DCN Next Generation

Installation and User Instructions

en | Digital Congress Network

BOSCH

Important Safeguards

Before you install or operate the DCN Next Generation digital congress network, you must read the Important Safety Instructions. The Important Safety Instructions are supplied together with the central control unit.

Disclaimers

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About this manual

Function

The Installation and User Instructions gives the installers and the operators the necessary data to install, configure and operate the DCN Next Generation digital congress network.

Digital version

The Installation and User Instructions is available as a digital file (Portable Document File, PDF).
When the PDF refers you to a location that contains more data, you can click the text to go there. The text contains hyperlinks.

Precautions and notes

The Installation and User Instructions uses precautions and notes. The precaution gives the effect if you do not obey the instructions. These are the types:

- **Note**
  A note gives more data.
- **Caution**
  If you do not obey the caution, you can cause damage to the equipment.
- **Warning**
  If you do not obey the warning, you can cause personal injury or death.

Signs

The Installation and User Instructions shows each precaution with a sign. The sign shows the effect if you do not obey the instruction.

⚠	**Precaution**
	General sign for cautions and warnings.

⚡	**Precaution**
	Risk of electric shock.

⚠	**Precaution**
	Risk of electro-static discharges (refer to the section 'Electro-static discharges').

The sign that is shown along with a note gives more data about the note itself.

ℹ	**Note**
	General sign for notes.

📖	**Note**
	Refer to another information source.

Electro-static discharges

Electro-static discharges can damage electric components. You must take measures to prevent electro-static discharges when you touch PCBs (refer to figure 1).
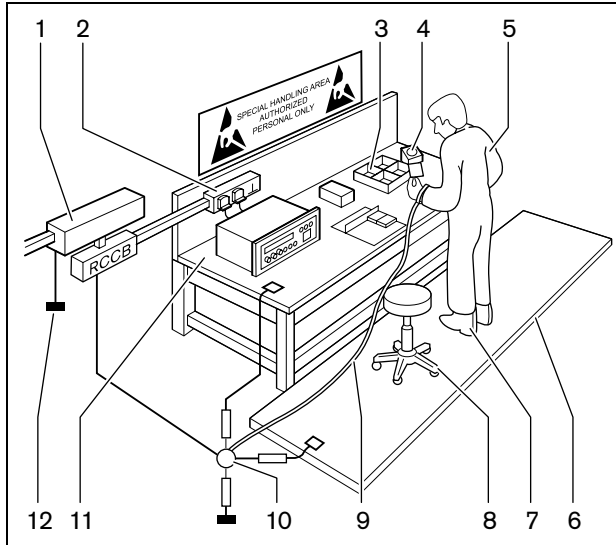

figure 1: ESD prevention

table 1: ESD prevention

No.	Description
1	Safety isolating transformer
2	Distribution supply box
3	Conductive compartment trays
4	Electro-static voltage sensor
5	Cotton overall
6	Conductive floor mat
7	Conductive boots/heel grounding protectors
8	Conductive stool
9	Strap (resistance 0.5 to 1.0 MΩ)
10	Common reference point
11	Conductive bench top
12	Supply ground

Conversion tables

Length, mass and temperature are in SI units. Refer to the data below to change SI units to imperial units.

table 2: Conversion of units of length

1 in =	25.4 mm	1 mm =	0.03937 in
1 in =	2.54 cm	1 cm =	0.3937 in
1 ft =	0.3048 m	1 m =	3.281 ft
1 mi =	1.609 km	1 km =	0.622 mi

table 3: Conversion of units of mass

1 lb =	0.4536 kg	1 kg =	2.2046 lb

table 4: Conversion of units of pressure

1 psi =	68.95 hPa	1 hPa =	0.0145 psi

> **i** **Note**
> 1 hPa = 1 mbar.

table 5: Conversion of units of temperature

$$°F = \frac{9}{5} \cdot °C + 32$$

$$°C = \frac{5}{9} \cdot (°F - 32)$$

Table of Contents

Section 1 - System Design and Planning

1 DCN design

1.1 Introduction

The DCN Next Generation has two parts: the DCN and the optical network. This chapter tells how to design the DCN.

1.2 Calculation tool

The calculation tool makes the planning and design of the DCN easier. You can find the calculation tool on the CD-ROM that is supplied with your system.

1.3 Concepts

1.3.1 Introduction

This section gives necessary data to understand the limitations in section 1.4.

1.3.2 Trunk and tap-off sockets

The DCN uses two types of socket:

- **DCN trunk sockets**
  Use the DCN trunk sockets to make a loop-through in the trunk of the DCN.
- **DCN tap-off sockets**
  Use the DCN tap-off sockets to make more branches in the DCN. A DCN tap-off socket always regenerates the digital DCN signal.

1.3.3 Cables

Many devices used in the DCN have a 2 m cable. If necessary the extension cable (LBB4116) can extend the device cables.

1.4 Limits

Make sure these limits are not exceeded when you design the DCN:

Limit 1: Control capacity

The maximum number of active devices in a DCN that a central control unit can control is 245. For the maximum number of active devices that a multi CCU can control, refer to section 2.7.3. The number of passive devices is without limit (refer to section 1.5).

Limit 2: Power capacity

- The maximum power that one DCN socket of the central control unit can supply is 65 W.
- The total power that the DCN sockets of the central control unit can supply is 130 W.
- The maximum power that one DCN socket of the extension power supply can supply is 85 W
- The total power that the DCN sockets of the extension power supply can supply is 255 W.

Refer to section 1.6.

Limit 3: Loop-throughs

The maximum number of loop-throughs in succession is 50. If there are more than 50 loop-throughs, the signal must be regenerated with a trunk splitter (LBB4114/00).

Limit 4: Tap-off connections

The maximum number of tap-off connections in succession between the central control unit and the last tap-off in a branch is four. If there are more than four tap-off connections in succession, the system does not operate correctly.

Limit 5: Cable lengths

Refer to section 1.7:

- With regenerative tap-offs, the maximum cable length is 250 m from the central control unit to the furthest device in any branch of the DCN.
- The maximum cable length from the central control unit to the first regenerative tap-off is 100 m.
- The maximum length of the cable between regenerative tap-offs is 100 m.
- Open-ended cables can cause an incorrect operation of the system.

> **i** **Note**
> The total cable length includes the 2 m long device cables.

1.5   Control capacity

1.5.1   Active devices

Active devices are devices that can:
- Receive data from the central control unit.
- Transmit data to the central control unit.

> **ℹ Note**
>
> Active devices must have an address (refer to section 8.7).

1.5.2   Passive devices

Passive devices can only receive data from the central control unit.

1.5.3   Overview

The following table shows the active and passive devices in the DCN.

table 1.1: Active and passive devices

Device	Type
DCN-CON	Active
DCN-CONCS	Active
DCN-CONFF	Active
DCN-CONCM	Active
DCN-DDB	Passive/Active
DCN-DDI	Active
DCN-DISL	Active
DCN-DISS	Active
DCN-DISCS	Active
DCN-DISD	Active
DCN-DISDCS	Active
DCN-DISV	Active
DCN-DISVCS	Active
DCN-EPS	Passive
DCN-FCS	Passive
DCN-FVU	Active
DCN-FVU-CN	Active
DCN-IDESK	Active
LBB4114/00	Passive
LBB4115/00	Passive

1.6   Power capacity

1.6.1   Introduction

Each device uses power, and most devices do not have an independent power supply.

1.6.2   Power consumption

The following table shows the power each device in the DCN uses.

table 1.2: Power consumption

Device	Watt
DCN-CON	3.4
DCN-CONCS	3.7
DCN-CONFF	4.2
DCN-CONCM	4.2
DCN-DDB	2.0
DCN-DDI	4.5
DCN-DISL	2.75
DCN-DISS	2.75
DCN-DISCS	2.9
DCN-DISD	2.8
DCN-DISDCS	3.15
DCN-DISV	3.05
DCN-DISVCS	3.20
DCN-EPS	0.8
DCN-FCS	0.9
DCN-FVU	1.0
DCN-FVU-CN	1.0
DCN-IDESK	3.6
LBB4114/00	1.3
LBB4115/00	1.4

> **ℹ Note**
>
> The power consumption of the DCN-DDI includes the power consumption of all flush-mounted devices that you can connect to it.

1.6.3 **Power supplies**

1.6.3.1 Introduction

The devices that supply power to the DCN are the central control unit and the extension power supply (refer to figure 1.1 and figure 1.3). The power that the central control unit supplies includes the power that the optical network uses.

1.6.3.2 DCN-CCU
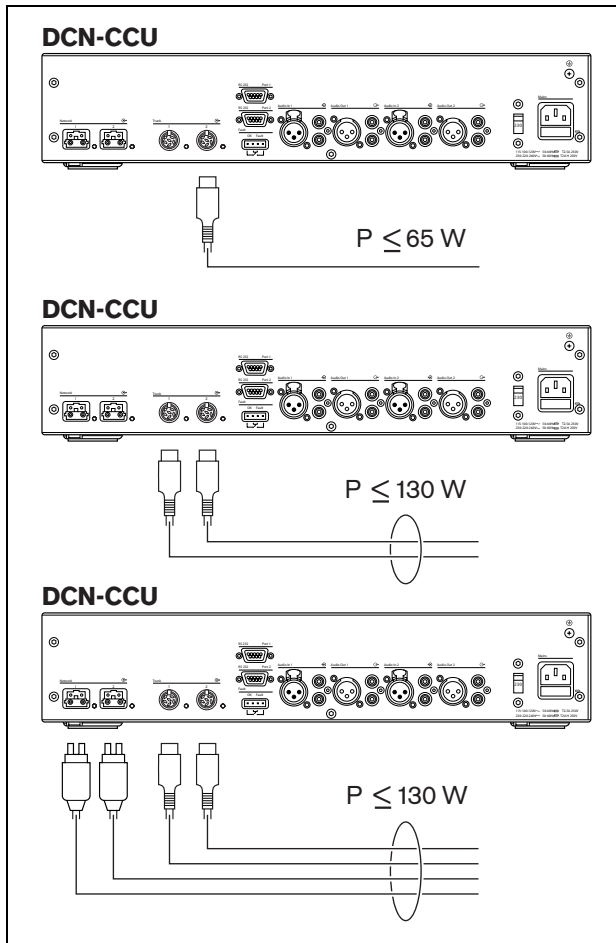
figure 1.1: DCN power supply: DCN-CCU

> ℹ **Note**
> If the power taken is higher than shown in figure 1.1, an overload situation will occur (refer to section 1.6.4).

1.6.3.3 DCN-CCUB
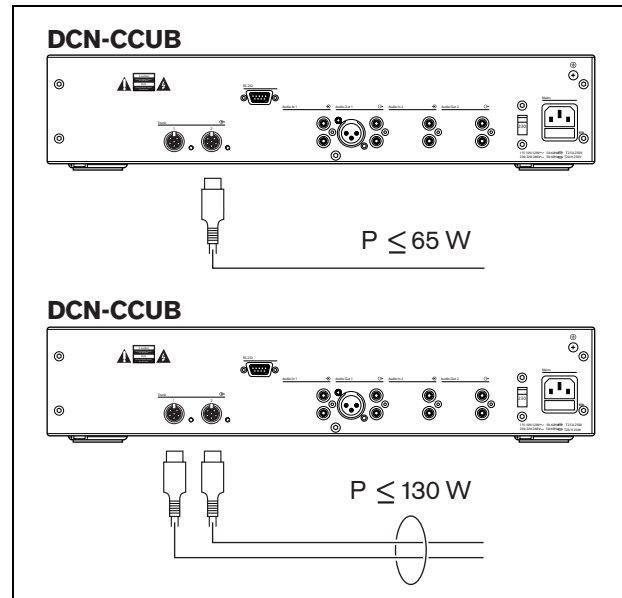
figure 1.2: DCN power supply: DCN-CCUB

1.6.3.4 DCN-EPS
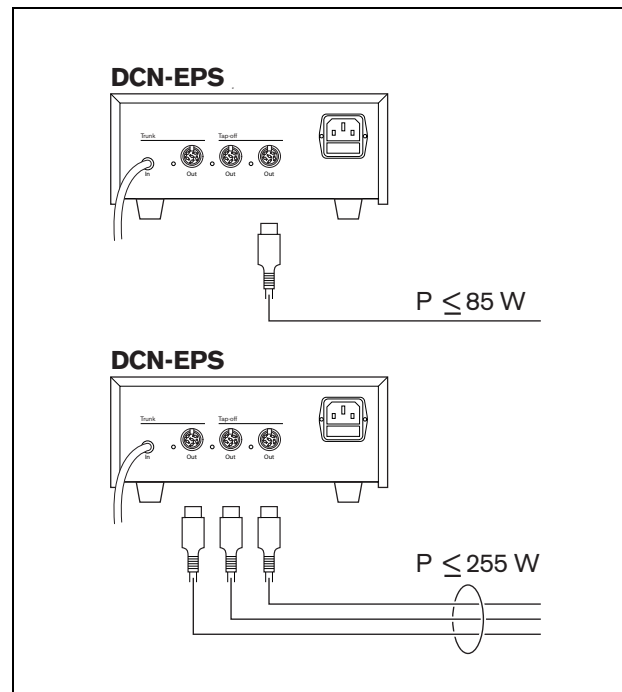
figure 1.3: DCN power supply: DCN-EPS

1.6.4 Overload indication

Each DCN socket of the central control unit and extension power supply has a red LED that comes on to show that there is a power overload. An overload occurs when:

- The necessary power for the devices is greater than that is supplied.
- A short-circuit occurs.

When an overload occurs, that socket is deactivated, and the connected devices do not operate. The socket checks every 8 seconds (DCN-CCU, DCN-CCUB) or 30 seconds (DCN-EPS) for power overloads.

1.6.5 Extension cables

Extension cables (LBB4116) have a direct effect on the available power. The longer an extension cable, the less power is available to drive the connected devices. You must chose the length of the extension cables carefully (refer to section 1.7.5).

1.7 Cable lengths

1.7.1 Maximum length

The cable length between the central control unit and the furthest device from the central control unit must not be more than 250 m. The cable length includes the device cable and extension cables.

1.7.2 To first regenerative tap-off

The total cable length between the central control unit and the first regenerative tap-off socket must not be more than 100 m. This includes the device cable and extension cables.

1.7.3 Between regenerative tap-offs

The total cable length between two regenerative tap-off sockets must not be more than 100 m. This includes the device cables and extension cables.

1.7.4 Open-ended DCN cables

'Open-ended' DCN cables are DCN cables of which the socket is not connected to a device in the DCN. 'Open-ended' cables can cause the system to operate incorrectly. You can 'close' the extension cable with a termination plug (refer to section 40). When the 'open-ended' cable is connected to a termination plug, the system operates correctly.

1.7.5 Power correction

1.7.5.1 Introduction

The necessary power from a DCN socket of the central control unit and the extension power supply is affected by:

- The type and number of connected devices.
- The lengths of the connected extension cables.

The power correction graph (refer to figure 1.4) corrects the power level to compensate for the extension cables.

1.7.5.2 Calculation

To find the correction for each DCN socket of the central control unit and the extension power supply with the graph, you must first calculate:

- The total power consumption of the devices that are connected to the socket. Refer to section 1.7.5.3.
- The length of the longest extension cable sequence. Refer to section 1.7.5.4.

1.7.5.3 Total power consumption

Do as follows:

1 Find the power consumption of each device from the consumption table (refer to table 1.2).

2 Add together the power used by all the devices. The result is the total power consumption of the devices that are connected to the socket.

1.7.5.4 Length of the longest extension cable sequence

Do as follows:

1 Add together the lengths of all extension cables in the longest sequence.

For example, an extension cable of 20 m is connected directly to a DCN socket of the central control unit. To the extension cable, a trunk splitter is connected. To each tap-off socket of the trunk splitter, an extension cable is connected. One extension cable has a length of 10 m, the other extension cable has a length of 40 m. The length of the longest extension cable sequence is, in this example: 20 + 40 = 60 m.

1.7.5.5 Graph

The power correction graph (refer to figure 1.4) corrects the power level to compensate for the extension cables.

Do as follows:

1 Find the total power consumption (refer to section 1.7.5.3) on the vertical axis (Y) of the power correction graph. For example, 40 W.

2 Find the length of the longest extension cable sequence (refer to section 1.7.5.4) on the horizontal axis (X) of the power correction graph. For example, 60 m.

The intersection of both values gives the necessary power from the socket. In this example it is 53 W.
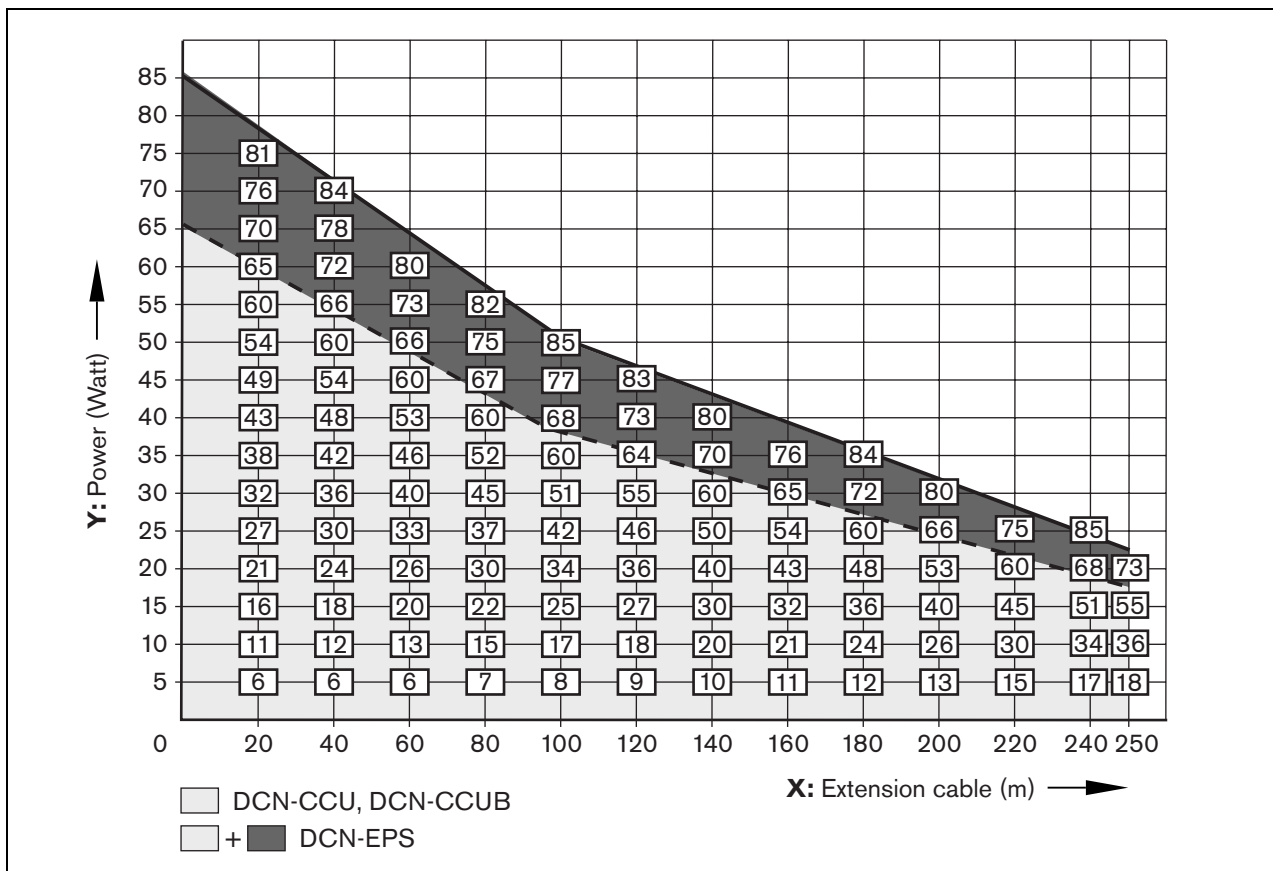
figure 1.4: Power correction graph

1.8   Examples

All examples use the power correction graph (refer to figure 1.4).

1.8.1   Discussion devices
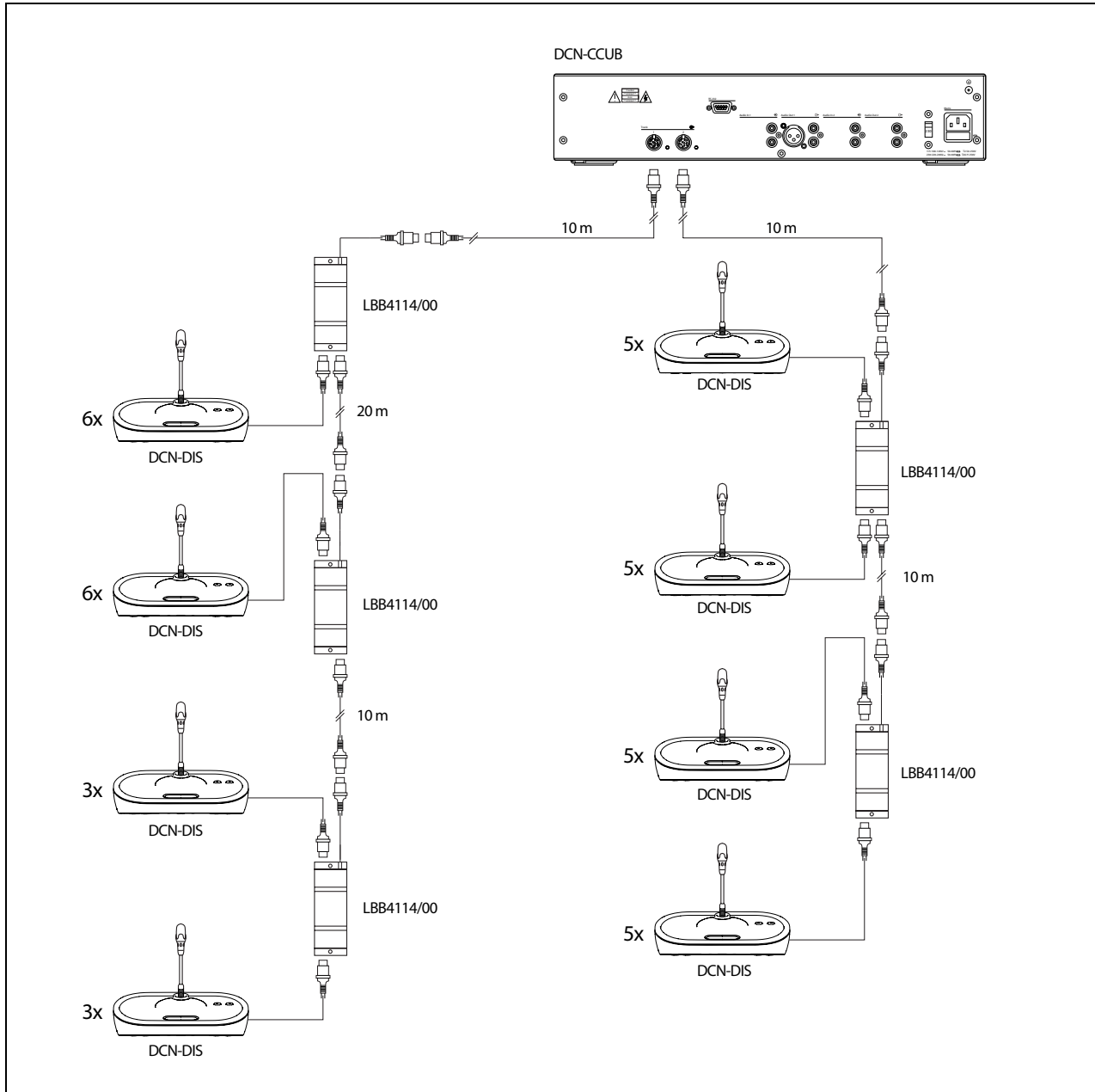
figure 1.5: Example with discussion units (DCN-DISS)

table 1.3: Example with discussion units (DCN-DISS)

Socket	Extension cable	Power for devices	Corrected power
Trunk 1	40 m	53.4 W	64.1 W
Trunk 2	20 m	57.6 W	62.8 W

1.8.2   Conference devices
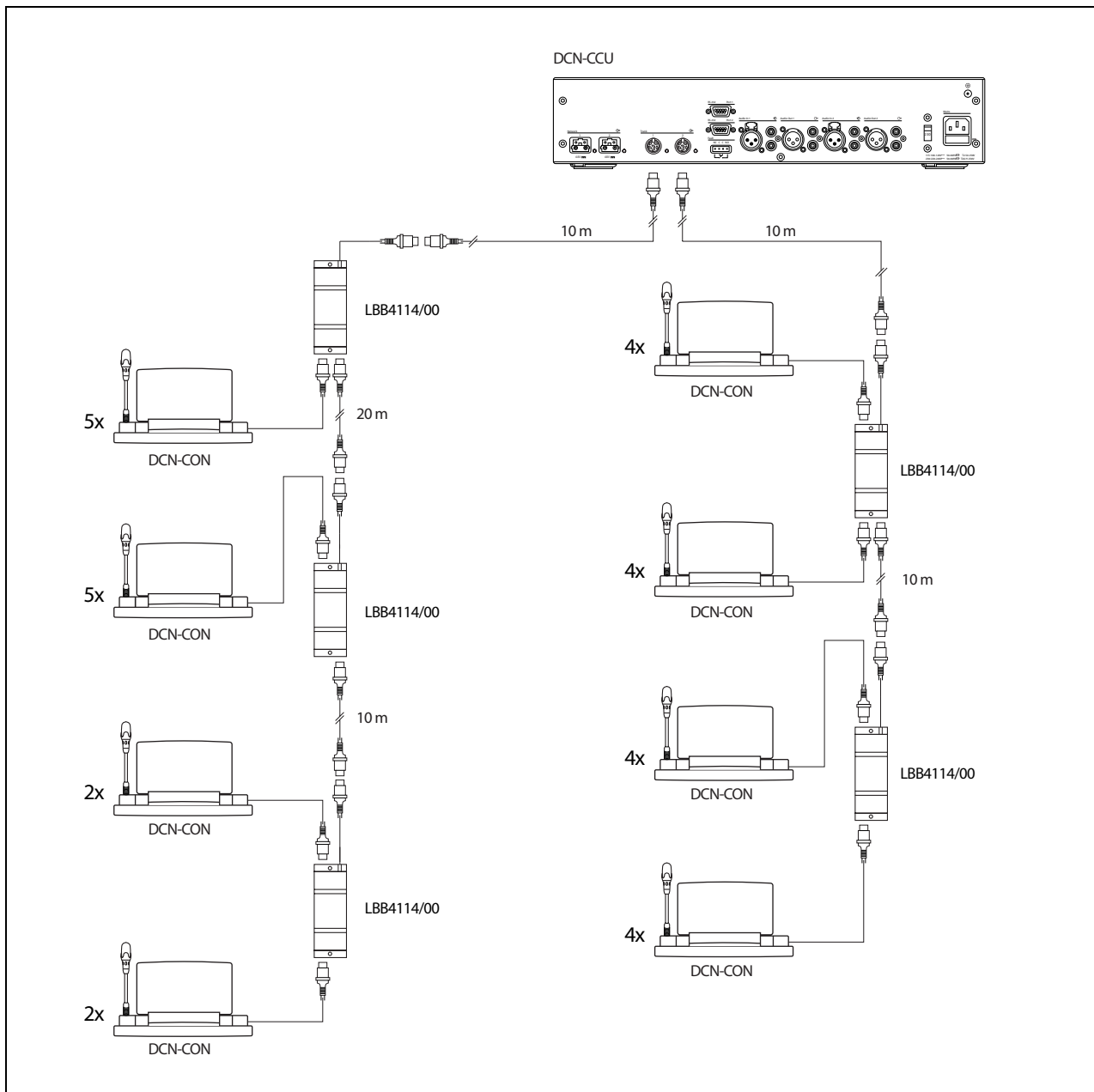
figure 1.6: Example with conference units (DCN-CON)

table 1.4: Example with conference units (DCN-CON)

Socket	Extension cable	Power for devices	Corrected power
Trunk 1	40 m	51.5 W	61.8 W
Trunk 2	20 m	57.0 W	62.2 W

1.8.3 DCN-CCU(B) power correction

table 1.5: DCN-CCU(B) power correction examples

Type	Extension cable	Diagram	Power for devices			Corrected power
DCN-DISS	0 m	23 x 2 m	`23 x 2.75`	`=`	**`63.25 W`**	63.3 W

DCN-DISS	100 m	LBB4116 LBB4114 — 100 m — 2 m — 13 x 2 m	`13 x 2.75`
			`1 x 1.3`
				`=`
				`=`
					`35.75 W`
					`1.3 W +`
					`37.05 W`
						63.5 W

DCN-CON	0 m	19 x 2 m	`19 x 3.4`	`=`	**`64.6 W`**	64.6 W

DCN-CON	100 m	LBB4116 LBB4114 — 100 m — 2 m — 10 x 2 m	`10 x 3.4`
			`1 x 1.3`
				`=`
				`=`
					`34.0 W`
					`1.3 W +`
					`35.3 W`
						60.5 W

DCN-CONFF	0 m	15 x 2 m	`15 x 4.2`	`=`	**`63.0 W`**	63.0 W

DCN-CONFF	100 m	LBB4116 LBB4114 — 100 m — 2 m — 8 x 2 m	`8 x 4.2`
			`1 x 1.3`
				`=`
				`=`
					`33.6 W`
					`1.3 W +`
					`34.9 W`
						59.8 W

DCN-DDI	0 m	14 x 2 m	`14 x 4.5`	`=`	**`63.0 W`**	63.0 W

DCN-DDI	100 m	LBB4116 LBB4114 — 100 m — 2 m — 8 x 2 m	`8 x 4.5`
			`1 x 1.3`
				`=`
				`=`
					`36.0 W`
					`1.3 W +`
					`37.3 W`
						63.9 W

DCN-FCS	0 m	50 x 2 m — LBB4114 2 m — 20 x 2 m	`70 x 0.9`
			`1 x 1.3`
				`=`
				`=`
					`63.0 W`
					`1.3 W +`
					`64.3 W`
						64.3 W

DCN-FCS	100 m	LBB4116 LBB4114 — 100 m — 2 m — 40 x 2 m	`40 x 0.9`
			`1 x 1.3`
				`=`
				`=`
					`36.0 W`
					`1.3 W +`
					`37.3 W`
						63.9 W

1.9   Interpretation devices

The maximum number of interpreter desks you can install in an interpreter booth is six. The figure 1.7 and figure 1.8 show two examples that use LBB4114/00 Trunk Splitter and LBB4115/00 Protected Trunk Splitters.

With an LBB4114/00 Trunk Splitter, you can connect the interpreter desks in series (refer to figure 1.7). If an interpreter desk becomes defective, the defective desk can have an effect on all other interpreter desks that have a connection to the same trunk.
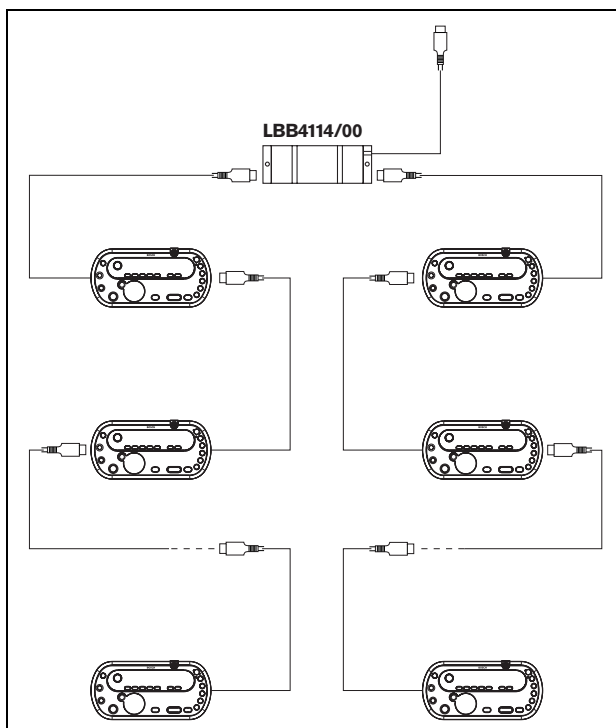
figure 1.7: Interpreter booths with LBB4114/00

With an LBB4115/00 Protected Trunk Splitter, you can connect two interpreter desks (refer to figure 1.8). If an interpreter desk becomes defective, the defective desk has no effect on all other interpreter desks that have a connection to the same trunk.
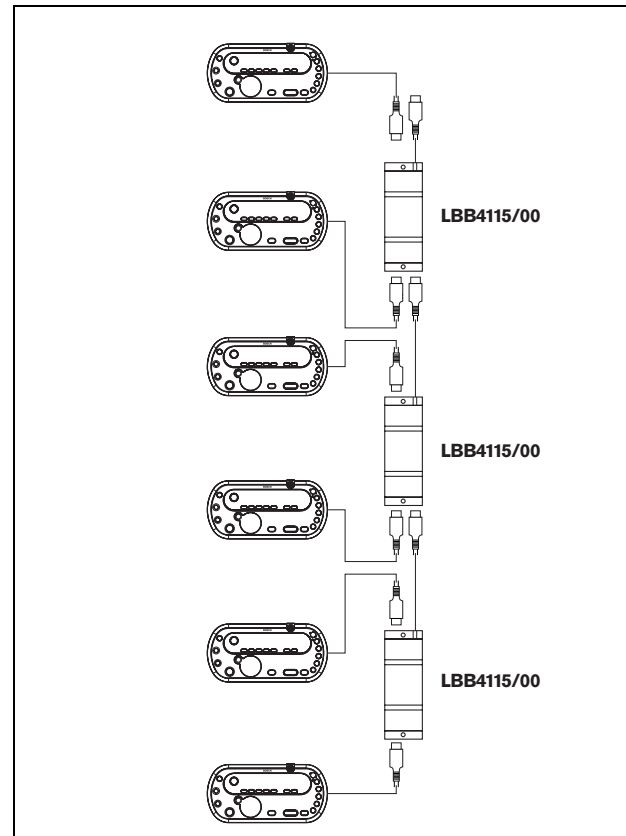
figure 1.8: Interpreter booths with LBB4115/00

2 Optical network design

2.1 Introduction

The DCN Next Generation has two parts: the DCN and the optical network. This chapter tells how to design the optical network.

2.2 Calculation tool

The calculation tool makes the planning and design of the optical network easier. You can find the calculation tool on the CD-ROM that is supplied with your system.

2.3 Limits

Make sure that these limits are not exceeded when you make the optical network:

Limit 1: Control capacity

The maximum number of nodes in the optical network is 63 (refer to section 2.4).

Limit 2: Number of devices

The maximum number of devices that you can connect to the optical network of the central control unit is 16. The maximum number of devices that you can connect to the network controller is determined by the control capacity.

Limit 3: Power capacity

The optical network sockets of the central control unit or network controller can supply the following maximum powers (also refer to section 2.5):
- Central control unit - total maximum power of 65 W for all sockets.
- Network controller - maximum power of 55 W for each socket.

Limit 4: Cables

Refer to section 2.6:
- The maximum length of a POF cable is 50 m.
- The maximum cable length (POF and GOF) of the optical network is dependent on the number of nodes in the optical network.
- The minimum bend radius of a 90 degree bend in a POF cable is 25 mm.
- The minimum coiling radius of a POF cable is 100 mm.

2.4 Control capacity

Each device in the optical network has a number of nodes (refer to table 2.1). The maximum number of nodes in the optical network is 63.

table 2.1: Nodes

Device	Nodes
DCN-CCU	2
LBB4402/00	1
LBB4404/00	1
LBB4410/00	1
LBB4414/10	0
INT-TX04	1
INT-TX08	2
INT-TX16	4
INT-TX32	8
PRS-4DEX4	1
DCN-NCO	3

2.5 Power capacity

2.5.1 Introduction

It is important that the devices in the optical network do not use more total power than you supply to the devices. Each device uses power and most devices do not have an independent power supply.

2.5.2 Power consumption

The table 2.2 shows the power each device in the optical network uses.

table 2.2: Power consumption

Device	Watt
LBB4402/00	7.6
LBB4404/00	10.5
LBB4410/00	3.9
LBB4414/10	4.6
PRS-4DEX4	6.0

> **i** **Note**
> The Integrus transmitters do not use power from the system.

2.5.3 **Power supply**

2.5.3.1 Introduction

The devices that supply power to the optical network are:

- the central control unit.
- the network controller.

If more power is necessary, you must install external power supplies in the optical network. (refer to 41.5.2). The devices below can connect to external power supplies:

- LBB4410/00 Network Splitter (refer to chapter 41).
- LBB4414/10 Fiber Interface (refer to chapter 42).

2.5.3.2 DCN-CCU

The central control unit supplies power to:

- the optical network
- the DCN sockets.

For an overview of the maximum power that the central control unit can supply refer to figure 2.1.
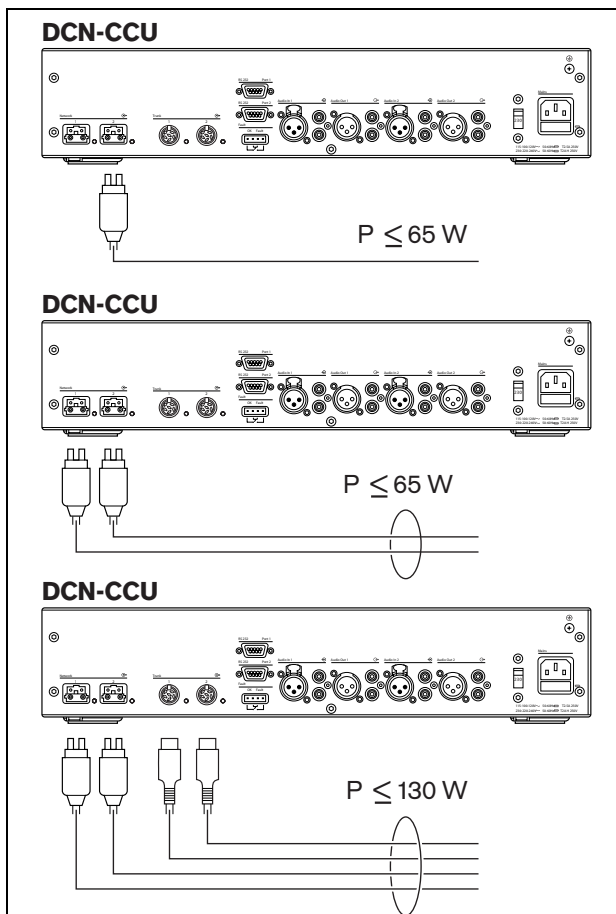
figure 2.1: Optical network power supply: DCN-CCU

2.5.3.3 DCN-NCO

If a network controller is connected, it will supply power to the optical network. In this case, the DCN-CCUs then only supply power to the DCN sockets. If a glass optical fibre is used to connect a remote CCU, this CCU then supplies the power for that part of the optical network.

The maximum power that each of the optical network sockets of the network controller can supply is 55 W.

2.5.4 **Overload indication**

Each optical network socket of the central control unit has a red LED that comes on to show that there is a power overload. An overload occurs when the necessary power for the devices is greater than that supplied. The sockets are set to off and the devices connected to the central control unit do not operate. The socket checks every 8 seconds.

The network controller does not have an overload indication.

> **i** **Note**
> If only one of the optical network sockets has a power overload, the two overload LEDs come on, and the power will be removed from both sockets.

2.6 **Cabling**

2.6.1 **Introduction**

Many devices in the optical network have two optical network sockets that are interchangeable. You can use the two optical network sockets to make a redundant ring. The optical network uses two types of cable:

- Plastic Optical Fiber (POF).
- Glass Optical Fiber (GOF).

> **i** **Note**
> The two optical network connectors are the same.

2.6.2 Optical fiber length

Because of optical attenuation, the maximum length of optical network cables (LBB4416) is 50 m. You can use GOF and fiber interfaces to increase the distance between devices to more than 50 m and less than 1500 m (refer to chapter 42).

> **i** **Note**
>
> If the distance between two devices is less than 100 m, use a network splitter between devices to remove the use of fiber interfaces. Use only the trunk sockets of the network splitter in this case.

2.6.3 Cable couplers

You can use the LBB4419/00 Cable Couplers to connect optical network cables to each other. A cable coupler causes optical attenuation. Each cable coupler decreases the maximum distance between two devices in the optical network (normally 50 meters) with 20 meters.

2.6.4 Maximum cable length

The maximum cable length (LBB4416 and GOF) of the optical network is dependent on:
- The number of nodes
- The number of LBB4414/10 Fiber Interfaces

Do as follows:
1 Find the number of nodes of each device from the node value table (refer to table 2.1). Add together the nodes of all devices.
2 With the value of step 1, use the graph (refer to figure 2.2) to find the maximum cable length without LBB4414/10 Fiber Interfaces.
3 Count the number of LBB4414/10 Fiber Interfaces. Each fiber interface decreases the maximum cable length from step 2 with 18 m.
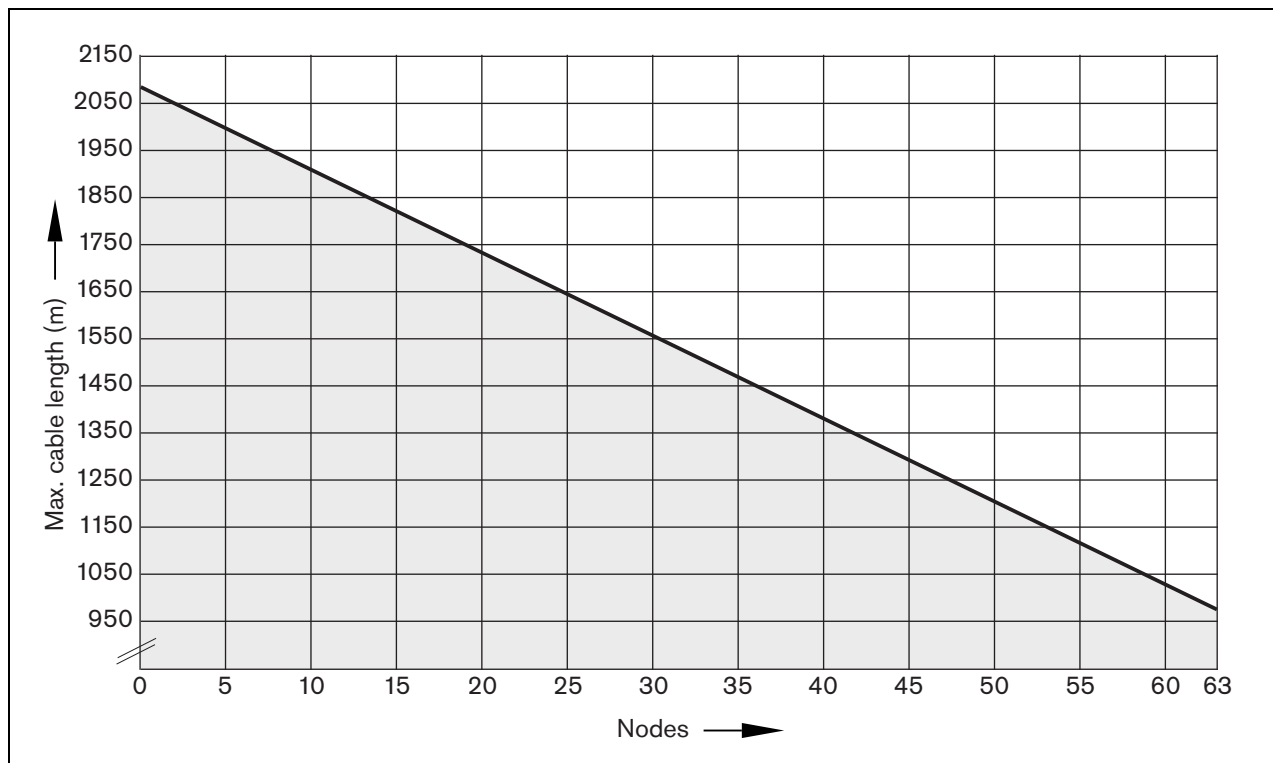
figure 2.2: Cable correction graph

2.6.5 Bending

The minimum bend radius of a 90 degree bend in an LBB4416 cable is 110 mm (refer to figure 2.3). A 180 degree bend is the same as two 90 degree bends.
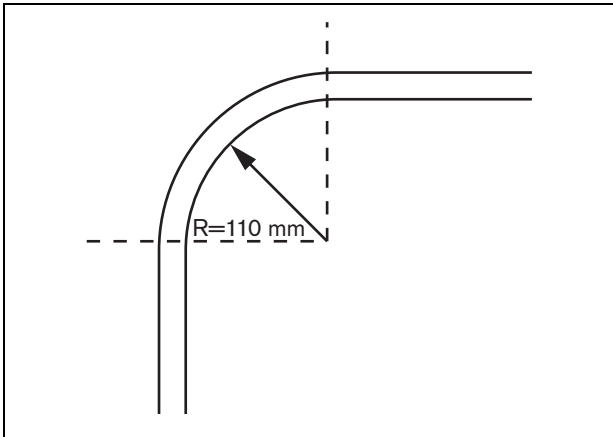
figure 2.3: Bend radius

2.6.6 Coiling

The minimum coiling radius of an LBB4416 cable is 110 mm (refer to figure 2.4).
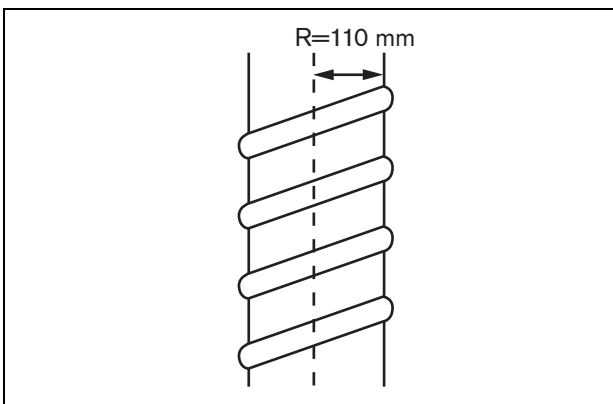
figure 2.4: Coiling radius

2.7 Example layouts

2.7.1 Introduction

The number and type of devices that make the optical network give the layout of the optical network. This chapter shows examples of the possible layouts of optical networks.

2.7.2 Basic optical network

Refer to figure 2.5 for an example of a basic optical network.
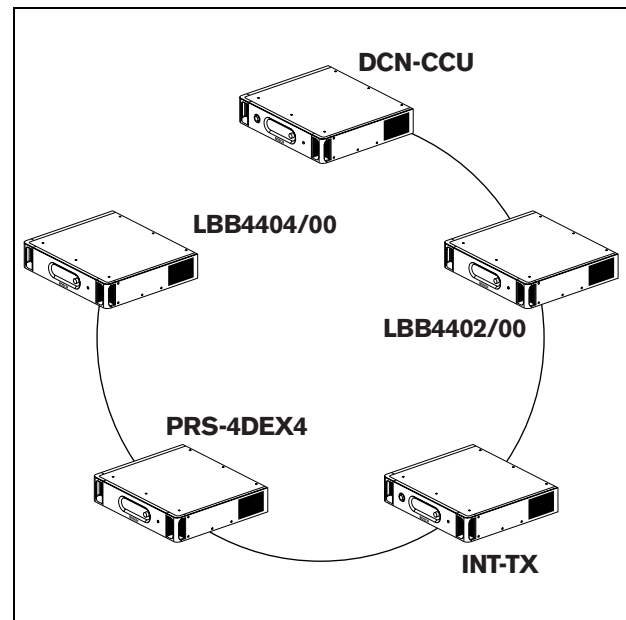
figure 2.5: Basic optical network

2.7.3   Redundant optical network

The basic optical network (refer to figure 2.5) has no redundant cables. If the cable between the central control unit (DCN-CCU) and the audio expander (LBB4402/00) breaks, the central control unit cannot transmit data to the audio expander. A solution for this problem is to use a redundant cable (refer to figure 2.6).
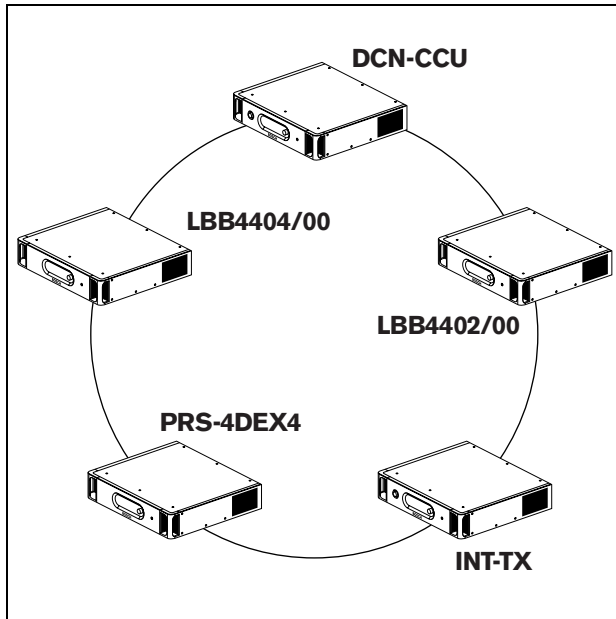
figure 2.6: Redundant optical network

The basic system with no redundant cables has no connection between the cobranet interface (LBB4404/00) and the central control unit (DCN-CCU). A system with redundant cables has a connection between the Cobranet Interface and the central control unit. This connection makes a ring. If a cable breaks, the optical network continues to operate.

The maximum total power of all devices in the redundant optical network is 65 W. If the optical network is defective near the central control unit, the other socket can supply power to all of the optical network.

2.7.4   Tap-offs

The network splitter (LBB4410/00) lets you make tap-offs (refer to figure 2.7). Tap-offs cannot be redundant. If the cable between the network splitter and the digital audio expander (PRS-4DEX4), becomes defective, the digital audio expander has no connection to the central control unit.
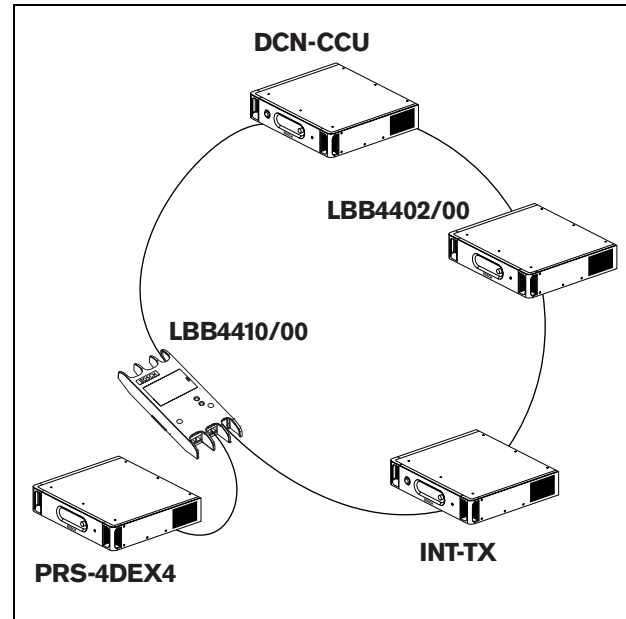
figure 2.7: Redundant optical network with tap-off

2.7.5   Multi-CCU system

Refer to figure 2.8 for an example of a basic multi-CCU system. The following can be connected to a multi-CCU system:

• A maximum of 30 DCN-CCU devices (refer to section 2.4).

• A maximum of 4000 delegate positions (up to 1500 delegate positions when used in combination with a PC).
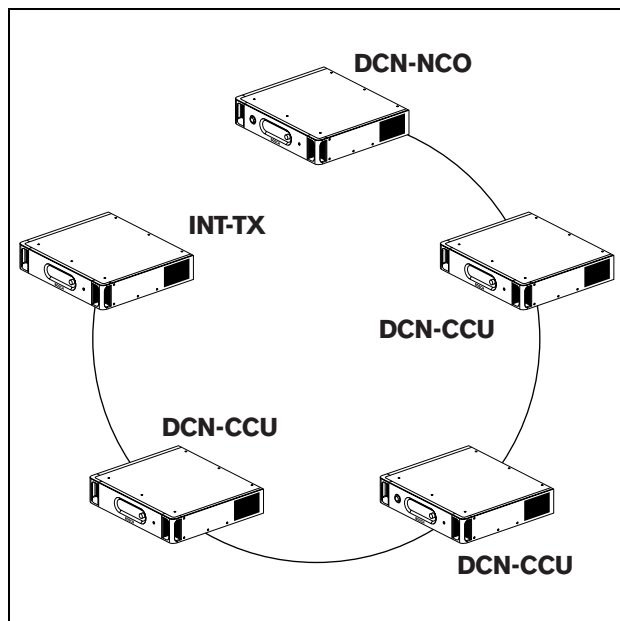
figure 2.8: Basic multi-CCU system

3 Wireless language distribution

You can connect the system to an Integrus digital infra-red language distribution system. This system has a transmitter, radiators and receivers.

> ℹ️ **Note**
> Refer to the Integrus Installation and User Instructions for more data.

figure 3.1: Integrus

4   CobraNet

CobraNet is a standard for the transport of real-time digital audio and control data through an Ethernet network. A CobraNet network can transport a maximum of 64 channels of 48 kHz, 20-bit audio through a 100 Mbit link connection in each direction. Many manufacturers of professional audio devices support the CobraNet standard.

The DCN Next Generation digital congress network can connect to CobraNet networks with the LBB4404/00 Cobranet Interface. For example, you can use the LBB4404/00 Cobranet Interface to:
- Benefit from Ethernet infrastructure
- Transport audio signals over large distances

PC data, for example data from the DCN Next Generation Open Interface can co-exist with CobraNet data on the same Ethernet network when you use managed Ethernet switches that are approved by Peak Audio.

> **Note**
> Refer to the CobraNet.info website (www.cobranet.info) for:
> - More data about CobraNet networks.
> - A list of approved Ethernet switches.

5　User set-up

5.1　Public areas

5.1.1　Hall displays

Put the hall displays in a position where users can easily see the display. Do not put the display in direct lighting or sunlight. The following has an effect on the visibility for the specified system:

- The distance that is necessary to see the display.
- The character size of the displays.
- Contrast and intensity of the lighting conditions.

The supplier of the hall display recommends all necessary adjustments.

5.1.2　Public areas and Walkways

Keep public areas clear of system and extension cables and connections.

5.2　Headphones/headsets

Put headphones and headsets with:

- Interpreter desks.
- Concentus delegate and chairman units.
- Channel selectors.
- Discussion units.
- Integrus receivers.

Acoustic feedback between the connected headphones or headsets and the microphone occurs when:

- The volume level is set too high.
- The headphones are too close to enabled microphones.

You must tell the users to keep sufficient distance from the microphones or not to set the volume level higher than is necessary. Refer to section 6.7.

5.3　Speaking distance

The recommend speaking distance from the microphones is 0.2 m to 0.4 m.

5.4　Interpreter booths

Make sure each interpreter booth has sufficient dimensions. The International Organization for Standardization (ISO) gives the specification for interpreter booths. For more data, refer to standard ISO 2603 'Booths for simultaneous interpretation - General characteristics and equipment'.

6   Device set-up

6.1   General

⚠️ **Caution**

Do not put objects on top of devices. Objects can fall through the airflow holes. A blockage of the airflow holes can cause a risk of fire.

⚠️ **Caution**

Do not put the devices near or above a radiator, heat grill or in direct sunlight.

⚠️ **Caution**

Do not cause vibration of the devices.

• Make sure that the area is clean.
• Make sure that the air is sufficiently cool.
• Make sure that there is sufficient lighting.

6.2   Cables

Use different cable ducts for the extension and mains cables. Identify each cable with a label and divide trunks to manageable geographic locations. In public areas where people can touch or move above the connectors and cables, use metal protection covers. Refer to the applicable protection specification of the protection covers.

6.3   Temperature

When devices are in a 19-inch rack, make sure there is rack space between the devices to let sufficient airflow. Forced airflow may be necessary to keep the temperature of the devices below the maximum temperature (refer to section 7.2). This extends the lifetime of the devices.

6.4   Ventilation

Keep a good airflow. Airflow holes are in the front, right and left sides of all 19-inch devices (for example, the central control unit and the audio expander).

• Put the devices on a hard and level surface.
• Put the central control unit at a minimum distance of 0.10 m from walls to let sufficient air flow.

6.5   Cleaning

⚠️ **Caution**

Do not use alcohol, ammonia or petroleum solvents or abrasive cleaners to clean the devices.

1   Disconnect the mains power supply from the devices, if you want to clean the devices.
2   Use a soft cloth that is not fully moist with a weak soap and water solution.
3   Let the device fully dry before you operate the device again.

6.6   Storage

ℹ️ **Note**

If the central control unit is stopped or disconnected from the mains power supply for more than 100 days, the values of all system parameter are erased. This includes all the values of the parameters of the interpreter desks, as well as the Software Licence code.

1   Disconnect the mains power supply from the devices, if you do not use the devices for a long time.
2   Keep the devices in a clean and dry area with a sufficient airflow.

6.7   Acoustic feedback

Acoustic feedback ('howling') occurs when the sound of the loudspeakers or headphones in the system is sent to the system again by enabled microphones.

table 6.1: Acoustic feedback

Source	Quick solution	Structural solution
The acoustic feedback is caused by the loudspeakers of the contribution devices.	Decrease the volume level of the system. For example, with the knob on the front of the central control unit (refer to section 8.10.3).	Do as follows: 1 Install a feedback suppressor between audio input 2 and audio output 2 of the central control unit. 2 Set the audio routing mode of the system to Insertion (refer to section 8.8.2).
The acoustic feedback is caused by an external public address system that is connected to the DCN Next Generation digital congress network.	Decrease the volume level of the public address system or the DCN Next Generation digital congress network.	Install a feedback suppressor between audio output 1 and the input of the external public address system.
The acoustic feedback is caused by the headphones that are connected to the contribution devices.	Tell the chairmen and the delegates to decrease the volume level of their headphones with their contribution devices.	Install and configure the headphones level reduction of the contribution devices. (Refer to the section about the contribution devices.)

7   Technical data

7.1   System electrical and electro-acoustic characteristics

7.1.1   General

table 7.1: Electro-acoustic characteristics

Nominal input level:
85 dB SPL
Overload input level:
110 dB SPL
Automatic gain reduction (not for PA-floor output):
• 24 dB (interpretation channels)
• 12 dB (delegate loudspeaker channel)
Automatic gain reduction with:
• 3 dB (2 microphones on
• 5 dB (3 microphones on)
• 6 dB (4 or more microphones on)
Loudspeaker gain control:
24 x 1 dB and off (mute)

7.1.2   Transmission links

- From delegate microphone to interpreter headphones
- From delegate microphone to delegate headphones
- From interpreter microphone to delegate headphones
- From interpreter microphone to interpreter headphones
- From auxiliary input to delegate headphones
- From auxiliary input to interpreter headphones
- From delegate microphone to auxiliary output
- From interpreter microphone to auxiliary output

table 7.2: Transmission links

Frequency response:
• 125 Hz to 20 kHz (General)
• 125 Hz to 3.5 kHz (Intercom links)
Harmonic distortion:
< 0.5%
Harmonic distortion @ overload:
< 1%
Crosstalk attenuation @ 4 kHz:
> 80 dB
Dynamic range:
> 90 dB

7.1.3 Combined devices from input to output

- Delegate microphone with transmission link to interpreter headphones
- Delegate microphone with transmission link to delegate headphones
- Delegate microphone with transmission link to auxiliary output

- Interpreter microphone with transmission link to interpreter headphones
- Interpreter microphone with transmission link to delegate headphones
- Interpreter microphone with transmission link to auxiliary output

table 7.3: Combined devices from input to output

Typical frequency response:
125 Hz to 20 kHz
Front-to-random sensitivity index:
> 4.6 dB
Rated equivalent sound pressure level due to inherent noise:
< 25 dB(A)
Total harmonic distortion @ overload:
< 1%
Crosstalk attenuation:
> 80 dB

7.2 Environmental conditions

table 7.4: Environmental conditions

Working conditions:
Fixed, stationary, transportable
Temperature range:
• -20 to +70 °C (transport)
• +5 to +45 °C (operation)
• For EPS and contribution devices with an LCD, the maximum temperature is +40 °C.
Relative humidity:
< 95%

7.3 Safety

According Low Voltage Directive 73/23/EEC amended by Directive 93/68 EEC.

- For European countries: according EN60065.
  Marking: CE
- For international countries: IEC 60065 according CB-Scheme.
- For North America:
  - USA: ANSI/UL 60065
  - Canada: CAN/CSA no. 60065
  - Marking c-CSA-us.

7.4 Electro-magnetic compatibility

table 7.5: Electromagnetic compatibility

EMC compatibility:
According ECM Directive 89/336/EEC amended by Directive 93/68/ECC
European approvals: CE marking
EMC environment: for commercial or professional use
EMC emission:
According harmonized standard EN 55103-1 (E3) (prof. audio/video equipment)
According FCC rules (FCC part 15) complying to limits for class A digital devices
EMC immunity:
According harmonized standard EN 55103-2 (E3) (prof. audio/video equipment)
Immune to mobile phones

7.5 Miscellaneous

table 7.6: Miscellaneous

Basic standard ESD:
According EN 61000-4-2.
Contact discharge: 4 kV and air discharge: 8 kV
Basic standard mains harmonics and voltage fluctuations, flicker:
According EN 61000-3-2 and EN 61000-3-3
Basic standard RF electromagnetic fields:
According EN 61000-4-3
RF conducted: 150 kHz - 80 MHz: 3 Vrms
RF radiated 80 - 1000 MHz: 3 V/m
Cellular telephone (GSM) dummy test: at 20 cm speech distance
Criteria: not effecting normal operation.
Magnetic immunity:
Rack mounting: 50 Hz - 10 kHz: 4 - 0.4 A/m
No rack mounting: 50 Hz - 10 kHz: 3 - 0.03 A/m
Basic standard low energy electrical fast transients, bursts:
According EN 61000-4-4
Mains: fast transients: 1 kV; signal and control data lines: 0.5 kV
Basic standard high energy surges:
According EN 61000-4-5
Mains: surges: 1 kV CM and 0.5 kV DM.
Basic standard voltage dips, short interruptions, variations:
According EN 61000-4-11
Mains: voltage dips 100% for 1 period, 60% for 5 periods, > 95% for 5 seconds.
Shock resistance:
According to IEC 68.2.29 Eb
Vibration resistance:
According to IEC 68.2.6 Fc, procedure A

Section 2 - Central Devices

8   DCN-CCU Central Control Unit

8.1   Introduction

The DCN-CCU Central Control Unit controls the system. The central control unit can operate with or without a control PC.

> **Note**
> The DCN-CCU-UL is the CSA/UL approved version of the DCN-CCU.

> **Note**
> The network controller and all CCUs in a multi CCU system must be switched on in order to work correctly, even if the CCUs are set to single mode.

> **Note**
> Transmitters, CCUs and network controllers must be connected to an optical network in the power off state.

8.2 Controls, connectors and indicators

8.2.1 Front view

The front of the central control unit (refer to figure 8.1) contains:

1 **On/off switch** - Starts and stops the central control unit.
2 **Display** - Shows the configuration menu (refer to section 8.10).
3 **Knob** - Operates the configuration menu (refer to section 8.10). You can also change the volume level of the system with the knob.
4 **Headphones socket** - Connects headphones to the central control unit (refer to section 8.5.4).
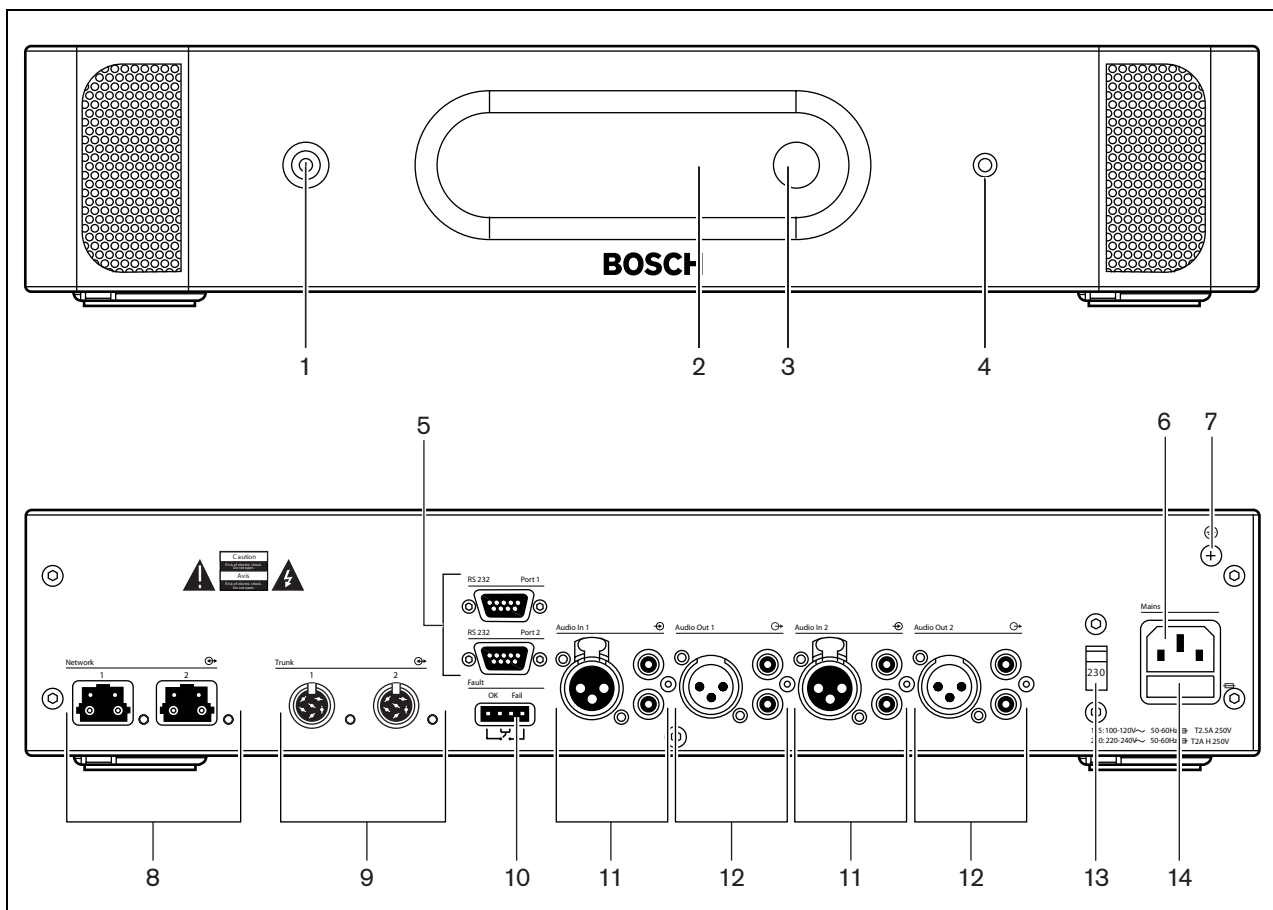
figure 8.1: Front and rear views

8.2.2 Rear view

The rear of the central control unit (refer to figure 8.1) contains:

5 **RS232 ports** - Connect a PC, remote controllers or video cameras to the central control unit (refer to section 8.5.8).

6 **Power inlet** - Connects the central control unit to the mains power supply with a power cable (refer to section 8.5.1).

7 **Ground screw** - Connects the central control unit to ground.

8 **Optical network sockets** - Connect the central control unit to the optical network (refer to section 8.5.3).

9 **DCN sockets** - Connect the central control unit to the DCN (refer to section 8.5.2).

10 **Fault contact** - Connects the central control unit to devices to sense the condition of the central control unit (refer to section 8.5.7).

11 **Audio inputs** - Connect the central control unit to external analog audio sources (refer to section 8.5.5). The functions of the audio inputs are:
  • Audio input 1: Floor
  • Audio input 2: Selectable recorder/delegate loud-speaker/mix-minus/insertion (refer to section 8.8.2).

12 **Audio outputs** - Connect the central control unit to external analog audio devices (refer to section 8.5.6). The functions of the audio inputs are:
  • Audio output 1: PA
  • Audio output 2: Selectable recorder/delegate loudspeaker/mix-minus/insertion (refer to section 8.8.2).

13 **Voltage selector** - Selects the voltage on which the central control unit must operate (refer to section 8.5.1).

14 **Fuse holder** - Prevents damage to the internal power supply unit of the central control unit (refer to section 8.5.1).

8.3 Internal settings

8.3.1 Overview

⚠️ **Caution**
Before you open the central control unit, disconnect it from the mains power supply. Electrical discharges from the mains power supply can kill you.

⚠️ **Caution**
Before you open the central control unit, take measures to prevent electro-static discharges.

The PCBs of the central control unit (refer to figure 8.2) contain:

15 **Software LEDs** - Show the condition of the software of the central control unit. When the software runs correctly, the yellow LED flashes and the green LED is constantly on.

16 **S600 switches** - Reserved (refer to section 8.3.2).

17 **X605 jumper block** - Enables or disables the watchdog (refer to section 8.3.5).

18 **Reset switch** - Starts the central control unit again.

19 **Optical network processor indicator** - Comes on when the optical network processor operates correctly.

20 **S500 switches** - Configure the RS232 ports of the central control unit (refer to section 8.3.3).

21 **X600 jumper block** - Connects and disconnects the internal back-up battery of the central control unit (refer to section 8.3.4).

22 **X104 jumper block** - Connects and disconnects the mechanical ground and the electrical ground (refer to section 8.3.6).

23 **Fuse** - Prevents damage to the electronic components in the central control unit.
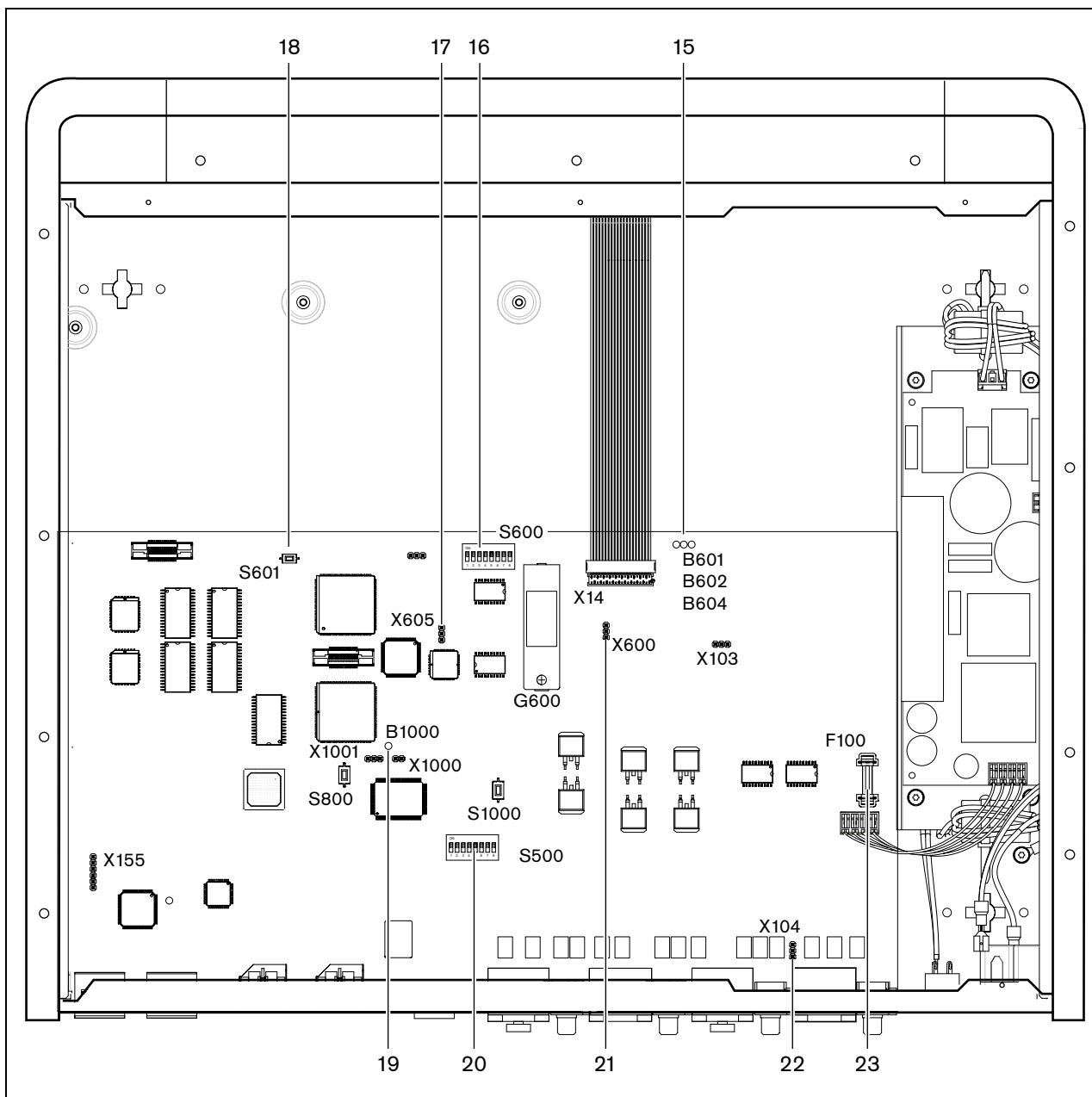
figure 8.2: Internal settings

8.3.2   S600 switches

table 8.1: S600 switches (= default)*

Switch	Position	Description
S600-1	ON* OFF	Reserved. Do not change the position of this switch.
S600-2	ON OFF*	Reserved. Do not change the position of this switch.
S600-3	ON OFF*	Reserved. Do not change the position of this switch.
S600-4	ON OFF*	Reserved. Do not change the position of this switch.
S600-5	ON OFF*	Reserved. Do not change the position of this switch.
S600-6	ON OFF*	Reserved. Do not change the position of this switch.
S600-7	ON OFF*	Reserved. Do not change the position of this switch.
S600-8	ON OFF*	Boot mode. Enables the download of new firmware (in case a download failed). Normal operation.

8.3.3   RS232 configuration

Use the S500 switches to configure the RS232 ports of
the central control unit (refer to table 8.2 and table 8.3).

table 8.2: RS232 protocol (= default)*

Protocol	Port 1		Port 2	
	S500-1	S500-2	S500-5	S500-6
Open interface	Off	Off	Off	Off
Terminal	Off	On	Off	On
Full	On*	Off*	On	Off
Camera control	On	On	On*	On*

table 8.3: RS232 baudrate (= default)*

Baudrate	Port 1		Port 2	
	S500-3	S500-4	S500-7	S500-8
9.6k	Off	Off	Off	Off
19.2k	Off	On	Off*	On*
57.6k	On	Off	On	Off
115.2k	On*	On*	On	On

8.3.4   Internal back-up battery

Use the X600 jumper block to connect and disconnect the internal back-up battery of the central control unit (refer to table 8.4).

> **i** **Note**
> When your central control unit is new, you must energize the central control unit to charge the internal back-up battery. The internal back-up battery is fully charged after 24 hours.

table 8.4: X600 jumper block (= default)*

Jumper shunt	Description
1 and 2 *	Connects the internal back-up battery. When you stop the central control unit, the memory of the central control unit is not erased.
2 and 3	Disconnects the internal back-up battery. When you stop the central control unit, the memory of the central control unit is immediately erased. The memory of the central control unit contains: • The license code • The settings of the interpreter desks.

> **i** **Note**
> You only have a license code when you use the system in combination with:
> • The PC Control Software
> • A remote controller

8.3.5   Watchdog

Use the X605 jumper to enable or disable the watchdog of the central control unit (refer to table 8.5).

table 8.5: X605 jumper block (= default)*

Jumper shunt	Description
Present	The watchdog is disabled. The central control unit does not start again after an error.
Not present*	Enables the watchdog. The central control unit starts again after an error.

> **i** **Note**
> When you disable the watchdog, the system can operate incorrectly.

8.3.6   Ground

Use the X104 jumper block to connect and disconnect the system ground and the ground of the central control unit (refer to table 8.6). For example, you can connect the system ground and the ground of the central control unit to prevent hum.

table 8.6: X104 jumper block (= default)*

Jumper shunt	Description
1 and 2	Connects the system ground and the ground of the central control unit.
2 and 3 *	Disconnects the system ground and the ground of the central control unit.

> **i** **Note**
> When you connect the system ground to the ground of more than one device in the system, you can create ground loops. Ground loops can cause hum.

8.4   Installation

Install the central control unit in a 19-inch rack system or on a flat surface. Four feet and two brackets are supplied with the central control unit (refer to figure 8.3).
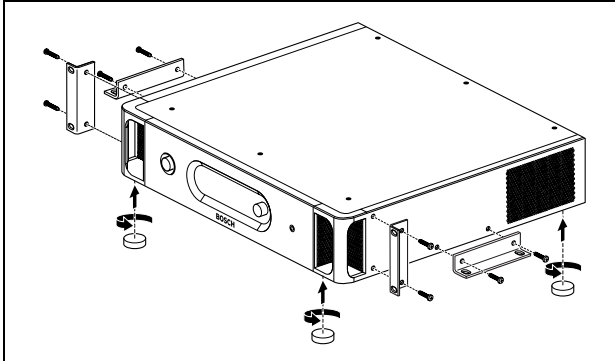
figure 8.3: Installation

table 8.7: Physical characteristics

Dimensions (h x w x d), flat surface:
92 x 440 x 400 mm (without brackets, with feet)
Dimensions (h x w x d), 19-inch rack system:
88 x 483 x 400 mm (with brackets, without feet)
Weight:
6.7 kg (without brackets, without feet)

> **i** **Note**
>
> When you install the central control unit in a 19-inch rack system, the central control unit extends 36 mm in front of the brackets.

8.5   External connections

8.5.1   Power supply

To connect the central control unit to a mains power supply do as follows:

> **i** **Note**
>
> The DCN-CCU is configured for a voltage of 220 - 240 V(AC). The DCN-CCU-UL is configured for a voltage of 100 - 120 V(AC).

1 Set the voltage selector on the rear of the central control unit to the correct position (refer to table 8.8).

table 8.8: Voltage selector

Power supply voltage	Voltage selector
90 to 132 V(AC)	115
198 to 264 V(AC)	230

2 Make sure that the fuse holder in the rear of the central control unit contains the correct fuse (refer to table 8.9).

table 8.9: Fuses

Voltage selector	Fuse
115	T2.5A 250 V (UL 248)
230	T2AH 250 V (IEC 60127)

3 Connect a locally approved power cable to the central control unit (refer to figure 8.4).
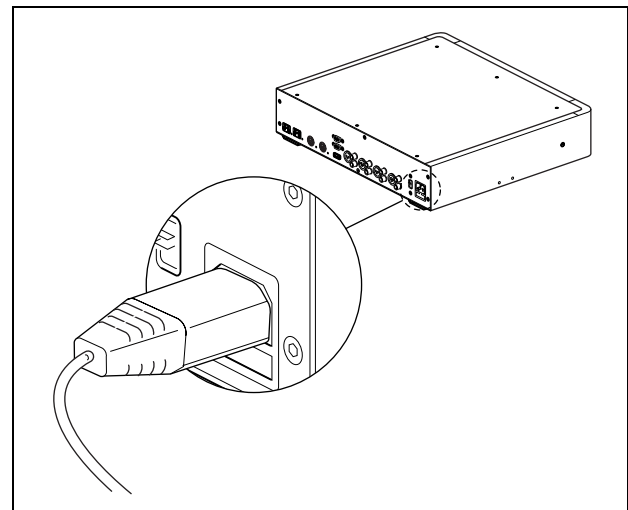
figure 8.4: Power supply

4   Connect the power cable to a power supply.

> ⚠️ **Caution**
>
> Make sure that the mains power supply is grounded. Electrical discharges from the mains power supply can kill you.

8.5.2   DCN

Connect the trunk of the DCN to the DCN sockets of the central control unit (refer to figure 8.5).
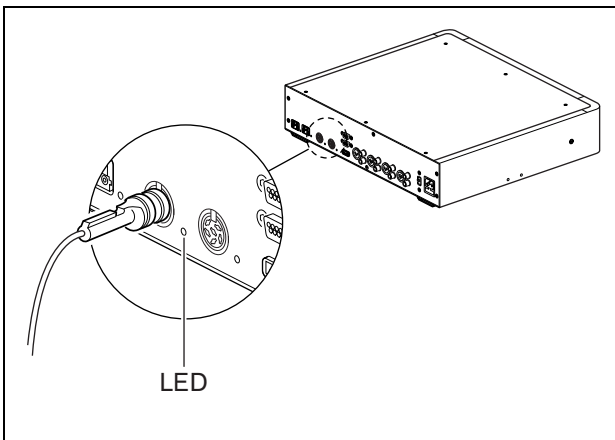
figure 8.5: DCN

Each DCN socket has a red LED that comes on if there is an overload (refer to figure 8.5 and section 2.5.4).

table 8.10: DCN connection

Number of connections:
2x DCN socket
Location:
Rear side
Power supply:
max. 65 W (refer to figure 1.1)

8.5.3   Optical network

Connect the trunk of the optical network to the optical network sockets of the central control unit with optical network cables (refer to figure 8.6).
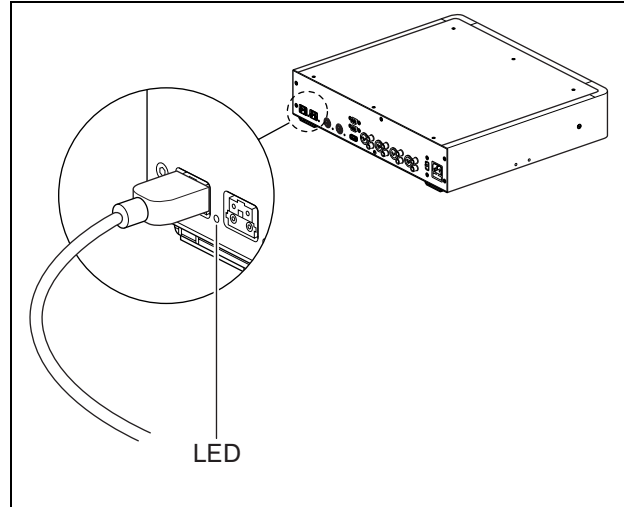
figure 8.6: Optical network

Each optical network socket has a red LED that comes on if there is an overload (refer to figure 8.6 and section 2.5.4).

table 8.11: Optical network connections

Number of connections:
2x proprietary sockets
Location:
Rear side
Nodes:
2
Power supply:
0 W when connected to a DCN-NCO
Max. 65 W when used without a DCN-NCO
(refer to figure 2.1)

8.5.4 Headphones

You can connect headphones to the headphones socket of the central control unit. The headphones must have a 3.5 mm plug (refer to figure 8.7).

figure 8.7: 3.5 mm headphones plug, connection

table 8.12: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
> You can also connect mono headphones to the headphones socket.

You can select the signal that is available on the headphones socket with the configuration menu (refer to section 8.10.9).

8.5.5 Audio inputs

You can connect an external analog audio source to the audio inputs of the central control unit. The central control unit has two audio inputs. Each audio input has (refer to figure 8.8):

- 1 XLR socket for balanced signals. The electric circuits behind the XLR sockets contain transformers.
- 1 double cinch socket for unbalanced signals.

> **i** **Note**
> The audio inputs change stereo signals in mono signals.
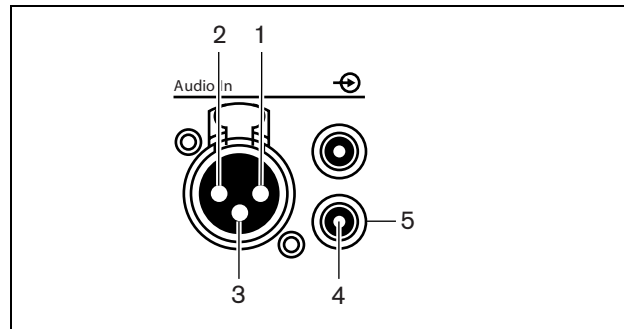
figure 8.8: Audio input, connection

table 8.13: Audio input, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal in
5		Return	Shield/ground

You can select the procedure that is used to send audio signals through the central control unit with the audio routing modes (refer to section 8.10.11).

> **i** **Note**
> You can only connect line level sources to the audio inputs of the central control unit. It is not possible to connect microphone sources.

table 8.14: Audio input details, line level signals

Number of connections:
• 1x XLR socket for each audio input
• 1x double cinch socket for each audio input
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level:
Refer to appendix A
Frequency response:
-3 dB @ 30 Hz and 20 kHz
Impedance:
• XLR: 22 kΩ
• Cinch: 12 kΩ
Signal-to-noise ratio:
> 85 dBA @ max. level
CMRR:
> 60 dB @ 100 Hz
> 50 dB @ 1 kHz
Crosstalk attenuation:
> 85 dB @ max. level
Distortion:
< 0.1% @ 100 Hz @ -3 dB of the max. input

8.5.6 Audio outputs

You can connect an audio recording device or a public address system to the audio outputs of the central control unit. The central control unit has two audio outputs. Each audio output has (refer to figure 8.9):

- 1 XLR plug for balanced signals. The electric circuits behind the XLR plugs contain transformers.
- 1 double cinch socket for unbalanced signals.

> **i** **Note**
> The two cinch sockets contain the same mono signal.
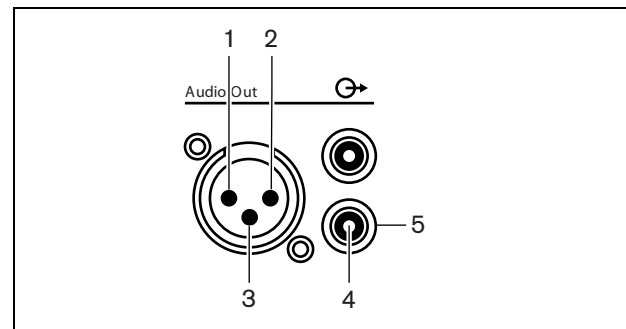
figure 8.9: Audio output, connection

table 8.15: Audio output, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal out
5		Return	Shield/Ground

You can select the procedure that is used to send audio signals through the central control unit with the available audio routing modes (refer to section 8.10.11).

table 8.16: Audio output details

Number of connections:
• 1x XLR plug for each audio output
• 1x double cinch socket for each audio output
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level (audio output 1):
Refer to appendix A
Nominal level (audio output 2):
Refer to appendix A
Frequency response:
-3 dB @ 30 Hz and 20 kHz
Impedance:
< 100 Ω
Signal-to-noise ratio:
> 89 dBA @ max. level
Crosstalk attenuation:
> 85 dB @ max. level
Distortion:
< 0.1% @ 100 Hz @ - 3 dB of the max. input

8.5.7 Fault contact

Use the fault contact to send the condition of the central control unit to external devices. If the central control unit operates correctly, the OK pins are internally connected. The central control unit internally connects the Fail pins when:

• The central control unit is stopped.
• The internal power supply unit operates incorrectly.
• The central control unit does a reset.
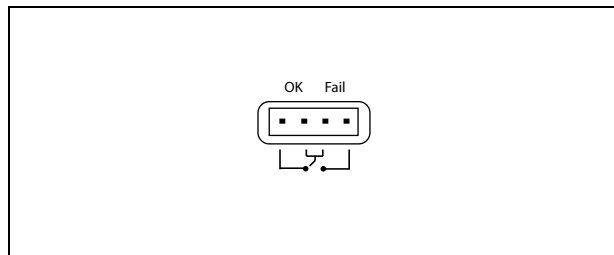
figure 8.10: Fault contact

table 8.17: Fault contact

Number of connections:
4-pole plug
Location:
Rear side
Signal:
Potential-free change-over relay
Voltage:
Max. 24 V(DC), 15 V(AC)
Current:
Max. 500 mA

8.5.8　RS232 ports

You can connect a PC, remote controllers or video cameras to the RS232 ports of the central control unit (refer to chapter 8.9). The central control unit has 2 RS232 ports. You can set the protocol and the baudrate of the RS232 ports with the S500 switches (refer to section 8.3.3).
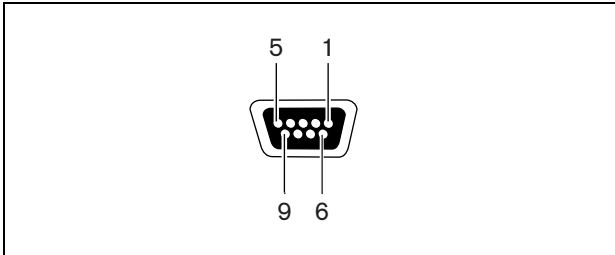
figure 8.11: RS232 port, connection

table 8.18: RS232 port, connection

Pin	Definition	Description
1	DCD	Data Carrier Select
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	SG	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

table 8.19: RS232 ports

Number of connections:
2x 9-pole SUB-D socket
Location:
Rear side
Maximum cable length:
9600 baud: 15 m, >9600 baud: 3 m
Signal levels:
EIA RS232-C interface specifications

8.6　Downloading

To download the software do the following:

1　Install the download and license tool on a PC (the download and license tool is on the CD).
2　Connect all central equipment that you want to use in this system to the CCU.
3　Connect the PC to the CCU.
4　Set the PC communication port to serial connection.
5　Select the correct serial port and baud rate (refer to section 8.3.3)
6　Download the CCU for wired DCN.
7　Download the optical devices.

> **ℹ Note**
>
> For the system to work correctly, all software and firmware of the central equipment and PC must be of the same release.

8.7　Initialization

8.7.1　Introduction

Each active device in the DCN (see section 1.5.1) must have an address. The central control unit cannot send data to an active device that does not have an address. During the initialization, the central control unit gives addresses to the active devices.

8.7.2　System

You must do the initialization of the system before you can use the system:

> **ℹ Note**
>
> It is not necessary to do an initialization when the system is re-installed in another location and contains the same devices after it is re-installed. Active devices hold their addresses.

1　Select the 7J De-init menu item of the configuration menu of the central control unit.

2　Push the knob to go to the 7J De-initialize menu item.

```
7J De-Initialize
Are you sure?No
```

3   Set the value of the parameter in the menu item to
    Yes. The addresses of all active devices in the DCN
    are erased. All LEDs on all active devices in the
    DCN come on.

```
7J De-Initialize
Are you sure?Yes
```

4   Push the microphone button of each active device in
    the DCN. When the central control unit gives an
    address to the active device, the LEDs of the active
    device go off.

> **i Note**
> Do not push more than one microphone button
> at the same time. The central control unit cannot
> give addresses to more than one active device
> at the same time.

> **i Note**
> The DCN-FVU Voting Units do not have a
> microphone button. Push voting button 3 to give
> an address to a voting unit.

> **i Note**
> You can also give an address to a DCN-DDI
> Dual Delegate Interface with voting button 3 of a
> connected DCN-FV Voting Panel.

8.7.3   Devices

You can also do the initialization of active devices that
are added to the system after you did the initialization of
the system.

> **⚠ Note**
> Use a paperclip or similar device to push the
> de-init switch. Do not use a sharp object,
> otherwise you might damage the de-init switch.

• Push the de-init switch of the active device for less
  than half a second to erase the address of the active
  device.
• Push and hold the de-init switch of the active device
  for more than one second to erase the address and
  do the initialization at the same time.

8.8   Configuration

8.8.1   Microphone modes
8.8.1.1   Introduction
Select the microphone mode with the 1 Mic. Mode
menu item (refer also to section 8.10.5). You can also set
the maximum number of enabled delegate
microphones.

> **i Note**
> In systems without a control PC, the maximum
> number of enabled chairman microphones is 15.

8.8.1.2   Open

In the Open mode, delegates can enable their microphones with the microphone button on their contribution devices. When the maximum number of delegates speak, the next delegate that enables his or her microphone is added to a request-to-speak list. The microphone is not enabled until another delegate disables his or her microphone.

> **i** **Note**
> Microphones of chairman devices can always be enabled in the Open mode.

8.8.1.3   Override

In the Override mode, delegates can activate their microphones with the microphone button on their contribution device. When the maximum number of delegates speak, the next delegate that activates his or her microphone automatically deactivates the microphone that was activated for the longest time.

> **i** **Note**
> Microphones of chairman units can always be activated in the Override mode.

8.8.1.4   Voice

In the Voice mode, delegates can enable their microphones with their voices. The maximum number of delegates that can speak at the same time is the same as the maximum number of enabled microphones. Delegates can mute their microphones with the microphone button on their contribution devices

> **i** **Note**
> The LED ring of the microphone (refer to section 17.4) does not come on. But, the LED of the microphone button is always on.

8.8.1.5   PTT

In the PTT (push-to-talk) mode, the delegates can activate their microphones with the microphone button on their contribution devices. The microphone is activated as long as the microphone button is pushed. When the maximum number of delegates speak, the other delegates cannot activate their microphones.

> **i** **Note**
> Microphones of chairman units can always be activated in the PTT mode.

8.8.2   Audio routing modes

8.8.2.1   Introduction

You can set the audio routing of audio input 2 and audio output 2 with the 7G Routing I/O 2 menu item (see section 8.10.11). The functions of audio input 1 and audio output 1 of the central control unit cannot be changed. The signal on audio input 1 is always added to the floor signal. The signal on audio output 1 is always suitable to connect the system to an external public address system.

8.8.2.2   Recorder

In the Recorder mode, audio output 2 of the central control unit transmits a signal that you can connect to an external audio recorder (refer to figure 8.12). The central control unit has no effect on the volume level of the signal.

In the Recorder mode, the signal on audio input 2 of the central control unit is added to the floor signal.
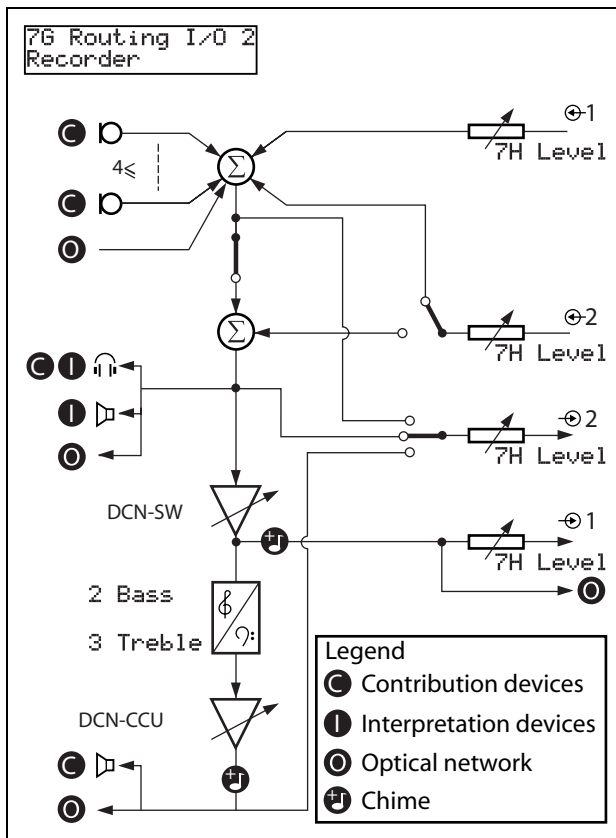
figure 8.12: Recorder
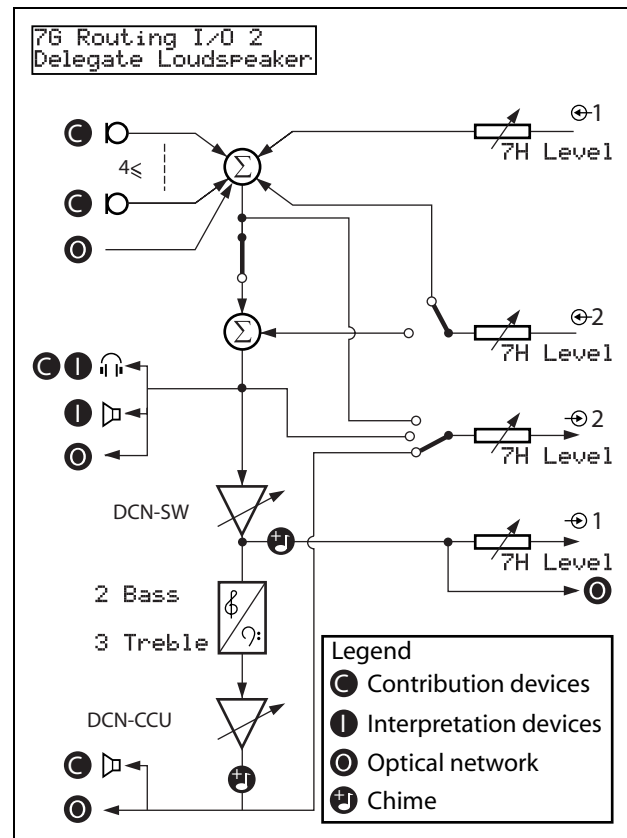
figure 8.13: Delegate loudspeaker

8.8.2.3   Delegate loudspeaker

In the Delegate loudspeaker mode, audio output 2 of the central control unit transmits a signal that you can connect to an external public address system (refer to figure 8.13). The central control unit sets:

- The volume level of the signal
- The levels of the bass of the signal
- The level of the treble signal

In the Delegate loudspeaker mode, the signal on audio input 2 of the central control unit is added to the floor signal.

8.8.2.4   Insertion

In the Insertion mode, audio output 2 and audio input 2 of the central control unit are used to add signals from external audio devices (refer to figure 8.14). For example, you can connect an external audio mixer between audio output 2 and audio input 2 of the central control unit.
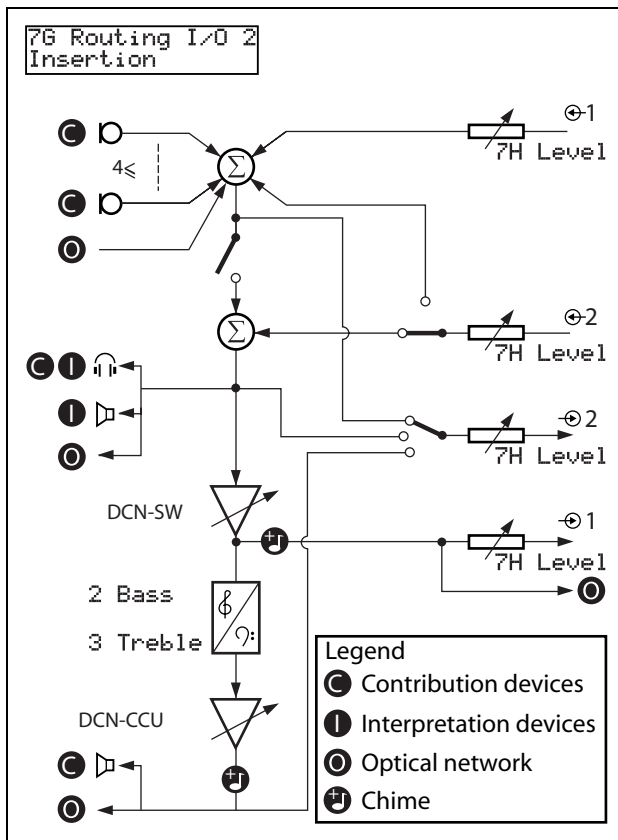
figure 8.14: Insertion

ℹ️ **Note**

In the Insertion mode, you must install a device between audio output 2 and audio input 2 of the central control unit. When you do not install a device, the audio signals from contribution devices (floor) leave the system, but do not enter the system again.

8.8.2.5 Mix-minus

Use the Mix-minus mode to:
- connect to a telephone coupler.
- connect two systems together.

ℹ️ **Note**

The Mix-minus connection does not cause acoustic feedback.

When you connect to a telephone coupler:
- Go to menu item 7G Routing I/O 2 to set the systems to the Mix minus mode.
- Connect audio input 2 and audio output 2 to the telephone coupler.

When you connect two systems together (refer to figure 8.15)
- Go to menu item 7G Routing I/O 2 to set the systems in the Mix minus mode.
- Connect audio input 2 of the first system to audio output 2 of the second system.
- Connect audio output 2 of the first system to audio input 2 of the second system.
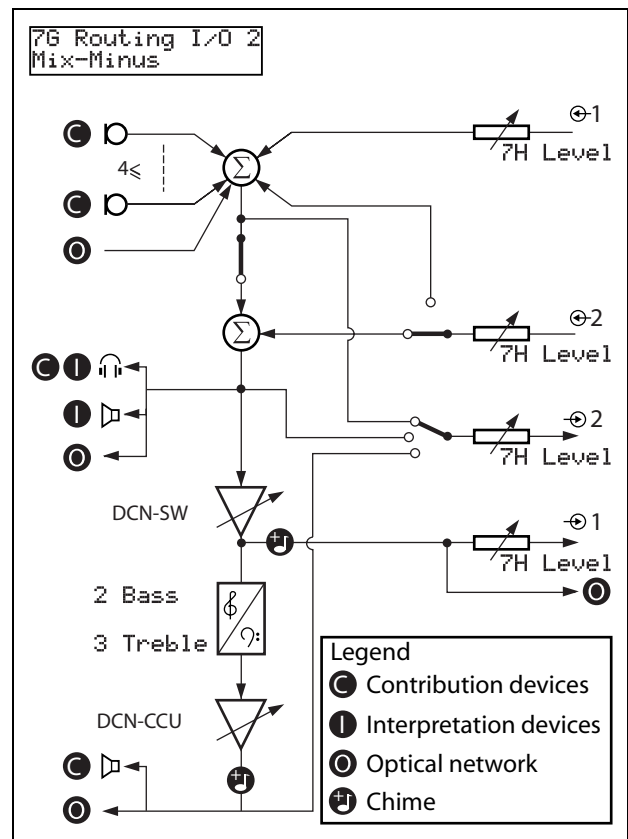
figure 8.15: Mix-minus

ℹ️ **Note**

When the distance between the two systems is great, you can use a telephone coupler to connect the two systems.

8.8.2.6   Local floor

Local floor is used to create directional sound. In the Local floor mode, audio output 4 of the central control unit only transmits the floor signal of the units connected to the CCU. You can connect audio output 4 to an external public address system.

8.8.3   Attention chimes

The central control unit can play an attention chime when the chairman:

- Pushes the priority button on the chairman device.
- Starts a voting session.

You can enable or disable attention chimes with the 7B Att. Tones menu item (refer also to section 8.10.11). There are 3 different attention chimes available.

8.8.4   Erase requests-to-speak and speakers

The central control unit can erase the requests-to-speak and speakers when the chairman pushes the priority button on the chairman device. You can enable or disable this function with the 7A Mic. Priority menu item (refer to section 8.10.11).

- If you set the menu item to Permanently off, the system does not activate the microphones of the delegates again when the chairman releases the priority button. The requests-to-speak and speakers are erased.
- If you set the menu item to Temporarily off, the system activates the microphones of the delegates again when the chairman releases the priority button. The requests-to-speak and speakers are not erased.

8.8.5   Floor distribution

The central control unit can send the floor signal to all empty channels in the system. You can enable or disable this function with the 7D Floor Distr. menu item (refer to section 8.10.11).

- If you set the menu item to Off, the central control unit does not send the floor signal to all empty signals in the system.
- If you set the menu item to On, the central control unit sends the floor signal to all empty channels in the system.

8.8.6   Intercom

8.8.6.1   Introduction

To enable the intercom you must first identify the locations of the operator and the chairman.

8.8.6.2   Location of the operator

To identify the location of the operator:

1   Select the 7Ea Assign menu item of the configuration menu of the central control unit.
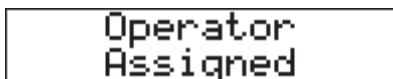
```
┌─────────────────────┐
│ 7Ea Assign          │
│ Operator? No        │
└─────────────────────┘
```

2   Set the value of the parameter in the menu item to Yes. The display of the central control unit shows:

```
┌─────────────────────┐
│    To Assign        │
│    Lift Handset     │
└─────────────────────┘
```

3   Lift the receiver of the intercom handset of the operator to identify the location of the operator. When the central control unit identifies the location, the display of the central control unit shows:

```
┌─────────────────────┐
│    Operator         │
│    Assigned         │
└─────────────────────┘
```

8.8.6.3   Location of the chairman

To identify the location of the chairman:

1   Go to the 7Eb Assign menu item of the configuration menu of the central control unit.

```
┌─────────────────────┐
│ 7Eb Assign          │
│ Chairman? No        │
└─────────────────────┘
```

2   Set the value of the parameter in the menu item to Yes. The display of the central control unit shows:

```
┌─────────────────────┐
│    To Assign        │
│    Lift Handset     │
└─────────────────────┘
```

3   Lift the receiver of the intercom handset of the chairman to identify the location of the chairman. When the central control unit identifies the location, the display of the central control unit shows:

```
Chairman
Assigned
```

8.9 Camera control configuration

8.9.1 Introduction

The central control unit can automatically point video cameras in the direction of the delegate or chairman that speaks.

You can connect camera(s) as follows:
- Direct camera control in a system without a PC.
- Camera control through a video switcher in a system without a PC.
- Direct camera control in a system with a PC.
- Camera control through a video switcher in a system with a PC.

8.9.2 Direct camera control without a PC

8.9.2.1 Overview

Refer to figure 8.16 for an overview of a system with direct camera control without a PC.

figure 8.16: Direct camera control without a PC

8.9.2.2 Requirements

These are the requirements for a system with direct camera control without a PC:
- AutoDome video camera (refer to the DCN Next Generation Data Brochure for recommended video cameras).
- Video display (refer to the DCN Next Generation Data Brochure for recommended video displays).
- Central control unit.
- Temporary PC with at least one serial port.
- LTC5136 Autodome Controller.

- LBB4162 Stand-alone Camera Control software module for systems without a PC.

8.9.2.3 Installation

1 Connect a video display to the video output of the AutoDome video camera.
2 Connect the LTC5136 AutoDome Controller to the AutoDome video camera.
3 Set the pre-positions of the AutoDome video camera with the AutoDome Controller.
4 Make sure that all pre-positions of the AutoDome video camera are correct.
5 Disconnect the LTC5136 AutoDome Controller from the AutoDome video camera.
6 Set the protocol for serial port 2 of the central control unit to camera control (refer to section 8.3.2).
7 Set the baudrate for serial port 2 of the central control unit to 9.6k (refer to section 8.3.2).
8 Connect the serial port of the temporary PC to the serial port 2 of the central control unit (refer to figure 8.17).

> ℹ️ **Note**
> Refer to section 8.5.8 for maximum cable lengths.
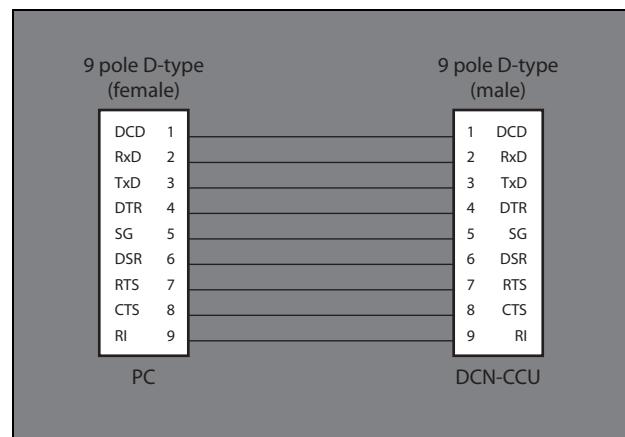
figure 8.17: PC to DCN-CCU

9 Install the LBB4162 stand-alone Camera Control software module in the temporary PC (refer to the DCN Next Generation Software Installation Instructions).
10 Attach the pre-positions of the AutoDome video camera to the seat numbers with the LBB4162 stand-

alone Camera Control software module (refer to the User Manual of the LBB4162 stand-alone Camera Control software module).

11 Disconnect the temporary PC from the central control unit.

12 Connect the AutoDome video camera to the central control unit (refer to figure 8.18).
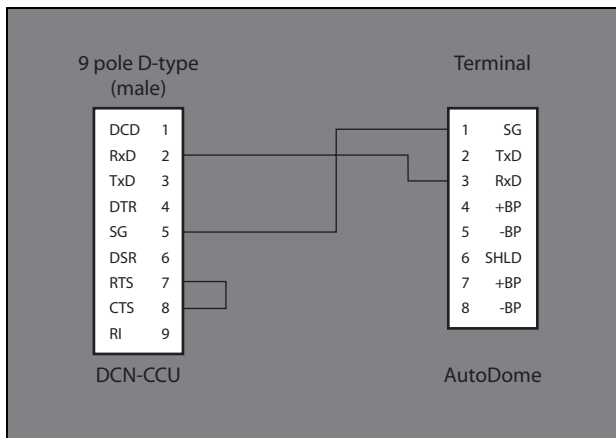
figure 8.18: DCN-CCU to AutoDome

8.9.3 Video switcher without a PC

8.9.3.1 Overview

Refer to figure 8.19 for an overview of a system without a PC and camera control through a video switcher.

figure 8.19: Video switcher without a PC

8.9.3.2 Requirements

These are the requirements for a system with camera control through a video switcher without a PC:

• Video cameras (refer to the DCN Next Generation Data Brochure for recommended video cameras).

• Allegiant video switcher with keyboard (refer to the DCN Next Generation Data Brochure for recommended video switchers).

• Video displays (refer to the DCN Next Generation Data Brochure for recommended video displays).

• Central control unit

• Temporary PC with two serial ports.

• LBB4162 Stand-alone Camera Control software module for systems without a PC.

8.9.3.3 Installation

1 Set the protocol for serial port 2 to camera control (refer to section 8.3.2).

2 Set the baudrate for serial port 2 to 19.2 k (refer to section 8.3.2).

3 Connect COM 1 of the temporary PC to the central control unit that is used to control video cameras (refer to figure 8.20).

> **i** **Note**
> Refer to section 8.5.8 for maximum cable lengths.
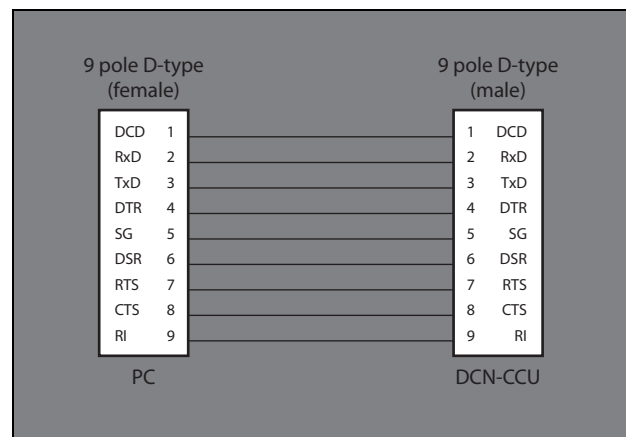
figure 8.20: PC to DCN-CCU

4 Connect COM 2 of the temporary PC to the serial port of the Allegiant video switcher (refer to figure 8.21). The baudrate of the connection must be 19.2k.
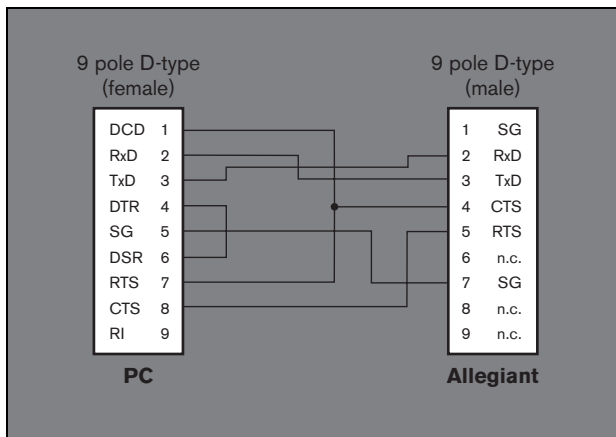
figure 8.21: PC to Allegiant

5 Connect a video display to the video output of the Allegiant video switcher.
6 Install the LBB4162 Camera Control software module in the temporary PC (refer to the DCN Next Generation Software Installation Instructions).
7 Start the LBB4162 Camera Control software module (refer to the User Manual of the LBB4162 Camera Control software module).
8 Set the pre-positions of the video cameras with the keyboard of the Allegiant video switcher.
9 Make sure that all pre-positions of all video cameras are correct.
10 Attach the pre-positions of the video cameras to the seat numbers with the LBB4162 Camera Control software module.
11 Disconnect the temporary PC from the central control unit and the Allegiant video switcher.
12 Connect the central control unit to the Allegiant video switcher (refer to figure 8.22).
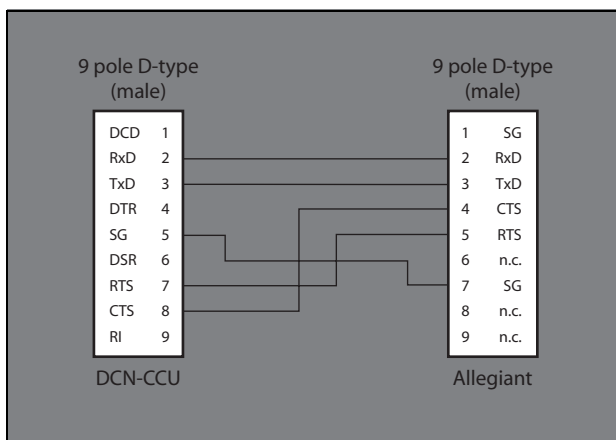
figure 8.22: Central control unit to video switcher

> **ℹ Note**
> When you make the cable that figure 8.22 shows, mark the ends of the cable with 'CCU' and 'Allegiant'. This makes sure that you connect the cable in the correct direction. When you connect the cable in the incorrect direction, the central control unit cannot send data to the Allegiant video switcher.

8.9.4 Direct control with a PC

8.9.4.1 Overview

Refer to figure 8.23 for an overview of a system with direct camera control with a PC.
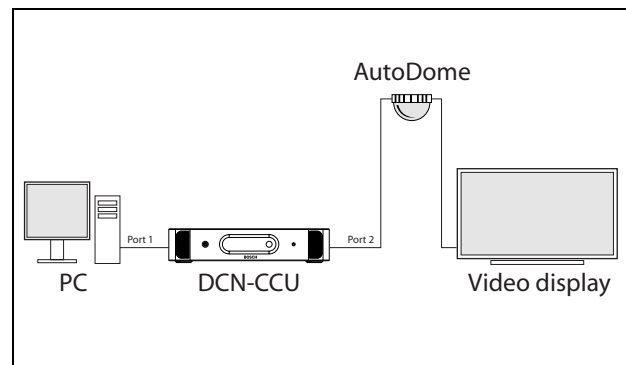
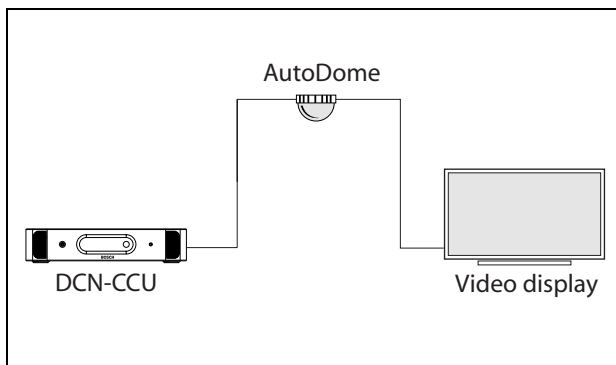*figure 8.23: Direct camera control with a PC*

8.9.4.2 Requirements

These are the requirements for a system with direct camera control with a PC:

- AutoDome video camera (refer to the DCN Next Generation Data Brochure for recommended video cameras).
- Video display (refer to the DCN Next Generation Data Brochure for recommended video displays).
- Central control unit
- PC with at least one serial port.
- LTC5136 Autodome Controller.
- LBB4188 Camera Control software module.

8.9.4.3 Installation

> **ℹ Note**
> Refer to section 8.5.8 for maximum cable lengths.

1 Connect a video display to the video output of he AutoDome video camera.

---

2 Connect the LTC5136 AutoDome Controller to the AutoDome video camera.

3 Set the pre-positions of the AutoDome video camera with the AutoDome controller.

4 Make sure that all pre-positions of the AutoDome video camera are correct.

5 Disconnect the LTC5136 AutoDome Controller from the AutoDome video camera.

6 Set the protocol and baudrate for serial port 1 and serial port 2 of the central control unit (refer to section 8.3.2 and table 8.20).

table 8.20: DCN-CCU to PC and AutoDome

Device	Serial port	Settings
PC	Port 1	Protocol: Full Baudrate: 115.2k
AutoDome	Port 2	Protocol: Camera control Baudrate: 9.6k

7 Connect the serial ports of the central control unit to the PC and the AutoDome video camera (refer to figure 8.24 and figure 8.25).
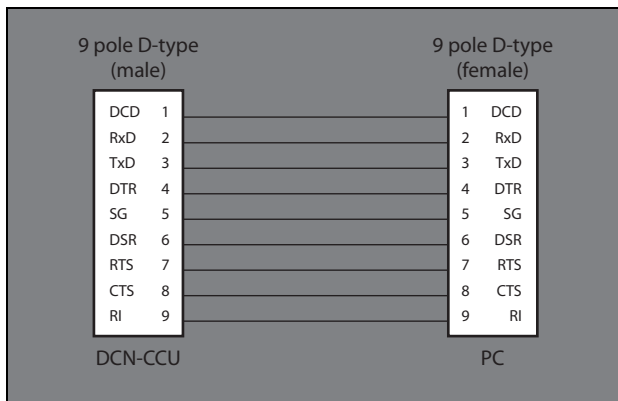
figure 8.24: DCN-CCU to PC
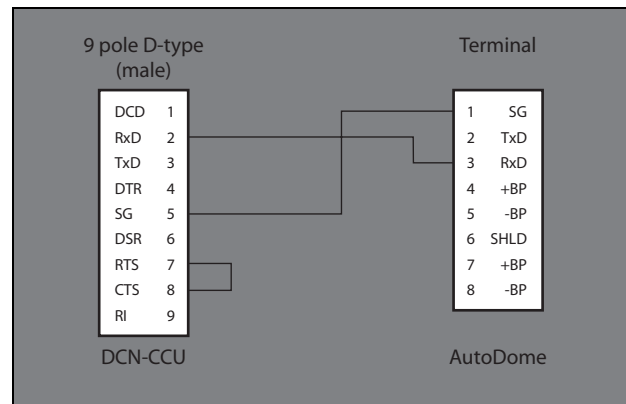
figure 8.25: DCN-CCU to AutoDome

> **i** Note
> Refer to section 8.5.8 for maximum cable lengths.

8 Install the LBB4188 Camera Control software module in the PC (refer to the DCN Next Generation Software Installation Instructions).

9 Attach the pre-positions of the AutoDome video camera to the seat numbers with the LBB4188 Camera Control software module (refer to the User Manual of the LBB4188 Camera Control software module).

8.9.5 Video switcher with a PC

8.9.5.1 Overview

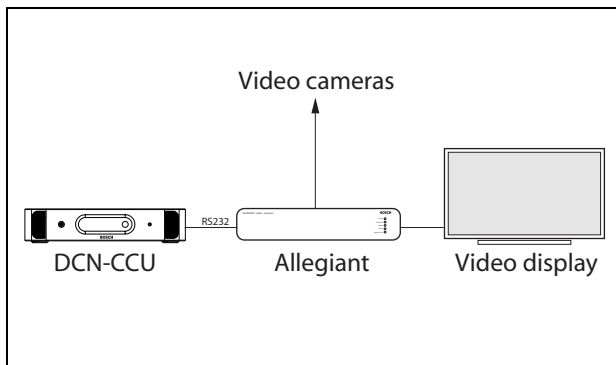Refer to figure 8.26 for an overview of a system with a PC and camera control through a video switcher.
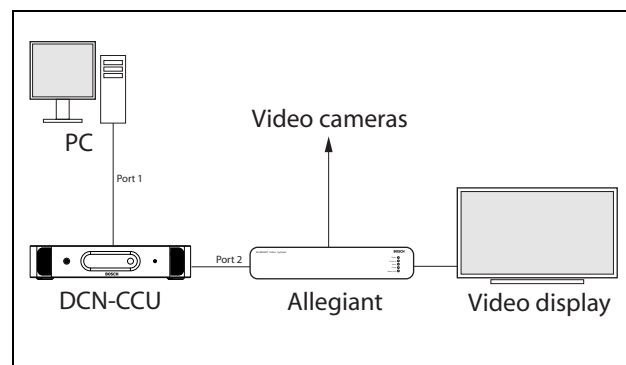
figure 8.26: Video switcher with a PC

8.9.5.2 Requirements

These are the requirements for a system with camera control through a video switcher with a PC:

- Video cameras (refer to the DCN Next Generation Data Brochure for recommended video cameras).
- Allegiant video switcher with keyboard (refer to the DCN Next Generation Data Brochure for recommended video switchers).
- Video displays (refer to the DCN Next Generation Data Brochure for recommended video displays).
- Central control unit.
- PC with at least one serial port.
- LBB4188 Camera Control software module.

8.9.5.3   Installation

1 Set the protocol and baudrate for serial port 1 and serial port 2 (refer to section 8.3.2 and table 8.21).
2 Connect the serial ports of the central control unit to the PC and the Allegiant video switcher (refer to figure 8.27 and figure 8.28).

table 8.21: DCN-CCU to PC and AutoDome

Device	Serial port	Settings
PC	Port 1	Protocol: Full Baudrate: 115.2k
Allegiant video switcher	Port 2	Protocol: Camera control Baudrate: 19.2k

figure 8.27: DCN-CCU to PC
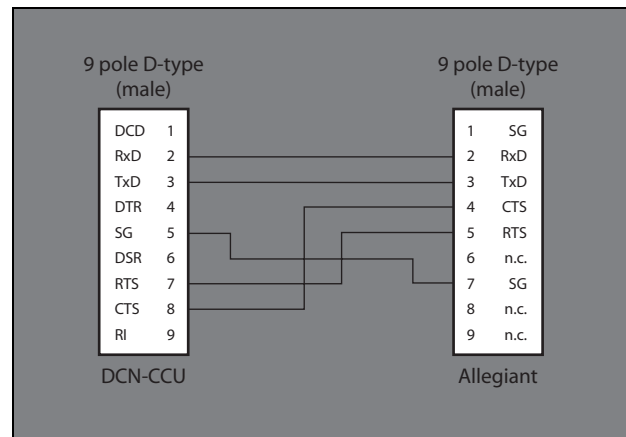
figure 8.28: DCN-CCU to Allegiant

> **i** **Note**
> Refer to section 8.5.8 for maximum cable lengths.

3 Connect a video display to the video output of the Allegiant video switcher.
4 Install the licence for the LBB4188 Camera Control software module in the CCU or network controller (refer to the DCN Next Generation Software Installation Instructions).
5 Start the LBB4188 Camera Control software module (refer to the User Manual of the LBB4188 Camera Control software module).
6 Set the pre-positions of the video cameras with the keyboard of the Allegiant video switcher.
7 Make sure that all pre-positions of all video cameras are correct.
8 Attach the pre-positions of the video cameras to the seat numbers with the LBB4188 Camera Control software module.

8.10 Configuration menu

8.10.1 Overview

Use the configuration menu of the central control unit to configure the central control unit and the system (refer to figure 8.29).
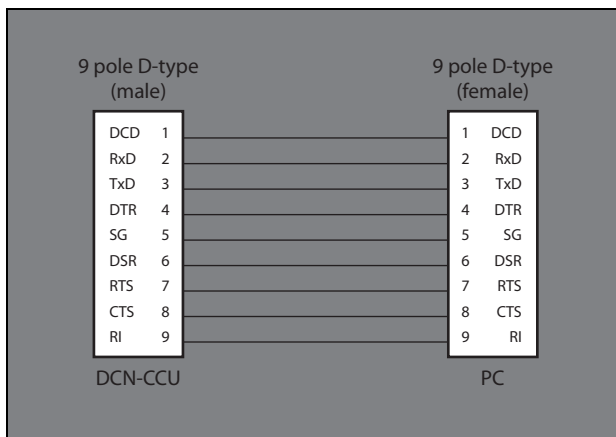
figure 8.29: Configuration menu

8.10.2　Navigation and operation

8.10.2.1　Menu items

The configuration menu consists of menu items. Refer to figure 8.30 for the parts of a menu item.
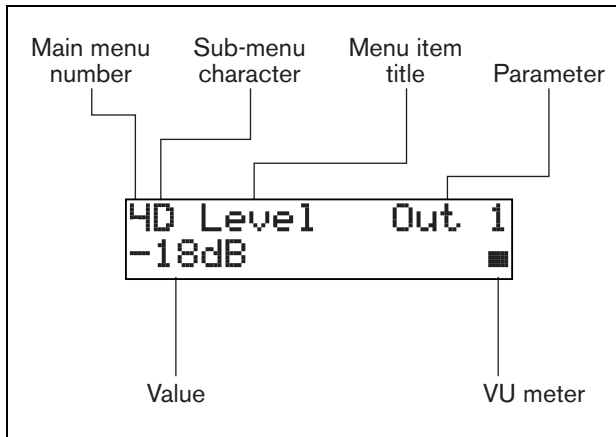
figure 8.30: Menu item parts

8.10.2.2　Number and characters

Identify menu items by the main menu number sub-menu character. The number identifies the main menu to which the menu item is connected. The characters identify the sub-menus to which the menu item is connected.

8.10.2.3　Menu title

Each menu item has a title. The title gives a short description of the function of the menu item.

8.10.2.4　Parameters and values

Most menu items have one or more parameters. To make adjustments, change the values of the parameters.

8.10.2.5　VU meter

Some menu items have a VU meter. The VU meter shows the volume levels of signals. The VU meter has seven rows.

table 8.22: VU meter

VU meter	Description
One row on	No signal
Seven rows on	Maximum signal
Triangle	Clipped signal
Minus	Disabled by control input

8.10.2.6　To open the main menu

To open the main menu, push the knob in the Main menu item. The main menu number and the menu item title flash.

8.10.2.7　To go through the main menu

- Turn the knob clockwise in the main menu to go to the next menu item in the main menu.
- Turn the knob counterclockwise in the main menu to go to the previous menu item in the main menu.

8.10.2.8　To open a sub-menu

When the display shows a menu item that has three dots (...), the menu item gives access to a sub-menu. To open the sub-menu, push the knob in a menu item that has three dots. (The last sub-menu character and the menu item title flash.)

> **ℹ Note**
>
> To open the Setup sub-menu, you must push and hold the knob for more than 3 seconds.

8.10.2.9　To select menu items in a sub-menu

1　Turn the knob clockwise in a sub-menu to go to the next menu item in the sub-menu.
2　Turn the knob counterclockwise in a sub-menu to go to the previous menu item in the sub-menu.

8.10.2.10　To open a menu item

1　Turn the knob to select the applicable menu item.
2　When the display shows the correct menu item, push the knob to open the menu item. The display shows a cursor.

8.10.2.11 To select a parameter

1 Open the correct menu item (refer to section 8.10.2.10).
2 Turn the knob to move the cursor to the parameter that is shown.
3 On the parameter, push the knob. The parameter flashes.
4 Turn the knob to go to the applicable parameter.
5 When the display shows the applicable parameter, push the knob to select the parameter. The display shows a cursor.

8.10.2.12 To change the value of a parameter

1 Select the applicable parameter (refer to section 8.10.2.11).
2 Turn the knob to move the cursor to the value.
3 Push the knob. The value flashes.
4 Turn the knob to go to the value.
5 When the display shows the correct value, push the knob to select the value. The display shows a cursor.

8.10.2.13 To close a menu item

1 Turn the cursor to the last character that identifies the menu item.
2 Push the knob to close the menu item. The last character and the menu item title flash.

8.10.2.14 To close a sub-menu

1 Turn the cursor to go to the last character but one that identifies the menu item.
2 Push the knob to close the sub-menu. The last character and the menu item title flash.

8.10.2.15 To close the main menu

1 From the main menu, turn the primary knob clockwise to go to the < Back menu item.
2 From the < Back menu item, push the knob to go to the Main menu item.

8.10.2.16 Example

For an example, do as follows to change the level of audio input 2 of the central control unit:

> **i** **Note**
> Make sure that when you do this example, you start from the main screen.

1 Push the knob to open the main menu.

```
1 Mic. Mode
Open      NOM:4
```

2 Turn the knob clockwise until 7 Setup ... is reached.

```
7 Setup      ...
```

3 Push-and-hold the knob for 3 seconds to open the sub-menu.

```
7A Mic.Priority
```

4 Turn the knob clockwise until 7H Level is reached.

```
7H Level     ...
```

5 Push the knob to go to the sub-menu.

```
7H Level  In 1
   0dB          ▪
```

6   Push the knob to open the sub-menu item.

```
7H Level In 1
   0dB              ■
```
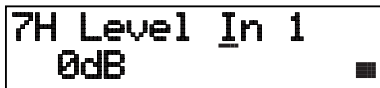
7   Turn the knob to move the cursor to the value that is
    shown.

```
7H Level In 1
   0dB              ■
```

8   On the value, push the knob.

```
7H Level In 1
   0dB              ▦
```
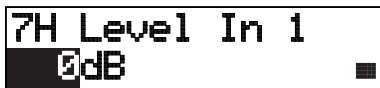
9   Turn the knob to change the value.

> **ℹ Note**
>
> In this example, the knob is turned
> counterclockwise to decrease the value from
> 0 dB to -6 dB. Turn the knob clockwise to
> increase the value.

```
7H Level In 1
  -6dB             ■
```
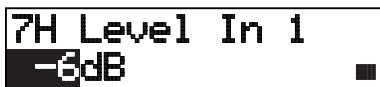
10 Push the knob to deselect the value.

```
7H Level In 1
  -6dB             ■
```
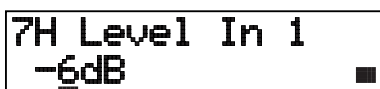
11 Turn the knob to go to the main menu number.

```
7H Level In 1
  -6dB             ■
```
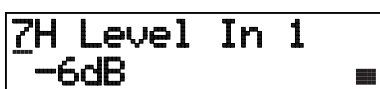
12 Push the knob to go back to the main menu.

```
7 Setup        ...
```

13 Turn the knob clockwise to go to the ＜ Back menu
    item.

```
< Back
```

14 Push the button to go to the main screen.

```
CCU
Volume -13dB
```
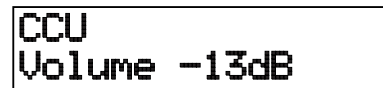
8.10.3   Main screen

When you start the central control unit, the display first
shows "Starting". The display then shows the main
screen, either single mode or multi mode. Single mode is
shown as default.

8.10.3.1   Single mode

The following screen is displayed:
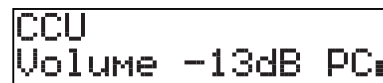
```
CCU
Volume -13dB PC■
```

The main screen shows:
•   The name of the central control unit. The default
    name is CCU. You can change the name with the
    7K Unit Name menu item (refer to section 8.10.11).
•   The volume setting in dB.
•   PC - when the PC control software is connected to
    the central control unit.
•   An indicator that shows the volume level of the
    loudspeakers of the contribution devices.

You can turn the knob to change the volume level.

8.10.3.2 Multi mode

The following screen is displayed.

```
CCU
Multi CCU 01     ■
```
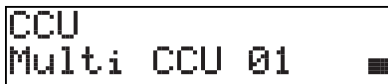
When the CCU is in multi mode, the main screen shows:

- The name of the central control unit. The default name is CCU. You can change the name with the 7K Unit Name menu item (refer to section 8.10.11).
- Multi CCU and the slave ID.
- An indicator that shows the volume level of the loudspeakers of the contribution devices.

> ℹ️ **Note**
>
> If you do not turn or push the knob for three minutes, the display automatically goes back to the Main menu item. The display does not automatically go back to the Main menu item from these menu items and their sub-menus:
> - 5 Monitoring
> - 7Ea Assign Operator
> - 7Eb Assign Chairman

8.10.4 Pop-up message

When the central control unit detects a fault, the display shows a pop-up message. If there is more than one message, the display shows the most important message (refer to table 8.23).

table 8.23: Messages (low to high importance)

Messages	Description
Invalid software	The central control unit cannot start. The central control unit does not contain the correct software.
Downloading	The central control unit downloads software.
No NCO	The central control unit is in multi-mode and the network controller is not available in the network.

When a fault condition is resolved, the fault message will disappear. The message No NCO goes out of view when you push the knob.

8.10.5 Microphone mode

Use the 1 Microphone mode menu item to set the
microphone mode (refer to table 8.24).

table 8.24: Microphone mode sub-menu (= default)*

Menu item	Parameter	Value	Description
1 Mic. Mode	Mode:	NOM:	The microphone mode of
	Open*	1, 2*, 3, 4	the DCN and the
	Override	1, 2*, 3, 4	maximum number of
	PTT	1, 2*, 3, 4	enabled delegate
	Voice	2*, 3, 4	microphones (refer to
			section 8.8.1).

When the central control unit is connected to the PC
control software (refer to table 8.25):
• the PC controls the parameters of the microphone
  mode.
• the parameters cannot be changed at the CCU.

table 8.25: Microphone mode sub-menu under PC control software

Menu item	Parameter	Value	Description
1 Mic. Mode	Mode:	NOM:	The microphone mode of
	Open	1, 2*, 3, 4	the DCN and the
	Override	1, 2*, 3, 4	maximum number of
	PTT	1, 2*, 3, 4	enabled delegate
	Voice	2*, 3, 4	microphones (refer to
	Operator	1, 2*, 3, 4	section 8.8.1).
	Response	1	

8.10.6 Bass

Use the 2 Bass menu to set the level of the bass of the
loudspeakers of the contribution devices (refer to table
8.26).

table 8.26: Bass sub-menu (= default)*

Menu item	Parameter	Value	Description
2 Bass	---	-12 to 12 dB (0 dB*)	The level of the bass output.

8.10.7 Treble

Use the 3 Treble menu to set the level of the treble of the loudspeakers of the contribution devices (refer to table 8.27).

table 8.27: Treble sub-menu (= default)*

Menu item	Parameter	Value	Description
3 Treble	---	-12 to 12 dB (0 dB*)	The level of the treble output.

8.10.8 Fault Status

Use the 4 Fault Status menu item to see the condition messages of the central control unit.

table 8.28: Messages (low to high importance)

Messages	Description
No Fault	The central control unit operates correctly.
No NCO	The central control unit is in multi-mode and the network controller is not available in the network.

8.10.9 Monitoring

Use the 5 Monitoring menu item to open the Monitoring sub-menu (refer to table 8.29).

table 8.29: Monitoring sub-menu (= default)*

Menu item	Parameter	Value	Description
5 Monitoring	Signal:	Volume level:	The signal that is available
	Floor*	-31 to 0 dB (-16 dB*)	on the headphones
	Input 1	-31 to 0 dB (-16 dB*)	socket of the central
	Input 2	-31 to 0 dB (-16 dB*)	control unit and its volume
	Output 1	-31 to 0 dB (-16 dB*)	level.
	Output 2	-31 to 0 dB (-16 dB*)	

8.10.10 Enquiry

Use the 6 Enquiry menu item to open the Enquiry
sub-menu. The menu items in this sub-menu give
general data about the central control unit (refer to table
8.30).

> **i** **Note**
> This data must be mentioned in all service
> requests and failure reports.

table 8.30: Enquiry sub-menu (= default)*

Menu item	Parameter	Value (read-only)	Description
6A Serial Number	---	e.g. 20.0.0027E	The hexadecimal serial number of the central control unit.
6B HW Version	---	e.g. 02.00	The version number of the hardware of the central control unit.
6C FPGA Version	---	e.g. 01.05	The version number of the FPGA firmware of the central control unit.
6D SW Version	---	e.g. 02.00.0777	The version number of the software of the central control unit.
6E FW Version	---	e.g. 3.10.1560	The version number of the firmware of the central control unit.

8.10.11 Setup

Use the 7 Setup menu item to open the Setup
sub-menu. You can use the menu items in this
sub-menu to configure the central control unit and the
system (refer to table 8.31).

table 8.31: Setup sub-menu (* = default)

Menu item	Parameter	Value	Description
7A Mic. Priority	---	Temporarily off* Permanently off	The action taken by the system when the chairman releases the priority button (refer to section 8.8.4).

7B Att. Tones	Event:
	  Priority*
	  Voting
		Chime:
		  Off, 1*, 2, 3
		  Off*, 1, 2, 3
			The attention chimes of the system (refer to section 8.8.3).

7C Request LED	LED setting	Flashing*, Continuous	Sets the behaviour of the request LED for the first delegate in the request list.
7D Floor Distr.	---	On*, Off	Enables or disables floor distribution (refer to section 8.8.5).
7E Intercom ...	---	---	Gives access to the Intercom sub-menu (refer to section 8.10.12).

7F Del. Display	---	Language:
		  English*
		  German
		  French
		  Italian
		  Dutch
		  Spanish
			The language that is used by the displays of the contribution devices. Other languages (e.g. Chinese) can be downloaded to the CCU, but will overwrite the default languages. The English language cannot be overwritten.

7G Routing I/O 2	---	Single mode:
		  Recorder*
		  Delegate loudspeaker
		  Mix-minus
		  Insertion
		Multi-mode:
		  Recorder*
		  Delegate loudspeaker
		  Local floor
			The audio routing mode of the central control unit (refer to section 8.8.2).

7H Level	Signal:
	  Input 1
	  Input 2
	  Output 1
	  Output 2
		Level:
		  -6 to 6 dB (0 dB*)
		  -6 to 6 dB (0 dB*)
		  -24 to 6 dB (0 dB*)
		  -24 to 6 dB (0 dB*)
			The nominal levels of the audio inputs and the audio outputs of the central control unit.

7I Multi mode	Mode:
	  Single*
	  Multi
		Multi CCU slave ID
		  --*, 01 to 30
			Sets the CCU to single or multi mode. The multi CCU slave ID can only be changed when the unit is in single mode (refer to section 10.7).

7J De-Init ...	---	---	Gives access to the De-initialization menu item (refer to section 8.10.13).

7K Unit Name	---	Name:
		  CCU*
		  Custom name
			The name of the central control unit (max. 16 characters).

7L Defaults ...	---	---	Gives access to the Reset menu item (refer to section 8.10.14)

8.10.12 Intercom

Use the menu items in the 7E Intercom sub-menu to identify the location of the chairman and the operator (refer to table 8.32 and section 8.8.6).

table 8.32: Intercom sub-menu (* = default)

Menu item	Parameter	Value	Description
7Ea Assign	Operator	No*	Does not start the assign operator procedure.
		Yes	Starts the assign operator procedure.
7Eb Assign	Chairman	No*	Does not start the assign chairman procedure.
		Yes	Starts the assign chairman procedure.

8.10.13 De-init

Use the 7J De-initialize sub-menu item in the 7J De-Init menu to erase the addresses of the contribution devices and the interpretation devices (refer to table 8.33 and section 8.7).

table 8.33: De-init sub-menu (* = default)

Menu item	Parameter	Value	Description
7J De-initialize	Are you sure?	No*	Does not erase the addresses.
		Yes	Erases the addresses.

8.10.14 Defaults

Use the Defaults sub-menu to set all parameters to the default values in the configuration menu (refer to table 8.34).

table 8.34: Defaults sub-menu (* = default)

Menu item	Parameter	Value	Description
7L	Reset to defaults?	No*	Does not put back the default values.
		Yes	Sets all parameters to the default values. This includes the values of the parameters of the interpreter desks. The name and the CCU ID are not changed. The CCU is also restarted.

9 DCN-CCUB Basic Central Control Unit

9.1 Introduction

The DCN-CCUB Basic Central Control Unit controls the system. The basic central control unit is a simplified version of the DCN-CCU Central Control Unit.

The DCN-CCUB Basic Central Control Unit:
- has one RS232 connection, instead of two
- has one XLR output
- does not have any XLR inputs
- does not have a fault contact
- cannot be connected to the optical network

> **i** **Note**
> The DCN-CCUB-UL is the CSA/UL approved version of the DCN-CCUB.

9.2 Controls, connectors and indicators

9.2.1 Front view

The front of the basic central control unit (refer to figure 9.1) contains:

1 **On/off switch** - Starts and stops the basic central control unit.
2 **Display** - Shows the configuration menu (refer to section 9.10).
3 **Knob** - Operates the configuration menu (refer to section 9.10). You can also change the volume level of the system with the knob.
4 **Headphones socket** - Connects headphones to the basic central control unit (refer to section 9.5.3)
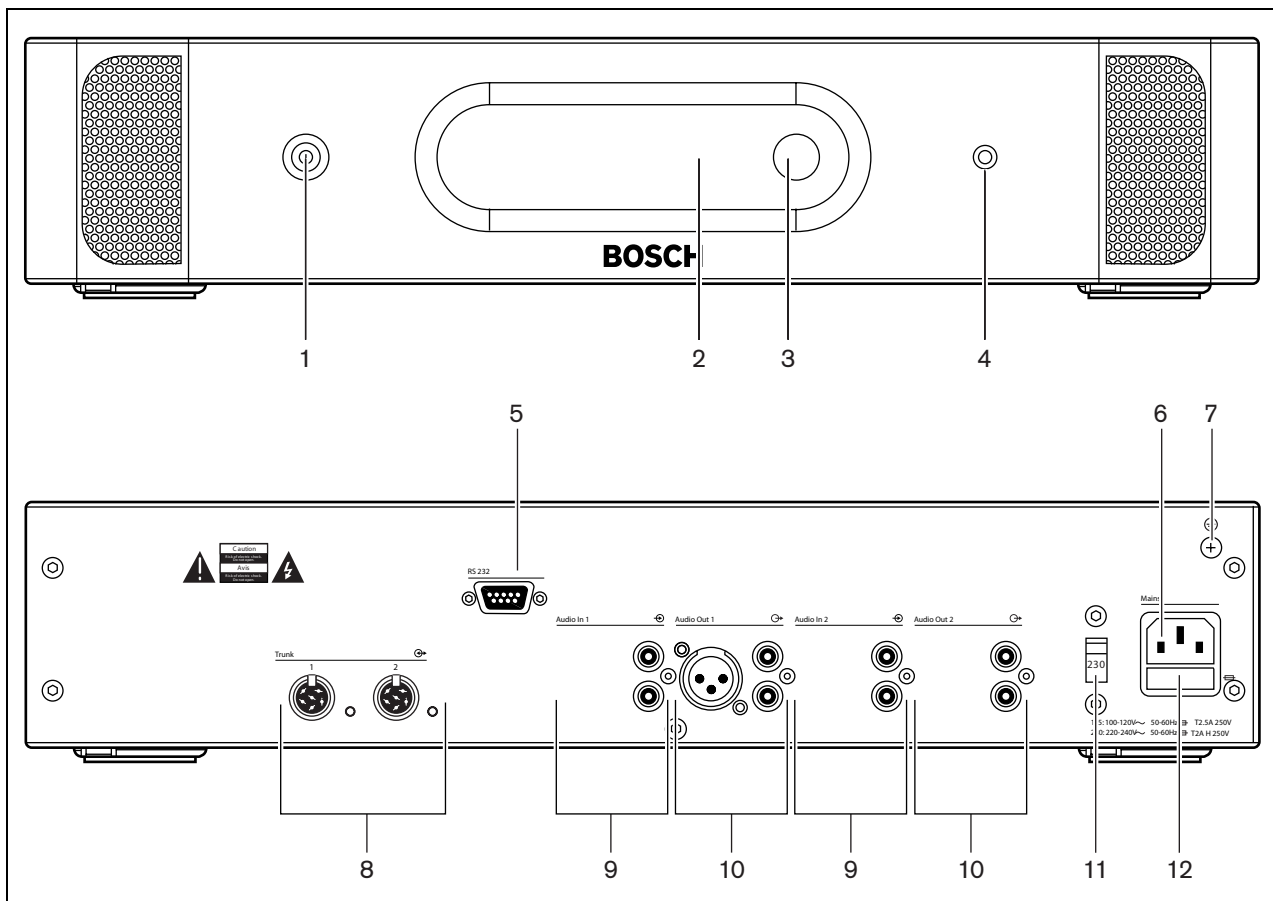
figure 9.1: Front and rear views

9.2.2 Rear view

The rear of the basic central control unit (refer to figure 9.1) contains:

5 **RS232 port** - Connects a PC, remote controllers, or video cameras to the basic central control unit (refer to section 9.5.6).

6 **Power inlet** - Connects the basic central control unit to the mains power supply with a power cable (refer to section 9.5.1).

7 **Ground screw** - Connects the basic central control unit to ground.

8 **DCN sockets** - Connect the basic central control unit to the DCN (refer to section 9.5.2).

9 **Audio inputs** - Connect the central control unit to external analog audio sources (refer to section 9.5.4). The functions of the audio inputs are:
   • Audio input 1: Floor
   • Audio input 2: Selectable recorder/delegate loud-speaker/mix-minus/insertion (refer to section 8.8.2).

10 **Audio outputs** - Connect the central control unit to external analog audio devices (refer to section 9.5.5). The functions of the audio inputs are:
   • Audio output 1: PA
   • Audio output 2: Selectable recorder/delegate loudspeaker/mix-minus/insertion (refer to section 8.8.2).

11 **Voltage selector** - Selects the voltage on which the central control unit must operate (refer to section 9.5.1).

12 **Fuse holder** - Prevents damage to the internal power supply of the basic central control unit (refer to section 9.5.1).

9.3 Internal settings

This information is the same for the basic central control unit and the CCU (refer to section 8.3).

The procedure to configure the RS23 port of the basic central control unit is the same as the procedure to configure RS232 port 1 of the central control unit (refer to section 8.3.3).

9.4 Installation

This information is the same for the basic central control unit and the CCU (refer to section 8.4).

9.5 External connections

This information is the same for the basic central control unit and the CCU (refer to section 8.5).

9.5.1 Power supply

Refer to section 8.5.1 for the instructions that tell you how to connect the basic central control unit to the mains power supply. The procedures to connect the central control unit and the basic central control unit to the mains power supply are the same.

9.5.2 DCN

Refer to section 8.5.2 for the instructions that tell you how to connect the basic central control unit to the trunk of the DCN. The procedures to connect the central control unit and the basic central control unit to the trunk of the DCN are the same.

9.5.3 Headphones

Refer to section 8.5.4 for information about the headphones socket of the basic central control unit. The headphones sockets of the central control unit and the basic central control unit are the same.

9.5.4 Audio inputs

You can connect an external analog audio source to the audio inputs of the basic central control unit. The basic central control unit has two audio inputs. Each audio input has a double cinch socket for unbalanced signals (refer to figure 9.2).

> **i** **Note**
> The audio inputs change stereo signals in mono signals.
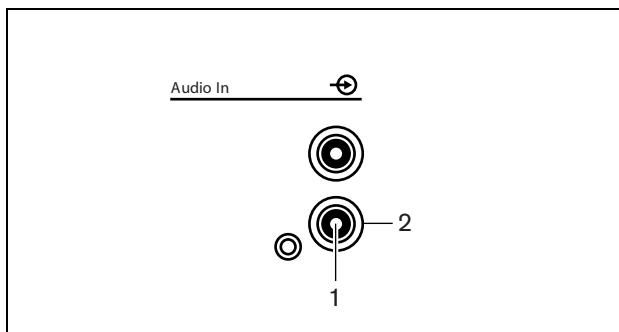
figure 9.2: Audio input, connection

table 9.1: Audio input, connection

Pin	Type	Signal	Description
1	Cinch	Live	Signal in
2		Return	Shield/ground

You can select the procedure that is used to send audio signals through the basic central control unit with the audio routing modes (refer to section 8.10.11).

> **i** **Note**
> You can only connect line level sources to the audio inputs of the basic central control unit. It is not possible to connect microphone sources.

table 9.2: Audio input details, line level signals

Number of connections:
1x double cinch socket
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level:
Refer to appendix A
Frequency response:
-3 dB @ 20 Hz and 20 kHz
Impedance:
12 kΩ
Signal-to-noise ratio:
> 85 dBA @ max. level
CMRR:
> 40 dB
Crosstalk attenuation:
> 85 dB @ max. level
Distortion:
< 0.05% @ 1 kHz @ -3 dB of the max. input

9.5.5 Audio outputs

You can connect an audio recording device or a public address system to the audio output of the basic central control unit. The basic central control unit has two audio outputs. Audio output 1 has (refer to figure 9.3):

- 1 XLR plug for balanced signal (no transformer inside)
- 1 double cinch socket for unbalanced signals.

Audio output 2 only has a double cinch socket for unbalanced signals.
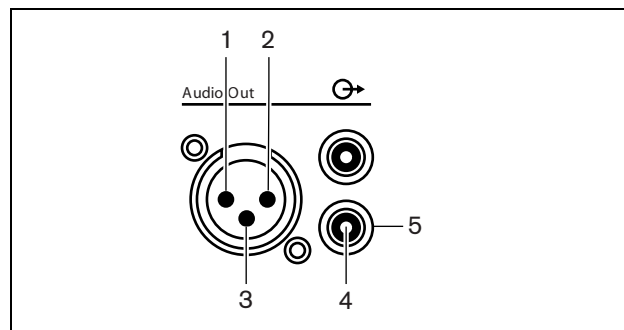
figure 9.3: Audio output, connection

table 9.3: Audio output, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal out
5		Return	Shield/Ground

You can select the procedure that is used to send audio signals through the basic central control unit with the available audio routing modes (refer to section 8.10.11).

table 9.4: Audio output details

Number of connections:	
• 1x XLR plug (audio input 1 only)	
• 1x double cinch socket	
Location:	
Rear side	
Cable:	
Shielded cable	
Maximum level:	
Refer to appendix A	
Nominal level (audio output 1):	
Refer to appendix A	
Nominal level (audio output 2):	
Refer to appendix A	
Frequency response:	
-3 dB @ 20 Hz and 20 kHz	
Impedance:	
< 100 Ω	
Signal-to-noise ratio:	
> 89 dBA @ max. level	
Crosstalk attenuation	
> 85 dB @ max. level	
Distortion:	
< 0.05% @ 1 kHz @ - 3 dB of the max. input	

9.5.6   RS232 port

Refer to section 8.5.8 for information about the RS232 port of the basic central control unit. The RS232 ports of the central control unit and the basic central control unit are the same.

9.6   Downloading

This information is the same for the basic central control unit and the CCU (refer to section 8.6).

9.7   Initialization

This information is the same for the basic central control unit and the CCU (refer to section 8.7).

9.8   Configuration

This information is the same for the basic central control unit and the CCU (refer to section 8.8).

9.9   Camera control configuration

9.9.1   Introduction

The basic central control unit can automatically point video cameras in the direction of the delegate or chairman that speaks.

You can connect camera(s) as follows:
• Direct camera control in a system without a PC
• Camera control through a video switcher in a system without a PC

9.9.2   Direct camera control without a PC

This information is the same for the basic central control unit and the CCU (refer to section 8.9.2), except that the baud rate and protocol settings apply to the RS232 port 1.

9.9.3   Video switcher without a PC

This information is the same for the basic central control unit and the CCU (refer to section 8.9.3), except that the baud rate and protocol settings apply to the RS232 port 1.

9.10   Configuration menu

This information is the same for the basic central control unit and the CCU (refer to section 8.10), except that the options under sub-menu 7I (Multi mode) are not available.

10 DCN-NCO Network Controller

10.1 Introduction

The DCN-NCO network controller controls a multi DCN-CCU system. The network controller can operate with or without a control PC.

> **i** **Note**
> The network controller and all CCUs in a multi CCU system must be switched on in order to work correctly, even if the CCUs are set to single mode.

> **i** **Note**
> Transmitters, CCUs and network controllers must be connected to an optical network in the power off state.

10.2   Controls, connectors and indicators

10.2.1   Front view

The front of the network controller (see figure 10.1) contains:

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

2 **Display** - Shows the configuration menu (refer to section 10.10).

3 **Knob** - Operates the configuration menu (refer to section 10.10). You can also change the volume level of the system with the knob.

4 **Headphones socket** - Connects headphones to the network controller (refer to section 10.6.4).
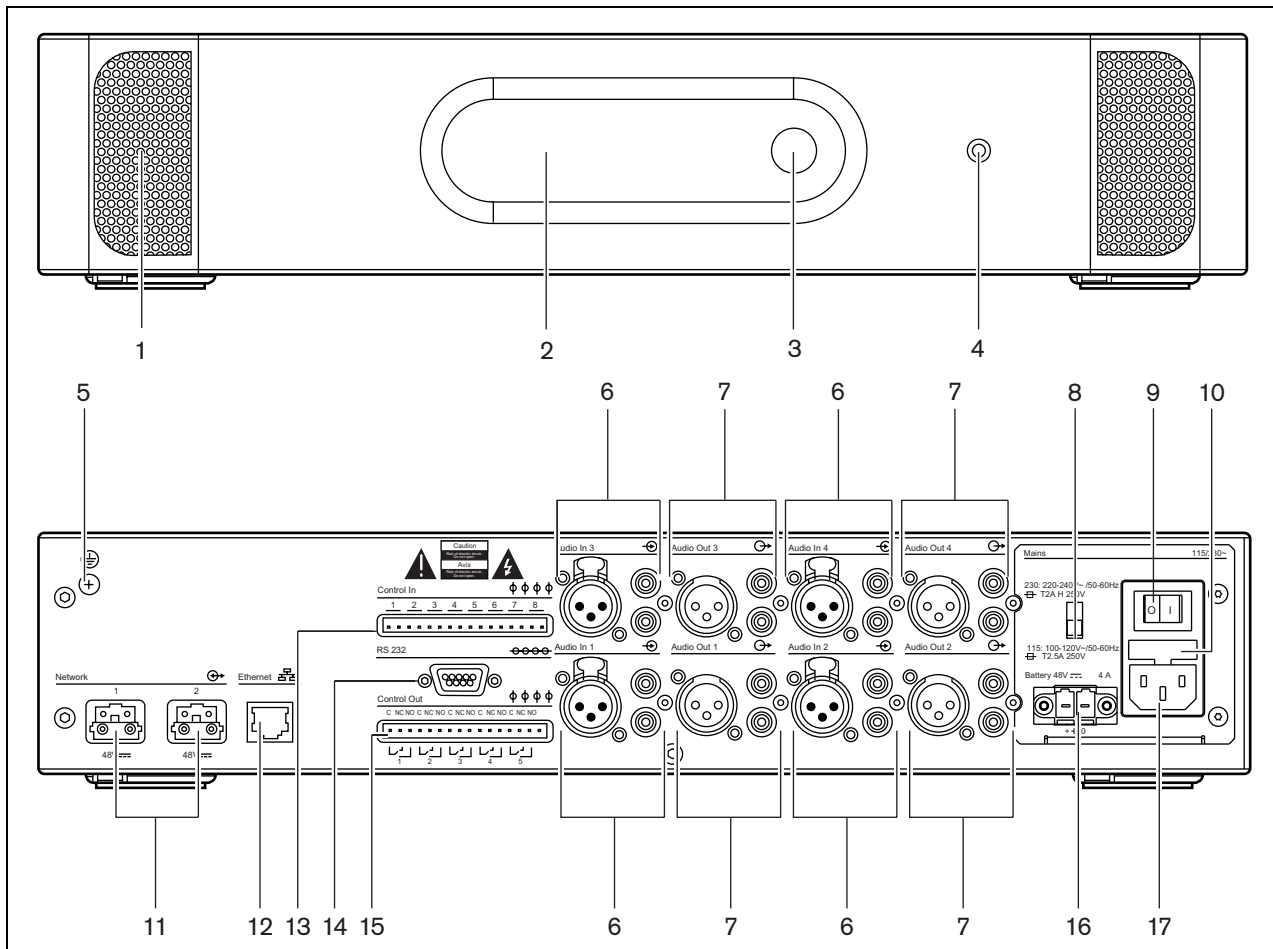
figure 10.1: Front and rear views of the network controller

10.2.2 Rear view

The rear of the network controller (refer to figure 10.1) contains the following:

5 **Ground screw** - Connects the network controller to ground.

6 **Audio inputs** - Connect the network controller to external analog audio sources (refer to section 10.6.5).
The functions of the audio inputs are:
- Audio input 1: Not used
- Audio input 2: Not used
- Audio input 3: Floor
- Audio input 4: Selectable Floor/insertion/mix-minus (refer to section 10.8.2).

7 **Audio outputs** - Connect the network controller to external analog audio devices (refer to section 10.6.6).
The functions of the audio inputs are:
- Audio output 1: PA
- Audio output 2: Recorder
- Audio output 3: Delegate loudspeaker
- Audio output 4: Selectable Floor/insertion/mix-minus (refer to section 10.8.2).

8 **Voltage selector** - Selects the voltage on which the network controller must operate (refer to section 10.6.1).

9 **Mains on/off switch** - Starts and stops the network controller (refer to section 10.6.1).

10 **Fuse holder** - Prevents damage to the internal power supply of the network controller (refer to section 10.6.1).

11 **Optical network sockets** - Connect the network controller to the optical network (refer to section 10.6.3).

12 **Ethernet interface** - Connects the network controller to external logging and configuration devices/systems. This interface is usually used to connect a control PC (refer to section 10.6.8) or an open interface client to the system.

13 **Control inputs** - Available for future use.

14 **RS232 port** - Connects a control camera to the network controller.

15 **Control outputs** - Control output 1 used for the fault contact (refer to section 10.6.7). Other outputs available for future use.

16 **Battery 48V** - Connects a back-up battery supply to the network controller (refer to section 10.6.2).

17 **Power inlet** - Connects the network controller to the mains power supply with a power cable (refer to section 10.6.1).

10.3 Internal settings

10.3.1 Overview

> ⚠ **Caution**
> Before you open the network controller, disconnect it from the mains power supply. Electrical discharges from the mains power supply can kill you.

> ⚠ **Caution**
> Before you open the network controller, take measures to prevent electro-static discharges.

The interior of the network controller (see figure 10.2) contains:

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

19 **Slot for compact flash card** - Not used for this application.
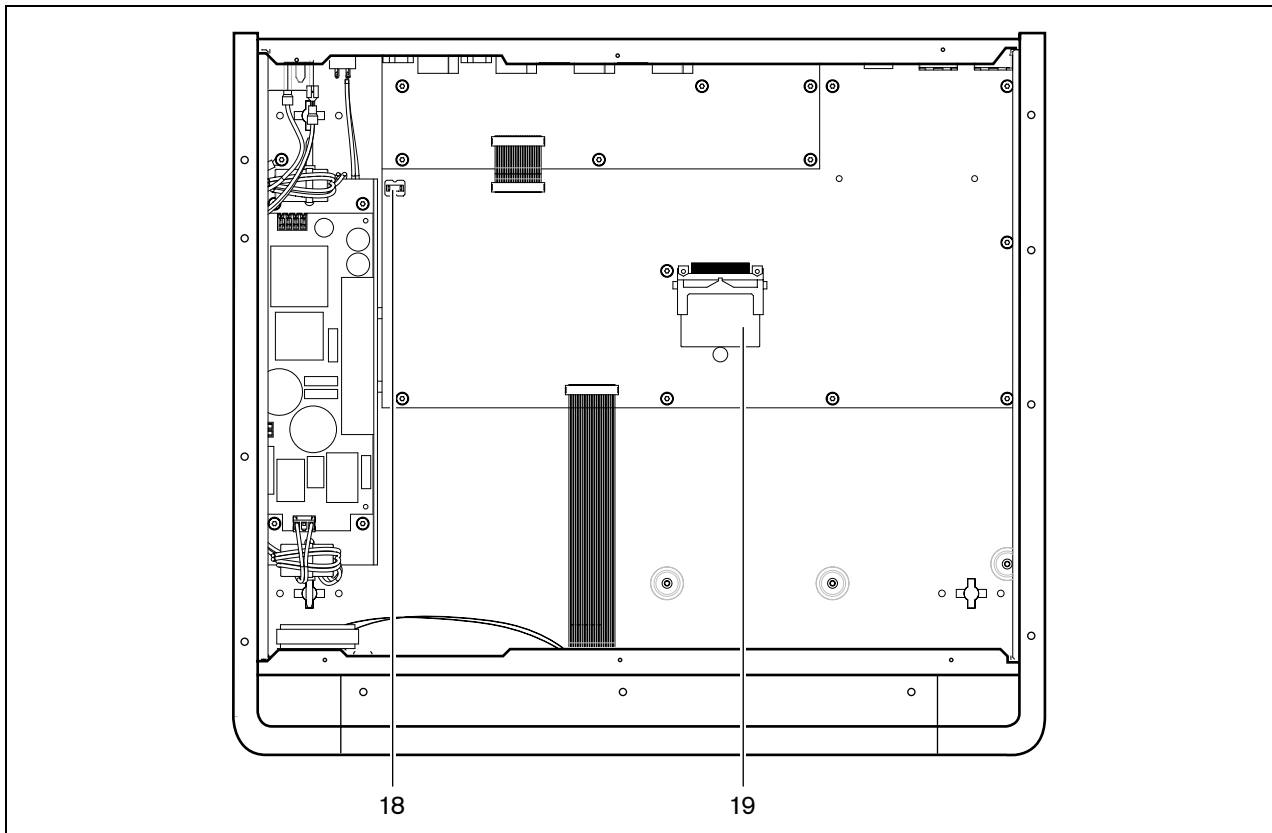
figure 10.2: Internal view of the network controller

10.3.2 Ground

Use the ground jumper block to connect and disconnect the system ground and the ground of the network controller (refer to table 10.1). For example, you can connect the system ground and the ground of the network controller to prevent hum.

> **i Note**
>
> When you connect the system ground to the ground of more than one device in the system, you can create ground loops. Ground loops can cause hum.

table 10.1: Ground jumper block (= default)*

Jumper shunt	Description
Connected	Connects the system ground and the ground of the network controller.
Disconnected *	Disconnects the system ground and the ground of the network controller.

10.4   Downloading

To download the software do the following:

1   Install the download and license tool on a PC (the download and license tool is on the CD).
2   Connect all central equipment to the network controller, except the CCUs.
3   Connect the PC to the network controller.
4   Set the PC communication port to network connection.
5   Configure the correct IP address (refer to section 10.10.13).
6   Download the network controller.
7   Download optical devices.
8   Set the PC communications port to serial connection.
9   Disconnect all CCUs.
10 Select the correct serial port and baud rate of each CCU (refer to section 8.3.3).
11 Connect the CCUs, one at a time, to the PC.
12 Download to the CCU: "software for wired DCN" (refer to section 8.6).

> **i   Note**
> Do not change the language selection when downloading the CCUs.

> **i   Note**
> For the system to work correctly, all software and firmware of the central equipment and PC must be of the same release.

> **i   Note**
> If you connect the network controller via a network, check with your IT department which IP address to use.

10.5   Installation

Refer to section 8.4 for information about the installation of the network controller. The procedures to install the central control unit and the network controller are the same.

10.6   External connections

10.6.1   Power supply

To connect the network controller to a mains power supply proceed as follows:

1   Set the voltage selector on the rear of the network controller to the correct position (refer to table 10.2).

table 10.2: Voltage selector

Power supply voltage	Voltage selector
90 to 132 V(AC)	115
198 to 264 V(AC)	230

2   Make sure that the fuse holder in the rear of the network controller contains the correct fuse (refer to table 10.3).

table 10.3: Fuses

Voltage selector	Fuse
115	T2.5A 250 V (UL 248)
230	T2AH 250 V (IEC 60127)

3   Connect a locally approved power cable to the network controller.
4   Connect the power cable to a power supply.

> **⚠   Caution**
> Make sure that the mains power supply is grounded. Electrical discharges from the mains power supply can kill you.

10.6.2 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 10.3.

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 from 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.

> **i** **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.
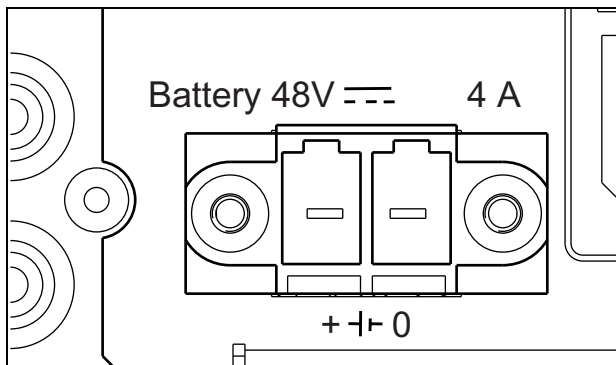
figure 10.3: Back-up power supply

10.6.3 Optical network

Connect the trunk of the optical network to the optical network sockets of the network controller with optical network cables.

table 10.4: Optical network connections

Number of connections:
2x proprietary sockets
Location:
Rear side
Nodes:
2
Power supply:
max. 65 W (refer to section 2.5.3.3)

10.6.4 Headphones

Refer to section 8.5.4 for information about the headphones socket of the network controller. The headphones sockets of the central control unit and the network controller are the same.

You can select the signal that is available on the headphones socket with the configuration menu (refer to section 10.10.9).

10.6.5 Audio inputs

You can connect an external analog audio source to the audio inputs of the network controller. The network controller has four audio inputs. Each audio input has (refer to figure 10.4):

- 1 XLR socket for balanced signals.
- 1 double cinch socket for unbalanced signals.

The electric circuits behind the XLR sockets of audio input 3 and audio input 4 contain transformers.

> **i** **Note**
>
> The audio inputs change stereo signals in mono signals.
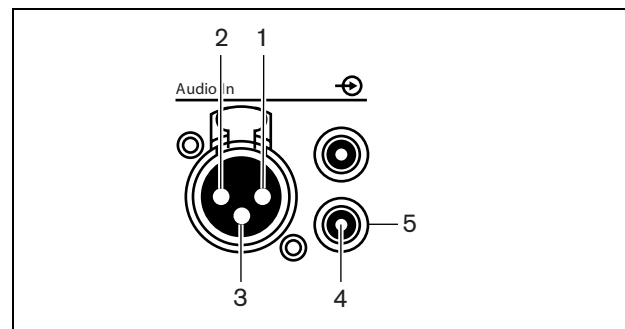
figure 10.4: Audio input, connection

table 10.5: Audio input, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal in
5		Return	Shield/ground

You can select the procedure that is used to send audio signals through the network controller with the audio routing modes (refer to section 10.10.11).

> ℹ️ **Note**
>
> You can only connect line level sources to the audio inputs of the network controller. It is not possible to connect microphone sources.

table 10.6: Audio input details, line level signals

Number of connections:
• 1x XLR socket for each audio input
• 1x double cinch socket for each audio input
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level:
Refer to appendix A
Frequency response:
-3 dB @ 30 Hz and 20 kHz
Impedance:
• XLR: 22 kΩ
• Cinch: 12 kΩ
Signal-to-noise ratio:
> 85 dBA @ max. level
CMRR:
> 60 dB @ 100 Hz
> 50 dB @ 1 kHz
Crosstalk attenuation:
> 85 dB @ max. level
Distortion:
< 0.1% @ 100 Hz @ -3 dB of the max. input

10.6.6 Audio outputs

You can connect an audio recording device or a public address system to the audio outputs of the network controller. The network controller has four audio outputs. Each audio output has (refer to figure 10.5):
• 1 XLR plug for balanced signals.
• 1 double cinch socket for unbalanced signals.

The electric circuits behind the XLR plugs of audio output 3 and audio output 4 contain transformers.

> ℹ️ **Note**
>
> The two cinch sockets contain the same mono signal.
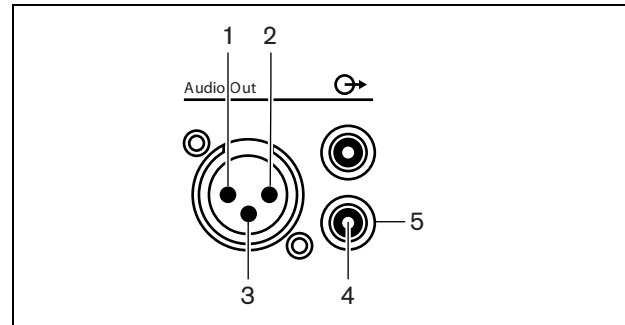
figure 10.5: Audio output, connection

table 10.7: Audio output, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal out
5		Return	Shield/Ground

You can select the procedure that is used to send audio signals through the network controller with the available audio routing modes (refer to section 10.10.11).

table 10.8: Audio output details

Number of connections:
• 1x XLR plug for each audio output
• 1x double cinch socket for each audio output
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level(s)
Refer to appendix A
Frequency response:
-3 dB @ 30 Hz and 20 kHz
Impedance:
< 100 Ω
Signal-to-noise ratio:
> 89 dBA @ max. level
Crosstalk attenuation:
> 85 dB @ max. level
Distortion:
< 0.1% @ 100 Hz @ - 3 dB of the max. input

10.6.7 Fault contact

The network controller has 5 control outputs (see figure 10.6). Control output 1 is used for the fault contact.

Use the fault contact to send the condition of the network controller to external devices. If the network controller operates correctly, the OK pin is internally connected. The network controller internally connects the Fail pins when:

• The network controller is stopped.
• The power supply (internal or external) operates incorrectly.
• The network controller does a reset.
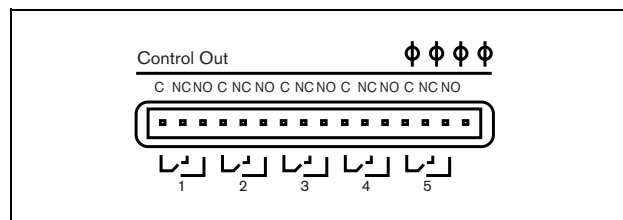
figure 10.6: Control outputs

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 10.9).

table 10.9: 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.

10.6.8 Ethernet connection

10.6.8.1 Introduction

A PC can be connected to the Ethernet connection of the network controller.

10.6.8.2 Direct connection

If your PC does not support automatic crossover, a crossover cable (Cat-5 cable) must be used (see figure 10.7).
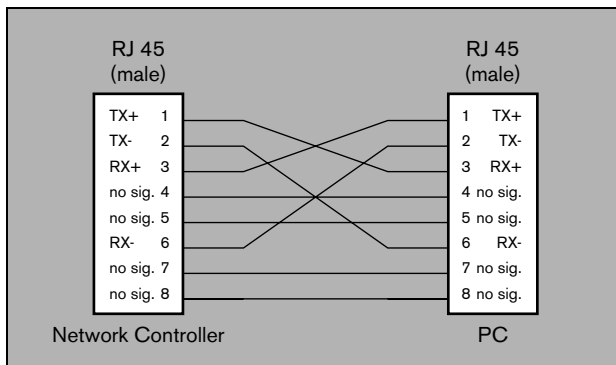
figure 10.7: Direct connection to PC using crossover cable

> ℹ **Note**
> The maximum length of a crossover-cable is 100 m.

10.6.8.3 Via a network

If the control PC must be connected to the network controller via a network, standard cables must be used to connect both the network controller and the control PC to the network.

> ⚠ **Caution**
> Do not connect the network controller and control PC to any network without consulting the network administrator.

10.6.9 RS232 ports

The network controller has a RS232 port for connecting dome camera and video switchers (refer to section 10.9). You can use the menu to set the baudrate of the RS232 port (refer to section 10.10.11).
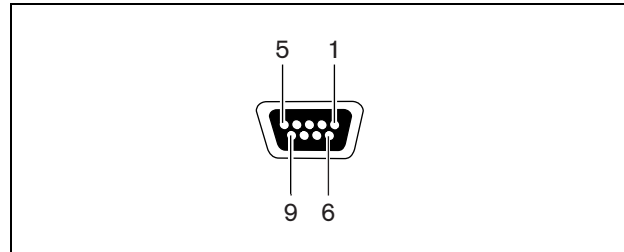
figure 10.8: RS232 port, connection

table 10.10: RS232 port, connection

Pin	Definition	Description
1	DCD	Data Carrier Select
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	SG	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

table 10.11: RS232 ports

Number of connections:
1x 9-pole SUB-D socket
Location:
Rear side
Maximum cable length:
9600 baud: 15 m, >9600 baud: 3 m
Signal levels:
EIA RS232-C interface specifications

10.7 Initialization

Initialize a multi CCU system as follows:

1 Initialize each CCU and all of its devices
   (refer to section 8.7).
2 For each CCU, select a unique multi CCU slave, and
   change the mode from "single" to "multi".
   (refer to table 8.31, menu item 7I Multi mode).

> **i** | **Note**
> You can only change the multi CCU slave ID
> when the CCU is in single mode.

10.8 Configuration

10.8.1 Microphone modes

This information is the same for the network controller
and the CCU (refer to section 8.8.1).

10.8.2 Audio routing modes

10.8.2.1 Introduction

You can set the audio routing of audio input 4 and
audio output 4 with the 7G Routing I/O 4 menu item
(see section 10.10.11). The functions of audio inputs 1,
2, and 3 and audio outputs 1, 2, and 3 of the network
controller cannot be changed:

*   The signal on audio input 3 is added to the floor
    signal.
*   The signal on audio output 1 is suitable to connect
    the system to an external public address system. The
    network controller does not set the volume level,
    bass, and treble.
*   The signal on audio output 2 is suitable to connect
    the system to a recorder.
*   The signal on audio output 3 is suitable to connect
    the system to an external public address system and
    contains the floor signal, which is sent to the delegate
    loudspeakers. The network controller sets the
    volume level, bass, and treble.

10.8.2.2 Floor

In the Floor mode, audio output 4 of the network
controller transmits the same signal as output 1 (refer to
figure 10.9). In the Floor mode, the signal on audio input
4 of the network controller is added to the floor signal.
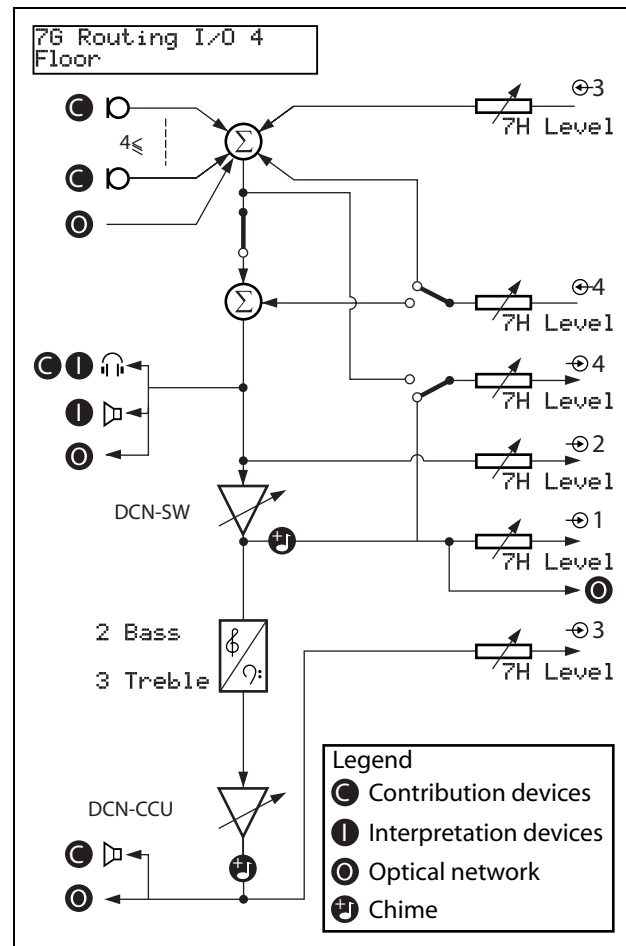
figure 10.9: Floor

10.8.2.3 Insertion

In the Insertion mode, audio output 4 and audio input 4 of the network controller are used to add signals from external audio devices (refer to figure 10.10). For example, you can connect an external audio mixer between audio output 4 and audio input 4 of the network controller.
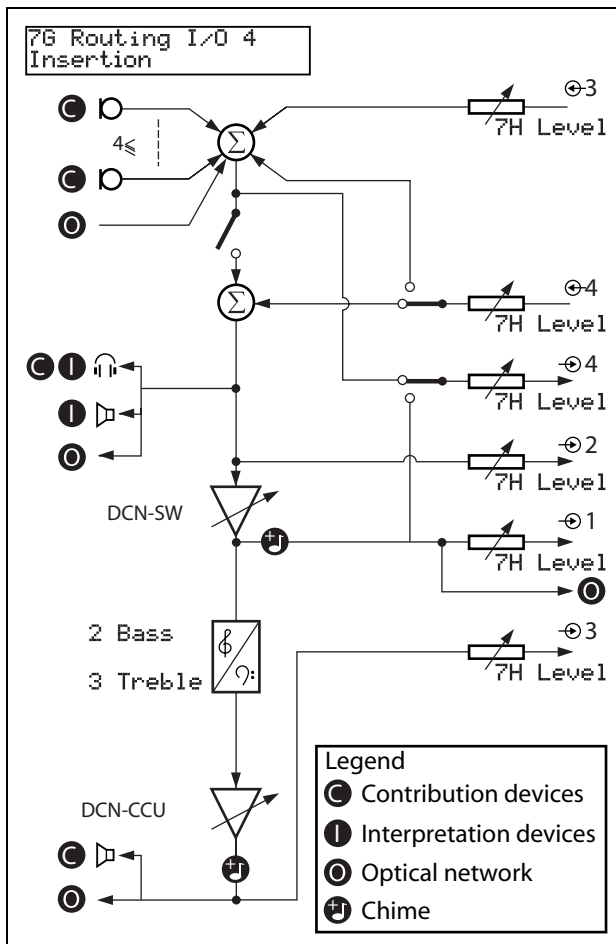
figure 10.10: Insertion

> ℹ️ **Note**
>
> In the Insertion mode, you must install a device between audio output 4 and audio input 4 of the network controller. When you do not install a device, the audio signals from contribution devices (floor) leave the system, but do not enter the system again.

10.8.2.4 Mix-minus

Use the Mix-minus mode to:
- connect to a telephone coupler.
- connect two systems together.

> ℹ️ **Note**
>
> The Mix-minus connection does not cause acoustic feedback.

When you connect to a telephone coupler:
- Go to menu item 7G Routing I/O 4 to set the systems to the Mix minus mode.
- Connect audio input 4 and audio output 4 to the telephone coupler.

When you connect two systems together (refer to figure 10.11):
- Go to menu item 7G Routing I/O 4 to set the systems in the Mix minus mode.
- Connect audio input 4 of the first system to audio output 4 of the second system.
- Connect audio output 4 of the first system to audio input 4 of the second system.
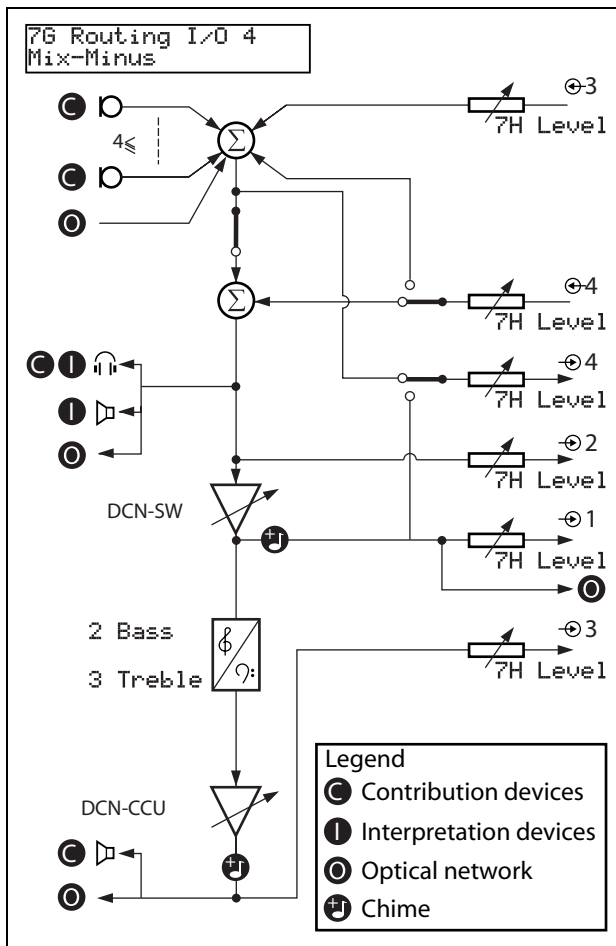
figure 10.11: Mix-minus

> **Note**
>
> When the distance between the two systems is great, you can use a telephone coupler to connect the two systems.

10.8.3 Attention chimes

This information is the same for the network controller and the CCU (refer to section 8.8.3).

10.8.4 Erase requests-to-speak and speakers

This information is the same for the network controller and the CCU (refer to section 8.8.4).

10.8.5 Floor distribution

This information is the same for the network controller and the CCU (refer to section 8.8.5).

10.8.6 Intercom

This information is the same for the network controller and the CCU (refer to section 8.8.6).

10.9 Camera control configuration

10.9.1 Introduction

The network controller can automatically point video cameras in the direction of the delegate or chairman that speaks.

You can connect camera(s) as follows:
- Direct camera control in a system without a PC.
- Camera control through a video switcher in a system without a PC.
- Direct camera control in a system with a PC.
- Camera control through a video switcher in a system with a PC.

10.9.2 Direct camera control without a PC

This information is the same for the network controller and the CCU (refer to section 8.9.2), except that:

- the protocol for RS 232 on the network controller is permanently set to camera control.
- the baud rate has to be set with menu item 7I Camera Cntrl (refer to section 10.10.11).

10.9.3 Video switcher without a PC

This information is the same for the network controller and the CCU (refer to section 8.9.3), except that:

- the protocol for RS 232 on the network controller is permanently set to camera control.
- the baud rate has to be set with menu item 7I Camera Cntrl (refer to section 10.10.11).

10.9.4 Direct control with a PC

This information is the same for the network controller and the CCU (refer to section 8.9.4), except that:

- the protocol for RS 232 on the network controller is permanently set to camera control.
- the baud rate has to be set with menu item 7I Camera Cntrl (refer to section 10.10.11).
- the PC is connected to the Ethernet connector, and the correct IP address has to be set (refer to section 10.10.11)

10.9.5 Video switcher with a PC

This information is the same for the network controller and the CCU (refer to section 8.9.5), except that:

- the protocol for RS 232 on the network controller is permanently set to camera control.
- the baud rate has to be set with menu item 7I Camera Cntrl (refer to section 10.10.11).
- the PC is connected to the Ethernet connector, and the correct IP address has to be set (refer to section 10.10.11)

10.10 Configuration menu

10.10.1 Overview

Use the configuration menu of the network controller to
configure the network controller and the system (refer to
figure 10.12).
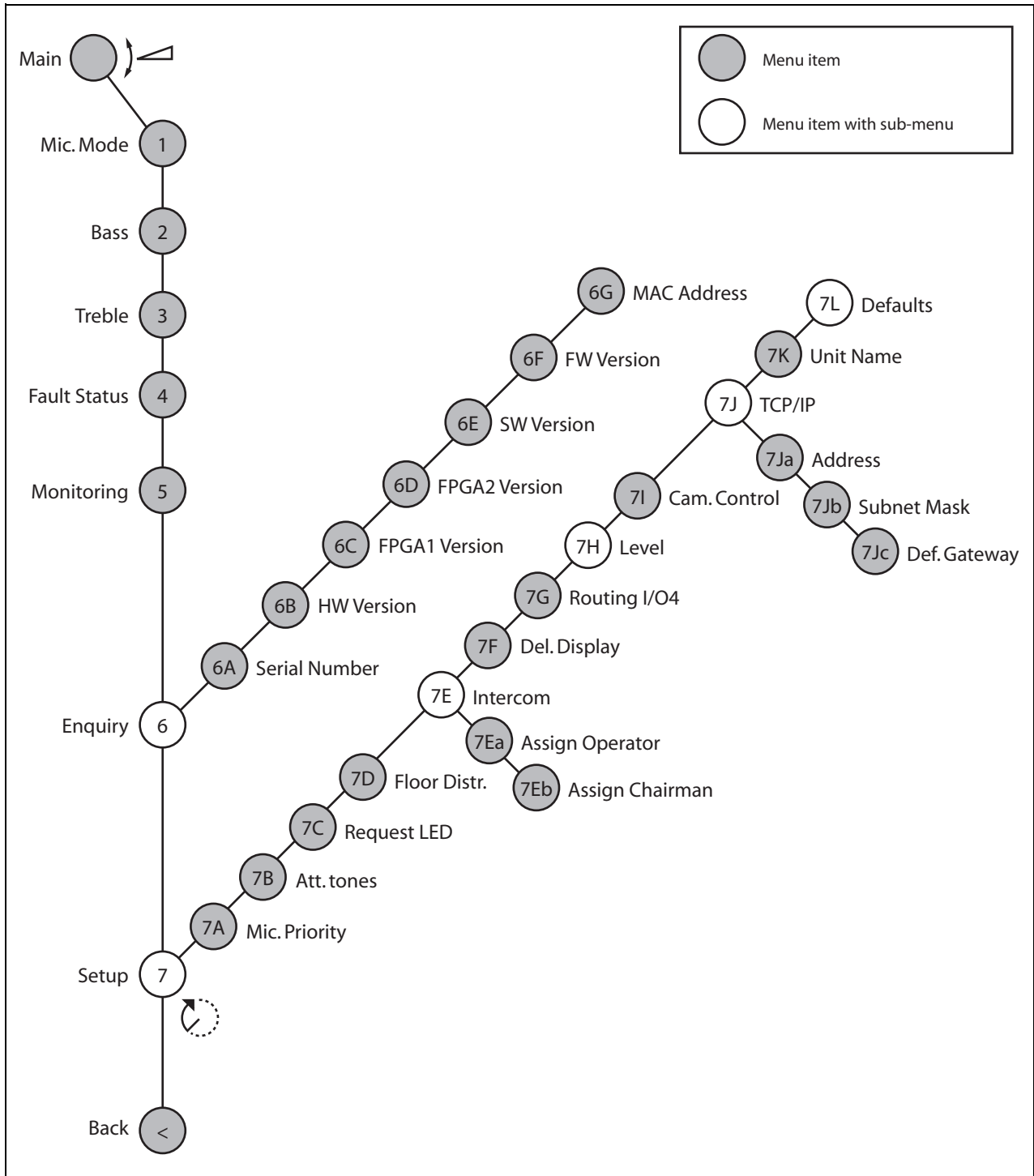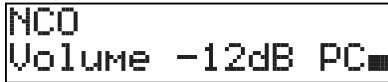
figure 10.12: Configuration menu

10.10.2 Navigation and operation

This information is the same for the network controller and the CCU (refer to section 8.10.2)

10.10.3 Main screen

When you start the network controller, the display first shows "Starting". The display then shows the main screen:

```
NCO
Volume -12dB PC▪
```

The main screen shows:
• The name of the network controller. The default name is NCO. You can change the name with the 7K Unit Name menu item (refer to section 10.10.11).
• The volume setting in dB.
• PC - when the PC control software is connected to the central control unit.
• An indicator that shows the volume level of the loudspeakers of the contribution devices.

You can turn the knob to change the volume level.

> ℹ **Note**
> If you do not turn or push the knob for three minutes, the display automatically goes back to the Main menu item. The display does not automatically go back to the Main menu item from these menu items:
> • 5 Monitoring
> • 7Ea Assign Operator
> • 7Eb Assign Chairman

10.10.4 Pop-up message

When the network controller detects a fault, the display shows a pop-up message. If there is more than one message, the display shows the most important message (refer to table 10.12).

table 10.12: Messages (low to high importance)

Messages	Description
Downloading	The network controller downloads software.
CCU Missing	This message is shown if the network controller detects that a CCU is lost.
Incompatible SW	This message is shown if the network controller detects incompatible software versions between master and one or more slave CCUs.

When a fault condition is resolved, the fault message will disappear. The message CCU Missing, and Incompatible SW go out of view when you push the knob.

> ℹ **Note**
> To remove a CCU from the network configuration, switch off the NCO, and then switch it back on again.

10.10.5 Microphone mode

Use the 1 Microphone mode menu item to set the microphone mode (refer to table 10.13).

table 10.13: Microphone mode sub-menu (= default)*

Menu item	Parameter	Value	Description
1 Mic. Mode	Mode:	NOM:	The microphone mode of
	Open*	1, 2*, 3, 4	the DCN and the
	Override	1, 2*, 3, 4	maximum number of
	PTT	1, 2*, 3, 4	enabled delegate
	Voice	2*, 3, 4	microphones (refer to
			section 8.8.1).

When the central control unit is connected to the PC control software (refer to table 10.14):
- the PC controls the parameters of the microphone mode.
- the parameters cannot be changed at the CCU.

table 10.14: Microphone mode sub-menu under PC control software

Menu item	Parameter	Value	Description
1 Mic. Mode	Mode:	NOM:	The microphone mode of
	Open	1, 2*, 3, 4	the DCN and the
	Override	1, 2*, 3, 4	maximum number of
	PTT	1, 2*, 3, 4	enabled delegate
	Voice	2*, 3, 4	microphones (refer to
	Operator	1, 2*, 3, 4	section 8.8.1).
	Response	1	

10.10.6 Bass

Use the 2 Bass menu to set the level of the bass of the loudspeakers of the contribution devices (refer to table 10.15).

table 10.15: Bass sub-menu (= default)*

Menu item	Parameter	Value	Description
2 Bass	---	-12 to 12 dB (0 dB*)	The level of the bass output.

10.10.7 Treble

Use the 3 Treble menu to set the level of the treble of
the loudspeakers of the contribution devices (refer to
table 10.16).

table 10.16: Treble sub-menu (* = default)

Menu item	Parameter	Value	Description
3 Treble	---	-12 to 12 dB (0 dB*)	The level of the treble output.

10.10.8 Fault Status

Use the 4 Fault Status menu item to see the condition of
the network controller. If there is more than one
message, the display shows the most important message
(refer to table 10.17).

table 10.17: Messages (low to high importance)

Messages	Description
No Fault	The network controller operates correctly.
CCU Missing	This message is shown if the NCO detects that a CCU is lost.
Incompatible SW	This message is shown if the NCO detects incompatible software versions between master and one or more slave CCUs.

10.10.9 Monitoring

Use the 5 Monitoring menu item to open the Monitoring
sub-menu (refer to table 10.18).

table 10.18: Monitoring sub-menu (* = default)

Menu item	Parameter	Value	Description
5 Monitoring	Signal:	Volume level:	The signal that is available
	None*	Mute, -31 to 0 dB (-16 dB*)	on the headphones socket
	Floor	Mute, -31 to 0 dB (-16 dB*)	of the network controller
	Input 3	Mute, -31 to 0 dB (-16 dB*)	and its volume level.
	Input 4	Mute, -31 to 0 dB (-16 dB*)	
	Output 1	Mute, -31 to 0 dB (-16 dB*)	If headphones are not
	Output 2	Mute, -31 to 0 dB (-16 dB*)	connected, the signal is
	Output 3	Mute, -31 to 0 dB (-16 dB*)	available on the
	Output 4	Mute, -31 to 0 dB (-16 dB*)	loudspeaker.

10.10.10 Enquiry

Use the 6 Enquiry menu item to open the Enquiry sub-menu. The menu items in this sub-menu give general data about the network controller (refer to table 10.19).

> **ℹ Note**
>
> This data must be mentioned in all service requests and failure reports.

table 10.19: Enquiry sub-menu

Menu item	Parameter	Value (read-only)	Description
6A Serial Number	---	e.g. 20.0.0027E	The hexadecimal serial number of the network controller.
6B HW Version	---	e.g. 02.00	The version number of the hardware of the network controller.
6C FPGA1 Version	---	e.g. 01.00	The version number of the MIF FPGA firmware of the network controller.
6D FPGA2 Version	---	e.g. 02.00	The version number of the MMU FPGA firmware of the network controller.
6E SW Version	---	e.g. 02.00.0777	The version number of the software of the network controller.
6F FW Version	---	e.g. 3.10.1560	The version number of the firmware of the network controller.
6G MAC address	---	e.g. 012345-6789AB	The MAC address of the network adaptor

10.10.11 Setup

Use the 7 Setup menu item to open the Setup sub-menu. You can use the menu items in this sub-menu to configure the network controller and the system (refer to table 10.20).

table 10.20: Setup sub-menu (* = default)

Menu item	Parameter	Value	Description
7A Mic. Priority	---	Temporarily off* Permanently off	The action taken by the system when the chairman releases the priority button (refer to section 8.8.4).

7B Att. Tones	Event:
	  Priority*
	  Voting
		Chime:
		  Off, 1*, 2, 3
		  Off*, 1, 2, 3
			The attention chimes of the system (refer to section 8.8.3).

7C Request LED	Led setting	Flashing*, Continuously lit	Sets the behaviour of the request LED for the first delegate in the request list.
7D Floor Distr.	---	On*, Off	Enables or disables floor distribution (refer to section 8.8.5).
7E Intercom ...	---	---	Gives access to the Intercom sub-menu (refer to section 10.10.12).

7F Del. Display	---	Language:
		  English*
		  German
		  French
		  Italian
		  Dutch
		  Spanish
			The language that is used by the displays of the contribution devices. Other languages (e.g. Chinese) can be downloaded to the network controller, but will overwrite the default languages. The English language cannot be overwritten.

7G Routing I/O 4	---	Mode:
		  Floor*
		  Mix-minus
		  Insertion
			Changes the audio routing of output 4

7H Level	Signal:
	  Input 3*
	  Input 4
	  Output 1
	  Output 2
	  Output 3
	  Output 4
		Level:
		  -6 to 6 dB (0 dB*)
		  -6 to 6 dB (0 dB*)
		  -24 to 6 dB (0 dB*)
		  -24 to 6 dB (0 dB*)
		  -24 to 6 dB (0 dB*)
		  -24 to 6 dB (0 dB*)
			The nominal levels of the audio inputs and the audio outputs of the network controller.

7I Camera Cntrl	Baudrate	Baudrate:
		  9.6k
		  19.2k*
		  57.6k
		  115.2k
			Sets the baudrate for the camera control (refer to section 10.9).

7J TCP/IP	---	---	Gives access to the TCP/IP submenus (refer to section 10.10.13).

7K Unit Name	---	Name:
		  CCU*
		  Custom name
			The name of the network controller (max. 16 characters).

7L Defaults ...	---	---	Gives access to the Reset menu item (refer to section 10.10.14)

10.10.12 Intercom

Use the menu items in the 7E Intercom sub-menu to identify the location of the chairman and the operator (refer to table 10.21 and section 8.8.6).

table 10.21: Intercom sub-menu (* = default)

Menu item	Parameter	Value	Description
7Ea Assign	Operator	No*	Does not start the assign operator procedure.
		Yes	Starts the assign operator procedure.
7Eb Assign	Chairman	No*	Does not start the assign chairman procedure.
		Yes	Starts the assign chairman procedure.

10.10.13 TCP/IP

Use the sub-menus TCP/IP Address, Subnet mask, and Default gateway in the 7J TCP/IP menu to set their respective values (refer to table 10.22).

table 10.22: TCP/IP sub-menu (* = default)

Menu item	Parameter	Value	Description
7Ja Address	---	e.g. 255.255.255.255	Sets the TCP/IP address.
7Jb Subnet Mask	---	e.g. 255.255.255.255	Sets the TCP/IP subnet mask
7Jc Def. Gateway	---	e.g. 255.255.255.255	Sets the TCP/IP default gateway

10.10.14 Defaults

Use the Defaults sub-menu to set all parameters to the default values in the configuration menu (refer to table 10.23).

table 10.23: Defaults sub-menu (* = default)

Menu item	Parameter	Value	Description
7L	Reset to defaults?	No*	Does not put back the default values.
		Yes	Sets all parameters to the default values. This includes the values of the parameters of the interpreter desks. The name is not changed.

11 LBB4402/00 Audio Expander

> ℹ **Note**
>
> The firmware version of the audio expander must be the same as the firmware version of the central control unit. You can send firmware to the audio expander and to the central control unit with the:
> • Download and License Tool
> • PC Control Software

11.1 Introduction

Use the LBB4402/00 Audio Expander if the system needs more than two analog audio inputs or audio outputs. Typically, the audio expander is used to:

• Connect external recording devices to the system
• Send audio signals to external devices
• Connect systems

11.2 Controls, connectors and indicators

11.2.1 Front view

The front of the audio expander (refer to figure 11.1) contains:

1 **Display** - Shows the configuration menu (refer to section 11.5).
2 **Knob** - Operates the configuration menu (refer to section 11.5).
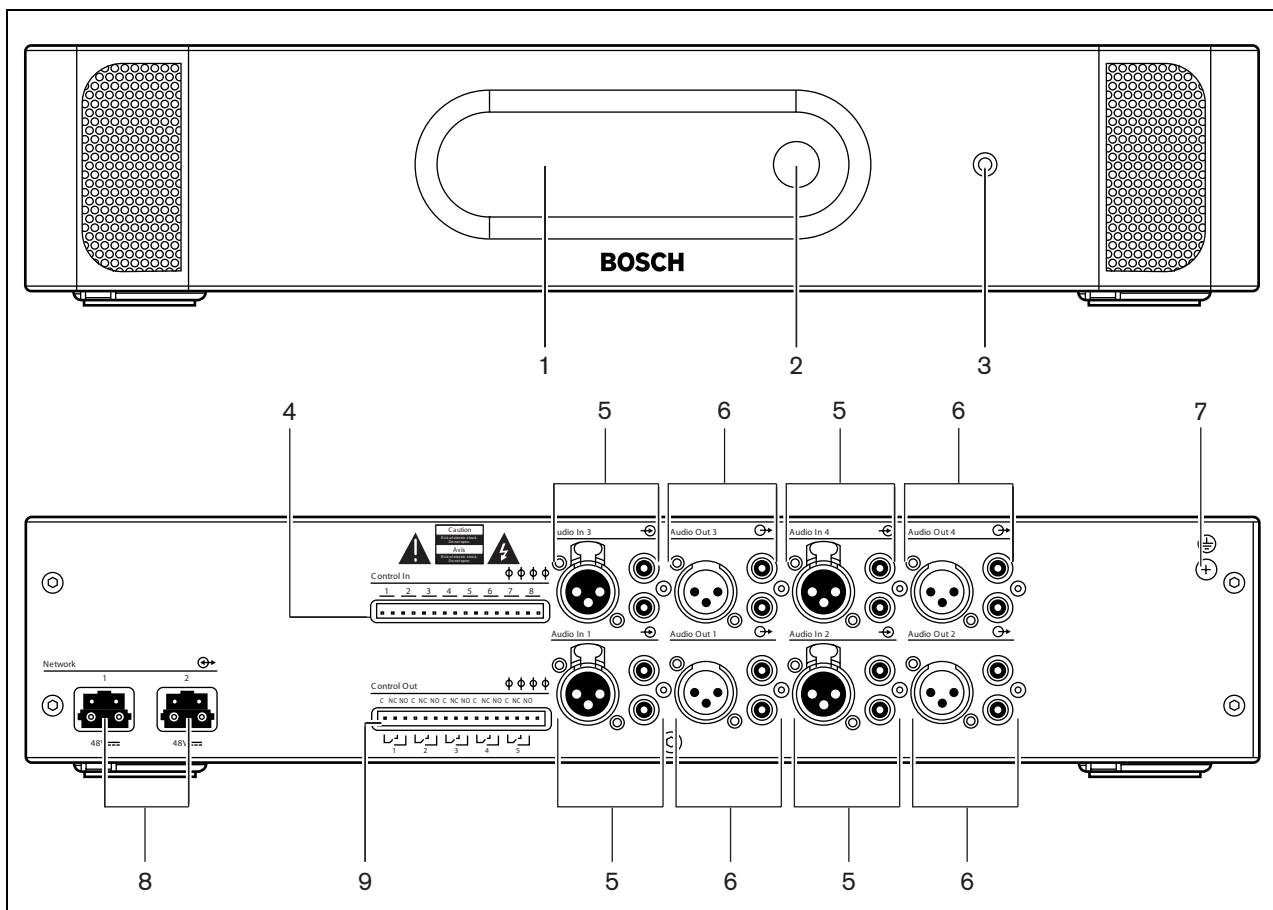3 **Headphones socket** - Connects headphones to the audio expander (refer to section 11.4.2).

figure 11.1: Front and rear views

11.2.2 Rear view

The rear of the audio expander (refer to figure 11.1) contains:

4 **Control inputs** - Connect the audio expander to external devices. Through the control inputs, external devices can control the audio inputs and the audio outputs of the audio expander (refer to section 11.4.5).

5 **Audio inputs** - Connect the audio expander to external analog audio sources (refer to section 11.4.3).

6 **Audio outputs** - Connect the audio expander to external analog audio devices (refer to section 11.4.4).

7 **Ground screw** - Connects the audio expander to ground.

8 **Optical network sockets** - Connect the audio expander to the optical network (refer to section 11.4.1).

9 **Control outputs** - Send the condition of the audio expander to external devices (refer to section 11.4.6).

11.3 Installation

You can install the audio expander in a 19-inch rack system or on a flat surface. Four feet and two brackets are supplied with the audio expander (refer to figure 11.2).
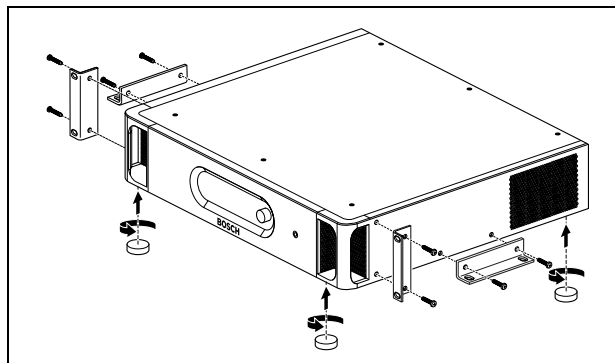
figure 11.2: Installation

table 11.1: Physical characteristics

Dimensions (h x w x d), flat surface:
92 x 440 x 400 mm (without brackets, with feet)
Dimensions (h x w x d), 19-inch rack system:
88 x 483 x 400 mm (with brackets, without feet)
Weight:
7.0 kg (without brackets, without feet).

> **i Note**
>
> If you install the audio expander in a 19-inch rack system, the audio expander extends 36 mm in front of the brackets.

11.4 External connections

11.4.1 Optical network

Connect the optical network sockets of the audio expander to the optical network with optical network cables (refer to figure 11.3).
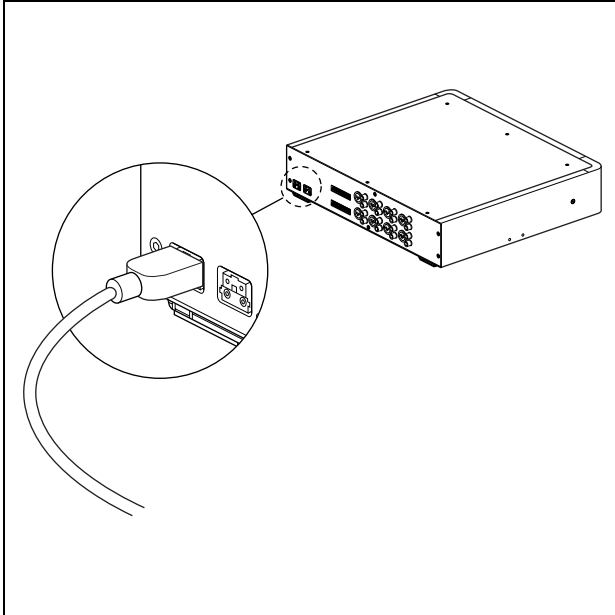
figure 11.3: Optical network

table 11.2: Optical network connections

Number of connections:
2x proprietary sockets
Location:
Rear side
Nodes:
1
Power consumption:
7.6 W

11.4.2 Headphones

You can connect headphones to the headphones socket of the audio expander. The headphones must have a 3.5 mm plug (refer to figure 11.4).
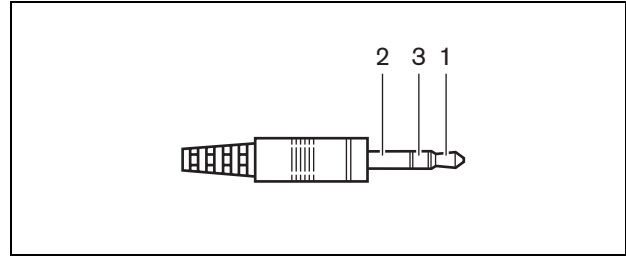
figure 11.4: 3.5 mm headphones plug, connection

table 11.3: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
> You can also connect mono headphones to the headphones socket.

You can select the signal that is available on the headphones socket with the configuration menu (refer to section 11.5.6).

11.4.3 Audio inputs

You can connect external analog audio sources to the audio inputs of the audio expander. The audio expander has four audio inputs. Each audio input has (refer to figure 11.5):

- 1 XLR socket for balanced signals. The electric circuits behind the XLR sockets contain transformers.
- 1 double cinch socket for unbalanced signals.

> **i** **Note**
>
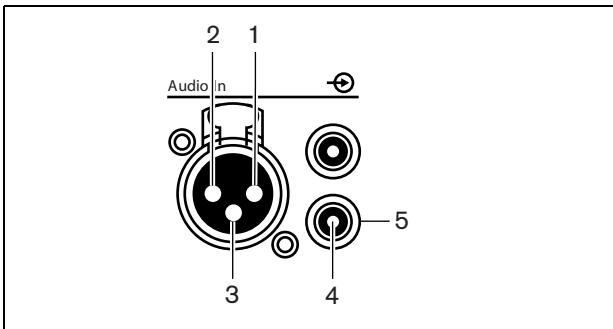> The audio inputs change stereo signals in mono signals.

figure 11.5: Audio input, connection

table 11.4: Audio input, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal in
5		Return	Shield/ground

> **i** **Note**
>
> When the interlock is None (refer to section 33.6.6.11), the audio inputs of the audio expander are disabled for translation channels only. Audio input channels can route to floor channels.

You can connect line level sources to all audio inputs of the audio expander.

table 11.5: Audio inputs, line level signals

Number of connections:
• 1x XLR socket for each audio input
• 1x double cinch socket for each audio input
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level:
Refer to appendix A
Frequency response:
-3 dB @ 30 Hz and 20 kHz
Impedance:
• XLR: 22 kΩ
• Cinch: 12 kΩ
Signal-to-noise ratio:
> 87 dBA @ max. output level
CMRR:
> 60 dB @ 100 Hz
Crosstalk attenuation:
> -85 dB @ max. level
Distortion:
< 0.1% @ 100 Hz @ -3 dB of the max. level

You can connect microphone sources (refer to table 11.6) only to the XLR plugs of audio input 1 and audio input 2 of the audio expander.

table 11.6: Audio inputs, microphone signal

Number of connections:
1x XLR socket for each audio input
Location:
Rear side
Cable:
Shielded cable
Nominal level:
Refer to appendix A
Range:
Refer to appendix A
Frequency response:
-3 dB @ 20 Hz and 20 kHz
0 dB @ 100 Hz, 1 kHz and 10 kHz
Impedance:
1360 Ω
Signal-to-noise ratio:
> 62 dBA
CMMR:
• > 55 dB @ 100 Hz
• > 65 dB @ 1 kHz and 10 kHz
Phantom power supply:
12 ± 1 V (max. 15 mA)

Use the configuration menu to configure the audio inputs of he audio expander (refer to section 11.5.8).

11.4.4 Audio outputs

You can connect audio recording devices or public address systems to the audio outputs of the audio expander. The audio expander has four audio outputs. Each audio output has (refer to figure 11.6):

•   1 XLR plug for balanced signals. The electric circuits behind the XLR plugs contain transformers.
•   1 double cinch socket for unbalanced signals

> **i** **Note**
> The two cinch sockets contain the same mono signal.
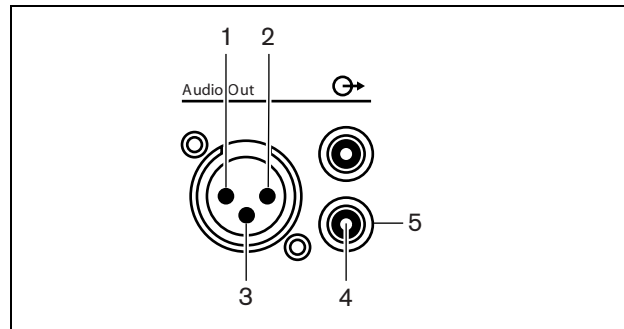
figure 11.6: Audio output, connection

table 11.7: Audio output, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal out
5		Return	Shield/Ground

Use the configuration menu to configure the audio outputs of the audio expander (refer to section 11.5.8).

table 11.8: Audio outputs

Number of connections:
• 1x XLR socket for each audio output
• 1x double cinch socket for each audio output
Location:
Rear side
Cable:
Shielded cable
Maximum output level:
Refer to appendix A
Nominal output level (floor):
Refer to appendix A
Nominal output level (interpreter channels):
Refer to appendix A
Frequency response:
-3 dB @ 30 Hz and 20 kHz
Output impedance:
< 100 Ω
Signal-to-noise ratio:
> 89 dBA @ max. output level
Crosstalk attenuation:
> 85 dB
Distortion:
< 0.05% @ 1 KHz @ -3 dB of max. input level

11.4.5 Control inputs

The audio expander has eight control inputs. With the control inputs, remote interpretation systems can control the audio inputs and the audio outputs of the audio expander. Each audio input and audio output has a control input (refer to figure 11.7 and table 11.9).
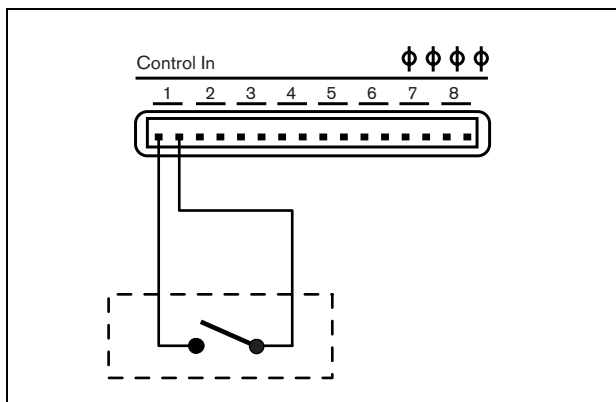
figure 11.7: Control inputs, connection

table 11.9: Control inputs, connection

Control input	Connection
1	Audio input 1
2	Audio input 2
3	Audio input 3
4	Audio input 4
5	Audio output 1
6	Audio output 2
7	Audio output 3
8	Audio output 4

When the circuit that is connected to a control input of an audio input or audio output is open, the audio input or audio output is enabled. Close the control input to disable the audio input or audio output.

When an control input is disabled, an X character replaces the VU meter of the corresponding audio input or audio output on the display.

table 11.10: Control inputs

Number of connections:
8x control inputs on 16-pole plug
Location:
Rear side
Signaling:
Potential-free change-over relay
Signal voltage:
Max. 24 V(DC), 15 V(AC)

11.4.6 Control outputs

The audio expander has five control outputs (refer to figure 11.8).

figure 11.8: Control outputs, connection

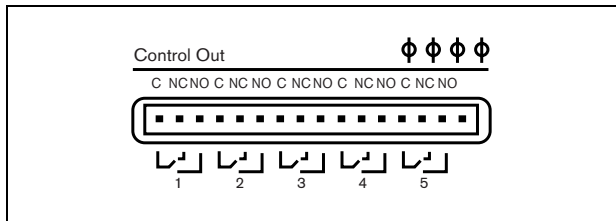With the control outputs, you can:
- Send the condition of the audio inputs to external devices (control output 1, 2, 3 and 4).
- Send the condition of the connection of the optical network to external devices (control output 5).

table 11.11: Control output conditions

Control output	Condition of	C-NO connected	C-NC connected
1	Channel attached to audio input 1	Engaged	Not engaged
2	Channel attached to audio input 2	Engaged	Not engaged
3	Channel attached to audio input 3	Engaged	Not engaged
4	Channel attached to audio input 4	Engaged	Not engaged
5	Optical network	Not available	Available

table 11.12: Control output, connection

Number of connections:
5x control outputs on 16-pole plug
Location:
Rear side
Maximum cable length:
1,000 m
Contact type:
SPDT (Relay contact, single pole, change-over contact
Contact voltage:
24 V(DC)
Contact current:
1 A
Off state (de-energized):
C-NC is closed, C-NO is open

11.5 Configuration menu

11.5.1 Overview

Use the configuration menu of the audio expander to configure the audio expander (refer to figure 11.9).
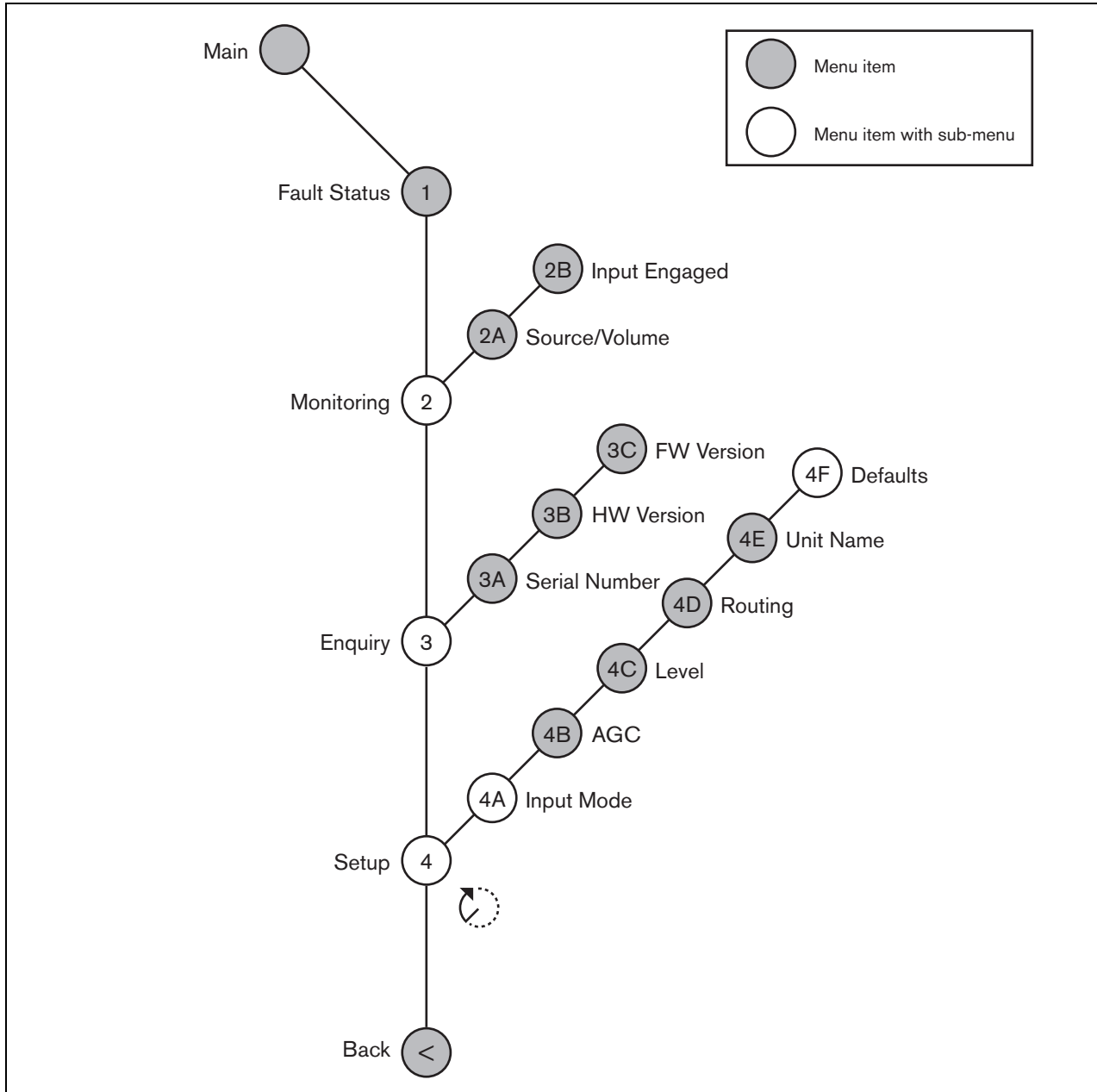

figure 11.9: Configuration menu

11.5.2 Navigation and operation

Refer to section 8.10.2 for information about the navigation and operation of the configuration menu of the audio expander. The navigation and operation of the configuration menu of the audio expander is the same as for the central control unit.

11.5.3 Main

When you start the audio expander, the display first shows Starting. The display then shows the Main menu item.

```
Analog Expander
In ■■_■ Out _■■_
```

> **i** **Note**
>
> If you do not turn or push the knob for three minutes, the display automatically goes back to the Main menu item. The display does not automatically go back to the Main menu item from the 2 Monitoring menu item and its sub-menus.

The Main menu item contains:
- The name of the audio expander. The default name is Analog Expander. You can change the name with the 4E Unit Name menu item (refer to section 11.5.8).
- Eight VU meters that show the volume levels of the audio inputs and audio outputs of the audio expander (refer to section 8.10.2.5). When an control input is disabled, an X character replaces the VU meter of the corresponding audio input or audio output on the display.

11.5.4 Fault pop-up

When the audio expander detects a fault, the display shows a message. If there is more than one message, the display shows the most important message (refer to table 11.13).

table 11.13: Messages (low to high importance)

Messages	Description
Upgrade unit sw	The audio expander does contain the correct firmware. You can send firmware to the audio expander with the: • Download and License Tool • PC Control Software
Downloading	The audio expander downloads software.
Max. CH mismatch	You have attached an audio input or audio output to a channel that does not exist.
No network	The audio expander cannot find the optical network.

When a fault condition is resolved, the fault message will disappear. The messages Max. CH mismatch, and No network go out of view when you push the knob.

11.5.5 Fault status

Use the 1 Fault Status menu item to see condition messages of the audio expander. If there is more than one message, the display shows the most important message (refer to table 11.14).

table 11.14: Messages (low to high importance)

Messages	Description
No Fault	The audio expander operates correctly.
Max. CH mismatch	You have attached an audio input or audio output to a channel that does not exist.
No network	The audio expander cannot find the optical network.

11.5.6 Monitoring

Use the 2 Monitoring menu item to open the Monitoring
sub-menu (refer to table 11.15).

table 11.15: Monitoring sub-menu (* = default)

Menu item	Parameter	Value	Description
2A Source/Volume	Signal: In 1* In 2 In 3 In 4 Out 1 Out 2 Out 3 Out 4	Volume level: -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*)	The signal that is available on the headphones socket of the audio expander and its volume level. The menu item also shows the attached channel (read-only).
2B Input Engaged	Audio input: 1, 2, 3, 4		If the menu item shows the number of the audio input, the channel on the audio input is already added to the system by another (digital) audio expander, a cobranet interface or an interpreter desk.

11.5.7 Enquiry

Use the 3 Enquiry menu item to open the Enquiry
sub-menu. The menu items in this sub-menu give
general data about the audio expander (refer to table
11.7).

> **Note**
> This data must be mentioned in all service
> requests and failure reports.

table 11.16: Enquiry sub-menu (* = default)

Menu item	Parameter	Value (read-only)	Description
3A Serial Number	---	e.g. 12.0.00362	The hexadecimal serial number of the audio expander.
3B HW Version	---	e.g. 15.00	The version number of the hardware of the audio expander.
3C FW Version	---	e.g. 3.10.1560	The version number of the firmware of the audio expander.

11.5.8 Setup

Use the 4 Setup menu item to open the Setup
sub-menu. Use the menu items in this sub-menu to
configure the audio expander (refer to table 11.17).

> **i** **Note**
> To open the Setup sub-menu, you must
> push and hold the knob for more than 3
> seconds.

table 11.17: Setup sub-menu (= default)*

Menu item	Parameter	Value	Description
4A Input Mode	---	---	Gives access to the Input Mode sub-menu (refer to section 11.5.9).
4B AGC	Input: Input 1 Input 2 Input 3 Input 4	AGC: On, Off On, Off On, Off On, Off	Sets the automatic gain control (AGC) of the audio inputs on and off (refer to section 11.5.10).
4C Level	Signal: Input 1 Input 2 Input 3 Input 4 Output 1 Output 2 Output 3 Output 4	Level: -6 to 6 dB (0 dB*) -6 to 6 dB (0 dB*) -6 to 6 dB (0 dB*) -6 to 6 dB (0 dB*) -24 to 6 dB (0 dB*) -24 to 6 dB (0 dB*) -24 to 6 dB (0 dB*) -24 to 6 dB (0 dB*)	The levels of the audio inputs and the audio outputs of audio expander.
4D Routing	Signal: Input 1 Input 2 Input 3 Input 4 Output 1 Output 2 Output 3 Output 4	Channel: --, 00 to 31 --, 00 to 31 --, 00 to 31 --, 00 to 31 --, PA, 00 to 31 --, PA, 00 to 31 --, PA, 00 to 31 --, PA, 00 to 31	The channel that is attached to the audio input or audio output of the audio expander. (PA = public address system.)
4E Unit Name	---	Name: Analog Expander* Custom name	The name of the audio expander (max. 16 characters).
4F Defaults	---	---	Opens the Reset menu item (refer to section 11.5.11).

11.5.9 Input mode

Use the Input mode sub-menu to set the input mode of audio input 1 and audio input 2 of the audio expander. Both inputs accept line level signals and microphone signals. When you connect a microphone signal to an audio input, you can also enable or disable the phantom power supply of the audio input (refer to table 11.17).

table 11.18: Input mode sub-menu (= default)*

Menu item	Parameter	Value	Description
4A Input 1	Input mode	Line*, Mic	The input mode of audio
	Phantom	On, Off*	input 1.
4A Input 2	Input mode	Line*, Mic	The input mode of audio
	Phantom	On, Off*	input 2.

11.5.10 Automatic gain control (AGC)

Use the AGC menu item to enable or disable the AGC of the audio inputs. If necessary, enable the AGC for the audio inputs that inject external interpretations in the system. The AGC makes sure that the nominal level of the received interpretations is 9 dBV (XLR), -6 dBV (cinch). When the nominal input of an external interpretation is high, the audio of the external interpretations will be too loud compared to the audio of the 'internal' interpretations from the interpreter desks.

> **i** **Note**
> When channel 00 is attached to an audio input, the system automatically disables AGC for the audio input. You cannot manually enable AGC for an audio input to which channel 00 is attached.

> **i** **Note**
> If two systems are connected by audio connections (Cobranet, AEX, or DEX), set the AGC to off.

11.5.11 Defaults

Use the Defaults sub-menu to put back the default
values for all parameters in the configuration menu
(refer to table 11.19).

table 11.19: Defaults sub-menu (* = default)

Menu item	Parameter	Value	Description
4F	Reset to defaults	No*	Does not put back the default values.
		Yes	Sets all parameters to the default values. The name is not changed.

12 PRS-4DEX4 Digital Audio Expander

> **i**
>
> **Note**
>
> The firmware version of the digital audio expander must be the same as the firmware version of the central control unit. You can send firmware to the digital audio expander and to the central control unit with the:
> - Download and License Tool
> - PC Control Software

12.1 Introduction

Use the PRS-4DEX4 Digital Audio Expander if the system needs digital audio inputs or outputs. Typically, the digital audio expander is used to:
- Connect external recording devices to the system
- Send audio signals to external devices
- Connect systems

12.2 Controls, connectors and indicators

12.2.1 Front view

The front of the digital audio expander (refer to figure 12.1) contains:

1 **Display** - Shows the configuration menu (refer to section 12.5).
2 **Knob** - Operates the configuration menu (refer to section 12.5).
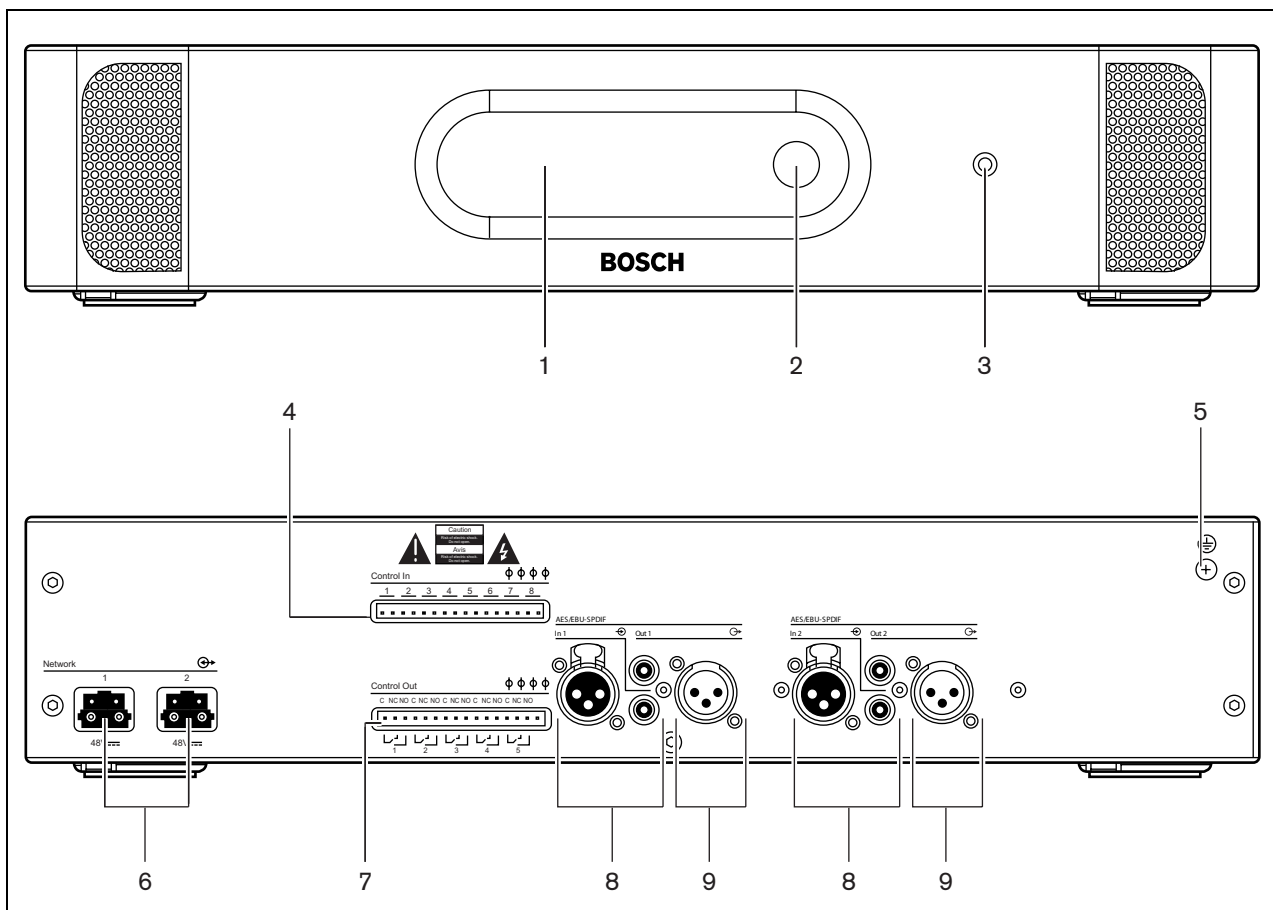3 **Headphones socket** - Connects headphones to the digital audio expander (refer to section 12.4.2).

figure 12.1: Front and rear views

12.2.2 Rear view

The rear of the digital audio expander (refer to figure 12.1) contains:

4 **Control inputs** - Connect the audio expander to external devices. Through the control inputs, external devices can control the audio inputs and the audio outputs of the audio expander (refer to section 12.4.5).

5 **Ground screw** - Connects the digital audio expander to ground.

6 **Optical network sockets** - Connect the audio expander to the optical network (refer to section 12.4.1).

7 **Control outputs** - Send the condition of the audio expander to external devices (refer to section 12.4.6).

8 **Audio inputs** - Connect the audio expander to external digital audio sources (refer to section 12.4.3).

9 **Audio outputs** - Connect the audio expander to external digital audio devices (refer to section 12.4.4).

12.3 Installation

You can install the digital audio expander in a 19-inch rack system or on a flat surface. Four feet and two brackets are supplied along with the digital audio expander (refer to figure 12.2).
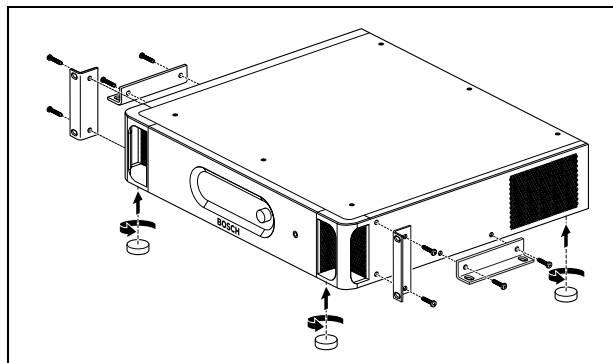

figure 12.2: Installation

table 12.1: Physical characteristics

Dimensions (h x w x d), flat surface:
92 x 440 x 400 mm (without brackets, with feet)
Dimensions (h x w x d), 19-inch rack system:
88 x 483 x 400 mm (with brackets, without feet)
Weight:
7.0 kg (without brackets, without feet).

> ℹ️ **Note**
>
> If you install the digital audio expander in a 19-inch rack system, the digital audio expander extends 36 mm in front of the brackets.

12.4   External connections

12.4.1   Optical network

Connect the optical network sockets of the digital audio expander to the optical network with optical network cables (refer to figure 12.3).
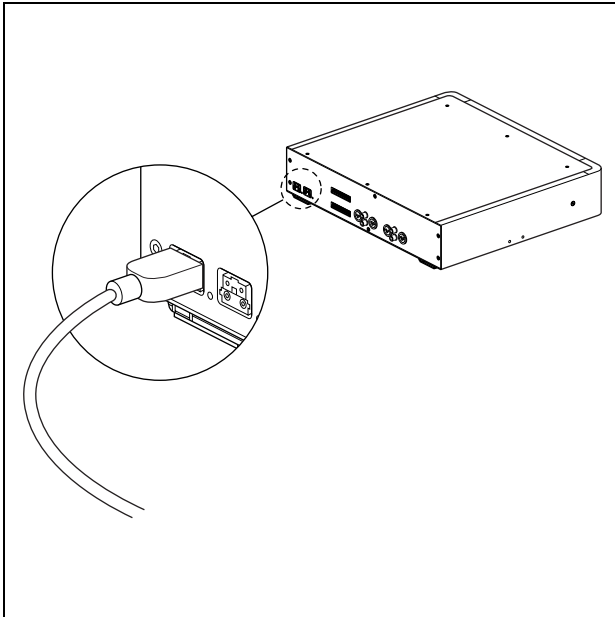

figure 12.3: Optical network

table 12.2: Optical network connections

Number of connections:
2x proprietary sockets
Location:
Rear side
Nodes:
1
Power consumption:
6.0 W

12.4.2   Headphones

You can connect headphones to the headphones socket of the digital audio expander. The headphones must have a 3.5 mm plug (refer to figure 12.4).
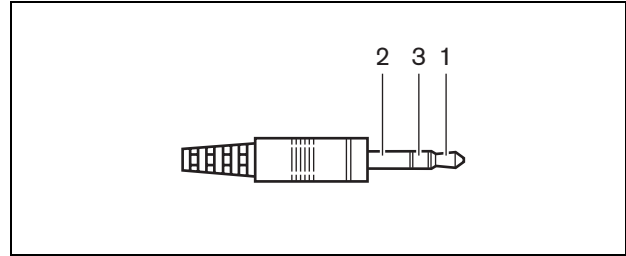

figure 12.4: 3.5 mm headphones plug, connection

table 12.3: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i   Note**
> You can also connect mono headphones to the headphones socket.

You can select the signal that is available on the headphones socket with the configuration menu (refer to section 12.5.6).

12.4.3 Audio inputs

You can connect external digital audio sources to the audio inputs of the digital audio expander. The digital audio expander has two audio inputs (refer to figure 12.5). Each audio input has:

- 1 XLR socket for AES/EBU signals. The electric circuits behind the XLR sockets contain transformers.
- 1 cinch socket for SPDIF signals.

> **i** **Note**
>
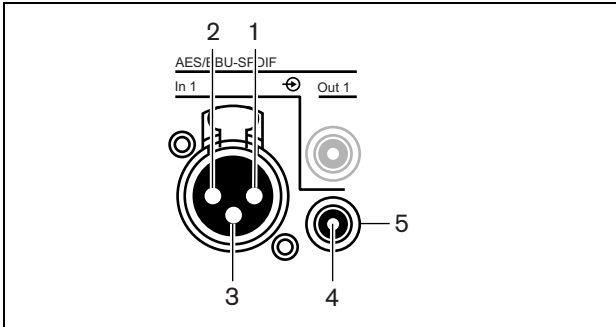> You cannot use the AES/EBU and SPDIF connections of the same audio input at the same time.

figure 12.5: Audio input, connection

table 12.4: Audio input, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal in
5		Return	Shield/ground

> **i** **Note**
>
> When the interlock is None (refer to section 33.6.6.11), the audio inputs of the digital audio expander are disabled for translation channels only. Audio input channels can route to floor channels.

Each audio input can contain a maximum of 2 channels (L and R). The digital audio expander does not change stereo signals in mono signals.

table 12.5: Audio inputs, digital signals

Number of connections:
• 1x XLR socket for each audio input
• 1x cinch socket for each audio input
Location:
Rear side
Cable:
Shielded cable
Maximum level:
Refer to appendix A
Nominal level:
Refer to appendix A
Impedance:
• XLR: 110 Ω
• Cinch: 75 kΩ

Use the configuration menu to configure the audio inputs of the digital audio expander (refer to section 12.5.9).

12.4.4 Audio outputs

You can connect external digital audio devices to the audio outputs of the digital audio expander. The digital audio expander has two audio outputs (refer to figure 12.6). Each audio output has:

- 1 XLR plug for AES/EBU signals. The electric circuits behind the XLR plugs contain transformers.
- 1 cinch socket for SPDIF signals.

> **i** **Note**
>
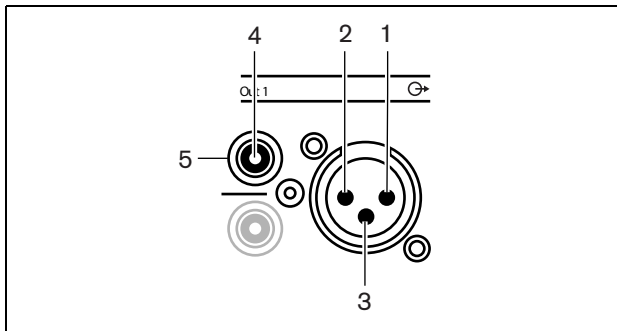> You cannot use the AES/EBU and SPDIF connections of the same audio output at the same time.

figure 12.6: Audio output, connection

table 12.6: Audio input, connection

Pin	Type	Signal	Description
1	XLR	Xternal	Shield/ground
2		Live	Positive
3		Return	Negative
4	Cinch	Live	Signal in
5		Return	Shield/ground

Each audio output can contain a maximum of 2 channels (L and R). The digital audio expander does not change stereo signals in mono signals.

table 12.7: Audio outputs, digital signals

Number of connections:
• 1x XLR plug for each audio output
• 1x cinch socket for each audio output
Location:
Rear side
Cable:
Shielded cable
Maximum output level:
Refer to appendix A
Nominal output level (floor):
Refer to appendix A
Nominal output level (interpreter channels):
Refer to appendix A
Output impedance:
• XLR: 110 Ω
• Cinch: 75 kΩ

Use the configuration menu to configure the audio outputs of the digital audio expander (refer to section 12.5.9).

12.4.5 Control inputs

The digital audio expander has eight control inputs. With the control inputs, remote systems can control the digital audio expander. Refer to section 11.4.5 for information about the control inputs of the digital audio expander. The control inputs of the audio expander and the digital audio expander do the same.

12.4.6 Control outputs

The digital audio expander has five control outputs. With the control outputs, you can send the condition of the digital audio expander to external devices. Refer to section 11.4.6 for information about the control outputs of the digital audio expander. The control outputs of the audio expander and the digital audio expander do the same.

12.5   Configuration menu

12.5.1   Overview

Use the configuration menu of the digital audio
expander to configure the digital audio expander (refer
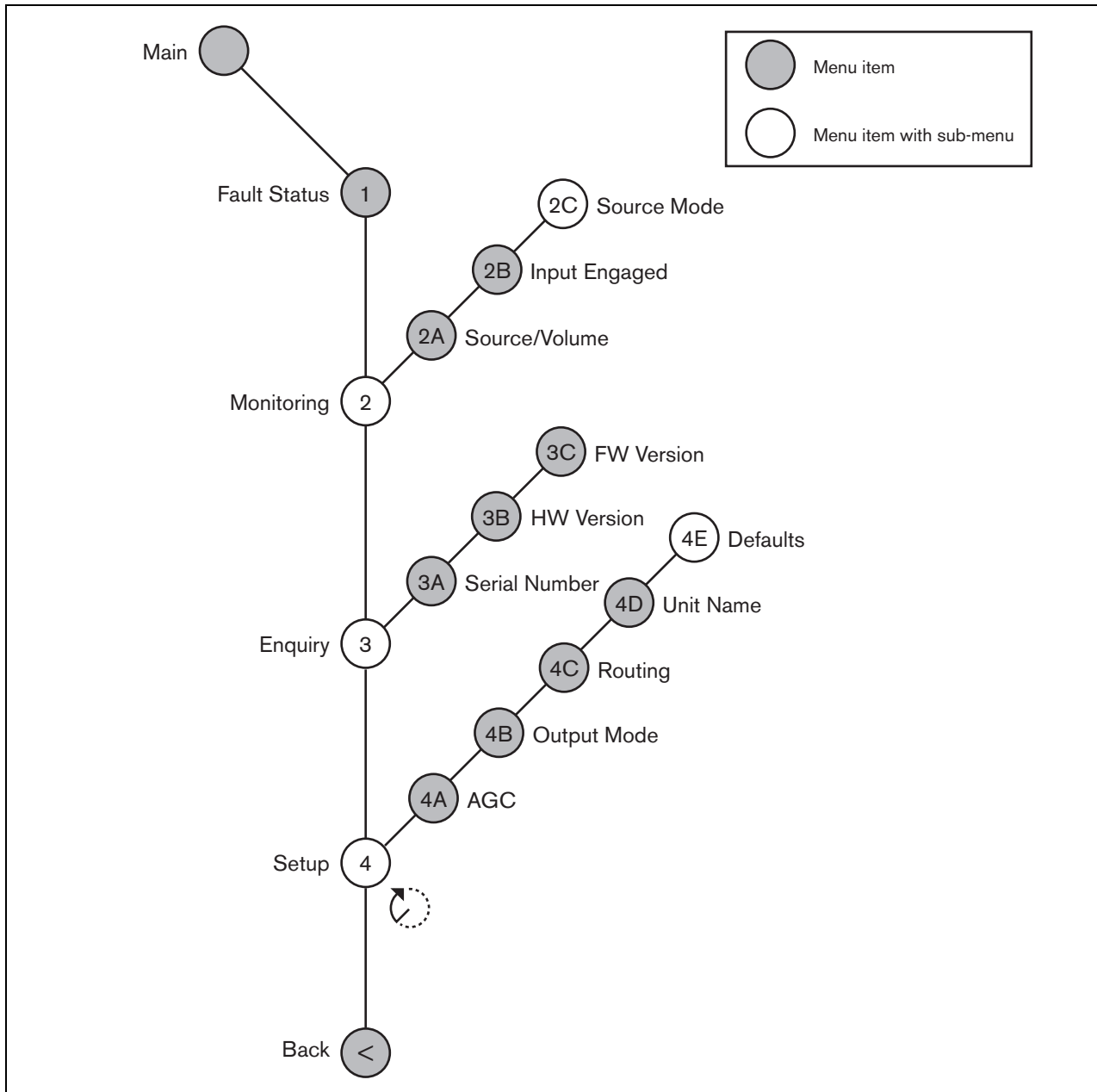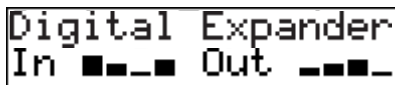to figure 12.7).

figure 12.7: Configuration menu

12.5.2 Navigation and operation

Refer to section 8.10.2 for information about the navigation and operation of the menu of the digital audio expander. The navigation and operation of the menu of the digital audio expander is the same as for the central control unit.

12.5.3 Main

When you start the digital audio expander, the display first shows Starting. The display then shows the Main menu item.

```
Digital Expander
In ▪▪_▪ Out _▪▪_
```

> ℹ **Note**
>
> If you do not turn or push the knob for three minutes, the display automatically goes back to the Main menu item. The display does not automatically go back to the Main menu item from the 2 Monitoring menu item and its sub-menus.

The Main menu item contains:
- The name of the digital audio expander. The default name is Digital Expander. You can change the name with the 4C Unit Name menu item (refer to section 11.5.8).
- Eight VU meters that show the volume levels of the audio inputs and audio outputs of the digital audio expander (refer to section 8.10.2.5). When an control input is disabled, an X character replaces the VU meter of the corresponding audio input or audio output on the display.

12.5.4 Fault pop-up

When the digital audio expander detects a fault, the display shows a message. If there is more than one message, the display shows the most important message (refer to table 12.8).

table 12.8: Messages (low to high importance)

Messages	Description
Upgrade unit sw	The digital audio expander does contain the correct firmware. You can send firmware to the digital audio expander with the: • Download and License Tool • PC Control Software
Downloading	The digital audio expander downloads software.
Max. CH mismatch	You have attached an audio input or audio output to a channel that does not exist.
No network	The digital audio expander cannot find the optical network.

When a fault condition is resolved, the fault message will disappear. The messages Max. CH mismatch, and No network go out of view when you push the knob.

12.5.5 Fault status

Use the 1 Fault Status menu item to see condition messages of the digital audio expander. If there is more than one message, the display shows the most important message (refer to table 12.9).

table 12.9: Messages (low to high importance)

Messages	Description
No Fault	The digital audio expander operates correctly.
Max. CH mismatch	You have attached an audio input or audio output to a channel that does not exist.
No network	The digital audio expander cannot find the optical network.

12.5.6 Monitoring

Use the 2 Monitoring menu item to open the Monitoring sub-menu (refer to table 12.10).

table 12.10: Monitoring sub-menu (= default)*

Menu item	Parameter	Value	Description
2A Source/Volume	Audio input or output: In 1L* In 1R In 2L In 2R Out 1L Out 1R Out 2L Out 2R	Volume level: -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*)	The signal that is available on the headphones socket of the digital audio expander and its volume level. The menu item also shows the attached channel (read-only).
2B Input Engaged	Audio input: 1L, 1R, 2L, 2R		If the menu item shows the number of the audio input, the channel on the audio input is already added to the system by another (digital) audio expander, a cobranet interface or an interpreter desk.
2C Source Mode	---	---	Gives access to the format digital audio (refer to section 12.5.7).

12.5.7 Source modes

Use the menu items in the 2C Source Mode sub-menu to view the formats of the digital audio on the audio inputs of the digital audio expander (refer to table 12.11).

table 12.11: Monitoring sub-menu (= default)*

Menu item	Parameter	Value	Description
2C	Audio input or output: Input 1* Input 2	Format: AES/EBU, SPDIF AES/EBU, SPDIF	Shows the format of the digital audio (read-only). When 'No valid signal' is shown, the audio input does not contain a valid signal.

12.5.8 Enquiry

Use the 3 Enquiry menu item to open the Enquiry
sub-menu. The menu items in this sub-menu give
general data about the digital audio expander (refer to
table 12.12).

> **i** **Note**
> This data must be mentioned in all service
> requests and failure reports.

table 12.12: Enquiry sub-menu (* = default)

Menu item	Parameter	Value (read-only)	Description
3A Serial Number	---	e.g. 1.A0.00220	The hexadecimal serial number of the digital audio expander.
3B HW Version	---	e.g. 15.00	The version number of the hardware of the digital audio expander.
3C FW Version	---	e.g. 3.10.1560	The version number of the firmware of the digital audio expander.

12.5.9 Setup

Use the 4 Setup menu item to open the Setup sub-menu. Use the menu items in this sub-menu to configure the digital audio expander (refer to table 12.13).

> **ℹ Note**
>
> To open the Setup sub-menu, you must push and hold the knob for more than 3 seconds.

table 12.13: Setup sub-menu (* = default)

Menu item	Parameter	Value	Description
4A AGC	Input:	AGC:	Sets the automatic gain
	Input 1L	On, Off	control (AGC) of the
	Input 1R	On, Off	audio inputs on and off
	Input 2L	On, Off	(refer to section 12.5.11).
	Input 2R	On, Off	
4B Output Mode	Output:	Format:	The format of the digital
	Output 1	AES/EBU*, SPDIF	audio for audio output 1
	Output 2	AES/EBU*, SPDIF	and audio output 2.
4C Routing	Input/output:	Channel:	The channel that is
	Input 1L	--*, 00 to 31	attached to the audio
	Input 1R	--*, 00 to 31	input or audio output of
	Input 2L	--*, 00 to 31	the digital audio expander.
	Input 2R	--*, 00 to 31	(PA = public address
	Output 1L	--*, PA, 00 to 31	system.)
	Output 1R	--*, PA, 00 to 31	
	Output 2L	--*, PA, 00 to 31	
	Output 2R	--*, PA, 00 to 31	
4D Unit Name	---	Name:	The name of the audio
		Digital Expander*	expander (max. 16
		Custom name	characters).
4E Defaults	---	---	Opens the Reset menu item (refer to section 12.5.10).

12.5.10 Defaults

Use the Defaults sub-menu to put back the default
values for all parameters in the configuration menu
(refer to table 11.19).

table 12.14: Defaults sub-menu (* = default)

Menu item	Parameter	Value	Description
4E	Reset to defaults	No*	Does not put back the default values.
		Yes	Sets all parameters to the default values. The name is not changed

12.5.11 Automatic gain control (AGC)

Use the AGC menu item to enable or disable the AGC
of the audio inputs. If necessary, enable the AGC for the
audio inputs that inject external interpretations in the
system. The AGC makes sure that the nominal level of
the received interpretations is 9 dBV (XLR), -6 dBV
(cinch). When the nominal input of an external
interpretation is high, the audio of the external
interpretations will be too loud compared to the audio
of the 'internal' interpretations from the interpreter
desks.

> **i** **Note**
> When channel 00 is attached to an audio input,
> the system automatically disables AGC for the
> audio input. You cannot manually enable AGC
> for an audio input to which channel 00 is
> attached.

> **i** **Note**
> If two systems are connected by audio
> connections (Cobranet, AEX, or DEX), set the
> AGC to off.

13 LBB4404/00 Cobranet Interface

13.1 Introduction

Use the LBB4404/00 Cobranet Interface to connect the system to a CobraNet network.

13.2 Controls, connectors and indicators

13.2.1 Front view

The front of the cobranet interface (refer to figure 13.1) contains:

1 **Display** - Shows the configuration menu (refer to section 13.5).
2 **Knob** - Operates the configuration menu (refer to section 13.5).
3 **Headphones socket** - Connect the headphones to the cobranet interface (refer to section 13.4.2).

> **i Note**
>
> The firmware version of the cobranet interface must be the same as the firmware version of the central control unit. You can send firmware to the cobranet interface and to the central control unit with the:
> • Download and License Tool
> • PC Control Software
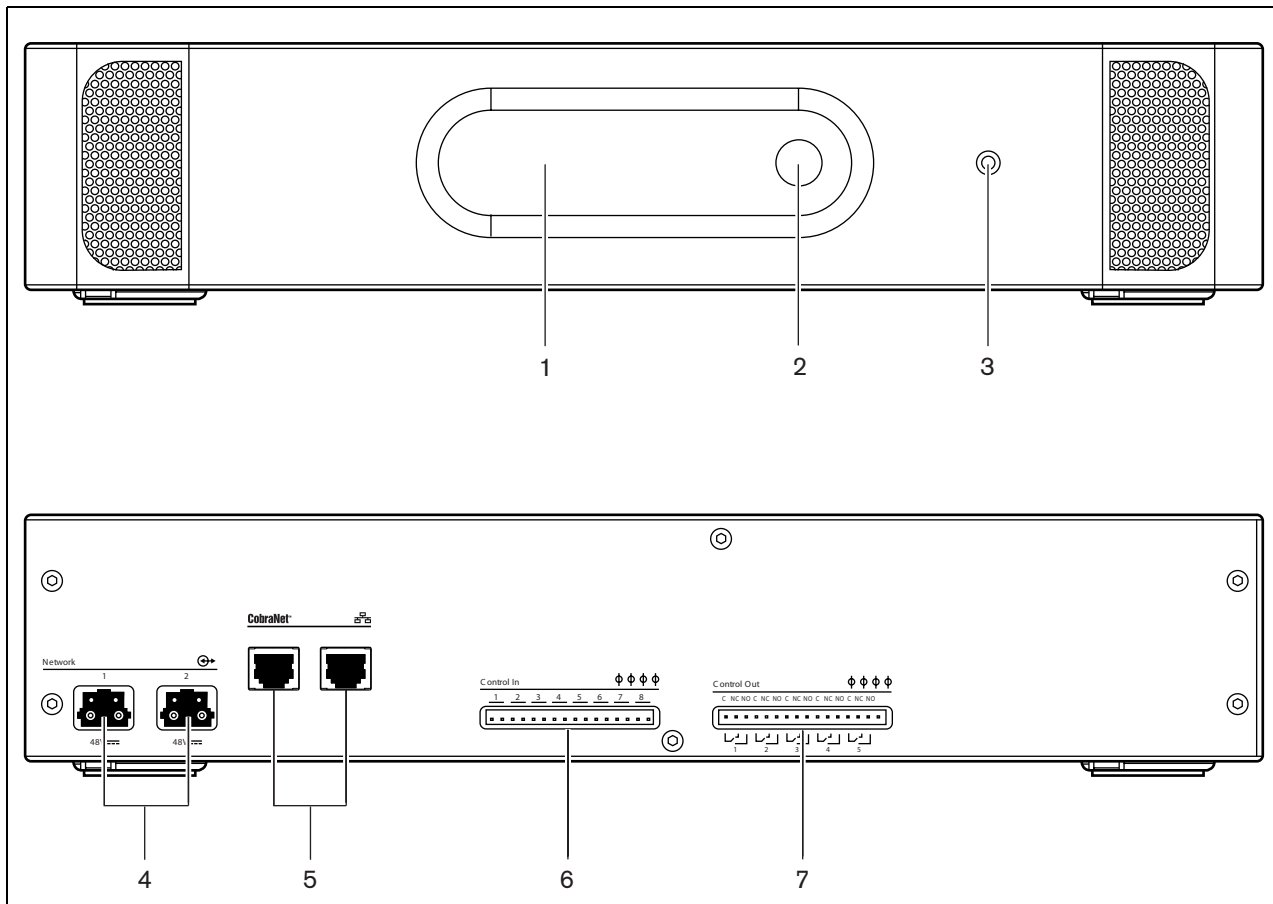
figure 13.1: Front and rear views

13.2.2 Rear view

The rear of the cobranet interface (refer to figure 13.1) contains:

4 **Optical network sockets** - Connect the cobranet interface to the optical network (refer to section 13.4.1).

5 **CobraNet sockets** - Connect the cobranet interface to the CobraNet network (refer to section 13.4.3). The CobraNet network contains the audio inputs and the audio outputs of the cobranet interface.

6 **Control inputs** - Connect the cobranet interface to external devices. Through the control inputs, external devices can control the audio inputs and the audio outputs of the cobranet interface (refer to section 13.4.5).

7 **Control outputs** - Send the condition of the cobranet interface to external devices (refer to section 13.4.6).

13.3 Installation

You can install the cobranet interface in a 19-inch rack system or on a flat surface. Four feet and two brackets are supplied along with the cobranet interface (refer to figure 13.2).
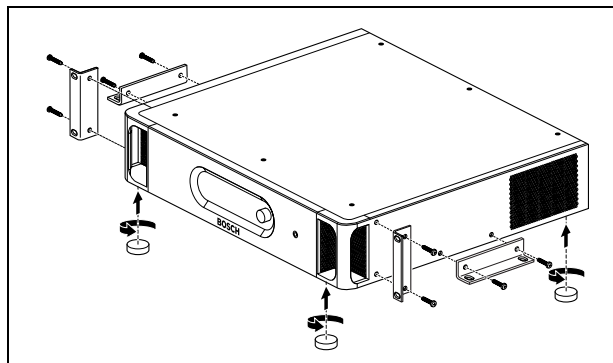
figure 13.2: Installation

table 13.1: Physical characteristics

Dimensions (h x w x d), flat surface
92 x 440 x 400 mm (without brackets, with feet)
Dimensions (h x w x d), 19-inch rack system
88 x 483 x 400 mm (with brackets, without feet)
Weight:
7.0 kg (without brackets, without feet).

> **ℹ Note**
> If you install the cobranet interface in a 19-inch rack system, the cobranet interface extends 36 mm in front of the brackets.

13.4 External connections

13.4.1 Optical network

Connect the optical network sockets of the cobranet interface to the optical network with optical network cables (refer to figure 13.3).
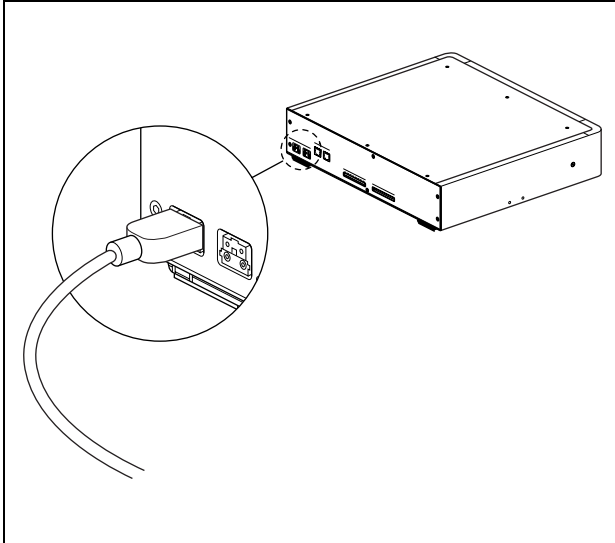

figure 13.3: Optical network

table 13.2: Optical network connections

Number of connections:
2x proprietary sockets
Location:
Rear side
Nodes:
1
Power consumption:
10.5 W

13.4.2 Headphones

You can connect headphones to the headphones socket of the cobranet interface. The headphones must have a 3.5 mm plug (refer to figure 13.4).

figure 13.4: 3.5 mm headphones plug, connection

table 13.3: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
>
> You can also connect mono headphones to the headphones socket.

You can select the signal that is available on the headphones socket with the configuration menu (refer to section 13.5.6).

13.4.3 CobraNet

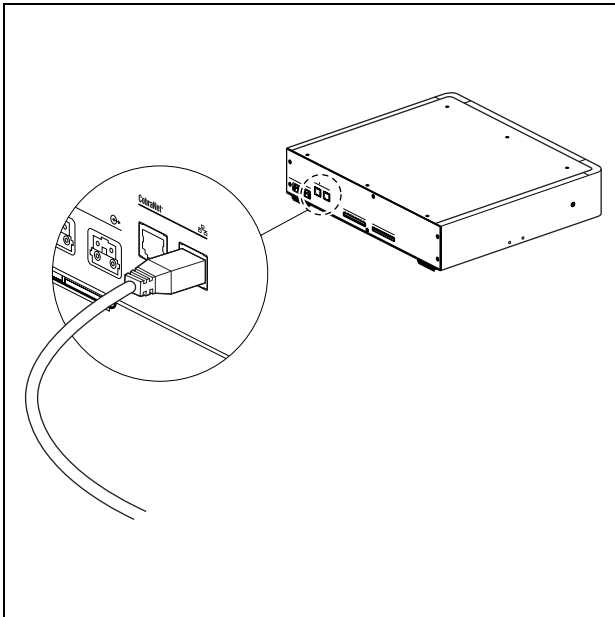Connect the cobranet interface to the CobraNet network with UTP cables (refer to figure 13.5).

figure 13.5: CobraNet network

table 13.4: CobraNet network connections

Number of connections:
2x RJ45 sockets
Location:
Rear side
Audio input:
4x Ethernet (16, 20 and 24 bit)
Audio outputs:
4x Ethernet (16, 20 and 24 bit)
Latency:
5.33 ms
Integrity assurance:
Watchdog

Each CobraNet socket has two LEDs that indicate the condition of the connection of the cobranet interface to the CobraNet (refer to table 13.5 and table 13.6)

table 13.5: Left LED

Color	Condition
Green (on)	CobraNet connection
Red (flash)	Unrecoverable error
Red (on)	Recoverable error

table 13.6: Right LED

Color	Condition
Green (on)	Socket is use
Yellow (on)	Cobranet interface is conductor

When you connect the cobranet interface to a CobraNet network, you must:
- Give an IP address to the cobranet interface with CobraNet Discovery (refer to chapter 13.6).
- Configure the CobraNet network with CNConfig (refer to chapter 13.7).

13.4.4 Audio inputs

> **i   Note**
> When the interlock is None (refer to section 33.6.6.11), the audio inputs of the cobranet interface are disabled.

13.4.5 Control inputs

The cobranet interface has eight control inputs. With the control inputs, remote systems can control the cobranet interface. Refer to section 11.4.5 for information about the control inputs of the cobranet interface. The control inputs of the audio expander and the cobranet interface do the same.

13.4.6 Control outputs

The cobranet interface has five control outputs. With the control outputs, you can send the condition of the cobranet interface to external devices. Refer to section 11.4.6 for information about the control outputs of the cobranet interface. The control outputs of the audio expander and the cobranet interface do the same.

13.5 Configuration menu

13.5.1 Overview

Use the configuration menu of the cobranet interface to configure the cobranet interface (refer to figure 13.6).
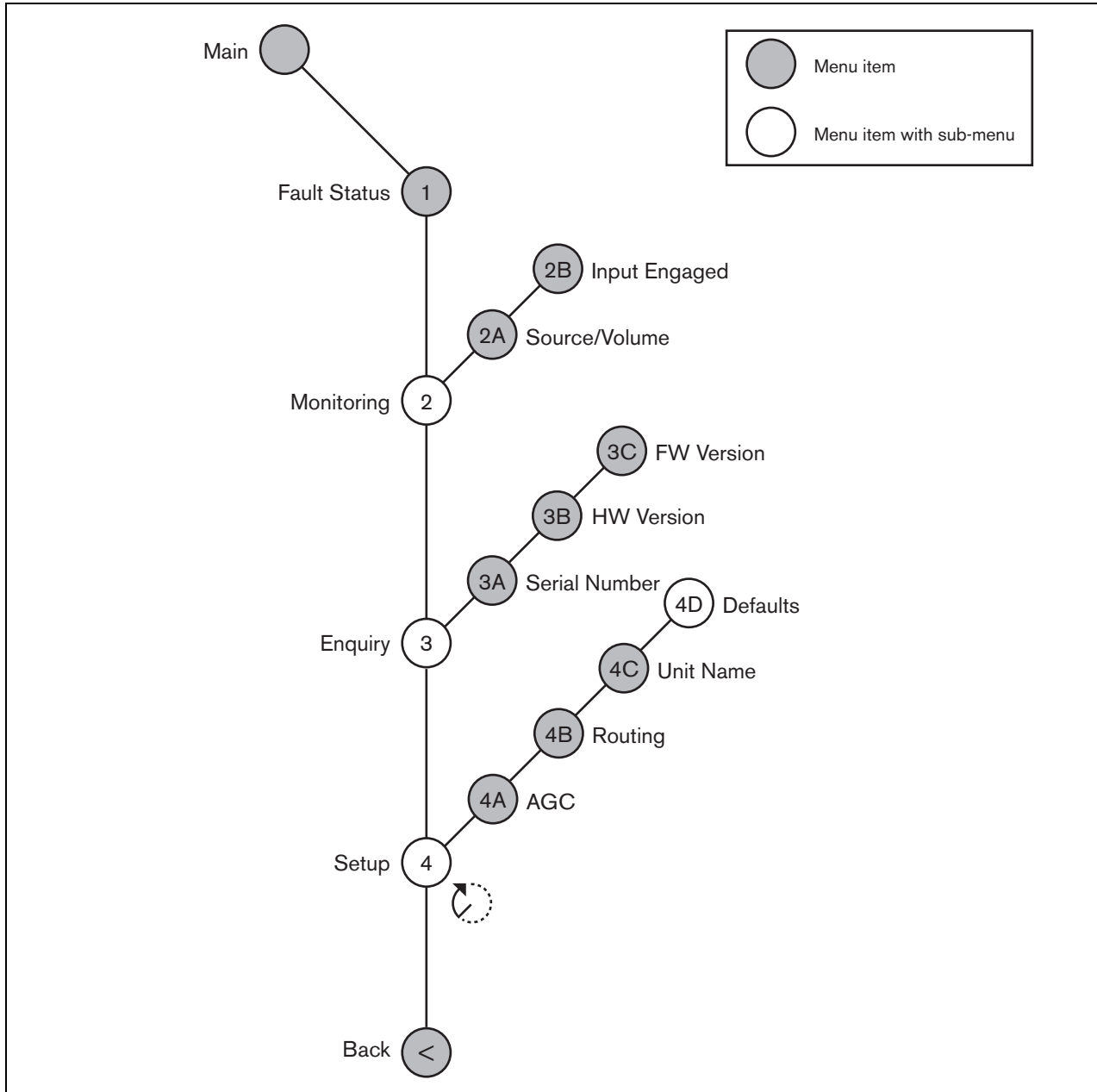

figure 13.6: Configuration menu

13.5.2 Navigation and operation

Refer to section 8.10.2 for information about the navigation and operation of the configuration menu of the cobranet interface. The navigation and operation of the configuration menu of the cobranet interface is the same as for the central control unit.

13.5.3 Main

When you start the cobranet interface, the display first shows Starting. The display then shows the Main menu item.

```
CobraNet
In ■■_■ Out _■■_
```

> **i** **Note**
>
> If you do not turn or push the knob for three minutes, the display automatically goes back to the Main menu item. The display does not automatically go back to the Main menu item from the 2 Monitoring menu item and its sub-menus.

The Main menu item contains:
- The name of the cobranet interface. The default name is CobraNet. You can change the name with the 4B Unit Name menu item (refer to section 13.5.8).
- Eight VU meters that show the volume levels of the audio inputs and audio outputs of the cobranet interface (refer to section 8.10.2.5). When an control input is disabled, an X character replaces the VU meter of the corresponding audio input or audio output on the display.

13.5.4 Fault pop-up

When the cobranet interface detects a fault, the display shows a message. If there is more than one message, the display shows the most important message (refer to table 13.7).

table 13.7: Messages (low to high importance)

Messages	Description
Upgrade unit sw	The cobranet interface does contain the correct firmware. You can send firmware to the cobranet interface with the: • Download and License Tool • PC Control Software
Downloading	The cobranet interface downloads software.
Max. CH mismatch	You have attached an audio input or audio output to a channel that does not exist.
CobraNet: 0xHH	The CobraNet module has a buddy link error. 0xHH is the hexadecimal error code. Refer to the CobraNet documentation on the CD-ROM that was supplied with your system for more information.
Internal: Mute	All audio inputs and audio inputs are muted.
Internal: 0xHH	The CobraNet module has a fault or an error. 0xHH is the hexadecimal error code. Refer to the CobraNet documentation on the CD-ROM that was supplied with your system for more information.
Internal: Fatal	The cobranet interface cannot start the firmware.
No network	The cobranet interface cannot find the optical network.

When a fault condition is resolved, the fault message will disappear. The messages CobraNet: 0xHH, Internal: Mute, Internal: 0xHH, Internal: Fatal, and No network go out of view when you push the knob.

13.5.5 Fault status

Use the 1 Fault Status menu item to see condition messages of the cobranet interface. If there is more than one message, the display shows the most important message (refer to table 13.8).

table 13.8: Messages (low to high importance)

Messages	Description
No Fault	The cobranet interface operates correctly.
Max. CH mismatch	You have attached an audio input or audio output to a channel that does not exist.
CobraNet: 0xHH	The CobraNet module has a buddy link error. 0xHH is the hexadecimal error code. Refer to the CobraNet documentation on the CD-ROM that was supplied with your system for more information.
Internal: Mute	All audio inputs and audio inputs are muted.
Internal: 0xHH	The CobraNet module has a fault or an error. 0xHH is the hexadecimal error code. Refer to the CobraNet documentation on the CD-ROM that was supplied with your system for more information.
Internal: Fatal	The cobranet interface cannot start the firmware.
No network	The cobranet interface cannot find the optical network.

13.5.6 Monitoring

Use the 2 Monitoring menu item to open the Monitoring
sub-menu (refer to table 13.9).

table 13.9: Monitoring sub-menu (= default)*

Menu item	Parameter	Value	Description
2A Source/Volume	Audio input or output: In 1* In 2 In 3 In 4 Out 1 Out 2 Out 3 Out 4	Volume level: -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*) -31 to 0 dB (16 dB*)	The signal that is available on the headphones socket of the cobranet interface and its volume level. The menu item also shows the attached channel (read-only).
2B Input Engaged	Audio input: 1, 2, 3, 4		If the menu item shows the number of the audio input, the channel on the audio input is already added to the system by another cobranet interface, a (digital) audio expander or an interpreter desk.

13.5.7 Enquiry

Use the 3 Enquiry menu item to open the Enquiry
sub-menu. The menu items in this sub-menu give
general data about the cobranet interface (refer to table
13.10).

> **ℹ Note**
> This data must be mentioned in all service
> requests and failure reports.

table 13.10: Enquiry sub-menu (= default)*

Menu item	Parameter	Value (read-only)	Description
3A Serial Number	---	e.g. 1C.0.00362	The hexadecimal serial number of the cobranet interface.
3B HW Version	---	e.g. 15.00	The version number of the hardware of the cobranet interface.
3C FW Version	---	e.g. 3.10.1560	The version number of the firmware of the cobranet interface.

13.5.8 Setup

Use the 4 Setup menu item to open the Setup
sub-menu. Use the menu items in this sub-menu to
configure the cobranet interface (refer to table 13.11).

> **i** **Note**
>
> To open the Setup sub-menu, you must
> push and hold the knob for more than 3
> seconds.

table 13.11: Setup sub-menu (* = default)

Menu item	Parameter	Value	Description

4A AGC	Input:
	  Input 1
	  Input 2
	  Input 3
	  Input 4
		AGC:
		  On, Off
		  On, Off
		  On, Off
		  On, Off
			Sets the automatic gain control (AGC) of the audio inputs on and off (refer to section 13.5.10).

4B Routing	Input/output:
	  Input 1
	  Input 2
	  Input 3
	  Input 4
	  Output 1
	  Output 2
	  Output 3
	  Output 4
		Channel:
		  --, 00 to 31
		  --, 00 to 31
		  --, 00 to 31
		  --, 00 to 31
		  --, PA, 00 to 31
		  --, PA, 00 to 31
		  --, PA, 00 to 31
		  --, PA, 00 to 31
			The channel that is attached to the audio input or audio output of the cobranet interface. (PA = public address system.)

4C Unit Name	---	Name:
		  CobraNet*
		  Custom name
			The name of the cobranet interface (max. 16 characters).

4D Defaults	---	---	Opens the Reset menu item (refer to section 13.5.9)

13.5.9 Defaults

Use the Defaults sub-menu to put back the default
values for all parameters in the configuration menu
(refer to table 13.12).

table 13.12: Defaults sub-menu (* = default)

Menu item	Parameter	Value	Description
4D	Reset to defaults	No*	Does not put back the default values.
		Yes	Sets all parameters to the default values. The name is not changed.

13.5.10 Automatic gain control (AGC)

Use the AGC menu item to enable or disable the AGC of the audio inputs. If necessary, enable the AGC for the audio inputs that inject external interpretations in the system. The AGC makes sure that the nominal level of the received interpretations is 9 dBV (XLR), -6 dBV (cinch). When the nominal input of an external interpretation is high, the audio of the external interpretations will be too loud compared to the audio of the 'internal' interpretations from the interpreter desks.

> **i** **Note**
> When channel 00 is attached to an audio input, the system automatically disables AGC for the audio input. You cannot manually enable AGC for an audio input to which channel 00 is attached.

> **i** **Note**
> If two systems are connected by audio connections (Cobranet, AEX, or DEX), set the AGC to off.

13.6 CobraNet Discovery

13.6.1 Introduction

With the CobraNet Discovery, you can:
- Find the IP addresses of the devices that are connected to the CobraNet network with a PC.
- Change the IP addresses of the devices that are connected to the CobraNet network with a PC.
- Change the firmware of the devices that are connected to the CobraNet network with a PC.

> **i** **Note**
> We assume that you understand the basic theory of CobraNet networks.

13.6.2 Installation

Install the CobraNet Discovery in a PC with the CD-ROM that is supplied with your system. The CD-ROM contains an automatic set-up program.

13.6.3 Start

Make sure that the PC in which you installed the CobraNet Discovery is connected to the CobraNet network. On the PC, go to Start > Programs > CobraNet Discovery. The monitor of the PC shows the CobraNet(tm) Discovery window (refer to figure 13.7 for an example).

13.6.4 Operation

The CobraNet(tm) Discovery window (refer to figure 13.7) shows the CobraNet devices on the CobraNet network and their Ethernet parameters.

> **i** **Note**
> The list also shows PC in which CobraNet Discovery is installed.

figure 13.7: CobraNet(tm) Discovery window

The list contains these data:
1 **S(tatus)** - Shows the condition of the CobraNet device. If the status column contains a green checkmark, the device is active. If the status column contains a red cross, the device is not active or not connected to the network.
2 **MAC Address** - Shows the MAC address of the CobraNet device.

3 **IP Address** - Shows the IP address of the device. Usually, the IP address of new devices is 0.0.0.0. CobraNet Discovery can automatically give addresses to new devices (refer to section 13.6.5).

4 **sysDescription** - Shows the name and the firmware version of the CobraNet device.

5 **errorCount** - Shows the number of errors of the CobraNet device since you started CobraNet Discovery.

To decrease the width of a column:

1 Click-and-hold the left mouse button on the right boundary of the column header.

2 Move the mouse to the left to decrease the width of the column.

3 Release the left mouse button.

To increase the width of a column:

1 Click-and-hold the left mouse button on the right boundary of the column header.

2 Move the mouse to the right to increase the width of the column.

3 Release the left mouse button.

To open the on-line help:

• Push the F1 function button on the keyboard of the PC in which the CobraNet Discovery was installed.

• Go to X:\Program Files\Peak Audio\CobraNet Discovery\CNDisco.chm. (X is the letter of the harddisk.)

13.6.5 Configuration

13.6.5.1 Overview

With the Configuration window, you can configure CobraNet Discovery. To open the Configuration window, go to View > Options.
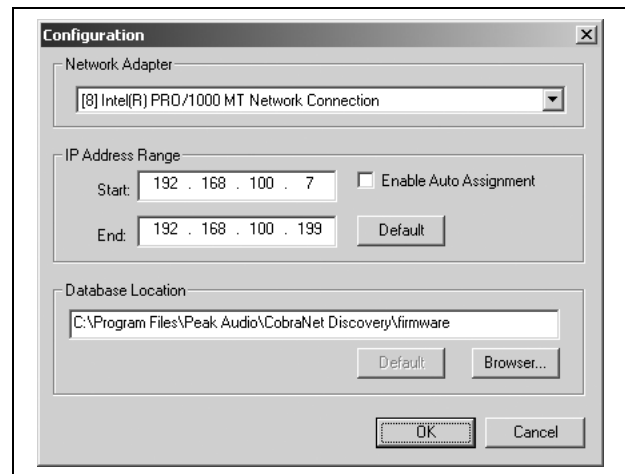
figure 13.8: CobraNet(tm) Discovery window

13.6.5.2 Network adapter

In the Network Adapter block, you must choose the Ethernet card of the PC that is used to connect to the CobraNet network.

13.6.5.3 IP addresses

When you put a checkmark in the Enable Auto Assignment box in the IP Address Range block, CobraNet Discovery automatically gives IP addresses to new CobraNet devices. You can set the range of automatically given IP addresses with the Start and End fields.

> **ℹ Note**
>
> When you remove the checkmark from the Enable Auto Assignment box, you will get access to the Start and End fields.

13.6.5.4 Firmware

Normally the firmware does not need updating. If you do have to update the firmware, you must use the database location on the PC.

13.7 CNConfig

13.7.1 Introduction

With the CNConfig, you can change the values of CobraNet parameters of CobraNet devices with a PC.

> ℹ️ **Note**
>
> We assume that you understand the basic theory of CobraNet networks.

13.7.2 Installation

Install the CNConfig in a PC with the CD-ROM that is supplied with your system. The CD-ROM contains an automatic set-up program.

13.7.3 Start

Make sure that the PC in which you installed the CNConfig is connected to the CobraNet network. On the PC, go to Start > Programs > Bosch > CNConfig. The monitor of the PC shows the CobraNet Settings window (refer to figure 13.9 for an example).

13.7.4 Operation

13.7.4.1 Introduction

The CobraNet Settings window (refer to figure 13.9) shows the CobraNet devices on the CobraNet network and their CobraNet parameters.
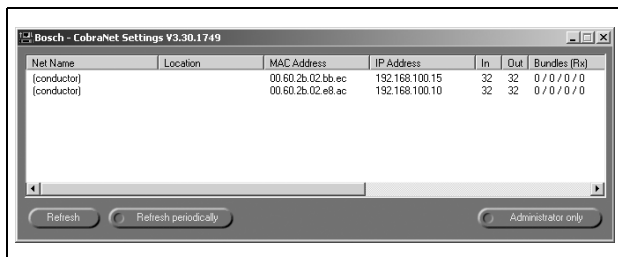
figure 13.9: CobraNet Settings window

To decrease the width of a column:

1 Click-and-hold the left mouse button on the right boundary of the column.
2 Move the mouse to the left to decrease the width of the column.
3 Release the left mouse button.

To increase the width of a column:

1 Click-and-hold the left mouse button on the right boundary of the column.
2 Move the mouse to the right to increase the width of the column.
3 Release the left mouse button.

To change the value of one parameter of a device:

1 Click on the device with the left mouse button.
2 Click on the parameter with the right mouse button.
3 Change the value of the parameter.

> ℹ️ **Note**
>
> To change the values of more than one parameter at the same time, use the Advanced configuration window (refer to figure 13.10).

To open the on-line help:

• Push the F1 function button on the keyboard of the PC in which the CNConfig was installed.
• Go to X:\Program Files\Bosch\CNConfig and double-click with the left mouse button on CNConfig.chm. (X is the letter of the harddisk.)

13.7.5 Configuration

13.7.5.1 Introduction

With the Advanced Configuration window (refer to figure 13.10), you can change the values of the CobraNet parameters of the CobraNet devices. To open the Advanced Configuration window, double-click on the CobraNet device in the CobraNet Settings window (refer to figure 13.9).

> ℹ️ **Note**
>
> Do not use the Advanced configuration window to give IP addresses to CobraNet devices. Always use CobraNet Discovery to give IP addresses to CobraNet devices.
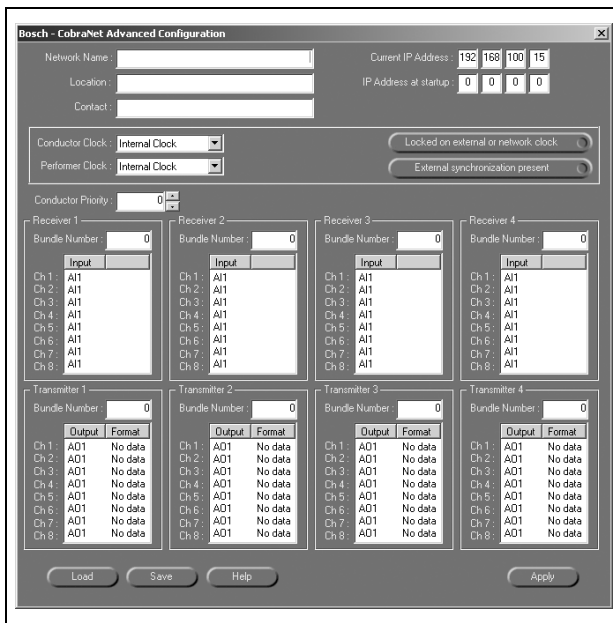
figure 13.10: Advanced configuration window

13.7.5.2 Conductor and clock

When the CobraNet device is an LBB4404/00
CobraNet Interface, make sure that you set:

- Conductor clock to Internal clock
- Perform clock to Internal clock

When the CobraNet device is an LBB4404/00
CobraNet Interface, these parameters are not
applicable:

- Locked on external or network clock
- External synchronization present
- Conductor Priority

13.7.5.3 Bundles

Introduction

The CobraNet network uses bundles for the transport of
audio signals. The cobranet interface can:

- Receive 4 bundles from the CobraNet network
  (receiver bundles). Refer to the Receiver blocks in
  figure 13.10.
- Send 4 bundles to the CobraNet network
  (transmitter bundles). Refer to the Transmitter blocks
  in figure 13.10.

Receiver bundles

Each receiver bundle can have 8 bundle channels. To
the bundle channels of a receiver bundle, you can
connect the audio inputs of the cobranet interface. Thus,
the audio inputs take audio signals from the CobraNet
network and send them to the optical network.

Do as follows to configure a receiver bundle of the
cobranet interface:

1 Go to the Advanced Configuration window (refer to
   figure 13.10) of CNConfig.
2 In the Bundle Number field of the receiver bundle,
   enter the number of the bundle that the receiver
   bundle must take from the CobraNet network (also
   refer to table 13.13).
3 Double-click on the first bundle channel (Ch 1) with
   the left mouse button. CNConfig shows an
   Rx Advanced Configuration window (refer to figure
   13.11). With the Rx Advanced Configuration window,
   you can change the audio inputs that are connected
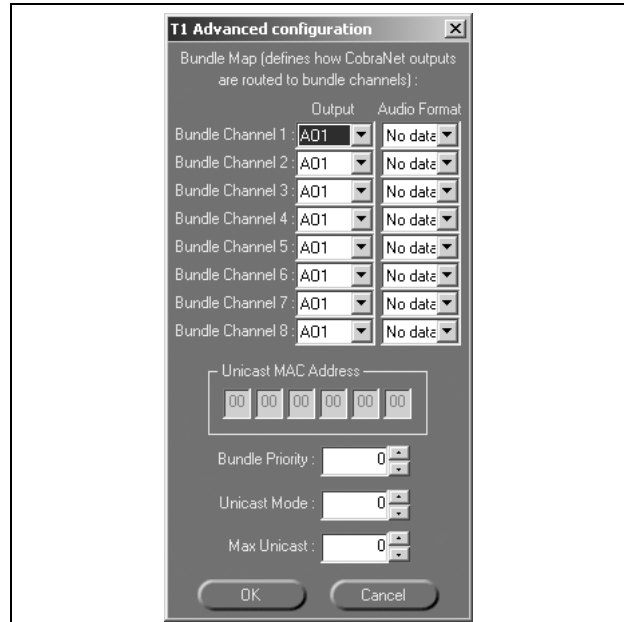   to the bundle channels.
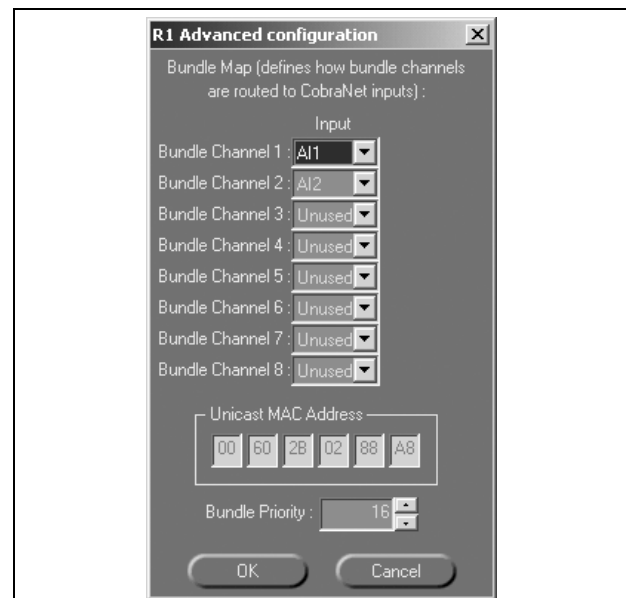
figure 13.11: Rx Advanced Configuration window

4 On the right of the Bundle Channel 1 block, click on
   the arrow button with the left mouse button. The
   CNConfig shows a list of audio inputs that you can
   connect to the bundle channel 1.
5 Click on the audio input that must be connected to
   the bundle channel. When the cobranet interface
   must not use the bundle channel, click on Unused
   with the left mouse button.

> **Note**
>
> Do not connect an audio input to more than one bundle channel (in the same or one of the other receiver bundles). When you connect an audio input to more than one bundle channel, the system can operate incorrectly.

6 Enter the values of the other parameters (for example, the bundle priority) of the receiver bundle (refer to the on-line help of the CNConfig).

7 Repeat step 4 to 6 for the other bundle channels in the receiver bundle.

Transmitter bundles

Each transmitter bundle can have 8 bundle channels. To the bundle channels of a transmitter bundle, you can connect the audio outputs of the cobranet interface. Thus, the audio outputs take audio signals from the optical network and send them to the CobraNet network.

Do as follows to configure a transmitter bundle of the cobranet interface:

1 Go to the Advanced Configuration window (refer to figure 13.10) of CNConfig.

2 In the Bundle Number field of the transmitter bundle, enter the number of the bundle that the cobranet interface sends to the CobraNet network (refer to table 13.13 in the on-line help of the CNConfig).

table 13.13: Bundle numbers

Bundle number	Description
0	Bundle not in use.
1 to 255	Multicast bundle
256 to 65279	Unicast bundle

> **Note**
>
> When the CobraNet network must send the transmitter bundle to one other device on the CobraNet network, make sure that the transmitter bundle is a unicast bundle.

3 Double-click on the first bundle channel (Ch 1) with the left mouse button. CNConfig shows a

Tx Advanced Configuration window (refer to figure 13.12). With the Tx Advanced Configuration window, you can change the audio outputs that are connected to the bundle channels.

figure 13.12: Tx Advanced Configuration window

4 On the right of the Bundle Channel 1 block, click on the arrow button with the left mouse button. The CNConfig shows a list of audio outputs that you can connect to the bundle channel 1.

5 Click on the audio output that must be connected to the bundle channel. When the cobranet interface must not use the bundle channel, click on Unused with the left mouse button.

> **Note**
>
> You can connect an audio output to more than one bundle channel. When you connect an audio output to more than one bundle channel, the system operates correctly.

6 Enter the values of the other parameters of the transmitter bundle (refer to the on-line help of the CNConfig).

7 Repeat step 4 to 6 for the other bundle channels in the transmitter bundle.

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Section 3 - Contribution Devices

14 DCN-DIS Discussion Units

14.1 Introduction

With the discussion units, the delegates can make contributions to a discussion. The chairman can use a discussion unit to monitor and control a discussion.

14.2 Controls, connectors and indicators

14.2.1 Top

The top of the discussion units (refer to figure 14.1 and figure 14.2) contains:

1 **Microphone socket** - Connects a DCN-MICL or DCN-MICS Pluggable Microphone to the discussion unit (refer to chapter 17).

> **i** **Note**
> You cannot connect a DCN-MICL or DCN-MICS Pluggable Microphone to the DCN-DISL and DCN-DISS Discussion Units. The DCN-DISL and DCN-DISS Discussion Units have fixed microphones.

2 **Loudspeaker** - Gives the audio signal from the floor to the delegate or the chairman. When the microphone is enabled, the signal of the loudspeaker is muted.

3 **Volume buttons** - Change the volume level of the signal that is sent to the headphones.

4 **Channel selector display** - Shows the number of the channel and the abbreviation of the language (refer to appendix B) that is sent to the headphones. When the display shows FLR, the floor signal is sent to the headphones.

> **i** **Note**
> You can set change the type of language abbreviation with menu e of the installation menu of the interpreter desk (refer to section 33.6.6.5).

5 **Channel selector buttons** - Select the channel that is sent to the headphones.

6 **Microphone buttons** - Enable or disable the microphone. Each microphone button has a LED that shows the condition of the microphone. The mode of the discussion unit (refer to section 14.7.1) gives the type and number of microphone buttons that you must install in the discussion unit.

7 **Voting buttons** - Operate the discussion unit. Each voting button has a yellow LED. The LED adjacent to voting button 1 is the attendance LED (refer to section 14.7.2).

14.2.2 Left and right sides

The left and right sides of the discussion units (refer to figure 14.3) contain:

8 **Headphones socket** - Connect headphones to the discussion unit (refer to section 14.6.2).

14.2.3 Rear side

The rear of the discussion units (refer to figure 14.4) contains:

9 **DCN cable** - Connects the discussion unit to the DCN (refer to section 14.6.1).

10 **DCN socket** - Makes a loop-through in the DCN with the discussion unit (refer to section 14.6.1).

14.2.4 Bottom side

The bottom side of the discussion units (refer to figure 14.5) contains:

11 **Screw holes** - Attach the discussion unit to a flat surface (refer to section 14.5).

12 **Configuration switches** - Configure the discussion unit (refer to section 14.3) and set the mode of the discussion unit (refer to section 14.4).

13 **De-init switch** - Erases the address of the discussion unit (refer to section 8.7). All LEDs on the discussion unit come on when the discussion unit does not have an address.
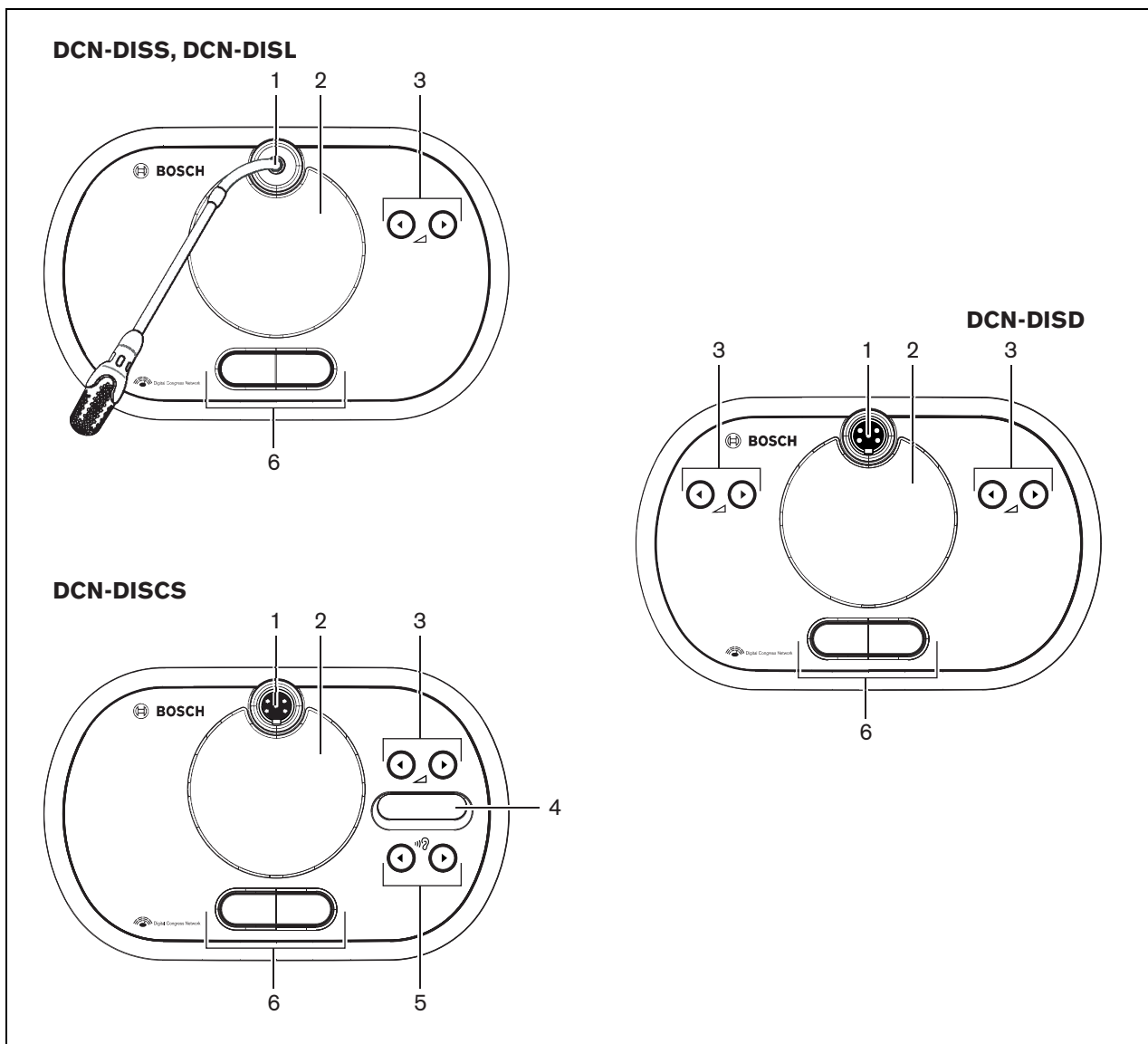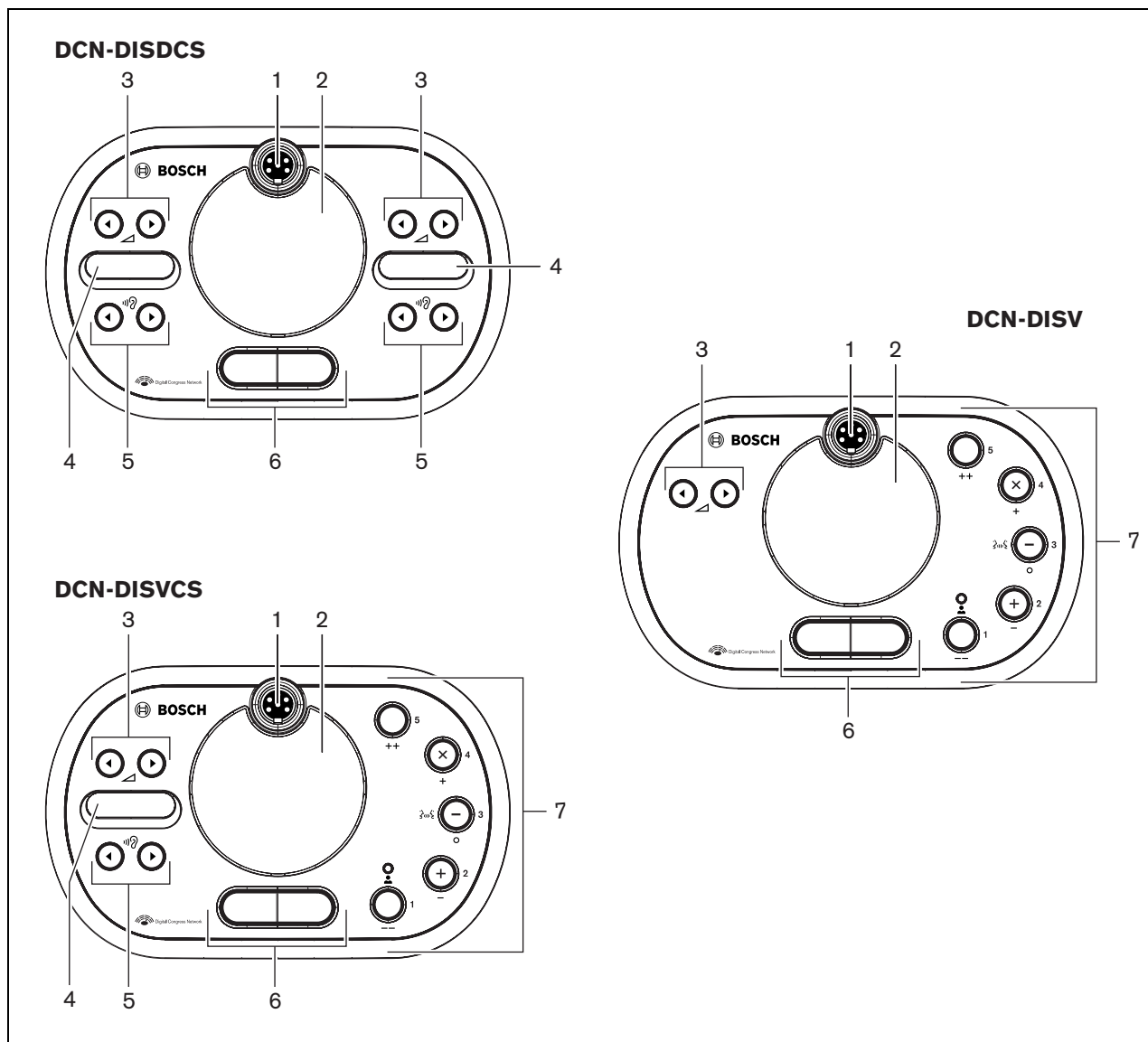
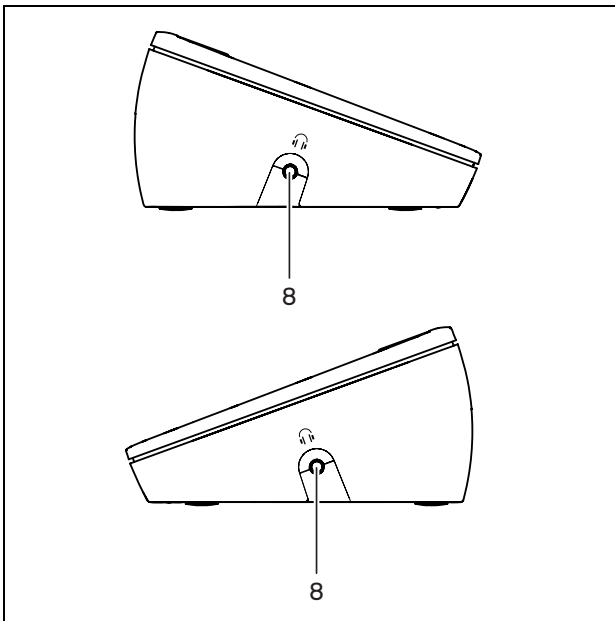*figure 14.1: Top views (1)*

figure 14.2: Top views (2)

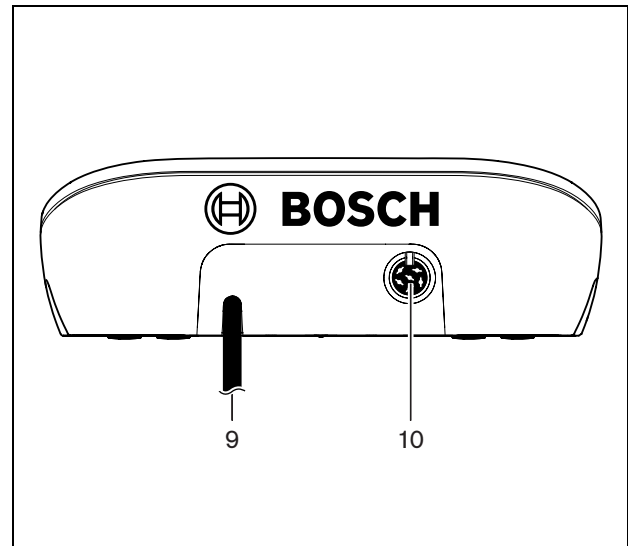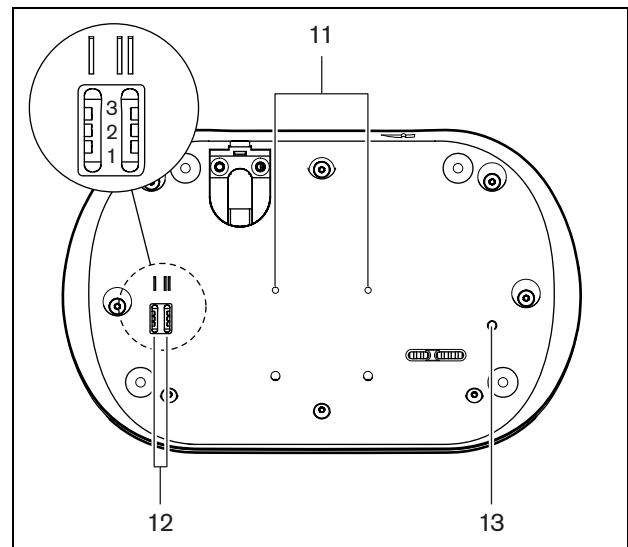*figure 14.3: Side views*

figure 14.4: Rear view

figure 14.5: Bottom view

14.3   Internal settings

14.3.1   Introduction

With the configuration switches on the bottom of the discussion unit (refer to figure 14.5, no. 12), you can configure the discussion unit.

> ℹ️ **Note**
>
> The internal settings apply to the discussion unit. When the discussion unit is in the dual delegate mode (refer to section 14.4.4), the internal settings are the same for the two delegates.

table 14.1: Internal settings

I	II	Internal setting
2	1	Microphone sensitivity (refer to section 14.3.2). Default: 0 dB.
2	2	Channel/volume restore function (refer to section 14.3.3). Default: disabled.
2	3	Headphones level reduction (refer to section 14.3.4) Default: disabled.

> ℹ️ **Note**
>
> The central control unit does not keep the internal settings of the discussion units. After you set the mode (refer to section 14.4), the discussion unit keeps the internal settings.

14.3.2   Microphone sensitivity

When the configuration switches are in the correct position (refer to table 14.1), you can adjust the microphone sensitivity of the discussion unit between -2 dB and 2 dB.

- To increase the microphone sensitivity with 0.5 dB, push the > volume button.
- To decrease the microphone sensitivity with -0.5 dB, push the < volume button.
- The color of microphone button LED indicates the microphone sensitivity (see table 14.2).

table 14.2 Microphone sensitivity adjustment

Value in dB	Color of microphone button LED
- 2.0	Red
- 1.5	Off
- 1.0	Orange
- 0.5	Off
0.0	Yellow
0.5	Off
1.0	Light green
1.5	Off
2.0	Green

> ℹ️ **Note**
>
> When the discussion unit has two sets of volume buttons, configure the microphone sensitivity with the right set of volume buttons. The microphone sensitivity cannot be configured with the left set of volume buttons.

14.3.3 Channel/volume restore function

When the configuration switches are in the correct position (refer to table 14.1), you can enable or disable the channel/volume restore function of the discussion unit.

- To enable the channel/volume restore function, push the > volume button. (The LED around the microphone buttons come on as green.) When the discussion unit is enabled, it automatically selects the last known channel and volume.
- To disable the channel/volume restore function, push the < volume button. (The LED around the left microphone button comes on as red.) When the discussion unit is enabled, it automatically selects channel 0 (floor) and sets the volume to -18 dB.

> **i** Note
>
> When the discussion unit has two sets of volume buttons, configure the channel/volume restore function with the right set of volume buttons. The channel/volume restore function cannot be configured with the left set of volume buttons.

For example, you can enable this function in discussions in which all delegates and chairmen have a fixed seat number.

14.3.4 Headphones level reduction

When the configuration switches are in the correct position (refer to table 14.1), you can enable or disable the headphones level reduction of the discussion unit.

- To enable the headphones level reduction, push the > volume button. (The LED around the left microphone button comes on as green.) When the microphone is enabled, the headphones level reduction is 18 dB.

> **i** Note
>
> When the discussion unit is in the dual delegate mode (refer to section 14.4.4) and the headphones level reduction is enabled:
> - The signal that is sent to the left headphones socket is decreased when the left microphone button is pushed. The signal that is sent to the right headphones socket is not decreased.
> - The signal that is sent to the right headphones socket is decreased when the right microphone button is pushed. The signal that is sent to the left headphones socket is not decreased.

- To disable the headphones level reduction, push the < volume button. (The LED around the left microphone button comes on as red.) When the microphone is enabled, there is no headphones level reduction.

> **i** Note
>
> When the discussion unit has two sets of volume buttons, configure the headphones level reduction with the right set of volume buttons. The headphones level reduction cannot be configured with the left set of volume buttons.

For example, you can enable this function to avoid acoustic feedback between the microphone and the headphones of the discussion unit.

14.4 Modes

14.4.1 Overview

With the configuration switches on the bottom of the discussion unit (refer to figure 14.5, no. 12), you can configure the mode of the discussion unit. Each type of discussion unit can operate in a number of modes (refer to table 14.3).

table 14.3: Modes

I	II	Mode
1	1	Single delegate (refer to section 14.4.2)
1	3	Chairman (refer to section 14.4.3)
3	1	Dual delegate (refer to section 14.4.4)
3	3	Single delegate with auxiliary control (refer to section 14.4.5)

14.4.2 Single delegate

When the discussion unit is in the single delegate mode, it is a delegate device for 1 delegate. You can put all types of discussion units in the single delegate mode. When you put the discussion unit in the single delegate mode, you must also install the default microphone buttons (refer to figure 14.6 and section 14.5.2).
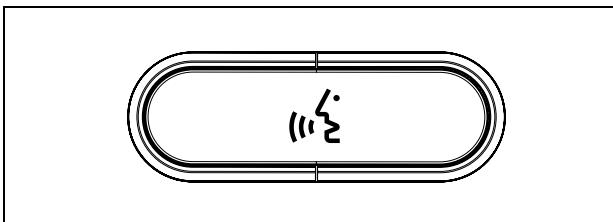
figure 14.6: Default microphone button

> **i** **Note**
> All discussion units are delivered with the default microphone button.

14.4.3 Chairman

When the discussion unit is in the chairman mode, it is a chairman device for 1 chairman. You can put all types of discussion units in the chairman mode. When you put the discussion unit in the chairman mode, you must also install the DCN-DISBCM Buttons (refer to figure 14.7 and section 14.5.2).
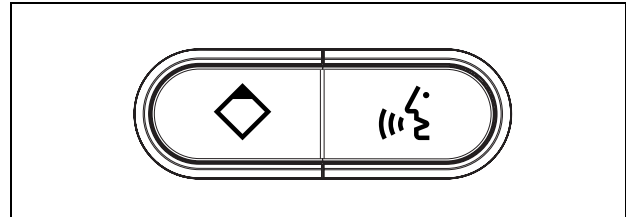
figure 14.7: DCN-DISBCM Buttons

The only difference between a delegate discussion unit and a chairman discussion unit is the priority button on the left of the microphone button. With the priority button, the chairman can disable the microphones of all delegate devices. At the same time, the priority button enables the microphone of the chairman. The system has the possibility to:
- Play an attention chime when the chairman pushes the priority button (refer to section 8.8.3).
- Erase the request-to-speak list and the speakers list when the chairman pushes the priority button (refer to section 8.8.4).

> **i** **Note**
> The DCN-DISBCM button come with a tool that you can use to remove the old buttons from the discussion unit (refer to figure 14.11).

14.4.4 Dual delegate

When the discussion unit is in the dual delegate mode, it is a delegate device for 2 delegates. The system sees the discussion unit as two separate devices, but it gives only one address to the discussion unit. You can only put these types of discussion units in the dual delegate mode:

• DCN-DISD
• DCN-DISDCS

When you put the discussion unit in the dual delegate mode, you must also install the DCN-DISBDD Buttons (refer to figure 14.8 and section 14.5.2).
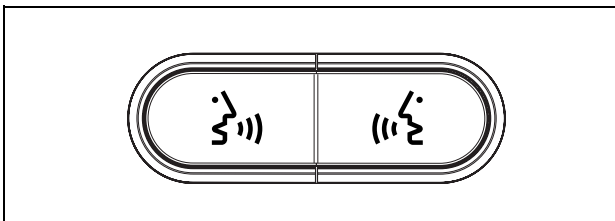
figure 14.8: DCN-DISBDD Buttons

> **Note**
> The DCN-DISBDD buttons come with a tool that you can use to remove the old buttons from the discussion unit (refer to figure 14.11).

14.4.5 Single delegate with auxiliary control

When the discussion unit is in the single delegate with auxiliary control mode, it is a delegate device for 1 delegate. The delegate can use the left microphone button as an auxiliary button. For example, to activate an indicator.

> **Note**
> When the delegate pushes the auxiliary button, the auxiliary button makes an event. Use the Open Interface to program the actions that must be started by the event. Refer to the applicable Software User Manual for instructions that tell you how to program the Open Interface.

You can only put these types of discussion units in the single delegate with auxiliary control mode:

• DCN-DISD
• DCN-DISDCS
• DCN-DISV
• DCN-DISVCS

When you put the discussion unit in the single delegate with auxiliary control mode, you must also install two microphone buttons (refer to section 14.5.2). For example, you can use the DCN-DISBCM Buttons (refer to figure 14.7).

14.5 Installation

14.5.1 Rims

The discussion units are delivered without rims. Before you install the discussion unit, you must first attach a DCN-DISR Rim to it. With the rims, you can change the look of the discussion unit.

Refer to figure 14.9 for instructions that tell you how to attach a rim to a discussion unit. Refer to figure 14.10 for instructions that tell you how to detach a rim from a discussion unit.
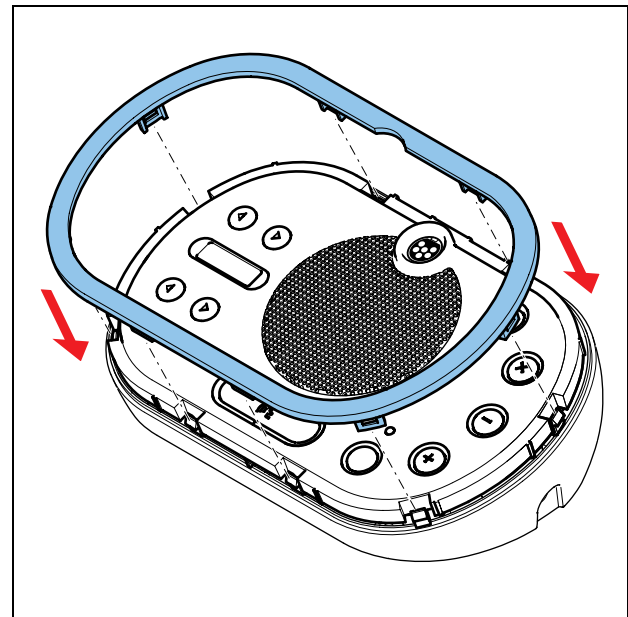
figure 14.9: Attach a rim
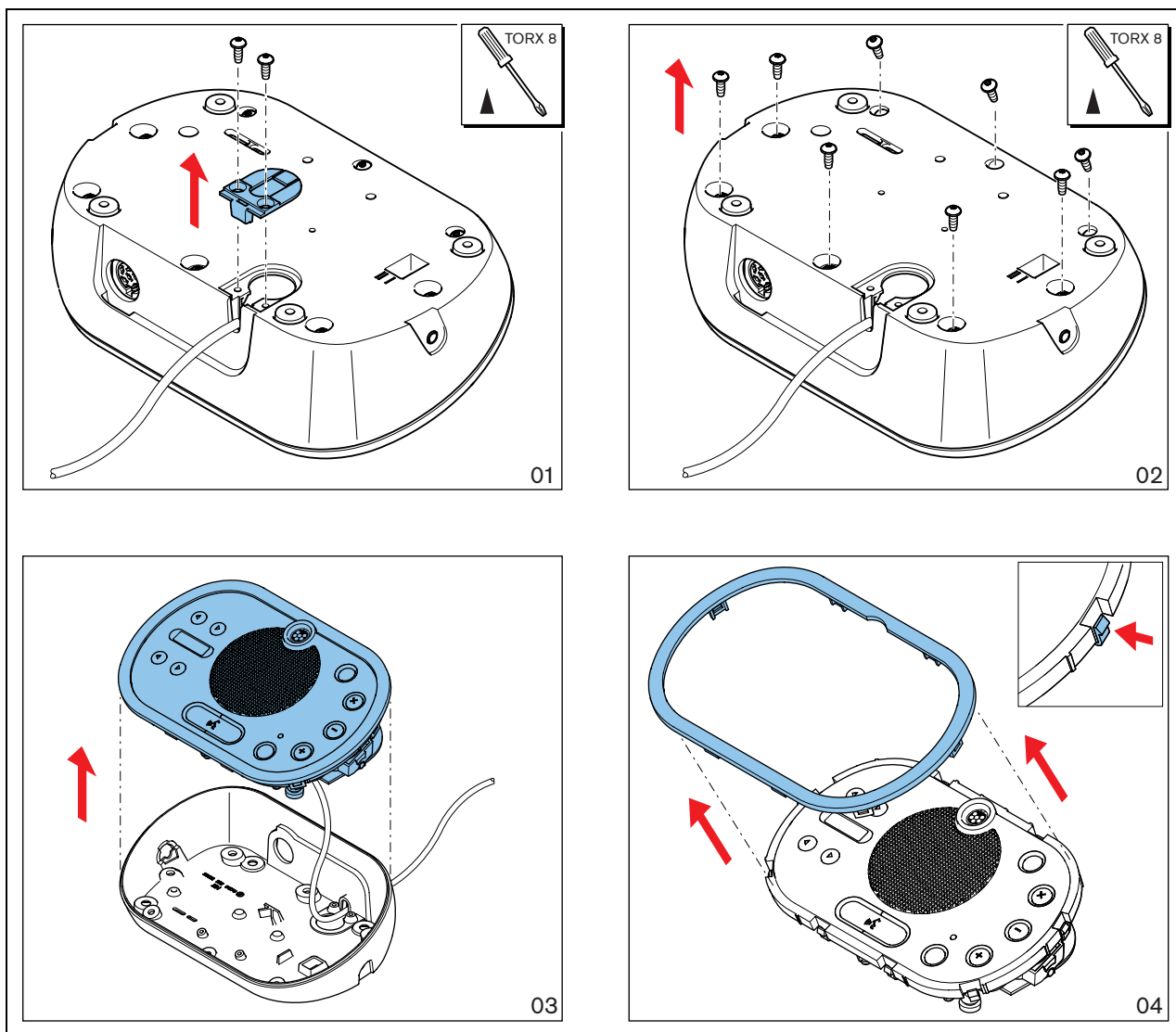
figure 14.10: Detach a rim

14.5.2 Microphone buttons

The mode of the discussion unit (refer to section 14.4) gives the type and number of microphone buttons that you must install in the discussion unit.

Refer to figure 14.11 for instructions that tell you how to remove microphone buttons from a discussion unit.
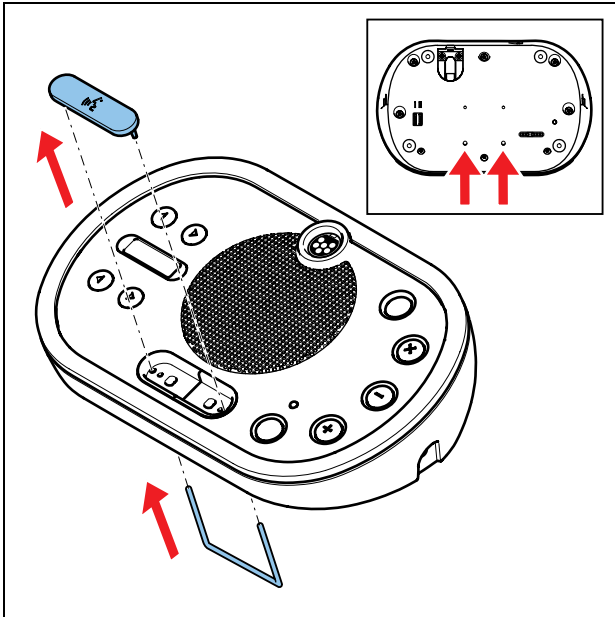
figure 14.11: Remove microphone buttons

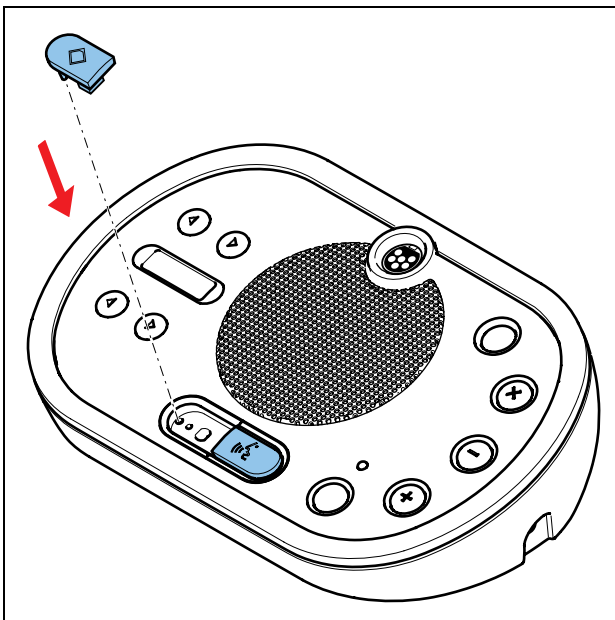Refer to figure 14.12 for instructions that tell you how to install microphone buttons on a discussion unit.

figure 14.12: Install microphone buttons

14.5.3 DCN cable

You can move the DCN cable from the rear side to the bottom side of the discussion unit (refer to figure 14.13).
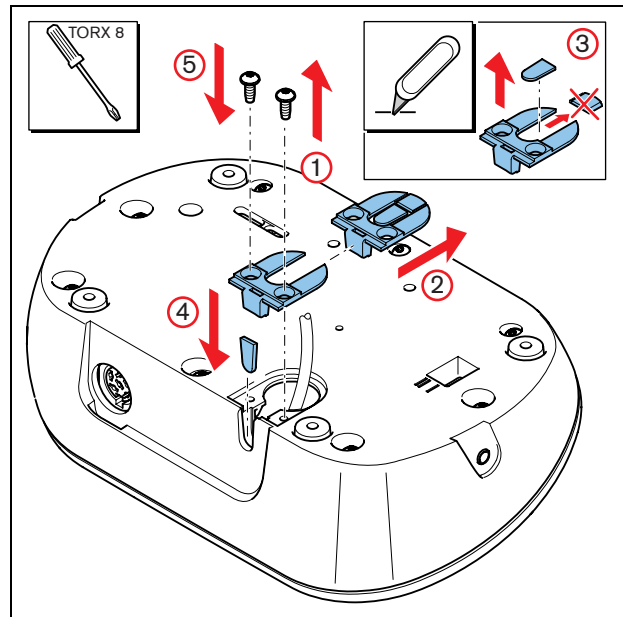
figure 14.13: Move the DCN cable

14.5.4 Discussion unit

> **i Note**
> The safety of this equipment has been tested according to the standards for moveable equipment. Before you use this equipment as stationary equipment in a North American country, contact your supplier.

Install the discussion unit on a flat surface or in a recess (refer to figure 14.14). When you install the discussion unit desk in a recess:
- Use the template (refer to figure 14.15).
- Move the DCN cable to the bottom side of the discussion unit (refer to figure 14.13).

> **i Note**
> When you install the discussion unit in a recess, make sure that the delegates or the chairman can connect the headphones.
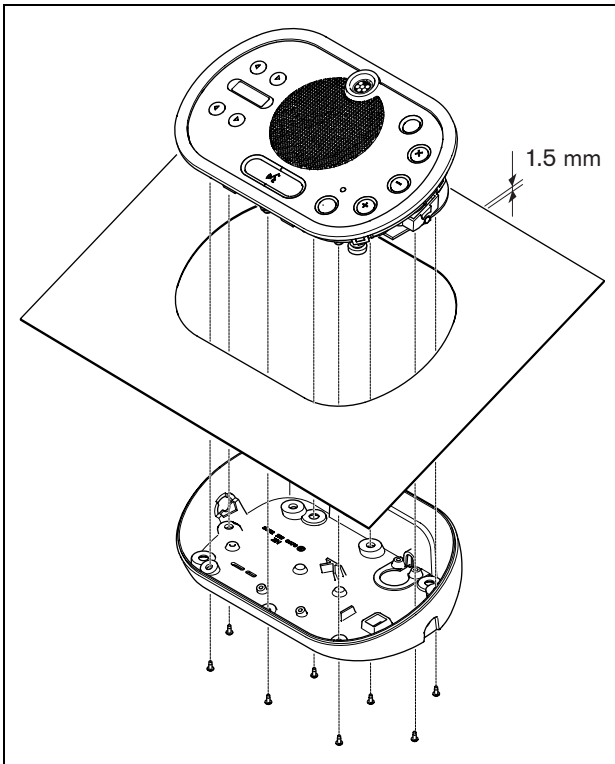
figure 14.14: Installation

table 14.4: Physical characteristics

Dimensions (h x w x d):
60 x 190 x 120 mm
Weight:
• DCN-DISL: 0.9 kg
• DCN-DISS: 0.9 kg
• DCN-DISCS: 0.8 kg
• DCN-DISD: 0.8 kg
• DCN-DISDCS: 0.8 kg
• DCN-DISV: 0.8 kg
• DCN-DISVCS: 0.8 kg

When you attach the discussion unit to a flat surface, put screws with a length of 8 mm in the screw holes (refer to figure 14.5, no. 11). The distance between the centres of the screw holes is 34 mm.
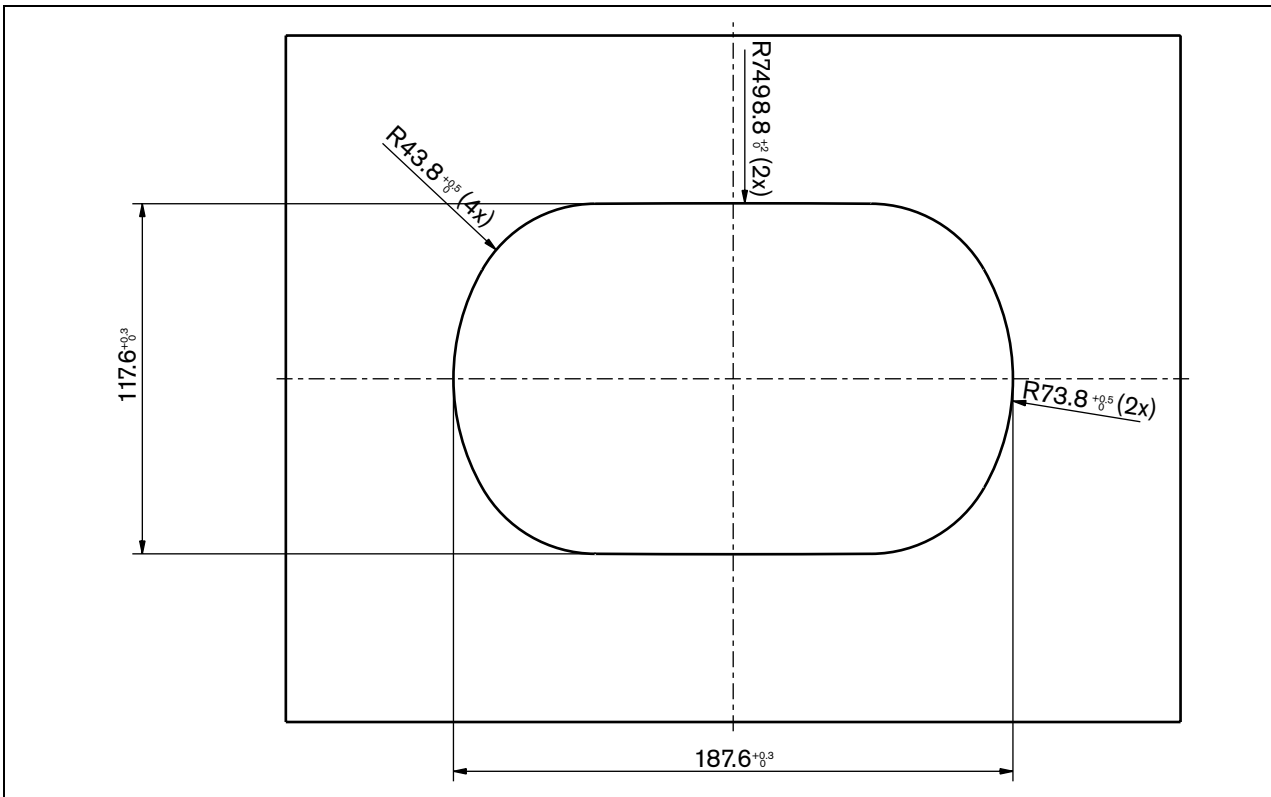
figure 14.15: Template (refer to the CD-ROM that is supplied with the system for a *.dwg file)

14.6   External connections

14.6.1   DCN

Connect the discussion unit to the DCN with the DCN cable. You can use the DCN socket to make a loop-through with the discussion unit.

table 14.5: DCN connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Location:
Rear side (default)
Power consumption:
•   DCN-DISL: 2.75 W
•   DCN-DISS: 2.75 W
•   DCN-DISCS: 2.9 W
•   DCN-DISD: 2.8 W
•   DCN-DISDCS: 3.15 W
•   DCN-DISV: 3.05 W
•   DCN-DISVCS: 3.20 W

> **i**   **Note**
>
> You can move the DCN cable from the rear side to the bottom side of the discussion unit (refer to figure 14.13).

You can use the cable-to-unit clamps to lock DCN cables to discussion units (refer to figure 14.16).
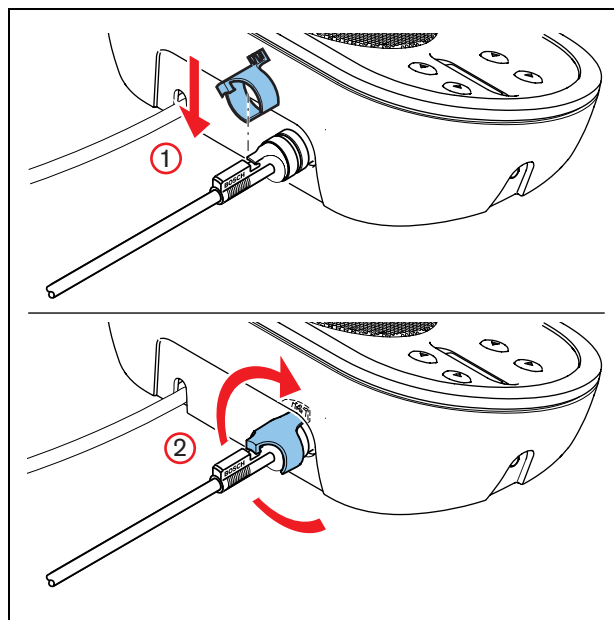
figure 14.16: Cable-to-unit clamp

14.6.2 Headphones

You can connect headphones to the headphones socket of the discussion unit, the headphones must have a 3.5 mm plug (refer to figure 14.17).
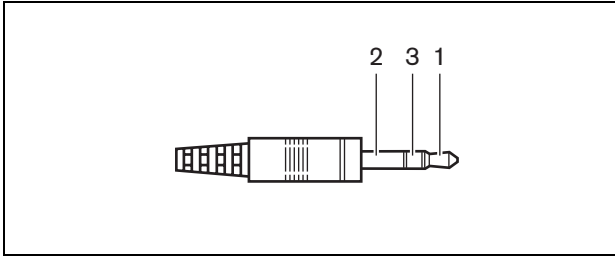
figure 14.17: 3.5 mm headphones plug, connection

table 14.6: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
> You can also connect mono headphones to the discussion unit.

table 14.7: Headphones sockets, details

Number of connections:
2x 3.5 mm socket
Location:
Right and left sides

14.7 Operation

14.7.1 Microphone

The colors of the LEDs of the microphone buttons show the condition of the microphone that is connected to the discussion unit (refer to table 15.12).

table 14.8: Condition

Color	Condition
Red (on)	Microphone enabled
Red (flash)	Last minute of speech time
Green (on)	Request-to-speak
Green (flash)	First in request-to-speak list
Yellow (on)	VIP mode

> **i** **Note**
> You can only put the discussion unit in the VIP mode with the Microphone Management software module. Refer to the applicable Software User Manual for instructions that tell you how to enable the VIP mode.

> **i** **Note**
> Refer to the Quick Reference Card of the discussion unit for instructions that tell you how to operate the discussion unit.

14.7.2 Attendance LED

table 14.9: Attendance LED

Attendance LED	Condition
Yellow (on)	Delegate present

15 DCN-CON Concentus Delegate Units

15.1 Introduction

With the DCN-CON, DCN-CONCS and DCN-CONFF Concentus Delegate Units, the delegates can make contributions to a conference.

15.2 Controls, connectors and indicators

15.2.1 Top

The top of the Concentus delegate units (refer to figure 15.1) contains:

1 **Microphone socket** - Connects a DCN-MICL or DCN-MICS Pluggable Microphone to the Concentus delegate unit (refer to chapter 17).

2 **Loudspeaker** - Gives the audio signal from the floor to the delegate. When the microphone is enabled, the signal of the loudspeaker is muted.

3 **Microphone LED** - Comes on when the microphone is enabled.

4 **Card reader** - Can give access to the Concentus delegate unit.

5 **Channel selector** - Selects the channel that is sent to the headphones.

6 **Microphone button** - Enables or disables the microphone. The microphone button has a LED that shows the condition of the microphone (refer to section 15.6).

7 **Voting buttons** - Operate the Concentus delegate unit. Each voting button has a yellow LED. The LED shows the condition of the voting button.

8 **Display** - Shows the menu of the Concentus delegate unit.

15.2.2 Left and right sides

The left and right sides of the Concentus delegate units (refer to figure 15.2) contain:

9 **External microphone socket** - Connects an external microphone or the microphone of a headset to the left side of the Concentus delegate unit (refer to section 15.5.2).

10 **Headphones sockets** - Connect headphones to the Concentus delegate unit (refer to section 15.5.3). Each side has one headphones socket.

11 **Volume controls** - Adjust the volume level of the signal that is sent to the headphones.

15.2.3 Bottom side

The bottom side of the Concentus delegate units (refer to figure 15.3 and figure 15.4) contains:

12 **Screws** - Connect the bottom plate to the cover of the Concentus delegate unit.

13 **DCN cable** - Connects the Concentus delegate unit to the DCN (refer to section 15.5.1).

14 **DCN socket** - Makes a loop-through in the DCN with the Concentus delegate unit (refer to section 15.5.1).

15 **Sensitivity potentiometer** - Adjusts the sensitivity of the microphone that is connected to the Concentus delegate unit (+/- 2 dB).

16 **RJ45 socket** - Connects an LBB3555/00 Intercom Handset, external contact or DCM-FCS Channel Selector to the Concentus delegate unit (refer to section 15.5.4, section 15.5.5 and section 15.5.6).

17 **Screw holes** - Attach the Concentus delegate unit to a flat surface (refer to section 15.4).

18 **De-init switch** - Erases the address of the Concentus delegate unit (refer to section 8.7). All LEDs on the Concentus delegate unit come on when the Concentus delegate unit does not have an address.
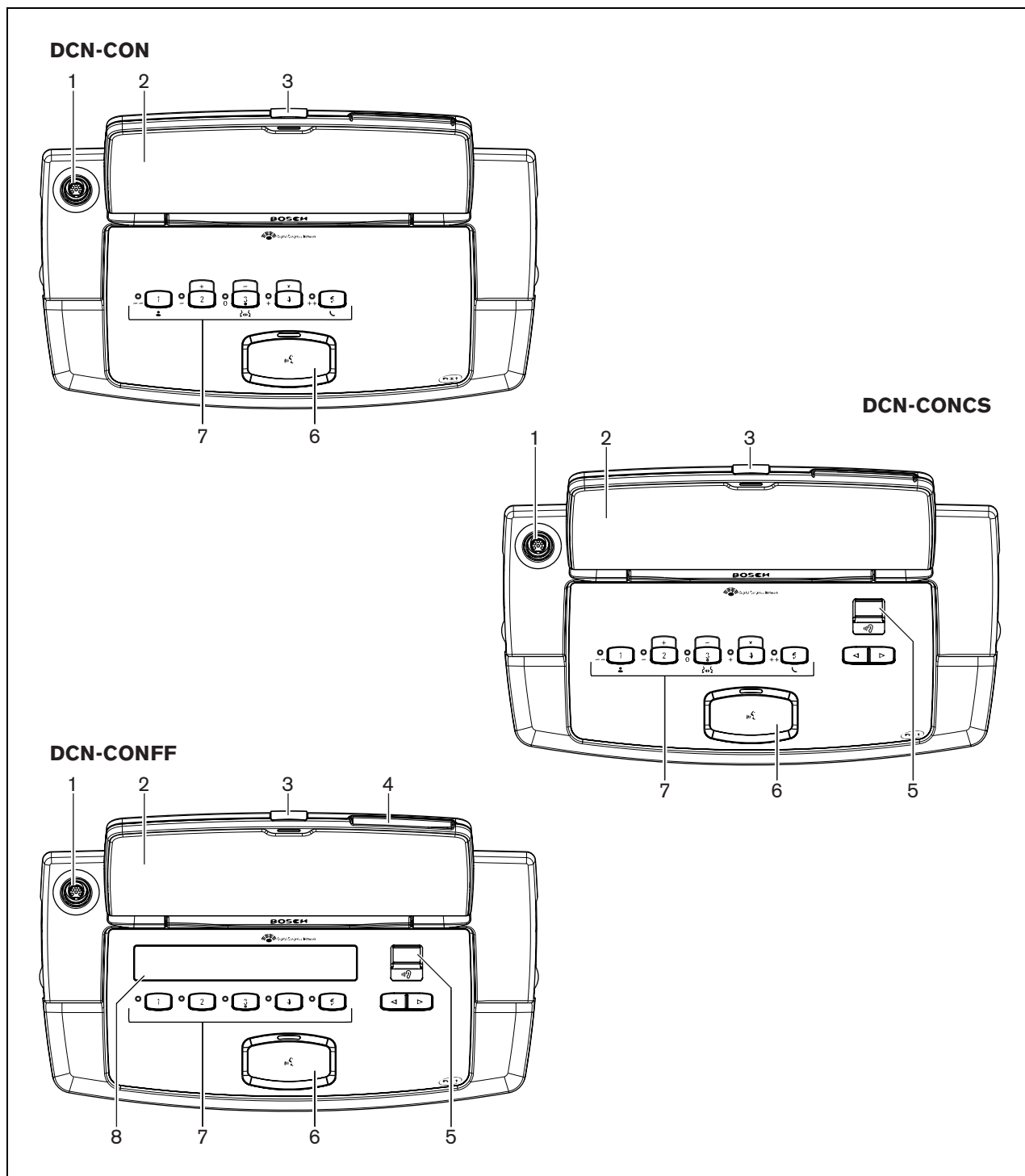
figure 15.1: Top views

> **Note**
>
> The Concentus conference units have pimples, which blind delegates and chairman can use to locate voting button 3.
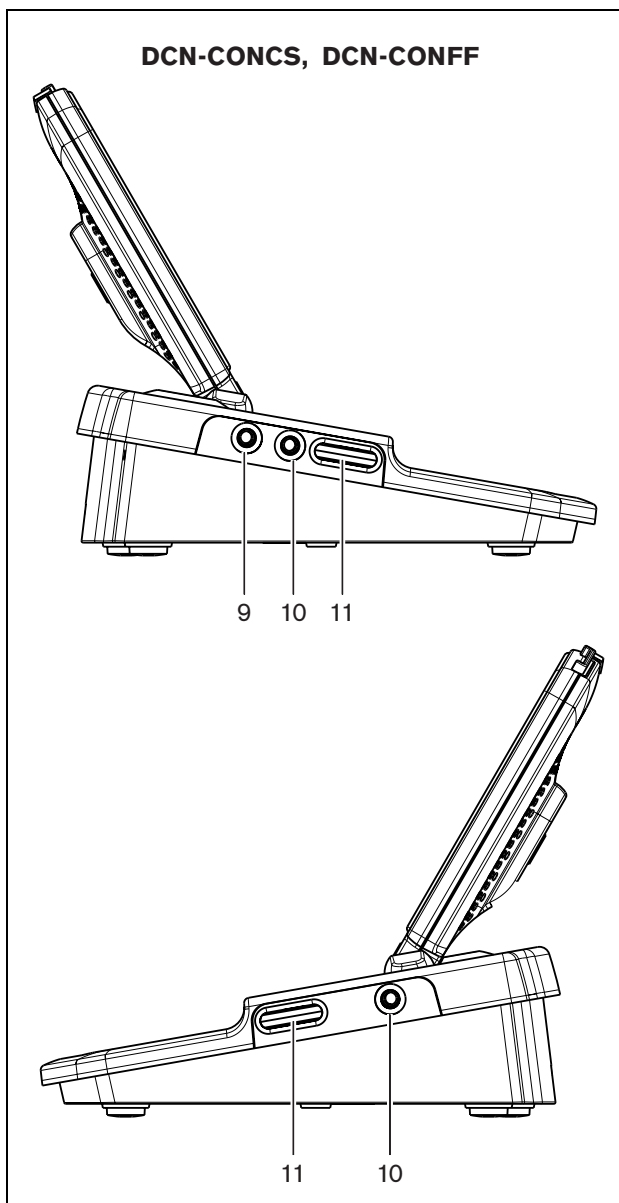
DCN-CONCS, DCN-CONFF
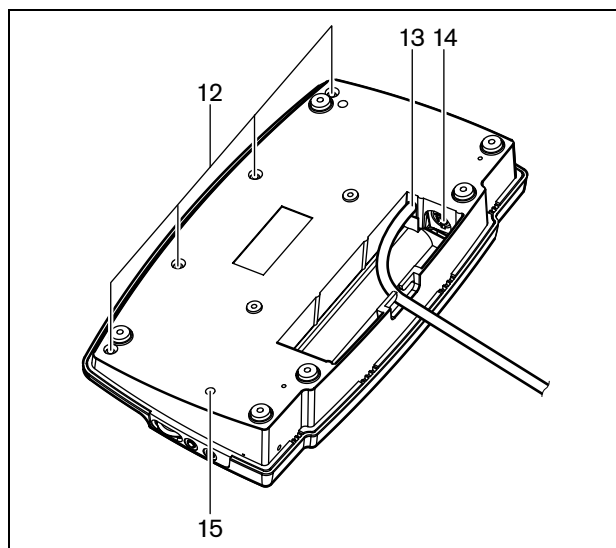
figure 15.2: Side views
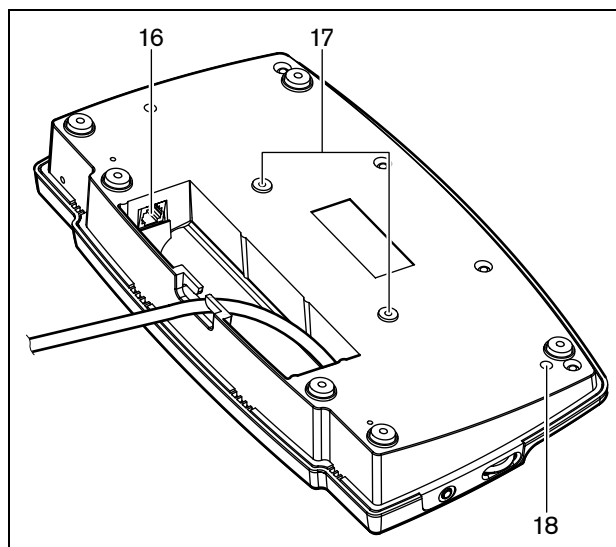

figure 15.3: Bottom view (1)

figure 15.4: Bottom view (2)

15.3 Internal settings

15.3.1 Introduction

The component side of the primary PCB of the Concentus delegate units (refer to figure 15.5) contains solder spots. With these solder spots, you can configure the Concentus delegate unit.

table 15.1: Solder spots

Solder spot	Function
S300	Restore channel function (refer to section 15.3.2).
S302	Auto standby function (refer to section 15.3.3).
S303	Headphones level reduction (refer to section 15.3.4).

Remove the screws (refer figure 15.3 no. 12) to get access to the primary PCB.

Caution
Before you open the Concentus delegate unit, take measures to prevent electro-static discharges.
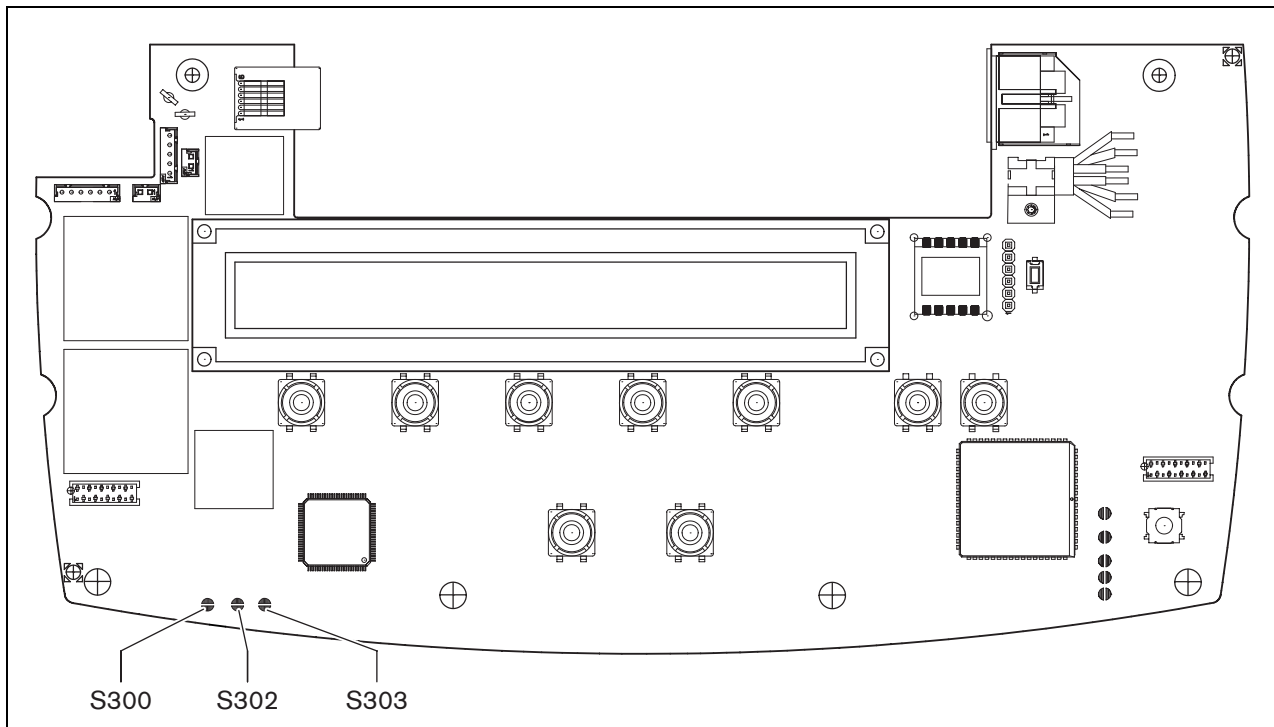
figure 15.5: Internal top view

15.3.2 Restore channel function

Use the S300 solder spot to enable or disable the restore channel function of the channel selector of the Concentus delegate unit.

> ℹ️ **Note**
> The DCN-CON does not have a channel selector.

table 15.2: Solder spot S300 (= default)*

Solder spot	Description
Not soldered*	The restore channel function is disabled. When the channel selector is enabled, it automatically selects channel 0 (the floor)
Soldered	The restore channel function is enabled. When the channel selector is enabled, it automatically selects last known channel.

For example, you can enable this function when all delegates and chairmen have a fixed seat number.

> ℹ️ **Note**
> The Concentus delegate unit saves all channel changes after 5 seconds.

> ℹ️ **Note**
> When the last know channel number is greater than the maximum number of channels that are available, the channel selector automatically goes to channel 0. When the last known channel becomes available, it is only restored when you did not operate the buttons of the channel selector.

15.3.3 Auto standby function

Use the S302 solder spot to enable or disable the auto standby function of the channel selector of the Concentus delegate unit.

> ℹ️ **Note**
> The DCN-CON does not have a channel selector.

table 15.3: Solder spot S302 (= default)*

Solder spot	Function
Not soldered*	The auto standby function is enabled. When the headphones are disconnected, the channel selector is disabled.
Soldered	The auto standby function is disabled. When the headphones are disconnected, the channel selector remains enabled.

The Concentus delegate unit detects the presence of the headphones with a switch inside the headphones socket. When the headphones are connected, the switch is closed.

15.3.4 Headphones level reduction

Use the S303 solder spot to enable or disable the headphones level reduction of the headphones that are connected to the Concentus delegate unit.

table 15.4: Solder spot S303 (= default)*

Solder spot	Function
Not soldered*	The headphones level reduction is disabled. When the red LED ring of the microphone comes on, there is no headphones level reduction.
Soldered	The headphones level reduction is enabled. When the red LED ring of the microphone comes on, the headphones level reduction is 18 dB.

For example, you can enable this function to avoid acoustic feedback between the microphone and the headphones of the Concentus delegate unit.

> **i** **Note**
>
> To show that there is only one minute of time left for the current speaker, the red LED ring can flash. During this period, the headphones level reduction remains enabled.

15.4 Installation

> **i** **Note**
>
> The safety of this equipment has been tested according to the standards for moveable equipment. Before you use this equipment as stationary equipment in a North American country, contact your supplier.

Install the Concentus delegate unit on a flat surface or in a recess (refer to figure 15.6). When you install the Concentus delegate unit in a recess, use the template (refer to figure 15.7) to make the correct contour.

table 15.5: Physical characteristics

Dimensions (h x w x d):
50 x 275 x 155 mm (table-top)
30 x 275 x 155 mm (flush-mounted)
Weight:
approximately 1.5 kg

You can attach the Concentus delegate unit to the bottom of the recess. Put screws with a length of 6.5 mm in the screw holes (refer to figure 15.4, no. 17). The distance between the centres of the screw holes is 100 mm.

20 mm
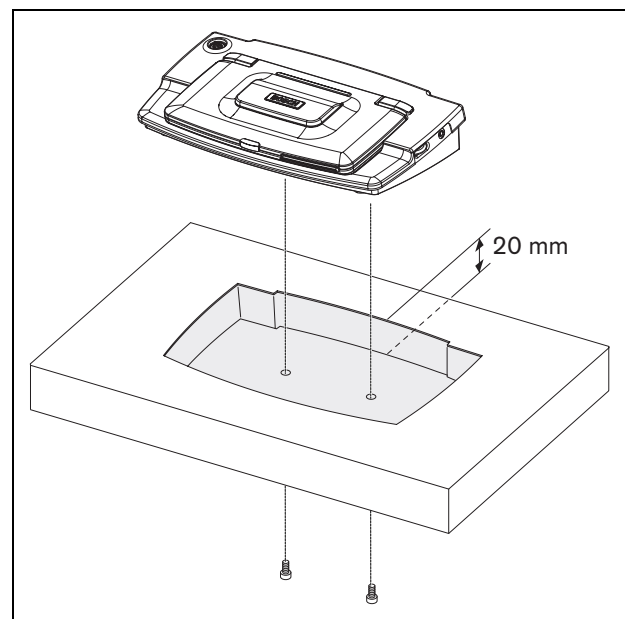
figure 15.6: Installation

15.5 External connections

15.5.1 DCN

Connect the Concentus delegate unit to the DCN with the DCN cable. You can use the DCN socket to make a loop-through with the Concentus delegate unit.

table 15.6: DCN connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Location:
Bottom side
Power consumption:
• DCN-CON: 3.4 W
• DCN-CONCS: 3.7 W
• DCN-CONFF: 4.2 W
• DCN-CONCM: 4.2 W
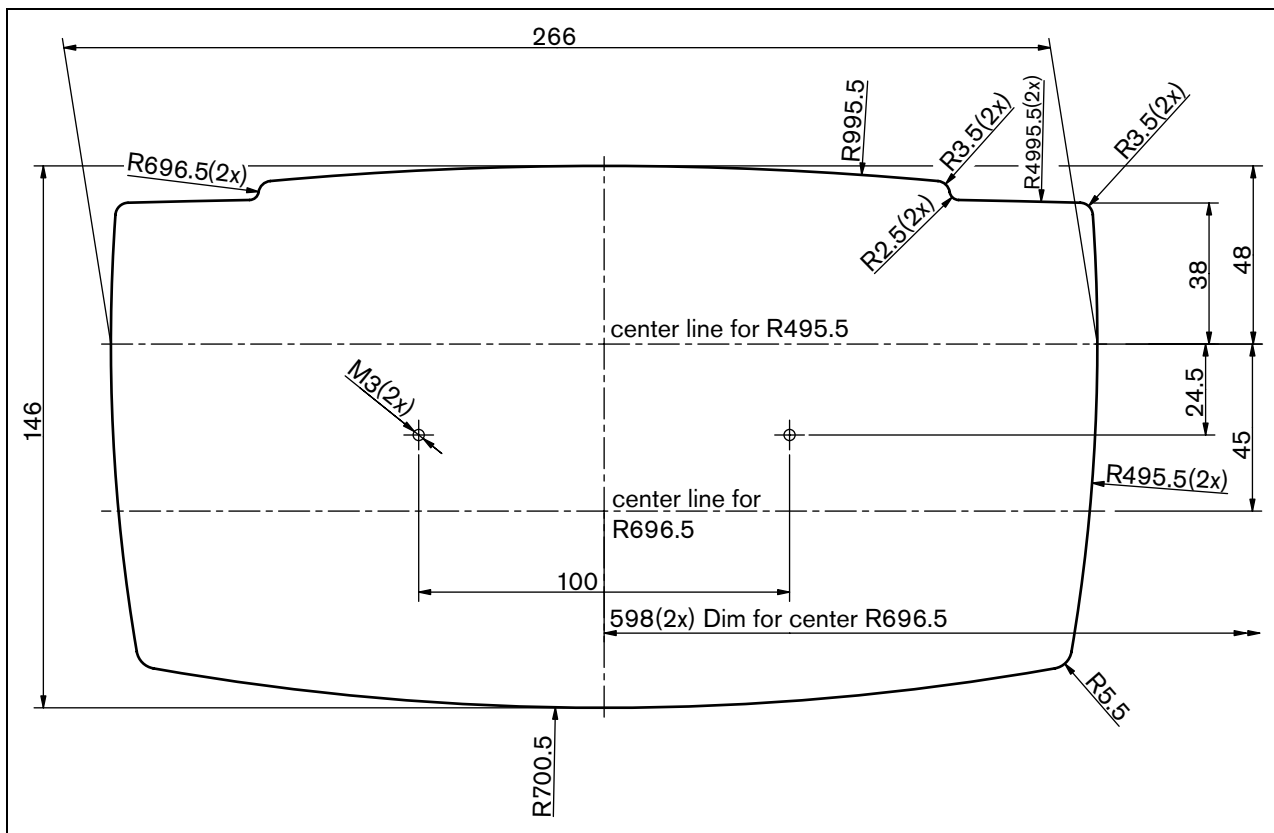
figure 15.7: Template (refer to the CD-ROM that is supplied with the system for a *.dwg file)

15.5.2 External microphone

You can connect an external microphone to the external microphone socket of the Concentus delegate unit (refer to figure 15.8).

> **i** **Note**
> The DCN-CON does not have a socket for an external microphone.
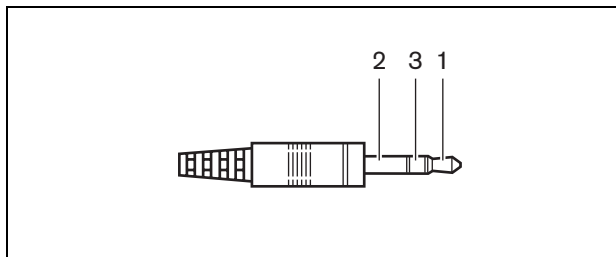
figure 15.8: 3.5 mm microphone plug, connection

table 15.7: 3.5 mm microphone plug, connection

Number	Signal
1	Microphone signal +
2	Microphone GND
3	Not connected (optional GND)

When you connect a headset to the Concentus delegate unit, you must connect the microphone of the headset to the external microphone socket.

The Concentus delegate unit senses that an external microphone is connected to the external microphone socket. The Concentus delegate unit internally disconnects the DCN-MICL or DCN-MICS Pluggable Microphone (if connected).

table 15.8: External microphone socket, details

Number of connections:
1x 3.5 mm socket
Location:
Left side
Audio levels:
Refer to appendix A

15.5.3 Headphones

You can connect headphones to the headphones sockets of the Concentus delegate unit. The headphones must have a 3.5 mm plug (refer to figure 15.9).

> **i** **Note**
> The DCN-CON does not have headphones sockets.
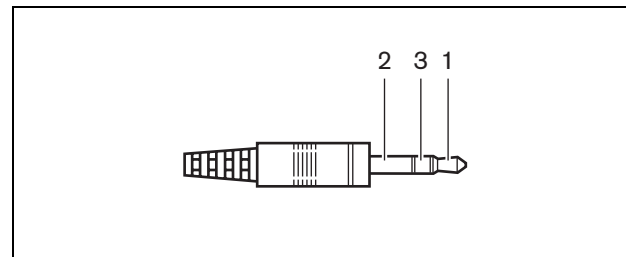
figure 15.9: 3.5 mm headphones plug, connection

table 15.9: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
> You can also connect mono headphones to the Concentus delegate unit.

When you connect a headset to the Concentus delegate unit, use the headphones socket on the left side. Adjacent to this headphones socket is an external microphone socket. Connect the microphone of the headset to this external microphone socket (refer to section 15.5.2).

table 15.10: Headphones sockets, details

Number of connections:
2x 3.5 mm sockets
Location:
Left and right sides

15.5.4 Intercom handset

You can connect an LBB3555/00 Intercom Handset to the Concentus delegate unit. The intercom handset must be connected to the RJ45 socket (refer to figure 15.10 and table 15.11).
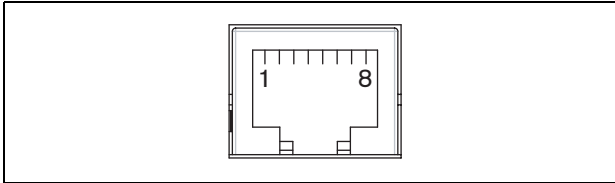

figure 15.10: RJ45 socket, connection

table 15.11: RJ45 socket, connection

Pin	Signal
1	Headphones level reduction
2	Microphone, ground
3	Microphone, in
4	Earpiece, positive
5	Earpiece, ground
6	Hook switch
7	Hook switch
8	External contact

Note

The LBB3555/00 Intercom Headset has a RJ11 plug (refer to chapter 18). This plug fits in the center of the RJ45 socket on the Concentus delegate unit. Pin 1 and pin 8 of the RJ45 socket (refer to figure 15.10) are not used.

15.5.5 External contact

You can connect an external contact to the Concentus delegate unit. The external contact must be connected between pin 5 and pin 8 of the RJ45 socket (refer to figure 15.11).

Note

The external contact is only available in systems that operate with a control PC that has one or more of these software modules:
- Parliamentary Voting software module
- Multi Voting software module
- Attendance Registration software module

Refer to the applicable Software User Manuals for the instructions that tell you how to use the external contact.
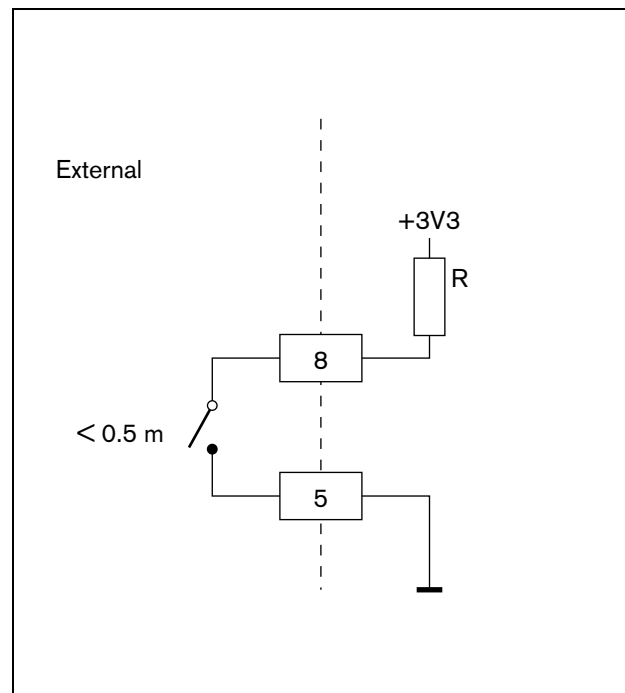
figure 15.11: External contact, connection

15.5.6 DCN-FCS Headphones level reduction

When you use a Concentus delegate unit with a DCN-FCS Channel Selector, you must connect pin 1 and 5 of the RJ45 socket (refer to figure 15.10 and table 15.11) to the level reduction plug of the channel selector (refer to figure 15.12). This prevents acoustic feedback.
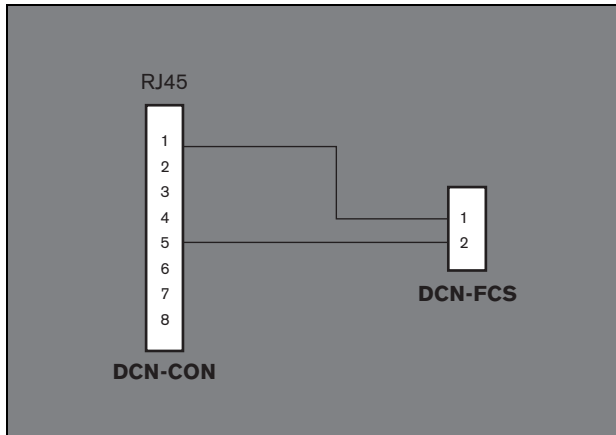
figure 15.12: Channel selector, connection

When the microphone that is connected to the Concentus delegate unit is enabled, the channel selector automatically decreases the volume level of the signal that is sent to the headphones of the channel selector.

15.6 Operation

The color of the LED of the microphone button shows the condition of the microphone that is connected to the Concentus delegate unit (refer to table 15.12).

table 15.12: Condition

Color	Condition
Red (on)	Microphone enabled
Red (flash)	Last minute of speech time
Green (on)	Request-to-speak
Green (flash)	First in request-to-speak list
Yellow (on)	VIP mode

ℹ **Note**

You can only put the Concentus delegate unit in the VIP mode with the Microphone Management software module. Refer to the applicable Software User Manual for instructions that tell you how to enable the VIP mode.

ℹ **Note**

Refer to the Quick Reference Card of the Concentus delegate unit for instructions that tell you how to operate the Concentus delegate unit.

16 DCN-CONCM Concentus Chairman Unit

16.1 Introduction

With the DCN-CONCM Concentus Chairman Unit, the chairman can monitor and control a conference.

16.2 Controls, connectors and indicators

The only difference between the Concentus chairman unit and the Concentus delegate unit is the priority button on the left of the microphone button (refer to figure 16.1).
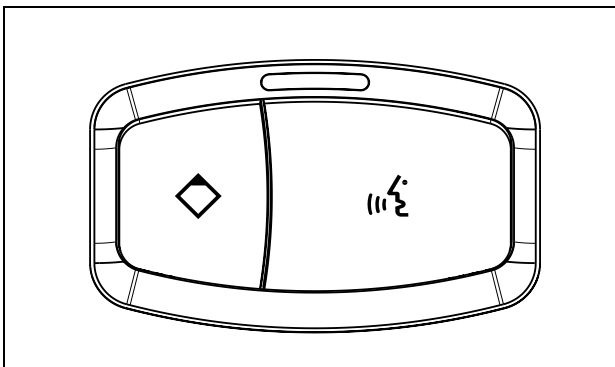
figure 16.1: Priority and microphone buttons

With the priority button, the chairman can disable the microphones of all delegate devices. At the same time, the priority button enables the microphone of the chairman. The system has the possibility to:

- Play an attention chime when the chairman pushes the priority button (refer to section 8.8.3).
- Erase the request-to-speak list and the speakers list when the chairman pushes the priority button (refer to section 8.8.4).

16.3 Internal settings

Refer to section 15.3 for information about the internal settings of the Concentus chairman unit. The internal settings of the Concentus delegate unit and the Concentus chairman unit are the same.

16.4 Installation

Refer to section 15.4 for information about the installation of the Concentus chairman unit. The procedures to install the Concentus delegate unit and the Concentus chairman unit are the same.

16.5 External connections

Refer to section 15.5 for information about the external connections of the Concentus chairman unit. The external connections of the Concentus delegate unit and the Concentus chairman unit are the same.

16.6 Operation

The color of the LED of the microphone button shows the condition of the microphone that is connected to the Concentus chairman unit (refer to table 15.12).

table 16.1: Condition

Color	Condition
Red (on)	Microphone enabled

> **Note**
> Refer to the Quick Reference Card of the Concentus chairman unit for instructions that tell you how to operate the Concentus chairman unit.

17 DCN-MICL, DCN-MICS Pluggable Microphones

17.1 Introduction

The DCN-MICL and DCN-MICS Pluggable Microphones (refer to table 17.1 and table 17.2) are used with the contribution and interpretation devices (refer to table 17.3).

table 17.1: Types and lengths

Type	Length (mm)
DCN-MICS	310
DCN-MICL	480

table 17.2: Electrical and acoustic properties

Nominal level:
85 dB SPL
Maximum level:
110 dB SPL at < 3% THD
Transducer type:
Electret
Directional pattern:
Cardioid
Equivalent input noise level:
24 dB(A)
Power consumption:
0.25 W

table 17.3: Compatible devices

Type	Description
DCN-IDESK	Interpreter Desk
DCN-FMIC	Microphone Connection Panel
DCN-CON	Concentus Delegate Unit
DCN-CONCS	Concentus Delegate Unit
DCN-CONFF	Concentus Delegate Unit
DCN-CONCM	Concentus Chairman Unit
DCN-DISD	Discussion Unit
DCN-DISCS	Discussion Unit
DCN-DISDCS	Discussion Unit
DCN-DISV	Discussion Unit
DCN-DISVCS	Discussion Unit

17.2 Controls, connectors and indicators

The pluggable microphone (refer to figure 17.1) contains:

1 **Indicator ring** - Shows the condition of the microphone (refer to section 17.4).

2 **Union nut** - Attaches the pluggable microphone to the device.

3 **Microphone plug** - Connects the microphone to devices (refer to section 17.3).
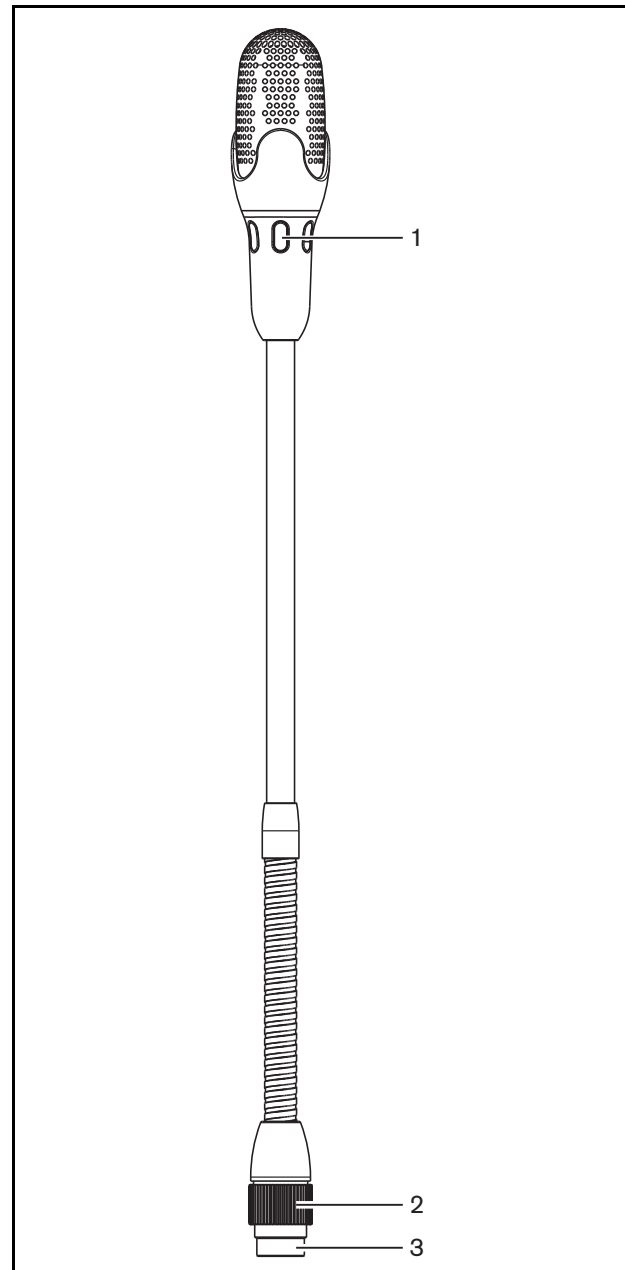
figure 17.1: Overview

17.3   External connections

Connect the pluggable microphone to compatible devices with the microphone plug (refer to figure 17.2).
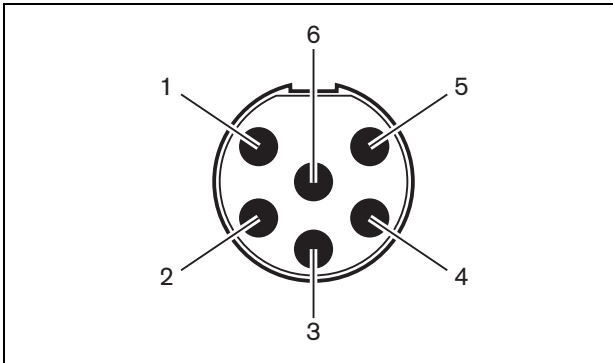
figure 17.2: Microphone plug, connection

table 17.4: Microphone plug, connection

Pin	Signal
1	Indicator ring, red (cathode)
2	Indicator ring common (anode)
3	Microphone signal +
4	Microphone GND
5	Shielding
6	Indicator ring, green (cathode)

17.4   Operation

The color of the indicator ring shows the condition of the microphone (refer to table 17.5).

table 17.5: Condition

Color	Condition
Red (on)	Microphone enabled
Red (flash)	Last minute of speech time
Green (on)	Request-to-speak
Green (flash)	First in request-to-speak list

> **Note**
>
> When the microphone is connected to a DCN-IDESK, it can only show that the microphone is enabled.

18   LBB3555/00 Intercom Handset

The LBB3555/00 Intercom Handset (refer to figure 18.1) is used along with contribution devices (refer to table 18.1). With the intercom handset, delegates and the chairman can speak to the operator (the person who controls the system). When the Intercom software module is installed, the delegates can also speak with each other.
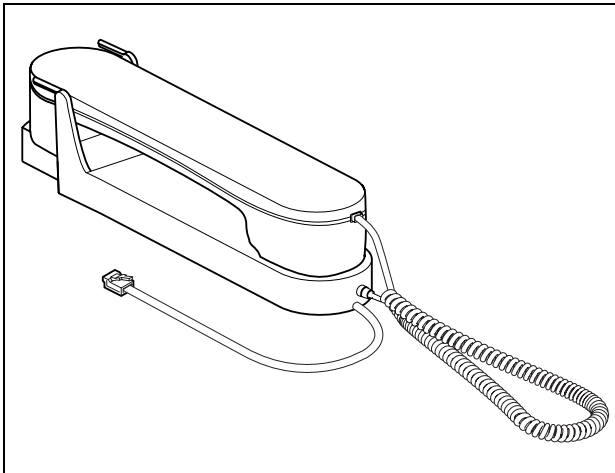
figure 18.1: Intercom handset

table 18.1: Compatible devices

Type	Description
DCN-DDI	Dual Delegate Interface
DCN-CON	Concentus Delegate Unit
DCN-CONCS	Concentus Delegate Unit
DCN-CONFF	Concentus Delegate Unit
DCN-CONCM	Concentus Chairman Unit

Connect the intercom plug of the intercom handset (refer to figure 18.2) to the intercom socket of a compatible device.
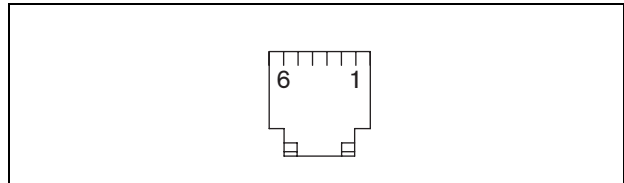
figure 18.2: Intercom plug (RJ11), connection

table 18.2: Intercom plug (RJ11), connection

Pin	Signal
1	Microphone, ground
2	Microphone, in
3	Earpiece, positive
4	Earpiece, negative
5	Hook switch
6	Hook switch

Section 4 - Flush-mounted Devices

19 Installation

19.1 Introduction

You can install flush-mounted devices in a recess in a flat surface (for example, table-tops, armrests of seats).

19.2 Methods

19.2.1 Snap-mounting

Use the snap-mounting method to install flush-mounted devices in panels with a thickness of 2 mm. The snap-mounting method uses the click-to-fit mechanism of the flush-mounted devices (refer to figure 19.1). You can 'click' the flush-mounted devices in the recess.
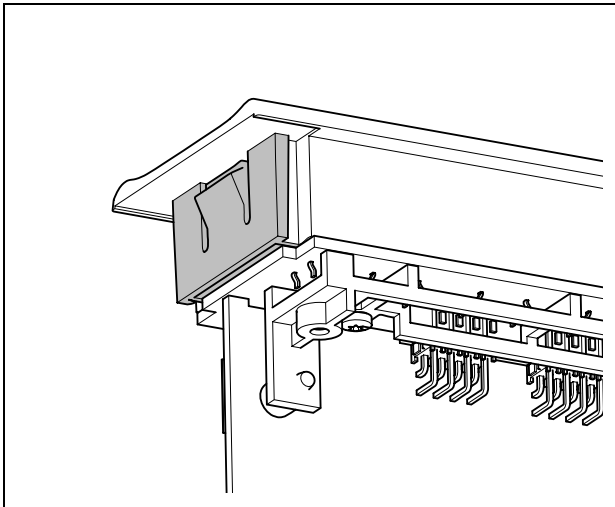
figure 19.1: Click-to-fit mechanism

19.2.2 Block-mounting

Use the block-mounting method to install flush-mounted devices in surfaces with a thickness > 2 mm. The block-mounting method uses the DCN-FEC End Caps, DCN-FCOUP Couple Pieces and DCN-FPT Flush Positioning Tool (refer to figure 19.4 and figure 19.5 for an example).

> ℹ️ **Note**
> Use a filling knife to remove flush-mounted devices from a surface.

19.3 Recesses

19.3.1 Snap mounting

Refer to figure 19.2 for the dimensions of a recess for the snap-mounting method.
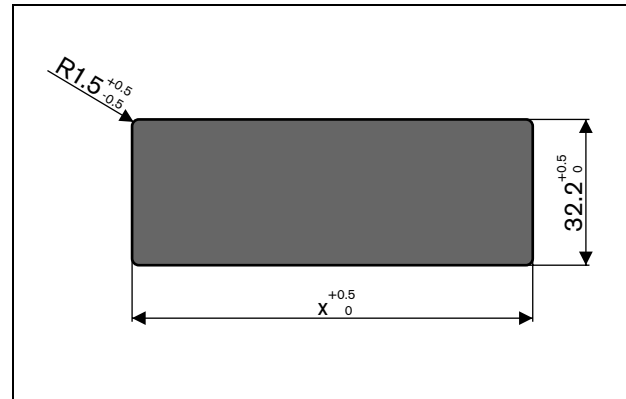
figure 19.2: Recess, snap-mounting method

The length (x) of a recess depends on the number-size factor (NSF) of the flush-mounted device that must be installed in the recess. To get the length of a recess:

1. Get the number-size factor (NSF) of the flush-mounted device from table 19.3.
2. Use the NSF to get the length (x) of the recess from table 19.1.

table 19.1: Lengths, snap-mounting method

Total NSF	x (mm)
1	38.2
2	88.2

19.3.2 Block-mounting

Refer to figure 19.2 for the dimensions of a recess for the block-mounting method.
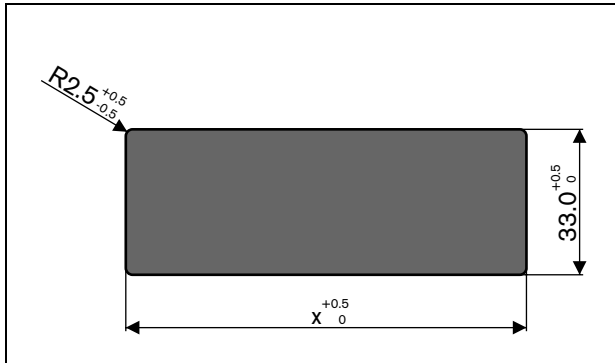
figure 19.3: Recess, block-mounting method

The length (x) of a recess depends on the total number-size factor (NSF) of the flush-mounted devices that must be installed in the recess. To calculate the length of a recess:

1 For each flush-mounted device, get the number-size factor (NSF) from table 19.3.
2 Add the NSFs of the flush-mounted devices to get the total NSF.
3 Use the total NSF to get the length (x) of the recess from table 19.2. The length includes the DCN-FCOUP couple pieces.

> **ℹ Note**
>
> Install DCN-FEC End Caps on the couple pieces at the two ends of the recess.

table 19.2: Lengths, block-mounting method

Total NSF	x (mm)
1	71.5
2	121.5
3	171.5
4	221.5
5	271.5
6	321.5
7	371.5
8	421.5
9	471.5
10	521.5
11	571.5
12	621.5

19.3.3 Number-size factor

The length of a recess depends on:
- The number of flush-mounted devices that are installed in the recess.
- The size of the flush-mounted devices that are installed in the recess.

To calculate the length of a recess, you must use the number-size factor (NSF, refer to table 19.3) of the flush-mounted devices.

table 19.3: Number-size factors

Flush-mounted device	NSF
DCN-FCS	2
DCN-FLSP	2
DCN-FMIC	1
DCN-FMICB	1
DCN-FPRIOB	1
DCN-FV	2
DCN-FVCRD	2
DCN-FVU	2
DCN-FVU-CN	2

figure 19.4: Example, block mounting method
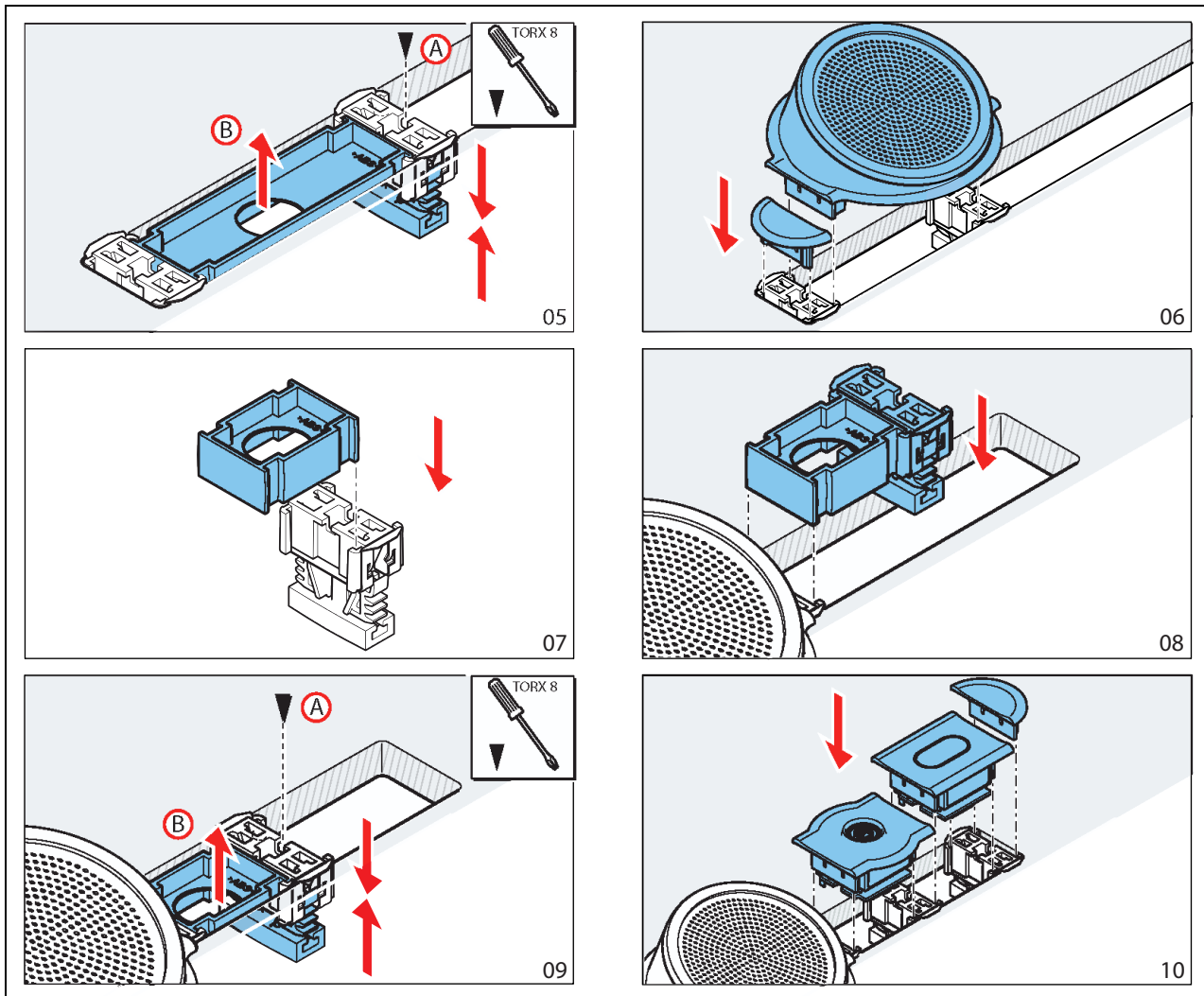
figure 19.5: Example, block mounting (continued)

20   DCN-FPT Flush Positioning Tool

When you use the block-mounting method to install flush-mounted devices, you can use the DCN-FPT Flush Positioning Tool (refer figure 20.1) to measure the distance between two couple pieces.
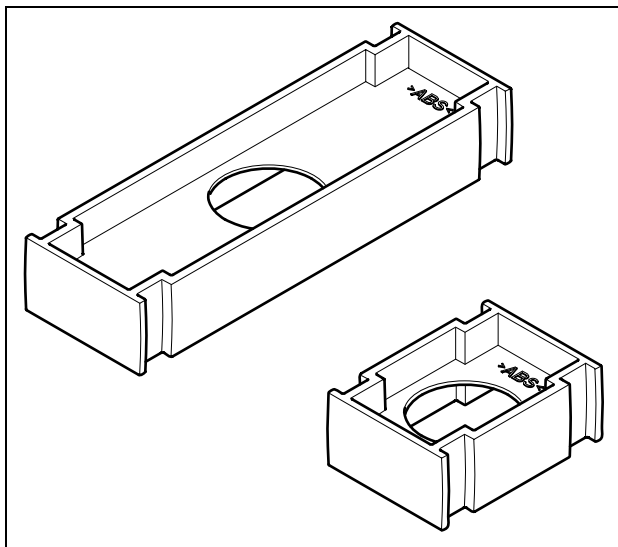
figure 20.1: Flush positioning tool

21 DCN-DDI Dual Delegate Interface

21.1 Introduction

Use the DCN-DDI Dual Delegate Interface to make contribution devices with flush-mounted devices.

21.2 Controls, connectors and indicators

The dual delegate interface (refer to figure 21.1) contains:

1 **DCN cable** - Connects the dual delegate interface to the DCN (refer to section 21.6.1).

2 **Mode selector** - Sets the mode in which the dual delegate interface operates (refer to section 21.4).

3 **Intercom socket** - Connects an LBB3555/00 Intercom Handset to the dual delegate interface (refer to section 15.5.4).

4 **Voting/Control inputs** - Connect DCN-FMICB Microphone Control Panels, DCN-FPRIOB Microphone Priority Panels and DCN-FV(CRD) Voting Panels to the dual delegate interface (refer to section 21.6.4).

5 **Lid** - Gives access to the controls inside (refer to section 21.3).

6 **Audio inputs** - Connect external audio sources to the dual delegate interface (refer to section 21.6.5).

7 **Audio outputs** - Connect loudspeakers to the dual delegate interface (refer to section 21.6.2).

8 **DCN socket** - Makes a loop-through in the DCN with the dual delegate interface (refer section 21.6.1).
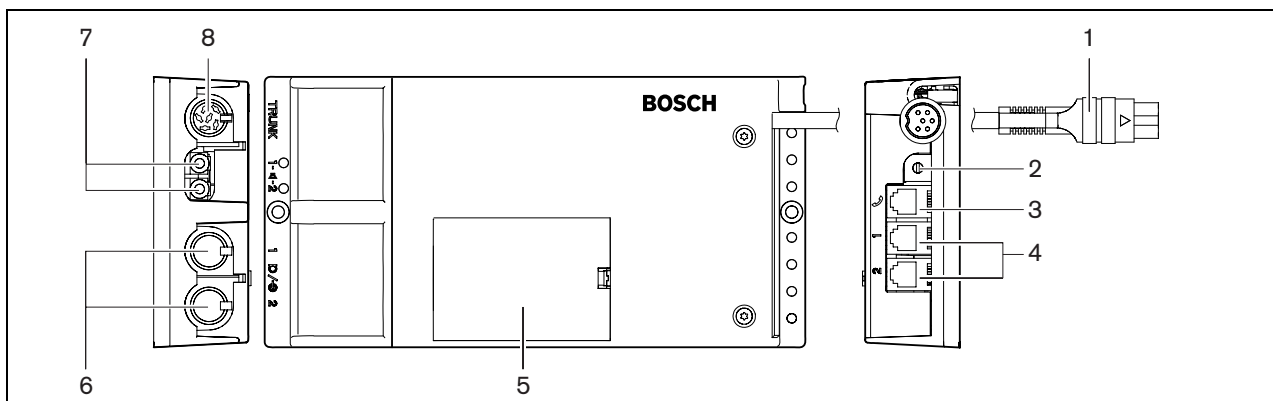
figure 21.1: Dual delegate interface

21.3 Internal settings

Remove the lid of the dual delegate interface to get access to the controls inside (refer to figure 21.2).
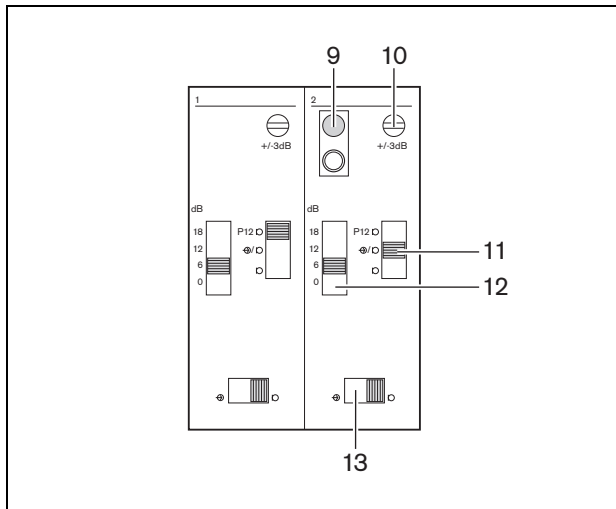
figure 21.2: Internal settings

9 **De-init switch** - Erases the address of the dual delegate interface (refer to section 8.7). The red LED adjacent to the de-init switch comes on when the dual delegate interface does not have an address.

10 **Input adjustment potentiometer** - Adjusts the sensitivity of the audio input.

11 **Input type switch** - Sets the type of audio input (refer to table 21.1).

table 21.1: Input type switch (* = default)

Position	Description
Upper	Balanced signal with phantom power
Center	Balanced signal without phantom power
Lower	Unbalanced signal*

12 **Input adjustment switch** - Sets the sensitivity of the audio input.

13 **Signal level switch** - Sets the signal level of the audio input (refer to table 21.2).

table 21.2: Signal level switch (* = default)

Position	Description
Left	Line level signal
Right	Microphone signal*

21.4 Configuration

21.4.1 Introduction

The number and types of (flush-mounted) devices that you can connect to the dual delegate interface depends on the selected mode. You can set the mode with the mode selector (refer to table 21.3).

table 21.3: Modes (* = default)

No.	Mode
0*	Dual delegate
1	Chairman
2	Dual delegate with one microphone
3	Dual delegate with muted loudspeakers
4	Single delegate
5	Entrance unit
6	Exit unit
7	Ambient microphone

21.4.2 Dual delegate

When the dual delegate interface is in the dual delegate mode, it is a delegate device for 2 delegates. The system sees the dual delegate interface as two separate devices, but it gives only one address to the dual delegate interface. Refer to figure 21.4 for a typical example.

When audio input 1 is enabled, the dual delegate interface disables audio output 1. When audio input 2 is enabled, the dual delegate interface disables audio output 2.

21.4.3 Chairman

When the dual delegate interface is in the chairman mode, it acts as a chairman device for 1 chairman. You can connect 2 audio inputs in the chairman mode. Refer to figure 21.5 for a typical example.

21.4.4 Dual delegate, one microphone

When the dual delegate interface is in the dual delegate with one microphone mode, it acts as a delegate device for 2 delegates, who share 1 audio input. The two delegates can enable or disable the audio input with their own microphone buttons. Refer to figure 21.6 for a typical example.

> **ℹ️ Note**
>
> You must close the solder spot of the DCN-FMIC (refer to section 22.3) when:
> • You connect a DCN-FMIC to the dual delegate interface **and**
> • The dual delegate interface is in the dual delegate with one microphone mode.

21.4.5 Dual delegate with both loudspeakers muted

This mode is the same as the dual delegate mode (see section 21.4.2), but both loudspeakers are muted when one of the microphones is active. This prevents unnecessary feedback in the system. Refer to figure 21.4 for a typical example.

21.4.6 Single delegate

When the dual delegate interface is in the single delegate mode, it acts as a delegate device for 1 delegate. Refer to figure 21.7 for a typical example.

You can connect an optional DCN-FMICB Microphone Control Panel. The delegate can use the microphone control panel as an auxiliary button. For example, to activate an indicator.

> **ℹ️ Note**
>
> The delegate can push the auxiliary button to start an event. Use the Open Interface to program the event (refer to the applicable Software User Manual).

21.4.7 Loudspeakers always active

By default the loudspeaker is muted when the corresponding microphone is active. This prevents unnecessary feedback in the system. However, to deactivate muting, connect the solder spots for the relevant loudspeaker (refer to table 21.4 and figure 21.3).

table 21.4: Solder spots

Solder spot	Open	Soldered
(X13)	Left loudspeaker muted when microphone active	Left loudspeaker always active
(X12)	Right loudspeaker muted when microphone active	Right loudspeaker always active
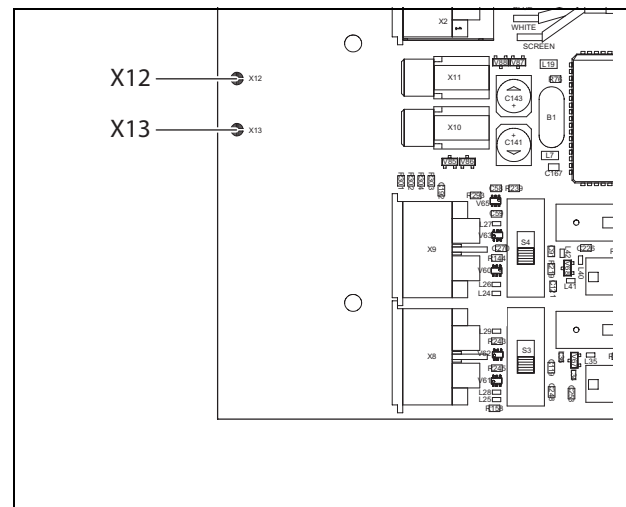
figure 21.3: Internal top view

21.4.8 Entrance unit

When the dual delegate interface is in the entrance unit mode, it acts as a device that is used at the entrance of the room to create a presence list. Refer to figure 21.8 for a typical example.

21.4.9 Exit unit

When the dual delegate interface is in the exit unit mode, it acts as a device that is used at the exit of the room to keep the presence list complete. Refer to figure 21.8 for a typical example.

21.4.10 Ambient microphone

When the dual delegate interface is in the ambient microphone mode, the signal of the connected audio input is sent to the floor when all other microphones in the system are disabled. Refer to figure 21.9 for a typical example.

> **i** **Note**
>
> The connected DCN-FMICB cannot enable or disable the audio input. You can use the connected DCN-FMICB to give an address to the delegate interface (refer to section 8.7).
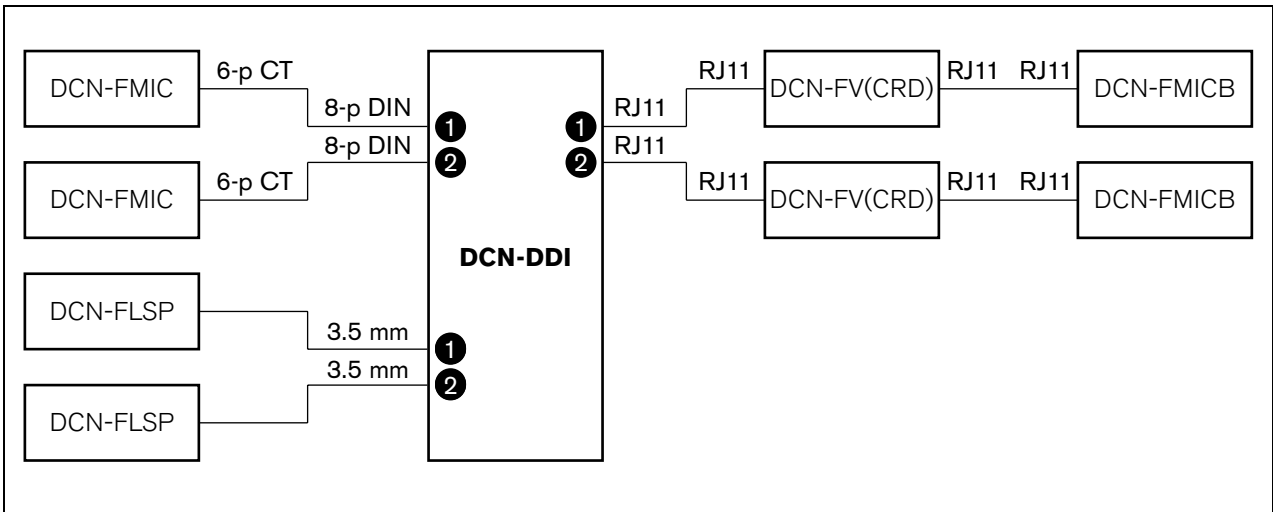
figure 21.4: Dual delegate mode (0) and Dual delegate with both loudspeakers muted mode (3)
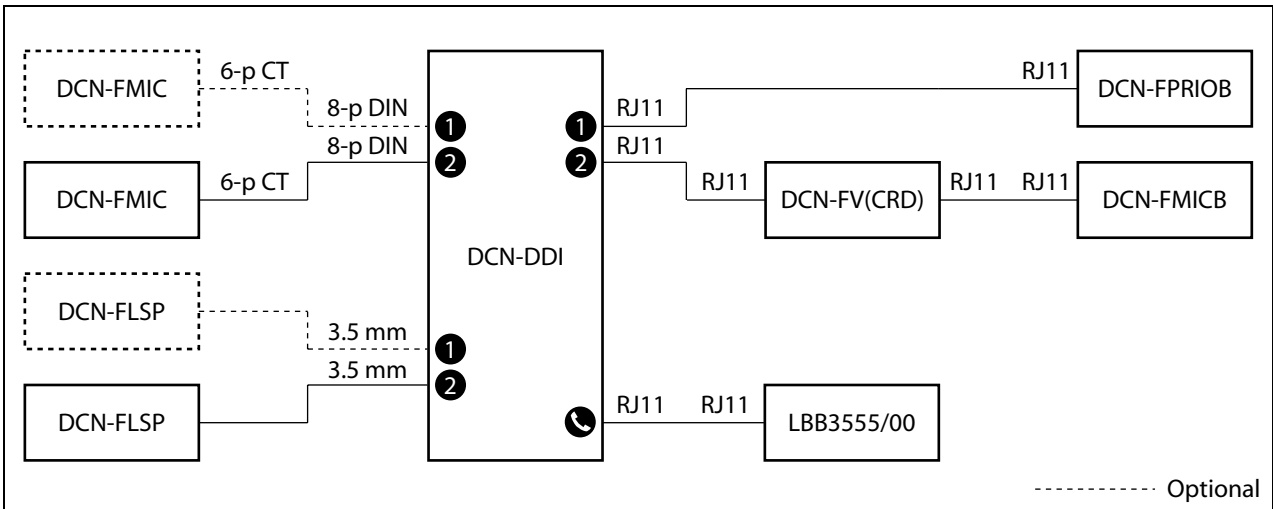
figure 21.5: Chairman mode (1)
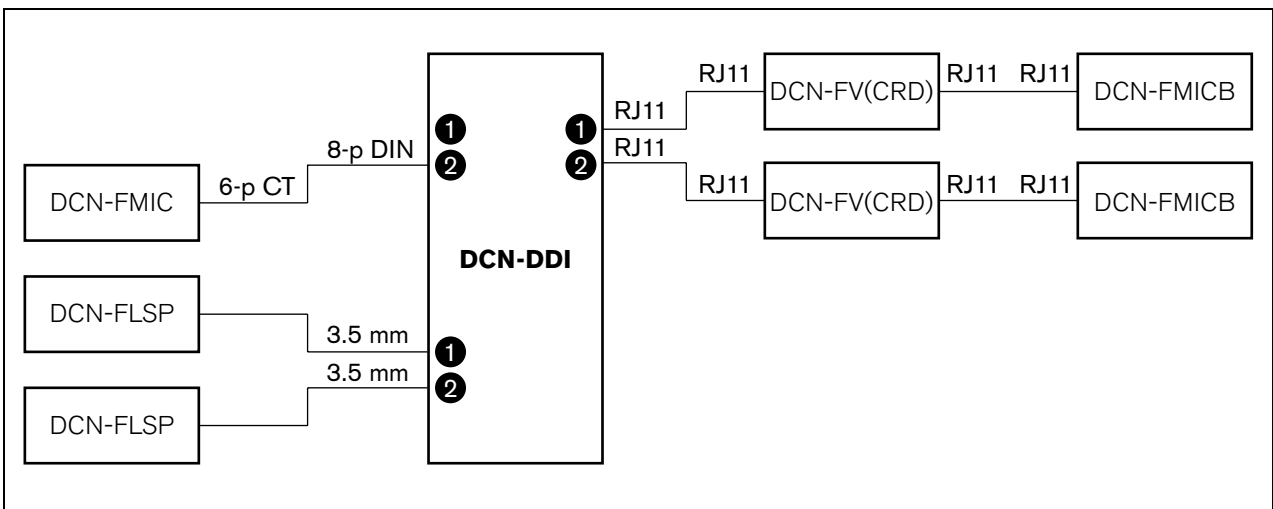
figure 21.6: Dual delegate mode, one microphone mode (2)
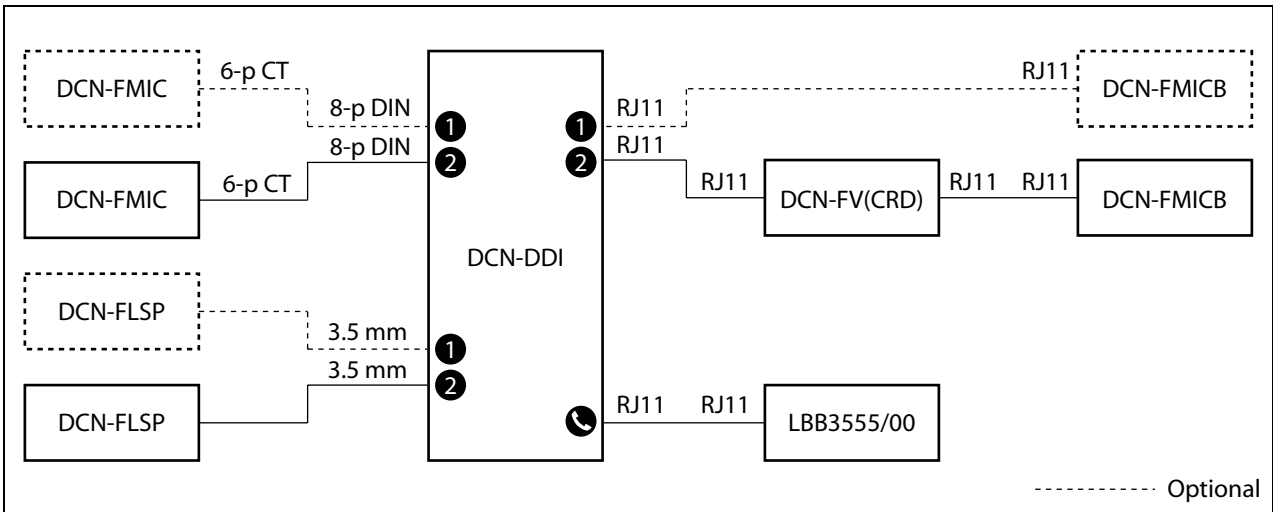
figure 21.7: Single delegate mode (4)
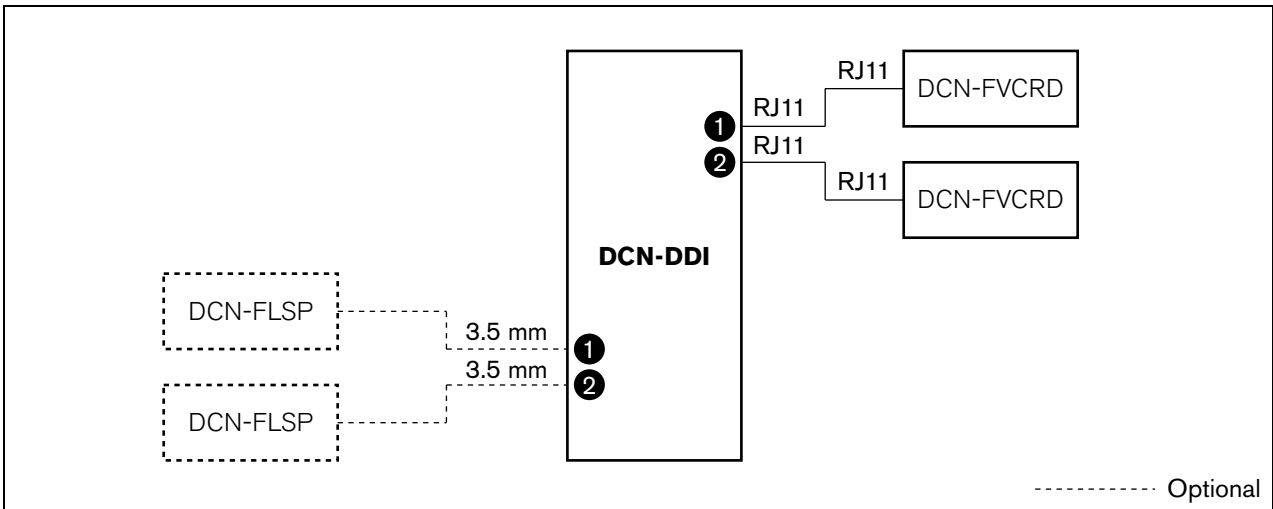
figure 21.8: Entrance unit mode and exit unit mode (5 and 6)
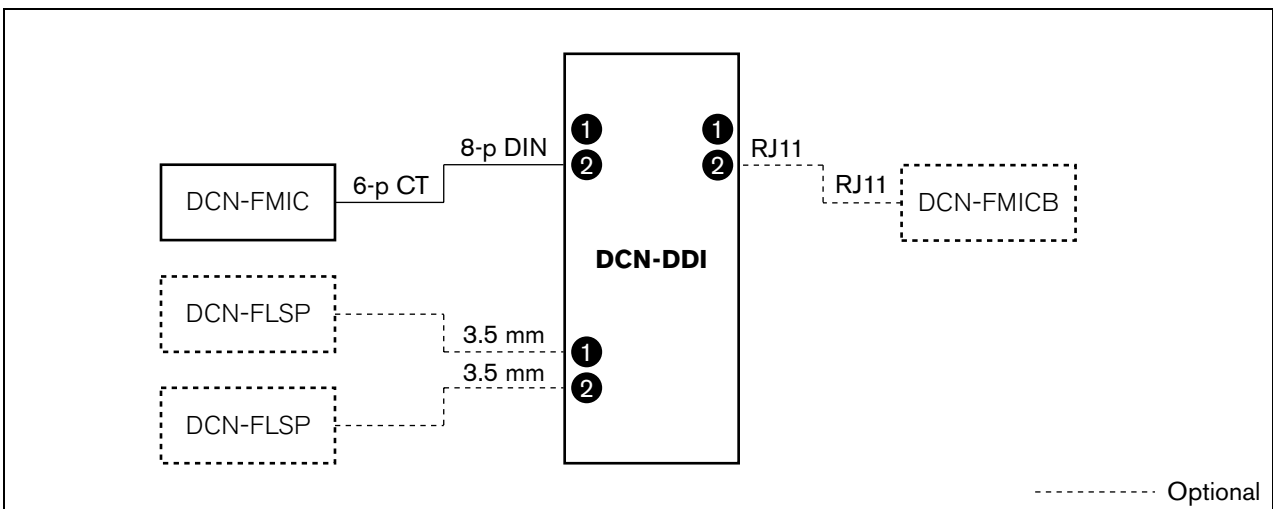
figure 21.9: Ambient microphone mode (7)

21.5   Installation

Install the dual delegate interface on a flat surface (refer to figure 21.10). Use the lid of the dual delegate interface to fix the positions of the DCN cables and the cables of the audio inputs and audio outputs.

---

i   **Note**

The DCN-DDI Dual Delegate Interface is not a flush-mounted device.

---
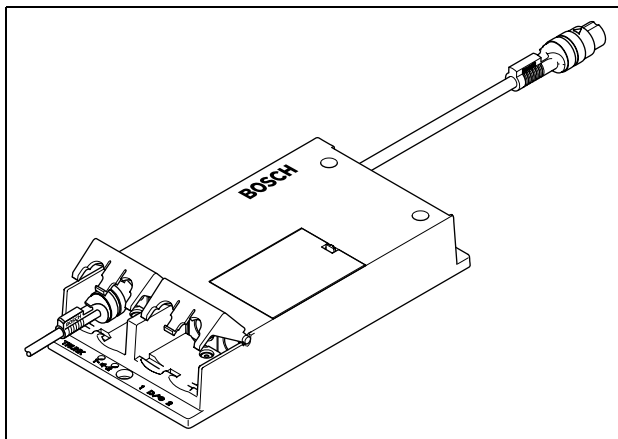
figure 21.10: Installation

table 21.5: Physical characteristics

Dimensions (h x w x d):
x 100 x 35 mm
Weight:
580 g

21.6   External connections

21.6.1   DCN

Connect the dual delegate interface to the DCN with the DCN cable. You can use the DCN socket to make a loop-through with the dual delegate interface.

table 21.6: DCN connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Location:
Bottom side
Power consumption:
2.2 W (4.5 W)

---

i   **Note**

The power consumption of 4.5 W includes the power consumption of all flush-mounted devices that you can connect to the dual delegate interface. These are:

- DCN-FLSP
- DCN-FMIC
- DCN-FMICB
- DCN-FPRIOB
- DCN-FV
- DCN-FVCRD

21.6.2 Audio outputs

You can connect loudspeakers to the audio outputs of the dual delegate interface. The loudspeakers must have 3.5 mm plugs (refer to figure 21.11).
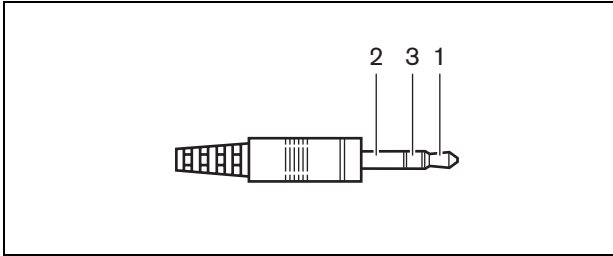

figure 21.11: 3.5 mm loudspeaker plug, connection

table 21.7: 3.5 mm loudspeaker plug, connection

Number	Signal
1	+
2	Not used
3	-

Typically, you will connect DCN-FLSP Loudspeaker Panels (refer to chapter 22) to the audio outputs.

table 21.8: Audio output details

Number of connections:
2x 3.5 mm socket
Location:
Left side
Cable:
Shielded cable
Audio levels:
Refer to appendix A
Load impedance:
> 8 Ω
Crosstalk between outputs:
> 40 dB

21.6.3 Intercom handset

You can connect an LBB3555/00 Intercom Handset to the dual delegate interface. The intercom handset must be connected to the intercom socket.

21.6.4 Voting/Control inputs

You can use the voting/control inputs to connect these devices to the dual delegate interface:
- DCN-FMICB Microphone Control Panel
- DCN-FPRIOB Priority Panel
- DCN-FV(CRD) Voting Panel

21.6.5 Audio inputs

You can connect microphone or line level signals to the audio inputs of the dual delegate interface. The audio inputs have DIN-8p-262° sockets (refer to figure 21.12).
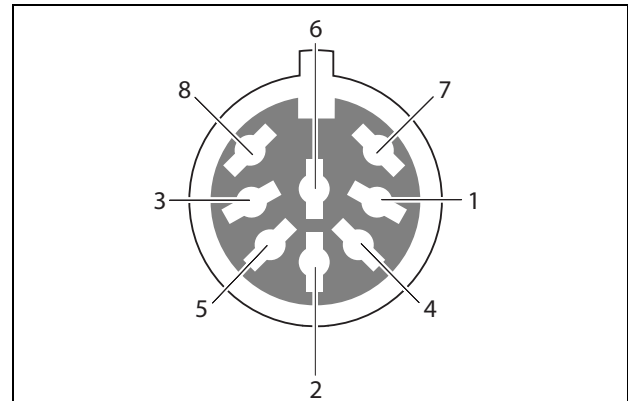

figure 21.12: Audio input, connection

table 21.9: Audio input, connection

Pin	Signal
1	Signal in, +
2	Microphone, common
3	Signal in, -
4	Microphone LED (max. 2 mA)
5	Request-to-speak LED (max. 7 mA)
6	Microphone button
7	+12 V(DC) (max. 20 mA)
8	LED ring control

table 21.10: Connections

Pin	Component
4 (-) to 7 (+)	Microphone on LED
5 (-) to 7 (+)	Request-to-speak LED
6 to 7	Momentarily microphone switch

Typically, you will connect DCN-FMIC Microphone
Connection Panels (refer to chapter 19) to the audio
inputs.

table 21.11: Audio inputs

Number of connections:
2x DIN-8p-262° sockets
Location:
Left side
Cable:
Shielded cable
Audio levels:
Refer to appendix A
Impedance:
Selectable: • Asymmetric mic.: $> 4 \ \text{k}\Omega$ • Symmetrical dynamic mic.: $> 2 \ \text{x} \ 33 \ \text{k}\Omega$ • Symmetrical phantom mic.: $> 2 \ \text{x} \ 680 \ \Omega$
Phantom supply:
12 V(DC) ± 10%, max. 15 mA
Signal-to-noise ratio:
> 90 dB
CMRR:
> 85 dBA @ max. level
Crosstalk between inputs:
> 40 dB

22 DCN-FMIC Microphone Connection Panel

> ⚠ **Caution**
>
> Before you touch the microphone connection panel, take measures to prevent electro-static discharges.

22.1 Introduction

With the DCN-FMIC Microphone Connection Panel, you can connect DCN-MICL and DCN-MICS Pluggable Microphones to the DCN-DDI Dual Delegate Interface.

22.2 Controls, connectors and indicators

The microphone connection panel (refer to figure 22.1) contains:

1 **Output level plug** - Connect the microphone connection panel to a DCN-FCS Channel Selector to prevent acoustic feedback (refer to section 22.5.2)

2 **Microphone socket** - Connects a DCN-MICL or DCN-MICS Pluggable Microphone to the microphone connection panel (refer to chapter 17).

3 **Solder spot** - Enables or disables the green LED ring of the connected DCN-MICL or DCN-MICS Pluggable Microphone (refer to section 22.3).
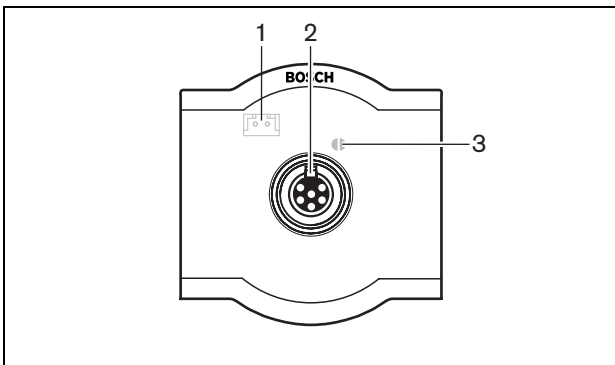
figure 22.1: Microphone connection panel

22.3 Internal settings

Use the solder spot to enable or disable the green LED ring of the connected DCN-MICL or DCN-MICS Pluggable Microphone (refer also to section 17.4).

table 22.1: Solder spot (= default)*

Solder spot	Description
Not soldered*	The green LED ring of the connected DCN-MICL or DCN-MICS Pluggable Microphone is enabled.
Soldered	The green LED ring of the connected DCN-MICL or DCN-MICS Pluggable Microphone is disabled.

When the microphone connection panel is connected to a dual delegate interface that is in the dual delegate with one microphone mode, you must disable the green LED ring. If you do not disable the LED ring, the LED ring of the connected microphone cannot show the correct condition. For example, first delegate 1 enables the microphone (red) and then delegate 2 makes a request-to-speak (green). Although the microphone is enabled, the green LED ring comes on when delegate 2 pushes the microphone button.
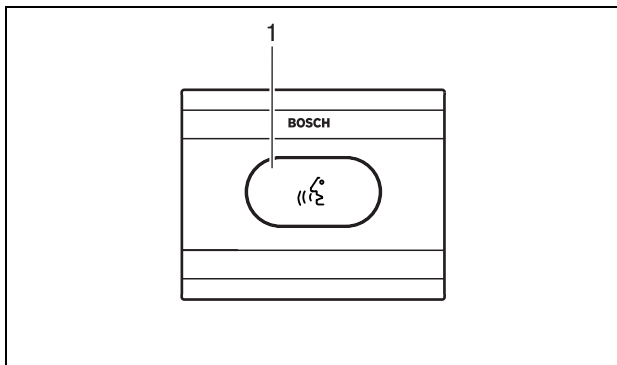
22.4 Installation

The microphone connection panel is a flush-mounted device. Refer to chapter 19 for the installation procedures.

table 22.2: Physical characteristics

Dimensions (h x w x d):
40 x 50 mm (built-in depth about 50 mm)
Weight:
10 g

22.5   External connections

22.5.1   Dual delegate interface

A cable with a 6-pole CT plug and an 8-pole DIN plug is supplied with the panel. Use this cable to connect the panel to a DCN-DDI Dual Delegate Interface (refer to section 21.4 and section 21.6).

Power consumption:
0.25 W

22.5.2   DCN-FCS Headphones level reduction

When you use a microphone connection panel with a DCN-FCS channel selector, connect the output level plug of the microphone connection panel to the level reduction plug of the channel selector (refer to figure 22.2 and figure 22.3). This prevents acoustic feedback.

When the microphone that is connected to the microphone connection panel is enabled, the channel selector automatically decreases the volume level of the signal that is sent to the headphones of the channel selector.

> **ℹ Note**
>
> You can connect, for example, an AMP173977-2 socket to the output level plug of the microphone connection panel.
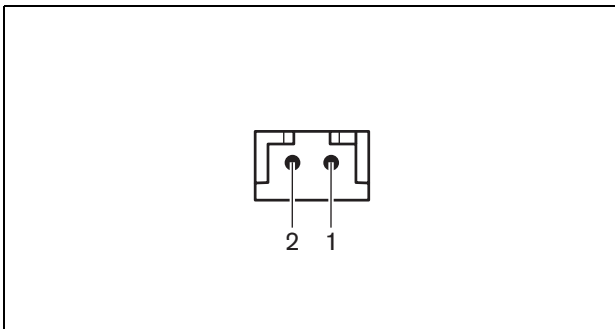
figure 22.2: Output level plug, connection

table 22.3: Output level plug, connection

Pin	Signal
1	Positive
2	GND
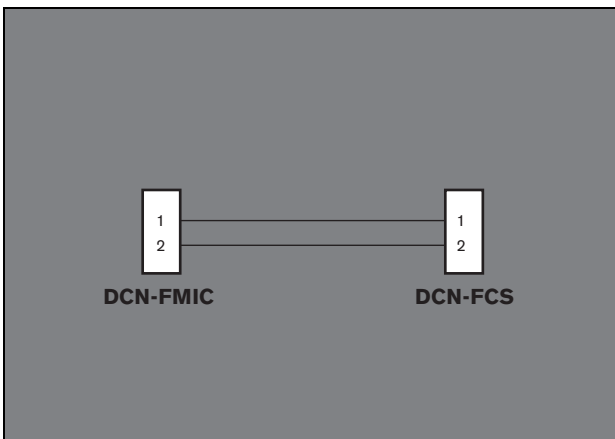
figure 22.3: Channel selector, connection

23 DCN-FMICB Microphone Control Panel

⚠️ **Caution**

Before you touch the microphone control panel, take measures to prevent electro-static discharges.

23.1 Introduction

With the DCN-FMICB Microphone Control Panel, delegates can enable or disable the audio input that is connected to the DCN-DDI Dual Delegate Interface.

23.2 Control, connectors and indicators

The microphone control panel (refer to figure 23.1) contains:

1 **Microphone button** - Enables or disables the microphone. The microphone button has a LED ring that shows the condition of the microphone (refer to section 23.5).

figure 23.1: Microphone control panel

23.3 Installation

The microphone control panel is a flush-mounted device. Refer to chapter 19 for the installation procedures.

table 23.1: Physical characteristics

Dimensions (h x w x d):
40 x 50 mm (built-in depth about 50 mm)
Weight:
54 g

23.4 External connections

A Cat-4 cable with RJ11 plugs is supplied with the microphone connection panel. Use this cable to connect the panel to the DCN-DDI Dual Delegate Interface or DCN-FV(CRD) Voting Panel (refer to section 21.4 and section 21.6).

table 23.2: Power consumption

Power consumption:
0.25 W

23.5 Operation

The color of the LED ring of the microphone button shows the condition of the microphone that is connected to the microphone control panel (refer to table 23.3).

table 23.3: Condition

Color	Condition
Red (on)	Microphone enabled
Red (flash)	Last minute of speech time
Green (on)	Request-to-speak
Green (flash)	First in request-to-speak list
Yellow (on)	VIP mode

ℹ️ **Note**

You can only put the microphone control panel in the VIP mode with the Microphone Management software module. Refer to the applicable Software User Manuals for instructions that tell you how to enable the VIP mode.

24　DCN-FPRIOB Priority Panel

⚠️ **Caution**

Before you touch the priority panel, take measures to prevent electro-static discharges.

24.1　Introduction

With the DCN-FPRIOB Priority Panel, chairmen can disable the microphones of all delegate devices. The priority panel must be used with the DCN-DDI Dual Delegate Interface in the chairman mode.

24.2　Controls, connectors and indicators

The priority panel (refer to figure 24.1) contains:

1 **Priority button** - Disables the microphones of all delegate devices and enables the microphone of the chairman device when it is pushed. The priority control button has a LED ring that shows the condition of the microphone (refer to section 24.5).

ℹ️ **Note**

The system has the possibility to:
- Play an attention chime when the chairman pushes the priority button (refer to section 8.8.3).
- Erase the request-to-speak list and the speakers list when the chairman pushes the priority button (refer to section 8.8.4).
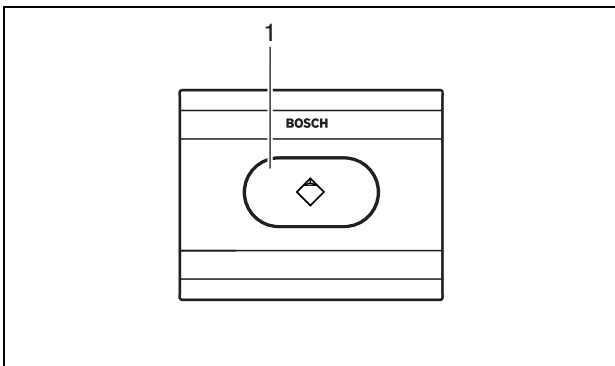
figure 24.1: Priority panel

24.3　Installation

The priority panel is a flush-mounted device. Refer to chapter 19 for the installation procedures.

table 24.1: Physical characteristics

Dimensions (h x w x d):
40 x 50 mm (built-in depth about 50 mm)
Weight:
54 g

24.4　External connections

A Cat-4 cable with RJ11 plugs is supplied with the priority panel. Use this cable to connect the panel to the DCN-DDI Dual Delegate Interface (refer to section 21.4 and section 21.6).

table 24.2: Power consumption

Power consumption:
0.25 W

24.5　Operation

The red LED ring comes on when you push the priority button.

25   DCN-FLSP Loudspeaker Panel

⚠️ **Caution**

Before you touch the loudspeaker panel, take measures to prevent electro-static discharges.

25.1   Introduction

You can connect the DCN-FLSP Loudspeaker Panel to the audio outputs of the DCN-DDI Dual Delegate Interface.

25.2   Controls, connectors and indicators

The loudspeaker panel (refer to figure 25.1) contains:

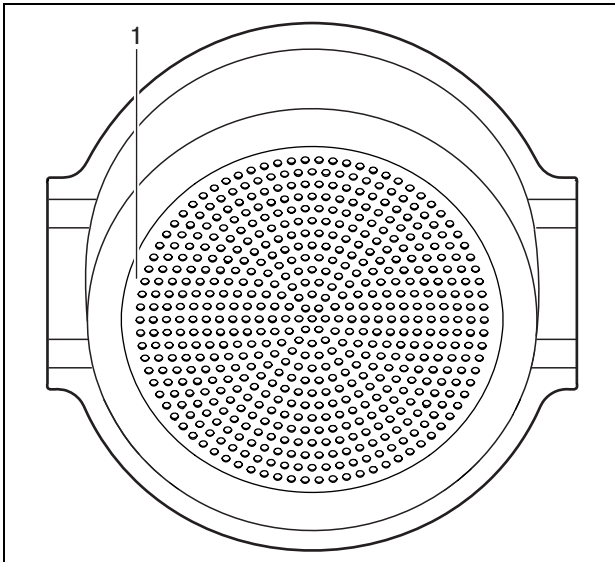1 **Loudspeaker** - Gives the audio signal from the floor to the delegate or chairman.

figure 25.1: Loudspeaker panel

25.3   Installation

The loudspeaker panel is a flush-mounted device. Refer to chapter 19 for the installation procedures.

table 25.1: Physical characteristics

Dimensions (h x w x d):
40 x 100 x 100 mm (built-in depth about 50 mm)
Weight:
203 g

25.4   External connections

A cable with a 3.5 mm plug is supplied with the loudspeaker panel (refer to figure 25.2). Use this cable to connect the panel to the DCN-DDI Dual Delegate Interface.
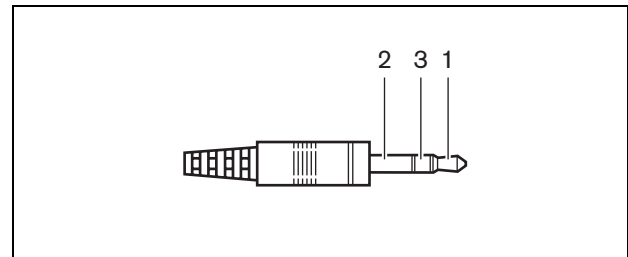
figure 25.2: 3.5 mm loudspeaker plug, connection

table 25.2: 3.5 mm loudspeaker plug, connection

Number	Signal
1	+
2	Not connected
3	-

table 25.3: Power consumption

Power consumption:
0.7 W

26   DCN-FV(CRD) Voting Panel

⚠️ **Caution**

Before you touch the voting panel, take measures to prevent electro-static discharges.

26.1   Introduction

With the DCN-FV(CRD) Voting Panel, delegates can make votes. The voting panel must be used with the DCN-DDI Dual Delegate Interface. Refer to table 26.1 for an overview of the different types.

table 26.1: Types

Type	Description
DCN-FVCRD	Voting panel with card reader
DCN-FV	Voting panel without card reader

26.2   Controls, connectors and indicators

26.2.1 Top

The top of the voting panel (refer to figure 26.2 and figure 26.1) contains:

1   **Condition LED** - Shows the condition of the voting panel (refer to section 26.5).
2   **Voting buttons** - Operate the voting panel (refer to section 26.5). Each voting button has a yellow LED. The LED shows the condition of the voting button.
3   **Card reader** - Can give access to the voting panel.
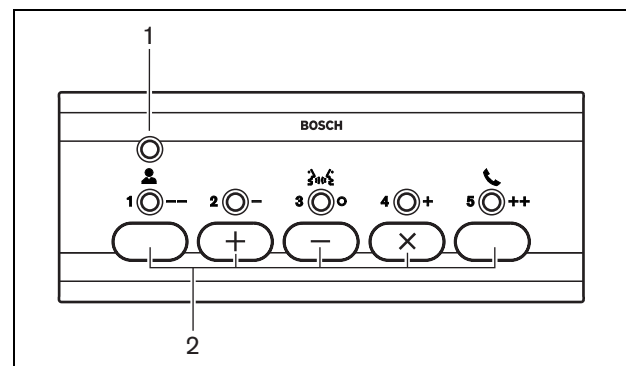
figure 26.1: Top view (DCN-FV)
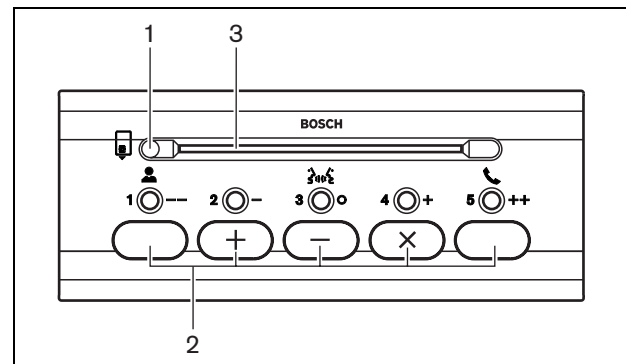
figure 26.2: Top view (DCN-FVCRD)

26.2.2 Bottom side

The bottom side of the voting panel (refer to figure 26.3) contains:

4 **External contact plug** - Connects the voting panel to an external contact (refer to section 26.4.2).

5 **Solder spot** - Configures the external contact plug (refer to section 26.4.2).

6 **RJ11 sockets** - Connect the voting panel to the DCN-DDI Dual Delegate Interface and the DCN-FMICB Microphone Control Panel.

> **i** **Note**
>
> The two RJ11 sockets are the same. There is not a special RJ11 socket for the dual delegate interface or the microphone control panel.
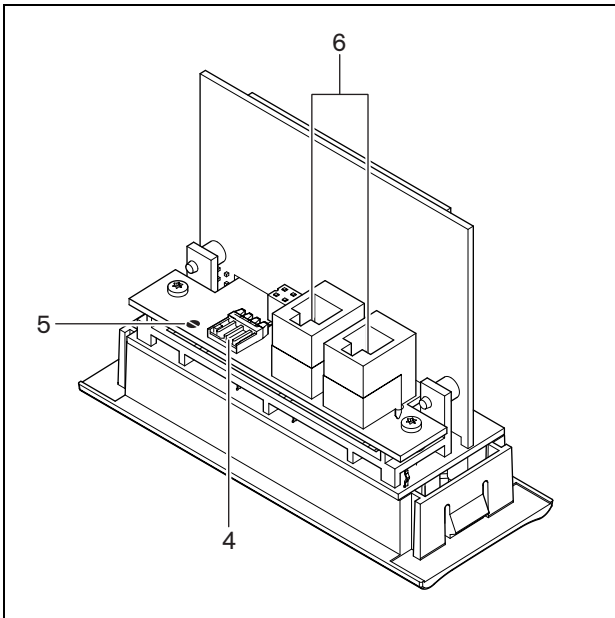
figure 26.3: Bottom view

26.3 Installation

The voting panel is a flush-mounted device. Refer to chapter 19 for the installation procedures.

table 26.2: Physical characteristics

Dimensions (h x w x built-in depth):
• 40 x 100 x 80 mm (DCN-FVCRD)
• 40 x 100 x 50 mm (DCN-FV)
Weight:
• 104 g (DCN-FVCRD)
• 81 g (DCN-FV)

You can install the voting panel in a DCN-TTH Tabletop Housing (refer to chapter 31).

26.4 External connections

26.4.1 Dual delegate interface

A Cat-4 cable with RJ11 plugs is supplied with the panel. Use this cable to connect the panel to the DCN-DDI Dual Delegate Interface (refer to section 21.4 and section 21.6).

table 26.3: Power consumption

Power consumption:
• 0.15 W (DCN-FVCRD)
• 0.10 W (DCN-FV)

26.4.2 External contact

You can connect an external contact to the voting panel. The external contact must be connected to the external contact plug (refer to figure 26.4 and table 26.4).

> **Note**
>
> The external contact function is only available in systems that operate with a control PC that has one or more of these software modules:
> • Parliamentary Voting software module
> • Multi Voting software module
> • Attendance Registration software module
>
> Refer to the applicable Software User Manuals for the instructions that tell you how to use the external contact.
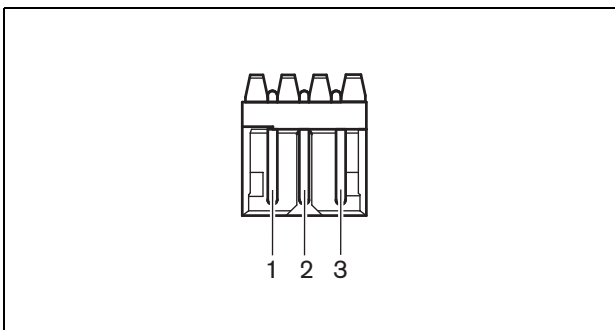
figure 26.4: External contact, connection

table 26.4: External contact, connection

Pin	Signal
1	+5 V(DC) (max. 20 mA)
2	Input, +
3	Input, -

> **Note**
>
> You can connect, for example, an AMP173977-3 socket to the external contact plug of the voting panel.

Use the solder spot (refer to section 26.2, no. 5) to configure the external contact plug. With the solder spot, you can configure the galvanic separation of pin 3 and the ground of the external contact plug (refer to table 26.5).

table 26.5: Solder spot (* = default)

Solder spot	Description
Not soldered*	Pin 3 and the ground of the external contact plug are not internally connected.
Soldered	Pin 3 and the ground of the external plug are internally connected.

Refer to figure 26.5 for a circuit diagram of an external contact connection that uses the galvanic separation.
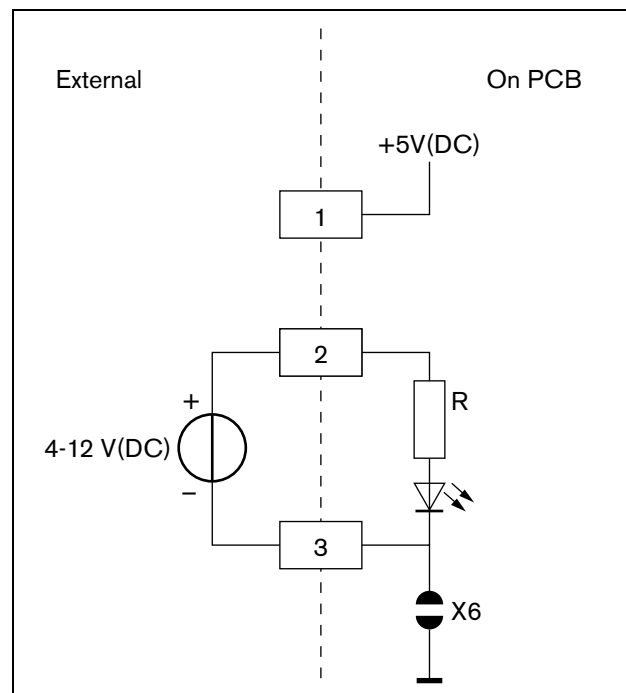

figure 26.5: External contact, connection (1)

Refer to figure 26.6 for a circuit diagram of an external contact connection that does not use the galvanic separation.
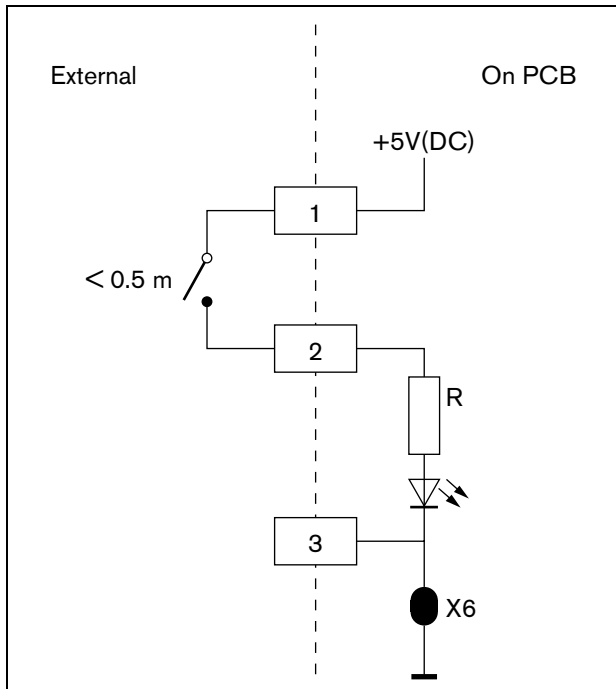

figure 26.6: External contact, connection (2)

26.5 Operation

The signs on the voting buttons show the parliamentary votes. The signs adjacent to the LEDs of the voting buttons show the multiple choice votes and the audience response votes.

> **i** Note
> In systems without control PC, it is only possible to make parliamentary votes.

The LEDs of the available voting buttons flash during a voting session. After the delegate has made a vote:
- The LED of the pushed voting button comes on.
- The LEDs of the other voting buttons go off.

The condition LED shows the condition of the voting panel (refer to table 26.6).

table 26.6: Conditions

LED	Condition
Off	Device or system off
Blue (on)	System on
Blue, flashing @ 5 Hz	No communication
Yellow, flashing @ 2 Hz	Card requested
Yellow, flashing @ 5 Hz	Card rejected
Yellow (on)	Delegate present

> **i** Note
> If an ID card has been requested (but cannot be used, because the unit does not have a card reader), the LED on the DCN-FV unit will continuously flash yellow.

27 DCN-FCS Channel Selector

⚠ **Caution**

Before you touch the channel selector, take measures to prevent electro-static discharges.

27.1 Introduction

With the DCN-FCS Channel Selector, delegates and chairmen can select a channel to listen to.

27.2 Controls, connectors and indicators

27.2.1 Front view

The front of the channel selector (refer to figure 27.1) contains:

1 **Headphones socket** - Connects headphones to the channel selector (refer to section 27.5.2).
2 **Volume buttons** - Control the volume level of the selected channel.
3 **Display** - Shows the number of the selected channel.
4 **Channel buttons** - Select the channel.
5 **External headphones (plug)** - Connects an external headphones socket to the channel selector (refer to section 27.5.2).

27.2.2 Top

The top of the channel selector (refer to figure 27.2) contains:

6 **DCN cable** - Connects the channel selector to the DCN (refer to section 27.5.1).
7 **DCN socket** - Makes a loop-through in the DCN with the channel selector (refer to section 27.5.1).
8 **Level reduction plug** - Reduces the level of the signal on the headphones when the microphone of a connected device is enabled (refer to section 27.7).
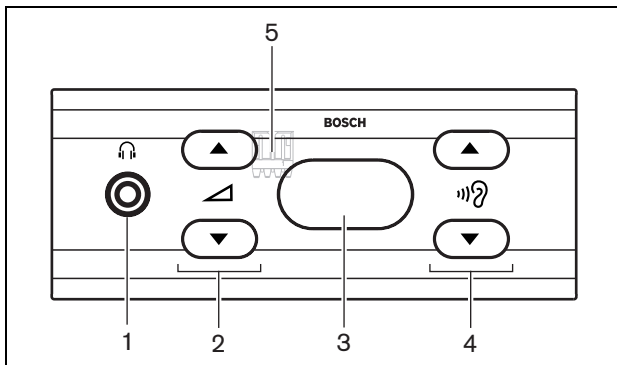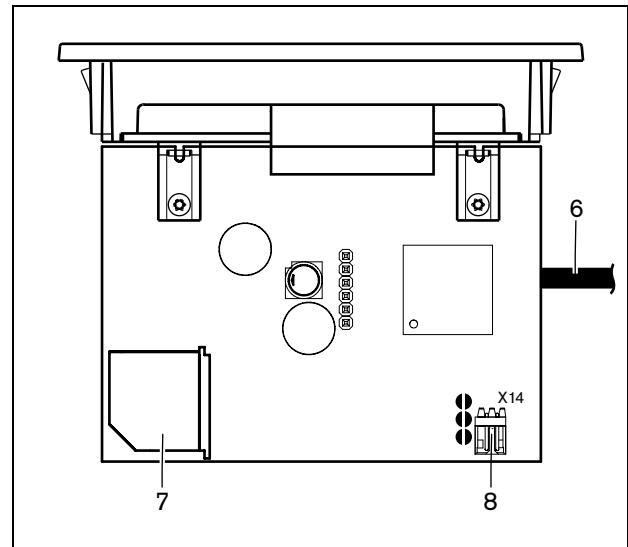
figure 27.2: Top view

figure 27.1: Front view

27.2.3 Rear view

The rear of the channel selector (refer to figure 27.3) contains:

9 **External headphones (solder pads)** - Connect an external headphones socket to the channel selector (refer to section 27.5.2).
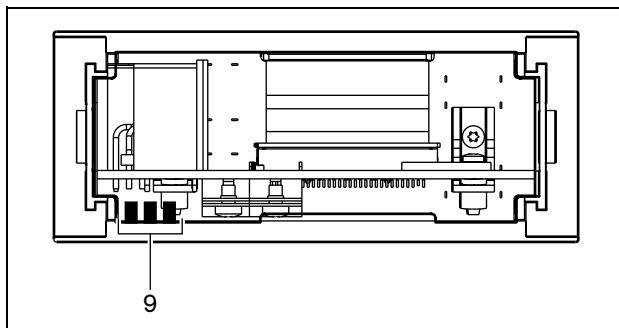

figure 27.3: Rear view

27.3 Internal settings

27.3.1 Introduction

The component side of the PCB of the channel selector (refer to figure 27.4) contains solder spots. With these solder spots, you can configure the channel selector.
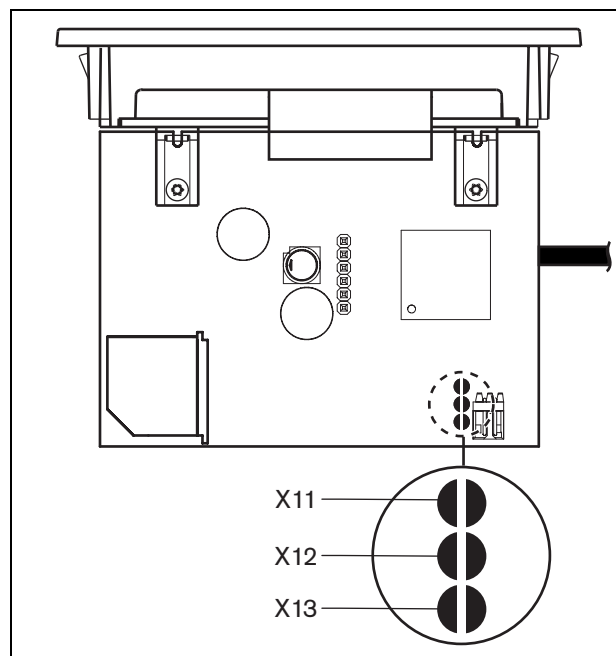

figure 27.4: Solder spots

table 27.1: Solder spots

Solder spot	Function
X11	Auto-standby function (refer to section 27.3.2).
X12	Volume increment/decrement function (refer to section 27.3.3).
X13	Channel/volume restore function (refer to section 27.3.4).

27.3.2 Auto standby function

Use the X11 solder spot to enable or disable the auto standby function of the channel selector.

table 27.2: Solder spot X11 (* = default)

Solder spot	Function
Not soldered*	The auto standby function is enabled. When the headphones are disconnected, the channel selector is disabled.
Soldered	The auto standby function is disabled. When the headphones are disconnected, the channel selector remains enabled.

> **ℹ Note**
>
> When you use the channel selector to record audio, you must close the X11 solder spot.

The channel selector measures the impedance between pin 1 and pin 2 of the headphones plug (see section 27.5.2). When this impedance is less than 1 kΩ, the channel selector identifies that the headphones are present.

27.3.3 Volume increment/decrement

With the X12 solder spot, you can enable or disable the volume increment/decrement function of the channel selector.

table 27.3: Solder spot X12 (* = default)

Solder spot	Function
Not soldered*	The volume increment/decrement function is enabled. When the volume up (down) button is pushed for longer than 0.25 seconds, the volume level is increased (decreased) with 12 dB per second.
Soldered	The volume increment/decrement function is disabled. When the volume up (down) button is pushed, the volume level increases (decreases) with one step of 1 dB.

27.3.4 Channel/volume restore function

Use the X13 solder spot to enable or disable the channel/volume restore function of the channel selector.

table 27.4: Solder spot X11 (* = default)

Solder spot	Function
Not soldered*	The channel/volume restore function is disabled. When the channel selector is enabled, it automatically: • Selects channel 0 (floor) • Sets the volume level to -18 dB.
Soldered	The channel/volume restore function is enabled. When the channel selector is enabled, it automatically: • Select the last known channel. • Sets the last know volume level.

For example, you can enable this function when all delegates and chairmen have a fixed seat number.

> **i** **Note**
> The channel selector saves all channel changes after 5 seconds.

> **i** **Note**
> If the last known channel number is greater than the maximum number of channels that are available, the channel selector automatically goes to channel 0. When the last known channel becomes available, it is only restored if you did not operate the buttons of the channel selector.

27.4 Installation

The channel selector is a flush-mounted device. Refer to chapter 19 for installation procedures.

table 27.5: Physical characteristics

Dimensions (h x w x d):
40 x 100 mm (built-in depth about 80 mm)
Weight:
approximately 300 g

You can install the channel selector in a DCN-TTH Tabletop Housing (refer to chapter 31).

27.5 External connections

27.5.1 DCN

Connect the channel selector to the DCN with the DCN cable. You can use the DCN socket to make a loop-through with the channel selector.

table 27.6: DCN connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Power consumption:
0.9 W

27.5.2 Headphones

You can connect headphones to the headphones socket of the channel selector. The headphones must have a 3.5 mm plug (refer to figure 27.5).
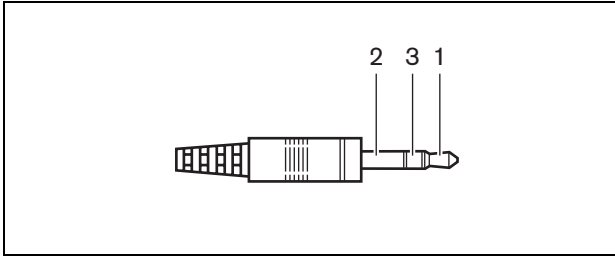

figure 27.5: 3.5 mm headphones plug, connection

table 27.7: 3.5 mm headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
>
> You can also connect mono headphones to the channel selector.

27.6 External headphones socket

You can connect an external headphones socket to the channel selector (e.g. a 6.3 mm headphones socket). The external headphones socket must be connected to a plug (refer to figure 27.6) or to solder pads (refer to figure 27.7).
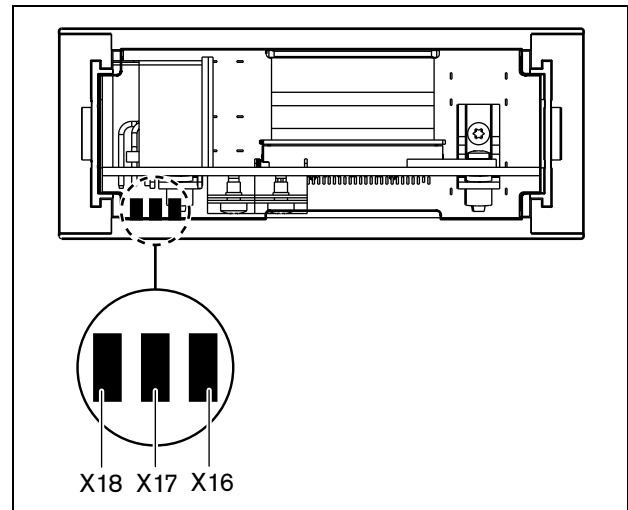
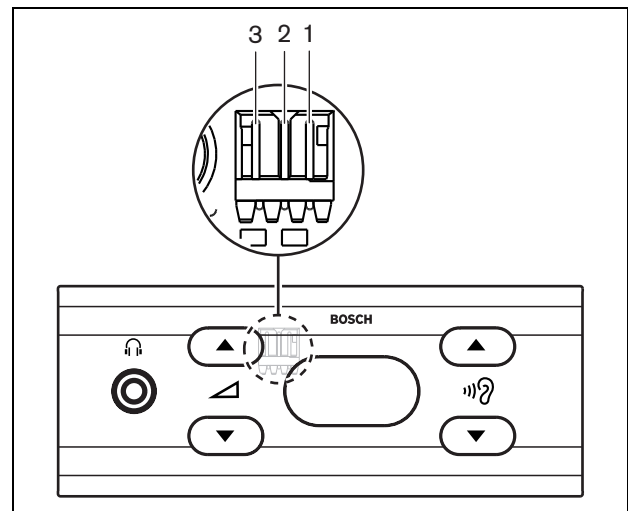*figure 27.6: External headphones, connection (1)*

figure 27.7: External headphones, connection (2)

The solder pads and the plug are internally connected (refer to table 27.8).

table 27.8: External headphones, connection

Plug (pin)	Solder pad	Signal
1	X18	Left
2	X16	Right
3	X17	Common

> ℹ️ **Note**
>
> You can connect, for example, an AMP173977-3 socket to the external headphones plug of the channel selector.

27.7 Level reduction plug

When the channel selector is used with a device that has a microphone, acoustic feedback can occur. Use the level reduction plug (refer to figure 27.8) to prevent acoustic feedback.
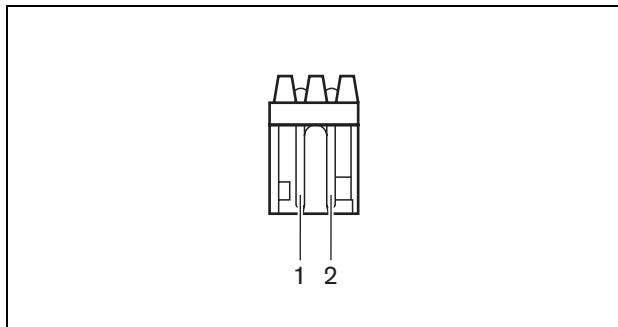
figure 27.8: Output level plug, connection

table 27.9: Output level plug, connection

Pin	Signal
1	Positive
2	GND

> ℹ️ **Note**
>
> You can connect, for example, an AMP173977-2 socket to the level reduction plug of the channel selector.

Connect a voltage to the level reduction plug to decrease the volume level of the signal on the headphones (refer to table 27.10).

table 27.10: Output level reduction

Voltage	Description
< 1 V(DC)	The output level of the channel selector is not decreased.
> 3 V(DC)	The output level of the channel selector is decreased.

These devices have a output level plug that you can connect to the level reduction plug of the channel selector:
- DCN-CON Concentus Delegate Unit
- DCN-CONCS Concentus Delegate Unit
- DCN-CONFF Concentus Delegate Unit
- DCN-CONCM Concentus Chairman Unit
- DCN-FMIC Microphone Connection Panel

28   DCN-FVU Voting Unit

⚠️ **Caution**

Before you touch the voting unit, take measures to prevent electro-static discharges.

28.1   Introduction

With the DCN-FVU Voting Unit, delegates can make votes. Refer to table 28.1 for an overview of the different types.

table 28.1: Types

Type	Description
DCN-FVU	Standard version
DCN-FVU-CN	Chinese version

28.2   Controls, connectors and indicators

28.2.1   Front view

The front of the voting unit (refer to figure 28.1 and figure 28.2) contains:

1 **Condition LED** - Shows the condition of the voting unit (refer to section 28.5).
2 **Voting buttons** - Operate the voting panel (refer to section 28.5). Each button has a LED that shows the condition of the button.
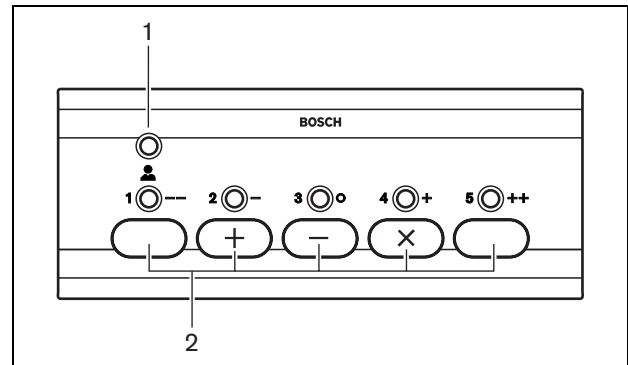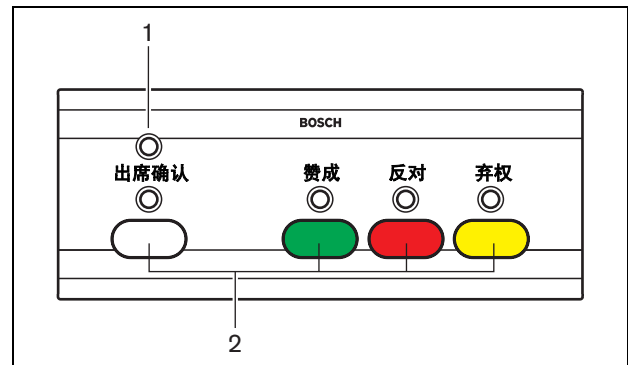

figure 28.1: Front view (DCN-FVU)

figure 28.2: Front view (DCN-FVU-CN)

28.2.2 Top

The top of the voting unit (refer to figure 28.3) contains:

3 **De-init switch** - Erases the address of the voting unit. All LEDs on the voting unit come on when the voting unit has no address (refer to section 8.7).

4 **DCN cable** - Connects the voting unit to the DCN (refer to section 28.4.1).

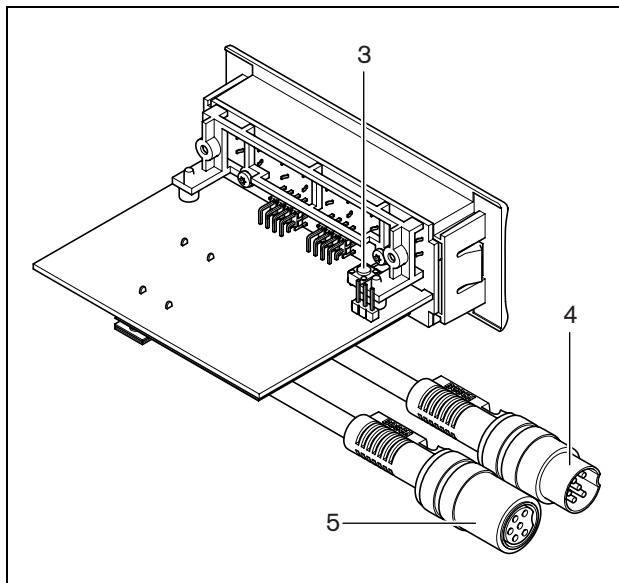5 **DCN socket** - Makes a loop-through in the DCN with the voting unit (refer to section 28.4.1).

figure 28.3: Top (all types)

28.2.3 Bottom

The bottom of the voting unit (refer to figure 28.4) contains:

6 **External contact plug** - Connects the voting unit to an external contact (refer to section 28.4.2).

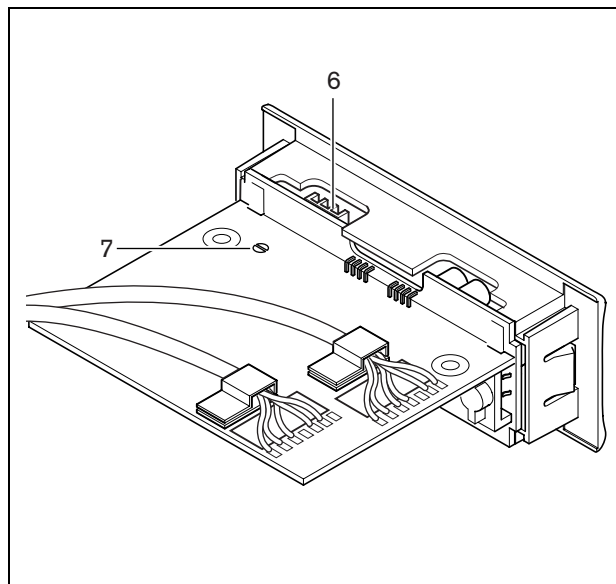7 **Solder spot** - Configures the external contact plug (refer to section 28.4.2).

figure 28.4: Bottom (all types)

28.3 Installation

The voting unit is a flush-mounted device. Refer to chapter 19 for the installation procedures.

table 28.2: Physical characteristics

Dimensions (h x w x d):
40 x 100 mm (built-in depth about 80 mm)
Weight:
250 g

You can install the voting unit in a DCN-TTH Tabletop Housing (refer to chapter 31).

28.4 External connections

28.4.1 DCN

Use the DCN cable with the DCN plug to connect the voting unit to the DCN. You can use the cable with the DCN socket to make a loop-through with the voting unit.

> **i** **Note**
>
> When you do not make a loop-through with the voting unit, connect an LBB4118/00 Cable Termination Plug to the DCN cable with the DCN socket. If you do not connect a cable termination plug, the system can operate incorrectly.

table 28.3: DCN connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Power consumption:
1.0 W

28.4.2 External contact

Refer to section 26.4.2 for information about the external contact of the voting unit. The external contacts of the voting panel and the voting unit are the same.
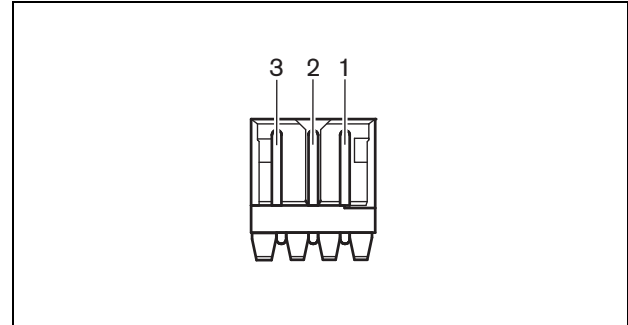

figure 28.5: External contact, connection

table 28.4: External contact, connection

Pin	Signal
1	+5 V(DC) (max. 20 mA)
2	Input, +
3	Input, -

> **i** **Note**
>
> You can connect, for example, an AMP173977-3 socket to the external contact plug of the voting panel.

Use the solder spot (refer to figure 28.4, no. 7) to configure the external contact plug. With the solder spot, you can configure the galvanic separation of pin 3 and the ground of the external contact plug (refer to table 28.5).

table 28.5: Solder spot (= default)*

Solder spot	Description
Not soldered*	Pin 3 and the ground of the external contact plug are not internally connected.
Soldered	Pin 3 and the ground of the external plug are internally connected.

Refer to figure 28.6 for a circuit diagram of an external contact connection that uses the galvanic separation.
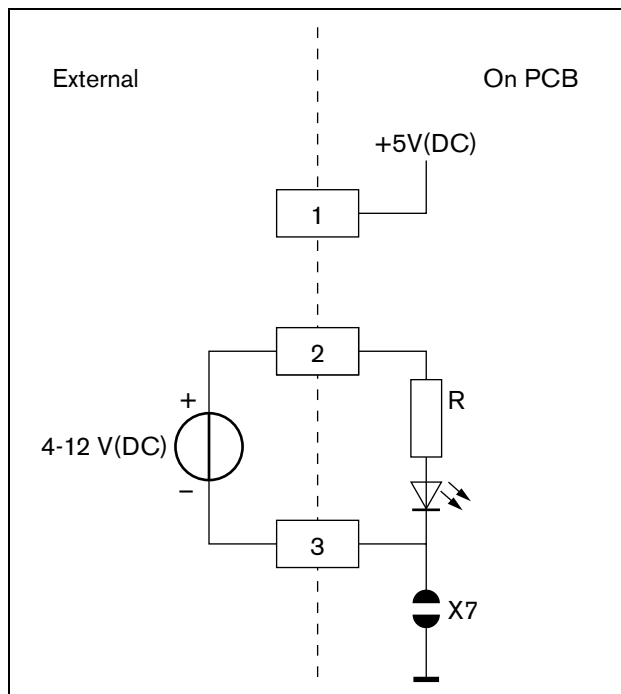
Refer to figure 28.7 for a circuit diagram of an external contact connection that does not use the galvanic separation.

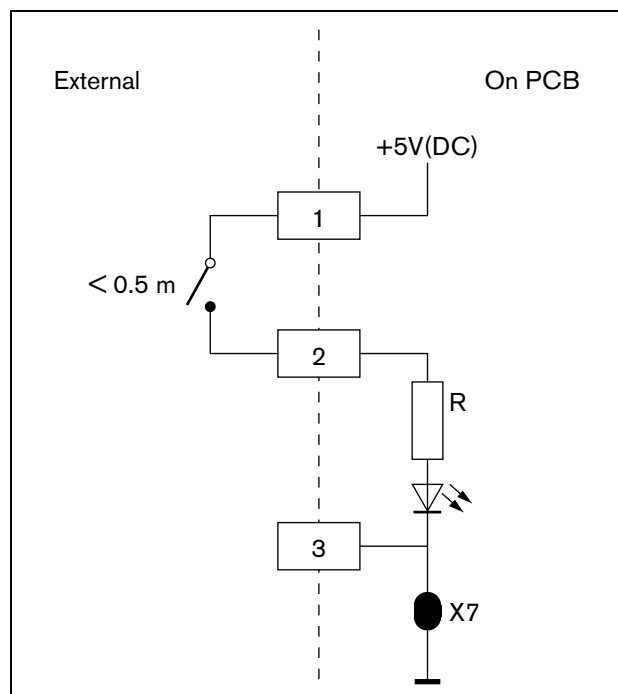figure 28.6: External contact, connection (1)

figure 28.7: External contact, connection (2)

28.5 Operation

Refer to section 26.5 for information about the operation of the voting panel. The operation of the voting unit and the voting panel are the same, but the condition LED of the voting panel shows less conditions (refer to table 28.6).

table 28.6: Conditions

LED	Condition
Off	Device or system off
Blue (on)	Device on
Blue, flashing @ 5 Hz	No communication
Yellow (on)	Delegate present

> **i** **Note**
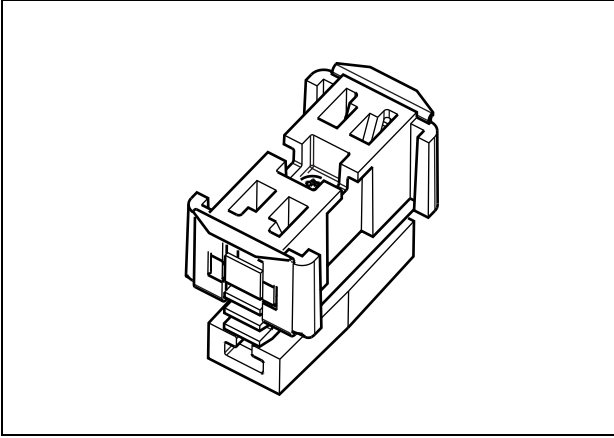>
> The chinese version of the voting panel can only be used for parliamentary voting sessions and for/against voting sessions, because the chinese version has 4 voting buttons. All other voting sessions use a minimum of 5 voting buttons.
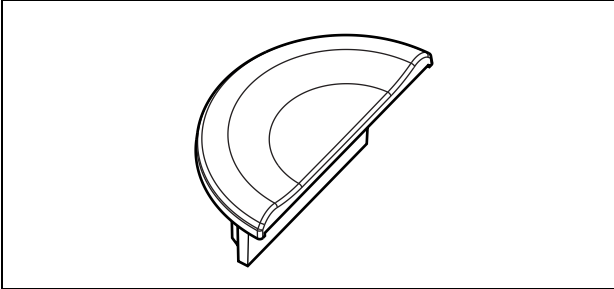
29   DCN-FCOUP Couple

You can use the DCN-FCOUP Couple to install
flush-mounted devices (refer to chapter 19).

figure 29.1: End cap

30   DCN-FEC End Caps

You can use the DCN-FEC End Caps to install
flush-mounted devices (refer to chapter 19).

figure 30.1: End cap

31 DCN-TTH Tabletop Housing

You can use the DCN-TTH Tabletop Housing to install these flush-mounted devices:

- DCN-FCS Channel Selector
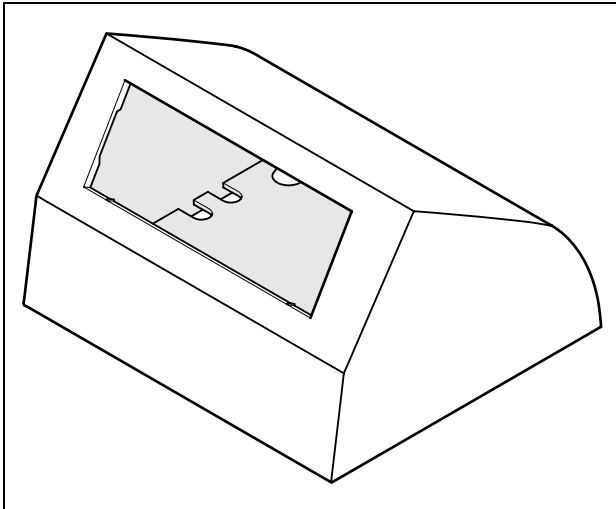- DCN-FV(CRD) Voting Panel
- DCN-FVU Voting Unit

figure 31.1 : Tabletop housing

table 31.1 : Physical characteristics

Dimensions (h x w x d):
80 x 120 x 105 mm
Weight:
243 g

> **ℹ Note**
>
> You can temporarily close the tabletop housing with a DCN-FBP (Flush Blank Panel).

Use the 'click-to-fit' mechanism (refer to figure 19.1) of the flush-mounted devices to install the flush-mounted devices in the tabletop housing. You can attach the tabletop housing to a flat surface with M3 screws (refer to figure 31.2).
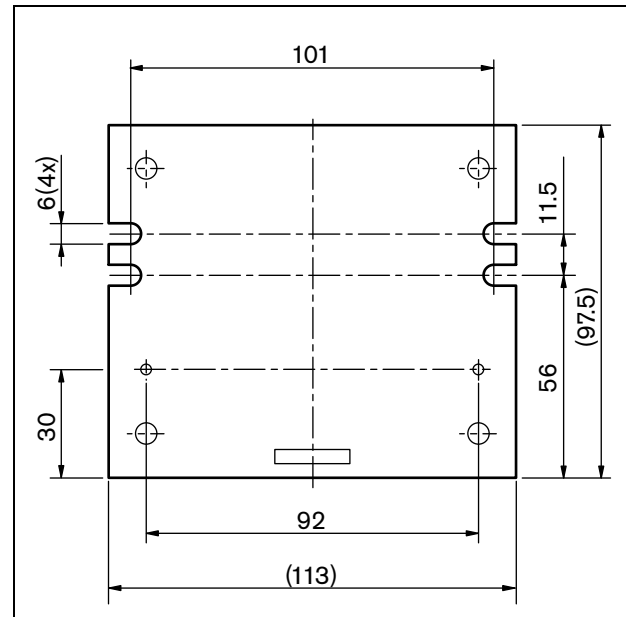

figure 31.2: Bottom view

32   DCN-FBP panels

You can use the DCN-FBP (Flush Bank Panel) or the DCN-FBPS (Flush Bank Panel Short) to temporarily close recesses (refer to figure 32.1 and table 32.1).
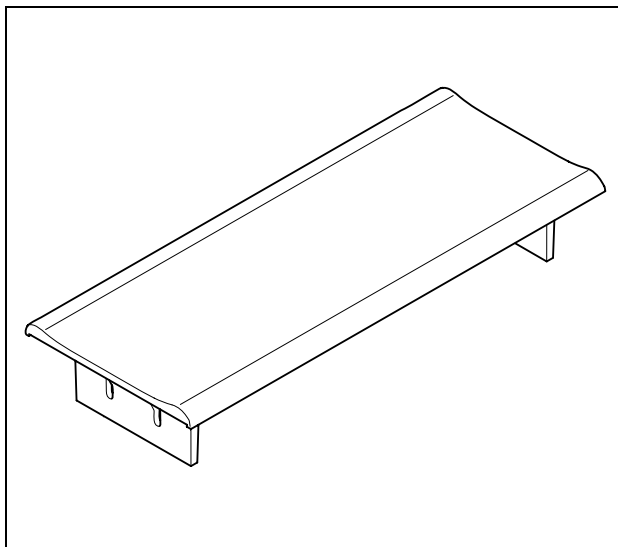

figure 32.1: Flush blank panel

table 32.1: Physical characteristics

Panel type	Dimensions (w x d)
DCN-FBP	40 x 100 mm
DCN-FBPS	40 x 50 mm

Intentionally left blank

Section 5 - Interpretation Devices

33 DCN-IDESK Interpreter Desks

33.1 Introduction

With the DCN-IDESK Interpreter Desks, the interpreters can add interpretations to the discussion or the conference.

33.2 Controls, connectors and indicators

33.2.1 Top

The top of the desk (refer to figure 33.1) contains:

1 **Beeps button** - Enables or disables the beeps (refer to section 33.5.4). This function is for blind interpreters.
2 **Primary knob** - Operates the display to configure and operate the interpreter desk.
3 **Display** - Shows the configuration and user menus.
4 **Pre-select buttons** - Give the interpreters access to a channel from which they can make interpretation.
5 **Output buttons** - Set the output channel to send the target language.
6 **Microphone socket** - Connects a DCN-MICL or DCN-MICS Pluggable Microphone to the interpreter desk (refer to chapter 17).
7 **Telephone LED** - Comes on when the interpreter desk receives a phone call from an external telephone system (refer to section 33.4.4).
8 **Intercom LED** - Comes on when the interpreter desk receives an intercom call.
9 **Message button** - Opens text messages that are sent to the interpreter desk. When the interpreter desk receives a message, the yellow LED adjacent to the message button blinks.
10 **Intercom button (operator)** - Opens an intercom channel to the operator.
11 **Headphones treble knob** - Adjusts the level of the treble of the signal that is sent to the headphones.
12 **Headphones bass knob** - Adjust the level of the bass of the signal that is sent to the headphones.
13 **Headphones volume knob** - Adjust the volume level of the signal that is sent to the headphones.
14 **Loudspeaker volume knob** - Adjusts the volume level of the signal that is sent to the loudspeaker of the interpreter desk.

15 **Loudspeaker** - The loudspeaker is on only when the microphones of all the interpreter desks in the same interpreter booth are off.
16 **Floor/Auto-relay button** - Sets the source of the interpretation (refer to also section 33.5).
17 **Microphone button** - Enables or disables the microphone. The microphone button has a red LED that comes on when the microphone is enabled.
18 **Mute button** - Temporarily disables the microphone.
19 **Help button** - For help signaling. The interpreter can only use the help button when the system contains an DCN-DDB Data Distribution Board (refer to section 47.5.2).
20 **Speak slowly button** - For speak slowly signaling. The interpreter can only use the speak slowly button when the system contains an DCN-DDB Data Distribution Board (refer to section 47.5.1).
21 **Intercom button (chairman)** - Opens an intercom channel to the chairman.

33.2.2 Left side

The left side of the interpreter desk (refer to figure 33.2) contains:

22 **Headphones socket (6.3 mm)** - Connects headphones with a 6.3 mm plug to the interpreter desk (refer to section 33.4.3).
23 **Headset socket** - Connects a headset to the interpreter desk (refer to section 33.4.2).
24 **Headphones socket (3.5 mm)** - Connects headphones with a 3.5 mm plug to the interpreter desk (refer to section 33.4.3).
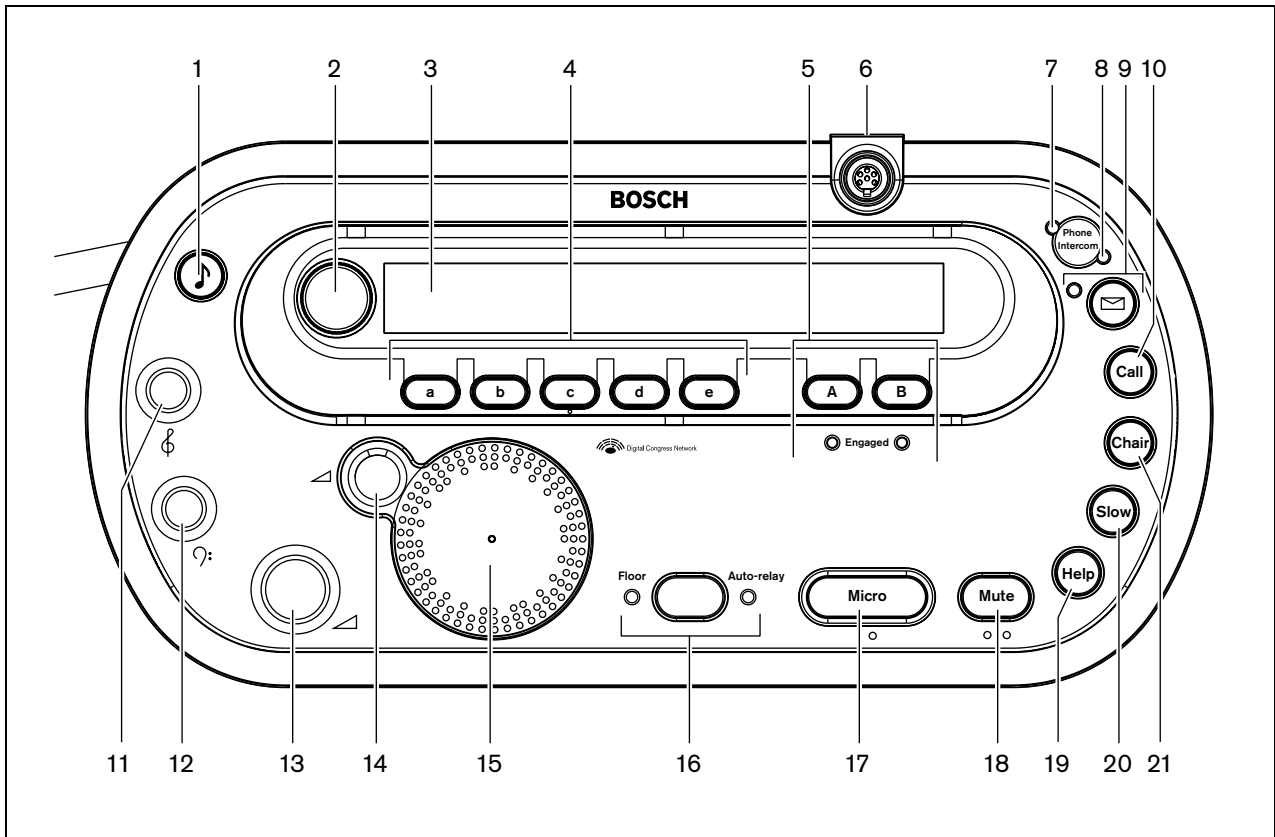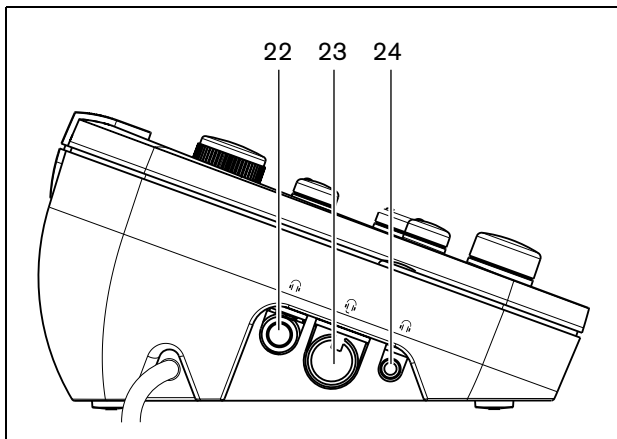
figure 33.1: Top view

figure 33.2: Left view

> ### ℹ Note
> The interpreter desks has pimples which blind interpreters can use to locate the Micro, Mute and c buttons (refer to figure 33.1).

33.2.3 Bottom side

The bottom side of the desk (refer to figure 33.3 and figure 33.4) contains:

25 **DCN cable** - Connects the interpreter desk to the DCN (refer to section 33.4.1).

26 **External devices socket** - Connects a booth-on-air indicator or device that operates the telephone and intercom LEDs on the interpreter desk (refer to section 33.4.4).

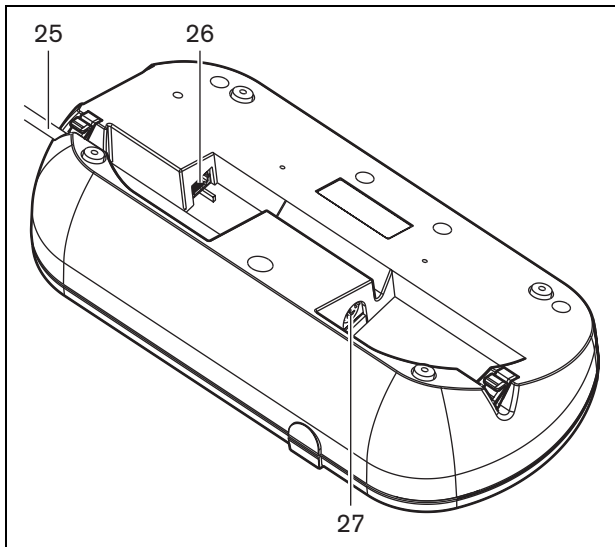27 **DCN socket** - Makes a loop-through in the DCN with the interpreter desk (refer to section 33.4.1).

figure 33.3: Bottom view (1)

28 **Screw holes** - Attach the interpreter desk to a flat surface (refer to section 33.3).

> **ℹ Note**
>
> The distance between the centers of the screw holes is 100 mm.

29 **De-init switch** - Erases the address of the interpreter desk (refer to section 8.7). All LEDs on the interpreter desk come on when the interpreter desk does not have an address.

30 **Sensitivity potentiometer** - Adjusts the volume level of the microphone that is connected to the interpreter desk.

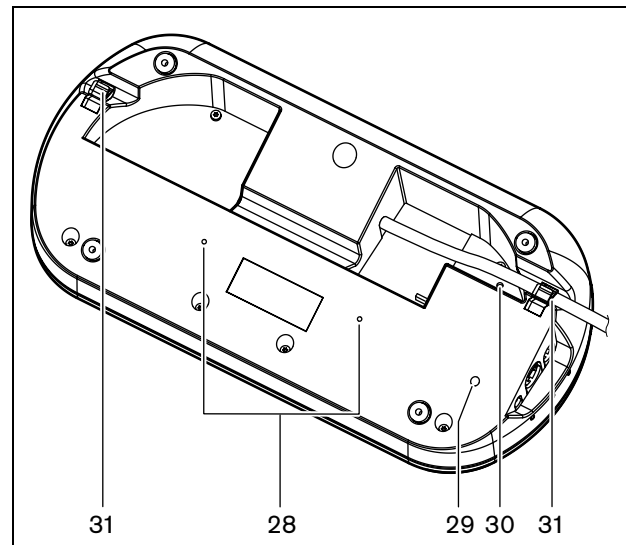31 **Cable lock** - Fixes the DCN cable.

figure 33.4: Bottom view (2)

33.3   Installation

Install the interpreter desk on a flat surface or in a recess (refer to figure 33.5). When you install the interpreter desk in a flat surface, use the template (refer to figure 33.6).

> ℹ️ **Note**
>
> When you install the interpreter desk in a recess, make sure that the interpreter can connect the headphones or the headset.

table 33.1: Physical characteristics

Dimensions (h x w x d):
80 x 330 x 160 mm
Weight:
1.3 kg

When you attach the interpreter desk to a flat surface, put screws with a length of 10 mm in the screw holes (refer to figure 33.4, no. 28). The distance between the centres of the screw holes is 100 mm.

1.5 mm
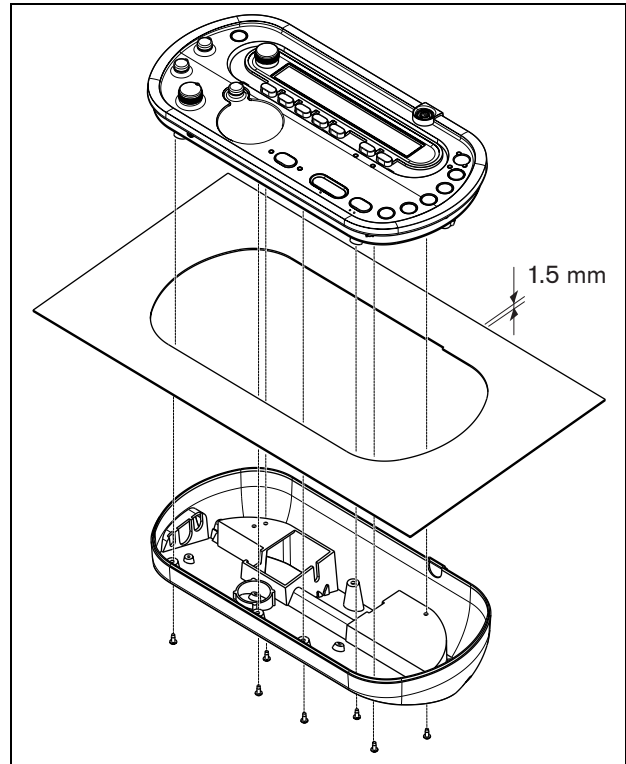
figure 33.5: Installation

63.8 ± 0.2

19.5 ± 0.1

$R49\pm0.2(4x)$

2 ± 0.1

$158^{+0.1}_{-0.2}$

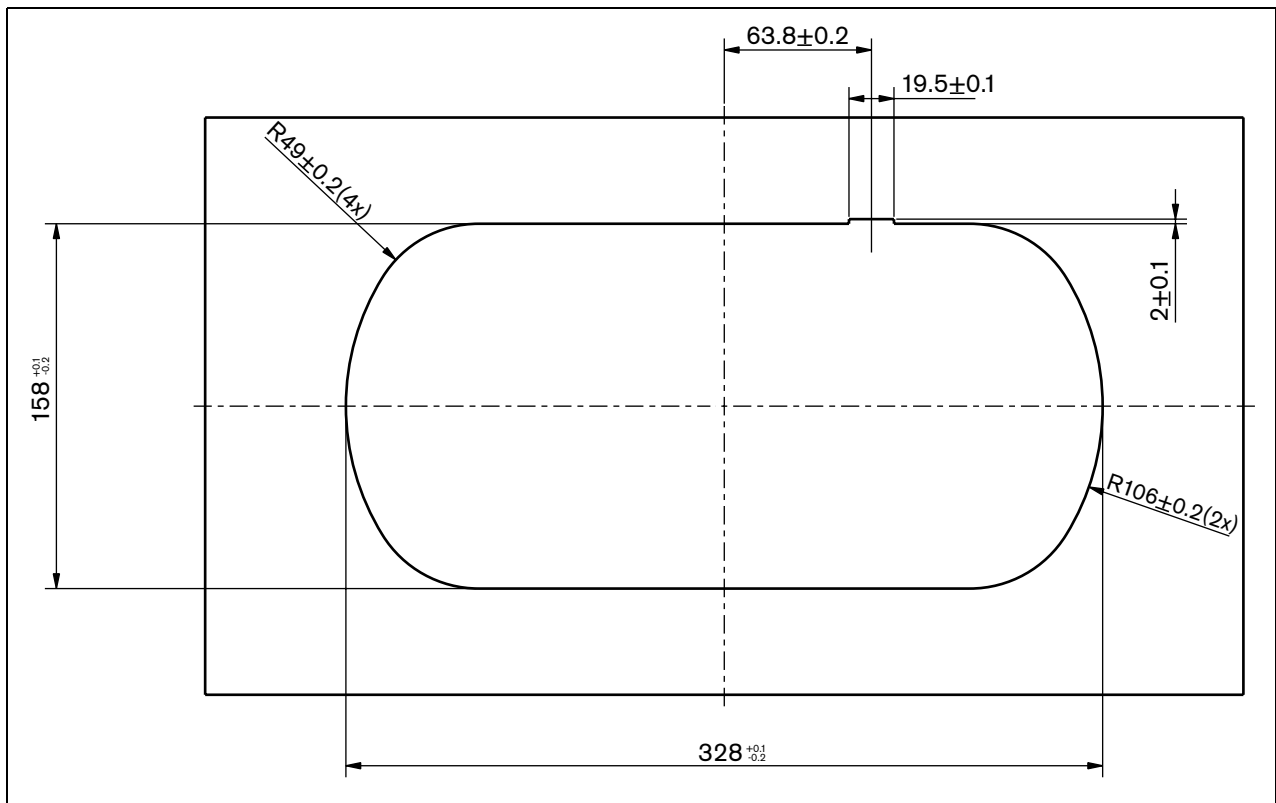$R106\pm0.2(2x)$

$328^{+0.1}_{-0.2}$

figure 33.6: Template (refer to the CD-ROM that is supplied with the system for a *.dwg file)

33.4 External connections

33.4.1 DCN

Connect the interpreter desk to the DCN with the DCN cable. You can use the DCN socket to make a loop-through with the interpreter desk.

table 33.2: DCN connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Location:
Bottom side
Power consumption:
3.6 W

33.4.2 Headset

You can connect a headset to the headset socket of the interpreter desk. The headset socket (refer to figure 33.2) must be IEC 268-11 compliant with a 5-pole 180° DIN plug.
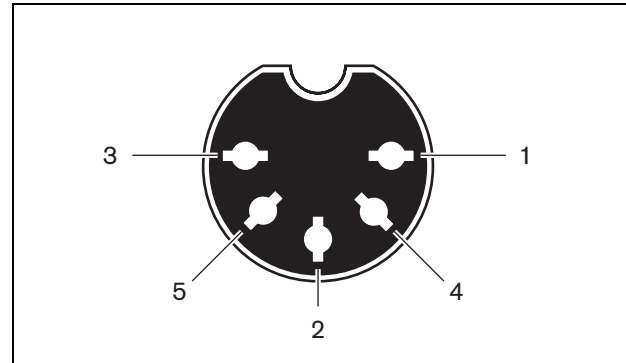

figure 33.7: Headset socket, connection

table 33.3: Headset socket, connection

Pin	Signal
1	Microphone supply
2	Microphone in
3	Headphones out, left
4	Headphones common
5	Headphones out, right

table 33.4: Headset socket

Number of connections:
1x IEC 268-11 5 pole 180° DIN socket
Location:
Left side
Nominal microphone input level:
7 mVrms
Maximum microphone input level:
25 dB with respect to nominal input level
Overload microphone input level:
> 124 mVrms

33.4.3 Headphones

You can connect headphones to the headphones sockets of the interpreter desk. The headphones must have a 3.5 mm plug (refer to figure 33.8) or a 6.3 mm plug (refer to figure 33.9).
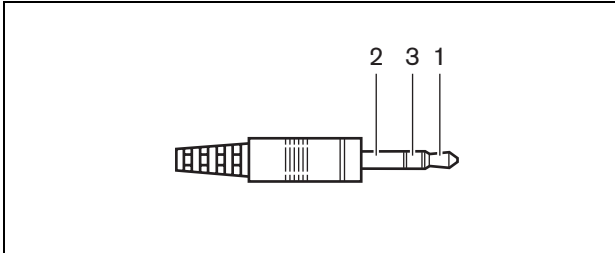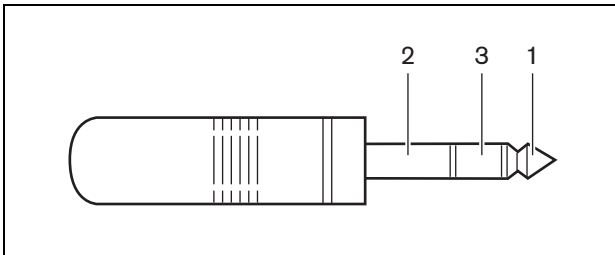

figure 33.8: 3.5 mm headphones plug, connection

figure 33.9: 6.3 mm headphones plug, connection

table 33.5: Headphones plug, connection

Number	Signal
1	Left
2	Common
3	Right

> **i** **Note**
> You can also connect mono headphones to the interpreter desk.

table 33.6: Headphones sockets, details

Number of connections:
1x 3.5 mm socket
1x 6.3 mm socket
Location:
Left side

33.4.4 External devices

You can use the external devices socket to connect:

- A booth-on-air indicator to the interpreter desk.
- An external intercom system to the intercom LED of the interpreter desk.
- An external telephone system to the telephone LED of the interpreter desk.
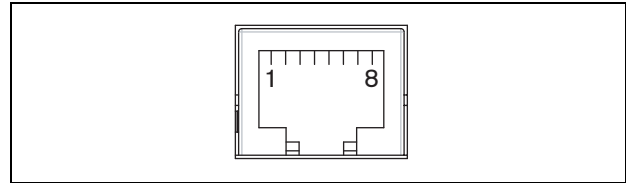
figure 33.10: External devices socket, connection

table 33.7: External devices socket, connection

Pin	Function	Signal
1	---	---
2	Booth-on-air	Switch pin 1
3	Booth-on-air	Switch pin 2
4	---	---
5	Telephone	Positive in
6	Telephone	Negative in
7	Intercom	Positive in
8	Intercom	Negative in

table 33.8: External devices socket, details

Number of connections:
1x RJ45 socket
Location:
Bottom side
Contact rating (booth-on-air contact):
24 V/1 A potential free contact
Signal levels:
• no call: < 1 V(DC)
• call: > 3 V(DC), max. 24 V(DC)

33.5   Operation

33.5.1   Introduction
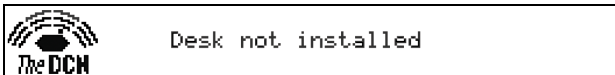
When you start the central control unit, the interpreter desk starts. The display on the desk shows the hardware and software versions. For example:

The operational mode starts automatically if the desk has the correct configuration. The operational mode is the default mode for the interpreter desk. If the desk is not configured, the display shows the screen:

> ℹ **Note**
> You cannot put a desk that is not configured in the operational mode.

33.5.2   Normal interpretation

In the usual procedure for interpreters (refer to figure 33.11), the interpreter knows the source floor language. The interpreter makes an interpretation of the source language in the target language. The language distribution channels transmit the target language to the delegate units.
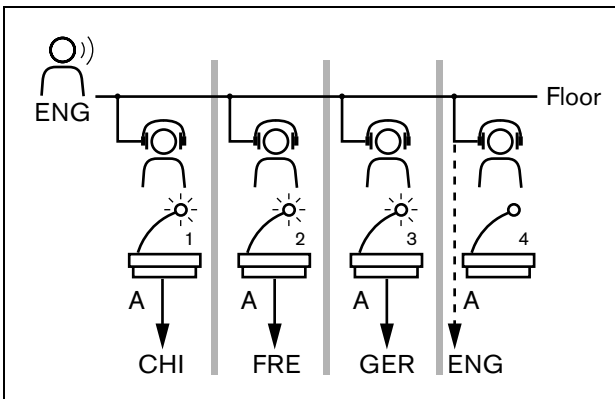

figure 33.11: Normal interpretation from floor

33.5.3   Auto-relay interpretation

Where the interpreter does not know the source floor language, the system has an automatic relay function (refer to figure 33.12).

One interpreter makes an interpretation from the source language (floor signal) in a language that the other interpreters know. This language is the auto-relay interpretation. The auto-relay interpretation automatically replaces the floor signal on all interpreter desks. All interpreters use the auto-relay interpretation to make interpretations.

The example in figure 33.12 shows that the floor signal is Chinese. The auto-relay is enabled at the Chinese interpreter desk. The Chinese-to-English interpreter selects output B and sends an English auto-relay interpretation to all other interpreter desks. The LED adjacent to the Floor/Auto-relay button shows on all other interpreter desks that the interpreter desk receive an auto-relay interpretation.
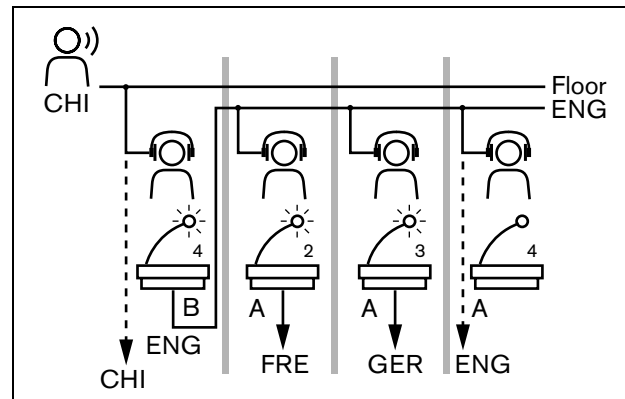

figure 33.12: Auto-relay interpretation

> ℹ **Note**
> In the installation mode of the interpreter desk, output B can be assigned with an auto-relay function.

33.5.4 Beeps

The interpreter desk can generate beeps for notification of special events to support blind interpreters (refer to table 33.9 and figure 33.13) on the headphones.

> ℹ **Note**
> The volume level of the beeps depends on the position of the volume control of the headphones.

The audio beeps can be toggled on and off with the beeps button (refer to figure 33.1). When beeps are enabled, a musical note appears in the display.

table 33.9: Beeps

Tone	Event
Beep on	Beeps are enabled.
Beep off	Beeps are disabled.
Microphone on	Microphone is switched on.
Microphone off	Microphone is switched off.
Quality indication	Own channel is selected while the microphone is on **OR** the quality of the selected channel is '-'.
External phonecall	Incoming phone call (only when beeps are enabled and microphone is off).
Intercom	Intercom call (only when beeps are enabled and microphone is off).

> ℹ **Note**
> Except for beep on and beep off, all beeps are only available when beeps have been enabled.
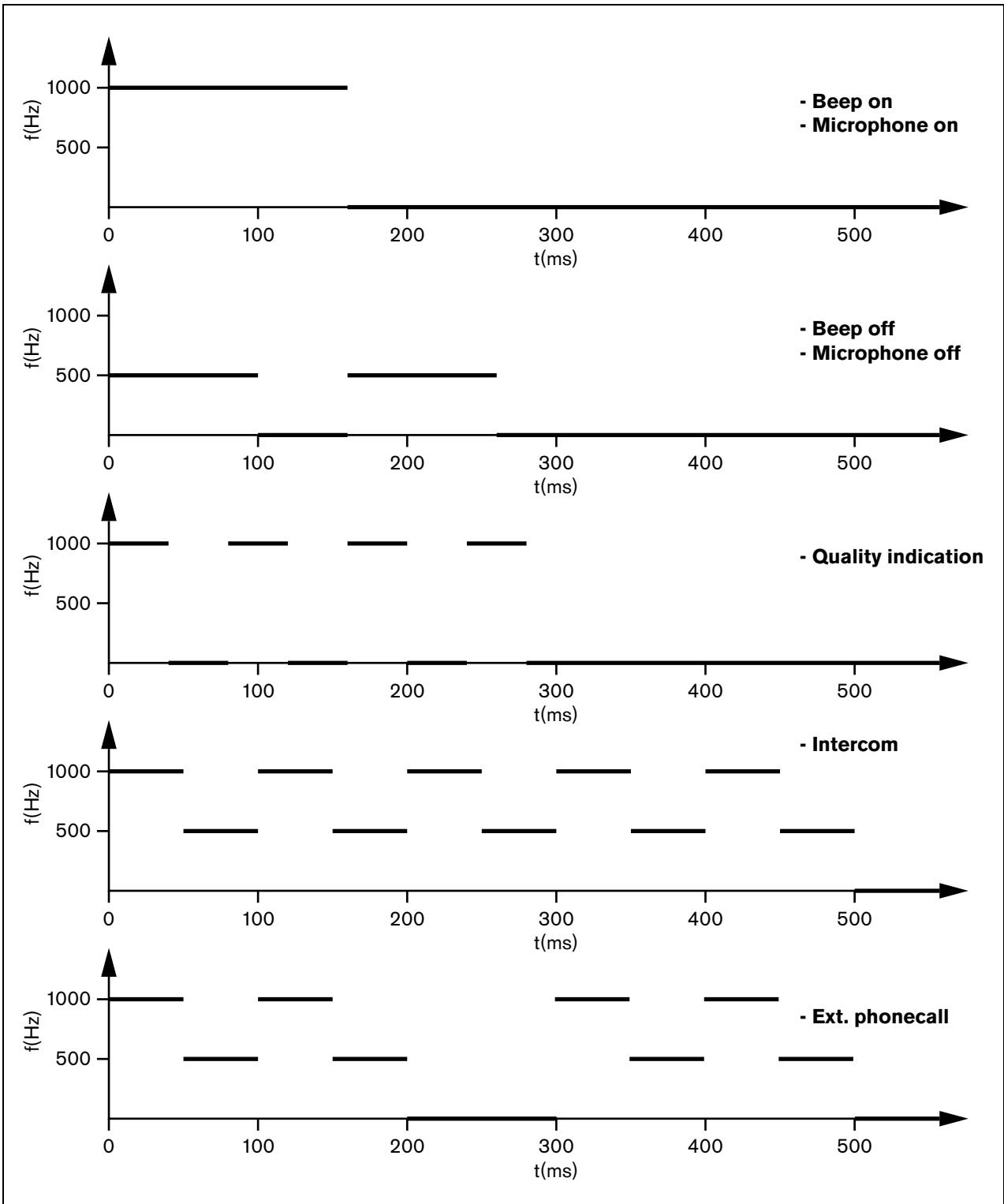
figure 33.13: Beeps

33.6 Configuration

33.6.1 Introduction

Before the start of a discussion or a conference, the interpreter and system parameters of the interpreter desk can be put manually in the installation mode of the desk.

33.6.2 Overview

The installation mode of the desk consists of a number of menus in which options have to be chosen. Some menus are applicable only to the desk that is being configured, whereas other menus apply to all interpreter desks in the system.

table 33.10: Installation mode menus

Menu	Description	Scope
a	User language	System
b	Interpreter booth number	Desk
c	Desk number	Desk
d	Number of channels	System
e	Language list	System
f	Language channels	System
g	Outgoing channel A	Desk
h	Outgoing channel B	Desk
j	Number of auto-relay booths	System
k	Auto-relay booths	System
l	Microphone locks	System
m	Speak slowly signaling	System
n	Help signaling	System
o	Speech timer	Desk
p	Microphone source	Desk

> **i** **Note**
> In PC based systems only menus a, b, c, o and p have to be configured manually on each desk. All other menus can be configured from the PC.

> **i** **Note**
> PC based systems using the Simultaneous Interpretation software module have extended control and preset facilities as compared to a stand-alone interpretation system.

> **i** **Note**
> A description of the Simultaneous Interpretation software manual is beyond the scope of this manual. Refer for detailed information about this software to its own manual.

33.6.3 Start the installation mode

1 Make sure the interpreter desk has an address (refer to section 8.7).
2 Push the b preselect channel button and the B output selection button at the same time. The installation mode of the interpreter desk starts.
3 The display shows:

```
Installation mode. Use dial and <> [ ] to
change options. ⬅ ➡ to change page.
◄━━  ━━►  ◄◆►  ◄■■  ◄➡►
```

> **i** **Note**
> Some installation mode screens affect all interpreter desks in the system, only one interpreter desk at a time can be in the installation mode.

4 When one of the interpreter desks in the system already is in the installation mode, the display shows:

```
Installation menu is in use by another
interpreter desk or the system is busy.
Please try again later.
```

33.6.4 Navigation in the installation mode

In the installation mode, only a small number of controls are available (refer to table 33.11 and figure 33.1).

table 33.11: Controls in the installation mode

Control	Function
Primary knob	Select menu option(s)
Preselect channel button a	Go to the previous menu
Preselect channel button b	Go to the next menu
Preselect channel button d	Clear current selection
Preselect channel button e	Enter current selection
Output selection button B	Exit the installation mode

33.6.5 Configuration procedures

To select the necessary parameters in the installation menus to configure the interpreter desk do as follows:

1 Push the a and b preselect channel buttons to go to the necessary installation menu. The parameter that is set has square brackets, for example, [option].

2 Push the d preselect channel button to clear the set parameter. The square brackets change to arrow brackets, for example, <option>. This shows that you can select a different choice with the primary knob.

3 Turn the primary knob to go to the necessary parameter. When the correct parameter is selected, push the e preselect channel button. The arrow brackets change to square brackets.

33.6.6 Menu screens

33.6.6.1 Menu a

Menu a sets the display language of the interpreter desk when in the installation mode. The language is set for all interpreter desks in the system.

```
Select language: [ENGLISH] DEUTSCH
 FRANÇAIS  ITALIANO  ESPAÑOL  NEDERLANDS   a
```

33.6.6.2 Menu b

Menu b sets the interpreter desk to an interpreter booth. It is necessary to set each interpreter desk in turn.

```
Select booth number:
 Booth [ 1] of 31                         b
```
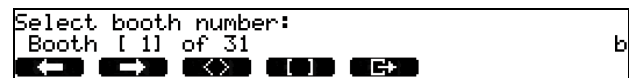
> **i Note**
> If an interpreter booth is full, no entry is possible and no response is given.

33.6.6.3 Menu c

Menu c sets a desk number to the unit in the interpreter booth. It is necessary to set each interpreter desk in turn.

```
Select desk number:
[1] 2  3  4  5  6                          c
```

> **i Note**
> If a desk number is already in use, no entry is possible and no response is given.

33.6.6.4 Menu d

Menu d sets the number of necessary language channels in the system. The number is set for all interpreter desks in the system.

```
Select number of channels:
[26] channels                              d
 ⬅   ➡   <>   []   ⏏
```

The default number of channels in a system that does not have a control PC is 26 (refer to table 33.12).

table 33.12: Channels

Language	≤ 26	27	28	29	30	31
Contribution	4	3	2	1	1	1
Intercom	1	1	1	1	0	0
Delegate	1	1	1	0	0	0

33.6.6.5 Menu e

Menu e sets the list of languages (refer to appendix B) that are used to display on the interpreter desk display. The language list is set for all interpreter desks in the system.

```
Select language list:
[ENGLISH] FRENCH  ORIGINAL               e
 ⬅   ➡   <>   []   ⏏
```

33.6.6.6 Menu f

Menu f sets a language to a specified channel. The number of channels to which a language can be set is the same as the number of channels set in menu d. The language list is set for all interpreter desks in the system.

```
Select language for channel 1:
[ALB - Albanian]                          f
 ⬅   ➡   <>   []   ⏏
```

```
Select language for channel 30:
[DUT - DUTCH]                             f
 ⬅   ➡   <>   []   ⏏
```

If a language is set to a channel, an asterisk appears in the display. For example:

```
Select language for channel 30:
[DUT - DUTCH]          *                  f
 ⬅   ➡   <>   []   ⏏
```
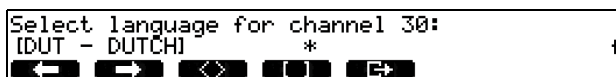
33.6.6.7　Menu g

Menu g sets a channel number to output A. The
channel number must be available on the interpreter
desk. It is necessary to set each interpreter desk in turn.

```
Select outgoing channel via A-output:
[ 2] of 26                                         g
◄━  ━►  ◄►  [ ]  ┗►
```


Note

When you install the interpreter desk for the first
time, the interpreter booth number is the default
channel number for output A.

33.6.6.8　Menu h

Menu h sets a channel to output B of the interpreter
desk. It is necessary to set each interpreter desk in turn.
Output B can be set either for none or all available
channels.

```
Select outgoing channel via B-output
[NONE] ALL                                         h
◄━  ━►  ◄►  [ ]  ┗►
```

33.6.6.9　Menu j

Menu j sets the number of auto-relay interpreter booths
in the system. The number is set for all interpreter desks
in the system.

```
Select number of auto-relay booth(s):
[ 0] of 31                                         j
◄━  ━►  ◄►  [ ]  ┗►
```

33.6.6.10　Menu k

Menu k sets the interpreter booths that are auto-relay
booths. The interpreter booths are set for all interpreter
desks in the system.

```
Select auto-relay 1:
[booth 1]                                          k
◄━  ━►  ◄►  [ ]  ┗►
```

```
Select auto-relay 31:
[booth 28]                                         k
◄━  ━►  ◄►  [ ]  ┗►
```

33.6.6.11　Menu l

Menu l sets the necessary interlock mode. The interlock
mode is set for all interpreter desks in the system.

```
Select microphone locks between booths:
[NONE]  OVERRIDE   INTERLOCK                        l
◄━  ━►  ◄►  [ ]  ┗►
```

table 33.13: Microphone lock options

Option	Description
None	No lock functionality. Audio inputs of the audio expander are disabled for translation channels only.
Override	Allows an interpreter to override another interpreter in another interpreter booth supplying the same interpretation channel.
Interlock	Blocks another interpreter from using the same channel in another interpreter booth.

Note

When the interlock mode is None and
interpreter desks using the same outgoing
channel are connected to different CCUs, the
interpreter desks work as if the interlock mode is
set to Interlock.

33.6.6.12　Menu m

Menu m sets the speak slowly signal on and off. Speak
slowly signaling must have the DCN-DDB Data
Distribution Board (refer to chapter 47).

```
Speak slowly signaling:
[NO] YES                                           m
◄━  ━►  ◄►  [ ]  ┗►
```
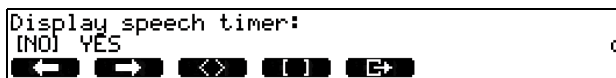
33.6.6.13 Menu n

Menu n sets the help signaling on and off. Help signaling must have the DCN-DDB Data Distribution Board (refer to chapter 47).

```
Help signaling:
[NO] YES                               n
◄━━  ━━►  ◄ ►  [ ]  ┗━►
```

33.6.6.14 Menu o

Menu o sets the speech timer of the interpreter desk on and off. It is necessary to set each interpreter desk in turn.

```
Display speech timer:
[NO] YES                               o
◄━━  ━━►  ◄ ►  [ ]  ┗━►
```

33.6.6.15 Menu p

Menu p sets the source for the microphone source. It is necessary to set each interpreter desk in turn.

```
Select microphone source:
AUTO  HEADSET  [MICROPHONE]            p
◄━━  ━━►  ◄ ►  [ ]  ┗━►
```

33.6.6.16 Exit screen

From the exit screen menu you can exit the installation mode.

```
End, use ┗━► to return to operational mode.
◄━━  ━━►  ◄ ►  [ ]  ┗━►
```
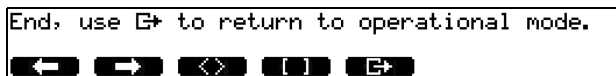
33.7 Operation

The colors of the LED around the microphone button shows the condition of the microphone that is connected to the interpreter desk (refer to table 33.14).

table 33.14: Condition

Color	Condition
Red (on)	Microphone enabled
Red (flash)	Engaged warning
Green (on)	Interpreter booth off

> **ℹ Note**
>
> Refer to the Quick Reference Card of the interpreter desk for instructions that tell you how to operate the interpreter desk.

Intentionally left blank.

Section 6 - Installation Devices

34 DCN-EPS Extension Power Supply

34.1 Introduction

The DCN-EPS Extension Power Supply supplies power to the DCN. You can use it to increase the number of devices that can be connected to the system. The Power Supply has a power consumption of 0.8 W.

> ℹ️ **Note**
>
> The DCN-EPS-UL Extension Power Supply is the CSA/UL approved version of the DCN-EPS.

34.2 Controls, connectors and indicators

34.2.1 Front view

The front of the extension power supply (refer to figure 35.1) contains:

1 **On/Off LED** - A green LED that comes on when:
- The power cable is connected to the mains power supply
- The trunk cable is connected to the system
- The central control unit is started
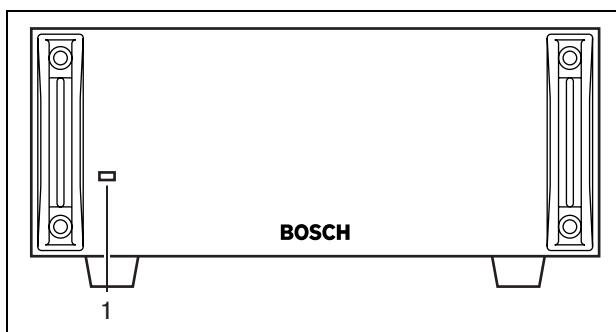
figure 34.1: Front view

34.2.2 Rear view

The rear of the extension power supply (refer to figure 34.2) contains:

2 **DCN cable** - Connects the extension power supply to the trunk of the DCN (refer to section 34.5.2).

3 **DCN socket (trunk)** - Makes a loop-through in the trunk of the DCN (refer to section 34.5.2).

4 **DCN sockets (tap-off)** - Make tap-offs in the DCN (refer to section 34.5.3). The socket regenerates the DCN signal.

5 **Power inlet** - Connects the extension power supply to the mains power supply with a power cable (refer to section 34.5.1).

6 **Fuse holder** - Prevents damage to the internal power supply unit of the extension power supply (refer to section 34.5.1).
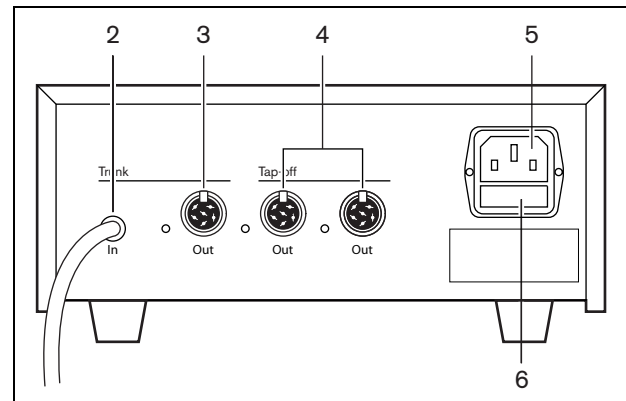

figure 34.2: Rear view

34.3 Internal settings

Use the connector block inside the extension power supply to select the voltage on which the extension power supply must operate (refer to figure 34.3 and table 34.1).
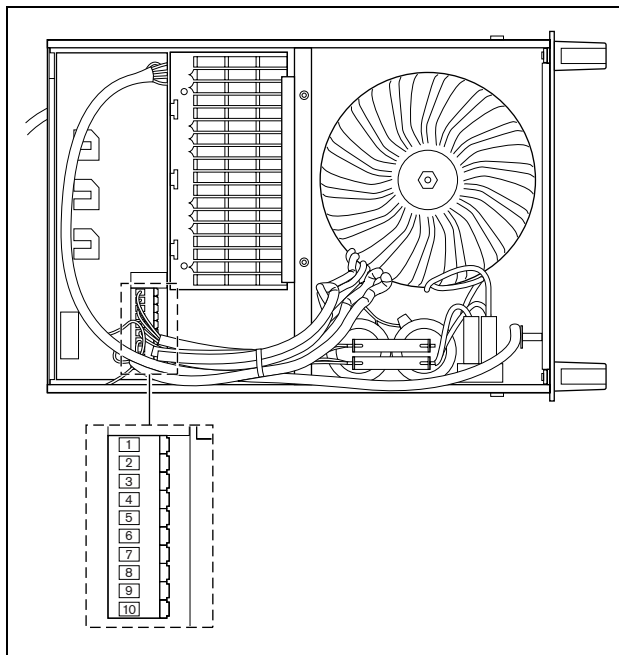

figure 34.3: Internal settings

table 34.1: Internal settings (n.c. = not connected)

Pin	Fuse T5A			Fuse T4A H		
	105 V(AC)	115 V(AC)	125 V(AC)	220 V(AC)	230 V(AC)	240 V(AC)
1	Blue (power)	n.c.	Blue (power)	Blue (power)	n.c.	Blue (power)
2	Black	Green	Green	Green	Green	Green
3	Green	Blue (power)	Black	Green	Black	Black
4	Orange	Orange	Orange	n.c.	Blue	n.c.
5	Blue (transformer)	Blue (transformer)	Blue (transformer)	Blue (transformer)	Blue (transformer)	Blue (transformer)
6	n.c.	Black	n.c.	Violet	Violet	Violet
7	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
8	n.c.	n.c.	n.c.	Orange	Orange	Orange
9	Violet	Violet	Violet	n.c.	n.c.	n.c.
10	Brown	Brown	Brown	Brown	Brown	Brown

34.4 Installation

Install the extension power supply in a 19-inch rack system or on a flat surface. Two brackets are supplied with the extension power supply (refer to figure 34.4).

> **i** **Note**
> You can only install the extension power supply in a 19-inch rack system together with a second extension power supply.
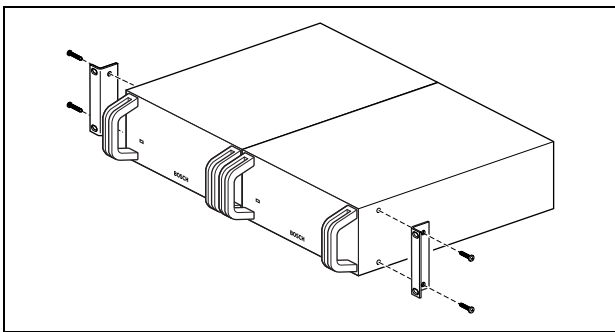

figure 34.4: Installation

table 34.2: Physical characteristics

Dimensions (h x w x d):
100 x 200 x 308 mm (without brackets)
Depth with brackets:
348 mm
Weight:
8.3 kg

34.5 External connections

34.5.1 Power supply

To connect the extension power supply to a power supply do as follows:

1 Connect the internal connector block to select the correct voltage that the extension power supply must operate (refer to section 34.3).

> **i** **Note**
> The DCN-EPS is configured for a voltage of 220 - 240 V(AC). The DCN-EPS-UL is configured for a voltage of 100 - 120 V(AC).

> **⚡ Caution**
> Before you open the extension power supply, you must disconnect it from the mains power supply. Electrical discharges from the mains power supply can kill you.

2 Make sure that the fuse holder on the rear of the extension power supply contains the correct fuse (refer to table 34.1).

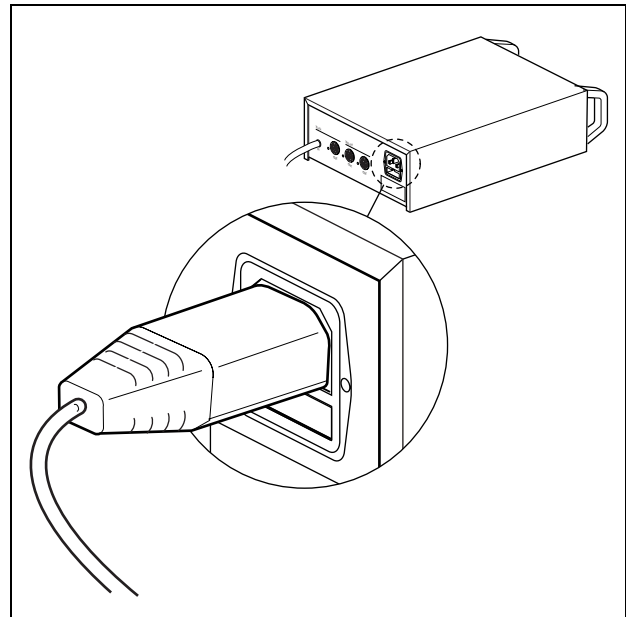3 Connect a locally approved power cable to the extension power supply (refer to figure 34.5).

figure 34.5: Power supply

4 Connect the power cable to a locally approved mains power supply.

⚠️ **Caution**
Make sure that the mains power supply is connect to a ground. Electrical discharges from the mains power supply can kill you.

34.5.2 DCN

Connect the extension power supply to the system with the DCN cable (refer to figure 34.6). You can use the DCN trunk socket to make a loop-through with the extension power supply.
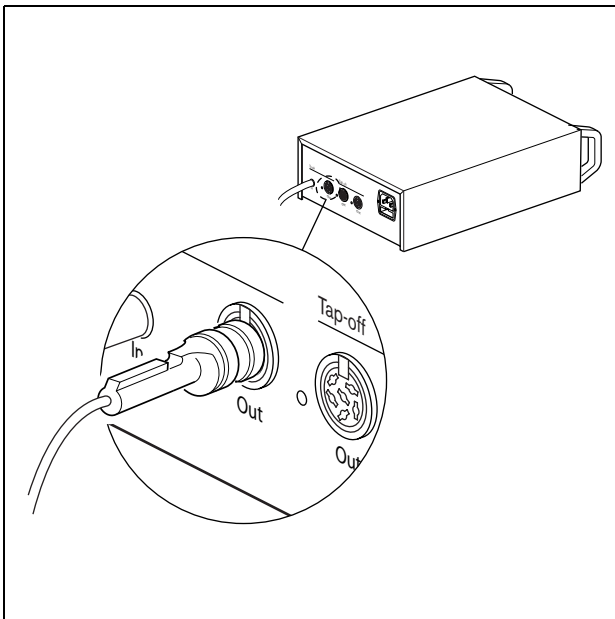

figure 34.6: DCN trunk

The DCN trunk socket has a red LED that comes on if there is an overload (refer to section 1.6.4).

table 34.3: DCN trunk connections

Number of connections:
1x DCN socket
1x DCN cable (2 m) with plug
Location:
Rear side
Power supply:
max. 1x 85 W

34.5.3 DCN tap-offs

With the DCN tap-off sockets, you can make tap-offs in the DCN (refer to figure 34.7).
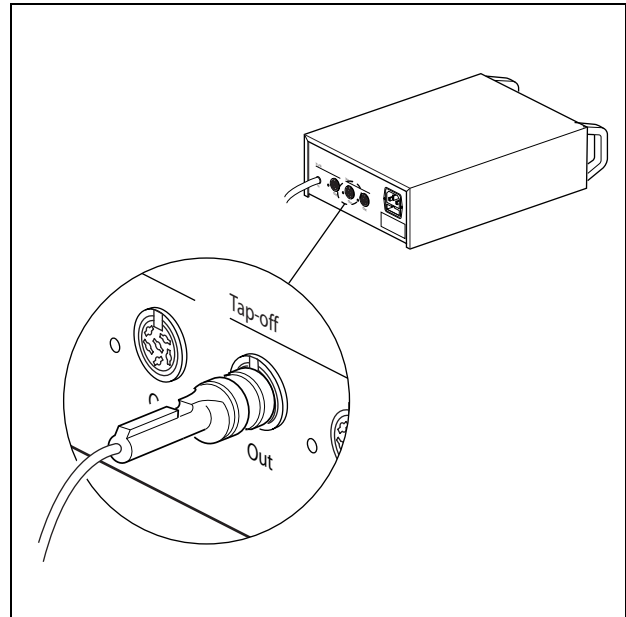

figure 34.7: DCN tap-offs

Each DCN tap-off socket has a red LED that comes on if there is an overload (refer to section 1.6.4).

table 34.4: DCN tap-off connections

Number of connections:
2x DCN socket
Location:
Rear side
Power supply:
max. 2x 85 W

35 LBB4114/00 Trunk Splitter

35.1 Introduction

Use the LBB4114/00 Trunk Splitter to divide the DCN trunk.

35.2 Controls, connectors and indicators

The trunk splitter (refer to figure 35.1) contains:

1 **DCN socket (tap-off 1)** - Makes a tap-off in the DCN (refer to section 35.4). The socket regenerates the DCN signal.
2 **DCN socket (tap-off 2)** - Makes a tap-off in the DCN (refer to section 35.4). The socket regenerates the DCN signal.
3 **DCN cable** - Connects the trunk splitter in the trunk of the DCN (refer to section 35.4).
4 **DCN socket (trunk)** - Makes a loop-through in the DCN with the trunk splitter (refer to section 35.4). The socket does not regenerate the DCN signal.
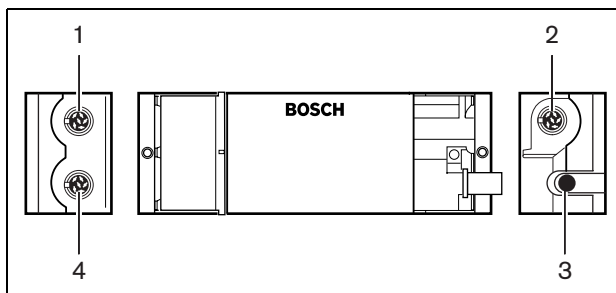
figure 35.1: Top and side views

35.3 Installation

You can install the trunk splitter on a flat surface (refer to figure 35.2). Use the lid of the trunk splitter to fix the the DCN cables.
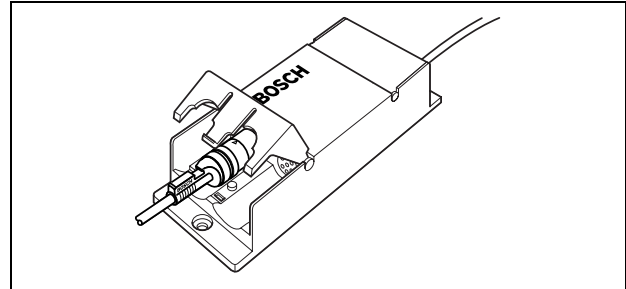

figure 35.2: Installation

table 35.1: Physical characteristics

Dimensions (h x w x d):
35 x 49 x 140 mm
Weight:
approximately 300 g

35.4 External connections

Connect the trunk splitter to the DCN with the DCN cable. You can use the DCN trunk socket to make a loop-through with the trunk splitter. With the DCN tap-off sockets, you can make tap-offs in the DCN.
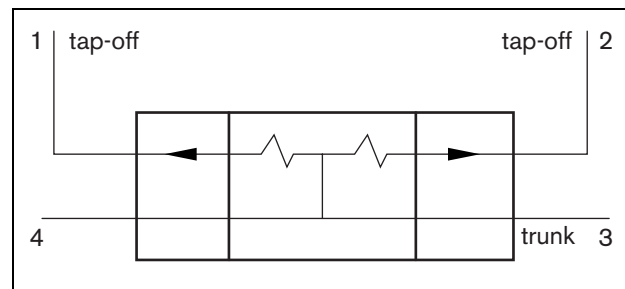

figure 35.3: DCN

table 35.2: DCN connection

Number of connections:
3x DCN socket
1x DCN cable (2 m) with plug
Location:
Front and rear sides
Power consumption:
1.3 W (LBB4114/00)
1.4 W (LBB4115/00)

36 LBB4115/00 Protected Trunk Splitter

36.1 Introduction

Use the LBB4115/00 Protected Trunk Splitter to make tap-offs in the DCN that have protection against short-circuits. Typically, you will use LBB4115/00 Protected Trunk Splitters to connect DCN-IDESK Interpreter Desks to the system.

36.2 Controls, connectors and indicators

The differences between the LBB4114/00 Trunk Splitter (refer to chapter 35) and the LBB4115/00 Protected Trunk Splitter are that the DCN tap-off sockets of the LBB4115/00 Protected Trunk Splitter:

- Each output has a maximum load of 4.5 W
- Give the trunk and the other tap-off protection against short-circuits.

36.3 Installation

Refer to section 35.3 for information about the installation of the LBB4115/00 Protected Trunk Splitter. The procedures to install the LBB4114/00 Trunk Splitter and the LBB4115/00 Protected Trunk Splitter are the same.

36.4 External connections

Refer to section 35.4 for information about the external connections of the LBB4115/00 Protected Trunk Splitter. The external connections of the LBB4114/00 Trunk Splitter and the LBB4115/00 Protected Trunk Splitter are the same.

37 LBB4116 Extension Cables

37.1 Introduction

These extension cable (assembly) products are available:

table 37.1: Extension cables

Type number	Cable length
LBB4116/02	2 m
LBB4116/05	5 m
LBB4116/10	10 m
LBB4116/15	15 m
LBB4116/20	20 m
LBB4116/25	25 m
LBB4116/00	100 m

Except for LBB4116/00, all extension cables have DCN plugs and sockets.

37.2 Connectors
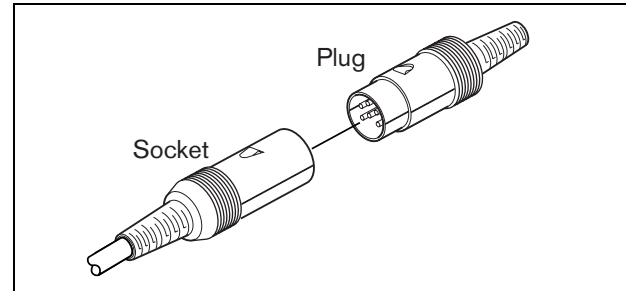
Refer to figure 37.1 and figure 37.2 for details.
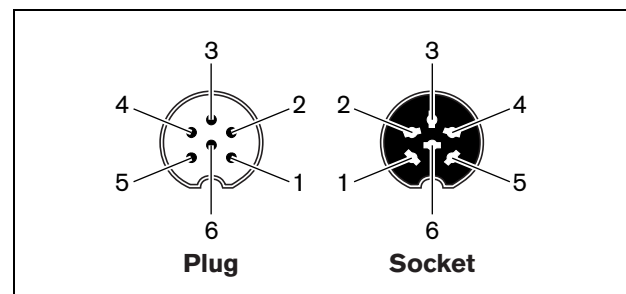

figure 37.1: DCN plug and socket

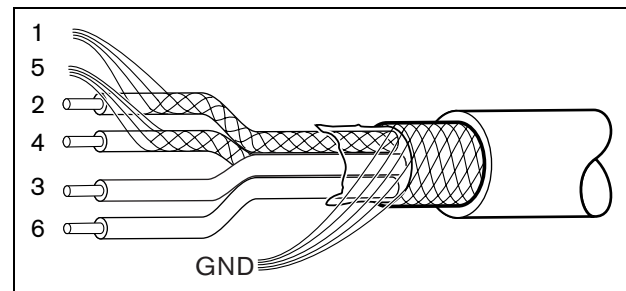*figure 37.2: DCN plug and socket, connection*

figure 37.3: DCN cable, connection

table 37.2: DCN cable, connection

Pin	Signal	Color
1	Downlink GND	---
2	Downlink data	Green
3	+40 V(DC)	Brown
4	Uplink data	White
5	Uplink GND	---
6	+40 V(DC)	Blue

37.3 Custom-made cables

You can make custom-made cables with the LBB4116/00 Extension Cable (100 m) and the LBB4119/00 DCN Connectors (refer to chapter 38).
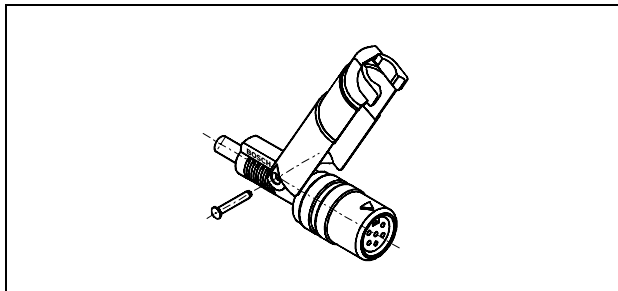
38   LBB4119/00 DCN Connectors

Use the LBB4119/00 DCN Connectors to make cables
from LBB4116/00 Extension Cable (100 m).
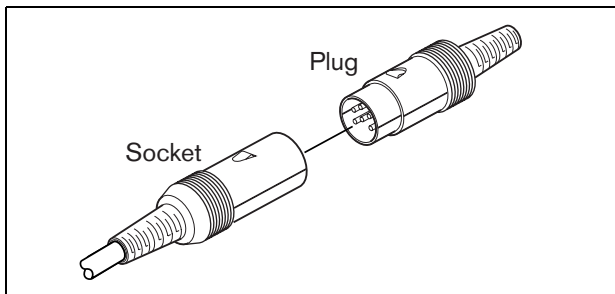
figure 38.1: DCN connectors

39   LBB4117/00 Cable Locking Clamps

You can use the LBB4117/00 Cable Locking Clamps to lock the connectors of extension cables. Each pair uses one clamp.
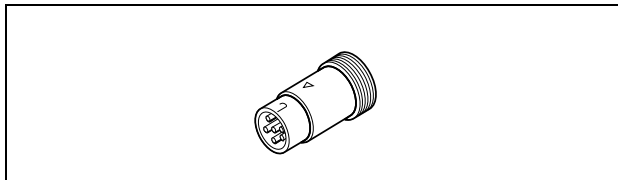

figure 39.1: Cable locking clamp

> **ℹ Note**
> You cannot use the LBB4417/00 Cable Locking Clamps with the LBB4419/00 DCN Connectors.

40   LBB4118/00 Cable Termination Plug

You must use an LBB4118/00 Cable Termination Plug to 'close' an 'open-ended' DCN cable (e.g. for voting units with two cables, or a spare or expansion cable).

figure 40.1: Cable termination plug

41 LBB4410/00 Network Splitter

41.1 Introduction

Use the LBB4410/00 Network Splitter to make tap-offs in the optical network that have protection against short-circuits.

41.2 Controls, connectors and indicators

The exterior of the network splitter (refer to figure 41.1) contains:

1 **External power supply socket** - Connects the network splitter to an external power supply (refer to section 41.5.2). The external power supply supplies power to the tap-offs. It does not supply power to the trunk.

2 **Optical network socket (tap-off 1)** - Makes a tap-off in the optical network (refer to section 41.5.1). The socket has a maximum load of 2.5 A that gives protection against short-circuits.

3 **Optical network socket (trunk)** - Connects the network splitter to the trunk of the optical network (section 41.5.1).

4 **Lid** - Gives access to the controls inside (refer to section 41.3). The rear side of the lid contains a label with an explanation about the internal settings (refer to figure 41.2).

5 **Status LED** - A yellow LED that gives information about the condition of the network splitter (refer to section 41.6).

6 **Status LED** - A green LED that gives information about the condition of the network splitter (refer to section 41.6).

7 **Optical network socket (tap-off 2)** - Makes a tap-off in the optical network (refer to section 41.5.1). The socket has a maximum load of 2.5 A that gives protection against short-circuits.

8 **Optical network socket (trunk)** - Connects the network splitter to the trunk of the optical network (refer to section 41.5.1).
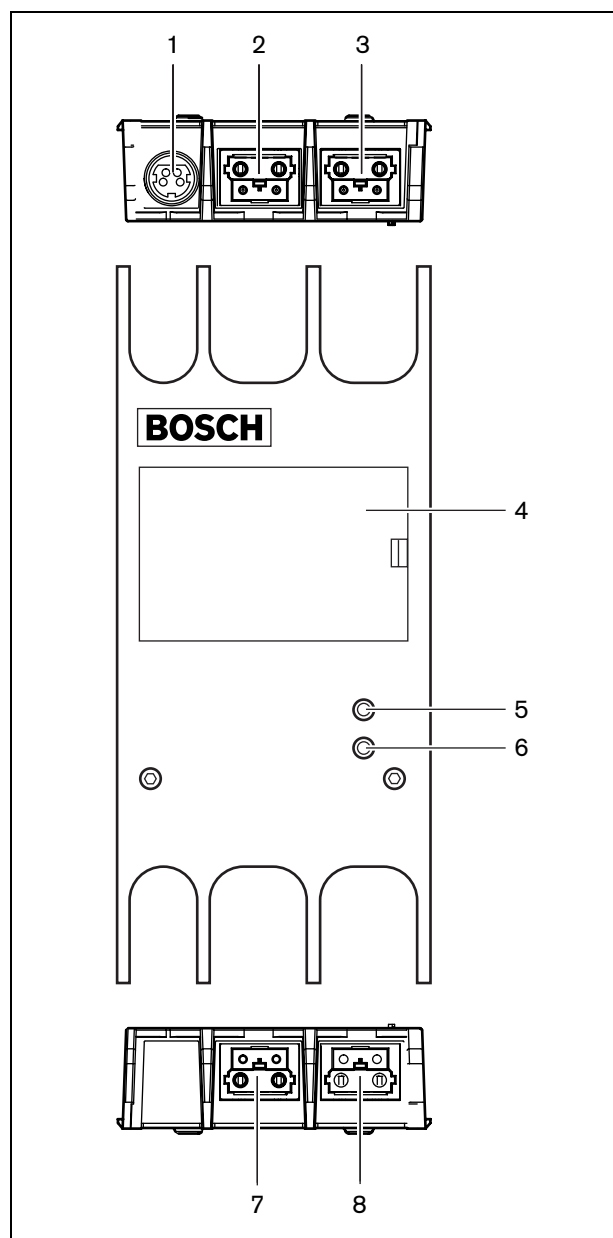

figure 41.1: Front, rear and top views

41.3 Internal settings

The rear of the cover of the network splitter shows a label that gives data of the internal connections (refer to figure 41.2). You can change the internal connections with the jumper blocks inside the network splitter.
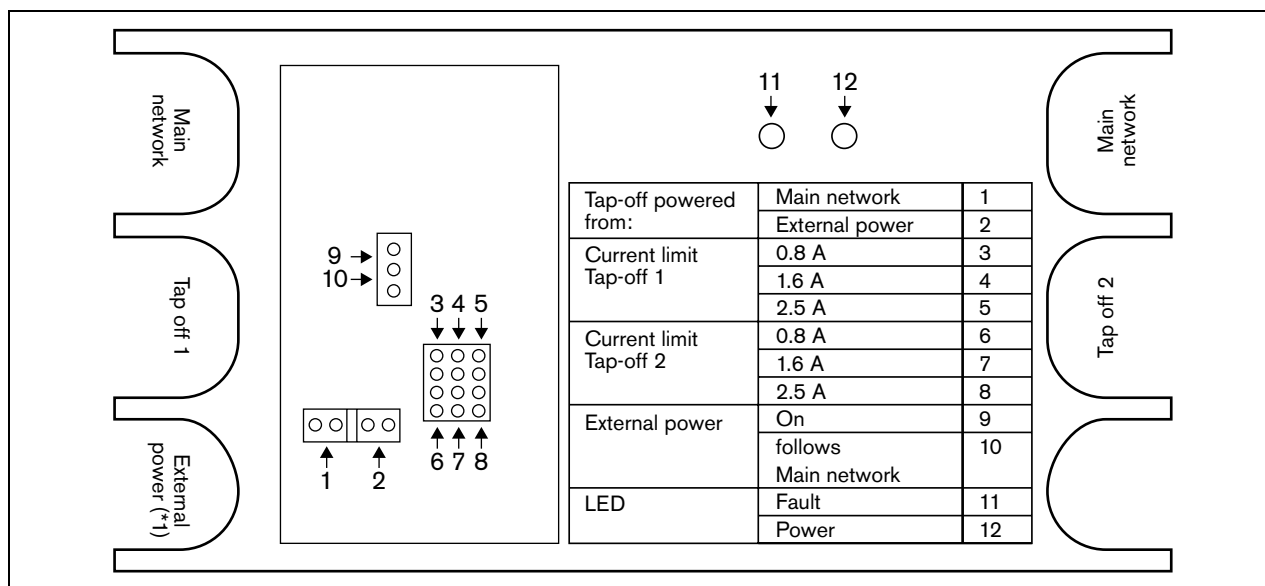

Tap-off powered from:	Main network	1
	External power	2
Current limit Tap-off 1	0.8 A	3
	1.6 A	4
	2.5 A	5
Current limit Tap-off 2	0.8 A	6
	1.6 A	7
	2.5 A	8
External power	On	9
	follows Main network	10
LED	Fault	11
	Power	12

figure 41.2: Label inside network splitter

To supply additional power to the tap-offs that are connected to the network splitter:

1 Put jumper shunt 1/2 on position 1.
2 Put jumper shunt 9/10 on position 10.
3 Connect an external power supply to the network splitter (refer to section 42.4.2).

41.4   Installation

You can attach the network splitter to a flat surface with a bracket (refer to figure 41.3). The distance (d) between the holes in the bracket is 40 mm.
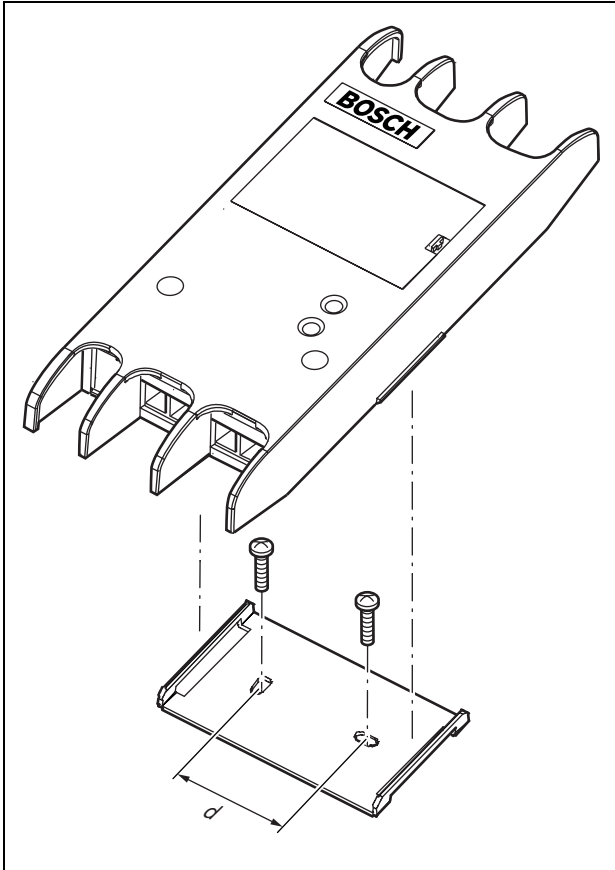

figure 41.3: Installation

Push the sides of the unit to attach or remove the unit from the bracket.

table 41.1: Physical characteristics

Dimensions (h x w x d):
200 x 82.5 x 28.9 mm
Weight:
approximately 300 g

41.5   External connections

41.5.1   Optical network

Connect the network splitter to the optical network with the optical network sockets (refer to figure 41.4).
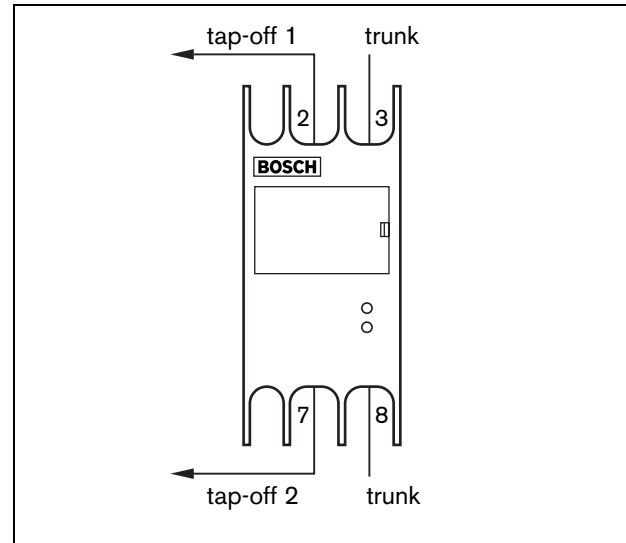

figure 41.4: Optical network

> **i**   **Note**
>
> If the distance between two devices is less than 100 m, use a network splitter between devices to remove the use of fiber interfaces. Use only the trunk sockets of the network splitter in this case.

table 41.2: Optical network connections

Number of connections:
4x optical network socket
Location:
Front and rear sides
Power consumption:
3.9 W

41.5.2 Power supply

You can connect an external power supply to the external power supply socket of the network splitter. The network splitter is supplied with a Kycon KPP-4P plug (refer to figure 41.5), which you can connect to this socket. The external power supply only supplies power to the connected tap-offs.
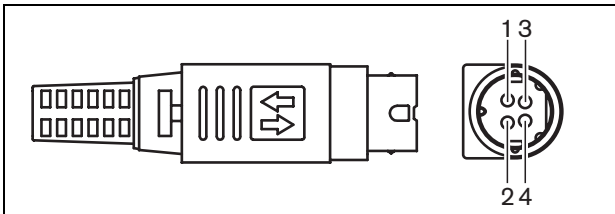

figure 41.5: Kycon KPP-4P plug, connection

table 41.3: Kycon KPP-4P plug, connection

Pin	Signal
1	Ground
2	Power from the external power supply. Voltage: 24 - 48 V, max. 5 A.
3	Power from the system. Voltage: 48 V, max. 5 A.
4	Not connected

Note

You can, for example, connect a DCN-EPS Extension Power Supply to the Kycon KPP-4P socket of the network splitter.

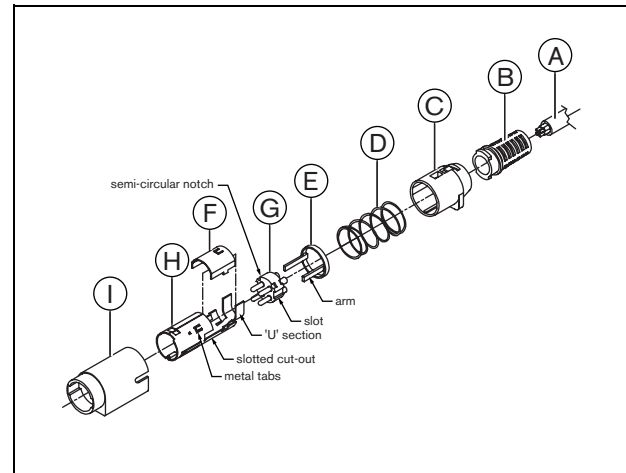The Kycon KPP-4P plug is shown in parts (refer to figure 41.6).

figure 41.6: Kycon KPP-4P plug, parts

table 41.4: Kycon KPP-4P plug, parts

Part	Description
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

You must assemble the connector before you use it.

1 Attach the Strain Relief (B) to the Plastic Enclosure (C).
2 Pull the Cable (A) through the Strain Relief (B)/Plastic Enclosure (C) assembly, Metal Spring (D) and Plastic Guide Ring (E).
3 Attach the ends of the cable wires to the solder cups on Pin Mold (G) (refer to figure 41.5 and table 41.3).
4 Correctly align the Pin Mold (G) with the Lower Metal Sleeve (H). The slotted sections on the sides of the Pin Mold (G) must align with the slotted cut-outs on the Lower Metal Sleeve (H). 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 the Pin Mold (G) into the Lower Metal Sleeve (H) until they lock.

6 Push the three metal tabs on the Lower Metal Sleeve (H) into the notches in the Pin Mold (G).

7 Crimp the 'U' section of the Lower Metal Sleeve (H) onto the Cable (A).

8 Attach the Plastic Ring Guide (E) to the Lower Metal Sleeve (H) and engage the plastic arms into the correct slots in the sides of the sleeve.

9 Attach the Top Metal Cover (F) to Lower Metal Sleeve (H). Be sure to align all tabs. Make sure that the cover is attached correctly.

10 Push the Metal Spring (D) to the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. This helps to hold the assembly together.

11 Push the Strain Relief (B)/Plastic Enclosure (C) assembly to the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. Align the two assemblies as shown in the drawing. Make sure that the Metal Spring (D) stays in place and does not bend during assembly. A large force can be necessary to attach the two assemblies together.

12 Make sure that the Strain Relief (B)/Plastic Enclosure (C) assembly is locked to the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. The two assemblies should not be able to be pulled apart.

13 Align the new assembly with the Plastic Coupling (I) shown in the drawing. Push assembly into Plastic Coupling (I) until it locks to the Plastic Coupling. The connector assembly is complete.

41.6 Operation

The two LEDs on the network splitter give information about the condition of the network splitter.

table 41.5: Status LEDs

Green (Power)	Yellow (Fault)	Condition
Off	Off	The network splitter does not receive any power.
Off	On	There is no optical network available or there is a fault in the optical network.
On	Off	The network splitter functions correctly.

42 LBB4414/10 Fiber Interface

42.1 Introduction

Use the LBB4414/10 Fiber Interface to connect a Plastic Optical Fiber (POF) to a Glass Optical Fiber (GOF). A GOF network can transmit a signal to a larger distance than a POF network.

42.2 Controls, connectors and indicators

The fiber interface (refer to figure 42.1) contains:

1 **External power supply socket** - Connects the fiber interface to an external power supply (refer to section 42.4.2).

2 **Optical network socket (POF)** - Connects the fiber interface to a POF (refer to section 42.4.1).

3 **Status LED** - A yellow LED that gives information about the condition of the fiber interface (refer to section 42.5).

4 **Status LED** - A green LED that gives information about the condition of the fiber interface (refer to section 42.5).

5 **GOF socket** - Connects the fiber interface to a GOF (refer to section 42.4.1).
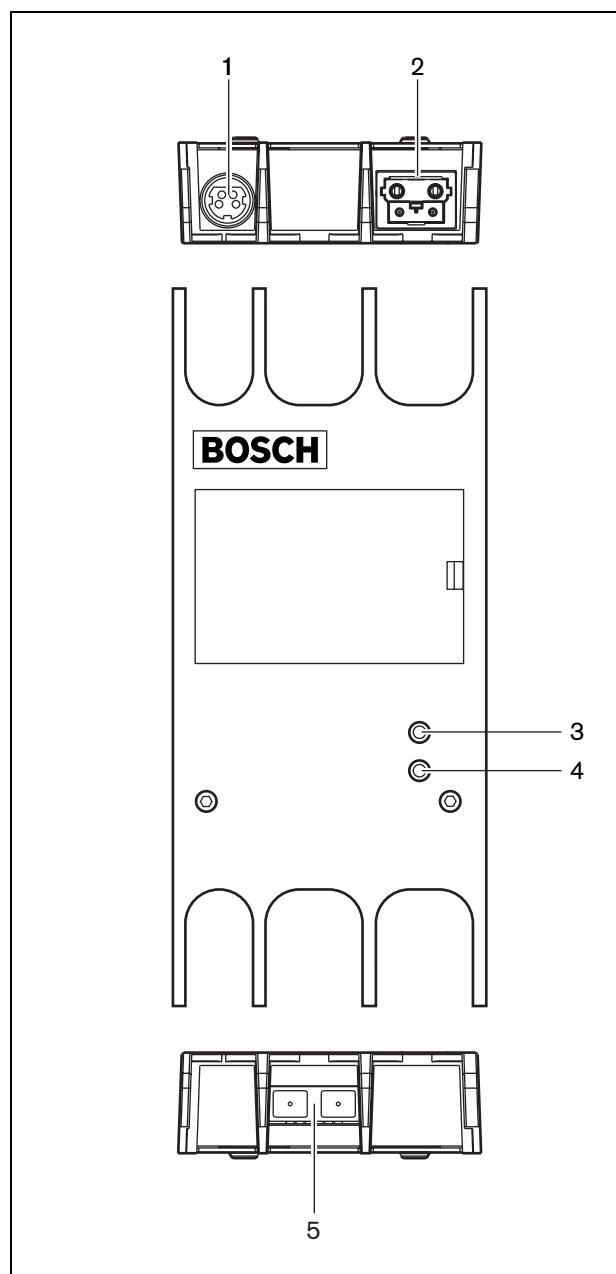

figure 42.1: Exterior of the fiber interface

42.3 Installation

Refer to section 41.4 for information about the installation of the fiber interface. The procedures to install the network splitter and the fiber interface are the same.

42.4 External connections

42.4.1 Optical network

The fiber interfaces connects a POF to a GOF. Use a GOF to connect two pieces of equipment in the optical network that are more than 50 m apart and less than 1,500 m. Use the fiber interfaces as a pair. The first connects a POF to a GOF, the second connects the GOF to a POF (refer to figure 42.2).
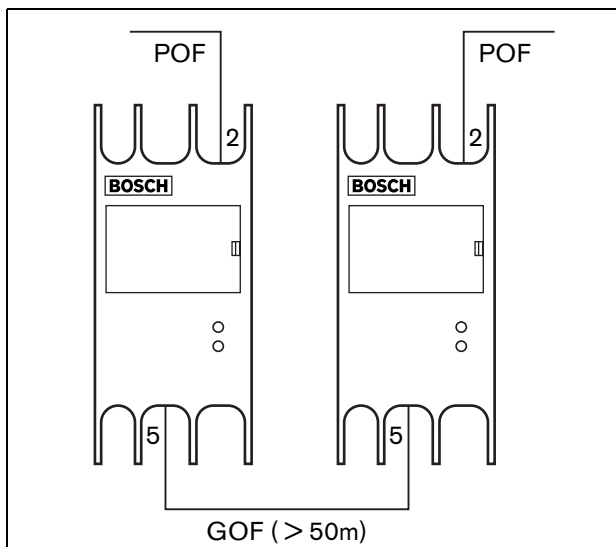

figure 42.2: Optical network

> ### Note
> If the distance between two devices is less than 100 m, a network splitter can be used in the middle to remove the use of fiber interfaces. Use only the trunk sockets of the network splitter in this case.

The GOF socket is a double SC socket (refer to figure 42.3) that uses invisible infra-red light (1300 nm).
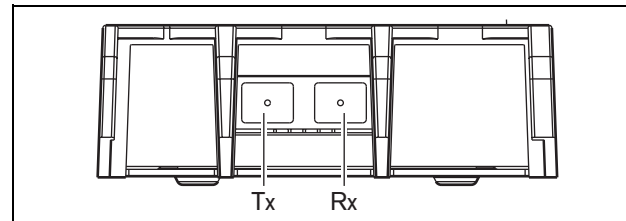

figure 42.3: Double SC socket, connection

table 42.1: Double SC socket, connection

Pin	Signal
Tx	Transmitter
Rx	Receiver

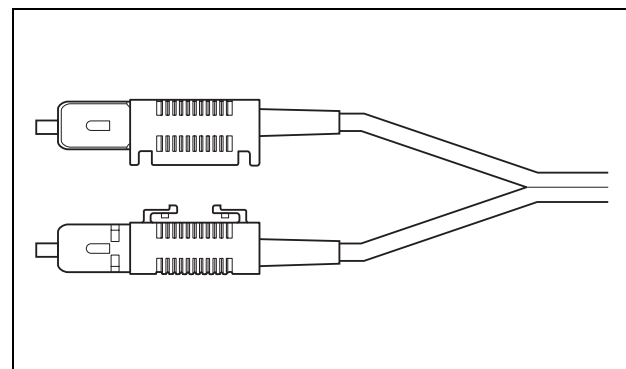Refer to figure 42.4 for an example of a GOF cable with a double SC plug.

figure 42.4: GOF with double SC plug

Make sure that all GOF cables:
- Are multi-mode GOF cables. (The system cannot use single mode GOF cables.)
- Are applicable for light with a wavelength of 1300 nm.
- Have a maximum attenuation of 2 dB/km.

table 42.2: Optical network connections

Number of connections:
1x optical network socket (POF)
1x optical network socket (GOF)
Location:
Front and rear sides
Power consumption:
4.6 W

42.4.2 Connect a power supply

You can connect an external power supply to the external power supply socket of the fiber interface. The fiber interface is supplied with a Kycon KPP-4P plug, which you can connect to this socket (refer to section 41.5.2).

> ⚠️ **Caution**
>
> Make sure a diode is installed between the external power supply and the fiber interface (refer to figure 42.5). The system voltage (nominally 40 V) can be higher than the external power supply. The higher system voltage is forced to the external power supply. The external power supply can become defective.

The diode should be specified for at least 50 V reverse voltage and a maximum current bigger than what can be expected from the connected load.
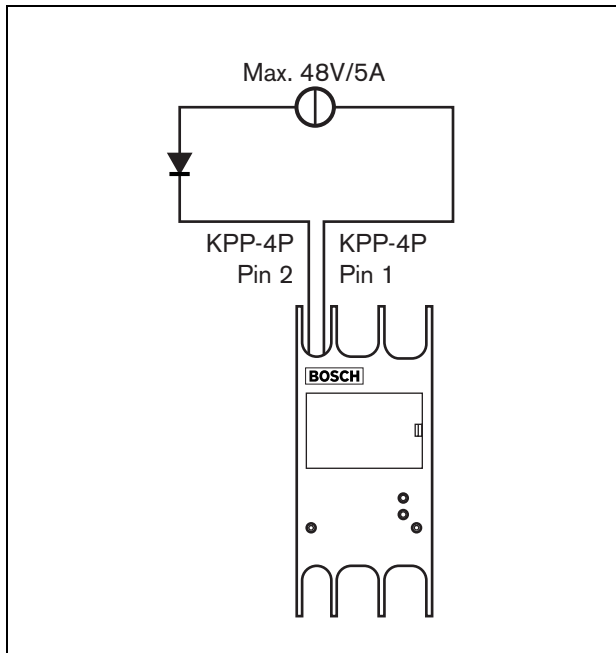

figure 42.5: Diode connection

42.5 Operation

The two LEDs on the fiber interface give information about the condition of the fiber interface.

table 42.3: Status LEDs

Green (Power)	Yellow (Fault)	Description
Off	Off	Off; no external power available.
Off	On	Stand-by; external power to POF turned off.
On	On	Operating; external power to POF turned on.
On	Off	Operating, no external power available, but powered from the POF side.
Flash	Off	Fault, no external power available and no protocol received.
Flash	On	Fault, external power available, but no protocol received.

43 LBB4416 Optical Network Cables

43.1 Introduction

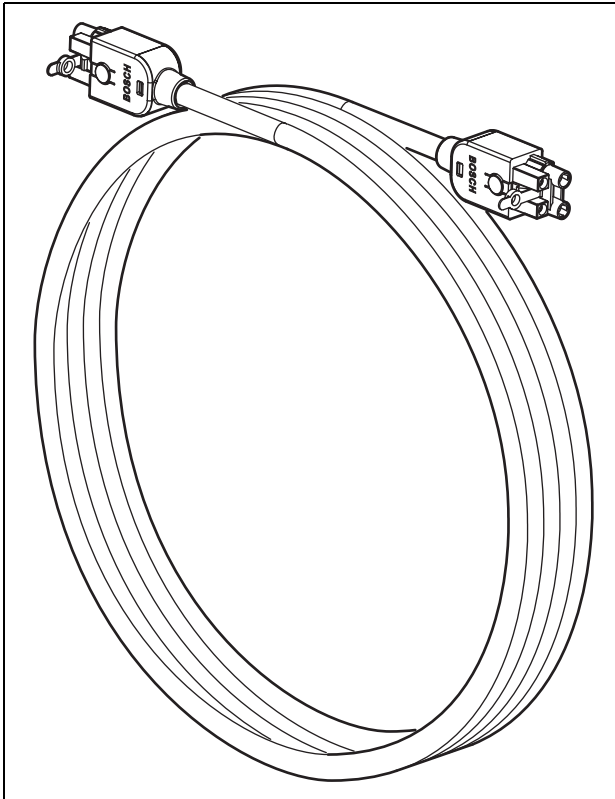The optical network cable contains two plastic optical fibers to transmit data and two copper cables to supply power.

figure 43.1: Optical network cable

table 43.1: Optical network cables

Type number	Cable length
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
LBB4416/00	100 m

Except for LBB4416/00, all optical network cables have optical network connectors.

43.2 Connectors

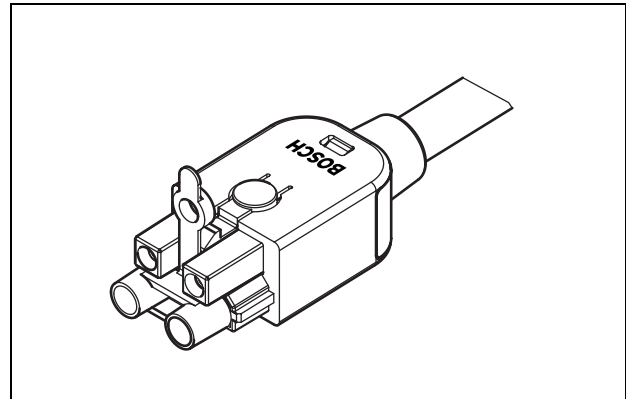Refer to figure 43.2 for details.

figure 43.2: Optical network connector (with dustcap)

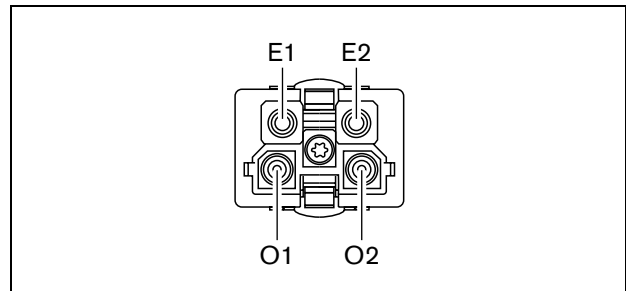*figure 43.3: Optical network connector, connection*

table 43.2: Optical network connector, connection

Pin	Signal	Wire
E1	+48 V(DC)	Copper
E2	GND	Copper
O1	Data	Optical fiber
O2	Data	Optical fiber

43.3 Wiring

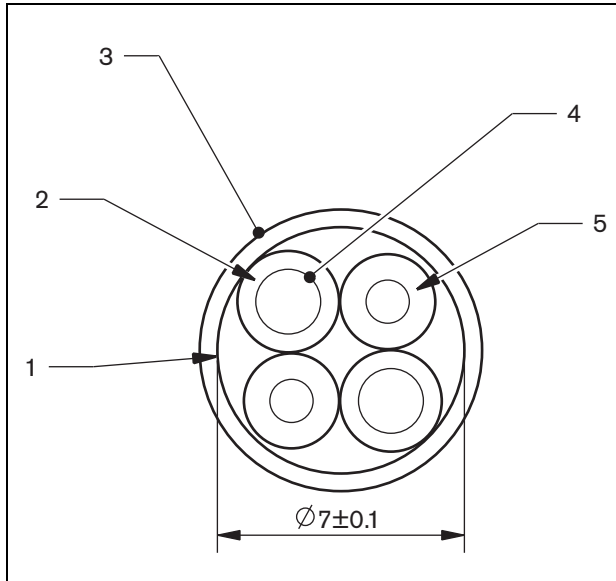Refer to figure 43.4 for details about the wires inside the extension cables.

figure 43.4 Wires

table 43.3: Wires

Number	Signal
1	Protective cloth
2	Insulation
3	Outer sheet
4	Stranded wire
5	Optical fiber

43.4 Custom-made cables

Use the LBB4418/00 Cable-connector Tool Kit to make cables from LBB4416/00 Optical Network Cables and LBB4417/00 Optical Network Connectors.

43.5 Technical data

table 43.4: 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:
• PMMA, 1 mm diameter includes cladding, 2 mm diameter includes insulation (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
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%

44 LBB4417/00 Optical Network Connectors

Use the LBB4417/00 Optical Network Connectors to make cables from LBB4416/00 Optical Network Cable (100 m) with the LBB4418/00 Cable-connector Tool Kit.
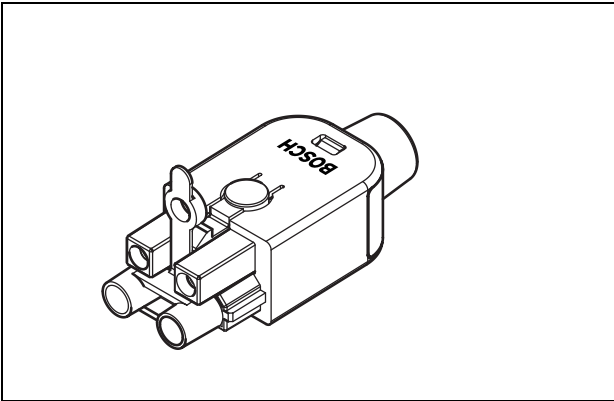
figure 44.1: Optical network connector

45 LBB4418/00

Cable-connector Tool Kit

45.1 Introduction

The LBB4418/00 Cable-connector Tool Kit is used to make optical network cables (refer to figure 43.1) from LBB4416/00 Optical Network Cable (100 m) and LBB4417/00 Optical Network Connectors.
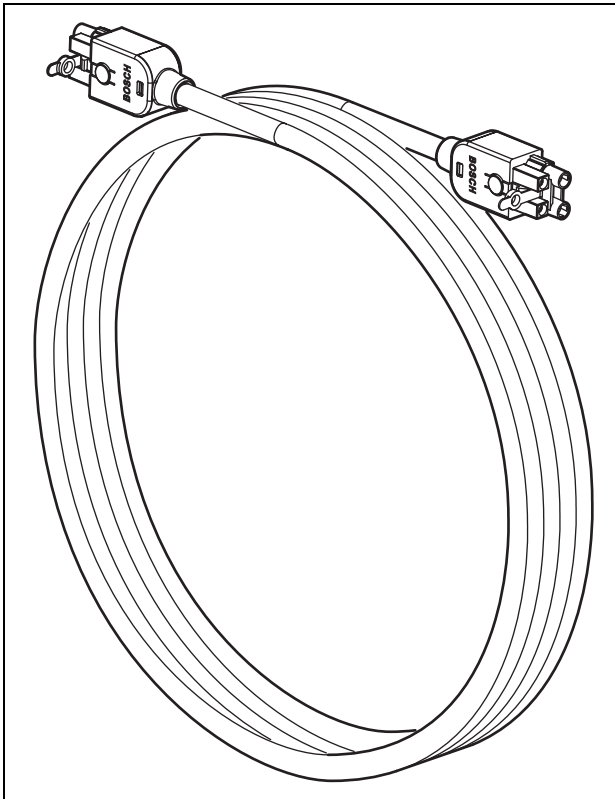
figure 45.1: Optical network cable

45.2 Contents

figure 45.2: Tool kit contents

table 45.1: Tool kit 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

Tool kit supplier:
Rennsteig Werkzeuge GmbH
Viernau, Thüringen, Germany
Supplier type number: 600 100 PHI

> **i** **Note**
> Before you use the POF cutter/stripping tool
> (tool 6), remove the blocking screw with the Torx
> screwdriver (tool 7).

> **i** **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**
> Apply a film of oil to all tools regularly to stop
> rust.

45.3   Connector components

The optical network connector (LBBB4417/00) has 10
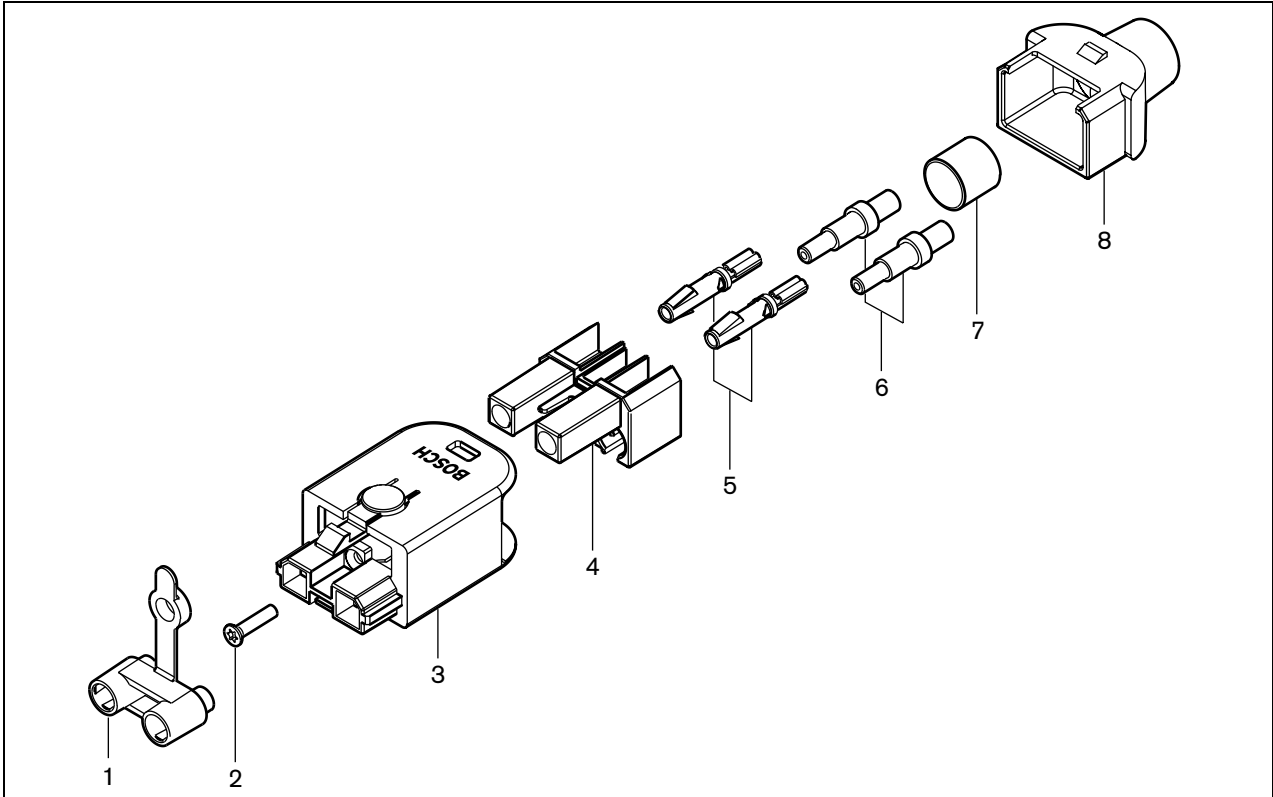parts (refer to figure 45.3 and figure 45.4).

figure 45.3: Connector assembly drawing
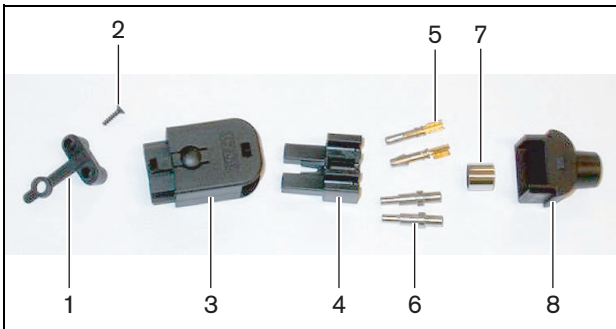
figure 45.4: Connector components

table 45.2: 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

45.4 Assemble the Cable-connector

45.4.1 Introduction

This chapter shows how to make the cable-connector. The procedure has these parts:

- Prepare (refer to section 45.4.3).
- Crimp the bush (refer to section 45.4.4).
- Remove the ends from the copper wires (refer to section 45.4.5).
- Attach the socket contacts (refer to section 45.4.6).
- Remove the ends from the optical fibers (refer to section 45.4.7).
- Attach the ferrules (refer to section 45.4.8).
- Assemble the connector (refer to section 45.4.9).

45.4.2 Cable types

There are two types of optical network cables:

- Type A cables. The plastic optical fibers are adjacent to each other (figure 45.5 shows both cable ends).
- Type B cables. The plastic optical fibers are opposite to each other (refer to figure 45.5, both cable ends are identical).
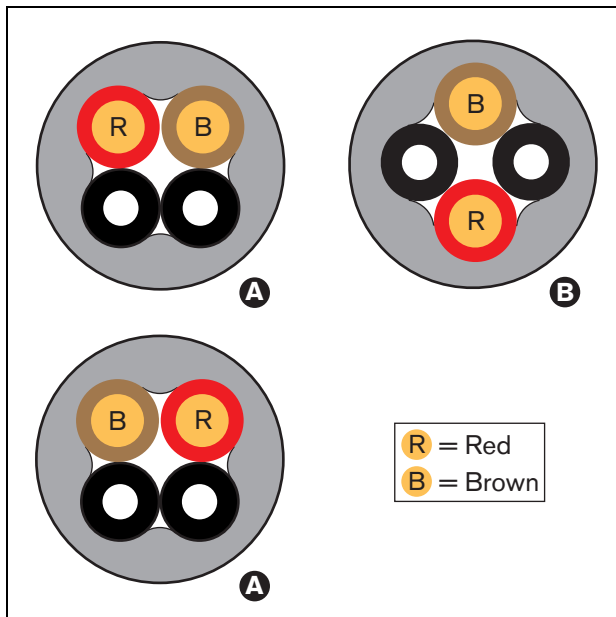

figure 45.5: Cable types

45.4.3 Prepare

Do as follows:

1 Use the cable cutter (tool 2) to cut the optical network cable to the correct length.

> **i** **Note**
> Light decreases in intensity through the length of the cable. The length of an optical network cable must be less than 50 m.

2 Examine the cable type (refer to section 45.4.2). Some steps in the procedure change because of the cable type.
3 Disassemble an optical network connector. An optical network connector has 10 parts (refer to section 45.3).
4 Push the cable through the back housing (refer to figure 45.6).

figure 45.6: Back housing on cable

5 Push the cable through the stripping tool (tool 5) to the mechanical stop (refer to figure 45.7).
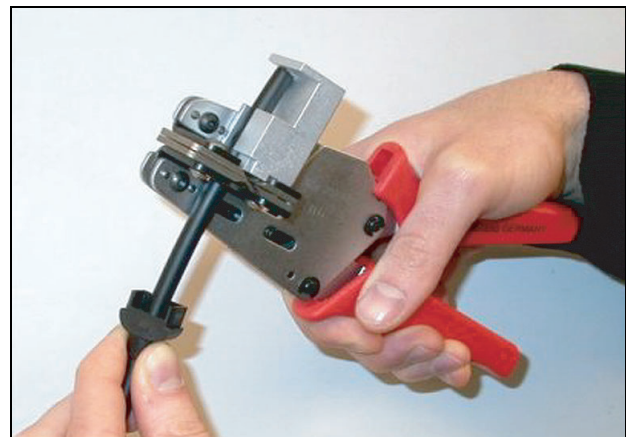6 Use the stripping tool to remove the outer sheath of the cable.

figure 45.7: Stripping the cable

45.4.4 Crimp the bush

Do as follows:

7   Put the cable end through crimping bush to the end
    of the outer sheath.

Note

The crimping tool (tool 3) makes the circular
shape of the cable cross-section and the
crimping bush at the end of the outer sheath
into a hexagonal shape.

Before you crimp the bush, make sure that both
plastic optical fibers are parallel to a flat side of
the hexagonal cross-section (refer to figure
45.8).

---
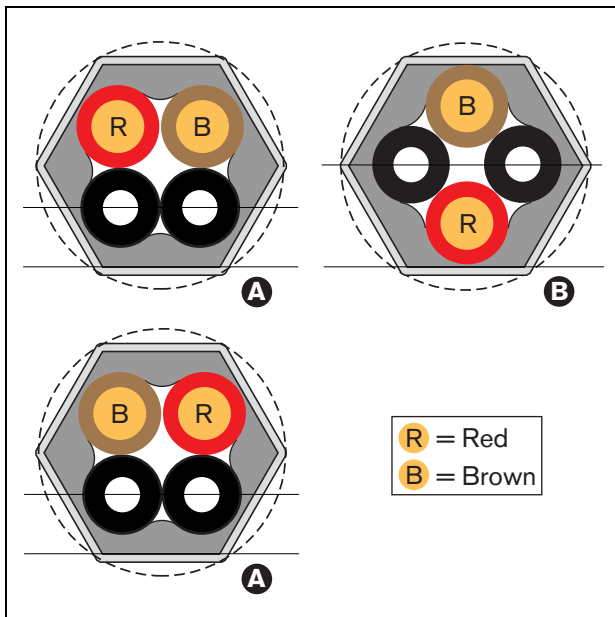
figure 45.8: Cross-section transformation

8   Use the crimping tool (tool 3, refer to figure 45.9) to
    attach the crimping bush to the outer sheath. The
    crimping bush stops the cable from rotating in the
    connector.

figure 45.9: Crimping the bush

45.4.5 Remove the ends of the copper wires

Do as follows:

9   Hold the crimping bush in position I with the
    stripping tool. Cut the copper wires at position II
    (refer to figure 45.10) with the cable cutter (tool 2).
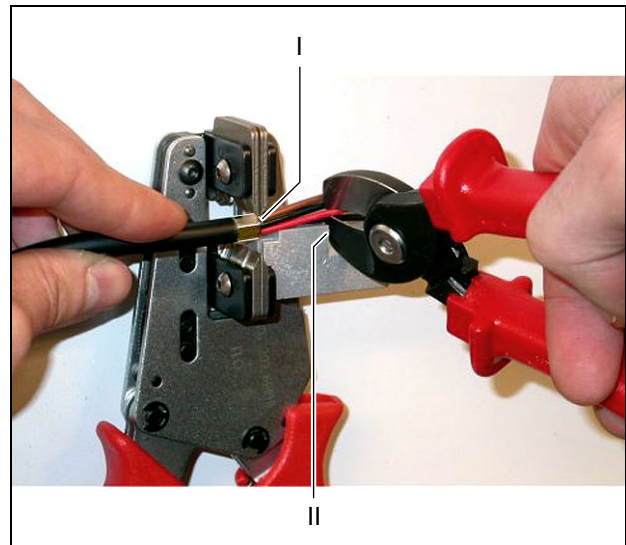
figure 45.10: Cutting a copper wire

10 Push the copper wires to the mechanical stop of the stripping tool (tool 5, refer to figure 45.11). Remove the red and brown insulations from the copper wires.
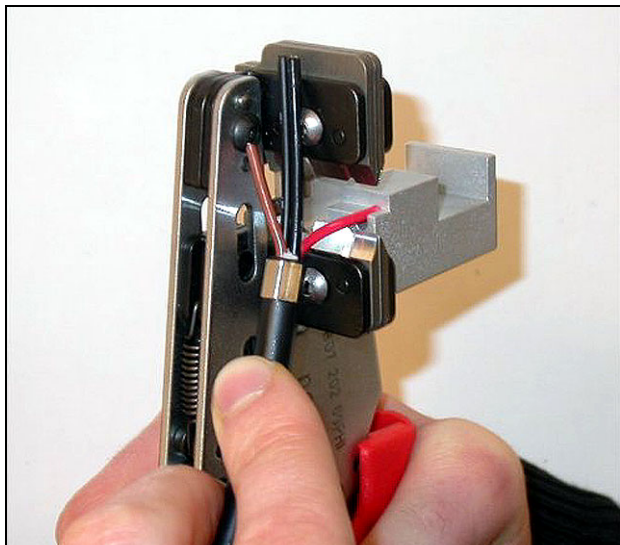
figure 45.11: Stripping a copper wire

45.4.6 Attach the socket contacts

Do as follows:

11 Put a socket contact in the crimping tool (tool 3, refer to figure 45.12). The upper part of the crimping tool contains a ridge to put the socket contact correctly in the tool (refer to figure 45.13).
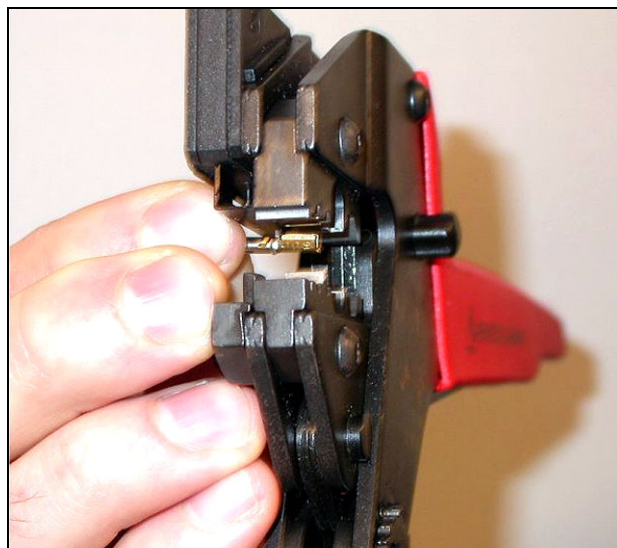
figure 45.12: Crimping a socket contact (1)
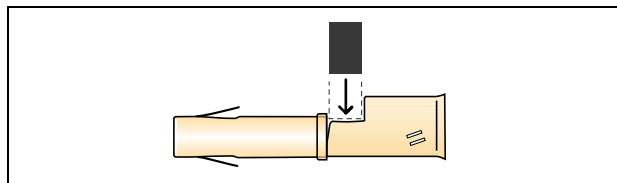
figure 45.13: Crimping a socket contact (2)

12 Put one of the bare, copper wires into the contact area of the socket contact. Close the crimping tool to crimp the socket contact onto the copper wire (refer to figure 45.14).
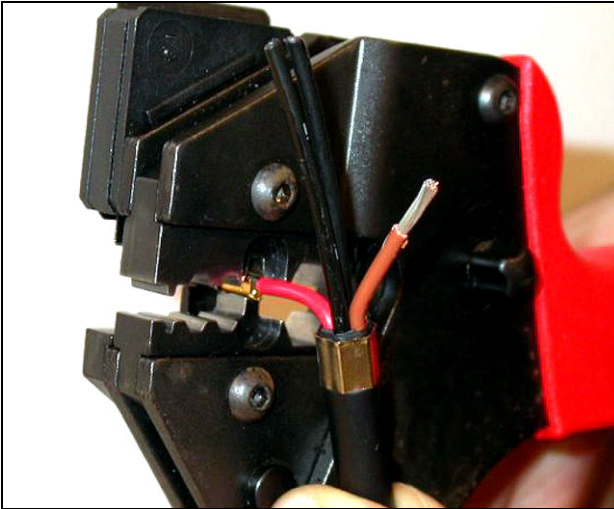
figure 45.14: Crimping a socket contact (2)

13 Repeat steps 11 and 12 for the other bare copper wire. Refer to figure 45.15 to see the result of this part of the cable-connector mounting procedure.

figure 45.15: Mounted socket contacts

45.4.7 Remove the sheath from the optical fibers

Proceed as follows:

14 Put the plastic optical fibers into the POF cutter/stripping tool (tool 6). The optical fiber that is to be cut must be put in the small guide hole. The other optical fiber must be put in the large guide hole (refer to figure 45.16). Push the cable until the crimping bush is against the stop (refer to figure 45.17).
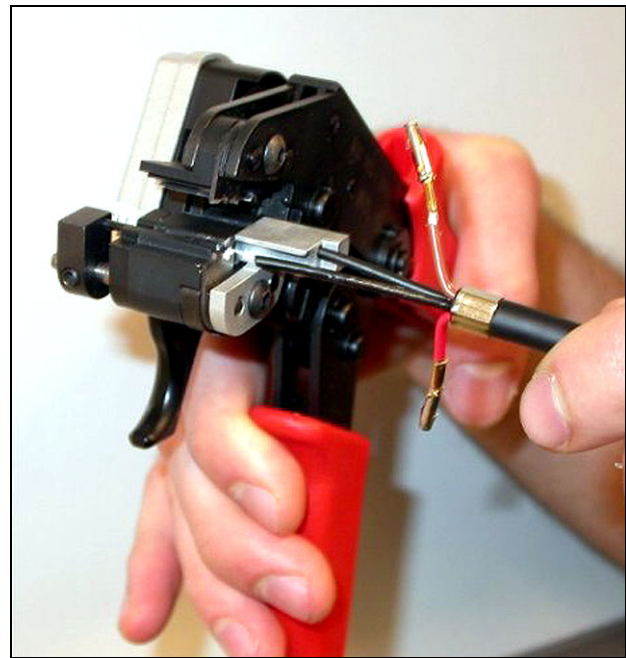
figure 45.16: Cutting a fiber (1)
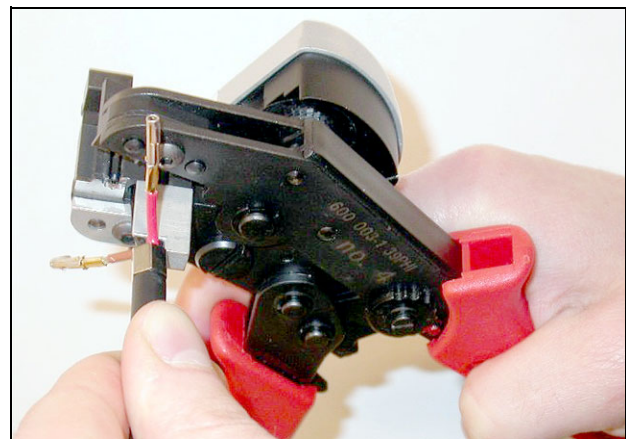
figure 45.17: Cutting a fiber (2)

15 Close the tool to hold the cable and pull the 'trigger' to cut the optical fiber (refer to figure 45.18).

figure 45.18: Cutting a fiber (3)

16 Repeat steps 14 and 15 for the other plastic optical fiber in the cable. Both fibers now have the correct length.

17 Put one of the optical fibers into the front part of the POF cutter/stripping tool (tool 6, refer to figure 45.19).
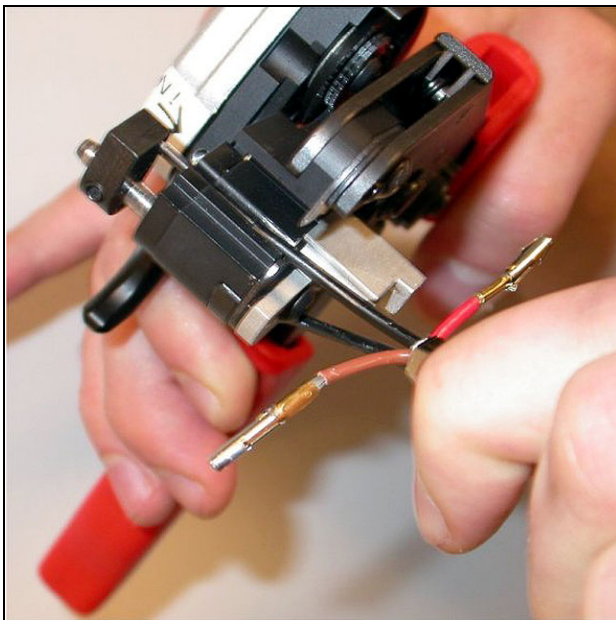
figure 45.19: Stripping a fiber

18 Close the tool and pull the fiber out to remove the sheath.

> **i** **Note**
> Do not forget to remove the piece of sheath from the tool.

19 Repeat steps 17 and 18 for the other fiber in the cable. Refer to figure 45.20 to see the result of this part of the cable-connector mounting procedure.
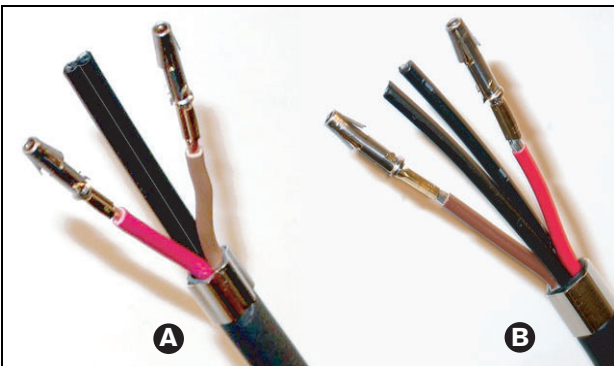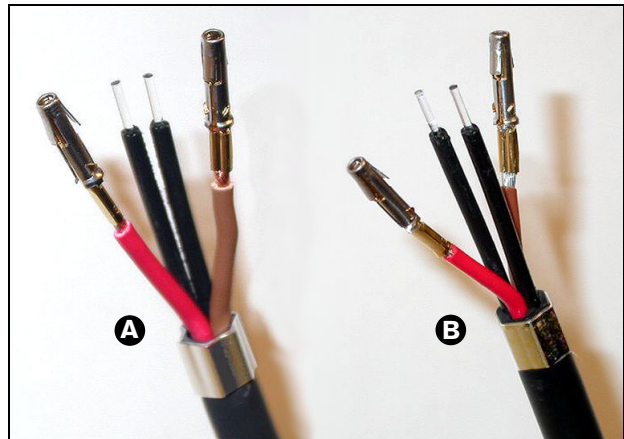

figure 45.20: Stripped optical fibers

45.4.8 Attach the ferrules

Do as follows:

20 Put a ferrule into the spring-loaded stop of the POF positioning/crimping tool (tool 4, refer to figure 45.21).

figure 45.21: Inserting a ferrule

21 Turn the small lever to lock the ferrule (refer to figure 45.22).
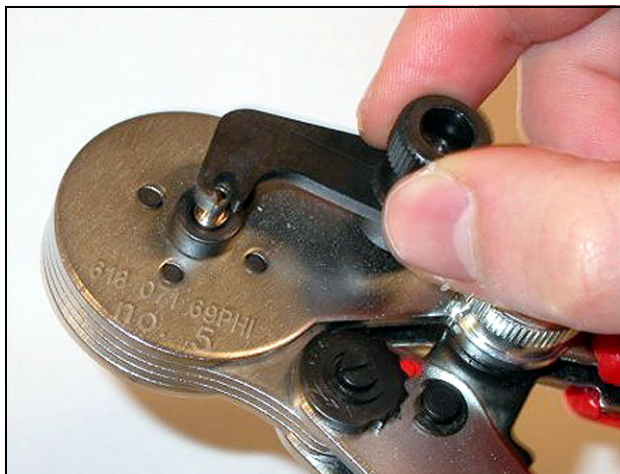
figure 45.22: Locking a ferrule

22 Put one plastic optical fiber into the ferrule in the spring-loaded stop of the POF positioning tool (refer to figure 45.23).
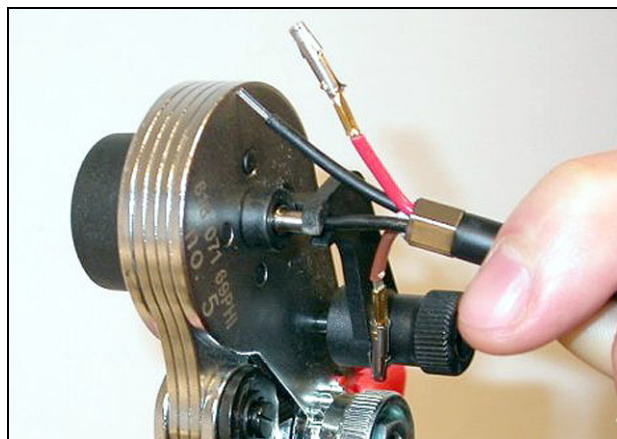
figure 45.23: Crimping ferrules (1)

23 Close and open the tool to crimp the ferrule onto the core of the fiber.

24 Repeat steps 20 to 23 for the other fiber in the cable. The ferrules only have been crimped on the core of the optical plastic fiber. The next step crimps the ferrules on the sheaths of the fibers.

25 Put both ferrules in the crimping tool (tool 3, refer to figure 45.24).
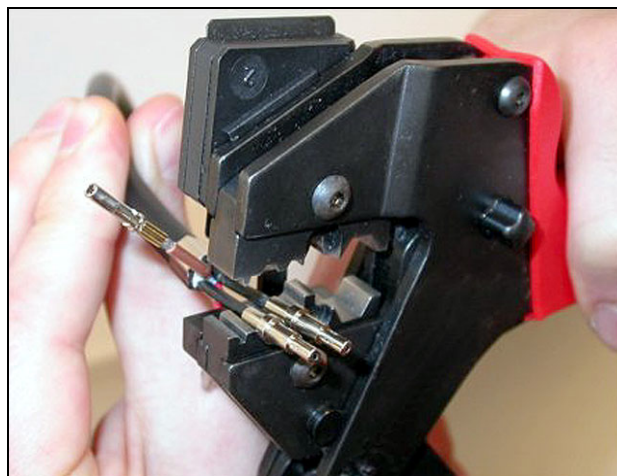
figure 45.24: Crimping ferrules (2)

26 Crimp the ferrules on the sheath using the crimping tool (tool 3, refer to figure 45.25). Refer to figure 45.26 for the result of this part of the cable-connector assembly procedure.
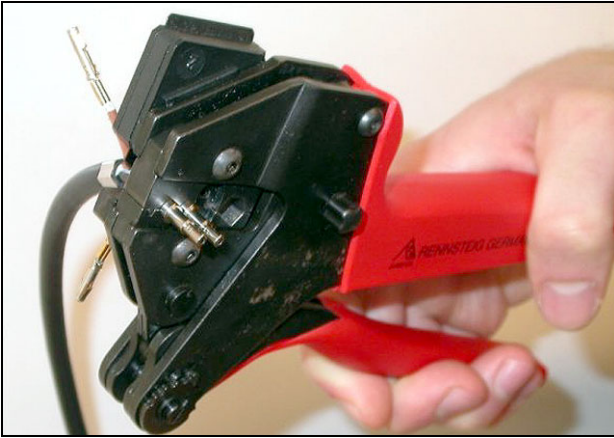
figure 45.25: Crimping ferrules (3)
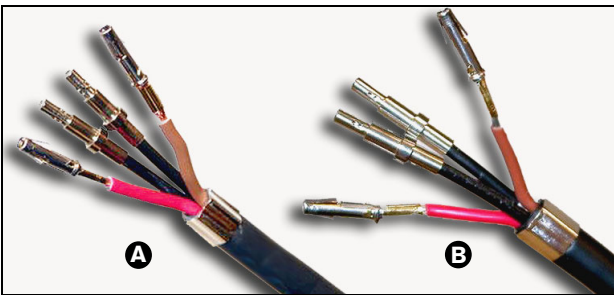
figure 45.26: Ferrules on fibers

45.4.9 Assemble the connector

Before you start to assemble the connector, the copper wires and the plastic optical fibers for must be correctly put in the connector. The copper wires will be attached to the upper part of the connector, the optical fibers will be attached to the lower part of the connector (refer to figure 45.27).

> **i Note**
> When replacing a connector, always first check the wiring in the connector at the other end.
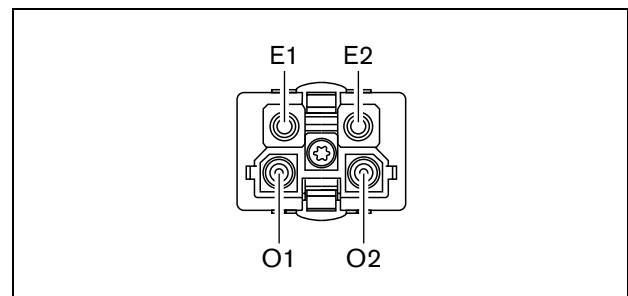
figure 45.27: Front view of connector

table 45.3: Optical network connector details

Pin	Signal	Wire
E1	+48V(DC)	Copper
E2	GND	Copper
O1	Data	Optical fiber
O2	Data	Optical fiber

Refer to the wiring diagram (figure 45.28) and figure 45.29 and figure 45.30.
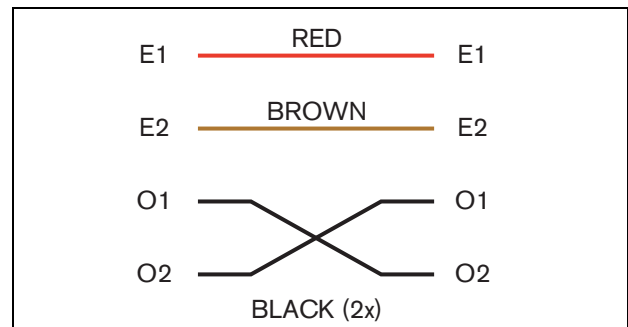
figure 45.28: Wiring diagram
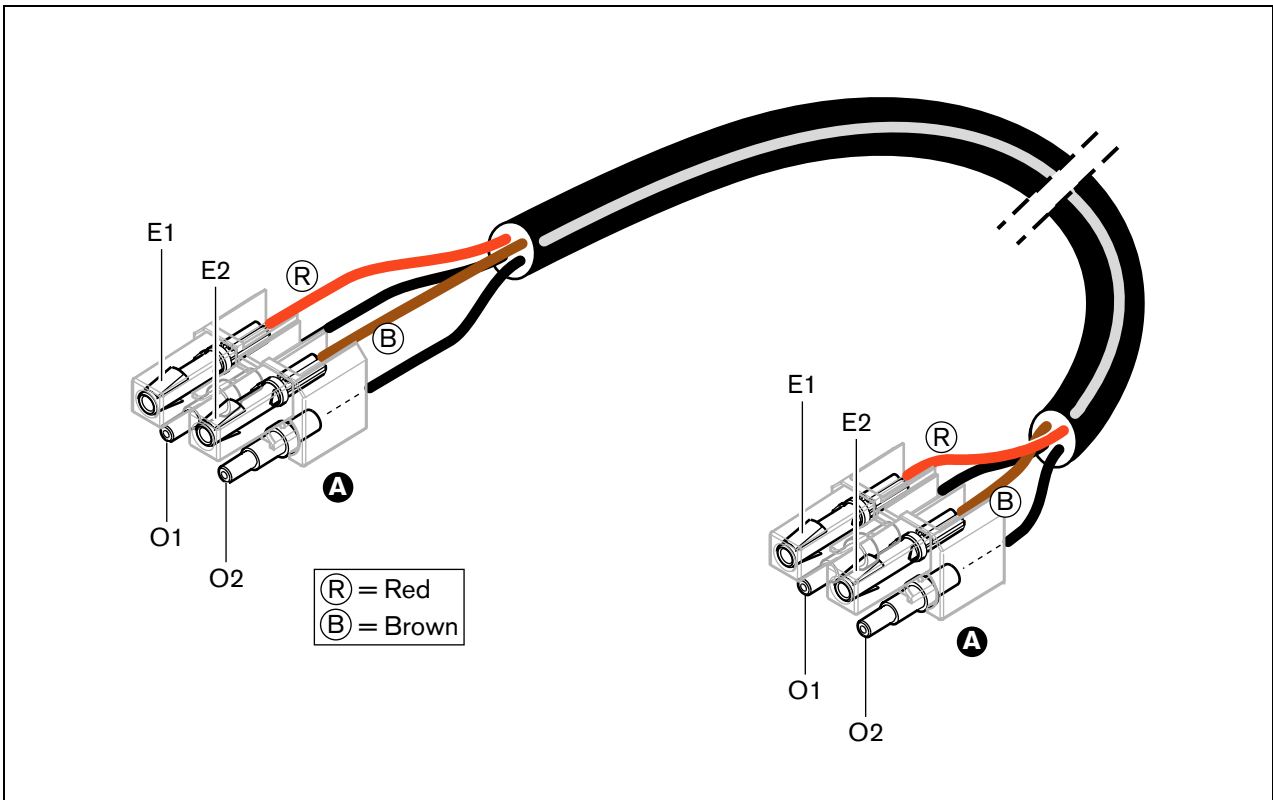
figure 45.29: Wiring diagram applied to type A optical network cables
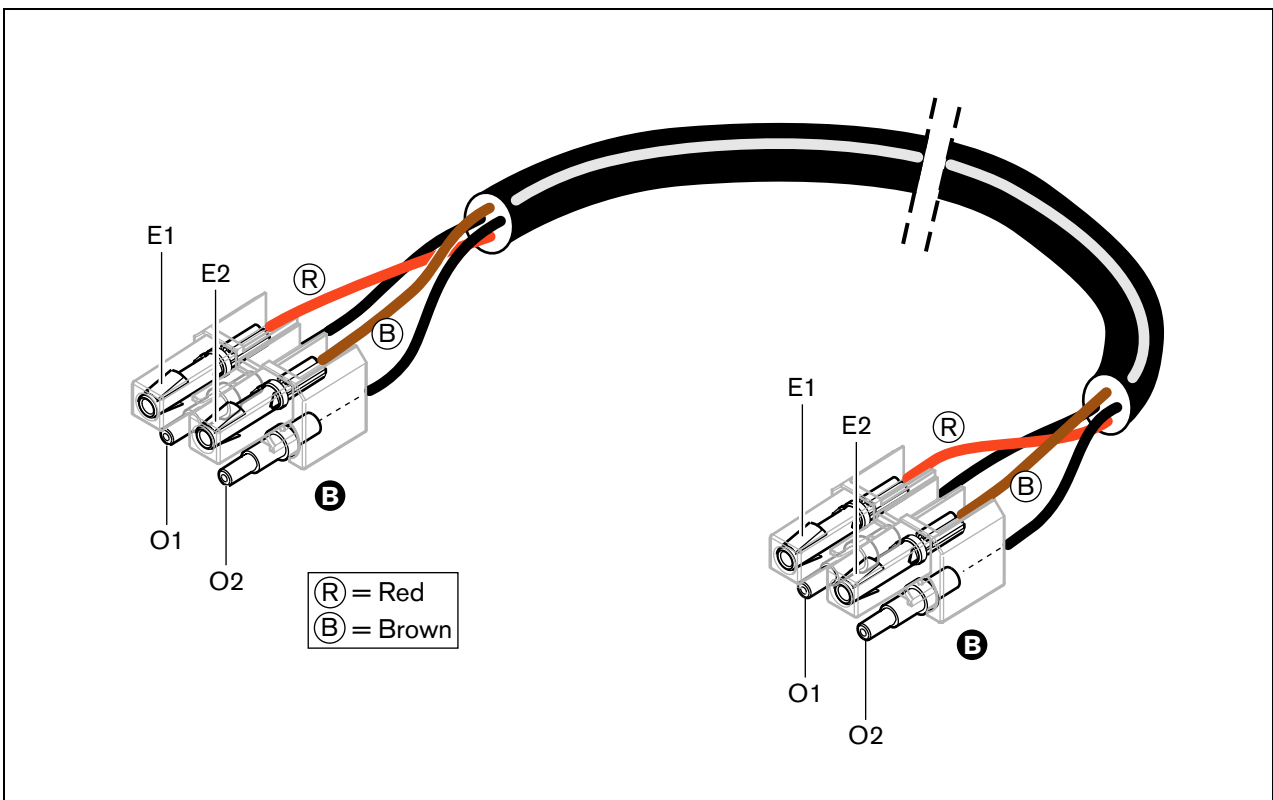
figure 45.30: Wiring diagram applied to type B optical network cables

Where applicable, the procedure to assemble the connectors for both types of cable is shown in the figures. Do as follows:

27 Make sure the ends of the cables and the plastic optical fibers correct (refer to figure 45.31).
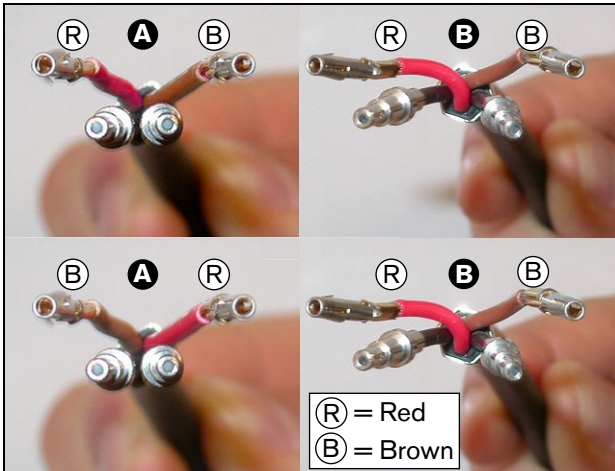
figure 45.31: Copper wires and fibers

28 Put the ferrules in the mounting block (refer to figure 45.32)
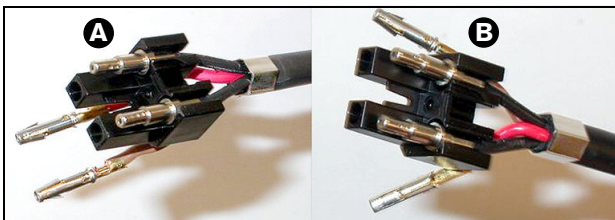
figure 45.32: Mounting block and back housing

29 Put the socket contacts in the mounting block (refer to figure 45.33). **Type A cables only:** One of the connectors attached to a type A cable, the red and brown copper wires must crossover as shown in the wiring diagram (refer to figure 45.29).
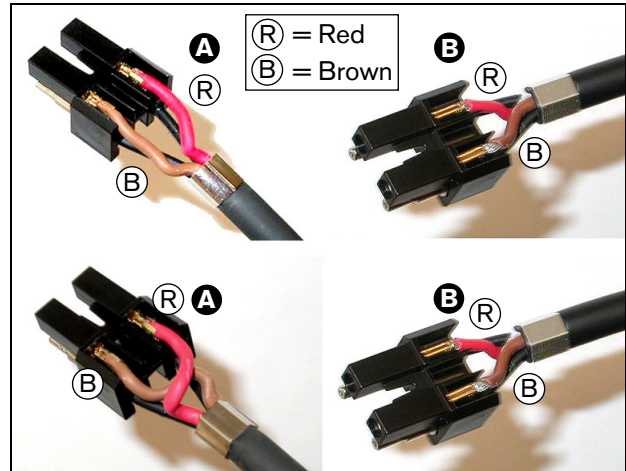
figure 45.33: Mounting block and back housing

30 Put the mounting block in the back housing (refer to figure 45.34)
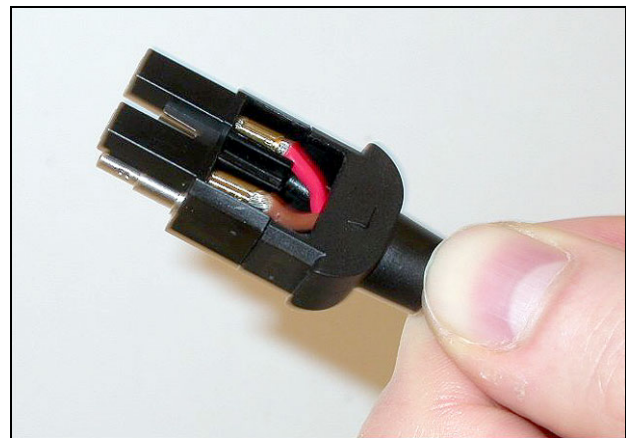
figure 45.34: Mounting block/back housing assembly

31 Click the front housing on the mounting block/back housing assembly (refer to figure 45.35).
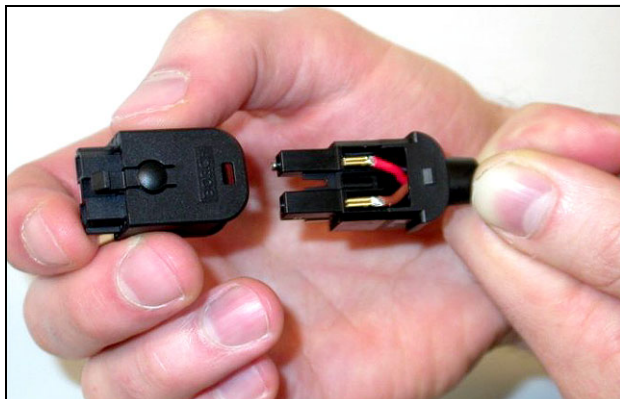
figure 45.35: Mounting the front housing

32 Insert the Torx screw into the front housing (refer to figure 45.36).
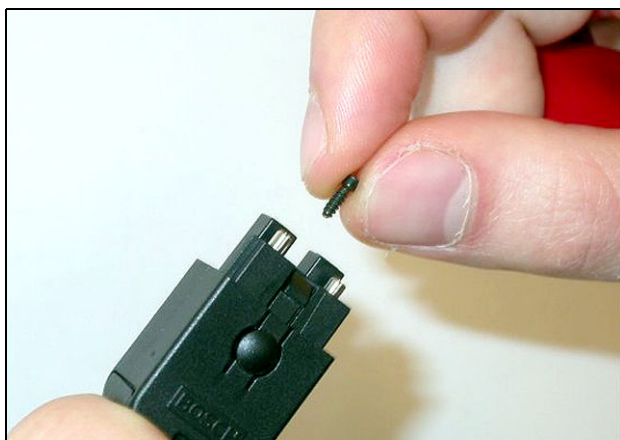
figure 45.36: Inserting the Torx screw

33 Tighten the Torx screw using the Torx screwdriver (tool 7, refer to figure 45.37).
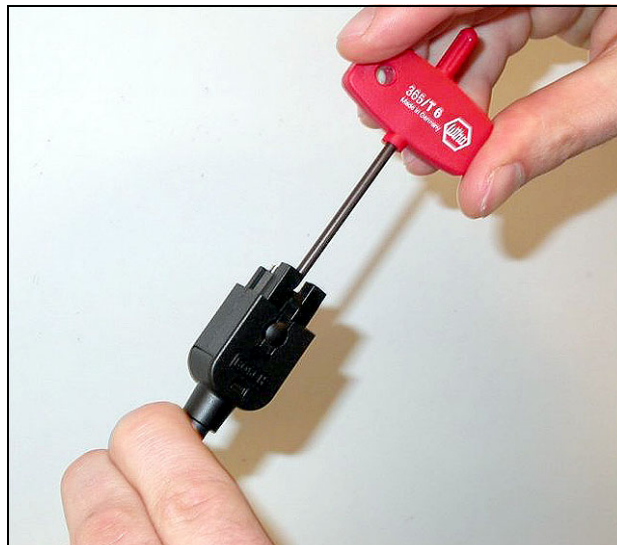
figure 45.37: Tightening the Torx screw

34 Put the dust cap on the connector to protect the plastic optical fibers (refer to figure 45.38).
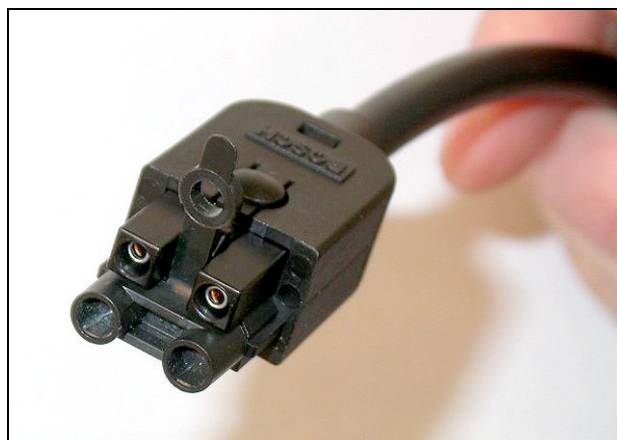
figure 45.38: Dust cap on connector

46 LBB4419/00 Cable Couplers

You can use the LBB4419/00 Cable Couplers to connect optical network cables to each other. A cable coupler causes optical attenuation. Each cable coupler decreases the maximum distance between two devices in the optical network (normally 50 meters) with 20 meters.
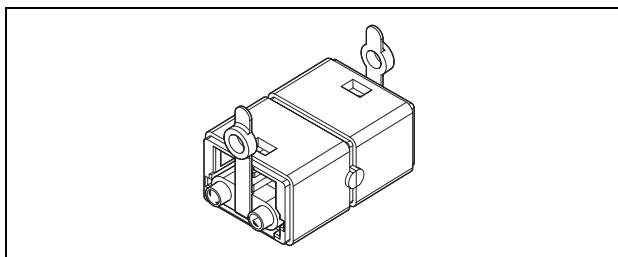
figure 46.1: Cable coupler (with dustcaps)

Section 7 - Peripheral Devices

47 DCN-DDB Data Distribution Board

47.1 Introduction

Use the DCN-DDB Data Distribution Board to connect hall displays to the system.

47.2 Controls, connectors and indicators

The data distribution board (refer to figure 47.1) contains:

1 **DCN cable** - Connects the data distribution board to the DCN (refer to section 47.7.2).
2 **J10 jumper block** - Selects the power supply of the data distribution board (refer to section 47.7.3).
3 **S8 switches** - Configure the data distribution board (refer to section 47.3.1).

4 **RS232 port** - To connect the data distribution board to a hall display (refer to section 47.3.2).
5 **Parallel inputs (connector)** - To make remote controls (refer to section 47.6).
6 **Parallel inputs (solder pads)** - To make remote controls (refer to section 47.6).
7 **Parallel outputs (solder pads)** - To make remote controls (refer to section 47.6).
8 **De-init switch (local)** - Erase the current address of the data distribution board (refer to section 8.7).
9 **Parallel outputs (connector)** - To make remote controls (refer to section 47.6).
10 **De-init switch (remote)** - Erase the address of the data distribution board from a remote site (refer to section 47.7.4).
11 **Power supply connector** - Connects an external power supply to the data distribution board (refer to section 47.7.3).
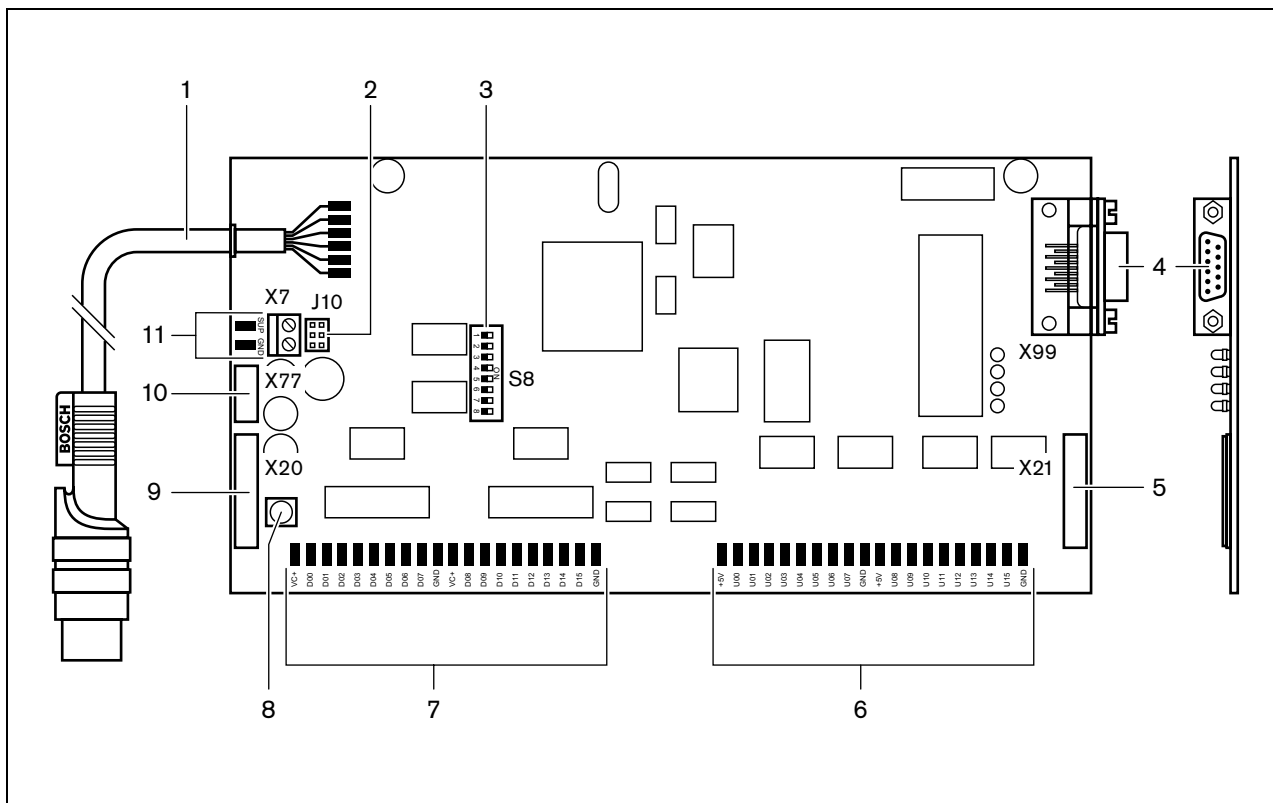
figure 47.1 : Top view of the data distribution board

47.3 Configuration

47.3.1 Overview

Configure the data distribution board with the S8 switches (refer to table 47.1).

table 47.1: S8 Dip switch settings (* = default)

Switch	Position	Description
S8-1	ON	RS232 enabled
	OFF*	RS232 disabled
S8-2	ON	Active mode
	OFF*	Passive mode
S8-3	ON	19200 baud
	OFF*	9600 baud
S8-4	ON	Reserved
	OFF*	
S8-5	ON	Reserved
	OFF*	
S8-6	ON	Address bit 0 = 1
	OFF*	Address bit 0 = 0
S8-7	ON	Address bit 1 = 1
	OFF*	Address bit 1 = 0
S8-8	ON	Address bit 2 = 1
	OFF*	Address bit 2 = 0

47.3.2 RS232 port

You can enable or disable the RS232 port of the data distribution board with the S8-1 switch. Set the baudrate with the S8-3 switch.

When you connect the data distribution board to a hall display, you must enable the RS232 port of the data distribution board. The baudrate for all hall displays is 19,200 baud. Only the numeric display can also operate with a 9,600 baud connection.
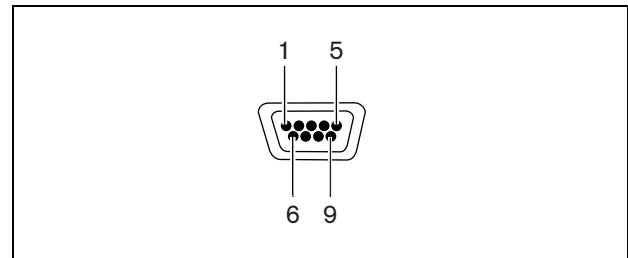
figure 47.2: RS232 port, connection

table 47.2: RS232 port, connection

Pin	Definition	Description
1	---	Not connected
2	RxD	Receive Data
3	TxD	Transmit Data
4	---	Not connected
5	SG	Signal Ground
6	---	Not connected
7	RTS	Request To Send
8	CTS	Clear To Send
9	---	Not connected

table 47.3: RS232 port, details

Number of connections:
1x female 9 pole SUB-D socket
Location:
Component side
Data format:
• 9600, 19200 baud
• 8 data bits
• 1 stop bit
• no parity
Signal levels:
EIA RS232-C interface specifications

47.3.3 Mode

47.3.3.1 Introduction

Set the mode of the data distribution board with the S8-3 switch. The data distribution board can be:

- A passive unit that receives data from the central control unit (passive mode).
- An active unit that also transmits data to the central control unit (active mode).

47.3.3.2 Passive mode

You must put the data distribution board in the passive mode when:

- You use data distribution board to send data to a hall display.
- You use data distribution board for speak slowly or help signaling.
- You only use the parallel outputs of the data distribution board.

If the data distribution board is in the passive mode, you must give it an address (refer to section 47.3.4). This address defines the application of the data distribution board. When you start the system for the first time, you must push the de-init switch of the data distribution board to send its address to the central control unit (refer to section 8.7).

When you use the central control unit to erase the addresses of all units (refer to section 8.7), you must not push the de-init switch again. The central control unit remembers the addresses of the passive data distribution boards when it is started again.

47.3.3.3 Active mode

You must put the data distribution board in the active mode when you use the parallel inputs of the data distribution board.

> **i** **Note**
>
> The maximum number of data distribution boards in the system is 15.

If the data distribution board is in active mode, the central control unit gives it an address. The system ignores the passive mode address of the data distribution board in the active mode (refer to section 47.3.4).

When you start the system for the first time, you must push the de-init switch of the data distribution board to obtain an address.

When you use the central control unit to erase the addresses of all units (refer to section 8.7), you must push the de-init switch again to obtain a new address. The central control unit does not remember the addresses of the active data distribution boards when it is started again.

47.3.4 Addresses

If necessary, set the address of the data distribution board with the S8-6, S8-7 and S8-8 switches. This address is only used when the data distribution board is in the passive mode (refer to section 47.3.3.2). The address defines the application of the data distribution board (refer to table 47.4).

table 47.4: Addresses

Address	S8-6	S8-7	S8-8	Description
248	0	0	0	Numeric display (refer to section 47.4.3).
249	1	0	0	Alpha-numeric display 1 (refer to section 47.4.3).
250	0	1	0	Alpha-numeric display 2 (refer to section 47.4.3).
251	1	1	0	Status display (e.g. synoptic display, refer to section 47.4.5).
252	0	0	1	Reserved
253	1	0	1	Speak slowly signaling (refer to section 47.5.1).
254	0	1	1	Help signaling (interpreter booth 1 to 16, refer to section 47.5.2).
255	1	1	1	Help signaling (interpreter booth 17 to 31, refer to section 47.5.2).

47.4 Hall displays

47.4.1 Communication

The data distribution board sends serial data to the hall display through the RS232 port. The serial data consists of ASCII text with ANSI escape codes for special functions. Refer to table 47.5 for the descriptions of <CR> and <LF> control characters.

table 47.5: ASCII control characters

Character	Description
<CR>	Moves the cursor to the first location on the current text line.
<LF>	Moves the cursor one row down in the current column

The data distribution board only sends ANSI codes and binary data to status displays.

47.4.2 ANSI support

47.4.2.1 Introduction

The connected hall display must be able to process all the ANSI escape codes that are listed below.

> **i** **Note**
> Not all of these codes are currently in use, but they must be implemented in the hall display for future compatibility.

47.4.2.2 Cursor location

```
<esc>[<line number>;<column number>H
<esc>[<line number>;<column number>f
```

figure 47.3: Cursor location

Moves the cursor to the specified location. If no text line number and column number is specified, the cursor moves to the upper left corner of the hall display (text line 1, column 1).

47.4.2.3 Cursor up

```
<esc>[<numlines>A
```

figure 47.4: Cursor up

Moves the cursor up in the same column. The number of text lines that it is moved is defined by numlines. If the cursor is already in the first text line, the hall display must ignore this escape function. If numlines is omitted, the data distribution board moves the cursor one text line.

47.4.2.4 Cursor down

```
<esc>[<numlines>B
```

figure 47.5: Cursor down

Moves the cursor down in the same column. The number of text lines that it is moved is defined by numlines. If the cursor is already in the last text line, the hall display must ignore this escape function. If numlines is omitted, the data distribution board moves the cursor one text line.

47.4.2.5 Cursor right

```
<esc>[<numlines>C
```

figure 47.6: Cursor right

Moves the cursor to the right in the same text line. The number of columns that it is moved is defined by numlines. If the cursor is already in the last column, the hall display must ignore this escape function. If numlines is omitted, the data distribution board moves the cursor one location.

47.4.2.6 Cursor left

```
<esc>[<numlines>D
```

figure 47.7: Cursor left

Moves the cursor to the left in the same text line. The number of columns that it is moved is defined by numlines. If the cursor is already in the first column, the hall display must ignore this escape function. If numlines is omitted, the data distribution board assumes a default value of 1 column.

47.4.2.7 Erase display

```
<esc>[2J
```

figure 47.8: Erase display

Erases the hall display and moves the cursor to its home location (text line 1, column 1).

47.4.2.8 Erase line

```
<esc>[K
```

figure 47.9: Erase line

Erases all characters from the location of the cursor to the end of the text line (including the character at the cursor location). The cursor remains in the same place.

47.4.3 Numeric display

On a numeric display, the data distribution board can show parliamentary voting results and a voting timer. A numeric display does not require a control PC.

The data distribution board sends six text lines to the hall display (refer to table 47.6). Each text line contains six locations.

table 47.6: Numeric display

Line	Item
1	Voting timer
2	Number of present delegates
3	Number of delegates who voted 'Yes'
4	Number of delegates who voted 'No'.
5	Number of delegates who voted 'Abstain'.
6	Number of delegates who did not vote.

> **Note**
> If there is no voting timer, the first text line is empty.

The voting timer is a number of four digits (two for the minutes, two for the seconds). There is no separator between the minutes and the seconds. The separator must be part of the fixed text on the hall display.

Example:
A parliamentary voting session in progress. There are 14 minutes and 25 seconds left. In the room are 1,235 delegates present: 945 delegates voted 'Yes', 30 delegates voted 'No', 255 delegates voted 'Abstain' and 5 delegates did not vote.

Refer to figure 47.10 for the data that the data distribution board sends to the hall display.

> **Note**
> An underscore represents a space.

```
<ESC>[2J1425<CR><LF>
1235<CR><LF>
_945<CR><LF>
__30<CR><LF>
_255<CR><LF>
___5
```

figure 47.10: Numeric display, example (1)

Refer to figure 47.11 for the data that the hall display shows.

figure 47.11: Numeric display, example (2)

47.4.4 Alphanumeric display

On an alphanumeric display, the data distribution board shows parliamentary voting results, microphone information and messages. An alphanumeric display requires a control PC and the Text/Status Display software module.

> **ℹ Note**
> Refer to the applicable Software User Manual for instructions that tell you how to operate the Text/Status Display software module.

The system can handle two different alphanumeric displays at the same time. There is no difference between hall display 1 and hall display 2, but the data distribution boards have different addresses.

The alphanumeric display must consist of 10 text lines that contain 33 characters. When the display is larger, the additional space will not be used.

Example:

A parliamentary voting session is in progress. There are 14 minutes and 25 seconds left. In the room are 1,235 delegates present: 945 delegates voted 'Yes', 30 delegates voted 'No', 255 delegates voted 'Abstain' and 5 delegates did not vote. The vote subject text is "Text line 1, Text line 2, Text line 3, Text line 4".

Refer to figure 47.12 for the data that the data distribution board sends to the hall display.

> **ℹ Note**
> <spaces> represents a sequence of maximum 33 spaces.

```
<ESC>[2JText line 1<spaces> <CR><LF>
     Text line 2<spaces> <CR><LF>
     Text line 3<spaces> <CR><LF>
     Text line 4<spaces> <CR><LF>
<ESC>[5;1HVoting : 1<ESC>[5;16H    Time:
<ESC>[6;16H      Yes:
<ESC>[7;1HPresent    <ESC>[7;11H: <ESC>[7;16H        No:
<ESC>[8;1HNot Voted : <ESC>[8;11H: <ESC>[8;16H  Abstain:
<ESC>[9;1HRollCall
<ESC>[10;1H<Screenline>
<ESC>[6;27H 945<ESC>[7H;27H  30<ESC>[8;27H
255<ESC>[7;12H1235<ESC>[8;12H    5<ESC>[5;28H14:25
```

figure 47.12: Alphanumeric display, example (1)

Refer to figure 47.13 for the data that the hall display shows.

figure 47.13: Alphanumeric display, example (2)

47.4.5 Status display

On a status display, the data distribution board shows the status of a parliamentary voting session. A status display requires a control PC and the Text/Status Display software module.

> **Note**
>
> Refer to the applicable Software User Manual for instructions that tell you how to operate the Text/Status Display software module.

To show the information, the status display receives either an ANSI erase display code (refer to section 47.4.2.7) or a display update command. This display update command is a dump of status information (752 bytes). It consists of:

- A start code of two byte (A5 A5).
- For the first 1,500 devices in the system, a device nibble that contains the status values of the contribution devices (refer to table 47.7).

table 47.7: Numeric display

Value	Status
0	The delegate at this unit is not present.
1	The delegate voted 'No'.
2	The delegate voted 'Abstain'.
4	The delegate voted 'Yes'.
8	The delegate is present, but has not voted.

> **Note**
>
> If there are less than 1,500 devices in the system, the remaining nibbles are always set to 00.

Two device nibbles together form a device byte. The location of the device nibbles in the device bytes depends on the alphabetically sorted seat number list in the installation file on the DCN control PC.

Example:

A system contains 6 units (refer to table 47.8). For this system, the entire display update command will be:

```
A5 A5 08 41 28 (and 747 bytes with value 00)
```

figure 47.14: Status display

table 47.8: Example

Seat number	Update command	Status	Status value
0001	byte 1, high nibble	Not present	0
00A1	byte 1, low nibble	Present	8
00A2	byte 2, high nibble	Yes	4
00B1	byte 2, low nibble	No	1
00C3	byte 3, high nibble	Abstain	2
0123	byte 3, low nibble	Present	8

47.5 Signaling

47.5.1 Speak slowly signaling

The interpreter desks (DCN-IDESK) have a Slow button. With this button, the interpreters can activate an indicator that tells the current speaker to speak slowly. This function of the interpreter desk must always be used along with the data distribution board. Refer to figure 47.15 for the physical connections.
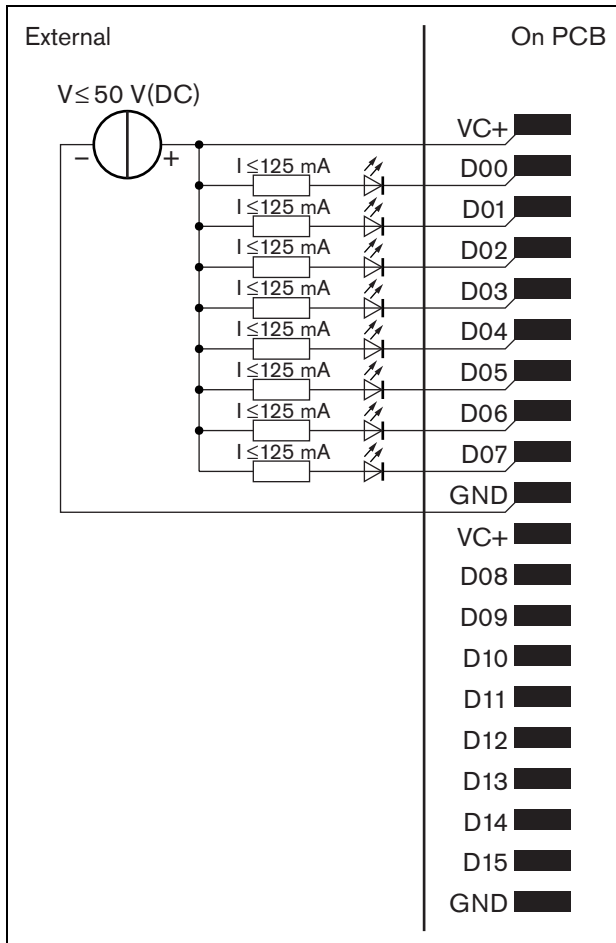
figure 47.15: Physical connections

> **ℹ Note**
>
> The parallel outputs are also available on a
> 20-pole connector (refer to table 47.9).

Refer to figure 47.16 for a circuit diagram for speak slowly signaling.
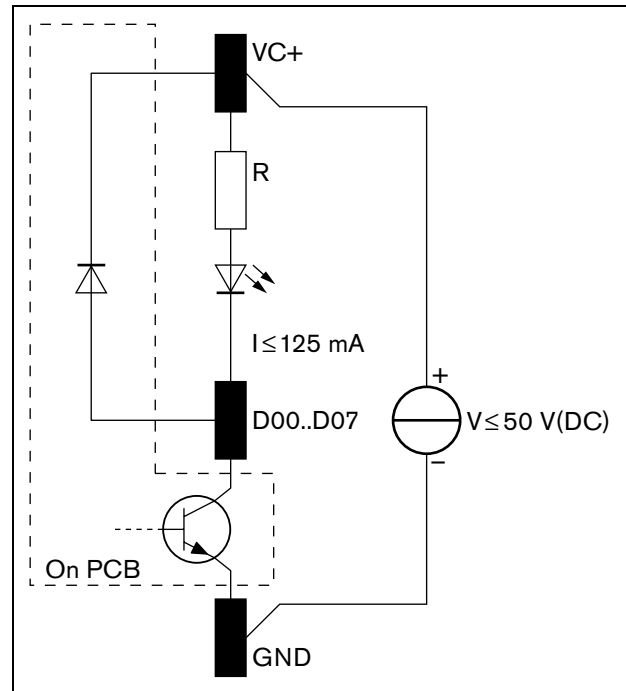
figure 47.16: Circuit diagram

The first request to speak slowly activates parallel output D00 of the data distribution board. The second request (from a different interpreter booth) activates parallel output D01, the third request activates parallel output D02 etc. The maximum number of activated parallel outputs is eight (D00 to D07).

47.5.2 Help signaling

The interpreter desks (DCN-IDESK) have a Help button. With this button, the interpreters can activate an indicator that tells the operator or chairman that they need assistance. This function of the interpreter desk must always be used along with the data distribution board. Refer to figure 47.17 for the physical connections.
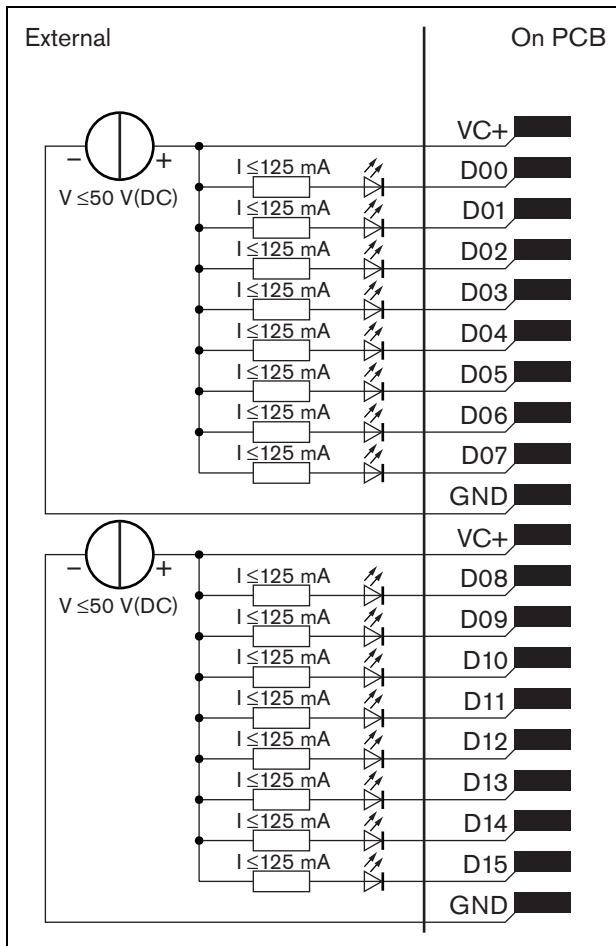
figure 47.17: Physical connections

> ℹ️ **Note**
> The parallel outputs are also available on a20-pole connector (refer to table 47.9).

Refer to figure 47.18 for a circuit diagram for help signaling.
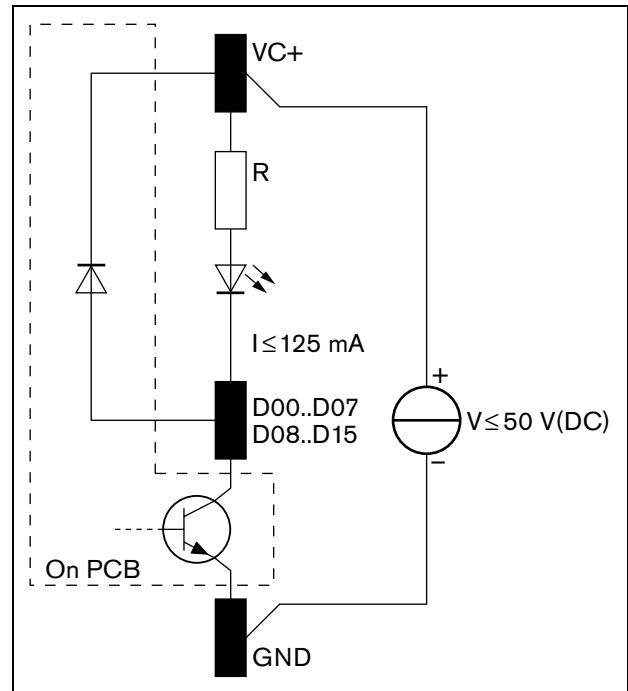
figure 47.18: Circuit diagram

Requests for assistance that come from interpreter booths 1 through 16 activate parallel outputs D00 to D15 on the data distribution board with address 254. Requests for assistance that come from interpreter booth 17 to 31 activate parallel outputs D00 to D15 on the data distribution board with address 255.

47.6   Remote controls

You can use the parallel inputs and parallel outputs as remote controls. For example, to switch on lamps, open doors or close curtains in the room.

> **i** **Note**
> The parallel inputs and parallel outputs are also available on a 20-pole connector (refer to table 47.9).

All parallel inputs and parallel outputs form pairs. For example, parallel input U00 controls parallel outputs D00.

table 47.9: Parallel inputs and outputs

Parallel inputs		Parallel outputs	
Pad	Pin	Pad	Pin
VC+	1	VC+	1
U00	2	D00	2
U01	3	D01	3
U02	4	D02	4
U03	5	D03	5
U04	5	D04	5
U05	7	D05	7
U06	8	D06	8
U07	9	D07	9
GND	10	GND	10
VC+	11	VC+	11
U08	12	D08	12
U09	13	D09	13
U10	14	D10	14
U11	15	D11	15
U12	16	D12	16
U13	17	D13	17
U14	18	D14	18
U15	reserved	D15	reserved
GND	20	GND	20

The parallel inputs do not only control the associated parallel output on the same data distribution board. They also control the associated parallel outputs on all other data distribution boards that are:

- In the active mode.
- In the passive mode and do not have address 253, 254 or 255.

> **i** **Note**
> Do not use a parallel output for more than one purpose.

For example, parallel input D00 of a distribution board does not only control parallel output U00 of the same data distribution board. It also controls all the parallel output U00 of all the other data distribution boards that are in the active mode or in the passive mode and do not have address 253, 254 or 255.

Refer to figure 47.19 for the physical connections of the parallel inputs.

Refer to figure 47.20 for the physical connections of the parallel outputs.
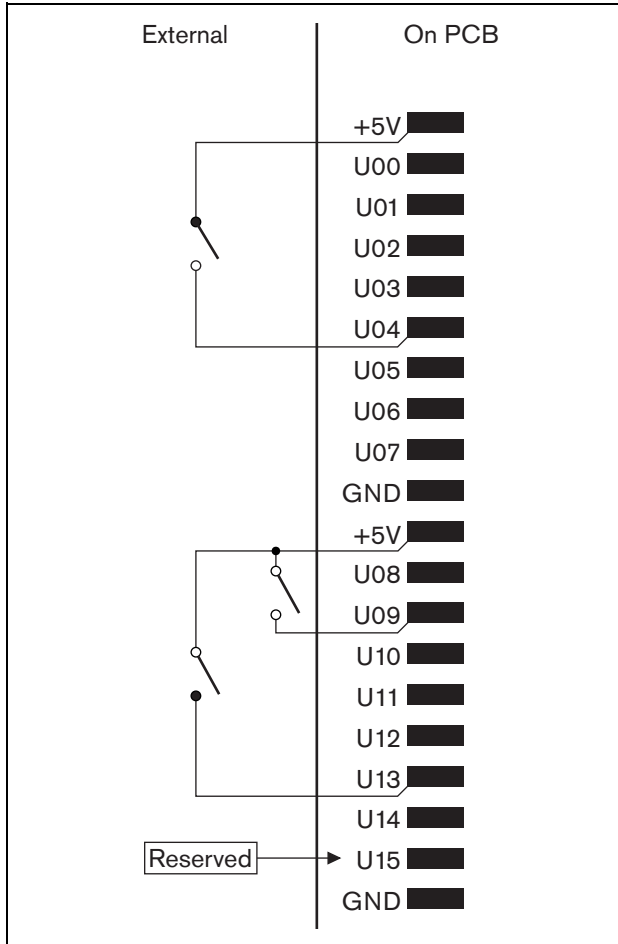
figure 47.19: Parallel inputs
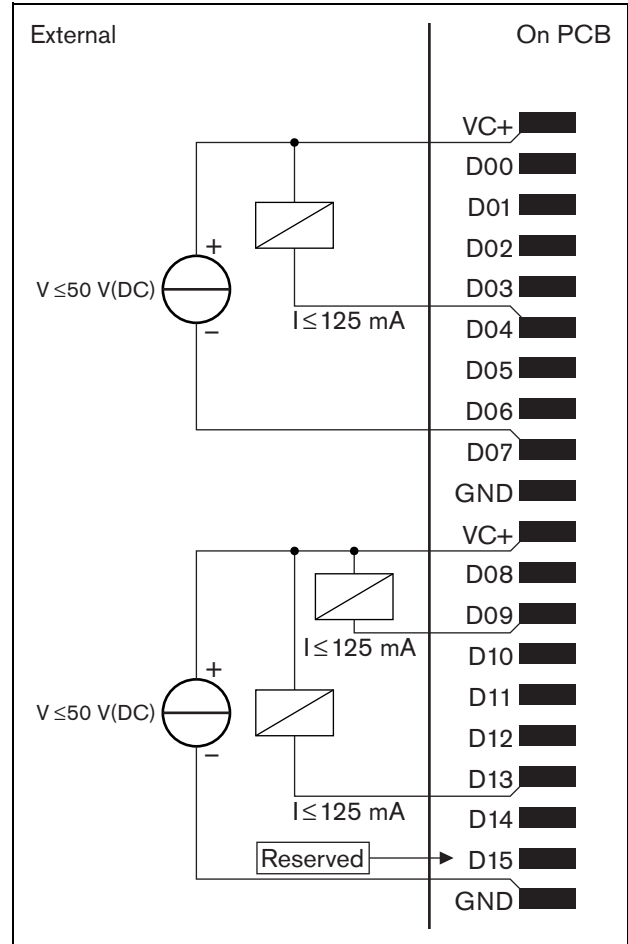
figure 47.20: Parallel outputs

Refer to figure 47.18 for a circuit diagram to connect the parallel inputs.
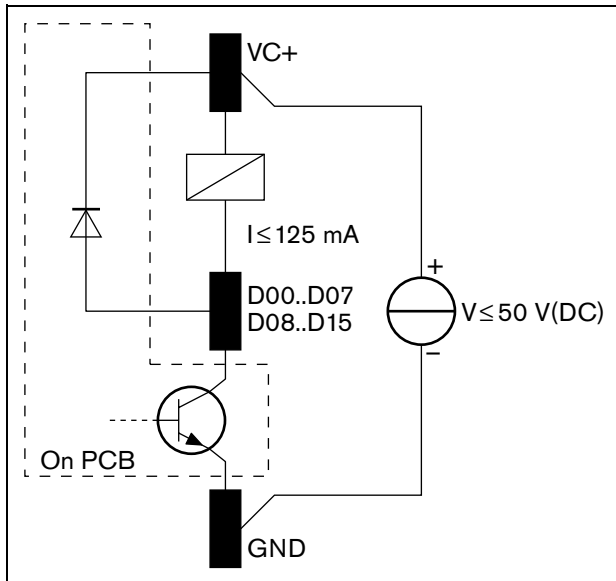
figure 47.21: Circuit diagram

47.7   Installation

47.7.1   Data distribution board

Install the data distribution board in the hall display.

table 47.10: Physical characteristics

Dimensions (h x w):
100 x 200 mm
Weight:
approximately 300 g

47.7.2   DCN

Use the DCN cable to connect the data distribution board to the DCN. You cannot make a loop-through in the DCN with the data distribution board.

> ℹ **Note**
>
> You connect the data distribution board to the DCN with a trunk splitter (LBB4114/00, LBB4115/00) to bypass the data distribution board.

47.7.3   Power supply

You can connect an external power supply to the power supply connector (refer to figure 47.22). The external power supply only gives power to the data distribution board. It does not give power to the DCN.
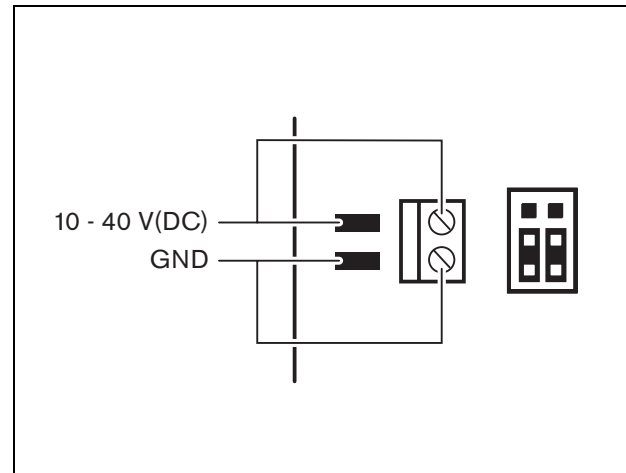
figure 47.22: Power supply

table 47.11: Power supply

Supply voltage (DCN or external):
10 - 40 V(DC)
Current consumption (DCN):
< 50 mA @ 40 V(DC)

You can enable or disable the connected external power supply with the J10 jumper block (refer to figure 47.23)
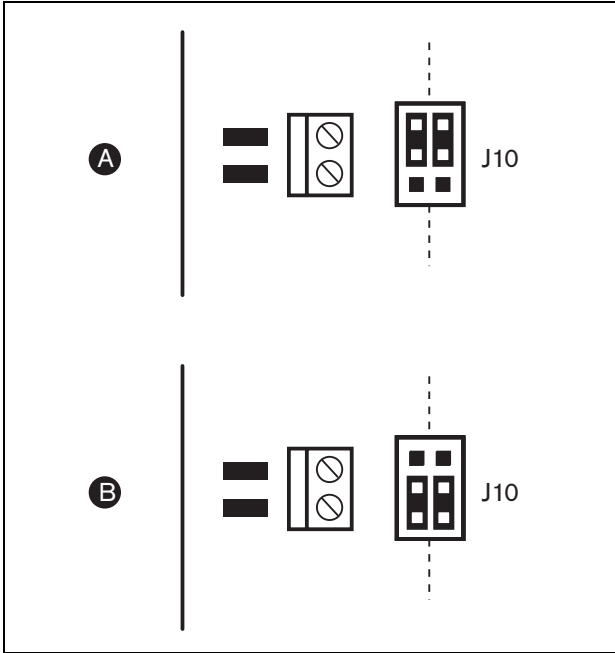
figure 47.23: Power supply

table 47.12: Jumper setting

Position	Power
A	System power supply
B	External power supply

47.7.4 Remote de-init switch

You can erase the address of the data distribution board from a remote site with connector X77 (refer to figure 47.1). This 10-pole connector has connections for a de-init switch and a de-init LED.

table 47.13: X77 remote initialization connector

Pin	Signal
1	+5 V
2	Init
3	Initialisation LED, anode
4	Initialisation LED, cathode
5	Not connected
6	Not connected
7	Not connected
8	Not connected
9	Not connected
10	Not connected

The remote de-init switch must be connected between pins 1 and 2. The de-init LED must be connected between pins 3 and 4.

48 LBB4157/00 Chip Card Encoder

48.1 Introduction

With the LBB4157/00 Chip Card Encoder and the ID-Card Encoder software module, you can configure DCN-IDCRD Chip Cards (refer to chapter 49).

48.2 Installation

> ⚠️ **Caution**
> Before you install the chip card encoder, disconnect the PC from the mains power supply. Electrical discharges from the mains power supply can kill you.

To connect the chip card encoder to a PC:

1 Disconnect the keyboard from the PC.
2 Connect the chip card encoder (1) to the PC with the plug of the serial cable (2).
3 Connect the chip card encoder (1) to the PC with the PS/2 plug (3).
4 Connect the keyboard to the PS/2 socket (4) of the chip card encoder.
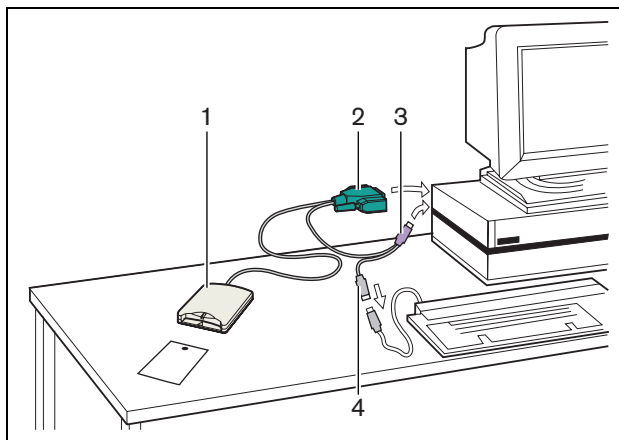
figure 48.1: Chip card encoder

48.3 Operation

> ℹ️ **Note**
> Refer to the applicable Software User Manual for instructions that tell you how to operate the ID-Card Encoder software module.

49   DCN-IDCRD Chip Cards

With the DCN-IDCRD Chip Cards delegates and chairmen can identify themselves to the system. You can use the chip cards to give the delegates and chairmen access to:

- The microphones of the contribution devices.
- The voting functions on the contribution devices.
- The intercom functions on the contribution devices.

> **i** **Note**
> To configure the chip cards, you must use the LBB4157/00 Chip Card Encoder (refer to chapter 48).
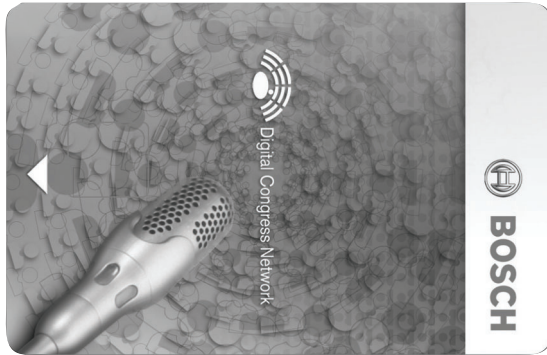
figure 49.1: Chip card

Refer to table 49.1 for the characteristics of the DCN-IDCRD Chip Cards.

table 49.1: Card characteristics

Number of cards:
100
Label area:
72 x 24 mm
Memory:
4096 bits (512 bytes)
Dimensions (h x w x d):
54 x 85.7 x 0.76 mm (conform ISO 7816 1-2)

> **i** **Note**
> You can put labels that are larger than 72 x 24 mm on the rear of the chip card.

> **i** **Note**
> Refer to the Delegate Database Software User Manual for instructions that tell you where to find the code of the card in the chip.

Section 8 - Troubleshooting

50 Procedure

When a problem occurs, do as follows:

1 Examine the system. For example, examine:
   - The LEDs on the devices.
   - The condition messages of the devices.
2 Write down your findings. When you write down your findings, you can give an explanation of your findings to other persons (for example, service engineers).
3 Refer to chapter 51 to find a solution for the problem that occurred. When you cannot find a solution, refer to the Bosch Extranet.
4 When you cannot find a solution for the problem with chapter 51 or the Bosch Extranet, contact your supplier.

51   Problems and hints

Problem	Hint
You cannot start the central control unit.	• The central control unit is not connected to a mains power supply (refer to section 8.5.1).
You cannot do the initialization of the DCN devices with their buttons.	• The DCN signal is re-generated too many times (refer to section 1.4). • The trunk is too long (refer to section 1.4). • The DCN signal is not re-generated each 100 m (refer to section 1.4).
On two or more contribution devices: • The indicator rings of the microphones come on as red, and • The LEDs of the microphone buttons are off, and • The microphone LED on top of the loudspeaker of the Concentus delegate units and Concentus chairman units come on as red.	• The contribution devices have the same address. Make sure that each active device in the DCN has a unique address (refer to section 8.7).
The displays of the Concentus devices show the start-up text.	• The DCN signal is re-generated too many times (refer to section 1.4). • The trunk is too long (refer to section 1.4). • The DCN signal is not re-generated each 100 m (refer to section 1.4).
You can operate the DCN devices with their buttons, but the DCN devices do not give an audio signal to their loudspeakers or headphones.	• The audio routing mode of the central control unit is Insertion and you did not connect a device between audio input 2 and audio output 2 of the central control unit (refer to section 8.8.2.4).
You cannot operate one or more DCN devices with their buttons and: • The system gives power to the trunks, and • The devices do not give an audio signal to their loudspeakers or headphones.	• The DCN contains a defective extension cable. Find the defective extension cable and replace it. The defective extension cable can be anywhere in the DCN.

Problem	Hint
You cannot operate one or more DCN devices with their buttons and: • The system gives power to the trunks, and • The devices give an audio signal to their loudspeakers or headphones that contains noise.	• The DCN contains a defective extension cable. Find the defective extension cable and replace it. The defective extension cable can be anywhere in the DCN.
A trunk does not receive power from the system and the overload LEDs on the central control unit or the extension power supply do not come on.	• The trunk is disconnected from the central control unit or extension power supply. Refer to section 8.5.2 for instructions that tell you how to connect a trunk to a central control unit. Refer to section 34.5.2 for instructions that tell you how to connect a trunk to an extension power supply. • The trunk contains a defective extension cable. Find the defective extension cable and replace it.
A trunk does not receive power from the system and the overload LEDs on the central control unit or the extension power supply come on.	• The devices that are connected to the trunk ask for too much power. Use the calculation tool to re-calculate the power consumption of the devices and the extension cables that are connected in the trunk. • The trunk contains a defective extension cable. Find the defective extension cable and replace it.
The devices that are connected to a tap-off socket of a network splitter do not operate.	• An LBB4115/00 Protected Trunk Splitter can cause the problem. The maximum power that a protected trunk splitter gives to each tap-off is 4.5 W (refer to chapter 36). If necessary, replace the LBB4115/00 Protected Trunk Splitter with an LBB4114/00 Trunk Splitter.
The PC Control Software shows grey icons.	• The license code is not correct. Make sure that you enter the correct license code. When you do not have a license code, contact your supplier. • The internal back-up battery is empty or disconnected. Refer to section 8.3.4 for instructions that tell you how to connect the internal back-up battery of the central control unit.
The settings of the interpreter desks were erased.	• The internal back-up battery of the central control unit is empty or disconnected. Refer to section 8.3.4 for instructions that tell you how to connect the internal back-up battery of the central control unit.
The central control unit does not control the video cameras correctly.	• The RS232 ports of the central control unit are not configured correctly. Refer to section 8.3.3 for instructions that tell you how to configure the RS232 ports of the central control unit.

Problem	Hint
The audio signals on the audio outputs of a (digital) audio expanders contains noise.	• The optical network cable that is connected to the (digital) audio expander is too long (refer to section 2.6).
The display of an optical network device shows No Network.	• The optical network cable that is connected to the optical network device is too long (refer to section 2.6).
The audio inputs of an optical network device do not give an audio signal.	• Make sure that the audio input is enabled with the control inputs (for example, refer to section 11.4.5). • The optical network does not contain more than 16 devices (refer to section 2.3).
A pluggable microphone does not operate correctly.	• The pluggable microphone is defective. Replace the pluggable microphone.
A discussion unit does not operate correctly.	• The discussion unit is not in the correct mode. Refer to section 14.4 for instructions that tell you how to change the mode of the discussion unit.
A flush-mounted device does not operate correctly.	• The dual delegate interface of the flush-mounted device is not in the correct mode. Refer to section 21.4 for instructions that tell you how to change the mode of the dual delegate interface.
A data distribution board does not operate correctly.	• The data distribution board is not in the correct mode. Refer to section 47.3.3 for instructions that tell you how to change the mode of the data distribution board.
During downloading, the message "download failed" occurs.	• Follow the instructions for downloading (refer to section 8.7 and 10.6).
Languages displayed on the Concentus units do not match with the languages set in the PC.	• Follow the instructions for downloading (refer to section 8.7 and 10.6).
Noise can be heard in the system.	• Earth the system at one point only (refer to section 8.3.6 and 10.3.2).
The system does not operate correctly, but you do not know what the problem is.	• An 'open-ended' DCN cable without a cable termination plug can cause the problem (refer to section 1.7.4). Connect cable termination plugs to all 'open-ended' DCN cables. • A transmitter which was connected while being switched on can cause the problem. Switch the transmitter off and on.
You cannot start the network controller.	• The network controller is not connected to a mains power supply (refer to section 10.6.1).
A multi CCU system does not operate correctly, but you cannot tell what the problem is.	• Check whether each sub system operates correctly in single CCU mode (refer to section 8.10.11). • A CCU or transmitter which was connected while being switched on can cause the problem. If the problem persists: switch off and on one by one the transmitter(s) and CCU(s) (refer to section 8.5.3 and 10.6.3).

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Section 9 - Appendices

A   Audio levels

A.1   DCN-CCU

table A.1: Analog line inputs

Plug or socket	Function	Nominal	Maximum
XLR	Floor	-12 dBV (- 6, + 6 dB)	12 dBV (- 6, + 6 dB)
Cinch	Floor	-24 dBV (- 6, + 6 dB)	0 dBV (- 6, + 6 dB)

table A.2: Outputs

Plug or socket	Function	Nominal	Maximum
XLR 1	PA	-12 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB)
XLR 2	Recorder	9 dBV(- 24, + 6 dB)	12 dBV(- 24, + 6 dB)
XLR 2	Delegate loudspeaker	0 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB))
XLR 2	Insertion/ mix-minus	-12 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB)
Cinch 1	PA	-24 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
Cinch 2	Recorder	-3dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
Cinch 2	Delegate loudspeaker	-12 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
Cinch 2	Insertion/ mix-minus	-24 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)

table A.3: Monitor

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	-1 dBV (mute, - 24 dB, 0 dB)	2 dBV (mute, - 24 dB, 0 dB)

A.2   DCN-NCO

table A.4: Inputs

Plug or socket	Function	Nominal	Maximum
XLR/Cinch 1 & 2	Not used	-	-
XLR 3 & 4	Floor	-12 dBV(- 6, + 6 dB)	12 dBV (- 6, + 6 dB)
Cinch 3 & 4	Floor	-24dBV(- 6, + 6 dB)	0 dBV (- 6, + 6 dB)

table A.5: Outputs

Plug or socket	Function	Nominal	Maximum
XLR 1	PA	-12 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB)
XLR 2	Recorder	9 dBV(- 24, + 6 dB)	12 dBV(- 24, + 6 dB)
XLR 3	Delegate loudspeaker	0 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB))
XLR 4	Insertion/ mix-minus	-12 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB)
Cinch 1	PA	-24 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
Cinch 2	Recorder	-3dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
Cinch 3	Delegate loudspeaker	-12 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
Cinch 4	Insertion/ mix-minus	-24 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)

table A.6: Monitor

Plug or socket	Function	Nominal	Maximum
3.5mm	Headphone	-1 dBV (mute, - 24 dB, 0 dB)	2 dBV (mute, - 24 dB, 0 dB)

A.3   LBB4402/00

table A.7: Analog line inputs

Plug or socket	Function	Nominal	Maximum
XLR	Floor	0 dBV (- 6, + 6 dB)	12 dBV (- 6, + 6 dB)
	Interpretation	0 dBV (- 6, + 6 dB)	12 dBV (- 6, + 6 dB)
Cinch	Floor	-12 dBV (- 6, + 6 dB)	0 dBV (- 6, + 6 dB)
	Interpretation	-12 dBV (- 6, + 6 dB)	0 dBV (- 6, + 6 dB)

table A.8: Microphone inputs

Plug or socket	Function	Nominal	Maximum
XLR	Microphone	-57 dBV (- 6, + 6 dB)	-26 dBV (- 6, + 6 dB)
Cinch	Microphone	---	---

table A.9: Analog outputs

Plug or socket	Function	Nominal	Maximum
XLR	PA	-12 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB)
	Interpretation	9 dBV(- 24, + 6 dB)	12 dBV (- 24, + 6 dB)
Cinch	PA	-24 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)
	Interpretation	-3 dBV(- 24, + 6 dB)	0 dBV (- 24, + 6 dB)

table A.10: Monitor

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	-1 dBV (mute, - 24 dB, 0 dB)	2 dBV (mute, - 24 dB, 0 dB)

A.4   PRS-4DEX4

table A.11: Monitor

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	-1 dBV (mute, - 24 dB, 0 dB)	2 dBV (mute, - 24 dB, 0 dB)

A.5   LBB4404/00

table A.12: Monitor

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	-1 dBV (mute, - 24 dB, 0 dB)	2 dBV (mute, - 24 dB, 0 dB)

A.6   DCN-IDESK

table A.13: Headphones

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	6.5 dBV	9.5 dBV
6.3 mm	Headphones	6.5 dBV	9.5 dBV

table A.14: Headset

Plug or socket	Function	Nominal	Maximum
5-pole DIN	Microphone	-24 dBV	-10 dBV
	Headphones	6.5 dBV	9.5 dBV

A.7   DCN-FCS

table A.15: Headphones

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	-1.5 dBV	1.5 dBV (mute, 0 dB)

A.8   DCN-CON

table A.16: Headphones

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	3 dBV	6 dBV (mute, 0 dB)

table A.17: Headset

Plug or socket	Function	Nominal	Maximum
3.5 mm	Microphone	-34 dBV	-10 dBV

A.9   DCN-DIS

table A.18: Headphones

Plug or socket	Function	Nominal	Maximum
3.5 mm	Headphones	3 dBV	6 dBV (mute, 0 dB)

A.10   DCN-DDI

table A.19: Dual delegate interface

Plug or socket	Function	Nominal	Maximum
8-pole DIN	Line in 0 dB	-18 dBV (- 3, + 3 dB)	12 dBV (- 3, + 3 dB)
	Line in 6 dB	-12 dBV (- 3, + 3 dB)	12 dBV (- 3, + 3 dB)
	Line in 12 dB	-6 dBV (- 3, + 3 dB)	12 dBV (- 3, + 3 dB)
	Line in 18 dB	0 dBV (- 3, + 3 dB)	12 dBV (- 3, + 3 dB)
	Mic 0 dB	-46 dBV (- 3, + 3 dB)	-16 dBV (- 3, + 3 dB)
	Mic 6 dB	-40 dBV (- 3, + 3 dB)	-16 dBV (- 3, + 3 dB)
	Mic 12 dB	-34 dBV (- 3, + 3 dB)	-16 dBV (- 3, + 3 dB)
	Mic 18 dB	-28 dBV (- 3, + 3 dB)	-16 dBV (- 3, + 3 dB)
3.5 mm	---	-5 dBV	7.5 dBV

B Language list

table B.1: Language list

English		French		Original	
Albanian	ALB	albanais	ALB	shqip	SQI
Arabic	ARA	arabe	ARA	arabiy	ARA
Armenian	ARM	arménien	ARM	hayeren	HYE
Belarusian	BEL	biélorusse	BIE	belaruskaâ	BEL
Bulgarian	BUL	bulgare	BUL	bulgarski	BUL
Burmese	BUR	birman	BIR	myanmasa	MYA
Catalan	CAT	catalan	CAT	català	CAT
Chechen	CHE	tchétchène	CHE	noxçiyn mott	CHE
Chinese	CHI	chinois	CHI	zhongwen	ZHO
Croatian	CRO	croate	CRO	hrvatski	HRV
Czech	CZE	tchèque	TCH	cesky	CES
Danish	DAN	danois	DAN	dansk	DAN
Dutch	DUT	néerlandais	NEE	Nederlands	NLD
English	ENG	anglais	ANG	English	ENG
Estonian	EST	estonien	EST	eesti keel	EST
Finnish	FIN	finnois	FIN	suomi	FIN
French	FRE	français	FRA	français	FRA
Georgian	GEO	géorgien	GEO	k'art'uli	KAT
German	GER	allemand	ALL	Deutsch	DEU
Greek	GRE	grec	GRE	elliniká	ELL
Hebrew	HEB	hébreu	HEB	ivrit	HEB
Hungarian	HUN	hongrois	HON	magyar nyelv	HUN
Icelandic	ICE	islandais	ISL	íslenska	ISL
Indonesian	IND	indonésien	IND	bs Indonesia	IND
Irish	IRI	irlandais	IRL	Gaeilge	GLE
Italian	ITA	italien	ITA	italiano	ITA
Japanese	JAP	japonais	JAP	nihongo	JPN
Khmer	KHM	khmer	KHM	khmêr	KHM
Korean	KOR	coréen	COR	choson-o	KOR
Lithuanian	LIT	lituanien	LIT	lietuviu	LIT
Laotian	LAO	laotien	LAO	pha xa lao	LAO
Latvian	LAT	letton	LET	latviesu	LAV
Luxembourg	LUX	luxembourg	LUX	lëtzebuerg	LTZ
Macedonian	MAC	macédonien	MAC	makedonski	MKD
Malay	MAL	malais	MAL	bh Malaysia	MSA
Maltese	MLT	maltais	MLT	il-Malti	MLT
Moldavian	MOL	moldave	MOL	moldoveana	MOL
Norwegian	NOR	norvégien	NOR	norsk	NOR
Persian	PER	persan	PER	fârsky	FAS
Polish	POL	polonais	POL	polski	POL
Portuguese	POR	portugais	POR	português	POR
Romanian	ROM	roumain	ROU	româna	RON
Russian	RUS	russe	RUS	russkij	RUS

table B.1: Language list

English		French		Original	
Serbian	SER	serbe	SER	srpski	SRP
Slovak	SLO	slovaque	SLO	slovenský	SLK
Slovenian	SLV	slovène	SLV	slovenski	SLV
Spanish	SPA	espagnol	ESP	español	SPA
Swedish	SWE	suédois	SUE	svenska	SWE
Thai	THA	thaï	THA	thai	THA
Turkish	TUR	turc	TUR	türkçe	TUR
Ukrainian	UKR	ukrainien	UKR	ukraïns'ka	UKR
Vietnamese	VIE	vietnamien	VIE	Tiếng Viêt	VIE
....	...	....	...	....	...

> **i Note**
>
> Dots (refer to last row of table B.1) indicate that
> the interpreter desk has been configured for a
> language that is not in the list.

C   Product index

C.1   Central control devices

table C.1: Central control devices

Product code	Product description	Refer to
DCN-CCU	Central control unit	Page 40
DCN-CCU-UL	Central control unit UL	Page 40
DCN-CCUB	Basic central control unit	Page 40
DCN-CCUB-UL	Basic central control unit UL	Page 40
DCN-EPS	Extension power supply	Page 220
DCN-EPS-UL	Extension power supply UL	Page 220
LBB4402/00	Audio expander	Page 96
LBB4404/00	CobraNet Interface	Page 120
PRS-4DEX4	Digital audio expander	Page 109
DCN-NCO	Network controller	Page 76

C.2   Installation devices

table C.2: Installation devices

Product code	Product description	Refer to
LBB4114/00	Trunk splitter	Page 224
LBB4115/00	Trunk splitter protected	Page 225
LBB4116/00	Extension cable, 100 m	Page 226
LBB4116/02	Extension cable, 2 m	Page 226
LBB4116/05	Extension cable, 5 m	Page 226
LBB4116/10	Extension cable, 10 m	Page 226
LBB4116/15	Extension cable, 15 m	Page 226
LBB4116/20	Extension cable, 20 m	Page 226
LBB4116/25	Extension cable, 25 m	Page 226
LBB4117/00	Cable locking clamp	Page 228
LBB4118/00	Cable termination plug	Page 229
LBB4119/00	DCN connectors	Page 227
LBB4410/00	Network splitter	Page 230
LBB4414/10	Fiber interface without address	Page 235
LBB4416/00	Network cable, 10 m	Page 238
LBB4416/01	Network cable, 0.5 m	Page 238
LBB4416/02	Network cable, 2 m	Page 238
LBB4416/05	Network cable, 5 m	Page 238
LBB4416/10	Network cable, 10 m	Page 238
LBB4416/20	Network cable, 20 m	Page 238
LBB4416/50	Network cable, 50 m	Page 238
LBB4417/00	Network connector	Page 240
LBB4418/00	Cable-connector tool kit	Page 241
LBB4418/50	Spare cutting tool	Page 241
LBB4419/00	Cable coupler	Page 254

C.3   Contribution devices

table C.3: Contribution devices

Product code	Product description	Refer to
DCN-CON	Concentus basic unit	Page 149
DCN-CONCM	Concentus chairman unit	Page 159
DCN-CONCS	Concentus unit with channel selector	Page 149
DCN-CONFF	Concentus unit full function	Page 149
DCN-DISBCM	Sets of buttons for 10 chairman discussion units	Page 136
DCN-DISBDD	Sets of buttons for 10 dual use discussion units	Page 136
DCN-DISCLM	Set of 25 cable clamps for discussion unit	Page 143
DCN-DISCS-D	Discussion unit with channel selector dark base	Page 136
DCN-DISCS-L	Discussion unit with channel selector light base	Page 136
DCN-DISD-D	Basic discussion unit dark base	Page 136
DCN-DISD-L	Basic discussion unit light base	Page 136
DCN-DISDCS-D	Discussion unit with channel selector dark base	Page 136
DCN-DISDCS-L	Discussion unit with dual channel selector light base	Page 136
DCN-DISL-D	Discussion unit with long microphone dark base	Page 136
DCN-DISL-L	Discussion unit with long microphone light base	Page 136
DCN-DISR-D	Set of 10 rims for discussion unit dark	Page 143
DCN-DISR-SR	Set of 10 rims for discussion unit silver	Page 143
DCN-DISRH-SR	Set of 10 rims for discussion unit high gloss silver	Page 143
DCN-DISRMH	Set of 10 rims for discussion unit high gloss metal	Page 143
DCN-DISRMS	Set of 10 rims for discussion unit semi gloss metal	Page 143
DCN-DISS-D	Discussion unit with short microphone dark base	Page 136
DCN-DISS-L	Discussion unit with short microphone light base	Page 136
DCN-DISV-D	Discussion unit with voting dark base	Page 136
DCN-DISV-L	Discussion unit with voting light base	Page 136
DCN-DISVCS-D	Discussion unit with voting and channel selector dark base	Page 136
DCN-DISVCS-L	Discussion unit with voting and channel selector light base	Page 136
DCN-MICL	Pluggable microphone long stem	Page 160
DCN-MICS	Pluggable microphone short stem	Page 160
LBB3555/00	Intercom handset	Page 162

C.4   Flush-mounted devices

table C.4: Flush-mounted devices

Product code	Product description	Refer to
DCN-DDI	Dual delegate interface	Page 169
DCN-FBP	Flush blank panel	Page 201
DCN-FBPS	Flush blank panel short	Page 201
DCN-FCOUP	Couple piece	Page 198
DCN-FCS	Channel selector unit for 32 channels	Page 187
DCN-FEC	End caps	Page 199
DCN-FLSP	Loudspeaker panel	Page 182
DCN-FMIC	Microphone connection panel	Page 178
DCN-FMICB	Microphone control panel	Page 180
DCN-FPRIOB	Priority panel	Page 181
DCN-FPT	Flush positioning tool	Page 168
DCN-FV	Voting panel	Page 183
DCN-FVCRD	Voting and card panel	Page 183
DCN-FVU	Voting unit	Page 193
DCN-FVU-CN	Voting unit Chinese	Page 193
DCN-TTH	Tabletop housing	Page 200

C.5   Interpretation devices
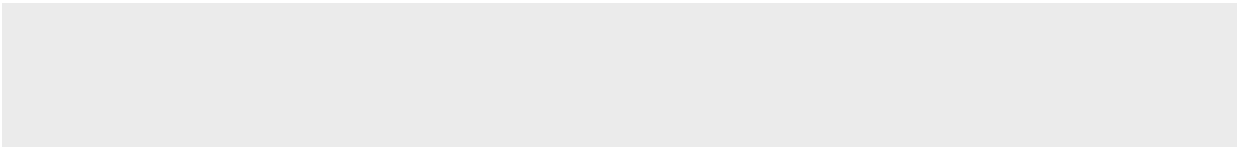
table C.5: Interpretation devices

Product code	Product description	Refer to
DCN-IDESK-L	Interpreter desk for 32 channels	Page 204
DCN-IDESK-D	Interpreter desk for 32 channels, dark	Page 204

C.6   Peripheral devices

table C.6: Peripheral devices

Product code	Product description	Refer to
LBB4157/00	Card encoder	Page 269
LBB4159/00	Chip cards	Page 270
DCN-DDB	Data distribution board	Page 256

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