin environment is installed on MS Windows and the sound files are located in the folder \<AsteriskRoot>\var\lib\sounds. This is usually C:\cygroot\asterisk\var\lib\sounds.

table 63.1: Sound files

Voice response menu item	Sound file	Content
Busy	There is no dedicated sound file for this tone. The telephone busy tone, typical for the configured country, is used.	-
Welcome	welcome.gsm	<Pause 0.5s> Welcome to the Praesideo public address sound system.
Enter personal number	enterpersonalnr.gsm	<Pause 0.5s> Please enter your personal number, followed by the hash or pound key.
Enter pin code	enterpincode.gsm	<Pause 0.5s> Please enter your PIN code, followed by the hash or pound key.
Invalid personal number or pin code	incorrect.gsm	<Pause 0.5s> This personal number or PIN code is not correct.
Enter predefined call	enterpredefinedcall.gsm	<Pause 0.5s> Please enter the number of the call, you want to make, followed by the hash or pound key.
Invalid predefined call	invalidpredefinedcall.gsm	<Pause 0.5s> This call number does not exist.
Enter zones and/or zone groups	enterzones.gsm	<Pause 0.5s> Please enter the numbers of the zones you want to address, press the star key after each zone number and the hash or pound key after the last zone number.
Invalid zone or zone group	invalidzone.gsm	<Pause 0.5s> This zone number does not exist.
Record live speech message	recordlivespeech.gsm	<Pause 0.5s> Please make your announcement after the beep. When you're finished, press the hash or pound key. <Pause 0.5s> {beep is added automatically}
Call successfully selected	callselected.gsm	<Pause 0.5s> Your call will be processed. You may hang up now or proceed with another call by entering a new call number.
Not licensed	notlicensed.gsm	<Pause 0.5s> The Praesideo public address sound system is not licensed for access by telephone.
Server not available	serverunavail.gsm	<Pause 0.5s> The Praesideo public address sound system service for access by telephone is not available at the moment. Please try again later.

The table 63.2 shows the general voice response flow that the caller will follow. Not all the steps need to be there. For instance, it can be configured that certain SIP-users have direct access, see section 61.5.4.12. In that case there is no need to enter a personal number and PIN code. Also predefined calls may be configured without live speech, in which case the voice response menu will skip the *recordlivespeech.gsm* request. In case no additional zones or zone groups need to be added to the selected predefined call, the caller just presses # immediately after the *enterzones.gsm* request, instead of zone numbers separated by a * and pressing a # at the end.

The content description of the voice response files in table 63.1 can be read to understand the required user action.

table 63.2: Voice response flow

Flow	Condition	Voice response	Action
Incoming call			
<Free?>	No	[country specific busy tone]	To: *Hang up call*
	Yes	"welcome.gsm"	
<Call server available?>	No	("serverunavail.gsm")	To: *Hang up call*
<Client licensed?>	No	("notlicensed.gsm")	To: *Hang up call*
	Yes	{"enterpersonalnr.gsm"}	User entry: 0..9, #
		{"enterpincode.gsm"}	User entry: 0..9, #
<Valid credentials?>	No	("incorrect.gsm")	To: "enterpersonalnr.gsm"
	Yes	"enterpredefinedcall.gsm	"User entry: 0..9, #
<Valid call number?>	No	("invalidpredefinedcall.gsm")	To: "enterpredefinedcall.gsm"
	Yes	"enterzones.gsm	"User entry: 0..9, *, #
<Valid zone (group)?>	No	("invalidzone.gsm")	To: "enterzones.gsm"
	Yes	{"recordlivespeech.gsm" + [beep]}	User entry: speech, #
		"callselected.gsm"	
<User entry: 0..9, #?>	Yes		To: <Valid call number?>
	No		To: *Hang up call*
Hang up call			*Make call(s)*

<…?> = Condition
[…] = Automatically generated tone
"…" = Voice response
("…") = Conditional voice response
{"…"} = Optional voice response, configuration dependant

The Praesideo distribution DVD contains an alternative set of gsm-files containing language independent tones. Unlike spoken messages these tones are not self-explaining, but have been designed to be at least distinguishable. This set is located in the *Audio tools and sounds* folder.

63.8 Linksys SPA3102 configuration

The Praesideo *PC Telephone Interface Client* connects directly to VoIP networks. In case a connection should be established to an analog telephone or PBX a converter is needed.
Although the Linksys SPA3102 Voice Gateway is certainly not the only device that can be used with the Praesideo *PC Telephone Interface Client* to connect to analog telephone lines (POTS), this unit is recommended for its availability, price and ease of configuration.
This section describes how to configure the Linksys SPA3102 for use with the Telephone Interface. It covers the device initialization, network configuration, connection with the Telephone Interface and disconnect detection.

figure 63.1: Linksys SPA3102 Voice Gateway with Router

63.8.1 Device initialization

To make sure that previous configuration settings do not interfere with the flow of this configuration, first perform the factory reset procedure. Remove all connectors from the device. Connect a telephone to the Phone port. Connect the power connector. Dial '****', wait for the menu response, dial '73738#', dial '1', hang-up. The device will now reset.

63.8.2 Network configuration

The device will now be configured in such a way that both configuration and telephone traffic will run through the Internet port. This port is also the port used to connect to the network containing the PC of the *PC Telephone Interface Client.*

Connect the PC network adapter of a PC to the Ethernet port of the SPA3102. Configure the PC network adapter to dynamically acquire an IP address (from the SPA3102). This will be in the 192.168.0.x range. Once the IP address is acquired, start a web browser and open http://192.168.0.1. The SPA3102 web configuration page opens.
Click 'Admin login' and click 'Advanced'. Make sure both modes are active in order to access all configuration fields.
Router → Wan Setup → Internet Connection Settings
Connection Type: Static IP
Router → Wan Setup → Static IP Settings
Static IP: <WAN IP address>
NetMask: <Network mask>
Router → Wan Setup → Remote Management
Enable WAN Web Server: yes

Click 'Submit all changes'

Now, the Ethernet port is no longer required. The web configuration is now accessible using the Internet port and the WAN IP address.

Note
The combination <WAN IP address> and <Network mask> should be provided by the network administrator to cover both the Linksys unit and the network address of the PC that runs the PC Telephone Interface Client.

63.8.3 PSTN configuration

Now the device will be configured to register itself on the Telephone Interface server and to forward incoming calls from the PSTN port directly to the Telephone Interface server. Make sure that 'Admin Login' and 'Advanced' are active.
Voice → PSTN Line → Proxy and registration
Proxy: <Telephone Interface IP address>
Voice → PSTN Line → Subscriber Information
Display Name: <SIP Username>
User ID: <SIP Username>
Password: <SIP Password>
Voice → PSTN Line → Dial Plans
Dial Plan 1: S0<:<VoIP extension>@<Telephone Interface IP address>
Voice → PSTN Line → PSTN-To-VoIP Gateway Setup

PSTN Caller Default DP: 1
Voice → PSTN Line → FXO Timer Values (sec)
PSTN Answer Delay: 0

Click 'Submit all changes'.

63.8.4 Disconnect detection

Several telephone disconnect methods are used in different countries. It is vital to configure the correct method in order to use the device with the Telephone Interface. Please consult your telephone provider for the disconnect method. The Linksys SPA3102 supports the following methods:

- CPC, a brief removal of the tip-and-ring voltage;
- Polarity Reversal;
- Long silence;
- Disconnect tone recognition.

Most telephone providers in Europe do not use the line voltage or reversal methods. The SPA3102 must recognize the disconnect tone in this region. E.g. in The Netherlands, the disconnect tone consists of a 500ms 440Hz tone followed by 500ms of silence in a loop. The configuration syntax for this tone is: 440@-30,440@-30;2(.5/.5/1+2).
Web configuration (make sure that 'Admin Login' and 'Advanced' are active):
Voice → PSTN Line → PSTN Disconnect Detection
Disconnect Tone: 440@-30,440@-30;2(.5/.5/1+2).

Click 'Submit all changes'.

63.8.5 ISDN telephones

Digital ISDN telephones can also be used via a local PBX that provides an analog line to the voice gateway. In this case the local PBX must be configured to generate DTMF tones upon reception of the corresponding ISDN commands to indicated button presses. These DTMF tones are required to identify the user input on the telephone, such as call selection and zone selection, to the Linksys SPA3102 voice gateway.

Note
The Linksys SPA3102 treats the sequence **# as a special command to disconnect the PSTN line. So this sequence should not be entered by the user in the voice response flow (see table 63.2). This could happen by mistake when numeric keys are missed while entering zone numbers because these are separated by a * and a # is entered to complete the zone entry.

64 Open Interface

64.1 Introduction

The Praesideo Open Interface is based on a Visual Basic implementation and is based on the COM technology (*OLE* automation subset), as described by Microsoft.

It is preferred to use *.NET* to implement the Praesideo Open Interface. *.NET* is the successor of *COM*, *COM+* and *DCOM* and is comparable to these. Existing *COM* interfaces can be used in a *.NET* environment. Many programming languages recognize *.NET*, which makes development of user interfaces by third parties easier.

At this moment, the Praesideo Open Interface is based on *COM* to enable connections to existing systems that are not built on *.NET*. Most current third party systems support *COM*, but not yet *.NET*. However, in the future, Bosch Security Systems will convert the *COM* interfaces to *.NET*.

It may be convenient to develop third party applications (e.g. PC call stations) in *.NET* already. These *.NET* applications can communicate with the current *COM* interface without any problems and will cause no problems in the future when the interface is based on *.NET*. If the application is developed in a *COM* environment, it must be rewritten when the interface is based on *.NET*.

The open interface connection (i.e. an Internet connection) is regarded as an open connection that requires extra safety precautions. For example, a firewall to prevent unauthorized persons from (ab)using the system. The system can also limit the access of TCP/IP devices (see section 43.12).

Use of the open interface can lead to situations in which the Praesideo system does not comply anymore to the evacuation standards that have been verified by TÜV. In that case, the TÜV certificate can be lapsed.

64.2 Scope

As mentioned before, the Open Interface manual describes how to use the Praesideo Open Interface in combination with Visual Basic. To understand this manual, knowledge in the following fields in necessary:

- The Visual Basic 6.0 programming language and its development environment.
- The principle of *COM* interfaces and *OLE* automation.
- The Praesideo system and its installation.

Note
The *COM* interface is not limited to Visual Basic. It can also be used in other programming languages that support COM. Visual Basic is just used as an example here.

The Open Interface Manual is intended for users, who want to use the Praesideo Open Interface. It is not possible to derive any rights from this manual regarding the programming interface. Extensions and improvements on the open interface can be implemented when new versions of Praesideo are introduced. Since this manual is intended for programmers, it is only available in English.

Although the open interface DLLs contain the previous versions of the open interface (for backward compatibility), only the open interface version 3.4 is described in this manual. The interfaces in the DLL are identified using a name extension. The original version does not have a name extension.

Note
A maximum of 5 TCP/IP devices, such as the PC Call Server or Logging Server, with Open Interface access can be used with a network controller. The configuration web browser uses a different port (port 80) for the connection and is not part of this limitation.

A Tones

A.1 Chimes

Name	Description
1-tone chime	Frequency 554 Hz. Signal duration 1.5 s.
2-tone chime	Frequencies 554 Hz, 440 Hz. Time between start of chimes 700 ms. Total signal duration 2.2 s.
2-tone chime L1	2-tone chime @ -16 dB followed by a pause of 0.5 s and a 2-tone chime @ -6 dB. Total signal duration 4.9 s.
2-tone chime L2	2-tone chime @ -21 dB followed by a pause of 0.5 s and a 2-tone chime of -6 dB. Total signal duration 4.9 s.
3-tone chime - A	Frequencies 392 Hz, 523 Hz, 659 Hz. Time between start of chimes 700 ms. Total signal duration 2.9 s.
3-tone chime - B	Frequencies 659 Hz, 523 Hz, 392 Hz. Time between start of chimes 700 ms. Total signal duration 2.9 s.
4-tone chime - A	Frequencies 554 Hz, 440 Hz, 493 Hz, 330 Hz. Time between start of chimes 700 ms. Total signal duration 3.6 s.
4-tone chime - B	Frequencies 659 Hz, 523 Hz, 392 Hz, 330 Hz. Time between start of chimes 700 ms. Total signal duration 3.6 s.
4-tone chime - C	Frequencies 196 Hz, 262 Hz, 330 Hz, 392 Hz. Time between start of chimes 700 ms. Total signal duration 3.6 s.
EMG chime	Frequencies 1350 Hz, 450 Hz, 3000 Hz, 1000 Hz. Time between start of chimes 10 ms. Total signal duration 1.0 s.
Normal chime	Frequencies 554 Hz, 440 Hz. Time between start of chimes 1 s. Total signal duration 2.0 s.

A.2 Alarms

Name	Description
Fast whoop	Sweeping signal from 700 Hz up to 880 Hz in 400 ms, followed by 400 ms of silence and repeating. Signal duration 4.8 s.
Police alarm	Alternating frequencies of 650 Hz and 850 Hz. Every frequency lasts 500 ms, repeating. Signal duration 5 s.
Crash alarm	Up and down sweeping signal, frequencies 500 Hz to 600 Hz with sweep time of 500 ms up and 500 ms down. Signal duration 5 s.
Fire repeating	Single tone of 1000 Hz. 300 ms on, 200 ms off and repeating. Signal duration 5 s.
Fire Dutch	2 times sweeping signal from 500 Hz up to 1200 Hz in 3.5 s, followed by 500 ms of silence. Signal according Dutch fire regulations.
Reference 440Hz	Single tone, 440 Hz. Signal duration 60 s.
Reference 440Hz C	Single tone, 440 Hz. Continuous.
Din alarm	Sweeping signal from 1200 Hz down to 500 Hz in 1 s and repeating. Signal duration 60 s.
Din alarm C	Sweeping signal from 1200 Hz down to 500 Hz in 1 s. Continuously repeating.
2-tone alarm 1	Alternating frequencies of 440 Hz and 554 Hz. Every frequency lasts 1 s. Signal duration 60 s.
2-tone alarm 1 C	Alternating frequencies of 440 Hz and 554 Hz. Every frequency lasts 1 s. Continuously repeating.
End of alarm	Sweeping signal from 100 Hz up to 420 Hz in 5 s, holding that frequency for 60 s, sweeping down to 100 Hz in 5 s.
Fire alarm 3	Sweeping signal from 100 Hz up to 420 Hz in 3 s, holding that frequency for 10 s, sweeping down to 300 Hz in 3 s, holding that frequency for 10 s and repeating. Signal duration 52 s.

All clear	Sweeping signal from 1000 Hz down to 650 Hz in 3 s, followed by 2 s of silence and repeating. Duration 60 s.
All clear C	Sweeping signal from 1000 Hz down to 650 Hz in 3 s, followed by 2 s of silence. Continuously repeating.
Fast whoop UK	Sweeping signal from 700 Hz up to 880 Hz in 400 ms, followed by 400 ms of silence and repeating. Signal duration 60 s.
Fast whoop UK C	Sweeping signal from 700 Hz up to 880 Hz in 400 ms, followed by 400 ms of silence. Continuously repeating.
2-tone alarm 2	Alternating frequencies of 650 Hz and 850 Hz. Every frequency lasts 500 ms, repeating. Signal duration 60 s.
2-tone alarm 2 C	Alternating frequencies of 650 Hz and 850 Hz. Every frequency lasts 500 ms. Continuously repeating.
Crash UK	Sweeping signal from 500 Hz up to 600 Hz in 500 ms, sweeping down to 500 Hz in 500 ms and repeating. Signal duration 60 s.
Crash UK C	Sweeping signal from 500 Hz up to 600 Hz in 500 ms, sweeping down to 500 Hz in 500 ms. Continuously repeating.
Fire alarm 1	Single tone of 1000 Hz. 300 ms on, 200 ms off and repeating. Signal duration 60 s.
Fire alarm 1 C	Single tone of 1000 Hz. 300 ms on, 200 ms off. Continuously repeating.
Air raid	Sweeping signal from 900 Hz up to 1000 Hz in 2.5 s, sweeping down to 900 Hz in 2.5 s and repeating. Signal duration 60 s.
Air raid C	Sweeping signal from 900 Hz up to 1000 Hz in 2.5 s, sweeping down to 900 Hz in 2.5 s. Continuously repeating.
Abandon platform	Single tone of 1000 Hz. Signal duration 60 s.
Abandon C	Single tone of 1000 Hz. Continuous.
F in morse	1000 Hz tone 100 ms on, 100 ms off, 100 ms on, 100 ms off, 300 ms on, 100 ms off, 100 ms on, 500 ms off. Repeating signal, duration 60.2 s.
F in morse C	1000 Hz 100 ms on, 100 ms off, 100 ms on, 100 ms off, 300 ms on, 100 ms off, 100 ms on, 500 ms off. Continuously repeating.
Slow whoop	Sweeping signal from 500 Hz up to 1200 Hz in 3.5 s followed by 500 ms of silence and repeating. Signal duration 60 s.
Slow whoop C	Sweeping signal from 500 Hz up to 1200 Hz in 3.5 s followed by 500 ms of silence. Continuously repeating.
NBC alarm	Sweeping signal from 900 Hz up to 1000 Hz in 2.5 s, sweeping down to 900 Hz in 2.5 s and repeating. Signal duration 60 s.
NBC alarm C	Sweeping signal from 900 Hz up to 1000 Hz in 2.5 s, sweeping down to 900 Hz in 2.5 s. Continuously repeating.
Mortar attack	Sweeping signal from 2000 Hz down to 1700 Hz in 300 ms and repeating. Signal duration 60 s.
Mortar attack C	Sweeping signal from 2000 Hz down to 1700 Hz in 300 ms. Continuously repeating.
Muster alarm	Single tone of 650 Hz. 7 times 1 s on, 1 s off, followed by continuous signal of 650 Hz. Signal duration 60 s.
Muster alarm C	Single tone of 650 Hz. 7 times 1 s on, 1 s off, followed by 46 s on and repeating. Continuous.
Boat fire C	Single tone of 800 Hz. 7 times 1 s on, 1 s off, followed by 2 s on, 1 s off. Continuously repeating.
Catastrophy	Single tone of 440 Hz. 7 s on, followed by 19 times 3 s off, 4 s on. Signal duration 140 s.
General alarm	Single tone of 440 Hz. Signal duration 140 s.
Fire alarm 2	Frequency 400 Hz. 25 s on, 10 s off. Continuously repeating.

Important Mesg	Single tone of 600 Hz. 5 times 6 s on and 12 s off, followed by 6 s on. Signal duration 96 s.
All clear 2	Single tone of 600 Hz. Signal duration 30 s.
Immediate danger	Single tone of 600 Hz. 200 ms on, 200 ms off. Signal duration 60 s.
Immediate danger short	Single tone of 600 Hz. 200 ms on, 200 ms off. Signal duration 10 s.
H2S alarm C	Up and down sweeping signal 600 Hz to 782 Hz. Sweep time 100 ms up, 100 ms down, 50 ms silence. Continuously repeating.
Toxic gas alarm 1 C	Up and down sweeping signal 500 Hz to 800 Hz. Sweep time 500 ms up, 500 ms down. Continuously repeating.
DP alert C	Up and down sweeping signal 500 Hz to 800 Hz. 2 times 250 ms sweep up and 250 ms sweep down, then followed by 1 s silence. Continuously repeating.
Tick tone C	Single tone 1800 Hz. 1 s on, 2 s silence. Continuously repeating.
Muster alarm 2 C	Sweeping signal 1200 Hz down to 500 Hz in 1 s. Continuously repeating.
General alarm C	Single tone of 1000 Hz. 1 s on, 1 s off. Continuously repeating.
Toxic gas alarm 2 C	Single tone of 1000 Hz. 5 times 100 ms on, 100 ms off. Continuously repeating.
All clear 3 C	Single tone of 2000 Hz. 3 times 500 ms on, 200 ms off, then followed by 2.8 s silence. Continuously repeating.
Abandon alarm C	Bell tone, 4 chimes with frequencies 6793 Hz, 2580 Hz, 3821 Hz and 1507 Hz. Continuously repeating.
Fire and gas 1 C	Bell tone, 4 chimes with frequencies 6793 Hz, 2580 Hz, 3821 Hz and 1507 Hz. 1 s on, 1 s off. Continuously repeating.
Fire and gas 2 C	Bell tone, 4 chimes with frequencies 6793 Hz, 2580 Hz, 3821 Hz and 1507 Hz. 3 s on, 1 s off. Continuously repeating.
Fire and gas 3 C	Bell tone, 4 chimes with frequencies 6793 Hz, 2580 Hz, 3821 Hz and 1507 Hz. 1 s on, 1 s off, 1 s on, 3 s off. Continuously repeating.
Emg 1 ISO8201 C	Sweeping signal from 700 to 800 Hz in 500 ms followed by 500 ms silence. Repeated 3 times followed by 1 s silence. Continuously repeating.
Emg 2 ISO8201 C	Single tone of 554 Hz, duration 250 ms followed by a single tone of 440 Hz, duration 250 ms followed by 500 ms silence. Repeated 3 times followed by 1 s silence. Continuously repeating.
Emg 3 ISO8201 C	Single tone of 1 kHz followed by 500 ms silence. Repeated 3 times followed by 1 s silence. Continuously repeating.
Emg 4 ISO8201 C	Single tone of 600 Hz followed by 500 ms silence. Repeated 3 times followed by 1 s silence. Continuously repeating.
Emg 5 ISO8201 C	Up and down sweeping signal, 500 Hz to 800 Hz ramp up in 250 ms and ramp down in 250ms, followed by 500 ms silence. Repeated 3 times followed by 1 s silence. Continuously repeating.
Silence period 2s	Silence period of 2 s
Silence period 4s	Silence period of 4 s
Silence period C	Continuous silence
Silence period 1m	Silence period 1 minutes
Silence period 2m	Silence period 2 minutes
Silence period 3m	Silence period 3 minutes
Silence period 4m	Silence period 4 minutes
Silence period 5m	Silence period 5 minutes
Silence period 10s	Silence period 10 seconds
Silence period 20s	Silence period 20 seconds
Silence period 30s	Silence period 30 seconds
Silence period 40s	Silence period 40 seconds
Silence period 50s	Silence period 50 seconds

A.3 Test tones

Name	Description
Test chime 250Hz	1-tone chime, frequency 250 Hz.
Test chime 1kHz	1-tone chime, frequency 1000 Hz.
Test chime 4kHz	1-tone chime, frequency 4000 Hz.
Silence period	Silence period of 500 ms.
Wobble	AVC calibration. Sweep 1 kHz to 2 kHz in 0.25 s, followed by sweep 2 kHz to 1 kHz in 0.25 s. Continuously repeating.
Silence period 2	AVC calibration. Silence period of 60 s.

B Kycon KPPX-4P connector

B.1 Introduction

This appendix contains assembly instructions and a connection diagram for the Kycon KPPX-4P connector that is used to connect the PRS-NSP Network Splitter, the PRS-FIN(S), PRS-FINNA Fiber Interface, the PRS-CSR Remote Control Station and the PRS-CSI Call Station Interface to power supplies. An alternative source for this connector is Multicomp type PM4490002-A05.

B.2 Assembly

The connector consists of the following (see figure B.1):

A Customer Cable
B Strain Relief
C Plastic Enclosure
D Metal Spring
E Plastic Guide
F Top Metal Cover
G Pin Mold
H Lower Metal Sleeve
I Plastic Coupling

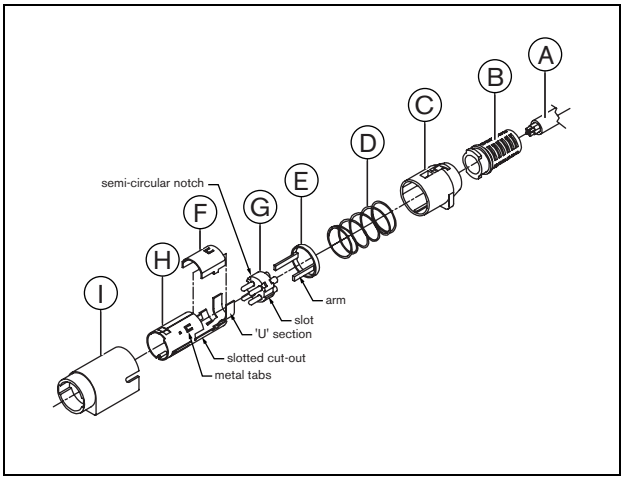

figure B.1: Assembly drawing

Proceed as follows to assembly a Kycon KPPX-4P connector:

1 Attach Strain Relief (B) to Plastic Enclosure (C).
2 Pass Cable (A) through Strain Relief (B)/Plastic Enclosure (C) assembly, Metal Spring (D) and Plastic Guide Ring (E).
3 Solder cable wires to solder cups on Pin Mold (G).
4 Properly align Pin Mold (G) with Lower Metal Sleeve (H). The slotted sections on the sides of the Pin Mold (G) must line up with the slotted cut-outs on the Lower Metal Sleeve (H) and the 3 semi-circular notches around the perimeter of the Pin Mold (G) must line up with the 3 metal tabs inside the Lower Metal Sleeve (H).
5 Push Pin Mold (G) forward into the Lower Metal Sleeve (H) until it locks into place.
6 Manually press the 3 metal tabs on the Lower Metal Sleeve (H) into the notches in the Pin Mold (G).
7 Crimp 'U' section of Lower Metal Sleeve (H) onto Cable (A).
8 Fit Plastic Ring Guide (E) into Lower Metal Sleeve (H) by placing plastic arms into the appropriate slots on the sides of the sleeve.
9 Attach Top Metal Cover (F) onto Lower Metal Sleeve (H). Be sure to align all tabs and securely install cover.
10 Push Metal Spring (D) onto the Top Metal Cover (F)/ Lower Metal Sleeve (H) assembly. This will help to hold the assembly together.
11 Push Strain Relief (B)/Plastic Enclosure (C) assembly onto the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. The two assemblies must be properly aligned as shown in the drawing. Be sure to check that the Metal Spring (D) remains in place and does not go underneath either the Plastic Enclosure (C) or the Plastic Guide (E) or twists during assembly. A significant amount of force may be necessary to lock the two assemblies together.
12 Check to make sure that the Strain Relief (B)/Plastic Enclosure (C) assembly is securely locked into place over the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. The two assemblies should not be able to be pulled apart.
13 Properly align the new assembly with the Plastic Coupling (I) as shown in the drawing. Push assembly into Plastic Coupling (I) until it locks properly into place. The entire plug assembly is now complete.

C Product index

table C.1: Product index

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PRS-NCO3	PRS-NCO3	NETWORK CONTROLLER	Page 103
PRS-4AEX4	PRS-4AEX4	AUDIO EXPANDER ANALOG	Page 127
LBB4404/00	PRS-4CIN4	COBRANET INTERFACE	Page 140
PRS-4OMI4	PRS-4OMI4	OMNEO INTERFACE	Page 152
PRS-NSP	PRS-NSP	NETWORK SPLITTER	Page 289
PRS-FIN	PRS-FIN	FIBER INTERFACE	Page 295
PRS-FINNA	PRS-FINNA	FIBER INTERFACE NON-ADDRESSABLE	Page 295
PRS-FINS	PRS-FINS	FIBER INTERFACE SINGLE MODE	Page 295
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LBB4416/01	PRS-CA0M5	NETWORK CABLE ASSY 0.5M	Page 302
LBB4416/02	PRS-CA002	NETWORK CABLE ASSY 2M	Page 302
LBB4416/05	PRS-CA005	NETWORK CABLE ASSY 5M	Page 302
LBB4416/10	PRS-CA010	NETWORK CABLE ASSY 10M	Page 302
LBB4416/20	PRS-CA020	NETWORK CABLE ASSY 20M	Page 302
LBB4416/50	PRS-CA050	NETWORK CABLE ASSY 50M	Page 302
LBB4417/00	PRS-CBCON	SET NETWORK CONN 20 PCS	Page 304
LBB4418/00	PRS-CBTK	CABLE/CONNECTOR TOOLKIT	Page 305
LBB4418/50	PRS-CBTKC	SPARE CUTTING TOOL 2 PCS	Page 318
LBB4419/00	PRS-CBCPL	SET CABLE COUPLERS 10 PCS	Page 318
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PRS-8B060	PRS-8B060	BASIC AMPLIFIER 8X60W	Page 197
PRS-16MCI	PRS-16MCI	MULTI CHANNEL INTERFACE	Page 188
LBB4430/00	PRS-CS	CALLSTATION BASIC	Page 230
LBB4432/00	PRS-CSKP	CALLSTATION KEYPAD	Page 235
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LBB4436/00	PRS-CSKPC	SET KEY COVERS 10 PCS	Page 285
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PRS-CRF	PRS-CRF	CALL STACKER	Page 285
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LBB4441/00	PRS-SVLSP	LSP SUPERVISION BOARD	Page 220
LBB4442/00	PRS-SVSET	LINE SUPERVISION SET	Page 220
LBB4443/00	PRS-SVLN	LINE SUPERVISION BOARD	Page 220
LBB4446/00	PRS-SVB	SET SV BRACKETS 10 PCS	Page 228
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PRS-TIC	PRS-TIC	PC TELEPHONE INTERFACE CLIENT	Page 506

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