

# DCN Next Generation



Security Systems

en | Installation and User Instructions  
Digital Congress Network

**BOSCH**



## Important Safeguards

Prior to installing or operating this product, always read the Important Safety Instructions which are available as a separate document (9922 141 7014x).

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# Table of Contents

|                                             |           |
|---------------------------------------------|-----------|
| <b>Important Safeguards</b>                 | <b>3</b>  |
| <b>Table of Contents</b>                    | <b>5</b>  |
| <b>Section 1 - Introduction</b>             | <b>9</b>  |
| 1. About this manual                        | 11        |
| 1.1 Purpose                                 | 11        |
| 1.2 Intended audience                       | 11        |
| 1.3 Hyperlinks                              | 11        |
| 1.4 Related documentation                   | 11        |
| 1.5 Alerts                                  | 11        |
| 1.6 Signs                                   | 12        |
| 1.7 Conversion tables                       | 12        |
| 2. Digital Congress Network Next Generation | 13        |
| 2.1 Introduction                            | 13        |
| 2.2 Modular system approach                 | 13        |
| 2.3 Advanced digital technology             | 13        |
| 2.4 Audio quality                           | 13        |
| 2.5 Reduced installation costs              | 13        |
| 2.6 Simplified wiring                       | 15        |
| 2.7 Central control unit                    | 16        |
| 2.8 Interpretation equipment                | 16        |
| 3. Glossary                                 | 17        |
| <b>Section 2 - Interpretation Equipment</b> | <b>19</b> |
| 4. LBB4120/00 Interpreter Desk              | 21        |
| 4.1 Introduction                            | 21        |
| 4.2 Controls, connectors and indicators     | 21        |
| 4.3 Connections                             | 24        |
| 4.4 Operation                               | 26        |
| 4.5 Programming                             | 33        |
| 4.6 Technical data                          | 39        |
| 5. LBB4124/xx Channel Selector              | 40        |
| 5.1 Introduction                            | 40        |
| 5.2 Controls, connectors and indicators     | 40        |
| 5.3 Connections                             | 42        |
| 5.4 Mounting                                | 45        |
| 5.5 Configuration                           | 45        |
| 5.6 Technical data                          | 47        |
| 5.7 Headphones                              | 47        |
| 6. LBB4149/xx Pluggable Microphone          | 48        |
| 6.1 Introduction                            | 48        |
| 6.2 Controls, connectors and indicators     | 48        |
| 6.3 Connections                             | 49        |
| 6.4 Operation                               | 49        |
| 6.5 Technical Data                          | 49        |
| 7. LBB4112/00 Data Distribution Board       | 50        |
| 7.1 Introduction                            | 50        |
| 7.2 Controls, connectors and indicators     | 50        |

|                                                    |                                            |           |
|----------------------------------------------------|--------------------------------------------|-----------|
| 7.3                                                | Connections .....                          | 51        |
| 7.4                                                | Configuration .....                        | 53        |
| 7.5                                                | Applications .....                         | 54        |
| 7.6                                                | Mounting .....                             | 58        |
| 7.7                                                | Technical data .....                       | 58        |
| <b>Section 3 - Central Control Equipment .....</b> |                                            | <b>59</b> |
| 8.                                                 | LBB4100/00(D) Central Control Unit .....   | 61        |
| 8.1                                                | Introduction .....                         | 61        |
| 8.2                                                | Controls, connectors and indicators .....  | 61        |
| 8.3                                                | Connections .....                          | 64        |
| 8.4                                                | Mounting .....                             | 68        |
| 8.5                                                | Using the configuration menu .....         | 69        |
| 8.6                                                | Configuration and operation .....          | 71        |
| 8.7                                                | Technical Data .....                       | 75        |
| 9.                                                 | LBB4106/00(D) Extension Power Supply ..... | 77        |
| 9.1                                                | Introduction .....                         | 77        |
| 9.2                                                | Controls, connectors and indicators .....  | 77        |
| 9.3                                                | Connections .....                          | 78        |
| 9.4                                                | Mounting .....                             | 80        |
| 9.5                                                | Technical data .....                       | 80        |
| 10.                                                | LBB4402/00 Analogue Audio Expander .....   | 81        |
| 10.1                                               | Introduction .....                         | 81        |
| 10.2                                               | Controls, connectors and indicators .....  | 81        |
| 10.3                                               | Connections .....                          | 82        |
| 10.4                                               | Mounting .....                             | 85        |
| 10.5                                               | Using the configuration menu .....         | 86        |
| 10.6                                               | Configuration and operation .....          | 88        |
| 10.7                                               | Technical Data .....                       | 93        |
| <b>Section 4 - Installation Accessories .....</b>  |                                            | <b>97</b> |
| 11.                                                | LBB4114/00 Trunk Cable Splitter .....      | 99        |
| 11.1                                               | Introduction .....                         | 99        |
| 11.2                                               | Controls, connectors and indicators .....  | 99        |
| 11.3                                               | Connections .....                          | 99        |
| 11.4                                               | Mounting .....                             | 99        |
| 11.5                                               | Technical data .....                       | 100       |
| 12.                                                | LBB4115/00 Tap-off Unit .....              | 101       |
| 12.1                                               | Introduction .....                         | 101       |
| 12.2                                               | Controls, connectors and indicators .....  | 101       |
| 12.3                                               | Connections .....                          | 101       |
| 12.4                                               | Mounting .....                             | 101       |
| 12.5                                               | Technical data .....                       | 102       |
| 13.                                                | LBB4116/xx Extension Cables .....          | 103       |
| 13.1                                               | Introduction .....                         | 103       |
| 13.2                                               | Connectors .....                           | 103       |
| 13.3                                               | Wiring .....                               | 103       |
| 13.4                                               | Custom-made cables .....                   | 104       |
| 14.                                                | LBB4117/00 Cable Locking Clamps .....      | 105       |
| 15.                                                | LBB4118/00 Termination Plug .....          | 106       |

|                                                    |            |
|----------------------------------------------------|------------|
| 16. LBB4125/00 End Caps .....                      | 107        |
| 17. LBB4127/00 Couple Pieces .....                 | 108        |
| 18. LBB4410/00 Network Splitter .....              | 109        |
| 18.1 Introduction .....                            | 109        |
| 18.2 Controls, connectors and indicators .....     | 109        |
| 18.3 Connections .....                             | 111        |
| 18.4 Mounting .....                                | 112        |
| 18.5 Operation .....                               | 112        |
| 18.6 Technical data .....                          | 112        |
| 19. LBB4414/00 Fiber Interface .....               | 113        |
| 19.1 Introduction .....                            | 113        |
| 19.2 Controls, connectors and indicators .....     | 113        |
| 19.3 Connections .....                             | 114        |
| 19.4 Mounting .....                                | 115        |
| 19.5 Operation .....                               | 116        |
| 19.6 Technical data .....                          | 116        |
| 20. LBB4416/xx Network Cables .....                | 117        |
| 20.1 Introduction .....                            | 117        |
| 20.2 Connectors .....                              | 117        |
| 20.3 Diagrams .....                                | 117        |
| 20.4 Wiring .....                                  | 118        |
| 20.5 Custom-made cables .....                      | 118        |
| 20.6 Technical data .....                          | 118        |
| 21. LBB4417/00 Network Connectors .....            | 119        |
| 22. LBB4118 Cable-connector Tool Kit .....         | 120        |
| 22.1 Introduction .....                            | 120        |
| 22.2 Contents .....                                | 120        |
| 22.3 Diagrams .....                                | 120        |
| 22.4 Creating optical network cables .....         | 121        |
| 23. LBB4419/00 Cable Couplers .....                | 125        |
| <b>Section 5 - System Installation .....</b>       | <b>127</b> |
| 24. Environmental conditions and maintenance ..... | 129        |
| 24.1 System .....                                  | 129        |
| 24.2 Public areas .....                            | 129        |
| 24.3 Technical rooms .....                         | 129        |
| 24.4 Ventilation .....                             | 130        |
| 24.5 Cleaning .....                                | 130        |
| 24.6 Storage .....                                 | 130        |
| 25. Flush-mounting .....                           | 131        |
| 25.1 Introduction .....                            | 131        |
| 25.2 Snap-mounting .....                           | 131        |
| 25.3 Block-mounting .....                          | 132        |
| 26. DCN Design .....                               | 134        |
| 26.1 Introduction .....                            | 134        |
| 26.2 Concepts .....                                | 134        |
| 26.3 Limitations .....                             | 134        |
| 26.4 Control capacity .....                        | 135        |
| 26.5 Power capacity .....                          | 135        |

|      |                                                      |            |
|------|------------------------------------------------------|------------|
| 26.6 | Tap-offs .....                                       | 136        |
| 26.7 | Loop-throughs .....                                  | 136        |
| 26.8 | Cable lengths .....                                  | 137        |
| 27.  | Optical network design .....                         | 139        |
| 27.1 | Introduction .....                                   | 139        |
| 27.2 | Limitations .....                                    | 139        |
| 27.3 | Control capacity .....                               | 139        |
| 27.4 | Power capacity .....                                 | 139        |
| 27.5 | Cabling .....                                        | 141        |
| 27.6 | Example layouts .....                                | 143        |
| 28.  | Interconnecting Interpretation Equipment .....       | 145        |
| 28.1 | Interpreter desks .....                              | 145        |
| 28.2 | Booths .....                                         | 145        |
| 29.  | Wireless Language Distribution .....                 | 146        |
|      | <b>Section 6 - System Set-up and Operation .....</b> | <b>147</b> |
| 30.  | Initialization .....                                 | 149        |
| 30.1 | Introduction .....                                   | 149        |
| 30.2 | Stand-alone system .....                             | 149        |
| 30.3 | PC based system .....                                | 149        |
| 31.  | DCN Configuration .....                              | 150        |
| 32.  | PC Control .....                                     | 151        |
| 32.1 | Requirements .....                                   | 151        |
| 32.2 | Connecting to the CCU .....                          | 151        |
| 32.3 | Connecting peripheral devices .....                  | 151        |
|      | <b>Section 7 - Appendices .....</b>                  | <b>153</b> |
| A    | Kycon KPP-4P connector .....                         | 155        |

# Section 1 - Introduction

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# 1 About this manual

## 1.1 Purpose

The purpose of the Installation and User Instructions is to provide information required to install and operate the Digital Congress Network Next Generation (DCN NG).

## 1.2 Intended audience

This manual is primarily intended for installers who are responsible for the installation and configuration of a DCN NG system. Besides information required to install the system, this manual also contains operating instructions. These are intended for the users of the system.

## 1.3 Hyperlinks

The Installation and User Instructions are also available as a digital document in the Adobe Portable Document Format (PDF). All references to pages, figures, tables, etc. in this digital document contain hyperlinks to the referenced location.

## 1.4 Related documentation

The following related documents are available:

- LBB4190/00 DCN Start-up Software User Manual (9922 141 7051xen).
- LBB4187/00 Open Interface Software User Manual (9922 7048xen)
- LBB4185/00 System Installation Software User Manual (9934 141 7046xen).
- LBB4172/00 Simultaneous Interpretation Software User Manual (9925 141 7036xen).

## 1.5 Alerts

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

- **Note**

Alert containing additional information. Usually, not observing a note alert does not result in damage to the equipment or personal injuries.

- **Caution**

The equipment can be damaged if the alert is not being observed.

- **Warning**

Persons can be (severely) injured or the equipment can be seriously damaged if the alert is not being observed.

- **Danger**

Not observing the alert can result in death.

## 1.6 Signs

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



### Note

General sign for notes.



### Note

Consult the indicated source of information.



### Caution, Warning, Danger

General sign for cautions, warnings and dangers.



### Caution, Warning, Danger

Risk of electric shock.



### Caution, Warning, Danger

Risk of electrostatic discharges.

## 1.7 Conversion tables

In this manual, SI units are used to express lengths, masses, temperatures etc.. These can be converted to non-metric units using the information provided below.

table 1.1: 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 1.2: Conversion of units of mass

|        |           |        |           |
|--------|-----------|--------|-----------|
| 1 lb = | 0.4536 kg | 1 kg = | 2,2046 lb |
|--------|-----------|--------|-----------|

table 1.3: Conversion of units of mass

|         |           |         |            |
|---------|-----------|---------|------------|
| 1 psi = | 68.95 hPa | 1 hPa = | 0.0145 psi |
|---------|-----------|---------|------------|



### Note

1 hPa = 1 mbar.

table 1.4: Conversion of units of temperature

|                                                |                                                  |
|------------------------------------------------|--------------------------------------------------|
| $^{\circ}F = \frac{9}{5} \cdot ^{\circ}C + 32$ | $^{\circ}C = \frac{5}{9} \cdot (^{\circ}F - 32)$ |
|------------------------------------------------|--------------------------------------------------|



## 2 Digital Congress Network Next Generation

### 2.1 Introduction

The Bosch Digital Congress Network Next Generation (DCN NG) brings the benefits of innovative digital technology to discussion, conference and congress systems. Digital signal processing and transmission via a simple network system not only offers great improvements in audio quality, but simplifies operation and installation. The control system has the option of modern, user-friendly software to set-up and control conferences, although it is just as easy to run an operator-free configuration.

### 2.2 Modular system approach

By simply daisy-chaining the modular units, any configuration can be put together. The modular structure of the system means all levels of conferences can be catered for without any difficulty. Systems can be expanded by adding more contribution equipment and introducing PC control with software modules.

### 2.3 Advanced digital technology

Signal transmission and processing is handled by proven digital audio technology. This technology is implemented into dedicated ICs handling digital audio processing as well as analogue-to-digital and digital-to-analogue conversion. Other ICs specially developed for this application include dedicated protocol converter chips. The system combines the highest levels of functionality and performance in an extremely compact design.

The diagram (see figure 2.1) shows how the 'building blocks' of the system fit together. The Audio Communication Network (ACN) family of protocol converter chips are simply connected to the network cabling carrying the digital signal.

The dedicated logical ICs in combination with analogue-to-digital and digital-to-analogue converters convert the digital signal from the system to audio, and convert the contributor's audio signal to digital, ready for protocol conversion by the ACN chip.

### 2.4 Audio quality

The result of this advanced digital technology is excellent audio performance with no loss in signal quality or level during transmission. Subsequently, each delegate receives an audio signal of consistently high quality, which makes a significant contribution to speech intelligibility. DCN NG virtually eliminates problems associated with analogue systems, such as background noise, interference, distortion and crosstalk.

### 2.5 Reduced installation costs

Fast, cost-saving installation is an important benefit of DCN NG digital technology. A thin, flexible, twin-coaxial cable carries all the system's digital signals, therefore eliminating the need for costly and vulnerable multi-core cables used in conventional analogue installations. This twin-coaxial cable can easily be run through existing ducting and cable conduits. It can simultaneously carry up to 32 high-quality contribution channels and 32 high-quality distribution channels.

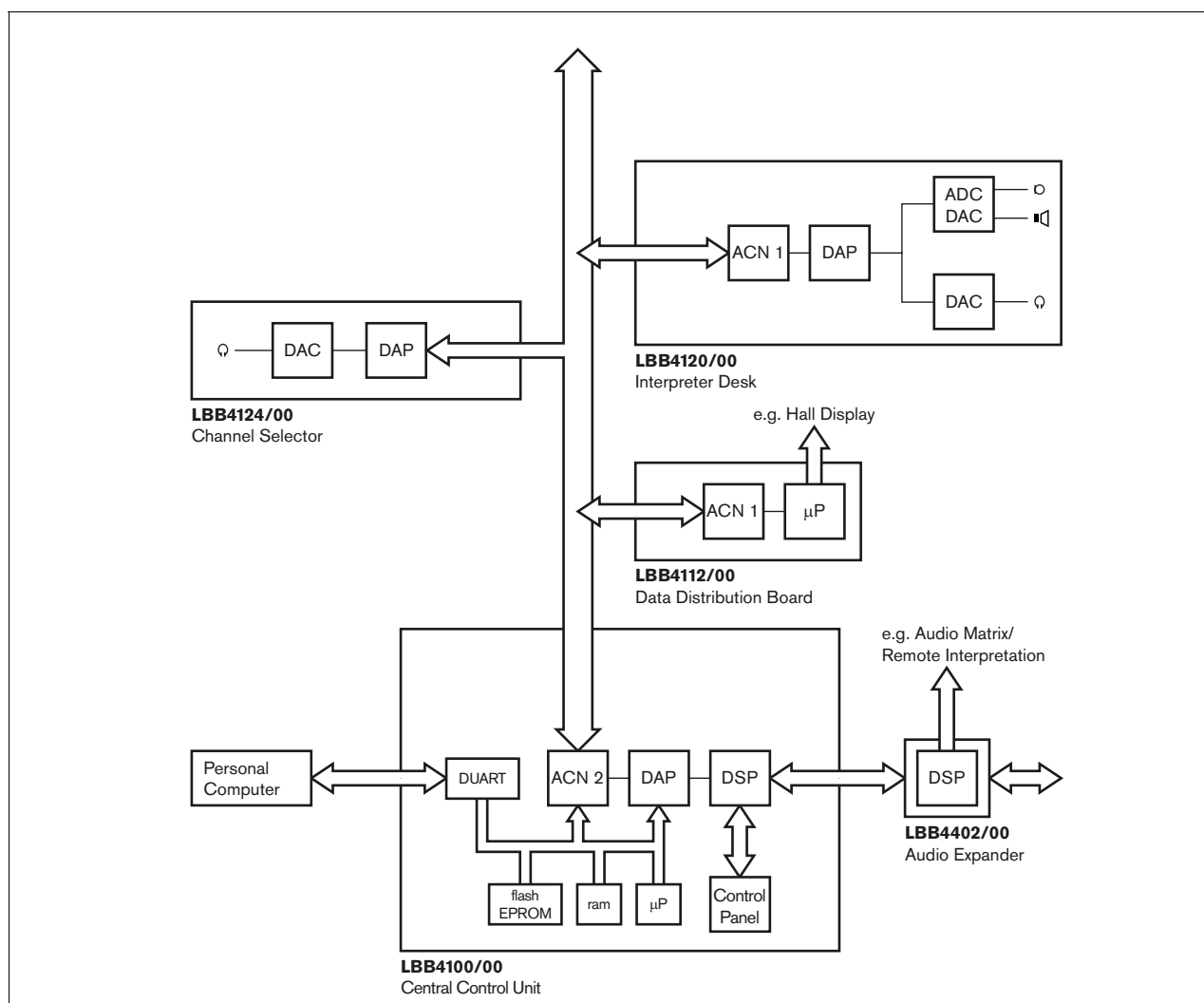


figure 2.1: Building blocks of DCN NG

## 2.6 Simplified wiring

Gone are the days of complex wiring through bulky trunking. The system overview (see figure 2.2) shows the cables used in the system. The DCN cables are used to transport all signals to all contribution and interpretation units throughout the system, and can be 'tapped' at any desired point to connect extra contribution units or other equipment, thus giving rise to a 'branched-tree' topology. In this way, future extensions to the system capacity, such as adding extra microphone units, do not require alterations to the existing system cabling. The power is also supplied to all units via two wires in the same cable. The central control equipment communicates over an optical fiber network. This network can also be 'tapped' at any point and therefore brings the same advantages as the DCN cabling.

Installation is further simplified and speeded up by the use of splitters and ready-made cables with sturdy, moulded connectors, thus allowing easy insertion of contribution equipment at any desired point in the system cabling. These easy-to-connect accessories are used for both fixed and portable installations, making DCN NG a versatile system that can be installed quickly and efficiently in any conference situation.

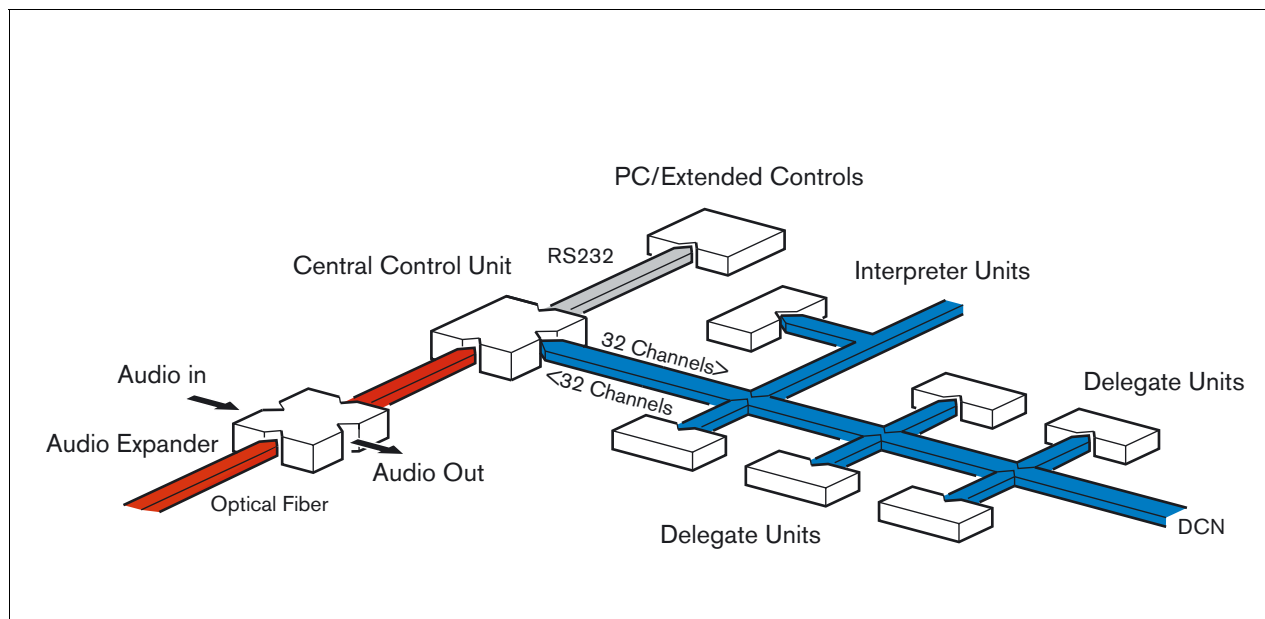


figure 2.2: System overview

## 2.7 Central control unit

The Central Control Unit (CCU) forms the heart of the congress management system. The CCU can operate stand-alone to provide automatic conference control, or be accessed by an operator via a PC when more extensive management is required.

## 2.8 Interpretation equipment

The system offers comprehensive facilities for simultaneous interpretation and distribution of the interpretations to conference participants, which allows it to meet the demands of international, multi-lingual conferences and congresses.

All interpretation facilities are fully integrated into the basic system concepts, with the digital distribution of the interpretations using the same trunk-line cabling as all other system functions. It is therefore a relatively simple task to integrate language facilities into existing systems.

The simultaneous interpretation system enables direct or auto-relay interpretation modes to cater for less well-known languages. Each interpreter desk has an output for the normal (primary) language and another for alternative languages.

### 3 Glossary

#### A

**ACN1, ACN2**

Network protocol chips.

**Active unit**

A unit that sends data on the uplink to the CCU and receives data on the downlink from the CCU.

#### C

**CCU**

See: Central Control Unit.

**Central control equipment**

Category of congress system equipment that is related to the central control of the system.

**Central Control Unit**

Piece of equipment that transmits, receives and processes multi-channel uplink, downlink and control data.

**CMRR**

Common mode rejection ratio.

#### D

**DAP**

Digital Audio Processor.

**dB**

Decibel.

**DCE**

Data Communication Equipment. Term used in RS232 communication protocol.

**DCN**

Digital Congress Systems that enables the central control unit to communicate with the interpretation and distribution equipment.

**DCN NG**

Digital Congress Network Next Generation. Digital congress system of Bosch Security Systems.

**DTE**

Data Terminal Equipment. Term used in RS232 communication protocol.

#### E

**ESD**

Electrostatic Discharge. This might damage electronic components.

**Extension cable**

Cable that is used to extend DCN cables.

#### F

**Flush-mounting**

Mounting a unit into a tabletop or an armrest of a seat.

#### G

**GOF**

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

#### I

**Information display**

Display showing information related to the conference or discussion.

**Interlock modes**

Pre-programmed settings for use in interpretation procedures.

**Interpretation**

Art of interpreting one language into another language.

**Interpretation (simultaneous)**

Art of interpreting one language into another language at the same time.

**Interpretation equipment**

Category of congress system equipment that is related to interpretation.

**Interpreter**

Person who translates orally for people speaking in different languages.

## L

**LCD**

Liquid Crystal Display. Type of display.

**LED**

Light Emitting Diode. Electronic component frequently used as indicator.

## M

**MMP**

Processor taking care of the communication and audio processing on the optical network of the system.

## P

**Passive unit**

A unit that only receives data on the downlink. An unlimited number of these units can be connected to a system.

**PC**

Personal Computer.

**PCB**

Printed Circuit Board.

**POF**

Plastic Optical Fiber. Type of fiber that is used to cover distances < 50 m in the optical network of the congress system.

## T

**Tap-off**

Network branch.

**Tap-off socket**

Socket that is used to create a branch in a network and that regenerates the network signal.

**Trunk**

Main cable run of a network.

**Trunk socket**

Socket that is used to loop a unit through in a network.

## Section 2 - Interpretation Equipment

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## 4 LBB4120/00 Interpreter Desk

### 4.1 Introduction

The LBB4120/00 Interpreter Desk is a single-user interpreter desk. It can accommodate up to 31 interpretation channels and the original floor language. A maximum of six desks can be installed per booth.

### 4.2 Controls, connectors and indicators

#### 4.2.1 Top view

The top of the desk (see figure 4.1) contains the following:

- 1 **Beep** - A key to toggle on and off audio beeps (see section 4.4.12). This function is intended for blind interpreters.
- 2 **Select knob** - A rotary push button to program and operate the desk (see section 4.4).
- 3 **LCD Display** - A 264x32 pixel graphic LCD display is used as an interactive display to program and operate the desk (see section 4.4).
- 4 **Preselected incoming channel** - Five keys for quick access to preselected incoming channels (see section 4.4.5).
- 5 **Output selection** - Two keys to select the output (see section 4.4.8). Each output has an *Engaged* LED to indicate which channel is engaged.
- 6 **Microphone connector** - A connector for connecting a pluggable microphone of type LBB4149/xx (see chapter 6).
- 7 **Telephone call indicator** - A yellow LED that indicates incoming phone calls from an external telephone system (see section 4.3.5).
- 8 **Intercom call indicator** - A yellow LED that indicates incoming external and internal intercom calls (see section 4.3.5).
- 9 **Message** - For future use.
- 10 **Intercom operator** - For future use.
- 11 **Treble** - A rotary knob to control the high tones of the headphones.
- 12 **Bass** - A rotary knob to control the low tones of the headphones.
- 13 **Headphones volume** - A rotary knob to control the volume of the headphones.

14 **Loudspeaker volume** - A rotary knob to control the volume of the loudspeaker.

15 **Loudspeaker** - The loudspeaker is only active when the microphones of all interpreter desks in the same booth are off (see section 4.4.3).

16 **Floor key** - A key to toggle between floor and auto-relay. Next to the key are two green LEDs that indicate whether floor or auto-relay has been selected (see section 4.4.4).

17 **Micro** - A key to toggle between microphone on and microphone off. If the microphone is on, a red LED ring around the key lights up. If all microphones in the booth are off, a green LED ring around the key lights up.

18 **Mute** - A key to mute the microphone as long as it is pressed.

19 **Help** - A key to activate an external indicator to request for help (see section 4.4.10).

20 **Speak slowly** - A key to activate an external indicator to request the current speaker to speak slower (see section 4.4.9).

21 **Intercom chairman** - For future use.

#### 4.2.2 Left view

The left of the desk (see figure 4.2) contains the following:

- 22 **6.3 mm jack headphones socket** - A 6.3 mm jack socket intended for connecting stereo headphones (see section 4.3.4).
- 23 **Headset socket** - A 5 pole 180 degrees DIN socket intended for IEC 268-11 compliant headsets (see section 4.3.3).
- 24 **3.5 mm jack headphones socket** - A 3.5 mm jack socket intended for connecting stereo headphones (see section 4.3.4).

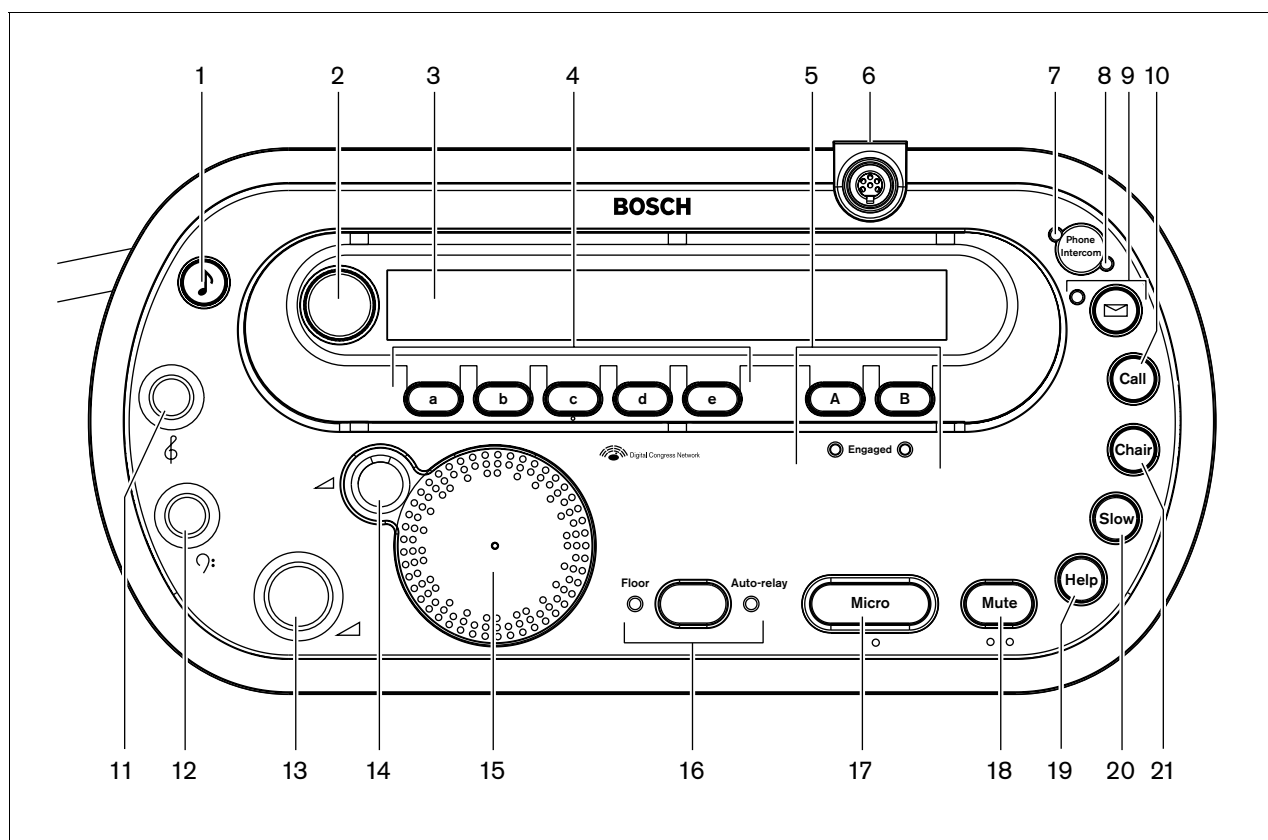


figure 4.1: Top view of the interpreter desk

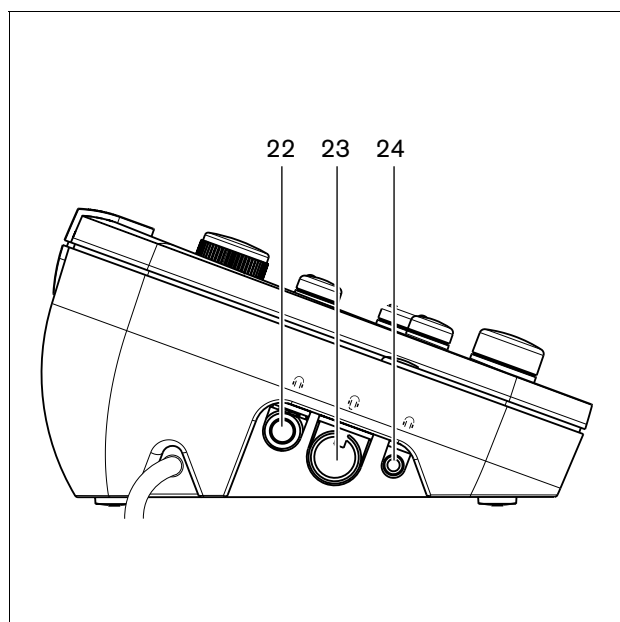


figure 4.2: Left view of the interpreter desk



#### Note

The interpreter desks has pimples which blind interpreters can use to locate the *Micro*, *Mute* and *c* keys (see figure 4.1).

### 4.2.3 Bottom view

The bottom of the desk (see figure 4.3) contains the following:

- 25 **DCN cable** - A 2 m long cable to connect the interpreter desk to the system. The cable is terminated with a moulded, male, 6-pole, circular connector (see section 4.3.2).
- 26 **External devices** - An RJ45 socket to connect a booth-on-air indication and to connect to devices that can activate the telephone and intercom indicators on the desk (see section 4.3.5).
- 27 **DCN socket** - A female, 6-pole, circular socket to loop the interpreter desk through (see section 4.3.2).

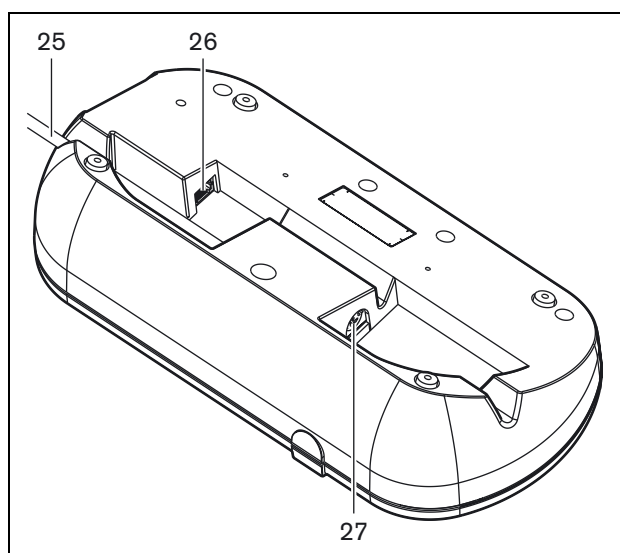


figure 4.3: Bottom view of the interpreter desk (1)

- 28 **De-init** - A recessed microswitch to reset the address of the unit (press briefly, see also chapter 30).
- 29 **Microphone volume** - A recessed potentiometer to adjust the volume of the microphone from -2 dB to 2 dB. The potentiometer adjusts the volumes of both the microphone connected to the desk and the microphone of the headset.

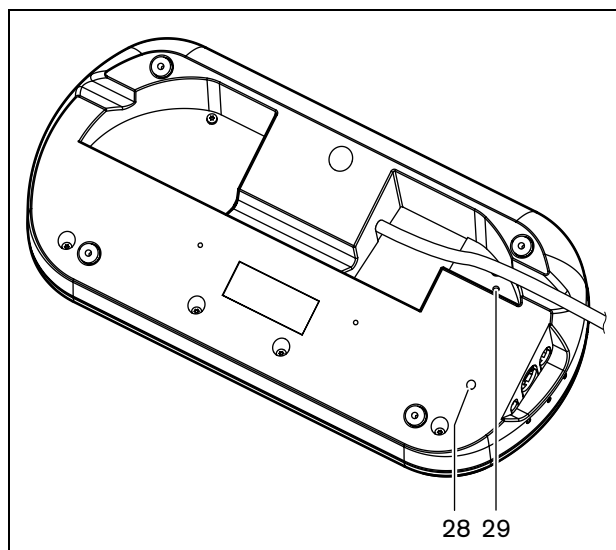


figure 4.4: Bottom view of the interpreter desk (2)

## 4.3 Connections

### 4.3.1 Introduction

This section gives an overview of typical system connections using the interpreter desk:

- Connecting to the system (see section 4.3.2).
- Connecting a headset (see section 4.3.3).
- Connecting headphones (see section 4.3.4).
- Connecting external devices (see section 4.3.5).

### 4.3.2 Connecting to the system

Use the DCN cable (see figure 4.3) to connect the interpreter desk to the system. The DCN socket is used to loop the interpreter desk through.

### 4.3.3 Connecting a headset

On the left side of the desk, a headset can be connected (see figure 4.2). The headset socket is intended for IEC 268-11 compliant headsets with a 5-pole 180° DIN connector.

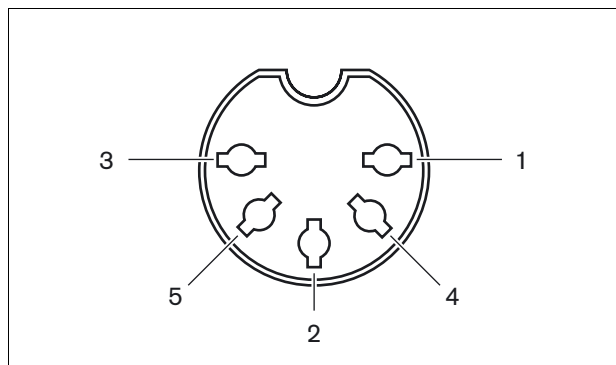


figure 4.5: Headset socket

table 4.1: Headset socket details

| Pin | Description          |
|-----|----------------------|
| 1   | Microphone supply    |
| 2   | Microphone in        |
| 3   | Headphones out left  |
| 4   | Headphones common    |
| 5   | Headphones out right |

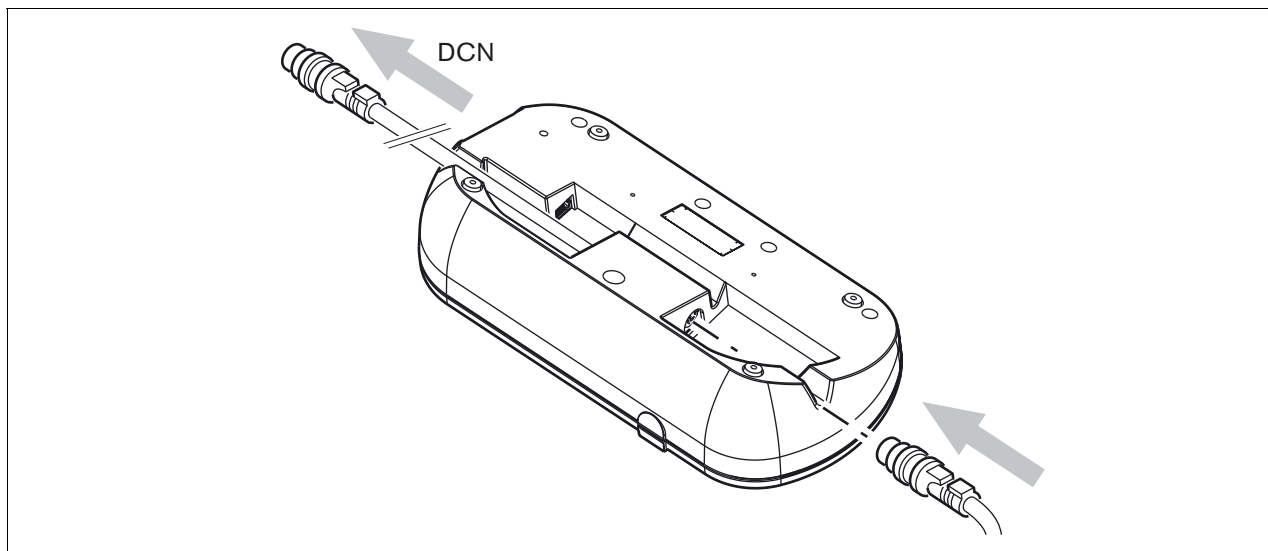


figure 4.6: Connecting to the system

### 4.3.4 Connecting headphones

On the left side of the desk, headphones can be connected (see figure 4.2). The jack plug of stereo headphones that are connected to the headphones sockets must comply to the following requirements:

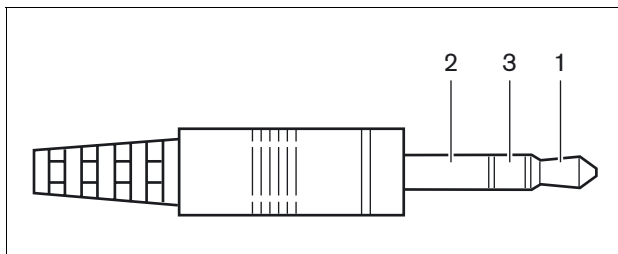


figure 4.7: 3.5 mm headphones jack plug

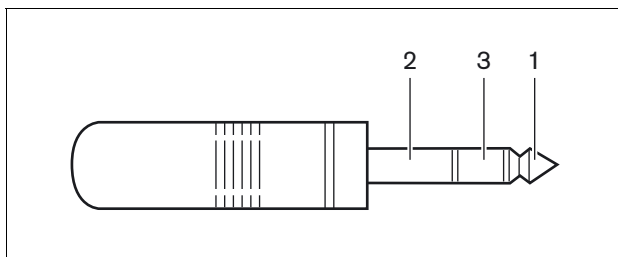


figure 4.8: 6.3 mm headphones jack plug

table 4.2: Headphones jack plug details

| Number | Signal       |
|--------|--------------|
| 1      | Signal left  |
| 2      | Common       |
| 3      | Signal right |

It is also allowed to use mono headphones.

### 4.3.5 Connecting external devices

The RJ45 socket on the bottom of the desk (see figure 4.3) is used to interface with a booth-on-air indication. When one or more microphones are active in a booth (i.e. the booth is active), a switch between pin 2 and pin 3 is closed.

The RJ45 socket can also be used to interface with devices that can activate the telephone call indicator (*Phone LED*) and intercom call indicator (*Intercom LED*) on the desk.

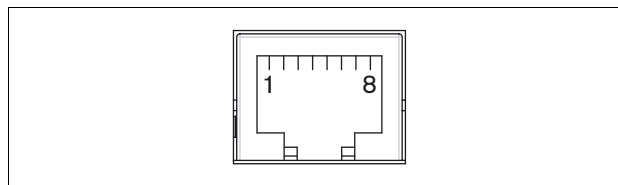


figure 4.9: RJ45 socket

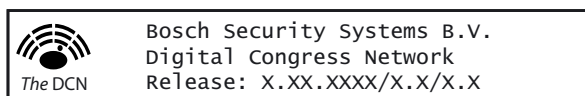
table 4.3: RJ45 socket details

| 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  |

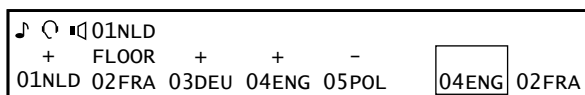
## 4.4 Operation

### 4.4.1 Introduction

Normally, the interpreter desk starts up when the CCU is switched on. First, the desk shows a screen that informs about its hardware and software versions. For example:

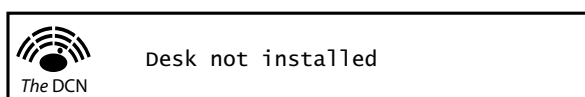


After a number of seconds, the operational mode is entered automatically if the desk has been programmed. For example:



The operational mode is the default mode for the interpreter desk. In the operational mode, the desk is divided into two main working sections: the listening section and the speech section. The listening section - the left side of the interpreter desk - includes headphones and loudspeaker monitoring facilities for listening to the floor and interpretation channels. The speech section - the right side of the interpreter desk - includes controls for the outputs.

If the desk has not been programmed, it shows the following screen to indicate it is not installed:



A 'not installed' desk cannot be put in the operational mode. It first must be programmed (see section 4.5).

### 4.4.2 Operational procedures

#### 4.4.2.1 Introduction

To cater for circumstances where the original floor language is either well-known or less well-known, two different operational procedures can be used:

- Normal interpretation (see figure 4.10).
- Relay interpretation (see figure 4.11).

#### 4.4.2.2 Normal interpretation

In the normal interpretation operation procedure (see figure 4.10), where the original floor language is familiar to all interpreters, they will listen to the original floor language for interpretation. The translations are then fed to the language distribution channels.

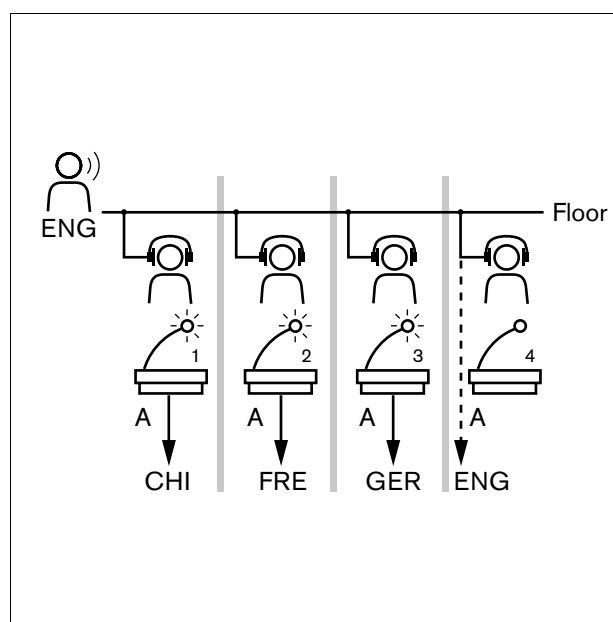


figure 4.10: Normal interpretation (floor active)

#### 4.4.2.3 Relay interpretation

In a situation where interpreters are unfamiliar with the floor language and therefore unable to interpret it, the system offers an automated relay facility (see figure 4.11). An interpreter assigned to translate the floor language, translates it into another language easily understood by other interpreters. The floor language on all interpreter desks is replaced by this transfer interpretation. This transfer interpretation or auto-relay is then used as the base for further translation. In the example in figure 4.11, the original floor language is Chinese. The auto-relay is enabled at the Chinese interpreter desk. This interpreter selects output B and automatically relays an English translation as auto-relay to all other desks for interpretation and also feeds the English language distribution channel. The incoming floor key indicator shows on all other desks that auto-relay is active.

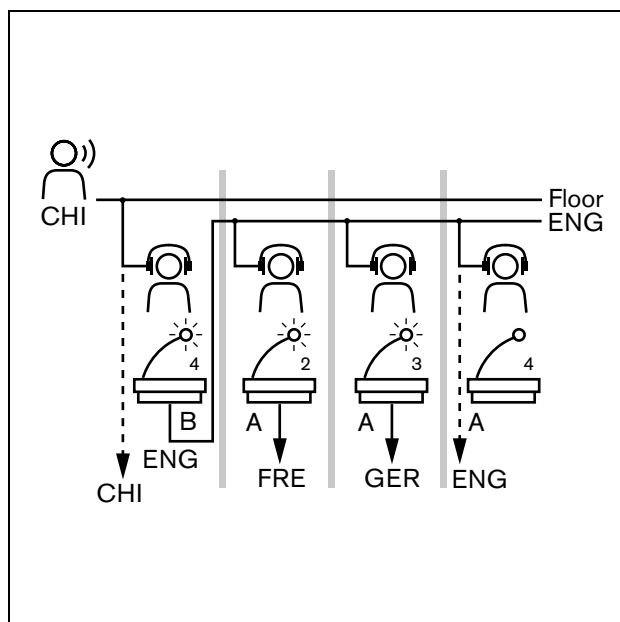


figure 4.11: Relay interpretation (auto-relay active)

#### 4.4.3 Loudspeaker source selection

To select a channel, rotate the select knob. To select the floor, press the select knob. When the desk is activated, the floor is automatically sent to the loudspeaker. The top line of the display shows the channel and language. For example:



#### Note

Loudspeaker channel selection is individual per desk and can differ per booth.

#### 4.4.4 Select the interpretation source

The source for interpretation is selected with the floor key (see figure 4.1). The key toggles between the following sources:

table 4.4: Interpretation source selection

| Source     | Description                                                                                                                                                                                                                                     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Floor      | The floor language is the source for interpretation. When selected, the floor LED lights up.                                                                                                                                                    |
| Auto-relay | If an auto-relay is available, the interpreter desk automatically switches to the auto-relay and the auto-relay LED lights up. Press the floor key to switch back to the floor. Press the floor key again to go back to auto-relay translation. |

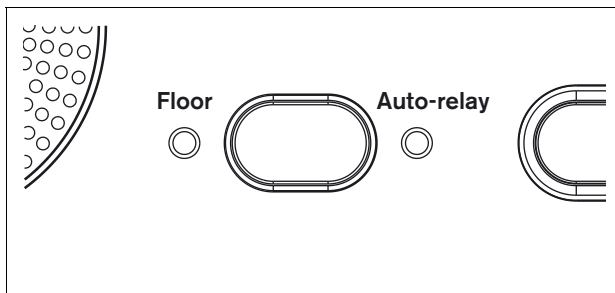


figure 4.12: Floor key and LEDs

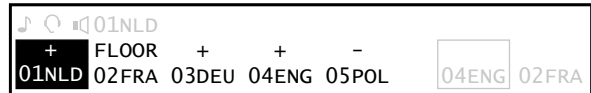


#### Note

When the desk is activated, the floor is automatically selected as the source. The last selected source is not stored when the desk is deactivated.

#### 4.4.5 Listen to a preselected channel

Press the desired preselect channel key (*a, b, c, d, e*) to listen to a preselected channel. The label above the pressed key is displayed in reverse text. For example:



It is possible for interpreters to switch to their own channel. However, in first instance, the desk regards this as a fault situation, because it is possible to have acoustical feedback between the headphones and the microphone connected to the interpreter desk. Instead of switching to the own channel when the microphone is switched on, the desk switches automatically to the floor. Select the own channel again to go to the own channel.

#### 4.4.6 Assigning a channel to a preselect channel key

The desk has 5 preselect channel keys (*a, b, c, d, e*). All keys can be set to one of the available channels, but not to the floor. To assign a channel to a preselect channel key, press-and-hold the preselect channel key and rotate the select knob to scroll to the desired channel. To assign channel 1 to a preselect channel key, press-and-hold the key and press the select knob.



#### Note

When the desk is switched to the installation mode and back to the operational mode again, the channel-key combinations are lost.



#### 4.4.7 View language quality of a channel

The language quality indication on the second line of the display gives the interpreter an at-a-glance quality indication of the preselected channels. For example:

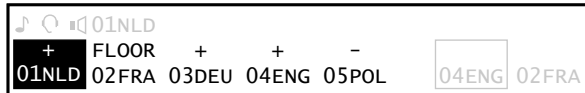


table 4.5: Language quality indication

| Indication | Description                                                              |
|------------|--------------------------------------------------------------------------|
| Floor      | The language is the original floor language.                             |
| +          | The language is a direct translation of the original floor language.     |
| -          | The language is not a direct translation of the original floor language. |



#### Note

When a channel with quality '-' is selected, a quality indication beep is audible on the headphones (only when beeps are enabled).

#### 4.4.8 Selecting an output

The desk has two output selection keys (A, B). Output A is normally reserved for the interpreter's most familiar outgoing language. The interpreter can select a second language for distribution on output B (if enabled). To select an output, press the A or B output selection keys. The label of the selected output is highlighted using a box. For example:



When the microphone is on, the label of the selected output is displayed in reverse text. For example:



The output A and output B *Engaged* LEDs (see figure 4.13) indicate when the relevant channels are engaged (see table 4.6).

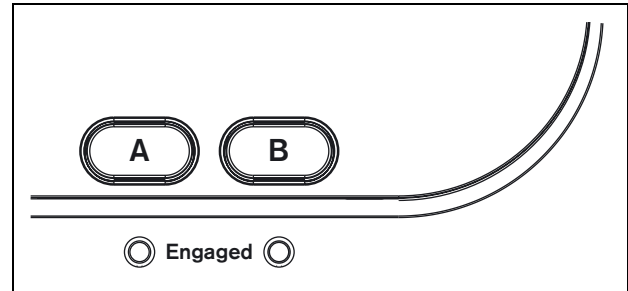


figure 4.13: Output selection keys and LEDs

table 4.6: Engaged LED

| Status           | Description                                             |
|------------------|---------------------------------------------------------|
| Continuously lit | The channel has been engaged on another desk.           |
| Blinking         | Translating to a channel that already has been engaged. |

To change the channel belonging to the B output, press-and-hold the B key, while selecting the desired channel using the select knob. Press the select knob in order to select the first available interpretation channel.

In the desk's installation mode, output B can be assigned with an auto-relay facility. See section 4.4.2 for background information about auto-relay interpretation.

#### 4.4.9 Request to speak slowly

To indicate the chairman or the current speaker to speak slowly, the interpreter desk provides the possibility to switch on an indicator at (for example) the chairman or speaker position (see section 4.5.6.12). Press-and-hold the *Slow* key to switch the indicator on (see figure 4.14). Release the *Slow* key to switch the indicator off. If the speak slowly function is available, the following text appears in the top line of the display:

```

Requesting current speaker to slow down
+ FLOOR + + - 
01NLD 02FRA 03DEU 04ENG 05POL 04ENG 02FRA
  
```

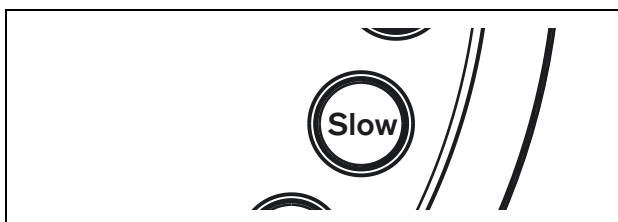


figure 4.14: Speak slowly key

If the speak slowly function is not available, the text *NOT AVAILABLE* is displayed in the top line of the display.

#### 4.4.10 Request for help

To indicate that assistance is needed, the interpreter desk provides the possibility to switch on an indicator at (for example) the chairman or operator position (see section 4.5.6.13). Press-and-hold the *Help* key to switch the indicator on (see figure 4.15). Release the *Help* key to switch the indicator off. If the request for assistance function is available, the following text appears in the top line of the display:

```

Requesting for help
+ FLOOR + + - 
01NLD 02FRA 03DEU 04ENG 05POL 04ENG 02FRA
  
```

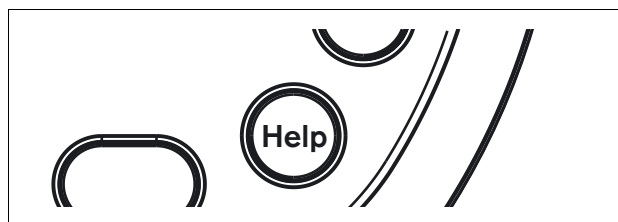


figure 4.15: Help key

If the request for assistance function is not available, the text *NOT AVAILABLE* is displayed in the top line of the display.

#### 4.4.11 Using the speech timer

If programmed (see section 4.5.6.14), a speech timer is available on the display.

```

01NLD 0:18:09
+ FLOOR + + - 
01NLD 02FRA 03DEU 04ENG 05POL 04ENG 02FRA
  
```

The timer resets to zero and starts counting when the microphone is switched from 'off' to 'on'. When the microphone is switched back to 'off', the timer stops and the time remains on the display.



#### Note

The mute key does not have any effect on the timer.

#### 4.4.12 Using the beep key

The interpreter desk can generate beeps for notification of special events to support blind interpreters (see table 4.7 and figure 4.17) on the headphones.



##### Note

The volume 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 beep key (see figure 4.16). When audio beeps are enabled, a musical note appears in the display:



figure 4.16: Beep key

table 4.7: Notification 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 (see 4.4.5) <b>OR</b> the quality of the selected channel is '-' (see 4.4.7). |
| 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).                                                               |



##### Note

Except for beep on and beep off, all beeps are only available when beeps have been enabled.

#### 4.4.13 Using a headset

If programmed for use in combination with a headset (see section 4.5.6.15), a headset icon is displayed:



The headset icon also appears when the microphone source has been set to automatic and a headset is detected.

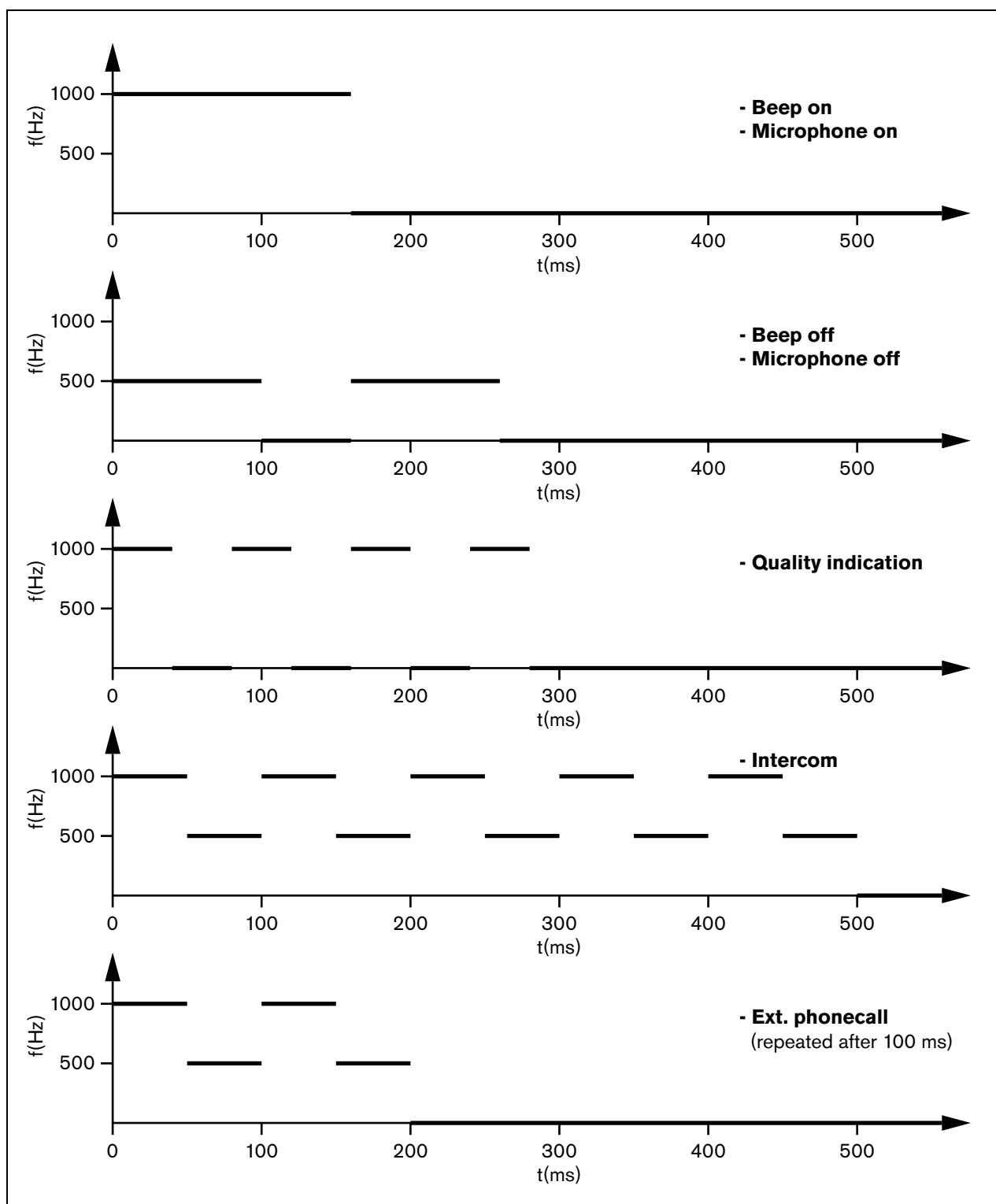


figure 4.17: Interpreter desk beep characteristics

## 4.5 Programming

### 4.5.1 Introduction

Prior to the start of a conference, the individual and interpretation system parameters of the interpreter desk can be set manually using the installation mode of the desk.

### 4.5.2 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 programmed, whereas other menus apply to all interpreter desks in the system.

table 4.8: Installation mode menus

| Menu | Description                 | Scope  |
|------|-----------------------------|--------|
| a    | User language               | System |
| b    | 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 supply booths    | System |
| l    | Microphone locks            | System |
| m    | Speak slowly signaling      | System |
| n    | Help signaling              | System |
| o    | Speech timer                | Desk   |
| p    | Microphone source           | Desk   |



#### Note

In PC based systems only menus *a*, *b*, *c*, *m*, *n*, *o* and *p* have to be programmed manually on each desk. All other menus can be programmed from the PC.



#### Note

PC based systems using the LBB4172/00 Simultaneous Interpretation Software Module have extended control and preset facilities as compared to a stand-alone interpretation system.



#### Note

A description of the LBB4172/00 Simultaneous Interpretation Software Module is beyond the scope of this manual. Refer for detailed information about this software to its own manual.

### 4.5.3 Entering the installation mode

The installation mode of the interpreter desk can be entered by simultaneously pressing the *b* preselect channel key and the *B* output selection key. Before attempting to program the desk, ensure that the system has been initialized (see chapter 30).

When the installation mode is entered, all text displayed is cleared from the display and the following screen becomes visible:

Installation mode. Use dial and <> [] to  
to change options, ← → to change page.



Because some installation mode screens affect all interpreter desks in the system, only one interpreter desk at a time can be in the installation mode. The following screen is shown when trying to enter the installation mode on other interpreter desks when one of the interpreter desks in the system already is in the installation mode:

Installation menu is in use by another  
interpreter desk or the system is busy.  
Please try again later.

### 4.5.4 Navigation in the installation mode

In the installation mode, only a limited number of controls are available (see table 4.9 and figure 4.1).

table 4.9: Controls in the installation mode

| Control                        | Function                   |
|--------------------------------|----------------------------|
| Select knob                    | Select menu option(s)      |
| Preselect channel key <i>a</i> | Go to the previous menu    |
| Preselect channel key <i>b</i> | Go to the next menu        |
| Preselect channel key <i>d</i> | Clear current selection    |
| Preselect channel key <i>e</i> | Enter current selection    |
| Output selection key <i>B</i>  | Exit the installation mode |

### 4.5.5 Programming procedures

Programming the interpreter desk involves selecting the desired options in the installation menus. In general, selecting another option takes the following steps:

- 1 Scroll to the required installation menu using the *a* and *b* preselect channel keys. The currently selected option is highlighted using square brackets. For example, [option].
- 2 Clear the current selection by pressing the *d* preselect channel key. The currently selected option then becomes highlighted using arrow brackets. For example, <option>. This indicates that another choice can be made using the select knob.
- 3 Rotate the select knob to scroll to the desired option. The selected entry is highlighted using arrow brackets. For example, <option>. After the desired, new option has been reached, enter the new option by pressing the *e* preselect channel key. The entered option is highlighted using square brackets [option].

### 4.5.6 Menu screens

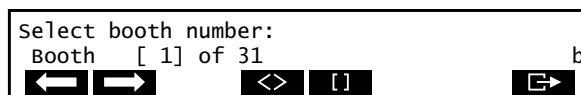
#### 4.5.6.1 Menu a - Language selection

This menu sets the language in which text is displayed on the display of the interpreter desk in the installation mode. Once set, this language is applicable for all interpreter desks in the system.



#### 4.5.6.2 Menu b - Booth number selection

This menu assigns the interpreter desk to a booth. It must be programmed for each interpreter desk individually.



#### Note

If a booth is full, no entry is possible and no response is given.

#### 4.5.6.3 Menu c - Desk number selection

This menu assigns a desk number to the unit within the selected booth. It must be programmed for each interpreter desk individually.

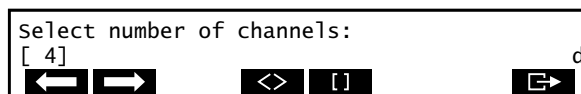


#### Note

If a desk number is already in use, no entry is possible and no response is given.

#### 4.5.6.4 Menu d - Number of channels selection

This menu selects the number of required language channels in the system. Once set, this number is applicable for all interpreter desks in the system.



#### 4.5.6.5 Menu e - Language list selection

This menu selects the list of language names (see table 4.11) and abbreviations that are used to display languages on the interpreter desk display. Once set, this list is applicable for all interpreter desks in the system.

#### 4.5.6.6 Menu f - Select language per channel

This menu assigns languages to the available channels. The number of channels to which a language can be assigned depends on the number of channels defined in menu d. The languages set in this menu are set for all interpreter desks in the system.

If the selected language already has been assigned to a channel, an asterisk appears in the display. For example:

#### 4.5.6.7 Menu g - Outgoing channel for A-output

This menu sets the channel number that is available on output A of the interpreter desk. This must be programmed for each interpreter desk individually.



#### Note

The booth number is the default channel number for output A.

#### 4.5.6.8 Menu h - Outgoing channel for B-output

This menu configures output B of the interpreter desk. This must be programmed for each interpreter desk individually. Output B can be configured either for none or all available channels.

#### 4.5.6.9 Menu j - Number of auto-relay booths

This menu sets the number of auto-relay booths in the system. Once set, this number is applicable for all interpreter desks in the system.

#### 4.5.6.10 Menu k - Select auto-relay booths

This menu specifies which booths are auto-relay booths. Once set, this is applicable for all interpreter desks in the system.

**4.5.6.11 Menu l - Microphone lock between booths**

This menu selects the desired interlock mode. Once set, it is applicable for all interpreter desks in the system.

Select microphone locks between booths:  
 [NONE] OVERRIDE INTERLOCK l  

← →
< >
[ ]
→

table 4.10: Microphone lock options

| Option    | Description                                                                                                       |
|-----------|-------------------------------------------------------------------------------------------------------------------|
| None      | No lock functionality.                                                                                            |
| Override  | Allows an interpreter to override another interpreter in another booth supplying the same interpretation channel. |
| Interlock | Block another interpreter from using the same channel in another booth.                                           |

**4.5.6.12 Menu m - Speak slowly signaling**

This menu switches speak slowly signaling on and off. Speak slowly signaling requires a data distribution board (LBB4112/00, see section 7.5.2).

Speak slowly signaling  
 [NO] YES m  

← →
< >
[ ]
→

**4.5.6.13 Menu n - Help signaling**

This menu switches help signaling on and off. Help signaling requires a data distribution board (LBB4112/00, see section 7.5.3).

Help signaling  
 [NO] YES n  

← →
< >
[ ]
→

**4.5.6.14 Menu o - Speech timer**

This menu switches the speech timer of the interpreter desk on and off. It must be programmed for each interpreter desk individually.

Display speech timer:  
 [NO] YES o  

← →
< >
[ ]
→

**4.5.6.15 Menu p - Microphone source**

This menu selects the microphone source. It must be programmed for each interpreter desk individually.

Select microphone source:  
 [AUTO] HEADSET MICROPHONE p  

← →
< >
[ ]
→

**4.5.6.16 Exit screen**

This menu explains how to exit the installation mode.

End, use → to return to operational mode.  

← →
< >
[ ]
→



## 4.5.7 Language list

table 4.11: 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 | noxçiy n 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 | islenska      | 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 |
| Serbian    | SER | serbe       | SER | srpski        | SRP |

table 4.11: Language list

| English    |            | French     |            | Original   |            |
|------------|------------|------------|------------|------------|------------|
| Slovak     | <i>SLO</i> | slovaque   | <i>SLO</i> | slovenský  | <i>SLK</i> |
| Slovenian  | <i>SLV</i> | slovène    | <i>SLV</i> | slovenski  | <i>SLV</i> |
| Spanish    | <i>SPA</i> | espagnol   | <i>ESP</i> | español    | <i>SPA</i> |
| Swedish    | <i>SWE</i> | suédois    | <i>SUE</i> | svenska    | <i>SWE</i> |
| Thai       | <i>THA</i> | thaï       | <i>THA</i> | thai       | <i>THA</i> |
| Turkish    | <i>TUR</i> | turc       | <i>TUR</i> | türkçe     | <i>TUR</i> |
| Ukrainian  | <i>UKR</i> | ukrainien  | <i>UKR</i> | ukraïns'ka | <i>UKR</i> |
| Vietnamese | <i>VIE</i> | vietnamien | <i>VIE</i> | Tiếng Việt | <i>VIE</i> |
| .....      | ...        | .....      | ...        | .....      | ...        |

**Note**

Dots (see last row of table 4.11) indicate that the desk has been configured for a language that is not in the list.

## 4.6 Technical data

### 4.6.1 Physical characteristics

**Dimensions (H x W x D):**

80 x 330 x 160 mm

**Weight:**

1.3 kg

### 4.6.2 Climate conditions

**Temperature:**

5 to 45 °C (operating)

-20 to 70 °C (transport, handling and storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (transport, handling and storage)

**Air pressure:**

600 to 1100 hPa

### 4.6.3 Power consumption

**Power consumption:**

3.5 W

### 4.6.4 DCN connections

**Number of connections:**

1x DIN-6 female DCN socket

1x DCN cable (2 m) with male connector

**Position:**

Bottom side

### 4.6.5 External devices socket

**Number of connections:**

1x RJ45 socket

**Position:**

Bottom side

**Maximum cable length:**

100 m

**Contact rating (booth-on-air contact):**

24 V/1 A potential free contact

**Signal levels for phone and intercom contacts:**

- < 1 V(DC) (no call)
- > 3 V(DC) (call)
- max. 24 V(DC)
- Optic galvanic separation

### 4.6.6 Headphones interface

**Number of connections:**

1x 3.5 mm jack socket

1x 6.3 mm jack socket

**Position:**

Left side

**Maximum output level:**

108 dB SPL (+ 9 dBV) per ear piece for the preferred headphones

**Minimum load impedance (per hairpiece):**

32 Ω

### 4.6.7 Headset interface

**Number of connections:**

1x IEC 268-11 5 pole 180° DIN socket

**Position:**

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

## 5 LBB4124/xx Channel Selector

### 5.1 Introduction

The LBB4124/xx Channel Selector is capable of retrieving the floor and up to 31 interpretation channels. It cannot handle intercom channels. The following types are available:

| Type       | Intended for                     |
|------------|----------------------------------|
| LBB4124/00 | Mounting in a horizontal surface |
| LBB4124/10 | Mounting in a vertical surface   |

## 5.2 Controls, connectors and indicators

### 5.2.1 Front view

The front of the channel selector (see figure 5.1) contains the following:

- 1 **Headphones output** - 3.5 mm jack socket to connect headphones.
- 2 **Volume control** - Two keys to control the volume of the headphones. When the maximum (minimum) volume is reached, pressing the volume up (down) key has no effect. The volume level is adjustable between -60 dB and 0 dB (60 steps). It is also possible to mute the volume. The default volume is -21 dB.
- 3 **Display** - Numeric display for channel number indication.
- 4 **Channel control** - Two keys (up, down) for channel selection.
- 5 **External headphones connector** - A 3-pin header to connect an extra headphones socket. The pin header is internally connected to solder pads (see section 5.2.3) that can be used for the same purpose. See section 5.3.4 for information about connecting an extra headphones socket.

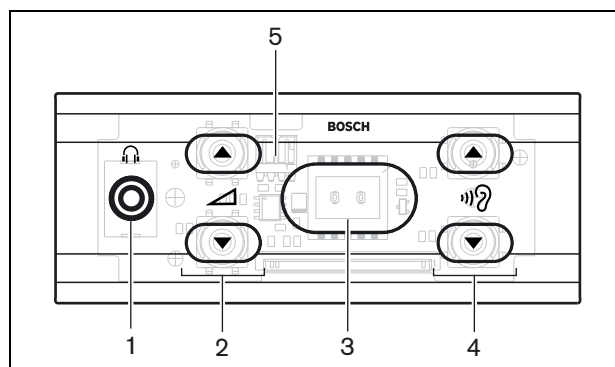


figure 5.1: Front view of the channel selector

### 5.2.2 Top view

The top of the channel selector (see figure 5.2) contains the following:

- 6 **DCN cable** - A 2 m long cable to connect the channel selector to the system. The cable is terminated with a moulded, male, 6-pole, circular connector (see section 5.3.2).
- 7 **DCN socket** - A female, 6-pole, circular socket to loop the channel selector through (see section 5.3.2).
- 8 **Solder spots** - Three solder spots to configure the channel selector (see section 5.5).
- 9 **Reduce output level** - A 2-pin header connector to reduce the output level of the channel selector. (see section 5.3.5).

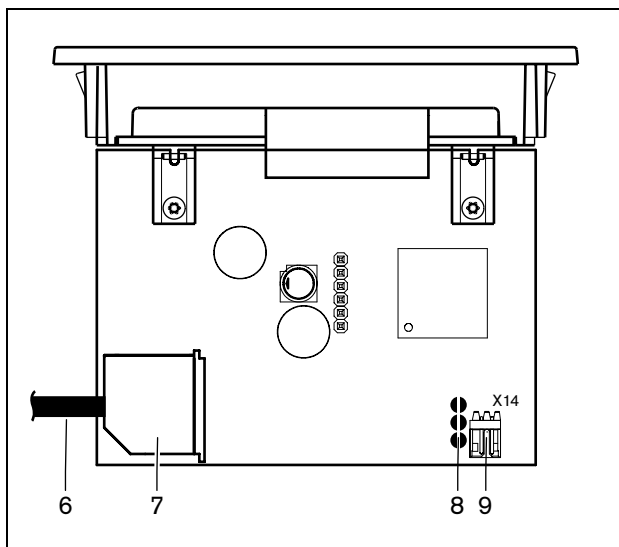


figure 5.2: Top view of the channel selector

### 5.2.3 Rear view

The rear of the channel selector (see figure 5.3) contains the following:

- 10 **Extra headphones connector** - Three solder pads to connect an extra headphones socket. These solder pads are internally connected to a 3-pin header (see section 5.2.1) that can be used for the same purpose. See section 5.3.4 for information about connecting an extra headphones socket.

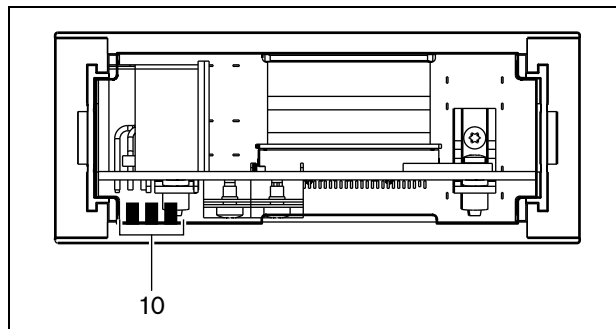


figure 5.3: Rear view of the channel selector

## 5.3 Connections

### 5.3.1 Introduction

This section gives an overview of typical system connections using the channel selector:

- Connecting to the system (see section 5.3.2).
- Connecting the headphones (see section 5.3.3).
- Connecting extra headphones sockets (see section 5.3.4).
- Connecting the output level reduction connector (see section 5.3.5).

### 5.3.2 Connecting to the system

Use the DCN cable (see figure 5.2) to connect the channel selector to the system. The DCN socket is used to loop the channel selector through.

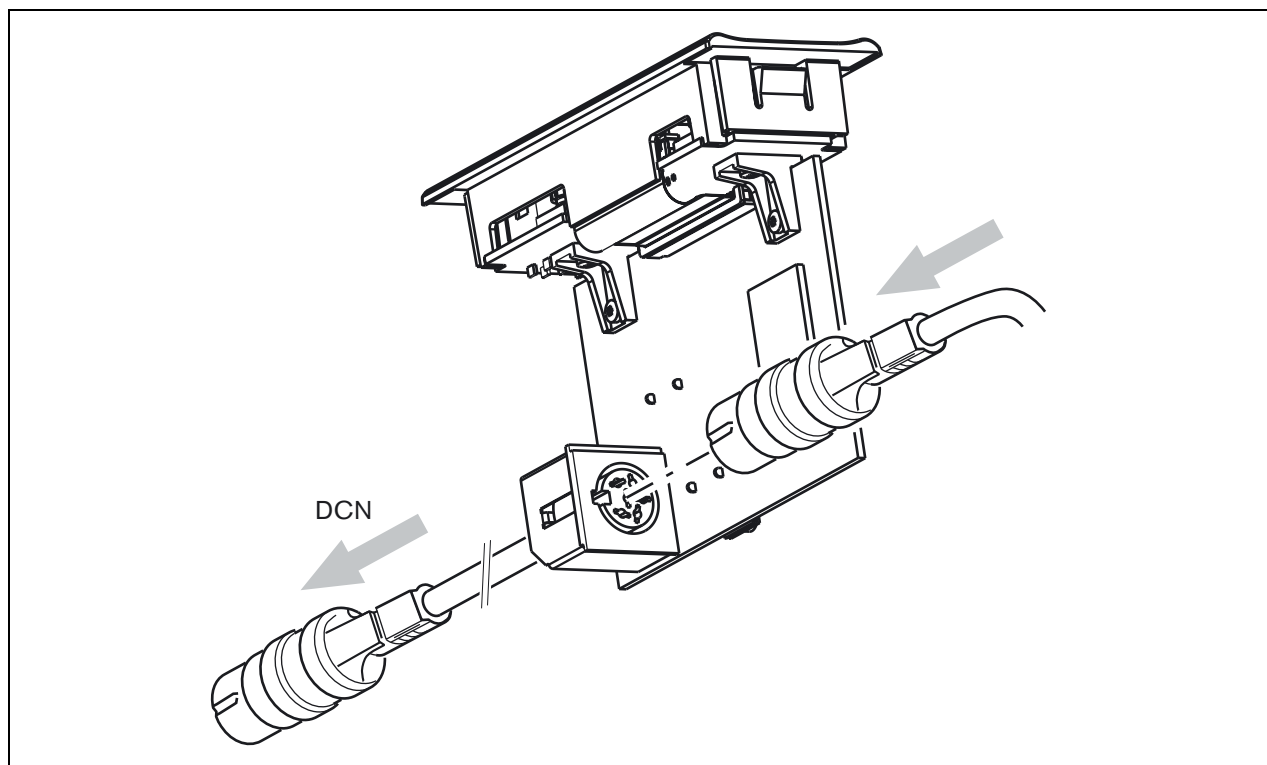


figure 5.4: Connecting to the system

### 5.3.3 Connecting the headphones

The 3.5 mm jack plug of the headphones that is connected to the headphones socket must comply to the following requirements:

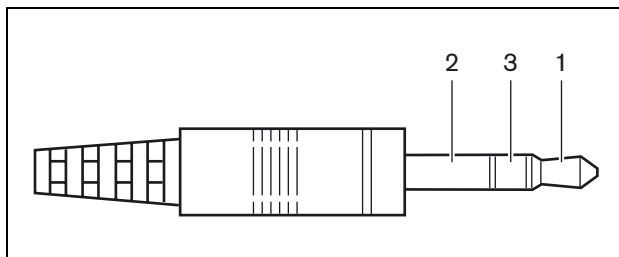


figure 5.5: 3.5 mm headphones jack plug

table 5.1: Headphones jack plug details

| Number | Signal       |
|--------|--------------|
| 1      | Signal left  |
| 2      | Common       |
| 3      | Signal right |



#### Note

Mono headphones are allowed. However, the output level can be lower than for similar stereo headphones.



#### Note

By default, the channel selector is automatically deactivated when the headphones are removed and the auto stand-by function has been enabled (see section 5.5.2).

### 5.3.4 Connecting extra headphones sockets

The channel selector has provisions for connecting extra headphones jack sockets (for example for a 6.3 mm socket). These provisions consist of a 3-pin header (see figure 5.6) and three solder pads (see figure 5.7).

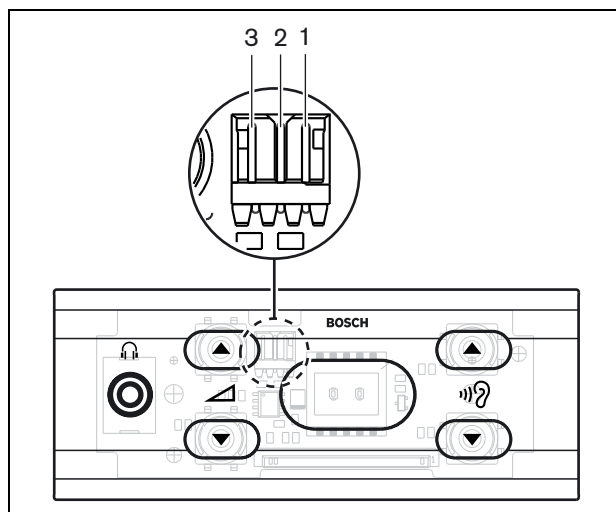


figure 5.6: Connecting extra headphones sockets (1)

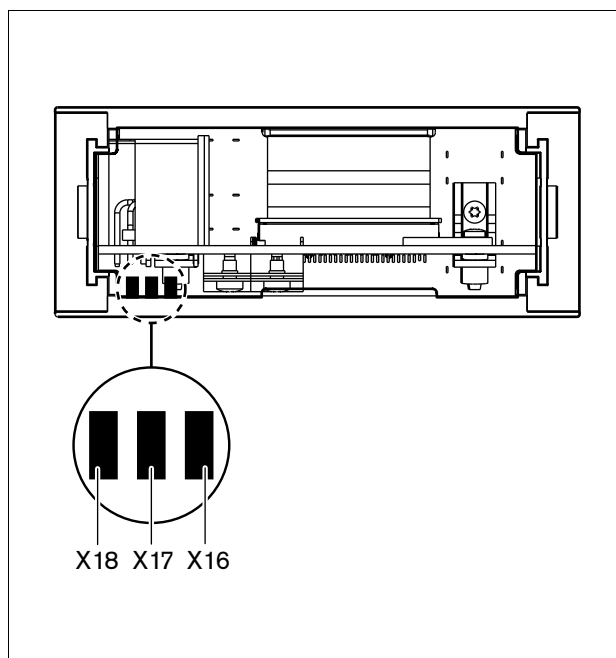


figure 5.7: Connecting extra headphones sockets (2)

The pin header and the solder pads are internally connected (see table 5.2).

table 5.2: Connecting extra headphones sockets

| Pin header | Solder pad | Signal       |
|------------|------------|--------------|
| 1          | X18        | Signal left  |
| 2          | X16        | Signal right |
| 3          | X17        | Common       |



#### Note

The type number of the socket that can be connected to the pin header is: AMP173977-3.



#### Note

Connecting headphones to the extra headphones socket provisions does not mute the headphones connected to the 3.5 mm jack socket on top of the channel selector.



#### Note

The channel selector is automatically deactivated when the headphones are removed and the auto stand-by function has been enabled. (see section 5.5.2).

### 5.3.5 Connecting the output level reduction connector

The reduce level output function is used to avoid acoustical feedback when the channel selector is used in combination with a microphone. It is activated by an external signal connected to X14 (see figure 5.8 and table 5.3)

table 5.3: Reduce output level connector X14

| Voltage | Description                                                                 |
|---------|-----------------------------------------------------------------------------|
| < 1 V   | The output level of the channel selector is not reduced.                    |
| > 3 V   | The output level of the channel selector is reduced by an additional 18 dB. |

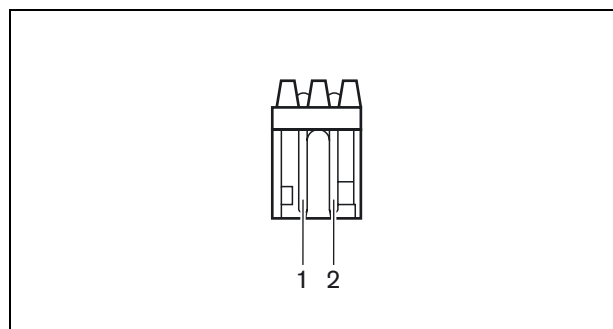


figure 5.8: Reduce output level connector

table 5.4: Reduce output level connector

| Position | Signal   |
|----------|----------|
| 1        | Positive |
| 2        | GND      |



#### Note

The type number of the socket that can be connected to the pin header is: AMP173977-2.



## 5.4 Mounting

The channel selector has been designed for flush-mounting (see chapter 25).

## 5.5 Configuration

### 5.5.1 Introduction

The following channel selector functions can be configured using solder spots on the PCB (see figure 5.9):

- Auto stand-by (see section 5.5.2).
- Auto increment/decrement volume (see section 5.5.3).
- Restore channel & volume (see section 5.5.4).



#### Caution

Use an anti-ESD bracelet to prevent electrostatic discharges when handling the printed circuit board.

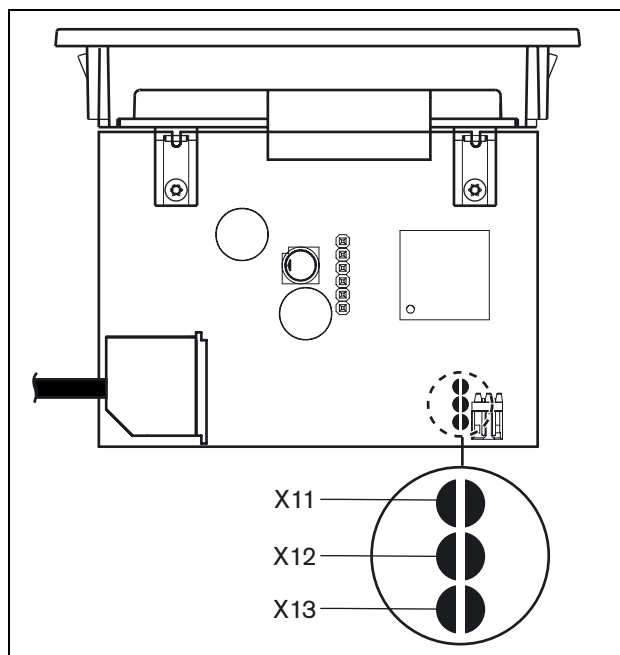


figure 5.9: Configuration solder spots

### 5.5.2 Auto stand-by (X11)

The auto stand-by function of the channel selector can be configured using solder spot *X11* (see figure 5.9).

table 5.5: Solder spot *X11*

| Solder spot       | Description                                                                                                                       |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Open<br>(default) | The auto stand-by function is enabled. The channel selector is deactivated when the headphones are removed from the jack socket.  |
| Closed            | The auto stand-by function is disabled. The channel selector remains active when the headphones are removed from the jack socket. |

The presence of the headphones is monitored by measuring the impedance between pin 1 and pin 2 of all headphones provisions (see also table 5.1). If it is  $> 1 \text{ k}\Omega$ , it is assumed that the headphones are disconnected.



#### Note

If the channel selector is used for recording purposes, the *X11* solder spot must be closed. The input impedance of a recorder may be more than  $1 \text{ k}\Omega$ .

### 5.5.3 Auto increment/decrement volume (X12)

The auto increment/decrement volume function of the channel selector can be configured using solder spot X12 (see figure 5.9).

table 5.6: Solder spot X12

| Solder spot       | Description                                                                                                                                                                                                                                                                                                                                 |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open<br>(default) | The auto increment/decrement volume function is enabled. As long as the volume up (down) key is pressed, the volume is increased (decreased) until the maximum (minimum) volume has been reached. The volume is incremented (decremented) at a rate of 12 dB per second when holding the volume up (down) key for longer than 0.25 seconds. |
| Closed            | The auto increment/decrement volume function of the channel selector is disabled. When the volume up (down) key is pressed, the volume is increased (decreased) with a single step of 1 dB.                                                                                                                                                 |

### 5.5.4 Auto restore function (X13)

The auto restore function of the channel selector can be configured using solder spot X13 (see figure 5.9). The auto restore function is intended for users that have a fixed seating.

table 5.7: Solder spot X13

| Solder spot       | Description                                                                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open<br>(default) | The auto restore function is disabled. When the system is switched on and the channel selector is activated, the default volume and channel settings are restored (channel: 0, volume: -21 dB). |
| Closed            | The auto restore function is enabled. When the system is switched on or the channel selector is activated, the last known volume and channel settings are restored.                             |



#### Note

Any changes in channel or volume settings are saved after 5 seconds.



#### Note

If the stored channel number is greater than the maximum number of channels available, the selector automatically chooses channel 0. However, if the number of channel available is increased and the stored channel number is less or equal to the maximum numbers available and if the channel control keys are not pressed in the mean time, the channel selector immediately switches to the stored channel.



#### Note

If the channel selector is used for recording purposes, the X13 solder spot must be closed.

## 5.6 Technical data

### 5.6.1 Physical characteristics

**Dimensions (H x W x D):**

40 x 100 mm (built-in depth about 80 mm)

**Weight:**

300 g

### 5.6.2 Climate conditions

**Temperature:**

5 to 45 °C (operating)

-20 to 70 °C (transport, handling and storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (transport, handling and storage)

**Air pressure:**

600 to 1100 hPa

### 5.6.3 Power consumption

**Power consumption:**

0.9 W

### 5.6.4 DCN connections

**Number of connections:**

1x DIN-6 female DCN socket

1x DCN cable (2 m) with male connector

**Position:**

Top side

## 5.7 Headphones

**Number of connections:**

1x 3.5 mm jack socket (front side)

1x 3 pin connector (top side; X21)

1 x 3 solder pads (bottom side; X16, X17, X18)

**Recommended type of headphones:**

LBB3443

## 6 LBB4149/xx Pluggable Microphone

### 6.1 Introduction

The LBB4149/xx Pluggable Microphones are uni-directional electret microphones with a flexible stem. They are intended for use with interpreter desks (LBB4120/00). The following types are available:

table 6.1: Types and lengths

| Type       | Length of stem (mm) |
|------------|---------------------|
| LBB4149/00 | 310                 |
| LBB4149/50 | 480                 |

### 6.2 Controls, connectors and indicators

The pluggable microphones (see figure 6.1) contain the following:

- 1 **Indicator** - A LED ring that provides information about the status of the microphone/unit combination (see section 6.4).
- 2 **Connector** - A 6-pole, mini DIN connector to connect the microphone to units (see section 6.3).

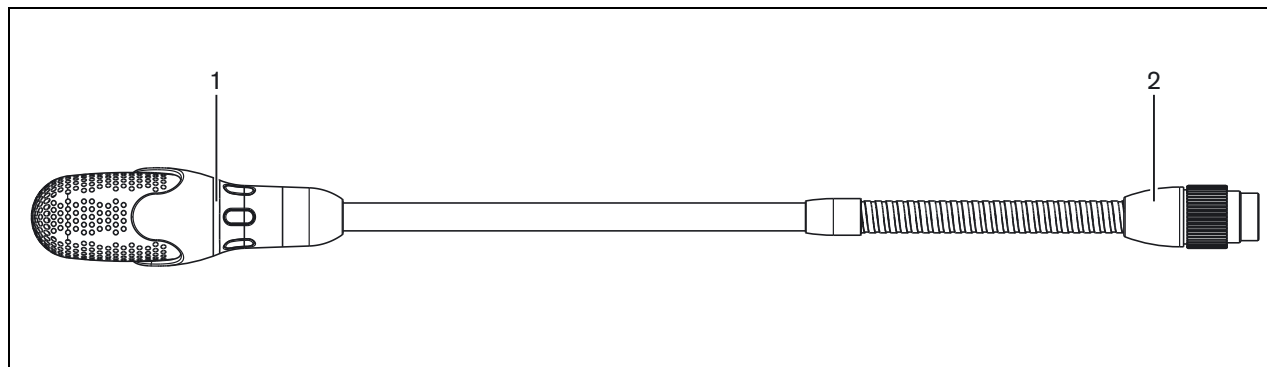


figure 6.1: Side view of the pluggable microphone

## 6.3 Connections

The pluggable microphone has a 6-pole, mini DIN connector for connecting to system units (see figure 6.2 for details). After the microphone has been connected to a unit, it can be locked by tightening the union nut.

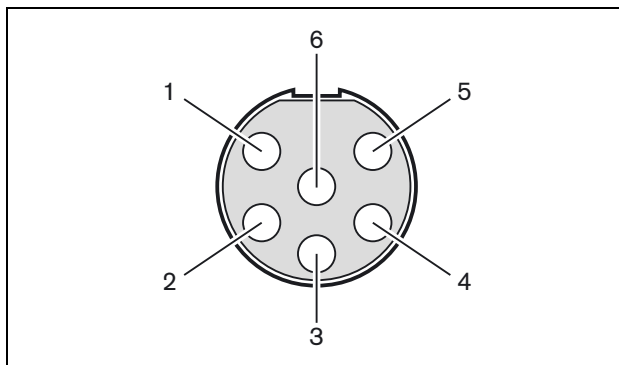


figure 6.2: Connector details (male mini DIN)

table 6.2: Connector details (male mini DIN)

| Pin | Signal                   | Color |
|-----|--------------------------|-------|
| 1   | Red LED ring (cathode)   | Pink  |
| 2   | LED ring common (anode)  | Grey  |
| 3   | Microphone signal +      | Red   |
| 4   | Microphone GND           | Black |
| 5   | Shielding                | Black |
| 6   | Green LED ring (cathode) | Blue  |

## 6.4 Operation

The LED ring indicates the status of the microphone/unit combination.

table 6.3: Status indications

| Color | Status            |
|-------|-------------------|
| Red   | Microphone active |
| Green | Request-to-speak  |

## 6.5 Technical Data

### 6.5.1 Physical characteristics

**Stem length:**

310 mm (/00)

480 mm (/50)

**Weight:**

110 g (/00)

125 g (/50)

**Mounting:**

6 pole mini XLR connector

### 6.5.2 Climate conditions

**Temperature:**

5 to 45 °C (operating)

-40 to 70 °C (transport, handling and storage)

**Relative humidity:**

max. 95%

### 6.5.3 Electrical/Acoustical

**Nominal level:**

85 dB SPL

**Maximum level:**

110 dB SPL at < 3% THD

**Transducer type:**

Condenser

**Directional pattern:**

Cardioid

**Equivalent input noise level:**

24 dB(A)

## 7 LBB4112/00 Data Distribution Board

### 7.1 Introduction

The LBB4112/00 Data Distribution Board provides the help and speak slowly indication initiated by LBB4120/00 Interpreter Desks.

### 7.2 Controls, connectors and indicators

The data distribution board contains the following:

- 1 **DCN cable** - A 2 m long cable to connect the data distribution board to the system. The cable is terminated with a moulded, male, 6-pole, circular connector (see section 7.3.2).
- 2 **J10 jumper** - Two jumpers to select between system power supply or an external power supply. (see section 7.3.3).
- 3 **S8 Dip switches** - A series of dip switches to configure the board (see section 7.4).
- 4 **RS232** - Reserved, for future use.
- 5 **Input** - A 20-pole parallel input connector to connect external devices (see section 7.3.4).
- 6 **Input** - Twenty solder pads for customized parallel input solutions (see section 7.3.4).
- 7 **Output** - Twenty solder pads for customized parallel output solutions (see section 7.3.4).
- 8 **Initialization button** - A button to initialize the address of the board (press briefly, see also chapter 30). Next to the button is a LED that indicates the non-initialized mode.
- 9 **Output** - A 20-pole parallel output connector to connect external devices (see section 7.3.4).
- 10 **Remote initialization** - A 10-pole connector for remote initialisation of the data distribution board. (see section 7.3.5).
- 11 **External power supply** - Provision to connect an external power supply to feed the data distribution board from an external power source instead of the system power supply (see section 7.3.3).

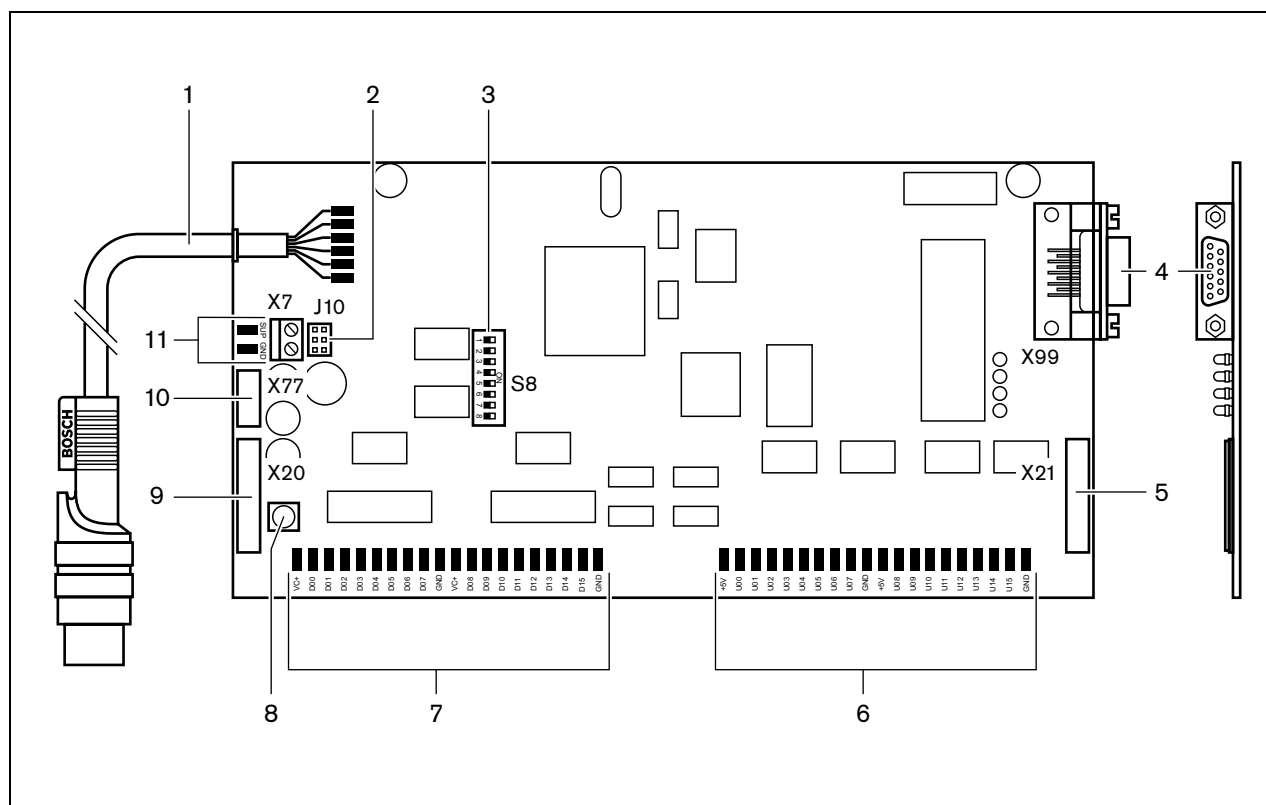


figure 7.1: Top view of the data distribution board

## 7.3 Connections

### 7.3.1 Introduction

This section gives an overview of typical system connections using the data distribution board:

- Connecting to the system (see section 7.3.2).
- Connecting an external power supply (see section 7.3.3).
- Connecting parallel inputs and parallel outputs (see section 7.3.4).
- Connecting a remote initialization circuit (see section 7.3.5).

### 7.3.2 Connecting to the system

Use the attached DCN cable to connect the data distribution board to the system. It is not possible to loop-through the board in the DCN. A trunk splitter (LBB4114/00) or tap-off unit (LBB4115/00) must be used if looping through is required.

### 7.3.3 Connecting an external power supply

The data distribution board has a provision for connecting an external power supply. This provision consists of two solder pads and a screw connector, which are connected in parallel. Whether the external power source or the system power supply is used, depends on the position of the *J10* jumpers.

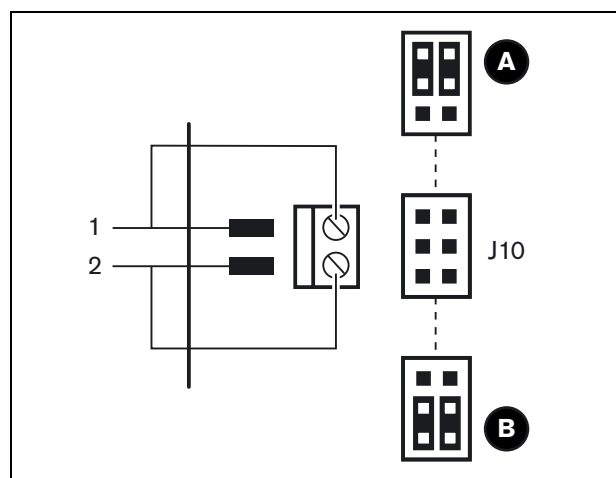


figure 7.2: Connecting an external power supply

table 7.1: Connector details

| Connection | Signal        |
|------------|---------------|
| 1          | 10 - 40 V(DC) |
| 2          | GND           |

table 7.2: Jumper setting

| Position | Power                 |
|----------|-----------------------|
| A        | System power supply   |
| B        | External power supply |

### 7.3.4 Connecting parallel inputs and outputs

When using the parallel inputs and outputs of the board, either the solder pads or the connector can be used. The parallel inputs connectors provide 16 logical inputs ( $U00$  to  $U15$ ), whereas the parallel output connectors provide 16 logical outputs ( $D00$  to  $D15$ ). Except for  $U15$  and  $D15$ , all of them can be used for the remote control of lamps, spotlights, doors, etc. without needing additional cabling. The function of the control inputs and outputs depends on the selected mode and address (see section 7.4).

All logical inputs and outputs form pairs. For example, logical input  $U00$  controls logical output  $D00$ . However, this does not apply to  $U15$  and  $D15$ . These do not form a pair.

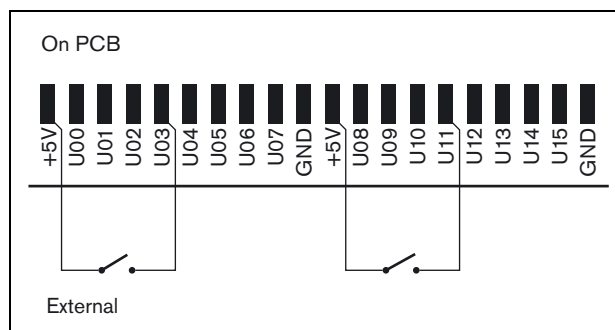


figure 7.3: Connecting parallel inputs (example)

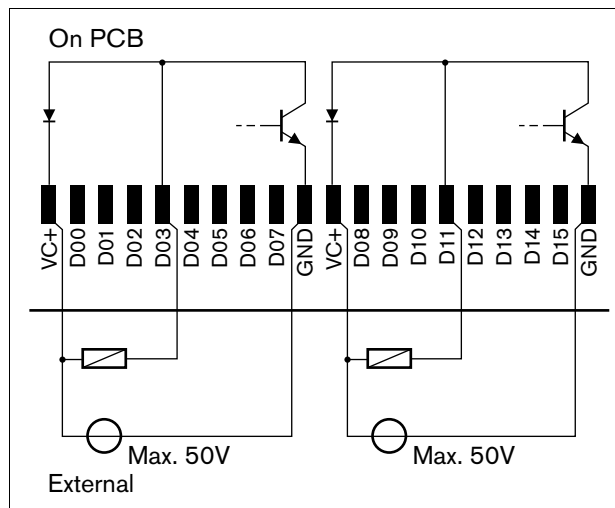


figure 7.4: Connecting parallel outputs (example)

table 7.3: 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              | 19  |
| GND             | 20       | GND              | 20  |



### 7.3.5 Remote initialisation

Instead of initializing the board using the on-board button, it is also possible initialize the board remotely using connector *X77* (see figure 7.1). This 10-pole connector provides connections for an initial is at ion button and an initialisation LED.

table 7.4: *X77 remote initialisation 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 initialisation button must be connected between pins 1 and 2, whereas the initialisation LED must be connected between pins 3 and 4.

## 7.4 Configuration

### 7.4.1 Overview

The *S8* series of dip switches on the data distribution board take care of the configuration of the data distribution board in the system.

table 7.5: *S8 Dip switch settings (\* = default)*

| Switch | Position | Description    |
|--------|----------|----------------|
| S8-1   | ON       | Reserved.      |
|        | OFF*     |                |
| S8-2   | ON       | Active mode.   |
|        | OFF*     | Passive mode.  |
| S8-3   | ON       | Reserved.      |
|        | OFF*     |                |
| S8-4   | ON       | Reserved.      |
|        | OFF*     |                |
| S8-5   | ON       | Reserved.      |
|        | OFF*     |                |
| S8-6   | ON       | Address bit 0. |
|        | OFF*     |                |
| S8-7   | ON       | Address bit 1. |
|        | OFF*     |                |
| S8-8   | ON       | Address bit 2. |
|        | OFF*     |                |

### 7.4.2 Mode selection

The data distribution board can be used as a passive unit for reception of data (passive mode) or as an active unit for transmission of data to the CCU (active mode) using switch *S8-2*. See section 7.5 for examples of applications of the data distribution board in the system and the required mode. When the board is in passive mode, an address must be assigned to it (see section 7.4.3).

### 7.4.3 Address settings

The passive mode address is set using switches *S8-6*, *S8-7* and *S8-8* (see table 7.6). The function of the data distribution board depends on the selected address.

## 7.5 Applications

### 7.5.1 Introduction

Using the data distribution board, it is possible to provide an interface for the control of external equipment. This section discusses three applications of interfacing to external equipment.

### 7.5.2 Speak slowly signaling

The interpreter desks (LBB4120/00) have a speak slowly mode (see section 4.5.6.12) that interpreters can use to activate an indicator that signals a speaker to talk slower (see section 4.4.9). This interpreter desk function must always be used in combination with the data distribution board.

In the speak slowly signaling application (see figure 7.5), the data distribution board is set to address 253. Each booth contributes to the logical outputs of the board via the speak slowly key on the interpreter desk (LBB4120/00). The first speak slowly request activates logical output *D00* of the board. The second request (from a different booth) activates output *D01*, the third activates output *D02* etc. In case of more than 8 speak slowly requests, contacts *D00* to *D07* all are activated.

### 7.5.3 Help signaling

The interpreter desks (LBB4120/00) have a help mode (see section 4.5.6.13) that interpreters can use to activate an indicator that signals that help or assistance is needed (see section 4.4.10). This interpreter desk function must always be used in combination with the data distribution board.

In the help signaling application (see figure 7.6), two data distribution boards are used set to addresses 254 and 255. Assistance requests coming from booth 1 to 16 activate respectively logical output *D00* to *D15* on the board with address 254. Assistance requests coming from booth 17 to 31 activate respectively logical output *D00* to *D14* on the board with address 255.

### 7.5.4 Digital input/output channel

In the digital input/output channel application (see figure 7.7), two data distribution boards are used, one in the active mode and one in the passive mode, to route digital inputs and outputs through the system.

table 7.6: Address settings

| Address | S8-6 | S8-7 | S8-8 | Description                                                     |
|---------|------|------|------|-----------------------------------------------------------------|
| 248     | 0    | 0    | 0    | Reserved, for future use.                                       |
| 249     | 1    | 0    | 0    | Reserved, for future use.                                       |
| 250     | 0    | 1    | 0    | Reserved, for future use.                                       |
| 251     | 1    | 1    | 0    | Reserved, for future use.                                       |
| 252     | 0    | 0    | 1    | Reserved, for future use.                                       |
| 253     | 1    | 0    | 1    | Speak slowly signaling application. See section 7.5.2.          |
| 254     | 0    | 1    | 1    | Help signaling application (booth 1 to 16). See section 7.5.3.  |
| 255     | 1    | 1    | 1    | Help signaling application (booth 17 to 31). See section 7.5.3. |

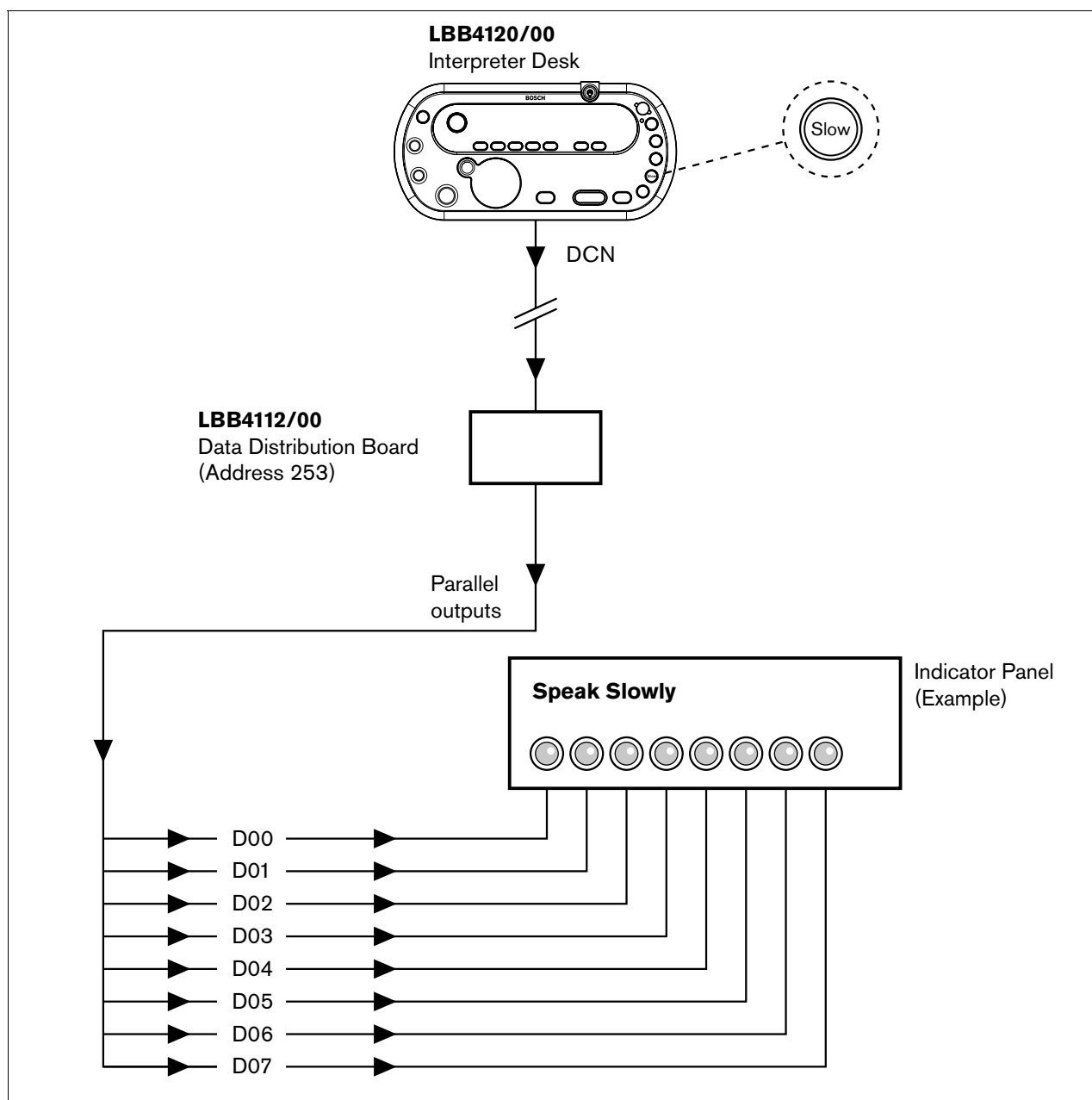


figure 7.5: Speak slowly signaling application

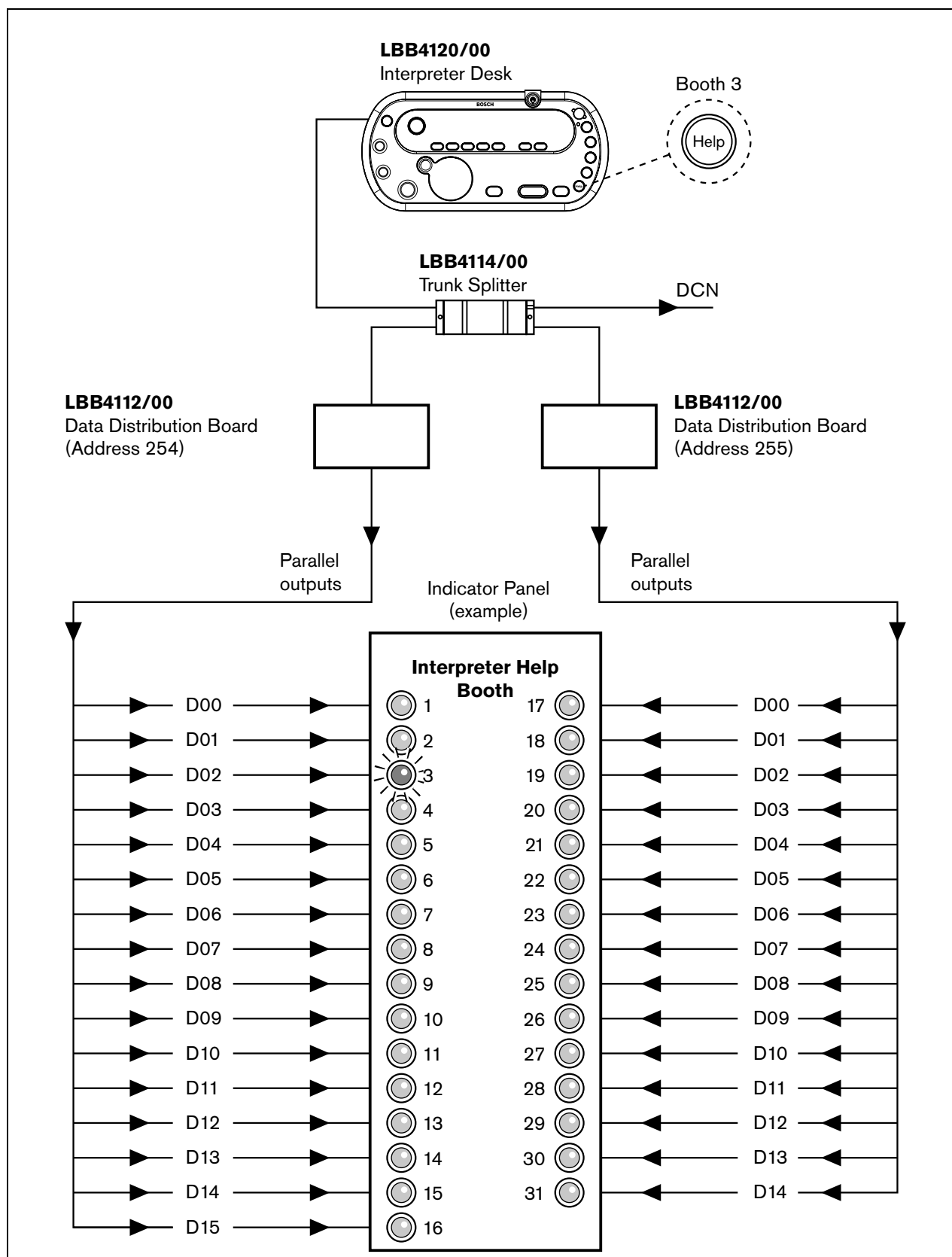


figure 7.6: Help signaling application

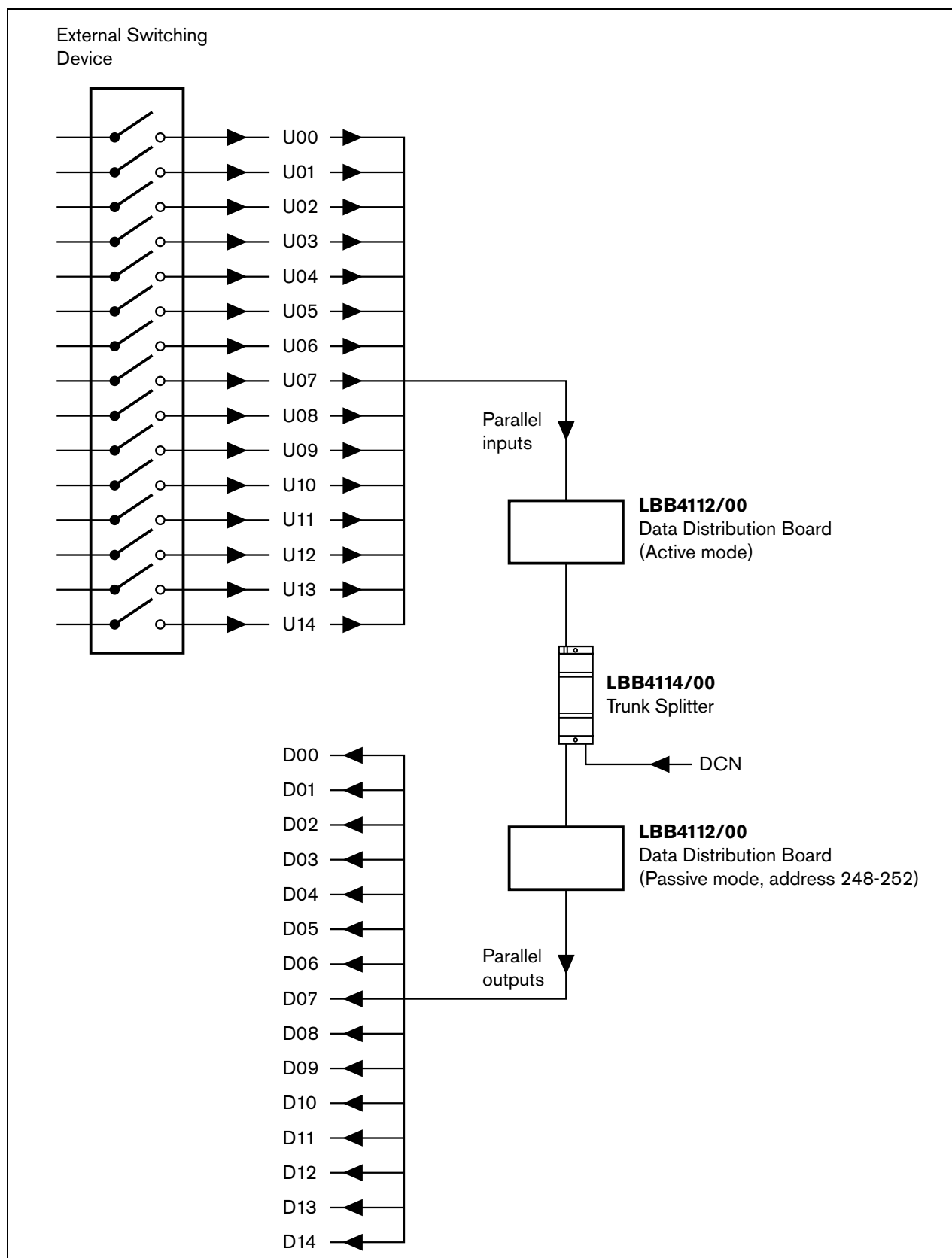


figure 7.7: Digital inputs and outputs

## 7.6 Mounting

To install the board, first mount and secure it in a convenient position. The DCN cable of the data distribution board connects directly to the system. To extend this cable, extension cables of type LBB4416/xx can be used (see also section 7.3.2).



### Caution

Use an anti-ESD bracelet to prevent electrostatic discharges when handling the printed circuit board.

## 7.7 Technical data

### 7.7.1 Physical characteristics

#### Dimensions (H x W):

100 x 200 mm

#### Weight:

300 g

### 7.7.2 Power consumption

#### Power consumption:

2 W

### 7.7.3 Climate conditions

#### Temperature:

5 to 45 °C (operating)

-20 to 70 °C (transport, handling and storage)

#### Relative humidity:

15 to 90% (operating)

5 to 95% (transport, handling and storage)

#### Air pressure:

600 to 1100 hPa

### 7.7.4 Electrical characteristics

#### Supply voltage (DCN) or external:

10 - 40 V(DC)

#### Current consumption (DCN):

< 50 mA at 40 V

#### Remote output open collector voltage (16):

< 50 V (freewheeling diodes at the outputs are provided permitting the connection of relays).

#### Remote output collector current (16):

< 125 mA

#### Remote input voltage:

0 to 5 V logic CMOS level

### 7.7.5 DCN connections

#### Number of connections:

1x DIN-6 female DCN socket

1x DCN cable (2 m) with male connector

#### Position:

Component side

## Section 3 - Central Control Equipment

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## 8 LBB4100/00(D) Central Control Unit

### 8.1 Introduction

The LBB4100/00 and LBB4100/00D Central Control Unit (CCU) are intended for use in PC controlled systems. However, they may also be used in stand-alone systems.



#### Note

The 'D' version is CSA/UL approved and has a modified power supply and a modified mains cord.

## 8.2 Controls, connectors and indicators

### 8.2.1 Front view

The front of the CCU (see figure 8.1) contains the following:

- 1 **Mains on/off switch** - A switch to switch on and off the CCU.
- 2 **Menu display** - A 2x16 character LCD display gives information about the CCU. It is also used to configure the system (see section 8.5).
- 3 **Menu button** - A turn-and-push button to operate the menu in combination with the display (see section 8.5).
- 4 **Monitoring headphones output** - A 3.5 mm jack socket to connect headphones for audio monitoring purposes.

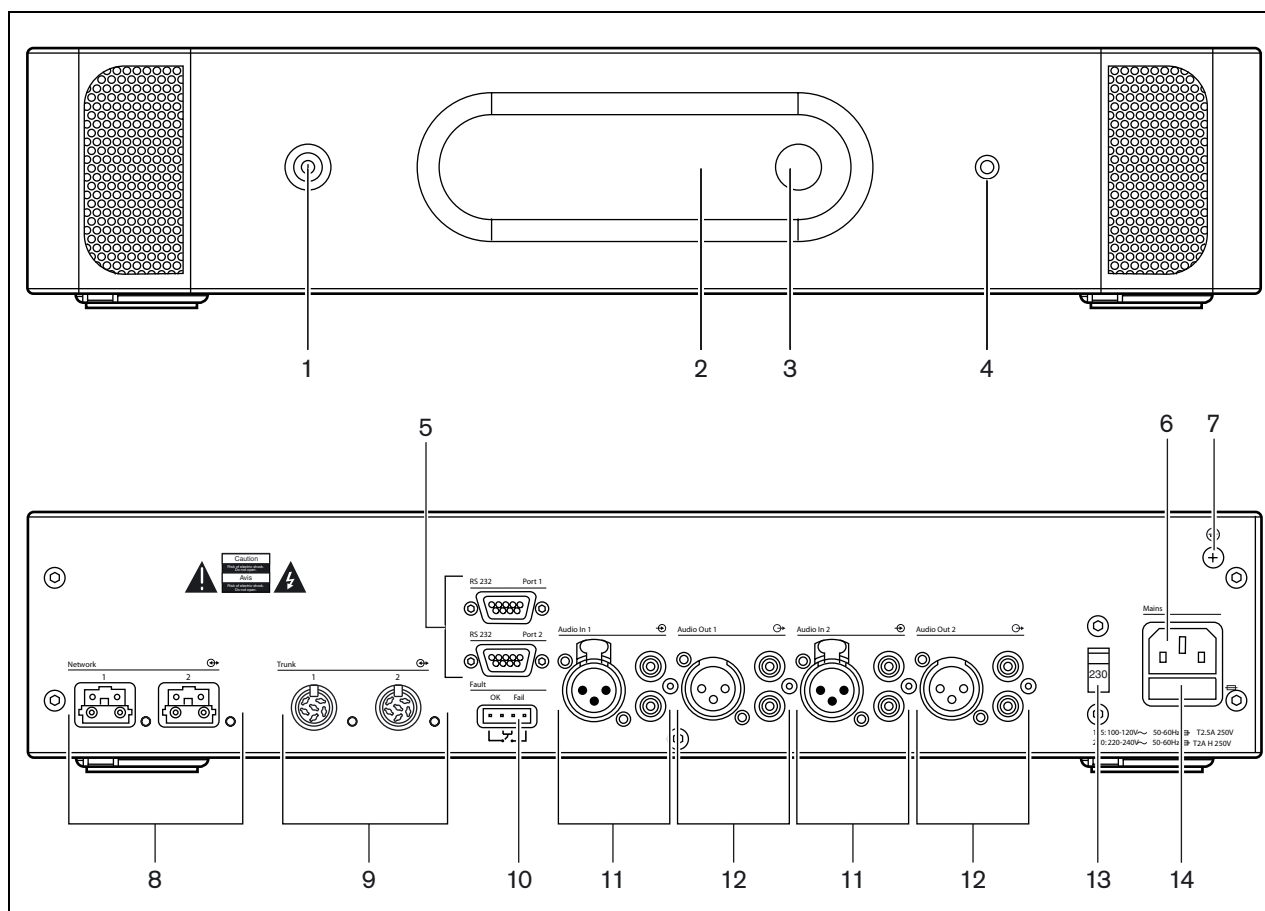


figure 8.1: Front and rear views of the CCU

### 8.2.2 Rear view

The rear of the CCU (see figure 8.1) contains the following:

- 5 **RS232 ports** - Two RS232 ports to connect external equipment to the CCU, for example a PC (see section 8.3.8).
- 6 **Mains inlet** - A socket to connect the CCU to a mains inlet (see section 8.3.2).
- 7 **Ground** - A connection to mechanically ground the CCU (when mounted in a rack).
- 8 **Optical network** - Two optical network sockets to connect the CCU to the optical network of the system. Each socket has a red LED that indicates overload situations (section 8.3.4).



#### Note

Even if only one of the optical network sockets has a power overload, both overload LEDs will be activated and the power will be removed from both sockets.

- 9 **DCN sockets** - Two sockets to supply and control DCN NG units. Each socket has a red LED that indicates power overload situations (see section 8.3.3).
- 10 **Fault contact** - A potential-free change-over relay contact that indicates the correct operation of the CCU (see section 8.3.7).
- 11 **Audio input** - Two audio inputs to insert analogue audio signals that originate from external audio sources into the system (see section 8.3.5).
- 12 **Audio output** - Two audio outputs to extract analogue audio signals from the system (see section 8.3.6).
- 13 **Voltage selector** - A voltage selector to select the local voltage (see section 8.3.2).
- 14 **Fuse holder** - A fuse holder with a fuse that protects the power supply of the CCU (see section 8.3.2).

### 8.2.3 Internal view

The interior of the CCU (see figure 8.2) contains the following:

- 15 **Software indicators** - Three LEDs (left to right: yellow, green, red) that indicate that the software is running. The red LED lights up during system reset or low voltage.
- 16 **S600 Dip switches** - A series of dip switches to configure the system (see chapter 31).
- 17 **X605 Jumper** - A jumper to specify whether the watchdog is be active (if not placed) or not (if placed). The watchdog restart the system after errors.



#### Caution

To ensure correct operation of the CCU under all conditions, the watchdog must be active. Disabling the watchdog can result in a system hang-up.

- 18 **Reset button** - A button to reset the CCU.
- 19 **Optical network processor indicator** - A LED that indicates that media processor is running, Normally, it is on.
- 20 **S500 Dip switches** - A series of dip switches to configure the RS232 ports of the CCU (see section 8.3.8).
- 21 **X600 Jumper** - A jumper to disconnect the back-up battery. The back-up battery is used to hold the settings when the power is switched of. If the jumper is placed on positions 1 and 2 the battery is connected (default). If the jumper is placed on positions 2 and 3 the battery is disconnected.
- 22 **X104 Jumper** - A jumper to connect the mechanical ground to the electrical ground (if placed on 1 and 2) or not (if placed on 2 and 3). By default, the jumper is placed on positions 2 and 3.
- 23 **Fuse** - A fuse to protect the main PCB of the CCU when the wrong voltage has been selected using the voltage selector on the rear.



#### Note

This fuse (no. 23) does not protect the power supply of the CCU.

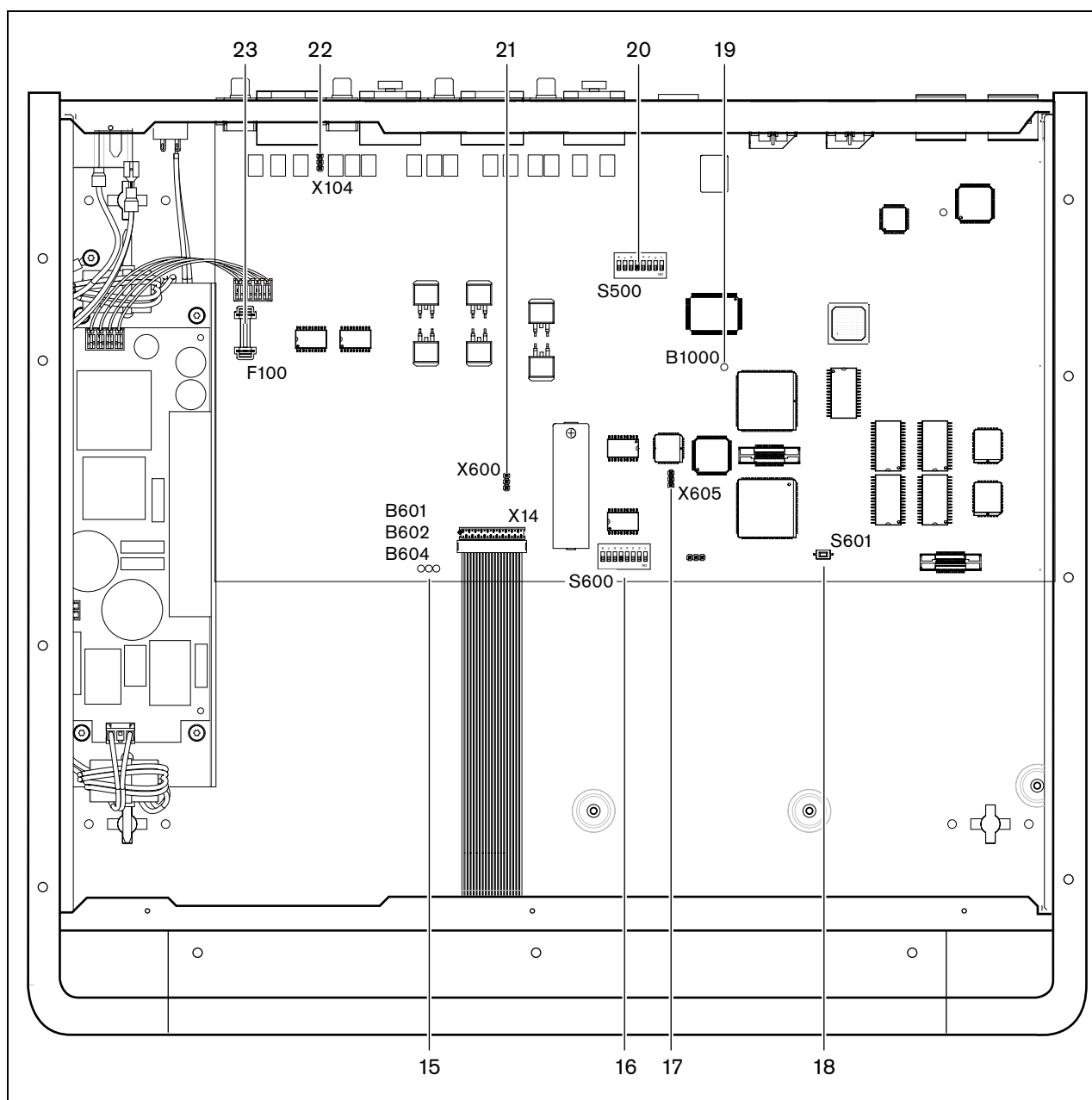


figure 8.2: Interior of the CCU

## 8.3 Connections

### 8.3.1 Introduction

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

- Connecting to the mains (see section 8.3.2).
- Connecting to the DCN (see section 8.3.3).
- Connecting to the optical network (see section 8.3.4).
- Connecting audio inputs (see section 8.3.5).
- Connecting audio outputs (see section 8.3.6).
- Connecting the fault contact (see section 8.3.7).
- Connecting the RS232 ports (see section 8.3.8).

### 8.3.2 Connecting to the mains

Connecting the CCU to the mains involves the following steps:

- 1 Select the correct local mains voltage using the voltage selector on the rear of the CCU and check if the CCU has been equipped with the correct type of fuse (see table 8.1).



#### Note

By default, LBB4100/00 is configured for a mains voltage of 220 - 240 V(AC), whereas the LBB4100/00D is configured for a mains voltage of 100 - 120 V(AC).

- 3 Connect the mains cord to a locally approved, earthed mains outlet.



#### Danger

The CCU must be powered via an earthed mains outlet.

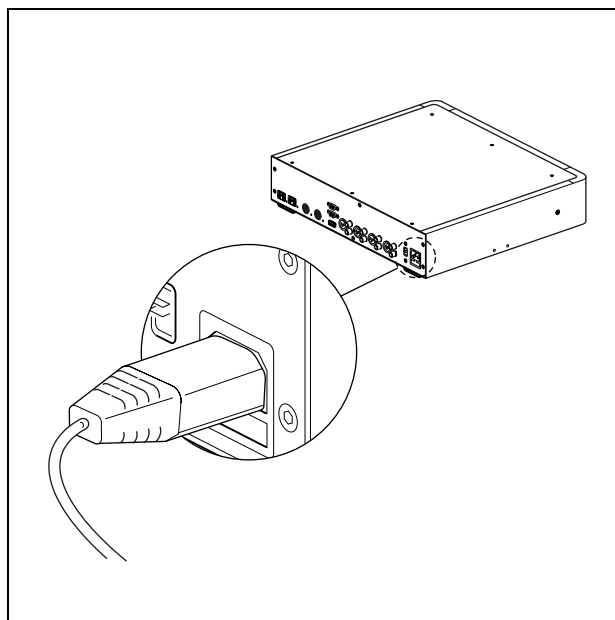


figure 8.3: Connecting to the mains

table 8.1: Voltage selector and fuse settings

| Mains voltage<br>V(AC) | Selector | Fuse        |
|------------------------|----------|-------------|
| 100 - 120              | 115      | T2.5A 250 V |
| 220 - 240              | 230      | T2A H 250 V |

- 2 Connect a locally approved mains cord to the CCU. (see figure 8.3).

### 8.3.3 Connecting to the DCN

Connect the DCN trunk line to the DCN sockets of the CCU using LBB4116/xx Extension Cables (see figure 8.4). Each socket has a red LED that lights up to indicate power overload situations. An overload situation occurs when the equipment connected to the sockets asks for more power than can be provided or when a short-circuit is detected (see also section 26.5.4)

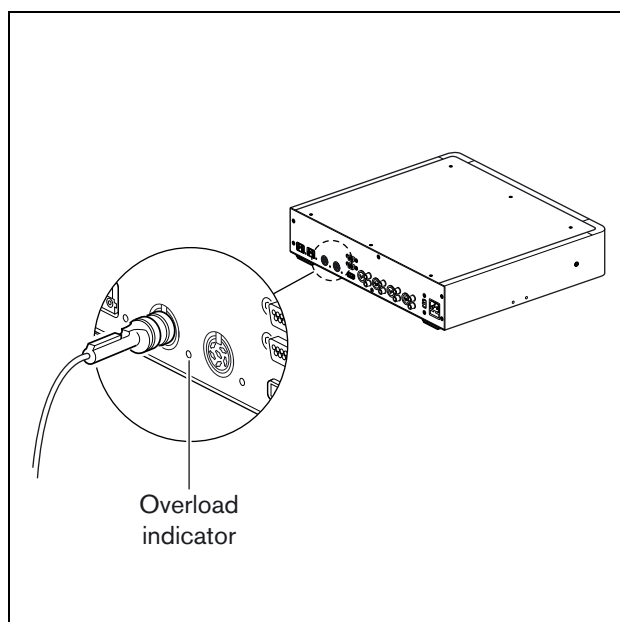


figure 8.4: Connecting to the DCN

### 8.3.4 Connecting to the optical network

Connect the optical network to the optical network sockets using LBB4416/xx optical Network Cables. Each socket has a red LED that lights up to indicate power overload situations. An overload situation occurs when the equipment connected to the sockets asks for more power than can be provided (see also section 27.4.4)

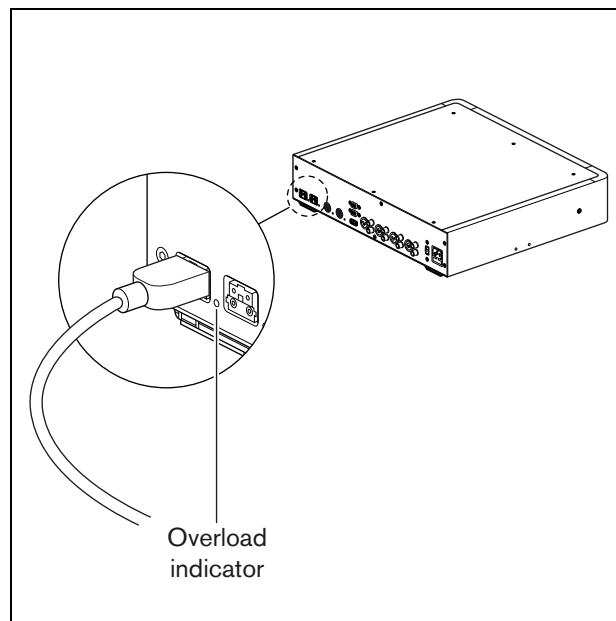


figure 8.5: Connecting to the optical network

### 8.3.5 Connecting audio inputs

The CCU has 2 audio inputs to interface with external analogue audio sources. Each audio source has two types of sockets on the rear of the CCU; one XLR socket (for balanced signals) and one double cinch socket (for unbalanced signals). Stereo signals connected to the same audio input are mixed into one single mono signal.

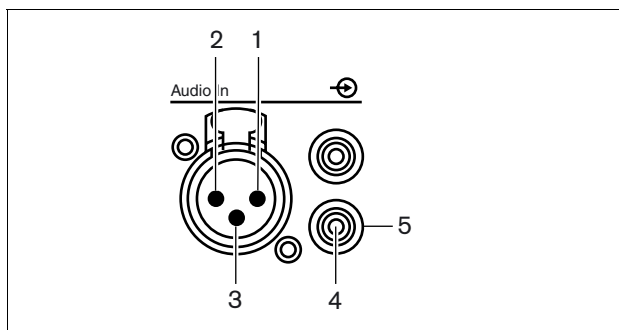


figure 8.6: Audio input sockets

table 8.2: Audio input socket details

| Pin | Socket | Signal  | Description   |
|-----|--------|---------|---------------|
| 1   | XLR    | Xternal | Shield/ground |
| 2   | XLR    | Live    | Positive      |
| 3   | XLR    | Return  | Negative      |
| 4   | Cinch  | Live    | Signal in     |
| 5   | Cinch  | Return  | Shield/Ground |

By default, the signals connected to audio inputs 1 and 2 are added to the floor channel (channel 0, see figure 8.7).

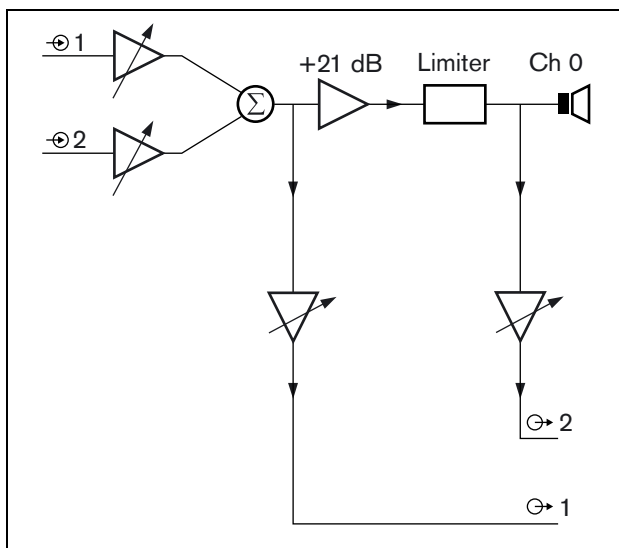


figure 8.7: Normal audio routing mode

### 8.3.6 Connecting audio outputs

The CCU has 2 audio outputs to route analogue audio signals to external equipment (e.g. a tape deck in order to record the audio). Each audio output has two sockets on the rear of the CCU; one XLR socket (for balanced signals) and one double cinch socket (for unbalanced signals).



#### Note

Both cinch sockets contain the same channel.

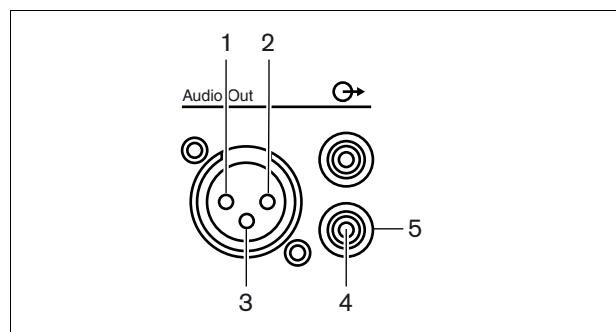


figure 8.8: Audio output sockets

table 8.3: Audio output socket details

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

By default, audio output 1 is intended for delivering the floor channel to a public address installation, whereas audio output 2 is intended for delivering the floor signal to an audio recorder (see figure 8.7).

### 8.3.7 Connecting the fault contact

The CCU has a fault contact. When the CCU is operating correctly, the *OK* pins of the connector are internally connected. In the case of faults, the *Fail* pins are internally connected.

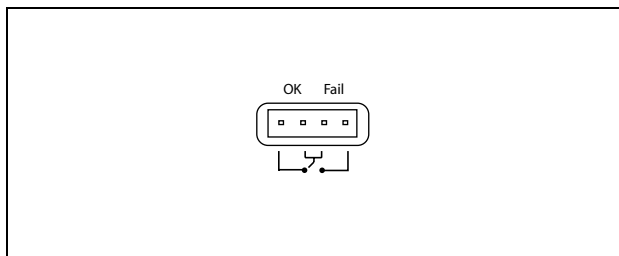


figure 8.9: Fault contact

### 8.3.8 Connecting the RS232 serial ports

The CCU has 2 RS232 ports to interface with control PCs or remote controllers (Open Interface). To connect control PCs, use a wire-to-wire cable. See figure 8.12 for an example of connecting a RS232 port of the CCU to a PC using a wire-to-wire cable.

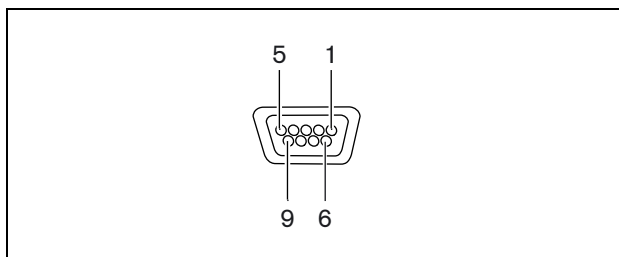


figure 8.10: RS232 connector (female)

table 8.4: RS232 connector details

| 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      |

By default, RS232 port 1 is configured for connection to a control PC.

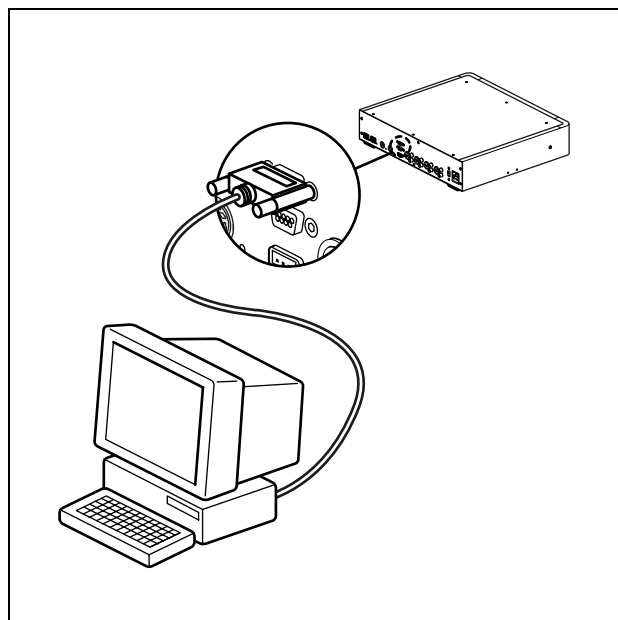


figure 8.11: Connecting a PC to the RS232 port

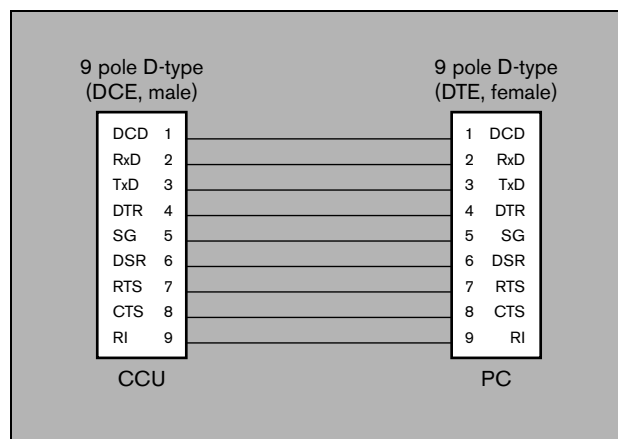


figure 8.12: Connecting a RS232 wire-to-wire cable



#### Note

It is possible to use a USB-to-RS232 adapter or Ethernet-to-RS232 adapter to connect the PC to the CCU.

The protocol as well as the baudrate settings for both RS232 ports are set with the S500 dip switches inside the CCU (see table 8.5 and table 8.6).

table 8.5: RS232 protocol settings (\* = default)

| Protocol       | Port 1        |               | Port 2        |               |
|----------------|---------------|---------------|---------------|---------------|
|                | Switch S500-1 | Switch S500-2 | Switch S500-5 | Switch S500-6 |
| Open interface | Off           | Off           | Off           | Off           |
| Terminal       | Off           | On            | Off           | On            |
| Full           | On*           | Off*          | On            | Off           |
| Reserved       | On            | On            | On*           | On*           |

table 8.6: RS232 baudrate settings (\* = default)

| Baudrate | Port 1        |               | Port 2        |               |
|----------|---------------|---------------|---------------|---------------|
|          | Switch S500-3 | Switch S500-4 | Switch S500-7 | Switch 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            |



#### Note

It is possible to select 'Full' protocol on both port 1 and 2. However, this is not recommended due to processing power and memory limitations

## 8.4 Mounting

The CCU is suitable for either table-top or 19-inch rack mounted use. Four feet (for table-top use) and two mounting brackets (for rack mounting) are supplied. The mounting brackets can also be used to mount the CCU to a flat surface.

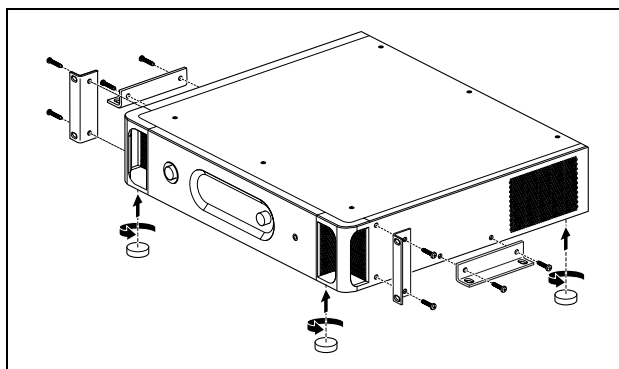


figure 8.13: Mounting



## 8.5 Using the configuration menu

### 8.5.1 Overview

All configuration and operation options of the CCU are set via an interactive menu, using a 2x16 character LCD display and a 'turn-and-push' menu button.

The overview of the menu structure is shown in figure 8.14. A general description of how to use the menu is given in section 8.5.2. The detailed descriptions of all menu items can be found in section 8.6.

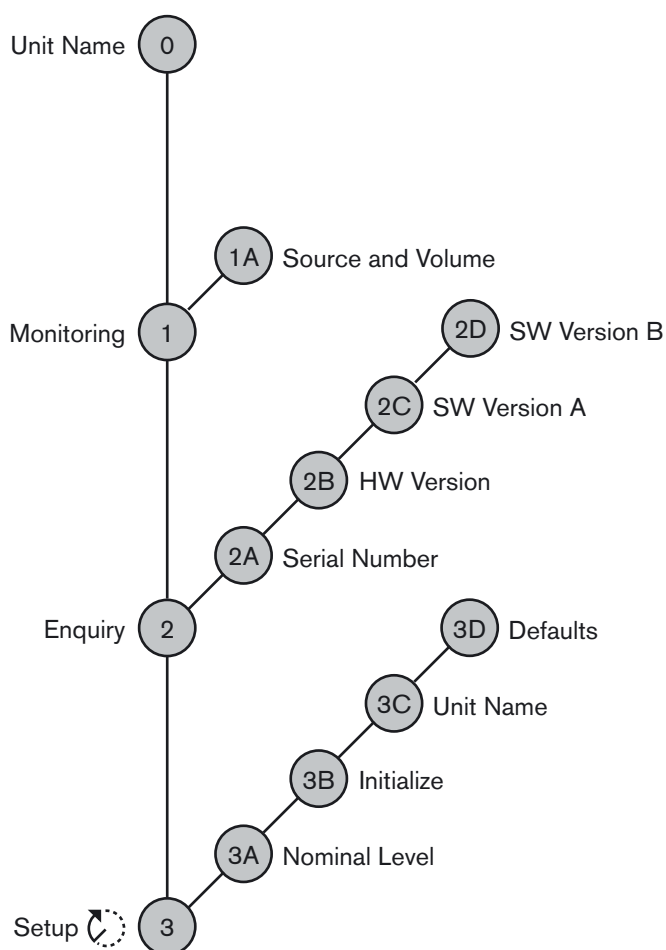


figure 8.14: Structure of the CCU front panel menu

### 8.5.2 Navigate through the menu

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

**Turn** the button to:

- Cycle through the menu items within a menu (the menu item number and title on the first line is blinking).
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

**Push** the button to:

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

After 3 minutes of inactivity, the display automatically switches back to the first item of the main menu (*Unit Name*).

Each menu is identified by a number (for the main menu) or by a number plus a character (for the submenus). The item identification can be found at the start of the first line and is used to navigate to and from submenus.

Most menu items have one or more settable configuration options. The value of an option can be changed by selecting a value from a list of available values.

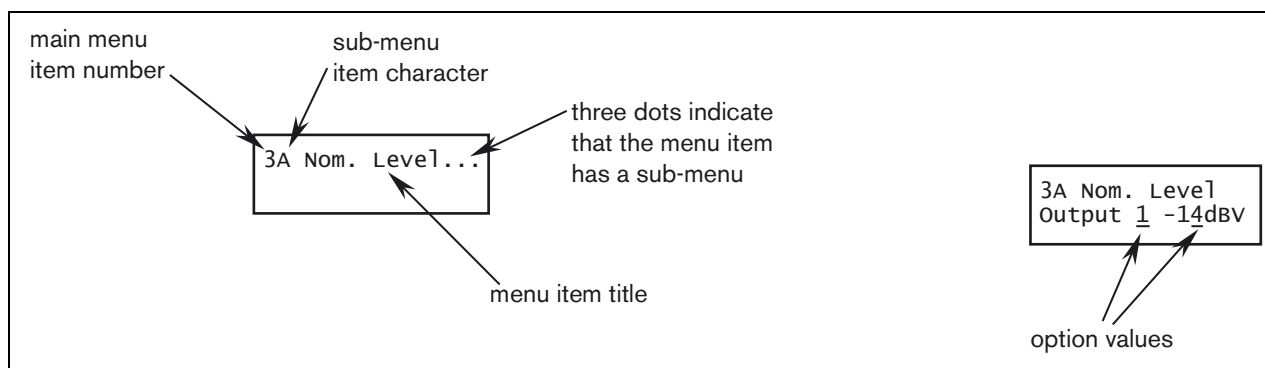


figure 8.15: Menu item screen elements

**To navigate through the main menu:**

- 1 Turn the button to move through the main menu items. The item number and title start blinking. (The first item, *Unit Name*, does not blink.)

**To jump to a submenu:**

- 1 Navigate in the main menu to an item with three dots (e.g. *Setup ...*).
- 2 Push the button to go to the submenu. The submenu item and title start blinking.

**Note**

To enter the *Setup* submenu, push and hold the button for at least 3 seconds.

**To navigate through a submenu:**

- 1 Turn the button to move the cursor to the submenu item character.
- 2 Push the button. The item character and title start blinking.
- 3 Turn to select another submenu item character.
- 4 Push to confirm the selection.

**To change option values:**

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

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

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

## 8.6 Configuration and operation

### 8.6.1 Introduction

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

### 8.6.2 Start-up

When the CCU is switched on, the display shows the *Unit Name* screen, which is the first item of the main menu. The display also goes to this screen after 3 minutes of inactivity.

**Note**

The CCU does not switch back to the start-up screen after 3 minutes of inactivity in submenu 1.

### 8.6.3 Main menu

The main menu contains the screens to show the unit name and contains the entry points to the *Monitoring*, *Enquiry* and *Setup* submenus.

table 8.7: Main menus

| Menu                | Description                                                         |
|---------------------|---------------------------------------------------------------------|
| 0 <i>Unit Name</i>  | Shows the name of the unit.<br>See section 8.6.4.                   |
| 1 <i>Monitoring</i> | Go to the <i>Monitoring</i> submenu.<br>See section 8.6.5.          |
| 2 <i>Enquiry</i>    | Go to the <i>Enquiry</i> submenu.<br>See section 8.6.6.             |
| 3 <i>Setup</i>      | Go to the <i>Setup</i> submenu.<br>See section 8.6.7 (and further). |

### 8.6.4 View unit name

The first screen of the main menu shows the name of the CCU. The default name is *CCU*.

### 8.6.5 Set monitoring options

The *Monitoring* submenu is used to set which signal is sent to the monitoring headphones output. It can be one of the audio inputs, audio outputs or the floor.

Furthermore, the submenu provides level meters for a visual identification of the actual signal strength.

table 8.8: Source/volume submenu (\* = default)

| Menu item        | Option             | Value 1            | Value 2                             | Description                                                                              |
|------------------|--------------------|--------------------|-------------------------------------|------------------------------------------------------------------------------------------|
| 1A Source/Volume | Source:            |                    |                                     |                                                                                          |
|                  | - Floor            |                    | Volume:<br>-31 to 0 dB<br>(-16 dB*) | The signal from the floor is available on the monitoring headphones output.              |
|                  | - Input <u>nn</u>  | Input nr:<br>1, 2  | Volume:<br>-31 to 0 dB<br>(-16 dB*) | The signal from audio input <u>nn</u> is available on the monitoring headphones output.  |
|                  | - Output <u>nn</u> | Output nr:<br>1, 2 | Volume:<br>-31 to 0 dB<br>(-16 dB*) | The signal from audio output <u>nn</u> is available on the monitoring headphones output. |

### 8.6.6 View version information

The *Serial Number*, *HW Version*, *SW Version A* and *SW Version B* menu items are used to obtain version information about the CCU. This information must be mentioned in service requests or failure reports.

table 8.9: Enquiry submenu

| Menu item        | Description                                           |
|------------------|-------------------------------------------------------|
| 2A Serial number | Shows the hexadecimal serial number.                  |
| 2B HW Version    | Shows the hardware version.                           |
| 2C SW Version A  | Shows the version number of the application software. |
| 2D SW Version B  | Shows the version number of the network software.     |

### 8.6.7 Set nominal level

The *Nominal Level* menu item is used to change the nominal levels for the audio inputs and outputs. The nominal level shown applies to the XLR sockets.  
(Nominal level cinch = nominal level XLR - 12 dB.)  
Furthermore, the submenu provides level meters for a visual identification of the signal strength.

table 8.10: Nominal Level submenu (\* = default)

| Menu item         | Option             | Value 1            | Value 2                                | Description                                    |
|-------------------|--------------------|--------------------|----------------------------------------|------------------------------------------------|
| 3A Nom. Level ... |                    |                    |                                        | Push the button to go to the submenu.          |
| 3A Nom. Level     | Source:            |                    |                                        |                                                |
|                   | - Input <u>nn</u>  | Input nr:<br>1, 2  | Level:<br>-24 to -12 dBV<br>(-18 dBV*) | The nominal level for audio input <u>nn</u> .  |
|                   | - Output <u>nn</u> | Output nr:<br>1, 2 | Level:<br>-42 to -12 dBV<br>(-18 dBV*) | The nominal level for audio output <u>nn</u> . |

### 8.6.8 Initialize the system

The *Initialize* menu item is used to initialize all units connected to the DCN sockets. All system units will need a new address after this action. The initialisation process is started by entering the submenu and confirming your choice.



#### Note

All system units that must be initialized must be connected before executing this function.

table 8.11: Initialize submenu (\* = default)

| Menu item         | Options       | Description                         |
|-------------------|---------------|-------------------------------------|
| 3B Initialize ... |               | Push the button to go the submenu.  |
| 3B Initialize     | Are you sure: |                                     |
|                   | - No*         | Cancel initialisation.              |
|                   | - Yes         | Start initialisation of the system. |

### 8.6.9 Set the unit name

The *Unit Name* item is used to assign a name to the CCU. The default name for all CCUs is *CCU*. The unit name may contain up to 16 ASCII characters.

### 8.6.10 Reset to factory default values

The *Defaults* menu item is used to reset all options to the factory defaults. However, the unit name is not reset.

table 8.12: Defaults submenu (\* = default)

| Menu item       | Options            | Descriptions                                                                 |
|-----------------|--------------------|------------------------------------------------------------------------------|
| 3D Defaults ... |                    | Push the button to go to the submenu.                                        |
| 3D Defaults ... | Reset to defaults? |                                                                              |
|                 | - No*              | Cancel reset.                                                                |
|                 | - Yes              | Reset all options to the factory default values. The unit name is not reset. |

## 8.7 Technical Data

### 8.7.1 Physical characteristics

**Dimensions (H x W x D):**

- 92 x 440 x 400 mm (for table-top use, without brackets, with feet)
- 88 x 483 x 400 mm (for 19" rack use, with brackets, without feet); 36 mm in front of brackets, 372 mm behind brackets

**Weight:**

6.6 kg (without 19" brackets and feet)

### 8.7.2 Climate conditions

**Temperature:**

5 to 55 °C (operating)

-20 to 70 °C (storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (storage)

**Air pressure:**

600 to 1100 hPa

### 8.7.3 Mains inlet

**Number of connections:**

1x IEC male mains inlet with fuse holder

**Position:**

Rear side

**Input voltage selector:**

115/230 V

**Fuse:**

T2.5A 250 V (voltage selector at 115 position)

T2AH 250 V (voltage selector at 230 position)

**Input voltage range:**

90 to 132 V(AC) (voltage selector at 115 position)

198 to 264 V(AC) (voltage selector at 230 position)

### 8.7.4 DCN connections

**Number of connections:**

2x DIN-6 female DCN socket

**Power supply:**

2 x 65 W

(Sum of power provided to the DCN and the optical network must be equal to or less than 130 W)

**Position:**

Rear side

### 8.7.5 Optical network connections

**Number of connections:**

2x proprietary female sockets

**Power supply:**

2 x 65 W

(Sum of power provided to the DCN and the optical network must be equal to or less than 130 W)

**Position:**

Rear side

### 8.7.6 RS232 Interface

**Number of connections:**

2x female 9 pole SUB-D connector

**Position:**

Rear side

**Maximum cable length:**

15 m (< 9600 baud)

3 m (> 9600 baud)

**Signal levels:**

According to EIA RS232-C interface specifications

### 8.7.7 Fault contact

**Number of connections:**

1x male 4 pole

**Position:**

Rear side

**Signaling:**

Potential-free, change-over relay

**Signal voltage:**

Max. 24 V(DC), 15 V(AC)

**Signal current:**

Max. 500 mA

### 8.7.8 Audio inputs

|                                                                                |
|--------------------------------------------------------------------------------|
| <b>Number of connections:</b>                                                  |
| 1x female XLR for each audio input                                             |
| 2x cinch for each audio input                                                  |
| <b>Position:</b>                                                               |
| Rear side                                                                      |
| <b>Cable:</b>                                                                  |
| Shielded cable                                                                 |
| <b>Input transformers:</b>                                                     |
| Optional and only for the XLR sockets.                                         |
| <b>Maximum input signal level:</b>                                             |
| 18 dBV (XLR), 6 dBV (cinch)                                                    |
| <b>Nominal input level:</b>                                                    |
| -12 dBV (XLR), -24 dBV (cinch)                                                 |
| <b>Nominal level range:</b>                                                    |
| -12 to 0 dB with respect to maximum input level                                |
| <b>Frequency response (without transformers):</b>                              |
| -3 dB at 20 Hz and 20 kHz                                                      |
| <b>Frequency response (with transformers):</b>                                 |
| -3 dB at 30 Hz and 20 kHz                                                      |
| <b>Input impedance:</b>                                                        |
| 100 k $\Omega$ (XLR), 12 k $\Omega$ (cinch), 22 k $\Omega$ (with transformers) |
| <b>Signal-to-noise ratio:</b>                                                  |
| > 87 dBA at maximum output level                                               |
| <b>CMRR (without transformers):</b>                                            |
| > 40 dB                                                                        |
| <b>CMRR (with transformers):</b>                                               |
| > 60 dB at 100 Hz                                                              |
| <b>Input crosstalk:</b>                                                        |
| < -85 dB at maximum level                                                      |
| <b>Distortion (without transformers):</b>                                      |
| < 0.05% at 1 kHz at -3 dB of the maximum input level                           |
| <b>Distortion (with transformers):</b>                                         |
| < 0.1% at 100 Hz at -3 dB of the maximum input level                           |



#### Note

Input transformers 1:2 (ST7301-1) available as service part 3922 000 02351.

### 8.7.9 Audio outputs

|                                                      |
|------------------------------------------------------|
| <b>Number of connections:</b>                        |
| 1x male XLR for each audio output                    |
| 2x cinch for each audio output                       |
| <b>Position:</b>                                     |
| Rear side                                            |
| <b>Cable:</b>                                        |
| Shielded cable                                       |
| <b>Output transformers:</b>                          |
| Optional and only for the XLR sockets.               |
| <b>Maximum output signal level:</b>                  |
| 18 dBV (XLR), 6 dBV (cinch)                          |
| <b>Nominal output level (general)</b>                |
| -12 dBV (XLR), -24 dBV (cinch).                      |
| <b>Nominal output level (for recording):</b>         |
| 9 dBV (XLR), -3 dBV (cinch)                          |
| <b>Nominal level range:</b>                          |
| -31 to 0 dB with respect to maximum output level     |
| <b>Frequency response (without transformers):</b>    |
| -3 dB at 20 Hz and 20 kHz                            |
| <b>Frequency response (with transformers):</b>       |
| -3 dB at 30 Hz and 20 kHz                            |
| <b>Output impedance:</b>                             |
| < 100 $\Omega$                                       |
| <b>Signal-to-noise ratio:</b>                        |
| > 89 dBA at maximum output level                     |
| <b>Output crosstalk:</b>                             |
| < -85 dB at maximum output level                     |
| <b>Distortion (without transformers):</b>            |
| < 0.05% at 1 kHz at -3 dB of the maximum input level |
| <b>Distortion (with transformers):</b>               |
| < 0.1% at 100 Hz at -3 dB of the maximum input level |



#### Note

Output transformers 1:1 (ST7679) available as service part 2422 531 02541.



## 9 LBB4106/00(D) Extension Power Supply

### 9.1 Introduction

The extension power supply is used in combination with a CCU to supply additional power to the DCN.



#### Note

The 'D' version is CSA/UL approved and has a modified supply and a modified mains cord.

### 9.2 Controls, connectors and indicators

#### 9.2.1 Front view

The front of the extension power supply (see figure 9.1) contains the following:

- 1 **Power indicator** - A green LED that is activated when the mains cord has been connected to a mains outlet, the trunk cable is connected to the system and the CCU is switched on.

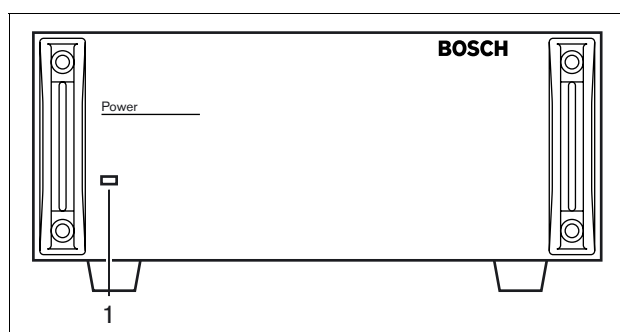


figure 9.1: Front view of the extension power supply

#### 9.2.2 Rear view

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

- 2 **DCN cable** - A 2 m long cable to connect the extension power supply to the system. The cable is terminated with a moulded, male, 6-pole, circular connector (see section 9.3.3).
- 3 **DCN socket (trunk)** - A female, 6-pole, circular socket to loop-through the extension power supply in the system. The socket has a red LED to indicate overload situations (see section 9.3.3).
- 4 **DCN sockets (tap-off)** - Two female, 6-pole, circular sockets to create tap-offs in the system. The signal is automatically regenerated. Each socket has a red LED to indicate overload situations (see section 9.3.4).
- 5 **Mains inlet** - A socket to connect the extension power supply to the mains (see section 9.3.2).
- 6 **Fuse holder** - A fuseholder with a fuse to protect the power supply of the extension power supply (see section 9.3.2).

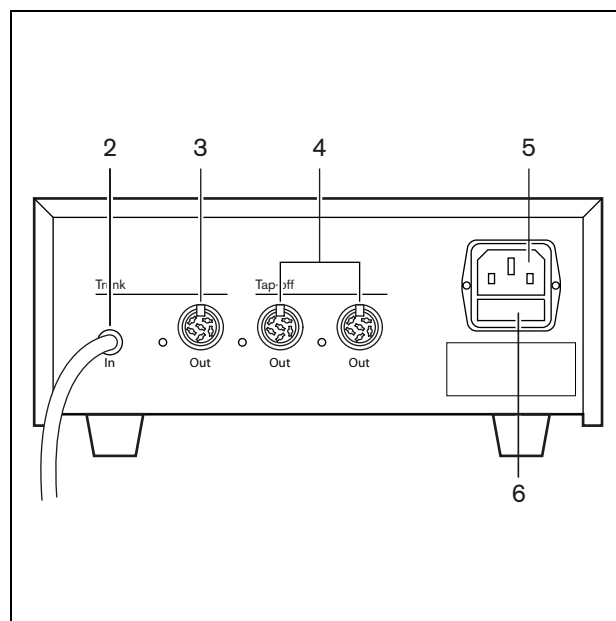


figure 9.2: Rear view of the extension power supply

## 9.3 Connections

### 9.3.1 Introduction

This section gives an overview of typical system connections using the extension power supply:

- Connecting to the mains (see section 9.3.2).
- Connecting to the system (see section 9.3.3).
- Connecting tap-offs (see section 9.3.4).

### 9.3.2 Connecting to the mains

Connecting the extension power supply to the mains involves the following steps:

- 1 Select the correct local mains voltage using the mains connector block (see figure 9.4).



#### Note

By default, the LBB4106/00 is configured for a mains voltage of 230 V(AC), whereas the LBB4106/00D is configured for a mains voltage of 115 V(AC).



#### Danger

Before removing the top cover, disconnect the mains and mains cable from the extension power supply. Read also the 'Important safeguards' which are available as a separate document (9922 141 7014x).



#### Danger

Ensure that the extension power supply is not connected to the mains supply when rewiring for a different voltage. The extension power supply must be earthed via the power supply using the green/yellow wire. The mains plug must be an earthed type.

- 2 Put the correct type of fuse in the extension power supply (see figure 9.4).
- 3 Connect a locally approved mains cord to the extension power supply (see figure 9.3).
- 4 Connect the mains cord to an locally approved mains outlet.

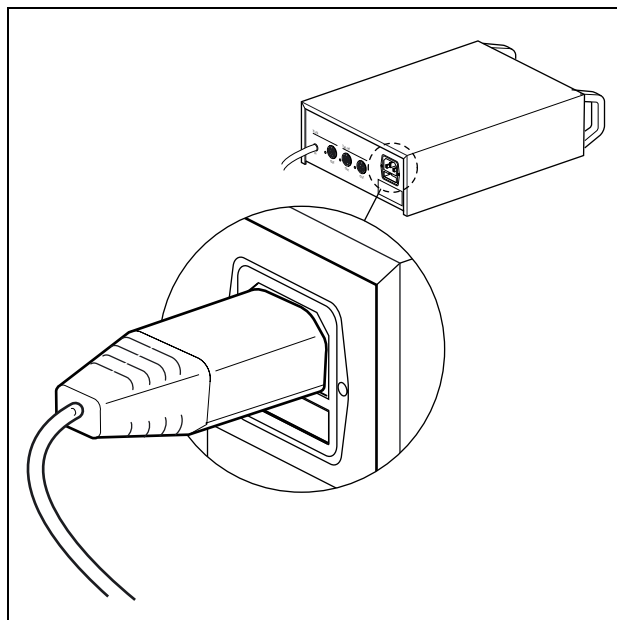
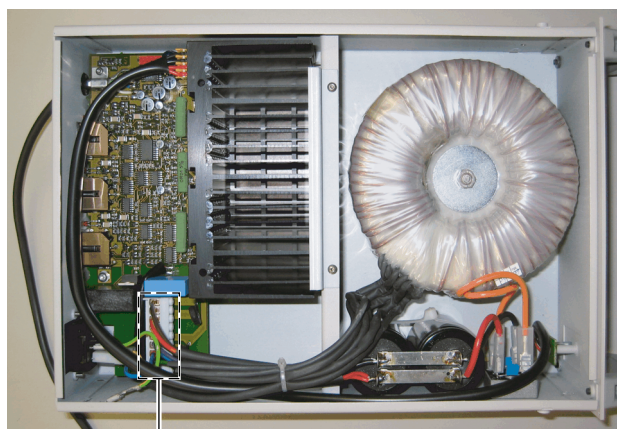


figure 9.3: Connecting to the mains



| Connector 10p | Fuse T5A                |            |            | Fuse T4A H |            |            |
|---------------|-------------------------|------------|------------|------------|------------|------------|
|               | 105V                    | 115V       | 125V       | 220V       | 230V       | 240V       |
| 1             | BLUE MAINS              | n.c.       | BLUE MAINS | n.c.       | BLUE MAINS | BLUE MAINS |
| 2             | BLACK                   | GREEN      | BLACK      | GREEN      | BLACK      | GREEN      |
| 3             | GREEN                   | BLUE MAINS | BLACK      | GREEN      | BLACK      | BLACK      |
| 4             | ORANGE                  |            |            | n.c.       | BLUE MAINS | n.c.       |
| 5             | BLUE (from transformer) |            |            |            |            |            |
| 6             | n.c.                    | BLACK      | n.c.       |            | VIOLET     |            |
| 7             | YELLOW                  |            |            |            |            |            |
| 8             | n.c.                    |            |            |            | ORANGE     |            |
| 9             | VIOLET                  |            |            |            | n.c.       |            |
| 10            | BROWN                   |            |            |            |            |            |

figure 9.4: Voltage and fuse settings

### 9.3.3 Connecting to the system

Use the DCN cable to connect the extension power supply to the system (see figure 9.5). The DCN trunk socket is used to loop the extension power supply through. It has a red LED that indicates power overload situations. An overload situation occurs when the equipment connected to the socket asks for more power than can be provided or when a short-circuit is detected (see also section 26.5.4).

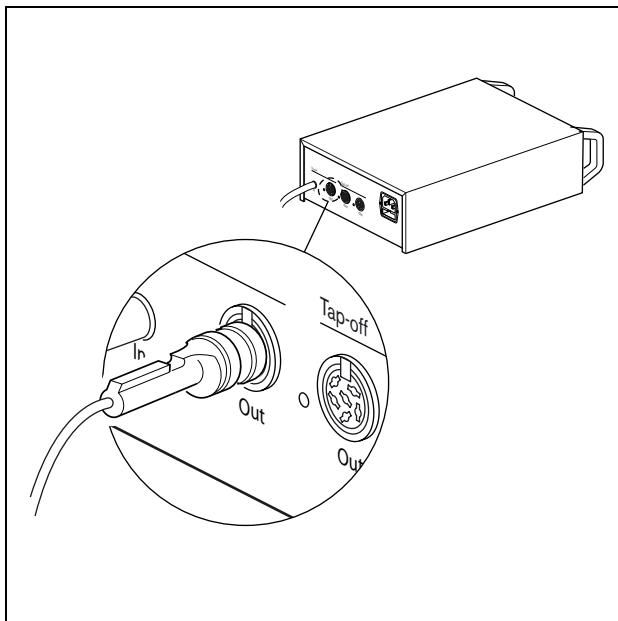


figure 9.5: Connecting to the system

### 9.3.4 Connecting tap-offs

Use the DCN tap-off sockets to create tap-offs in the system (see figure 9.6). Each socket has a red LED that indicates power overload situations. An overload situation occurs when the equipment asks for more power than can be provided (see also section 26.5.4).

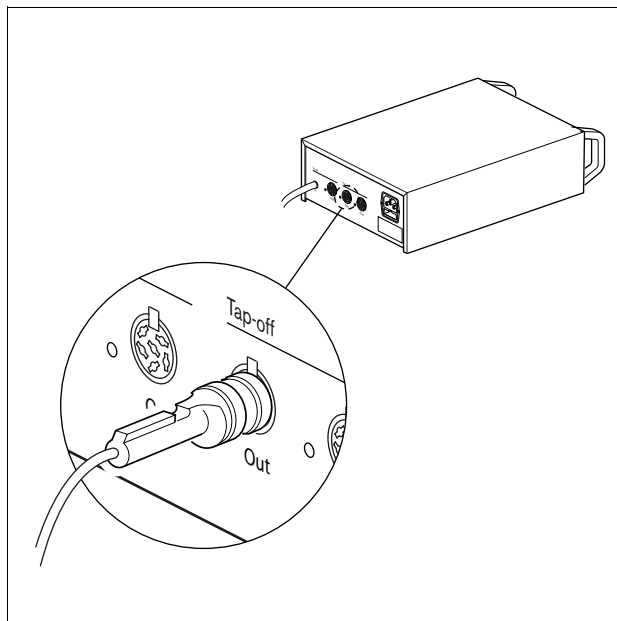


figure 9.6: Connecting tap-offs

## 9.4 Mounting

The extension power supply is suitable for either table-top or 19 inch rack mounted use. The unit can only be rack-mounted when two extension power supplies are used. The units are attached to each other using a supplied metal plate that joins the units together at the front and rear. Once joined, the unit can be mounted using the mounting brackets supplied with each unit.

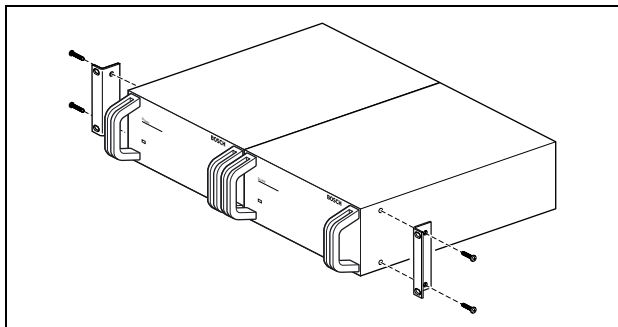


figure 9.7: Mounting

## 9.5 Technical data

### 9.5.1 Physical characteristics

#### Dimensions (H x W x D):

100 x 220 x 308 mm (excl. brackets)

#### Depth including brackets:

348 mm

#### Weight:

8.3 kg

### 9.5.2 Power consumption

#### Power consumption:

0.7 W

### 9.5.3 Climate conditions

#### Temperature:

5 to 45 °C (operating)

-20 to 70 °C (storage)

#### Relative humidity:

max. 95%

#### Air pressure:

600 to 1100 hPa

### 9.5.4 Mains inlet

#### Number of connections:

1x IEC male mains inlet with fuse holder

#### Position:

Rear side

#### Fuse:

T5A 125 V (100 - 120 V (AC))

T4A H 230 V (220 - 240 V(AC))

#### Input voltage (selectable):

105, 115, 125, 220, 230 and 240 V(AC)

### 9.5.5 DCN connections

#### Number of connections:

3x DIN-6 female DCN socket

1x DCN cable (2 m) with male connector

#### Power supply:

3 x 85 W (on DCN sockets)

#### Position:

Rear side

## 10 LBB4402/00 Analogue Audio Expander

### 10.1 Introduction

The LBB4402/00 analogue Audio Expander is used if the system requires additional inputs for inserting audio into the systems or additional outputs for extracting audio from the system.

## 10.2 Controls, connectors and indicators

### 10.2.1 Front view

The front of the analogue audio expander (see figure 10.1) contains the following:

- 1 **Menu display** - A 2x16 character LCD display gives information about the analogue audio expander analogue. It is also used as an interactive display for configuring the analogue audio expander (see section 10.5).
- 2 **Menu button** - A turn-and-push button to operate the menu in combination with the display (see section 10.5).
- 3 **Monitoring headphones output** - A 3.5 mm jack socket to connect headphones for audio monitoring purposes.

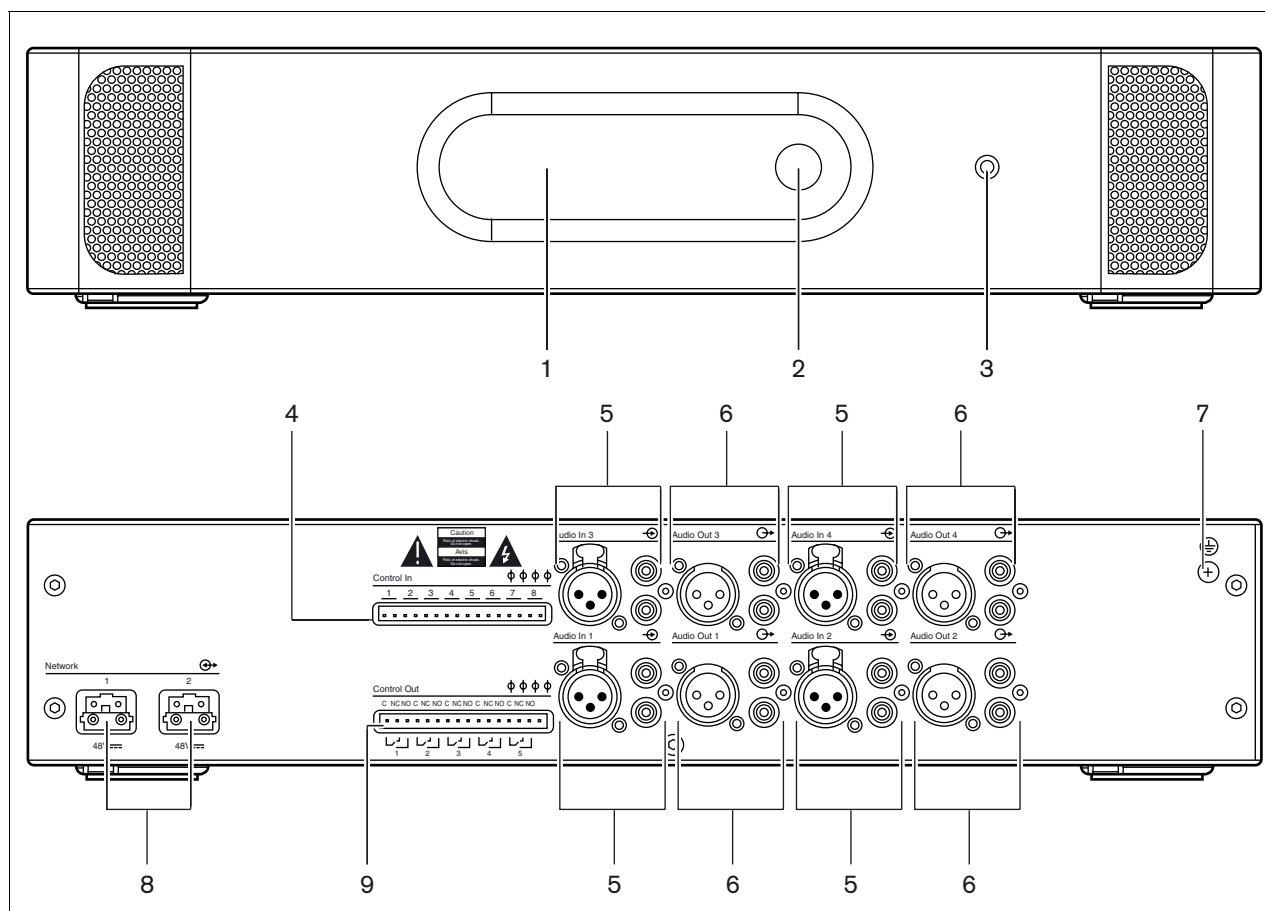


figure 10.1: Front and rear views of the analogue audio expander

### 10.2.2 Rear view

The rear of the analogue audio expander (see figure 10.1) contains the following:

- 4 **Control inputs** - Eight control inputs to enable and disable the audio inputs and the audio outputs of the audio expander analogue (see section 10.3.5).
- 5 **Audio inputs** - Four audio inputs to insert analogue audio signals that originate from external audio sources (see section 10.3.3).
- 6 **Audio outputs** - Four audio outputs to extract analogue audio signals from the system (see section 10.3.4).
- 7 **Ground** - A connection to mechanically ground the audio expander analogue (when mounted in a rack).
- 8 **Optical network** - Two optical network sockets to connect the audio expander analogue to the optical network (see section 10.3.2).
- 9 **Control outputs** - Five control outputs to indicate if audio outputs and the optical network connection are active (see section 10.3.6).

## 10.3 Connections

### 10.3.1 Introduction

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

- Connecting to the optical network (see section 10.3.2).
- Connecting the audio inputs (see section 10.3.3).
- Connecting the audio outputs (see section 10.3.4).
- Connecting the control inputs (see section 10.3.5).
- Connecting the control outputs (see section 10.3.6).

### 10.3.2 Connecting to the optical network

Connect the optical network to the optical network sockets on the audio expander analogue using LBB4416/xx optical Network Cables.

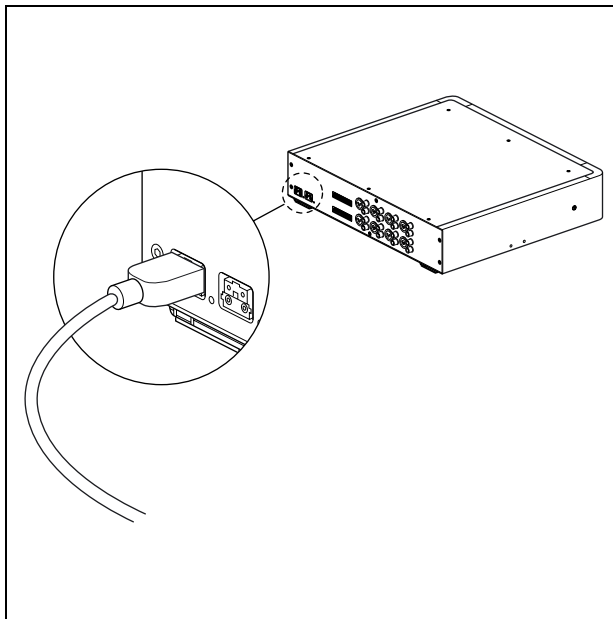


figure 10.2: Connecting to the optical network

### 10.3.3 Connecting audio inputs

The audio expander analogue has 4 audio inputs to interface with external analogue audio sources. Each audio input has two types of sockets on the rear of the audio expander analogue: one XLR socket (for balanced signals) and one double cinch socket (for unbalanced signals).



#### Note

The audio expander analogue mixes signals connected to the cinch sockets of the same audio input into one single mono signal.

The analogue audio can be line as well as microphone. See table 10.1 for an overview of the input types supported by each of the inputs.

table 10.1: Audio input types

| Audio input | Microphone | Line |
|-------------|------------|------|
| 1           | Yes        | Yes  |
| 2           | Yes        | Yes  |
| 3           | No         | Yes  |
| 4           | No         | Yes  |



#### Note

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

See figure 10.3 for details about the audio input sockets.

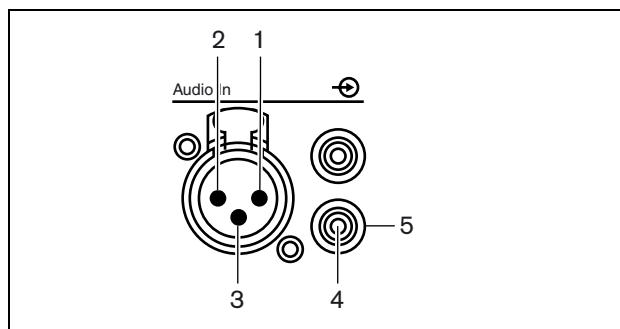


figure 10.3: Audio input sockets

table 10.2: Audio input socket details

| Pin | Type  | Signal  | Description                |
|-----|-------|---------|----------------------------|
| 1   | XLR   | Xternal | Shield/ground              |
| 2   | XLR   | Live    | Positive, phantom supply + |
| 3   | XLR   | Return  | Negative, phantom supply - |
| 4   | Cinch | Live    | Signal in                  |
| 5   | Cinch | Return  | Shield/Ground              |

### 10.3.4 Connecting audio outputs

The audio expander analogue has 4 audio outputs to route analogue audio signals to external equipment (e.g. a tape deck in order to record the audio). Each audio output has two sockets on the rear of the audio expander analogue; one XLR socket (for balanced signals) and one double cinch socket (for unbalanced signals).

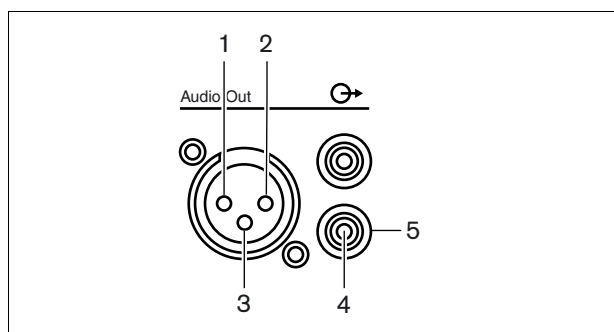


figure 10.4: Audio output sockets

table 10.3: Audio output socket details

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

### 10.3.5 Connecting the control inputs

The analogue audio expander has 8 control inputs to enable and disable the audio inputs and the audio outputs of the audio expander analogue. By default, all audio inputs and audio outputs are enabled. An audio input or output can be disabled by closing its control input (see table 10.4, table 10.5 and figure 10.5).

table 10.4: Audio inputs and control inputs

| Audio input | Control input |
|-------------|---------------|
| 1           | 1             |
| 2           | 2             |
| 3           | 3             |
| 4           | 4             |

table 10.5: Audio outputs and control inputs

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

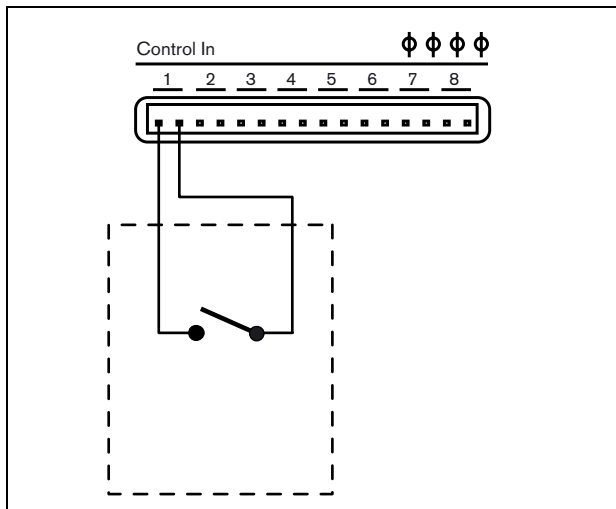


figure 10.5: Control input connector

### 10.3.6 Connecting the control outputs

The analogue audio expander has 5 control outputs. Four control outputs are used to indicate if the channels that are available on the audio inputs are already in use by another unit (i.e. channel engaged). When the channel available on an audio input is engaged, the control output belonging to the audio input is closed (see table 10.6, table 10.7 and figure 10.6).

table 10.6: Audio inputs and control outputs

| Audio input | Control output |
|-------------|----------------|
| 1           | 1              |
| 2           | 2              |
| 3           | 3              |
| 4           | 4              |

table 10.7: Control output states

| State          | Description         |
|----------------|---------------------|
| NO-C connected | Channel engaged     |
| NC-C connected | Channel not engaged |

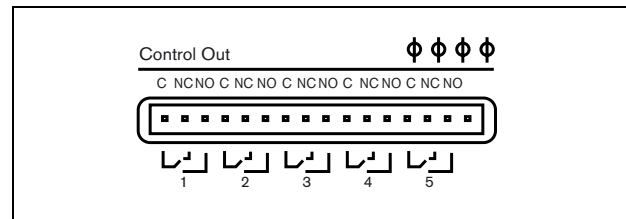


figure 10.6: Control output connector

The fifth control output is used to indicate if the optical network is available (NO-C connected) or not (NC-C connected).



## 10.4 Mounting

The analogue audio expander is suitable for either table-top or 19-inch rack mounted use. Four feet (for table-top) use and two mounting brackets (for rack mounting) are supplied. The mounting brackets can also be used to mount the analogue audio expander to a flat surface.

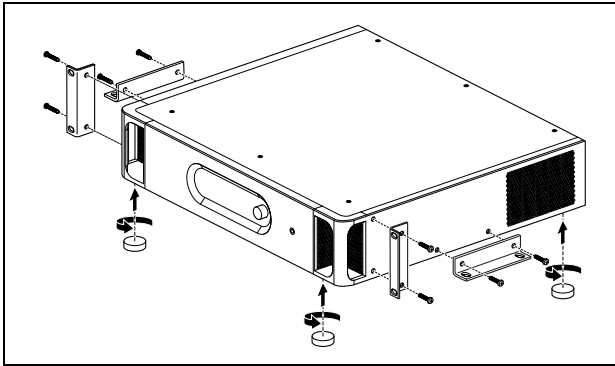


figure 10.7: Mounting

## 10.5 Using the configuration menu

### 10.5.1 Overview

All configuration and operation options of the analogue audio expander are set via an interactive menu, using a 2x16 character LCD display and a 'turn-and-push' menu button.

The overview of the menu structure is shown in figure 10.8. A general description of how to use the menu is given in section 10.5.2. The detailed descriptions of all menu items can be found in section 8.6.



figure 10.8: Structure of the analogue audio expander front panel menu

## 10.5.2 Navigate through the menu

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

**Turn** the button to:

- Cycle through the menu items within a menu (the menu item number and title on the first line is blinking).
- Go to a settable option within a menu item (a blinking cursor moves through the menu screen).
- Cycle through the available values for a settable option (the value is blinking).

**Push** the button to:

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

After 3 minutes of inactivity, the display automatically switches back to the first item of the main menu (*Main*). Each menu is identified by a number (for the main menu) or by a number plus a character (for the submenus). The item identification can be found at the start of the first line and is used to navigate to and from submenus.

Most menu items have one or more settable configuration options. The value of an option can be changed by selecting a value from a list of available values.

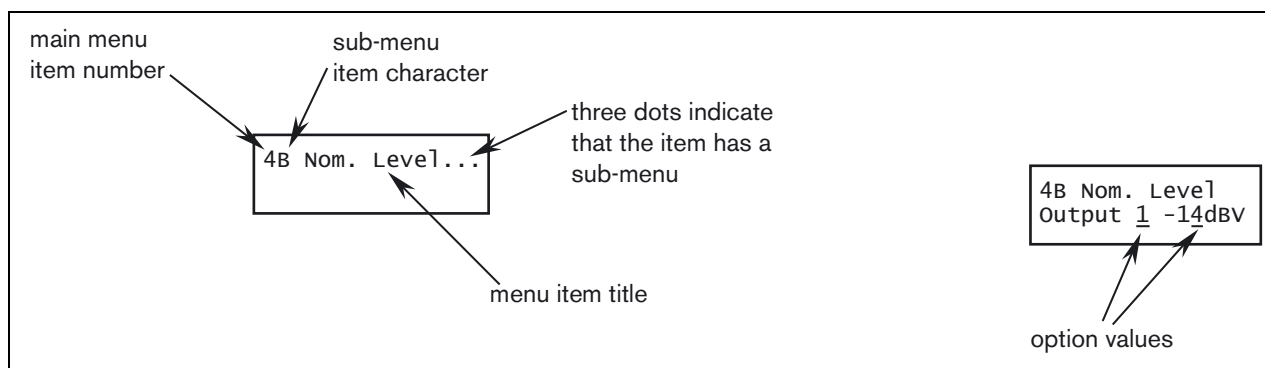


figure 10.9: Menu item screen elements

**To navigate through the main menu:**

- 1 Turn the button to move through the main menu items. The item number and title start blinking. (The first item, *Main*, does not blink.)

**To jump to a submenu:**

- 1 Navigate in the main menu to an item with three dots (e.g. *Setup* ...).
- 2 Push the button to go to the submenu. The submenu item and title start blinking.

**Note**

To enter the Setup submenu, push and hold the button for at least 3 seconds.

**To navigate through a submenu:**

- 1 Turn the button to move the cursor to the submenu item character.
- 2 Push the button. The item character and title start blinking.
- 3 Turn to select another submenu item character.
- 4 Push to confirm the selection.

**To change option values:**

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

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

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

## 10.6 Configuration and operation

### 10.6.1 Introduction

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

### 10.6.2 Start-up

When the analogue audio expander is activated, the display shows the *Main* screen, which is the first item of the main menu. The display also goes to this screen after 3 minutes of inactivity.

**Note**

The audio expander does not switch back to the start-up screen after 3 minutes of inactivity in submenu 2.

### 10.6.3 Main menu

The main menu contains the screens to show the unit name and contains the entry points to the *Monitoring*, *Enquiry* and *Setup* submenus.

table 10.8: Main menus

| Menu                  | Description                                                       |
|-----------------------|-------------------------------------------------------------------|
| 0 <i>Main</i>         | Shows the main screen. See section 10.6.4.                        |
| 1 <i>Fault Status</i> | Go to the <i>Fault Status</i> submenu. See section 10.6.5.        |
| 2 <i>Monitoring</i>   | Go to the <i>Monitoring</i> submenu. See section 10.6.6.          |
| 3 <i>Enquiry</i>      | Go to the <i>Enquiry</i> submenu. See section 10.6.7.             |
| 4 <i>Setup</i>        | Go to the <i>Setup</i> submenu. See section 10.6.8 (and further). |

### 10.6.4 Main screen

The first screen of the main menu shows the name of the analogue audio expander and the input and output activities. The default name is *Analog Expander*.

### 10.6.5 View fault status

The *Fault Status* submenu is used to monitor the fault status of the analogue audio expander. If there are multiple faults, only the most severe fault is shown. See table 10.9 for a list of faults.

table 10.9: Possible faults in order of severity (high to low)

| Menu item               | Description                                                                       |
|-------------------------|-----------------------------------------------------------------------------------|
| <i>No network</i>       | The optical network protocol is not received or not synchronized.                 |
| <i>Max. CH Mismatch</i> | An audio input or audio output has been assigned to a channel that does not exist |
| <i>No fault</i>         | No fault                                                                          |

### 10.6.6 Set monitoring options

The *Monitoring* submenu provides access to the *Source/Volume* and *Input Engaged* menu items. The *Source/Volume* menu item is used to set which signal is sent to the monitoring headphones output, whereas the *Input Engaged* menu item is used to shown which channel is engaged.

table 10.10: Source/volume submenu (\* = default)

| Menu item               | Option                 | Value 1                  | Value 2                             | Description                                                                              |
|-------------------------|------------------------|--------------------------|-------------------------------------|------------------------------------------------------------------------------------------|
| 2A <i>Source/Volume</i> | Source:                |                          |                                     |                                                                                          |
|                         | - In <u>nn</u>         | Input nr:<br>1*, 2, 3, 4 | Volume:<br>-31 to 0 dB<br>(-16 dB*) | The signal from audio input <u>nn</u> is available on the monitoring headphones output.  |
|                         | - Out <u>nn</u>        | Output nr:<br>1, 2, 3, 4 | Volume:<br>-31 to 0 dB<br>(-16 dB*) | The signal from audio output <u>nn</u> is available on the monitoring headphones output. |
| 2B <i>Input Engaged</i> | Source:<br>- <u>nn</u> |                          |                                     | The channel assigned to audio input <u>nn</u> is engaged.                                |

### 10.6.7 View version information

In the *Enquiry* submenu, version information of the analogue audio expander can be found. This information must be mentioned in service requests or failure reports.

table 10.11: Enquiry submenu

| Menu item        | Description                                           |
|------------------|-------------------------------------------------------|
| 3A Serial number | Shows the hexadecimal serial number.                  |
| 3B HW Version    | Shows the hardware version.                           |
| 3C SW Version    | Shows the version number of the application software. |

### 10.6.8 Set input mode

The *Input mode* menu item is used to set the input mode for audio inputs 1 and 2. These are selectable between line and microphone, whereas audio inputs 3 and 4 are always line inputs.

table 10.12: Input Mode submenu (\* = default)

| Menu item         | Option            | Value 1           | Value 2                                                                       | Description                           |
|-------------------|-------------------|-------------------|-------------------------------------------------------------------------------|---------------------------------------|
| 4A Input Mode ... |                   |                   |                                                                               | Push the button to go to the submenu. |
| 4A Input Mode ... | Source:           |                   |                                                                               |                                       |
|                   | - Input <u>nn</u> | Input nr:<br>1, 2 | Mode:<br><i>Line*</i><br><i>Mic (Phantom Off*)</i><br><i>Mic (Phantom On)</i> | The mode for audio input <u>nn</u> .  |

### 10.6.9 Set nominal level

The *Nominal Level* menu item is used to change the nominal levels for the audio outputs. The nominal level shown applies to the XLR sockets. (Nominal level cinch = nominal level XLR - 12 dB.) The submenu gives also a visual identification of the signal strength:

table 10.13: *Nominal Level submenu (\* = default)*

| Menu item     | Option             | Value 1                  | Value 2                                 | Description                                                                    |
|---------------|--------------------|--------------------------|-----------------------------------------|--------------------------------------------------------------------------------|
| 4B Nom. Level |                    |                          |                                         | Push the button to go to the submenu.                                          |
| 4B Nom. Level | Source:            |                          |                                         |                                                                                |
|               | - Input <u>nn</u>  | Input nr:<br>1, 2, 3, 4  | Level:<br>-24 .. -12 dBV<br>(- 18 dBV*) | The nominal level for audio input <u>nn</u> when the input mode is line.       |
|               | - Input <u>nn</u>  | Input nr:<br>1, 2, 3, 4  | Level<br>-66 .. -51 dBV<br>(-57 dBV*)   | The nominal level for audio input <u>nn</u> when the input mode is microphone. |
|               | - Output <u>nn</u> | Output nr:<br>1, 2, 3, 4 | Level:<br>-24 to -12 dBV<br>(-18 dBV*)  | The nominal level for audio output <u>nn</u> .                                 |

### 10.6.10 Configure routing

The *Routing* submenu assigns system channels to the audio inputs and audio outputs.

table 10.14: *Routing submenu (\* = default)*

| Menu item      | Option             | Value 1                  | Value 2                   | Description                                                                                  |
|----------------|--------------------|--------------------------|---------------------------|----------------------------------------------------------------------------------------------|
| 4C Routing ... |                    |                          |                           | Push the button to go to the submenu.                                                        |
| 4C Routing     | Source:            |                          |                           |                                                                                              |
|                | - Input <u>nn</u>  | Input nr:<br>1, 2, 3, 4  | Channel:<br>--*, 00 to 31 | The channel assigned to audio input <u>nn</u> . The '--' indicates that no audio is routed.  |
|                | - Output <u>nn</u> | Output nr:<br>1, 2, 3, 4 | Channel:<br>--*, 00 to 31 | The channel assigned to audio output <u>nn</u> . The '--' indicates that no audio is routed. |

### 10.6.11 Set the unit name

Each analogue audio expander can be assigned a name via the *Unit Name* menu item. The default name is *Analog Expander*. The unit name may contain up to 16 ASCII characters.

### 10.6.12 Reset to factory default values

Use the *Defaults* menu item to reset all options to the factory defaults. However, the unit name is not reset.

table 10.15: Defaults submenu (\* = default)

| Menu item       | Options            | Descriptions                                                                         |
|-----------------|--------------------|--------------------------------------------------------------------------------------|
| 4E Defaults ... |                    | Push the button to go to the submenu.                                                |
| 4E Defaults ... | Reset to defaults? |                                                                                      |
|                 | - No*              | Cancel reset.                                                                        |
|                 | - Yes              | Reset all options to the factory default values. The user defined name is not reset. |



## 10.7 Technical Data

### 10.7.1 Physical characteristics

**Dimensions (H x W x D):**

- 92 x 440 x 400 mm (for table-top use, without brackets, with feet)
- 88 x 483 x 400 mm (for 19" rack use, with brackets, without feet); 36 mm in front of brackets, 372 mm behind brackets

**Weight:**

6.6 kg (without 19" brackets and feet)

### 10.7.2 Climate conditions

**Temperature:**

5 to 55 °C (operating)

-20 to 70 °C (storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (storage)

**Air pressure:**

600 to 1100 hPa

### 10.7.3 Power consumption

**Power consumption:**

5.6 W

### 10.7.4 Optical network connections

**Number of connections:**

2x proprietary female sockets

**Position:**

Rear side

### 10.7.5 Analogue line inputs

**Number of connections:**

1x male XLR for each audio input

2x cinch for each audio input

**Position:**

Rear side

**Cable:**

Shielded cable

**Maximum input level:**

18 dBV (XLR), 6 dBV (cinch)

**Input range:**

-12 to 0 dB with respect to maximum output level

**Nominal input level:**

-12 dBV (XLR), -24 dBV (cinch)

**Input sensitivity setting:**

Software

**Frequency response:**

-3 dB at 20 Hz and 20 kHz (tolerance  $\pm 1$  dB)

**Input impedance:**

100 k $\Omega$  (XLR), 12 k $\Omega$  (cinch)

**Signal-to-noise ratio:**

87 dBA at maximum level

**CMRR:**

40 dB at 1 kHz

**Input crosstalk:**

75 dB at 100 Hz, 1 kHz and 10 kHz

**Distortion:**

< 0.05% at 1 kHz at - 3 dB of the maximum input level

### 10.7.6 Analogue microphone inputs (only input 1 and input 2)

|                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Number of connections:</b>                                                                                                                              |
| 1x female XLR for each audio input                                                                                                                         |
| 2x cinch for each audio input                                                                                                                              |
| <b>Position:</b>                                                                                                                                           |
| Rear side                                                                                                                                                  |
| <b>Cable:</b>                                                                                                                                              |
| Shielded cable                                                                                                                                             |
| <b>Nominal input level:</b>                                                                                                                                |
| -57 dBV based on 91 dB SPL for a microphone with sensitivity of 2 mV/Pa, a male voice with normal loudness and a speaker to microphone distance of 0.15 m. |
| <b>Input range:</b>                                                                                                                                        |
| 15 dB                                                                                                                                                      |
| <b>Input sensitivity setting:</b>                                                                                                                          |
| Software                                                                                                                                                   |
| <b>Frequency response:</b>                                                                                                                                 |
| -3 dB at 300 Hz and 20 kHz (tolerance $\pm 1$ dB)                                                                                                          |
| First order, high-pass speech filter at 300 Hz                                                                                                             |
| <b>Input impedance:</b>                                                                                                                                    |
| 1360 $\Omega$                                                                                                                                              |
| <b>Signal-to-noise ratio:</b>                                                                                                                              |
| > 62 dBA                                                                                                                                                   |
| <b>CMRR:</b>                                                                                                                                               |
| > 55 dB at 100 Hz                                                                                                                                          |
| > 65 dB at 1 kHz and 10 kHz                                                                                                                                |
| <b>Phantom supply:</b>                                                                                                                                     |
| 12 $\pm$ 1 V (max. 15 mA)                                                                                                                                  |
| <b>Limiter:</b>                                                                                                                                            |
| Analogue limiter, level -8 dB with respect to maximum.                                                                                                     |
| <ul style="list-style-type: none"> <li>• attack time: 1 ms</li> <li>• decay time: 300 ms</li> <li>• threshold at nominal input level</li> </ul>            |

### 10.7.7 Audio outputs

|                                                      |
|------------------------------------------------------|
| <b>Number of connections:</b>                        |
| 1x male XLR for each audio output                    |
| 2x cinch for each audio output                       |
| <b>Position:</b>                                     |
| Rear side                                            |
| <b>Cable:</b>                                        |
| Shielded cable                                       |
| <b>Maximum output level:</b>                         |
| 18 dBV (XLR), 6 dBV (cinch)                          |
| <b>Nominal output level (interpreter channels):</b>  |
| -9 dBV (XLR), -3 dBV (cinch)                         |
| <b>Output range:</b>                                 |
| 30 dB                                                |
| <b>Output level setting:</b>                         |
| Software                                             |
| <b>Frequency response:</b>                           |
| -3 dB at 20 Hz and 20 kHz (tolerance $\pm 1$ dB)     |
| <b>Output impedance:</b>                             |
| < 100 $\Omega$                                       |
| <b>Signal-to-noise ratio:</b>                        |
| > 89 dBA at maximum level                            |
| <b>Output crosstalk:</b>                             |
| < -85 dB                                             |
| <b>Distortion:</b>                                   |
| < 0.05% at 1 kHz at -3 dB of the maximum input level |

### 10.7.8 Control inputs

|                                   |
|-----------------------------------|
| <b>Number of connections:</b>     |
| 1x male 16 pole                   |
| <b>Position:</b>                  |
| Rear side                         |
| <b>Cable:</b>                     |
| Limited by usage                  |
| <b>Signaling:</b>                 |
| Potential-free, change-over relay |
| <b>Signal voltage:</b>            |
| Max. 24 V(DC), 15 V(AC)           |
| <b>Signal current:</b>            |
| Max. 500 mA                       |

### 10.7.9 Control outputs

|                                                        |
|--------------------------------------------------------|
| <b>Number of connections:</b>                          |
| 1x male 16 pole                                        |
| <b>Position:</b>                                       |
| Rear side                                              |
| <b>Maximum cable length:</b>                           |
| 1 km                                                   |
| <b>Contact type:</b>                                   |
| Relay contact, single pole, change-over contact (SPDT) |
| <b>Contact voltage:</b>                                |
| 24 V(DC)                                               |
| <b>Off state (unpowered):</b>                          |
| C-NC is closed, C-NO is open                           |

Intentionally left blank.

## Section 4 - Installation Accessories

Intentionally left blank.

## 11 LBB4114/00 Trunk Cable Splitter

### 11.1 Introduction

The LBB4114/00 Trunk Cable Splitter is used to split the DCN trunk to achieve a neat and tidy layout of the system and its connected equipment.

### 11.2 Controls, connectors and indicators

The trunk cable splitter (see figure 11.1) contains the following:

- 1 **DCN socket (tap-off 1)** - A female, 6-pole, circular socket to create a tap-off. The signal is automatically regenerated (see section 11.3).
- 2 **DCN socket (tap-off 2)** - A female, 6-pole, circular socket to create a tap-off. The signal is automatically regenerated (see section 11.3).
- 3 **DCN cable** - A 2 m long cable to connect the trunk cable splitter to the system. The cable is terminated with a moulded, male, 6-pole, circular connector (see section 11.3).
- 4 **DCN socket (trunk)** - A female, 6-pole, circular socket to loop the trunk cable splitter through in the system (see section 11.3).

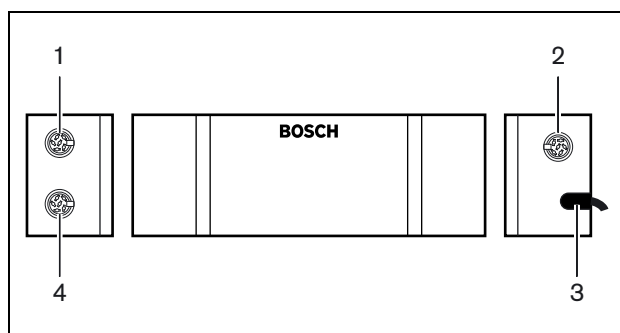


figure 11.1: Top and side views of trunk cable splitter

### 11.3 Connections

This section gives an overview of typical system connections using the trunk cable splitter:

- Looping the trunk through (see figure 11.2).
- Creating tap-offs (see figure 11.2).

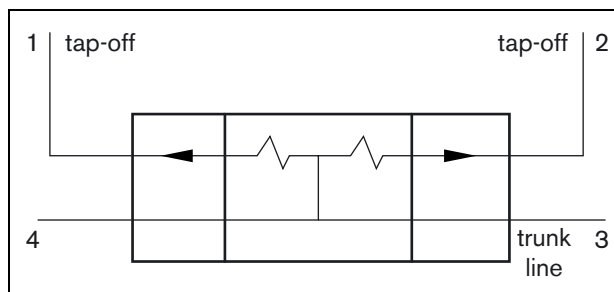


figure 11.2: Connecting the trunk cable splitter

### 11.4 Mounting

The trunk cable splitter has two screw holes for mounting purposes.

## 11.5 Technical data

### 11.5.1 Physical characteristics

**Dimensions (H x W x D):**

35 x 49 x 140 mm

**Weight:**

approx. 300 g

### 11.5.2 Climate conditions

**Temperature:**

5 to 45 °C (operating)

-40 to 70 °C (transport, handling and storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (transport, handling and storage)

**Air pressure:**

600 to 1100 hPa

### 11.5.3 Power consumption

**Power consumption:**

1.3 W

### 11.5.4 DCN connections

**Number of connections:**

3x DIN-6 female DCN socket

1x DCN cable (2 m) with male connector

**Position:**

Front and rear sides



## 12 LBB4115/00 Tap-off Unit

### 12.1 Introduction

The LBB4115/00 Tap-off Unit is used to create short-circuit proof tap-off points in the DCN trunk.

### 12.2 Controls, connectors and indicators

The tap-off unit (see figure 12.1) contains the following:

- 1 **DCN socket (tap-off 1)** - A female, 6-pole, circular socket to create a tap-off. The signal is automatically regenerated (see section 12.3). Furthermore, the tap-off is protected for short-circuits and has a maximum load of 3.5 W.
- 2 **DCN socket (tap-off 2)** - A female, 6-pole, circular socket to create a tap-off. The signal is automatically regenerated (see section 12.3). Furthermore, the tap-off is protected for short-circuits and has a maximum load of 3.5 W.
- 3 **DCN cable** - A 2 m long cable to connect the tap-off unit to the system. The cable is terminated with a moulded, male, 6-pole, circular connector (see section 12.3).
- 4 **DCN socket (trunk)** - A female, 6-pole, circular socket to loop the tap-off unit through in the system (see section 12.3).

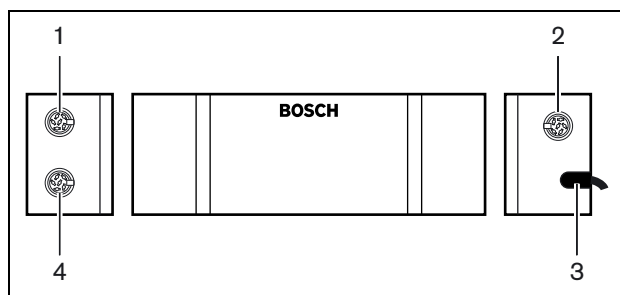


figure 12.1: Top and side views of the tap-off unit

### 12.3 Connections

This section gives an overview of typical system connections using the tap-off unit:

- Looping the trunk through (see figure 12.2).
- Creating tap-offs (see figure 12.2).

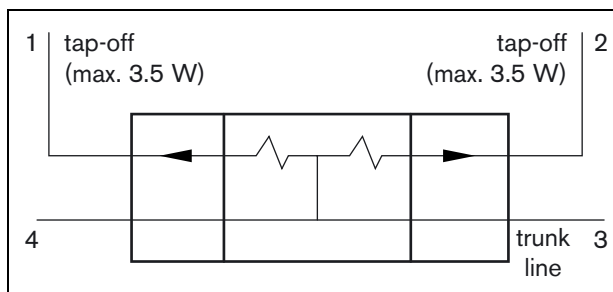


figure 12.2: Connecting the tap-off unit

### 12.4 Mounting

The tap-off unit has two screw holes for mounting purposes.

## 12.5 Technical data

### 12.5.1 Physical characteristics

**Dimensions (H x W x D):**

35 x 49 x 140 mm

**Weight:**

approx. 0.3 kg

### 12.5.2 Climate conditions

**Temperature:**

5 to 45 °C (operating)

-40 to 70 °C (transport, handling and storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (transport, handling and storage)

**Air pressure:**

600 to 1100 hPa

### 12.5.3 Power consumption

**Power consumption:**

1.4 W

### 12.5.4 DCN connections

**Number of connections:**

3x DIN-6 female DCN socket

1x DCN cable (2 m) with male connector

**Position:**

Front and rear sides

## 13 LBB4116/xx Extension Cables

### 13.1 Introduction

The following DCN extension cable (assembly) products are available:

table 6.1: DCN extension cables

| Type number | Cable length |
|-------------|--------------|
| LBB4116/00  | 100 m        |
| LBB4116/02  | 2 m          |
| LBB4116/05  | 5 m          |
| LBB4116/10  | 10 m         |
| LBB4116/15  | 15 m         |
| LBB4116/20  | 20 m         |
| LBB4116/25  | 25 m         |

### 13.2 Connectors

Except for LBB4116/00, all cables are terminated with 6-pole, circular, moulded, male and female connectors on both ends of the cable (see figure 13.2 and table 13.1).

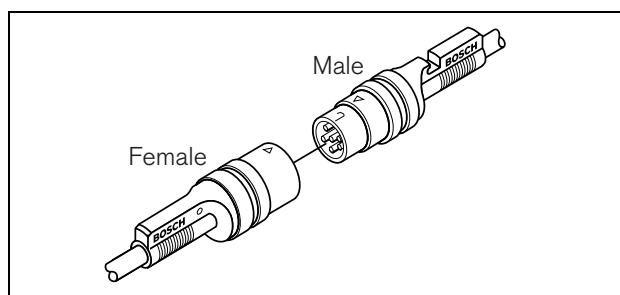


figure 13.1: DCN connectors

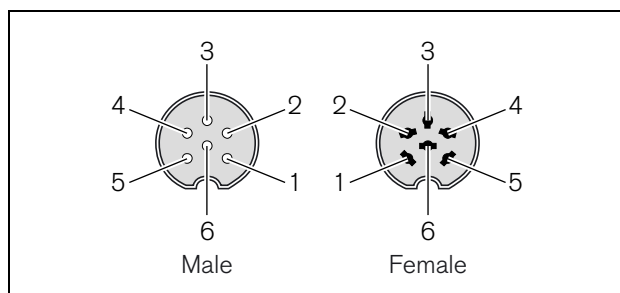


figure 13.2: DCN connector details

Both female and male connectors have a plug-locking facility. To lock connectors, cable locking clamps (LBB4417/00) can be used.

### 13.3 Wiring

See figure 13.3 for details about the wires inside the extension cables.

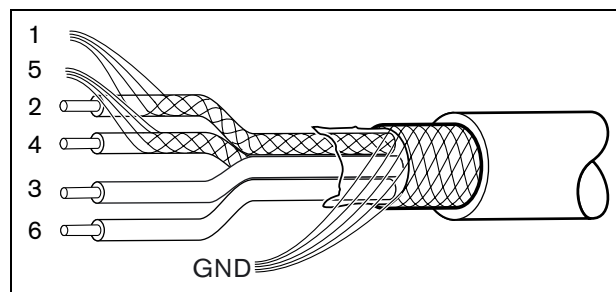


figure 13.3: DCN cable

table 13.1: DCN cable details

| 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  |

## 13.4 Custom-made cables

See table 13.2 and section 13.3 for information about creating customized cable connections.

table 13.2: DCN cable connectors

| Connector                                             | Hirschmann<br>type no. | Service code no. |
|-------------------------------------------------------|------------------------|------------------|
| Cable-plug<br>(black) with<br>locking screw<br>(male) | MAS 6100               | 5322 264 54055   |
| Cable-plug<br>(black) with<br>locking screw<br>(male) | MAS 60                 | 4822 264 40024   |
| Cable socket<br>with locking<br>screw (female)        | MAK 6100               | 5322 264 10367   |



### Note

MAS 6100 cannot be used in the trunk splitter (LBB4114/00) and tap-off unit (LBB4115/00) due to the length of the cap.



### Note

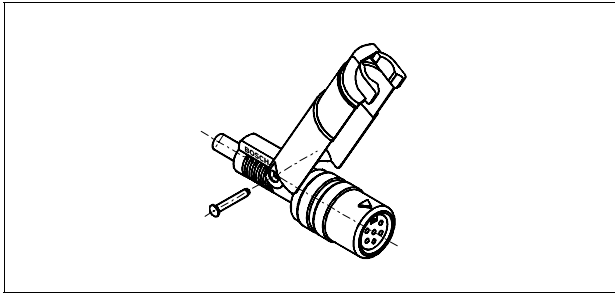
The screening of the cable is connected to the earth tags of the Hirschmann cable plug/socket and is potentially live. Therefore, only use isolated sockets for extension cables, patch panels and floor boxes.

When connecting connectors to extension cables, it is recommended that insulated, metal shield connectors are used, rather than plastic shield connectors to protect the connectors according to EMC specifications.

## 14 LBB4117/00 Cable

### Locking Clamps

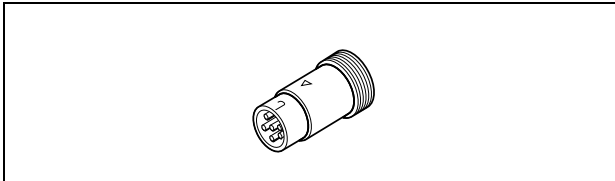
The LBB4117/00 Cable Locking Clamps are used to lock male and female connectors of DCN extension cables of type LBB4116/xx. Each pair of male-female connectors requires one clamp.



*figure 14.1: Cable locking clamp*

## 15 LBB4118/00 Termination Plug

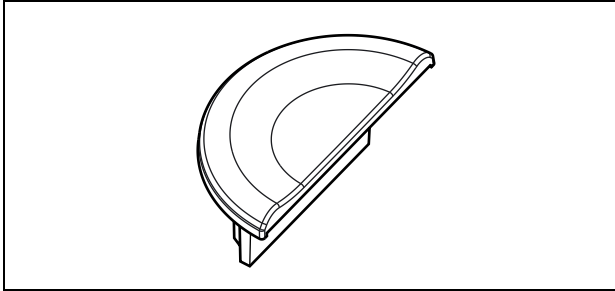
The LBB4118/00 Termination Plug is used to 'close' open-ended DCN cabling (e.g. a spare or future expansion cable).



*figure 15.1: Termination plug*

## 16 LBB4125/00 End Caps

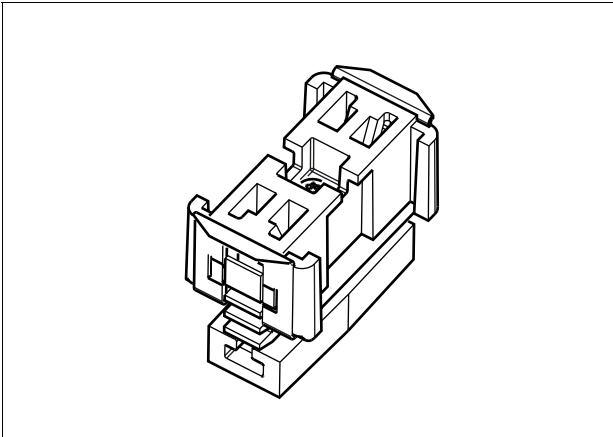
The LBB4125/00 End Caps are used in combination with LBB4127/00 Couple Pieces and flush-mounting equipment. See chapter 25 for information about flush-mounting.



*figure 16.1: End cap*

## 17 LBB4127/00 Couple Pieces

The LBB4127/00 Couple Pieces are used in combination with flush-mounting equipment. See chapter 25 for information about flush-mounting.



*figure 17.1: Couple piece*



## 18 LBB4410/00 Network Splitter

### 18.1 Introduction

The LBB4410/00 Network Splitter is used to create short-circuit proof tap-off points in the optical network.

### 18.2 Controls, connectors and indicators

#### 18.2.1 Exterior

The exterior of network splitter (see figure 18.1) contains the following:

- 1 **External power supply** - A socket for an (optional) external power supply. The external power supply only feeds the tap-offs. It does not provide power to the trunk line (see section 18.3.3).
- 2 **Tap-off 1** - An optical network socket to create a tap-off. The tap-off is protected for short-circuits and has a maximum load of 2.5 A (see sections 18.2.2 and 18.3.2).
- 3 **Trunk** - An optical network socket to connect the network splitter to the optical network (see section 18.3.2).
- 4 **Lid** - A lid that provides access to the jumpers (see section 18.2.2). The rear side of the lid contains a label with explanation about the internal settings (see figure 18.3).
- 5 **Status LED** - A yellow status LED that provides information about the status of the network splitter (see section 18.5).
- 6 **Status LED** - A green status LED that provides information about the status of the network splitter (see section 18.5).
- 7 **Tap-off 2** - An optical network socket to create a tap-off. The tap-off is protected for short-circuits and has a maximum load of 2.5 A (see sections 18.2.2 and 18.3.2).
- 8 **Trunk** - An optical network socket to connect the network splitter to the optical network (see section 18.3.2).

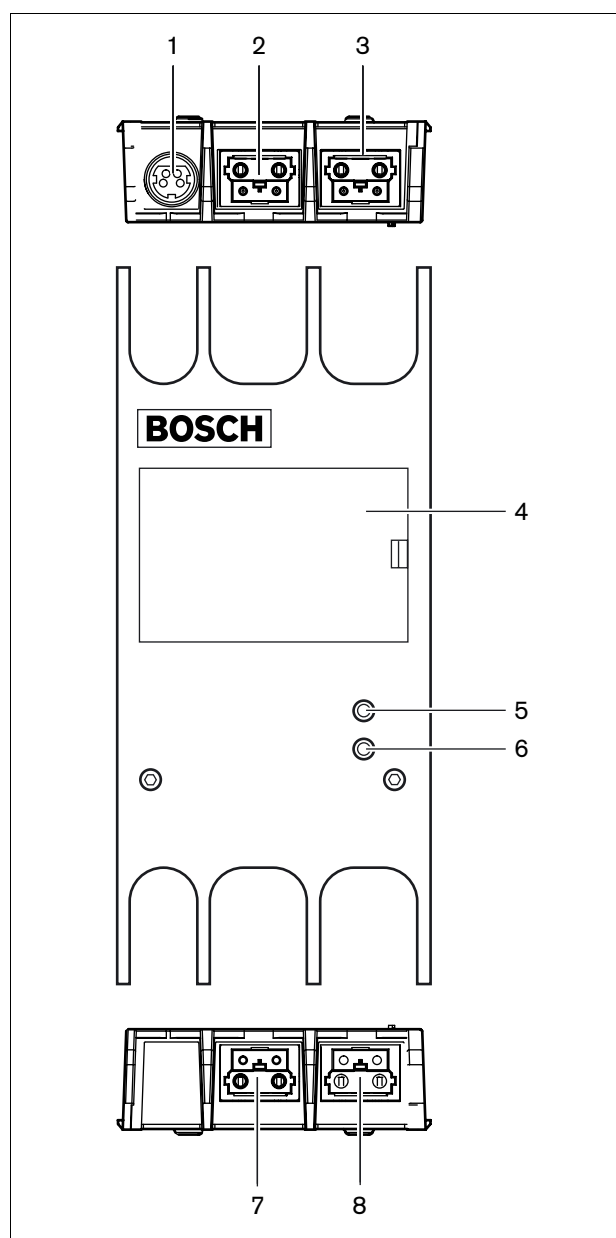


figure 18.1: Exterior of the network splitter

### 18.2.2 Interior

The interior of the network splitter (see figure 18.2) contains the following:

- 9 **Tap-off power source** - A jumper that specifies whether the tap-offs are powered from the system or use an external power supply connected to the network splitter. See the label at the rear side of the lid for information about the jumper settings.
- 10 **Follow main network** - Do not change this.
- 11 **Tap-off 2 power limiter** - A jumper that limits the power supplied to tap-off 2. If the tap-off asks for more power than allowed, the tap-off is shut down. See the label at the rear side of the lid for information about the jumper settings.
- 12 **Tap-off 1 power limiter** - A jumper that limits the power supplied to tap-off 1. If the tap-off asks for more power than allowed, the tap-off is shut down. See the label at the rear side of the lid for information about the jumper settings.

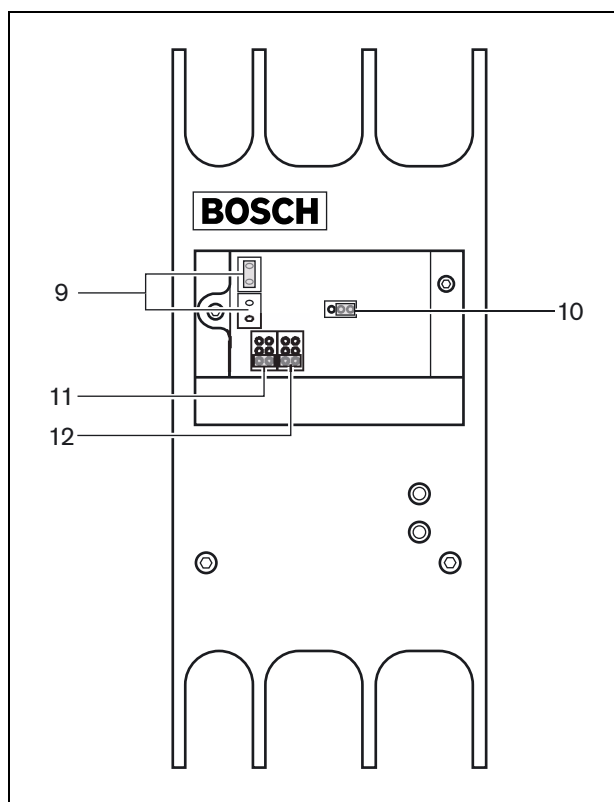


figure 18.2: Interior of the network splitter

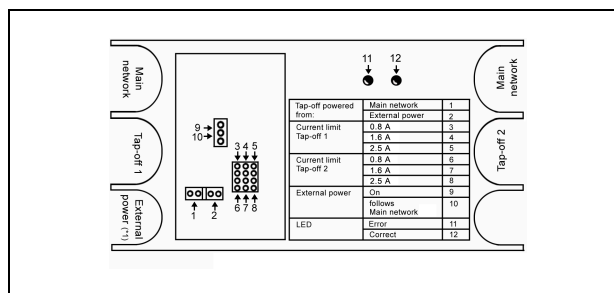


figure 18.3: Label inside network splitter

## 18.3 Connections

### 18.3.1 Introduction

This section gives an overview of typical system connections using the network splitter:

- Looping the trunk through (see section 18.3.2).
- Creating tap-offs (see section 18.3.2).
- Connecting an external power supply (see section 18.3.3).



#### Note

It is not possible to create a closed loop using a network splitter.

### 18.3.2 Connecting the trunk line and creating tap-offs

See figure 18.4 for information about connecting the trunk line and the tap-offs to the network splitter.

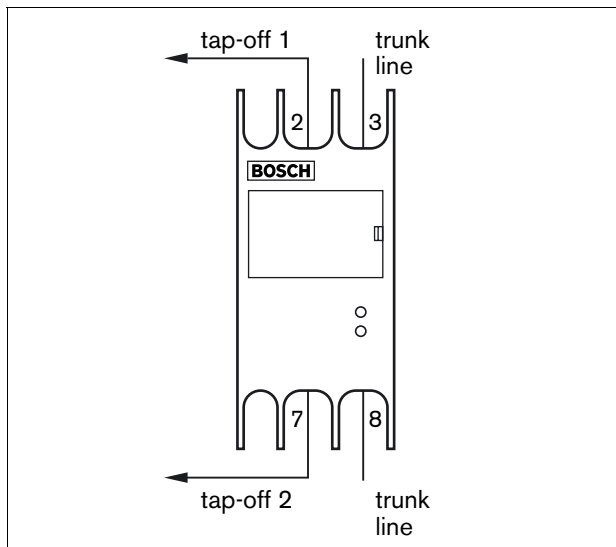


figure 18.4: Connecting the network splitter



#### Note

If the distance between two units is less than 100 m, a network splitter can be used in the middle to overcome the use of fiber interfaces. Use only the trunk sockets in this case.

### 18.3.3 Connecting a power supply

The network splitter is delivered with a separate Kycon KPP-4P connector to connect the external power supply to the network splitter.



#### Note

The external power supply can only feed the tap-offs and not the main network branch.

The Kycon KPP-4P connector has four pins (see figure 18.5):

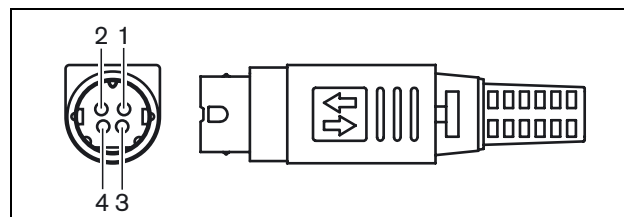


figure 18.5: Kycon KPP-4P connector

table 18.1: Kycon KPP-4P connector details

| Pin | Signal                                        |
|-----|-----------------------------------------------|
| 1   | Ground                                        |
| 2   | Power from local power supply (max. 48 V/5A). |
| 3   | Power from the system (max 48V/5A)            |
| 4   | Not connected                                 |



#### Note

For detailed connector assembly instructions, see appendix A.

## 18.4 Mounting

The network splitter can be mounted to a wall or any other flat surface using a bracket (see figure 18.6). The distance (d) between the holes in the bracket is 40 mm.

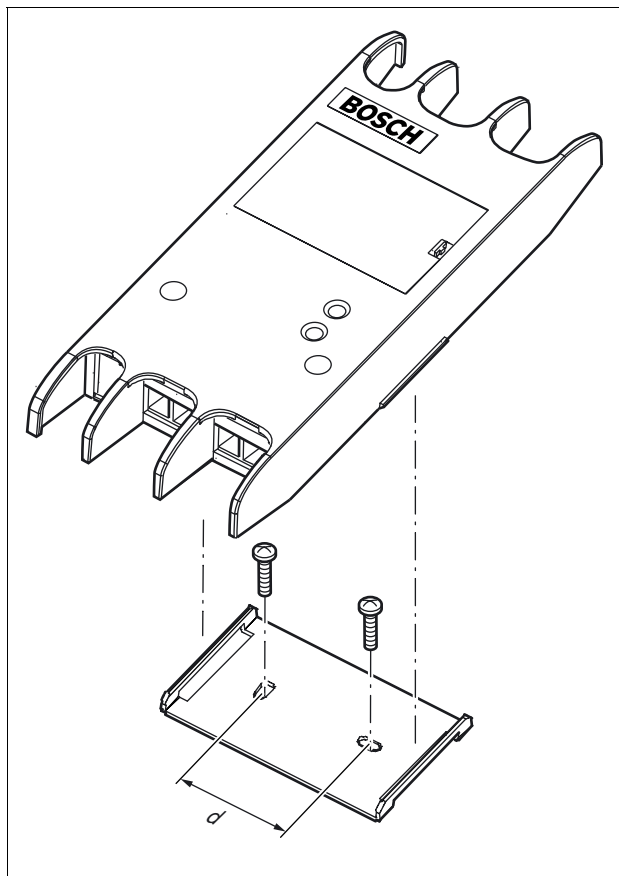


figure 18.6: Mounting

Press the sides of the unit to snap it in and out of the bracket.

## 18.5 Operation

The two LEDs on the network splitter provide information about the status of the network splitter.

table 18.2: Status LED indicators

| Green<br>(Power) | Yellow<br>(Fault) | Status                                         |
|------------------|-------------------|------------------------------------------------|
| Off              | Off               | No power                                       |
| Off              | On                | No optical network or<br>optical network fault |
| On               | Off               | Functioning correctly                          |

## 18.6 Technical data

### 18.6.1 Physical characteristics

#### Dimensions (H x W x D):

200 x 82.5 x 28.9 mm

#### Weight:

approx. 300 g

### 18.6.2 Climate conditions

#### Temperature:

-5 to 45 °C (operating)

-20 to 70 °C (transport, handling and storage)

#### Relative humidity:

15 to 90% (operating)

5 to 95% (transport, handling and storage)

#### Air pressure:

600 to 1100 hPa

### 18.6.3 Power consumption

#### Power consumption:

3.9 W

### 18.6.4 Optical network connections

#### Number of connections:

4x proprietary female sockets

#### Position:

Front and rear sides

### 18.6.5 External power supply

#### Number of connections:

1x 4 pin female socket

#### Position:

Rear side

#### Input voltage:

48 V(DC)

#### Input voltage range:

28 to 48 V(DC)

#### Current:

max. 5 A

## 19 LBB4414/00 Fiber

### Interface

#### 19.1 Introduction

The fiber interface is used to convert from plastic optical fiber cable (POF) to glass optical fiber cable (GOF) and vice versa to cover distances of more than 50 m in the optical network.

#### 19.2 Controls, connectors and indicators

The fiber interface (see figure 19.1) contains the following:

- 1 **External power supply** - A connection for an optional external power supply (see section 19.3.3).
- 2 **Control inputs** - for future use.
- 3 **POF socket** - A POF socket to connect the fiber interface to a POF cable (see section 19.3.2).
- 4 **Lid** - for future use.
- 5 **Status LED** - A yellow status LED that provides information about the status of the fiber interface (see section 19.5).
- 6 **Status LED** - A green status LED that provides information about the status of the fiber interface (see section 19.5).
- 7 **GOF socket** - A GOF socket to connect the fiber interface to a GOF cable (see section 19.3.2).

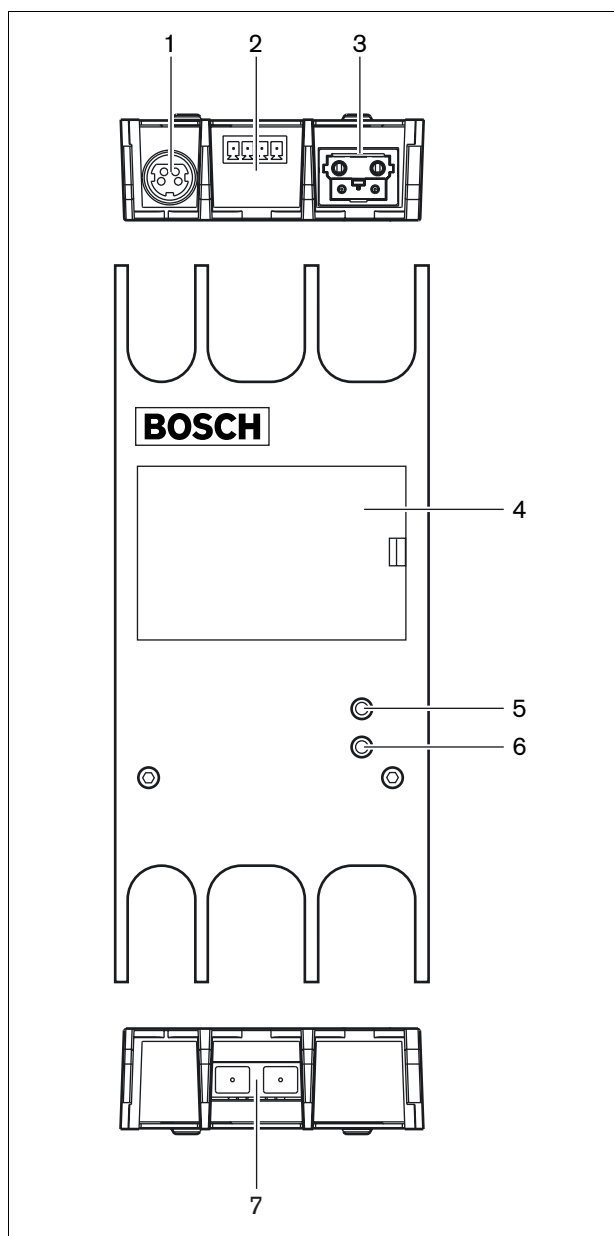


figure 19.1: Exterior of the fiber interface

## 19.3 Connections

### 19.3.1 Introduction

This section gives an overview of typical system connections using the fiber interface:

- Connecting the POF cable (see section 19.3.2).
- Connecting the GOF cable (see section 19.3.2).
- Connecting an external power supply (see section 19.3.3).

### 19.3.2 Connecting POF and GOF cables

Fiber interfaces convert from POF to GOF to connect two pieces of equipment in the optical network of the system that are more than 50 m apart and less than 1,500 m. Usually they are used in pairs. The first converts from POF to GOF, whereas the second converts from GOF back to POF (see figure 19.2).

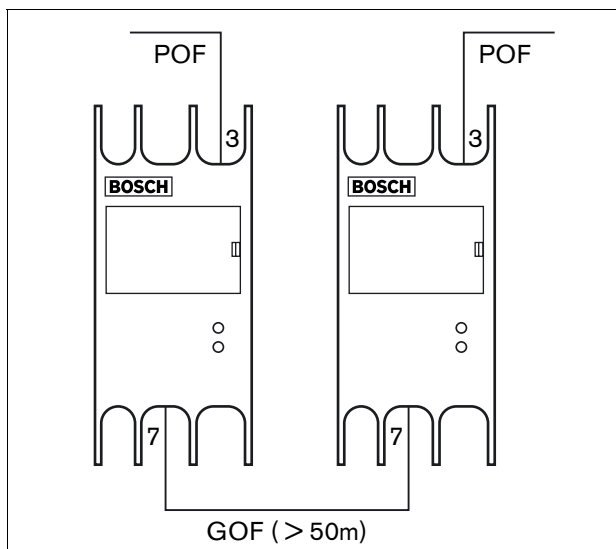


figure 19.2: Connecting the fiber interface

### 19.3.3 Connecting a power supply

The fiber interface is delivered with a separate Kycon KPP-4P connector to connect the external power supply to the fiber interface. The Kycon KPP-4P connector has four pins (see figure 19.3):

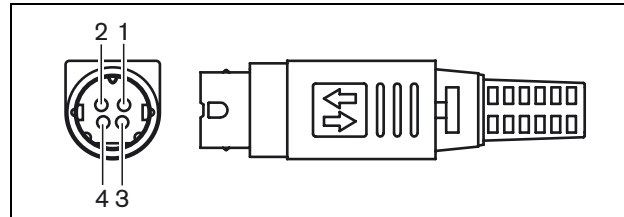


figure 19.3: Kycon KPP-4P connector

table 19.1: Kycon KPP-4P connector details

| Pin | Signal                                           |
|-----|--------------------------------------------------|
| 1   | Ground                                           |
| 2   | Power from local power supply<br>(max. 48 V/5 A) |
| 3   | Power from the system<br>(max 48V/5 A)           |
| 4   | Not connected                                    |



#### Note

For detailed connector assembly instructions, see appendix A.

If the fiber interface uses an external power supply and the system power supply is present as well, it is possible that the system voltage (nominally 48 V) is higher than the external power supply voltage. In that case, this higher voltage is forced on the output of the external power supply.

Many external power supplies are not able to accept this and get defective as a result. To isolate the external power supply from a higher terminal voltage, a series diode should be inserted between the external power supply and the fiber interface (see figure 19.4).

Technically, it was not possible to incorporate this diode into the fiber interface because it is allowed to power a significant part of the optical network from this external power supply, with up to 5 A load. With a load of 5 A, the power dissipation of the diode would be such that the internal temperature of the fiber interface would become too high. 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.

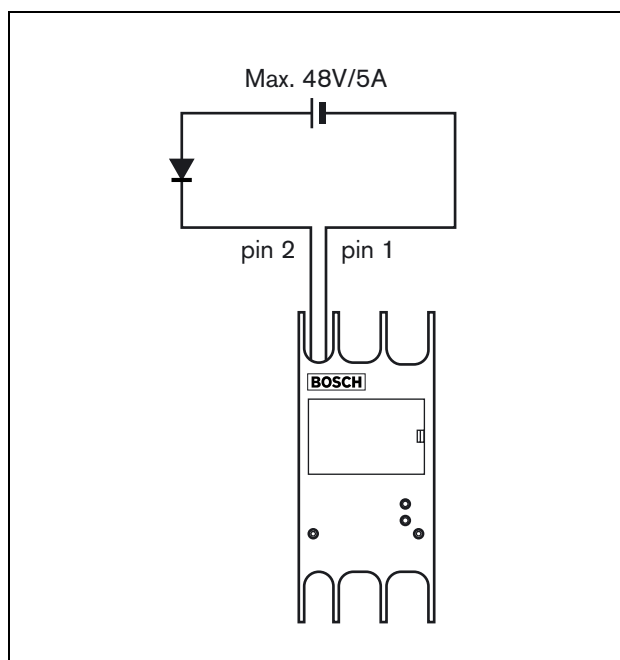


figure 19.4: Diode connection

## 19.4 Mounting

The fiber interface can be mounted to a wall or any other flat surface using a bracket. See figure 19.5 for more information. The distance between the holes in the bracket (d) is 40 mm.

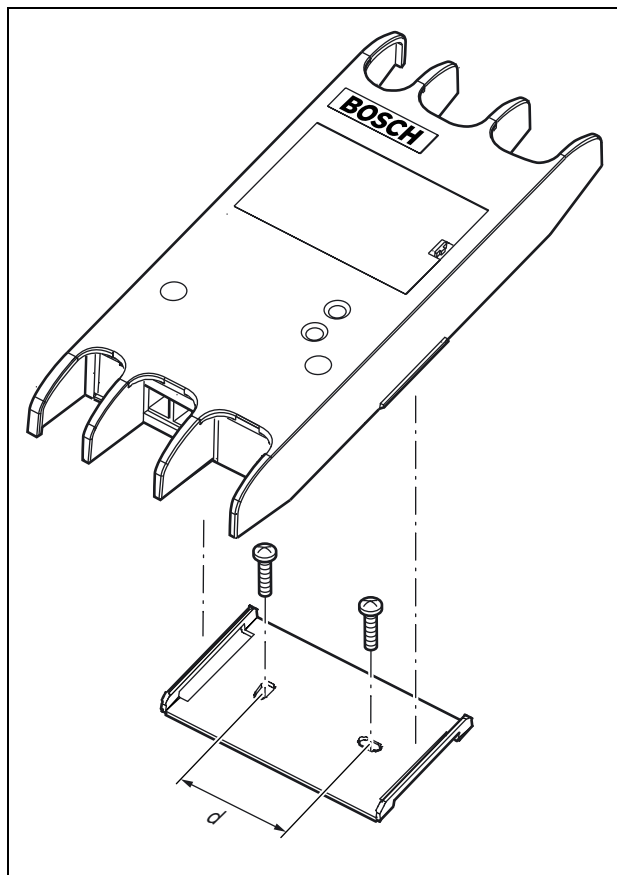


figure 19.5: Mounting

Press the sides of the unit to snap it in and out of the bracket.

## 19.5 Operation

The two LEDs on the fiber interface provide information about the status of the fiber interface.

table 6.2: status LED indicators

| Green<br>(Power) | Yellow<br>(Fault) | Description                                                            |
|------------------|-------------------|------------------------------------------------------------------------|
| Off              | Off               | Off; no external power available.                                      |
| Off              | On                | Stand-by; external power to POF switched off.                          |
| On               | On                | Operating; external power to POF switched on.                          |
| On               | Off               | Operating, no external power available, but powered from the POF side. |
| Blink            | Off               | Fault, no external power available and no protocol received.           |
| Blink            | On                | Fault, external power available, but no protocol received.             |

## 19.6 Technical data

### 19.6.1 Physical characteristics

**Dimensions (H x W x D):**

200 x 82.5 x 28.9 mm

**Weight:**

approx. 300 g

### 19.6.2 Climate conditions

**Temperature:**

-5 to 55 °C (operating)

-20 to 70 °C (transport, handling and storage)

**Relative humidity:**

15 to 90% (operating)

5 to 95% (transport, handling and storage)

**Air pressure:**

600 to 1100 hPa

### 19.6.3 Power consumption

**Power consumption:**

4.5 W

### 19.6.4 Optical network connections

**Number of connections:**

1x proprietary female socket

1x industry standard SC socket

**Position:**

Front and rear sides

### 19.6.5 External power supply

**Number of connections:**

1x 4 pin female socket

**Position:**

Rear side

**Input voltage:**

48 V(DC)

**Input voltage range:**

28 to 48 V(DC)

**Current:**

max. 5 A



## 20 LBB4416/xx Network Cables

### 20.1 Introduction

All LBB4416/xx optical Network Cables contain two plastic optical fibers for data communication and two copper cores for power supply. All cables (except for the LBB4416/xx) are supplied with the network connectors fitted.

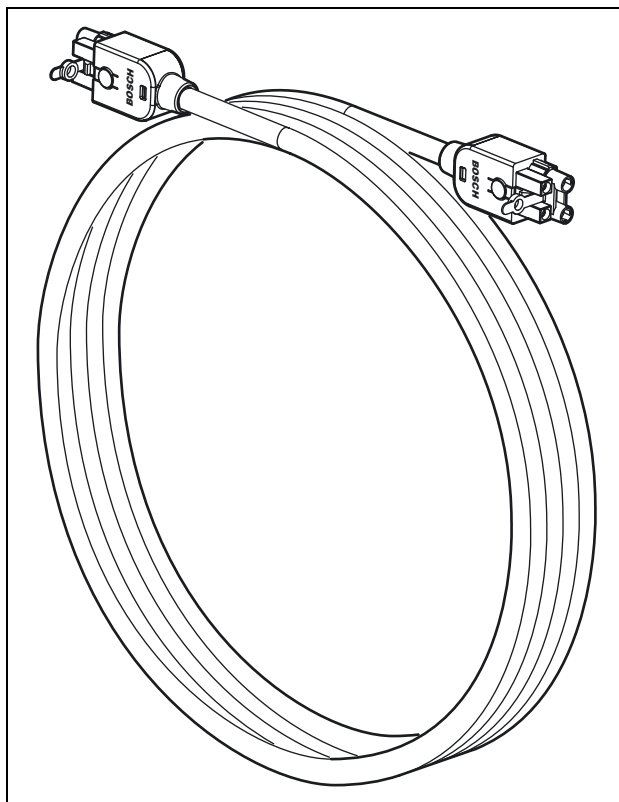


figure 20.1: Optical network cable

table 20.1: Optical network cables

| Type number | Cable length |
|-------------|--------------|
| LBB4416/00  | 100 m        |
| LBB4416/01  | 1 m          |
| LBB4416/02  | 2 m          |
| LBB4416/05  | 5 m          |
| LBB4416/10  | 10 m         |
| LBB4416/20  | 20 m         |
| LBB4416/50  | 50 m         |

### 20.2 Connectors

Except for LBB4416/00, all cables are terminated with male, proprietary connectors on both ends of the cable. See figure 20.2 for connector details.

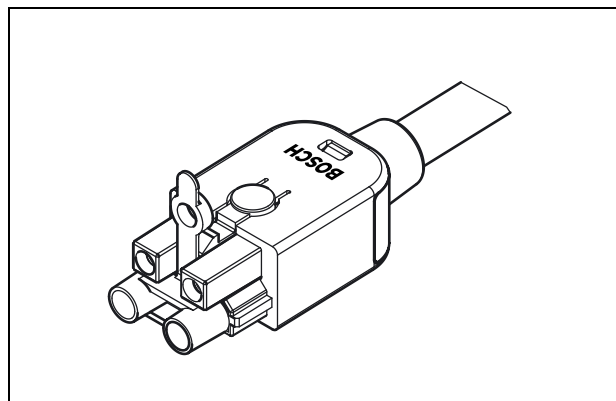


figure 20.2 Connector (with dustcap)

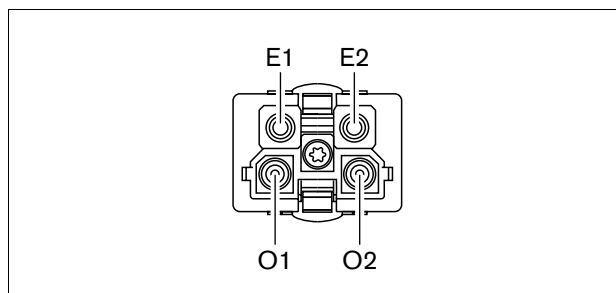


figure 20.3 Connector details

### 20.3 Diagrams

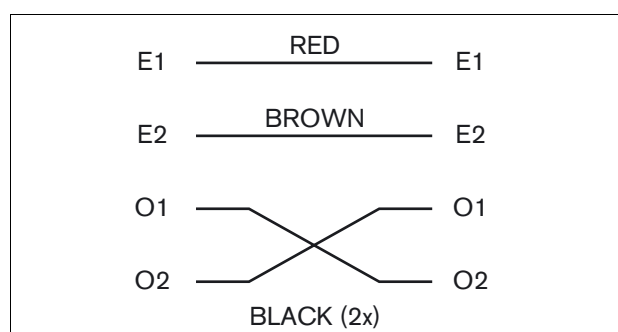


figure 20.4 Wiring diagram

table 20.2: Connector details

| Pin | Signal    | Wire          |
|-----|-----------|---------------|
| E1  | +48 V(DC) | Copper        |
| E2  | GND       | Copper        |
| O1  | Data      | Optical fiber |
| O2  | Data      | Optical fiber |

## 20.4 Wiring

See figure 20.5 for details about the wires inside the extension cables.

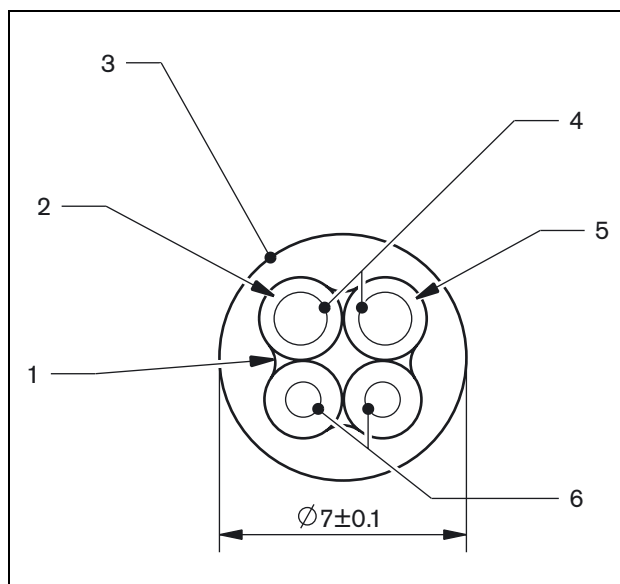


figure 20.5 Cable details

table 20.3: Cable details

| Number | Signal           | Color |
|--------|------------------|-------|
| 1      | Protective cloth | ----  |
| 2      | Insulation       | Brown |
| 3      | Outer sheet      | Black |
| 4      | Stranded wire    | ----- |
| 5      | Insulation       | Red   |
| 6      | Optical fiber    | ----- |

## 20.5 Custom-made cables

Use LBB4418/00 Cable-connector Tool Kit to create custom-made cables out of LBB4416/00 Network Cables and LBB4417/00 Network Connectors.

## 20.6 Technical data

### Insulation:

LSZH (low smoke/zero halogen), black

### Outer diameter:

7 mm

### Power supply wires (2):

Copper, stranded 1 mm<sup>2</sup>, red and brown insulation, resistance < 0.018 Ω/m

### Optical fibers (2):

- PMMA, 1 mm diameter including cladding, 2 mm diameter including 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

### UL-compliance:

UL444 (60 °C/60 V), UL1666

### Flame retardant:

according to IEC 60332-1 / 60 s

### Halogen level:

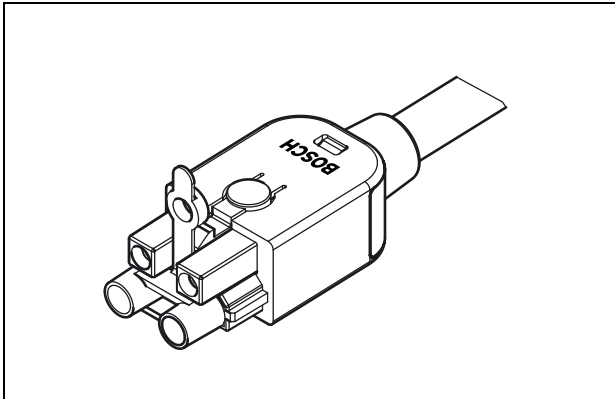
according to IEC 60754-2, pH > 4.3 and conductivity < 10 uS/mm

### Smoke level:

according to IEC 61034-2, light transmittance > 60%

## 21 LBB4417/00 Network Connectors

The LBB4417/00 Network Connectors are used to create custom-made cables in combination with LBB4416/00 Network Cable (100 m) and the LBB4418/00 Cable-connector Tool Kit.



*figure 21.1: Optical network connector*

## 22 LBB4118 Cable-connector

### Tool Kit

#### 22.1 Introduction

The LBB4418/00 optical Cable-connector Tool Kit is used to create custom-made extension cables out of LBB4416/00 optical Network Cable (100 m) and LBB4417/00 optical Network Connectors.

#### 22.2 Contents



figure 22.1: Cable-connector tool kit contents

#### Supplier:

Rennsteig Werkzeuge GmbH  
Viernau, Thüringen, Germany  
Supplier type number: 600 100 PHI

table 6.3: Tool kit contents

| No. | Description                           | Orderno.       |
|-----|---------------------------------------|----------------|
| 1   | Spare cutting system (with Allen key) | 600 004 0      |
| 2   | Cable cutter                          | 600 015 36     |
| 3   | Crimping tool (3 type)                | 642 509 3 23   |
| 4   | POF positioning and 4 crimp tool      | 618 071 69PHI  |
| 5   | Stripping tool (2 type)               | 607 202 69PHI  |
| 6   | POF cutter/stripping tool             | 600 003 - 1 39 |
| 7   | Torx screwdriver                      | C209 000077    |

#### 22.3 Diagrams

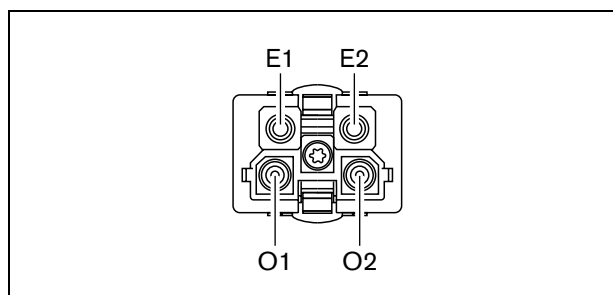


figure 22.2: Optical connector details

table 22.1: Optical connector details

| Pin | Signal   | Wire          |
|-----|----------|---------------|
| E1  | +48V(DC) | Copper        |
| E2  | GND      | Copper        |
| O1  | Data     | Optical fiber |
| O2  | Data     | Optical fiber |

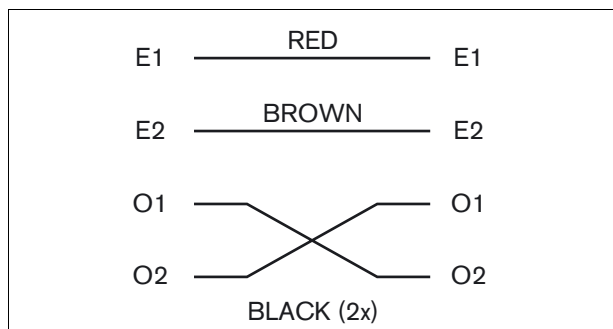


figure 22.3: Wiring diagram

## 22.4 Creating optical network cables

Carry out the following steps to mount a system bus connector onto an optical network cable:

- 1 Slide the back housing over the cable.
- 2 Strip the outer jacket using the stripping tool (tool 5). The cable end must be positioned against the stop. See the next figure.



figure 22.4: Step 2

- 3 Crimp the crimping bush using the crimping tool (tool 3). See the next figure.

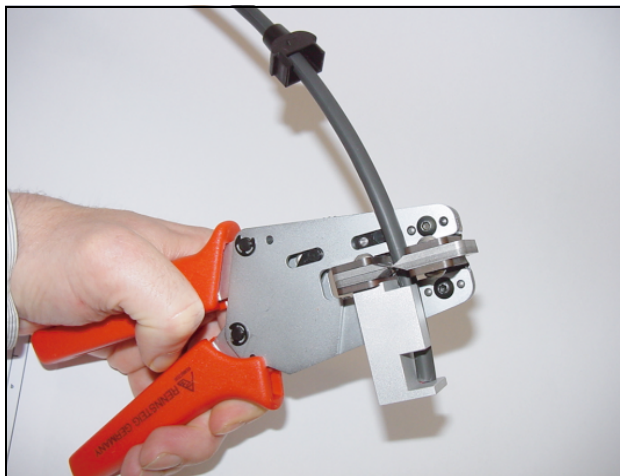


figure 22.5: Step 3

- 4 Cut the copper wires at the proper length using the cable cutter (tool 2). To this end, fix the wires in the cutting position with the help of the stripping tool (tool 5). See the next figure.

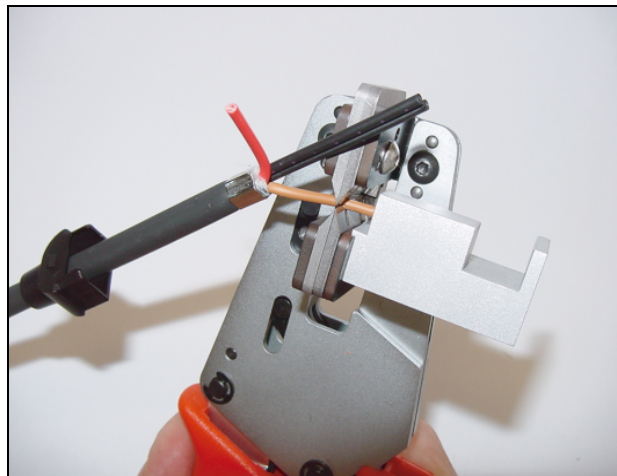


figure 22.6: Step 4

- 5 Strip the copper wires using the stripping tool (tool 5). See the next figure.

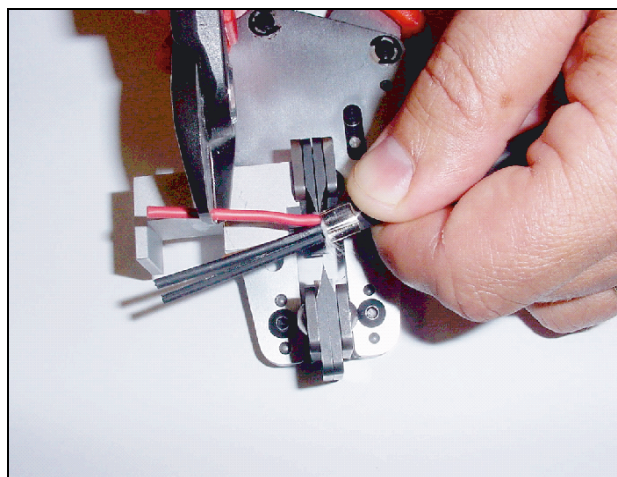


figure 22.7: Step 5



- 6 Crimp the socket contacts onto the copper wires using the crimping tool (tool 3). See the next figure.

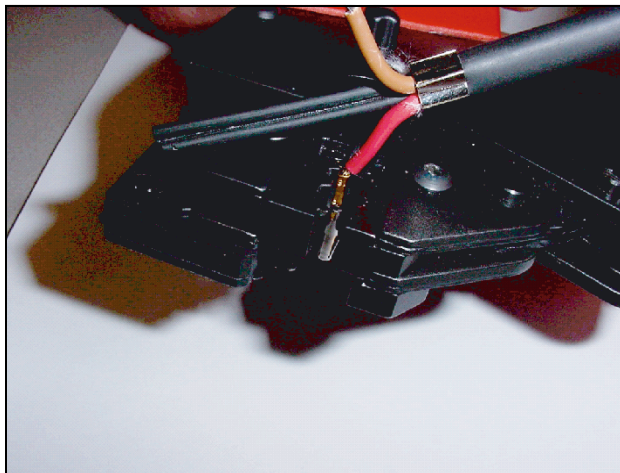


figure 22.8: Step 6

- 7 Cut the fibers at the proper length using the POF cutter/stripping tool (tool 6). See the next figure. (The fiber that must be cut must be put in the small guiding hole and rest against the stop, the other fiber must be put in the large guiding hole.)



**Note**

After 1,260 cuts the POF cutter/stripping tool blocks automatically. Replace the cutting system with the spare cutting systems (tool 1). Additional spare cutting tools are available under type number LBB4418/50.

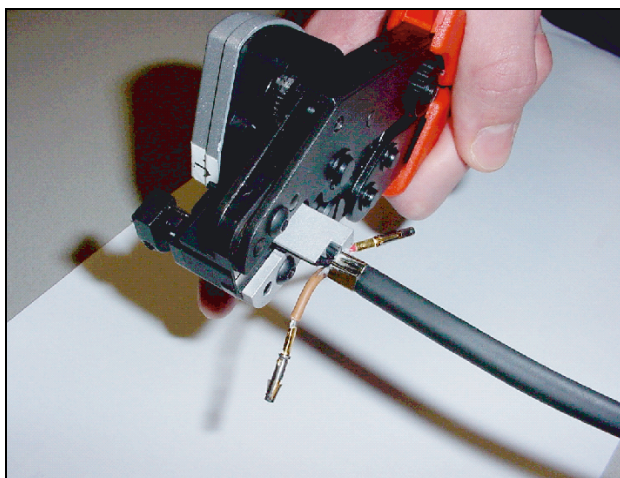


figure 22.9: Step 7

- 8 Strip the fibers using the POF cutter/stripping tool (tool 6). The crimping bush must rest against the stop. See the next figure.

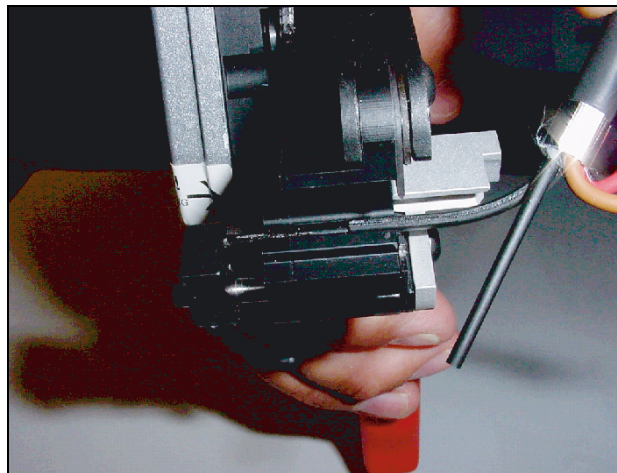


figure 22.10: Step 8

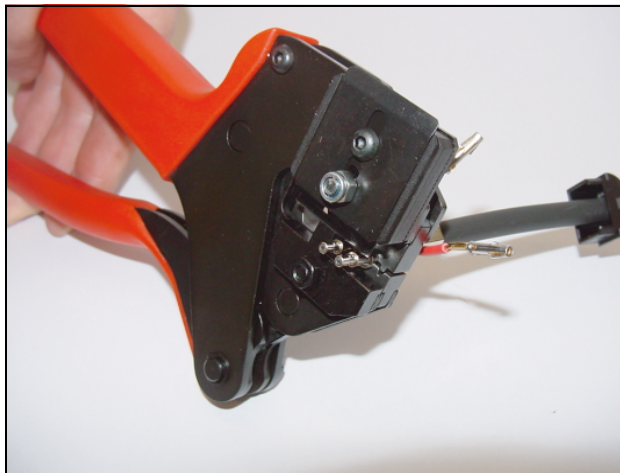
- 9 Put the ferrule into the POF positioning tool (tool 4). See the next figure.



figure 22.11: Step 9

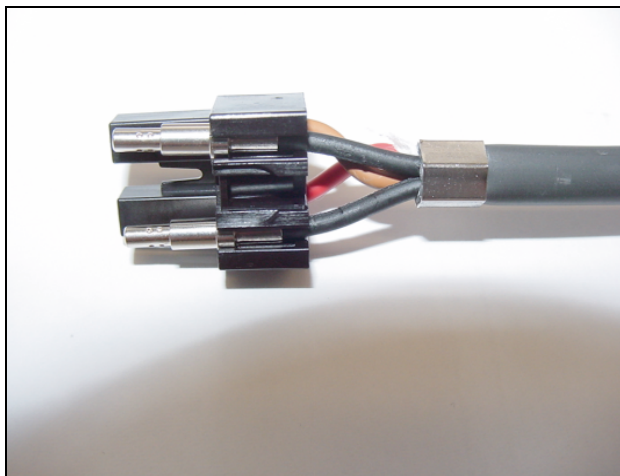
- 10 Insert the fiber into the ferrule by pushing the spring-loaded stop of the POF positioning tool (tool 4).
- 11 Repeat steps 7 to 10 for the other fiber.

- 12 Apply dual crimp on the back of the ferrules using the crimping tool (tool 3). See the next figure.



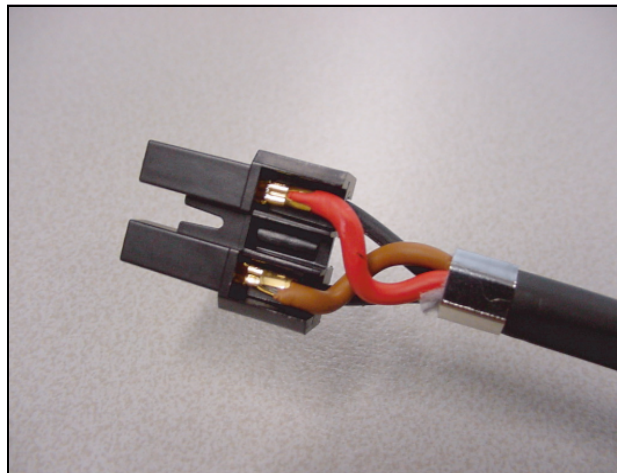
*figure 22.12: Step 12*

- 13 Hook the ferrules into the mounting block. See the next figure.



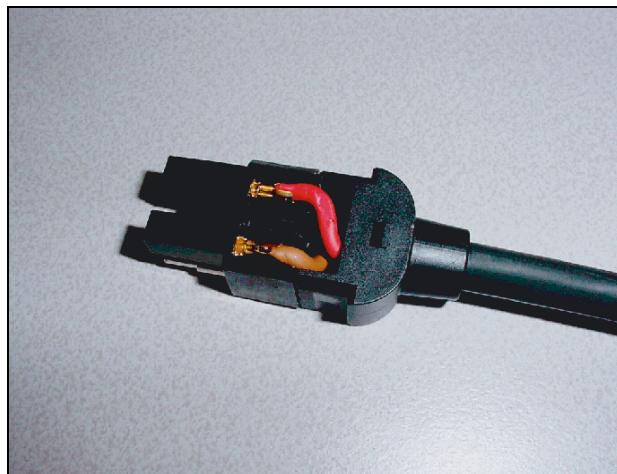
*figure 22.13: Step 13*

- 14 Snap the socket contacts (of the copper wires) into the mounting block (the crimp must be at the top).



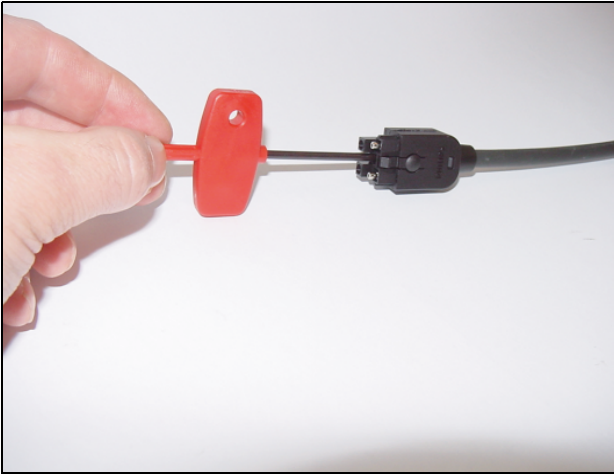
*figure 22.14: Step 14*

- 15 Slide the back housing against the mounting block with the angled edges to each other. See the next figure.



*figure 22.15: Step 15*

- 16 Snap the back housing onto the front housing.
- 17 Mount the torx screw to fix the back housing to the front housing using the torx screwdriver (tool 7). See the next figure.



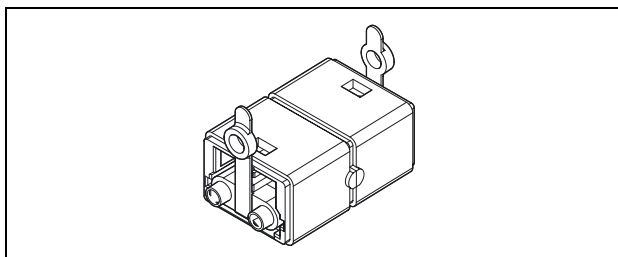
*figure 22.16: Step 17*

- 18 Clean the fibers with alcohol or isopropanol.



## 23 LBB4419/00 Cable Couplers

The LBB4419/00 Cable Couplers are used to connect extension cables to each other. However, in each cable coupler, a small amount of light gets lost. Therefore, each cable coupler limits the maximum distance of between two pieces of equipment (normally 50 meters) with 20 meters.



*figure 23.1: Cable coupler (with dustcaps)*

Cable couplers can also be used in combination with the tap-off sockets of network splitters (LBB4410/00) to create temporarily or easily detachable connections (e.g. break-out boxes).

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## Section 5 - System Installation

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## 24 Environmental conditions and maintenance

### 24.1 System

Where appropriate, use cable ducts for extension and mains cables. In order to identify such cables consider using cable tallies. Trunk lines, where appropriate, should be divided into manageable geographic locations. In public areas where connectors and cables could be trampled on, consider using protective metal covers according to the applicable protection specification.

### 24.2 Public areas

#### 24.2.1 Lighting

When placing channel selector units, ensure that the displays are positioned in such a way as to avoid direct lighting or sunlight. The recommended viewing distance (due to the size of the characters) is at max. 1.5 m with a minimum light level of 50 lux so as to operate the unit while still having a good viewing angle.

#### 24.2.2 Displays

Place public displays in positions where they can be easily viewed by all participants concerned. Avoid placement in direct lighting or sunlight. The size and viewing distance for public displays shall be selected depending on the visibility criteria for each specific system. Aspects such as viewing distance, character size for hall displays, contrast and brightness under the usual lighting conditions shall be taken into account. Advice is to be given by the equipment suppliers.

#### 24.2.3 Walkways

In public areas, ensure that the cables attached to the system units, including the extension cables, are run and laid out in a neat and tidy manner where they do not interfere and hinder public walkways.

### 24.2.4 Headphones/headsets

Where appropriate, place headphones/headsets with the interpreter desks. Acoustic feedback, causing 'Larsen' effect (howling), is possible when connected headphones/headsets reproducing the floor channel with a high volume, come too close to an activated microphone. The minimum distance recommended between microphone and headphones/headsets to avoid the 'Larsen' effect, depends on the type of headphones/headsets, the volume setting and if worn or laid down on a desk or table. The users should be instructed to keep sufficient distance or to set the volume not louder than necessary.

### 24.2.5 Speaking distance

The recommended speaking distance from microphones is 20 - 30 cm.

### 24.3 Technical rooms

It is recommended that in technical rooms where central control equipment is housed, the following conditions should be met:

- When units are mounted in a 19" rack, sufficient rack space is required between heat generating units to allow proper ventilation. Proper precautionary measures should also be taken inside the rack (e.g. forced ventilation inside racks) to keep the ambient temperature well below the maximum allowed temperature to extend the life-time of the equipment.
- Ensure that the area is a dust-free environment.
- Ensure adequate air-conditioning.
- Ensure adequate lighting, but also ensure that the lighting does not impede the central operators.
- Do not place objects on top of the units, which could fall into vents or which could cover them and prevent proper cooling of the electronics of the units. This could infiltrate into the unit which could cause trouble such as fire or electronic shock.

- Do not expose units to rain or excessive moisture to avoid the risk of shock or permanent damage to the system units.
- Do not attempt to remove the top cover of central control units, audio expanders and extension power supplies as you will be exposed to a shock hazard. The covers should only be removed by qualified maintenance personnel. The units are designed for indoor use only. Please refrain from subjecting the units to vibration, and never place the units near or over a radiator, heat grill or in direct sunlight.

**Note**

Damage to the mains cords may cause fire or a potential shock hazard.

### 24.3.1 Interpreter booths

Pressure and speed of work at most international conferences means that interpreters have to take turn and turn about to keep pace and ensure a steady flow of smooth interpretation. This means that each interpreter booth has to be large enough to accommodate at least two or maybe three interpreters. The specification for interpreter booths has been laid down by the International Organization for Standardization (ISO). See standard ISO 2603:1998(E) 'Booths for simultaneous interpretation - General characteristics and equipment' for more information.

## 24.4 Ventilation

Maintain good ventilation. Ventilation holes are provided on the front, right and left sides of the central control units. Place the units on a hard and level surface and position at least 4 inches from walls to ensure proper ventilation.

## 24.5 Cleaning

Do not use alcohol, ammonia or petroleum based liquids or abrasive cleaners to clean the equipment. Unplug and clean with a soft cloth slightly dampened with mild soap and water solution. Allow to dry completely before operating the relevant unit.

## 24.6 Storage

Disconnect the mains supply from all mains supplied units, if the units are not to be used for an extended period of time. Store in a dust free dry area with adequate ventilation. Do not store in areas affected by direct sunlight or in high or extreme cold conditions.

**Note**

If the central control unit is powered down and/or disconnected from the mains longer than 100 days, all system settings will be lost including all settings of the interpreter desks.

## 25 Flush-mounting

### 25.1 Introduction

Flush-mounting units form the building blocks for customized units. They are intended for use in fixed systems, where portability is not required. The units can be neatly installed into either table-tops or seat armrests. See table 25.1 for an overview of flush-mounting units.

table 25.1: Flush-mounting units

| Type no.   | Description      |
|------------|------------------|
| LBB4124/xx | Channel Selector |

Two methods are used to mount the units:

- Snap-mounting (see section 25.2).
- Block-mounting (see section 25.3).

## 25.2 Snap-mounting

### 25.2.1 Introduction

The snap-mounting method is used to install flush-mounting units in panels with a thickness of 2 mm. This method uses the 'click-to-fit' mechanism (see figure 25.1) to secure the units in cut-outs in table-tops or the armrest of seats. This mechanism is available on all flush-mounting units.



figure 25.1: Click-to-fit mechanism

### 25.2.2 Cut-outs

This section shows the dimensions of the cut-outs that must be made for snap-mounting the available flush-mounting units.

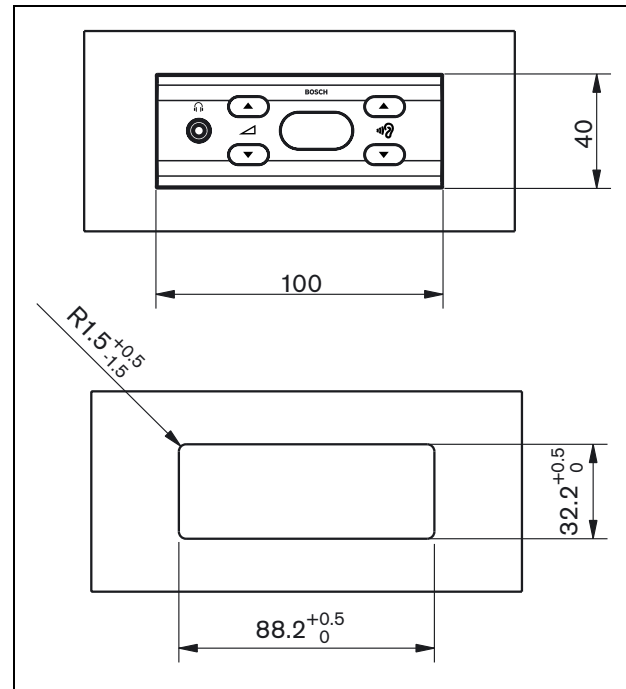


figure 25.2: LBB4124/00 Channel Selector

## 25.3 Block-mounting

### 25.3.1 Introduction

The block-mounting method is used to install flush-mounting units in panels of 2 mm. This method uses couple pieces (LBB4127/00) to secure the units in cut-outs in table-tops or the armrests of seats. See figure 25.4 for an example of block-mounting a channel selector (LBB4124/00).

### 25.3.2 Cut-outs

This section shows the dimensions of the cut-outs that must be made for block-mounting the available flush-mounting units.

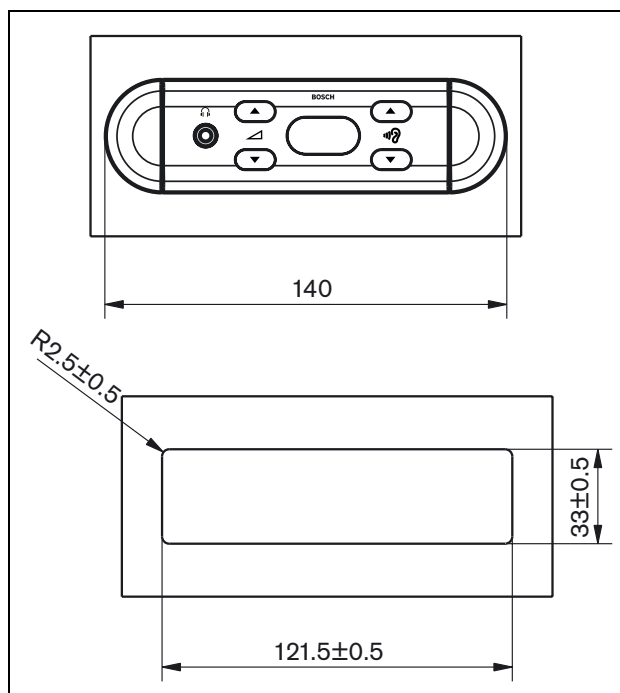


figure 25.3: LBB4124/00 Channel Selector



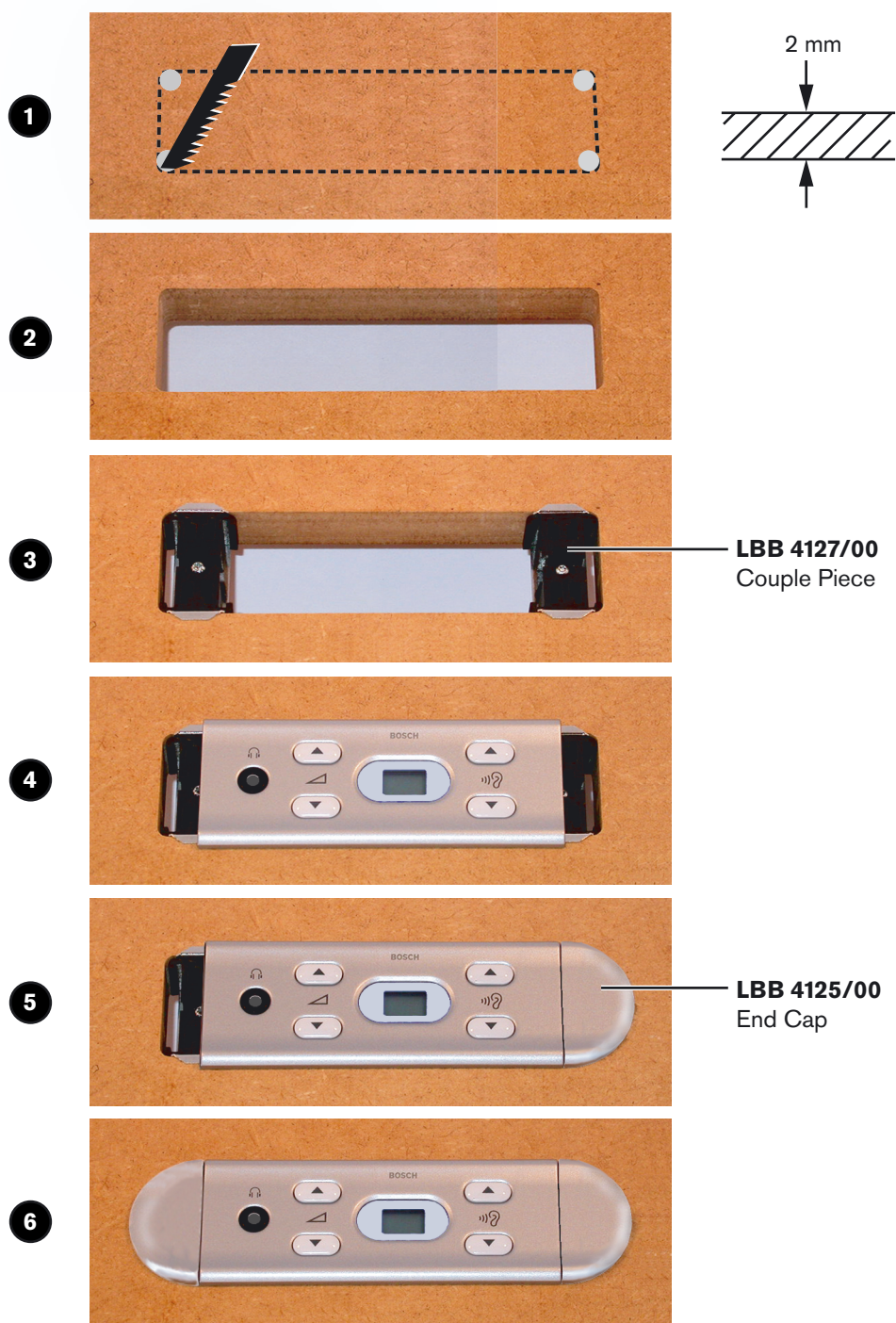


figure 25.4: Block-mounting

## 26 DCN Design

### 26.1 Introduction

This chapter provides information about installing the DCN.

### 26.2 Concepts

#### 26.2.1 Introduction

Before the limitations for the DCN are described (see section 26.3) first a number of concepts, necessary to understand the limitations, are explained.

#### 26.2.2 Trunk and tap-offs sockets

In the DCN, two types of sockets are available: trunk sockets and tap-off sockets. Trunk sockets are intended for looping the DCN trunk through (except for the DCN trunk sockets on the CCU), whereas tap-off sockets are used to create additional branches. A tap-off socket always regenerates the digital DCN signal.

#### 26.2.3 Unit cables and extension cables

All units that can be put in the DCN have an attached cable. This unit cable is 2 m long. If necessary, these unit cables can be extended with extension cables (LBB4116/xx).

### 26.3 Limitations

Observe the following limitations when designing the DCN:

#### **Limitation 1: Control capacity**

The maximum number of active units in the DCN that can be controlled by the CCU is 245 (see section 26.4).

#### **Limitation 2: Power capacity**

The maximum power that can be supplied by a single CCU (LBB4100/00) socket is 65 W. The maximum power that can be supplied by a single extension power supply (LBB4106/00) socket is 85 W (see section 26.5).

#### **Limitation 3: Tap-off connections**

The number of serial tap-off connections from the CCU (LBB4100/00) to the last tap-off in a branch must not exceed 4. Any unit connected thereafter will not function correctly (see section 26.6).

#### **Limitation 4: Loop-through connections**

The maximum number of loop-through connections in succession is 50. After 50 loop-throughs, the signal must be regenerated (see section 26.7).

#### **Limitation 5: Cable lengths**

- The total cable length between the CCU (LBB4100/00) and the last unit in any branch of the DCN must not exceed 250 m if regenerative tap-offs are used.
- The total cable length of the cable from the CCU (LBB4100/00) to the first regenerative tap-off must not exceed 100 m.
- The total length of the cable between regenerative tap-offs must not exceed 100 m.



#### **Note**

The total cable length includes the 2 m long unit cables.

See section 26.8 for information about cable length limitations.

## 26.4 Control capacity

The built-in control facilities of the CCU (LBB4100/00) are capable of controlling up to a maximum of 245 active units and an unlimited number of passive units.

## 26.5 Power capacity

### 26.5.1 Introduction

Each unit in the system consumes a certain amount of power. The total power consumption of all units in the DCN may not be higher than the total supplied power.

### 26.5.2 Power consumption

See table 26.1 for an overview of the power consumption of the units in the DCN.

table 26.1: Overview of power consumption

| Unit       | Description             | Watt |
|------------|-------------------------|------|
| LBB4106/00 | Extension Power Supply  | 0.7  |
| LBB4112/00 | Data Distribution Board | 1.4  |
| LBB4114/00 | Trunk Splitter          | 1.3  |
| LBB4115/00 | Tap-off Unit            | 1.4  |
| LBB4120/00 | Interpreter Desk        | 3.5  |
| LBB4124/xx | Channel Selector        | 0.9  |

### 26.5.3 Power supplies

The only units that can supply power to the DCN are the CCU (LBB4100/00) and the extension power supply (LBB4106/00). See figure 26.1 and figure 26.2. The power supplied by the CCU includes the power supplied to the optical network.

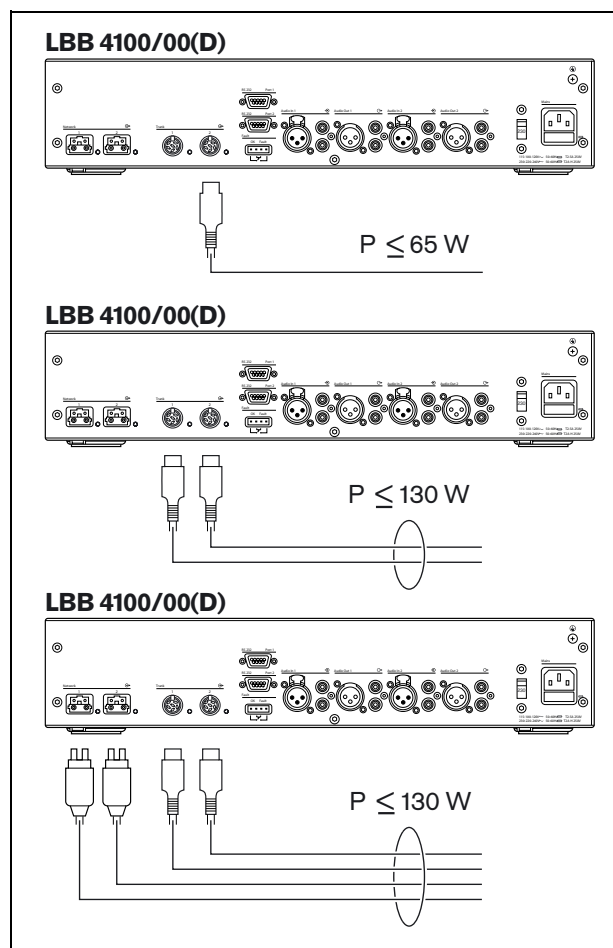


figure 26.1: DCN power supply (1)



#### Note

If the power is higher than indicated in figure 26.1, an overload situation occurs (see section 27.4.4).

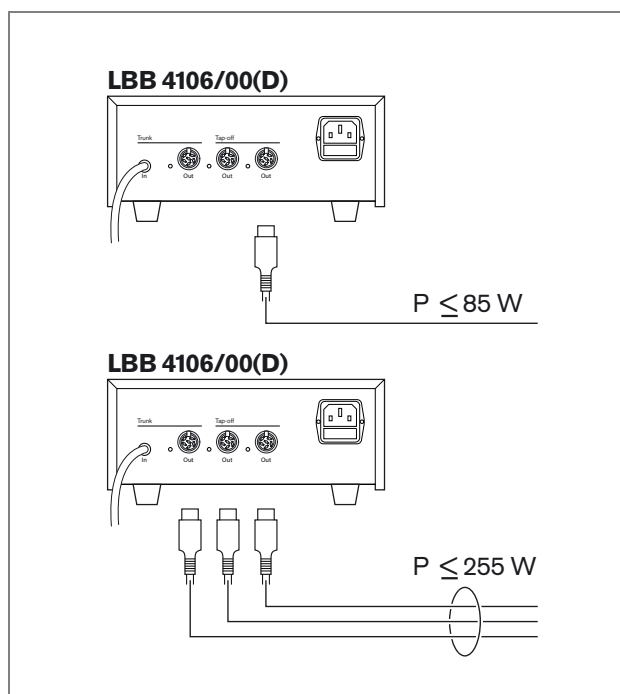


figure 26.2: DCN power supply (2)

## 26.6 Tap-offs

Because tap-off sockets regenerate the digital DCN signal, the number of tap-off sockets connected in series is limited. The number of serial tap-off connections from the CCU to the last tap-off in a branch must not exceed 4.

## 26.7 Loop-throughs

The maximum number of loop-through connections in succession is 50. After 50 loop-throughs, the digital DCN signal must be regenerated. This can be done using a trunk splitter (LBB4114/00) or tap-off unit (LBB4115/00).

### 26.5.4 Overload indication

Each DCN socket of the CCU (LBB4100/00) and extension power supply (LBB4106/00) has a red LED that lights up to indicate power overload situations. An overload situation occurs when the equipment connected to the socket asks for more power than can be supplied or when a short-circuit is detected. Once an overload situation is detected, the sockets are switched off. As a result, all units that are connected to the CCU are deactivated. It takes less than 30 seconds (LBB4100/00) or 8 seconds (LBB4106/00) before the socket is checked again.

### 26.5.5 Extension cables

DCN extension cables (LBB4416/xx) have a direct influence on the available power. The longer the total length of extension cable connected to a DCN trunk socket of a CCU (LBB4100/00) or extension power supply (LBB4106/00), the fewer power is available for powering the units connected to that socket. The length of used extension cables must therefore always be taken into account (see section 26.8.3).

## 26.8 Cable lengths

### 26.8.1 Branch length

The total cable length between the CCU and the last unit in any branch of the system must not exceed 250 m. This includes both unit and extension cables. See figure 26.4 for an example.

### 26.8.2 Main branch

The total cable length between the CCU and the first regenerative tap-off socket must not exceed 100 m. This includes both unit and extension cables. See figure 26.4 for an example.

### 26.8.3 Power correction

The power available from an DCN socket is not only influenced by the type and number of units connected to the socket (see sections 26.5.2 and 26.5.3), but also by the sum of the lengths of the extension cables connected to the socket. Using the cable correction graph (see figure 26.3), it is possible to correct the available power for extension cable length. For each DCN socket:

- 1 Use the power consumption table (see table 26.1) to calculate the amount of power consumed by the units connected to the socket.
- 2 Calculate the total length of extension cable connected to the socket.
- 3 Locate the value obtained in step 1 on the Y axis of the graph (see figure 26.3) and the value obtained in step 2 on the X axis. Using standard graph reading procedures, join the two together to obtain the power consumption corrected for extension cable length. These are shown within the squares.

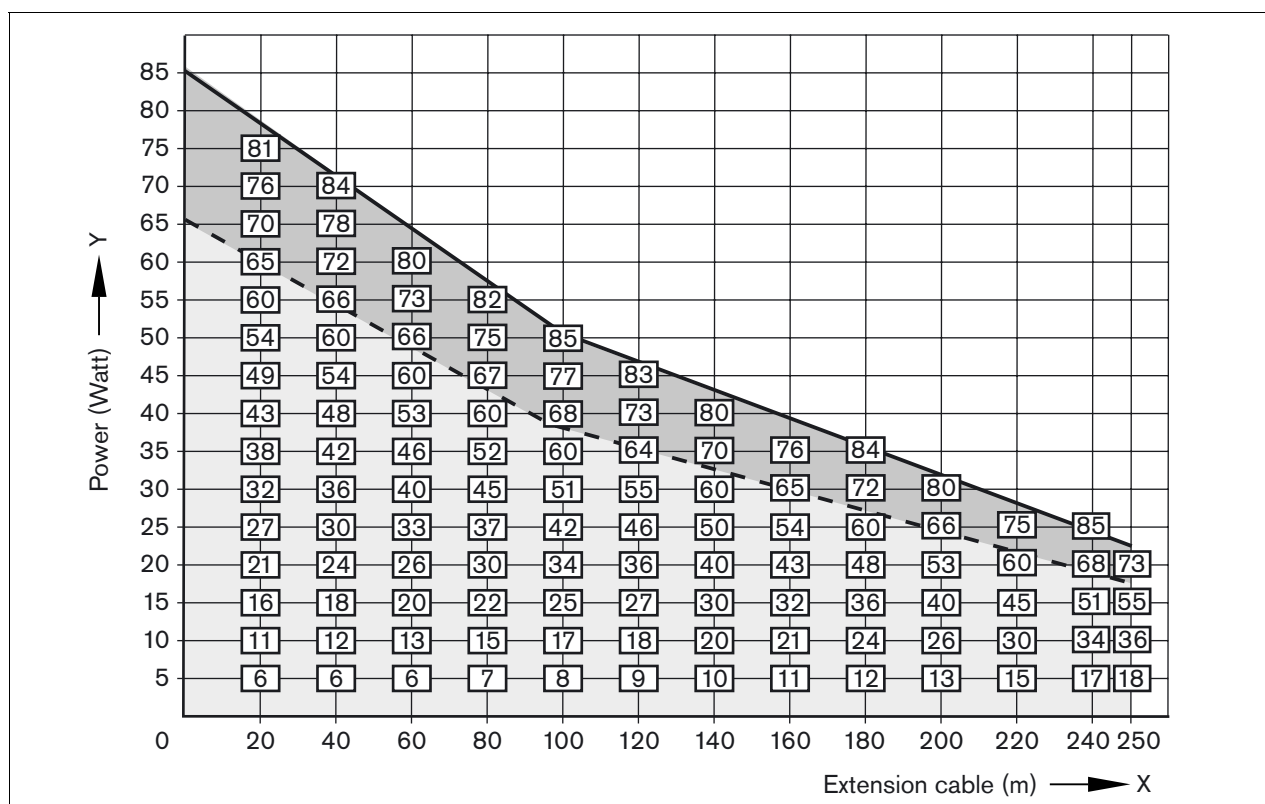


figure 26.3: Cable correction graph

## 26.8.4 Example

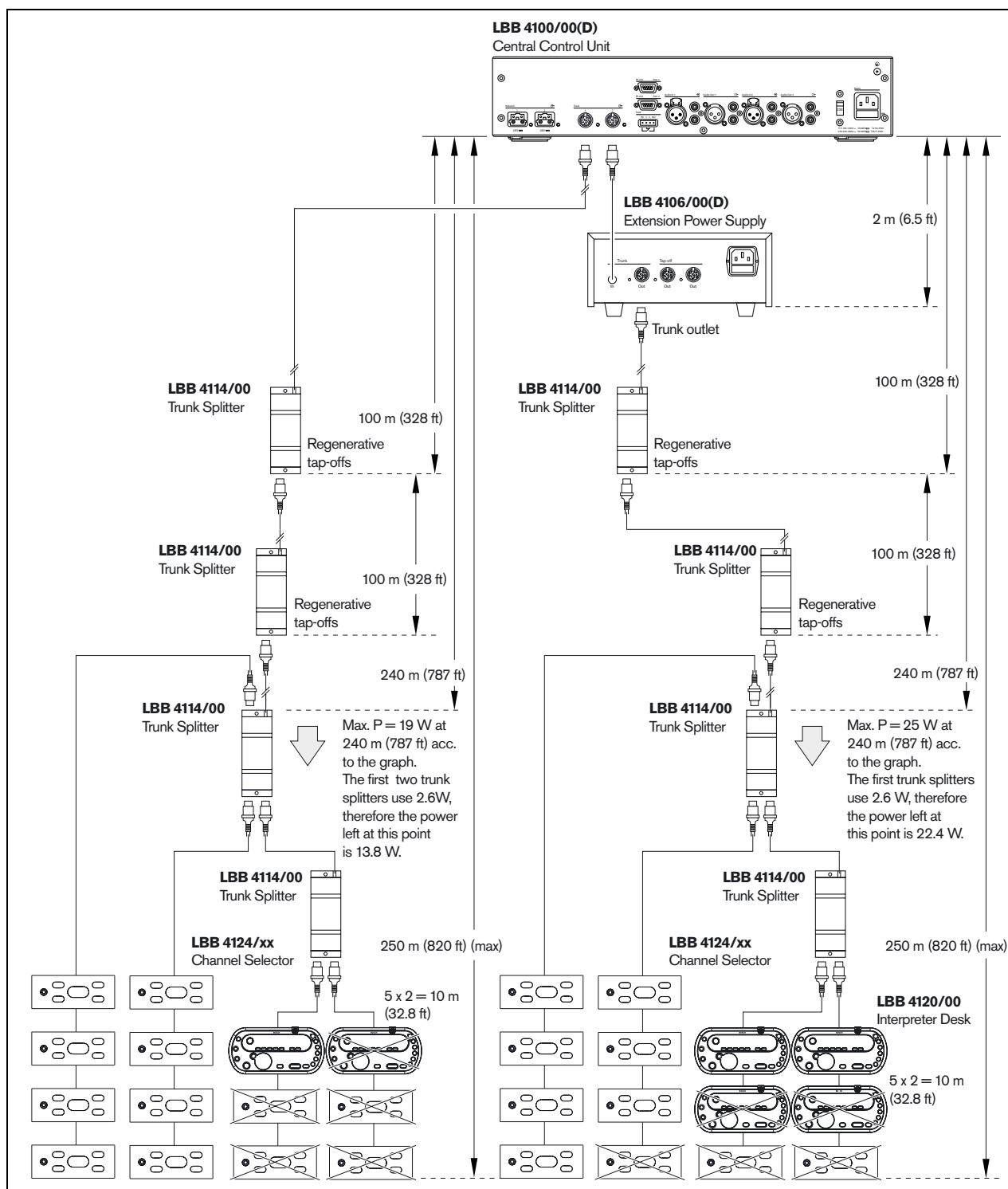


figure 26.4: Example DCN

## 27 Optical network design

### 27.1 Introduction

This chapter provides system information about installing the optical network.

### 27.2 Limitations

Observe the following limitations when designing the optical network of the system.

#### **Limitation 1: Control capacity**

The optical network may not contain more than 63 nodes (see section 27.3).

#### **Limitation 2: Power capacity**

The maximum power that can be supplied by a single CCU (LBB4100/00) socket is 65 W (see section 27.4).

#### **Limitation 3: Cabling**

- The maximum length of a POF wire is 50 m.
- The total length of all optical fibers together (both POF and GOF) in the optical network depends on the number of nodes in the optical network.
- The bend radius of optical network cables (LBB4416/xx) is 25 mm.
- The minimum coiling radius of optical network cables (LBB4416/xx) is 100 mm.

See section 27.5 for information about optical network cabling.

### 27.3 Control capacity

Each unit in the optical network represents a certain amount of nodes (see table 27.1). The maximum number of nodes in the optical network is 63.

*table 27.1: Nodes*

| Unit       | Description             | Nodes |
|------------|-------------------------|-------|
| LBB4100/00 | Central Control Unit    | 2     |
| LBB4402/00 | Audio Expander Analogue | 1     |
| LBB4410/00 | Network Splitter        | 1     |
| LBB4414/00 | Fiber Interface         | 1     |

### 27.4 Power capacity

#### 27.4.1 Introduction

Each unit in the system consumes a certain amount of power. The total power consumption of all units in the optical network may not be higher than the total supplied power.

#### 27.4.2 Power consumption

See table 27.2 for an overview of the power consumption of the units in the optical network.

*table 27.2: Overview of power consumption*

| Unit       | Description             | Watt |
|------------|-------------------------|------|
| LBB4402/00 | Audio Expander Analogue | 5.6  |
| LBB4410/00 | Network Splitter        | 3.9  |
| LBB4414/00 | Fiber Interface         | 4.5  |



### 27.4.3 Power supply

By default, the only unit that can supply power to the optical network is the CCU (LBB4100/00), see figure 27.1. The power supplied by the CCU includes the power supplied to the DCN.

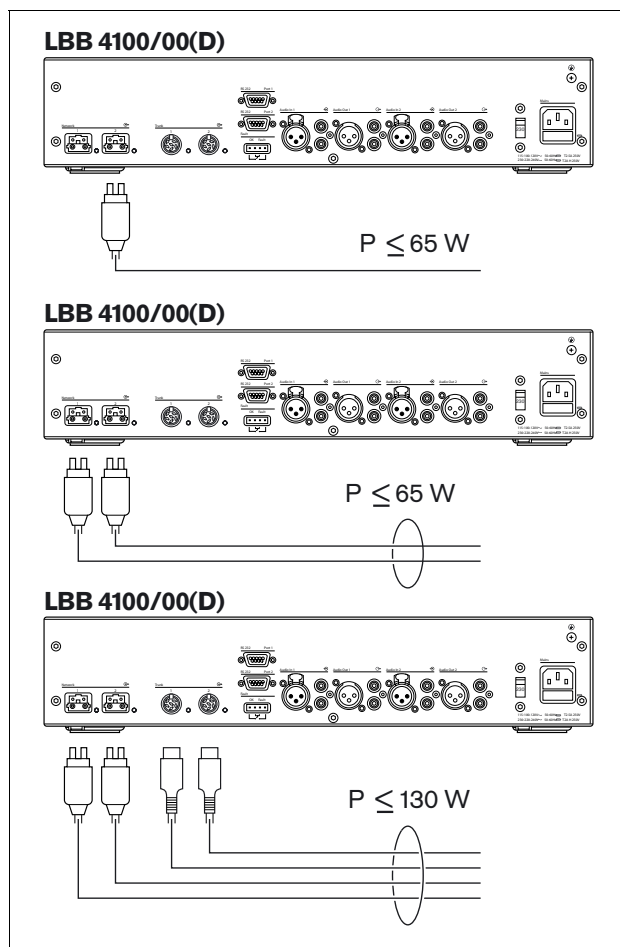


figure 27.1: Optical network power supply

If more power is needed, external power supplies must be used to feed the optical network. The following units have a provision for connecting external power supplies:

- LBB4410/00 Network Splitter.
- LBB4414/00 Fiber Interface.

The amount of Watt provided by an external power supply is calculated as follows:

$$P = V \cdot I$$

P = Power (W)

V = DC voltage (V)

I = DC current (A)

Because all the optical network units have built-in switched mode power supplies, the power consumption is virtually constant and within a certain range independent of the supply voltage V. The lower V is, the higher I will be.

### 27.4.4 Overload indication

Each optical network socket of the CCU (LBB4100/00) has a red LED that lights up to indicate power overload situations. An overload situation occurs when the equipment connected to the socket asks for more power than can be supplied. Once an overload situation is detected, the sockets are switched off. As a result, all units that are connected to the CCU are deactivated. It takes less than 30 seconds before the sockets are checked again.



#### Note

Even if only one of the optical network sockets has a power overload, both overload LEDs will be activated and the power will be removed from both sockets.



## 27.5 Cabling

### 27.5.1 Introduction

All units in the optical network are equipped with two interchangeable optical network sockets. Use one of these connectors to connect a unit to the previous unit and the other to connect it to the next unit in the chain.



#### Note

Both optical network connectors are identical.

### 27.5.2 POF cable length

Due to light loss, the maximum length of optical network cables (LBB4416/xx) is 50 m. If the distance between two pieces of equipment in the optical network is more than 50 m and less than 1500 m, fiber interfaces (LBB4414/00) and glass optical fiber (GOF) must be used (see figure 27.2).

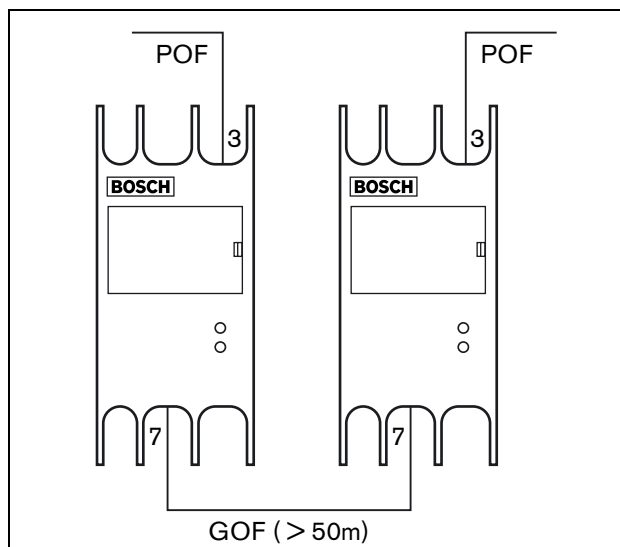


figure 27.2: Using the fiber interface

If GOF cables are used, make sure that they:

- are multimode GOF cables (single mode GOF cables are not supported);
- have a maximum attenuation of 2 dB/km;
- are suitable for light with a wavelength of 1300 nm;
- are terminated with standard SC connectors.



#### Note

It is also possible to increase the distance between units above 50 m by inserting network splitters (LBB4410/00) every 50 m or less. Although no tap-off may be required, the network signal is regenerated in the network splitter to cover another 50 m. Use only the trunk sockets in this case.

### 27.5.3 Optical fiber length

The maximum length of all optical fibers together (both POF and GOF) in the optical network depends on the number of nodes in the system (see table 27.1 for a list of node values). The graph (see figure 27.4) shows the relation between the number of nodes in the optical network and the maximum optical fiber length.

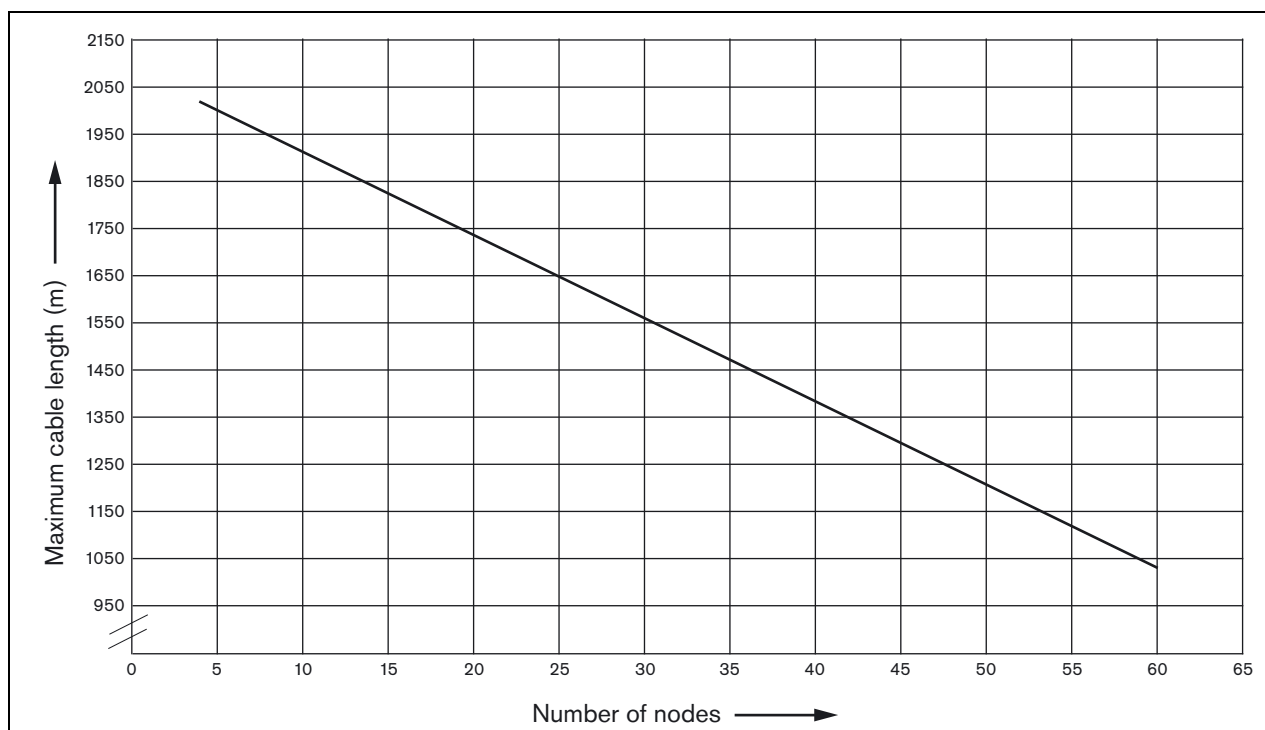


figure 27.3: Maximum optical fiber length vs. number of nodes

### 27.5.4 Bending

The bend radius of a 90 degree bend is 25 mm (see figure 27.4). A 180 degree bend equals two bends.

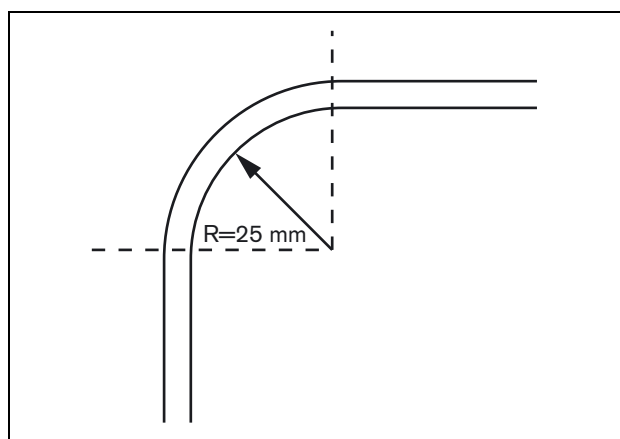


figure 27.4: Bend radius

### 27.5.5 Coiling

The minimum coiling radius is 100 mm (see figure 27.5).

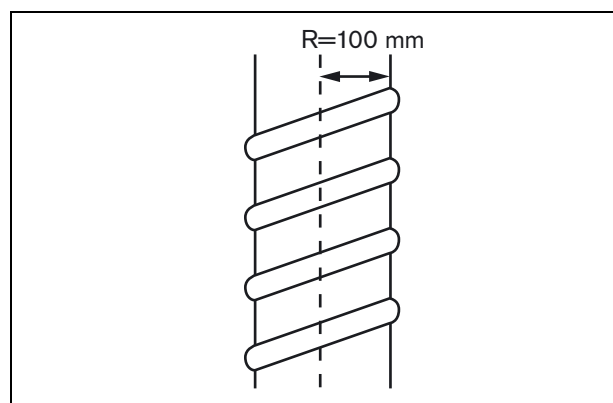


figure 27.5: Coiling radius

## 27.6 Example layouts

### 27.6.1 Introduction

The exact lay-out of the optical network depends on the number and type of units that form the optical network. This section contains some easy-to-follow examples of (strongly simplified) optical networks to illustrate the possibilities.

### 27.6.2 Basic optical network

See figure 27.6 for an example of a basic optical network.

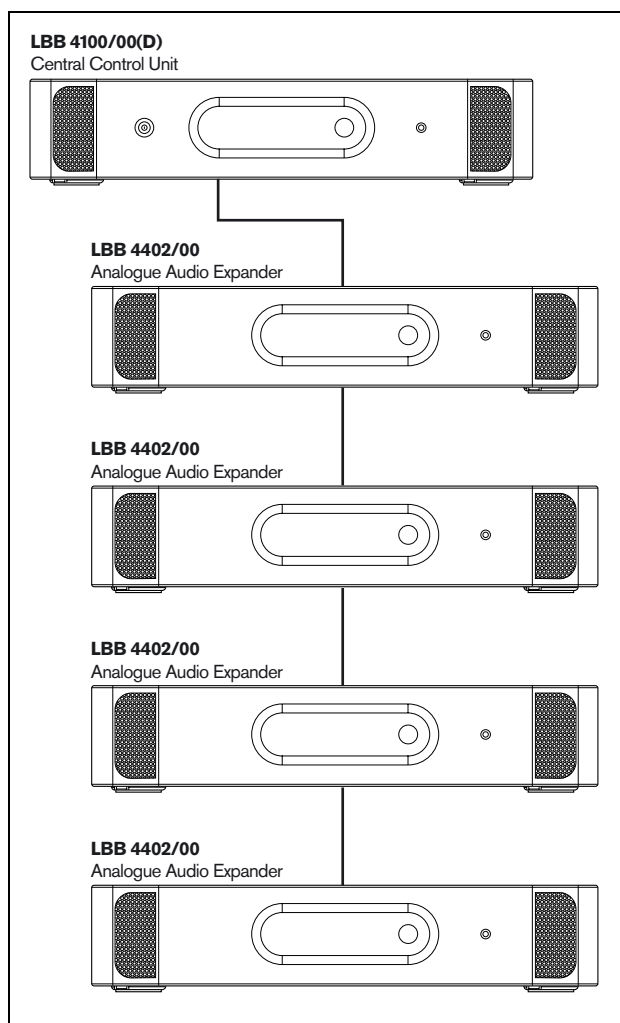


figure 27.6: Basic optical network

### 27.6.3 Redundant cabling

The basic optical network (see figure 27.6) has no redundant cabling. If the cable between the CCU (LBB4100/00) and the audio expander analogue (LBB4402/00) breaks, it becomes impossible to transfer audio from the audio expander to the network. This can be solved by creating a redundant cabled system (see figure 27.7).

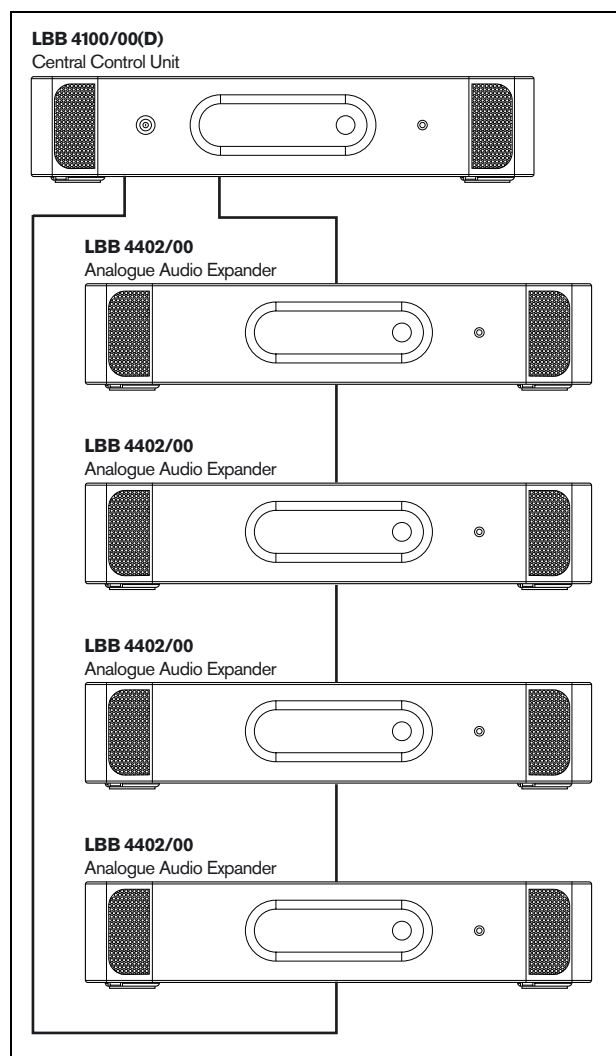


figure 27.7: Redundant optical network

The only difference between the basic system and this redundant cabled system is the connecting between the last audio expander (LBB4402/00) and the CCU (LBB4401/00). The equipment now forms a ring. If a cable breaks, the optical network remains operational.

When creating a redundant optical network, the total power consumption of the equipment in the optical network must be less than 65 W. This is to ensure that when there is a fault in the network close to the optical network sockets of the CCU, the other socket can still feed the entire optical network.

### 27.6.4 Tap-offs

The network splitter (LBB4410/00) makes it possible to create tap-offs (see figure 27.8). Please note that tap-offs can never be redundant. If the cable between the network splitter and audio expander C breaks, audio expander C is not connected to the CCU anymore.

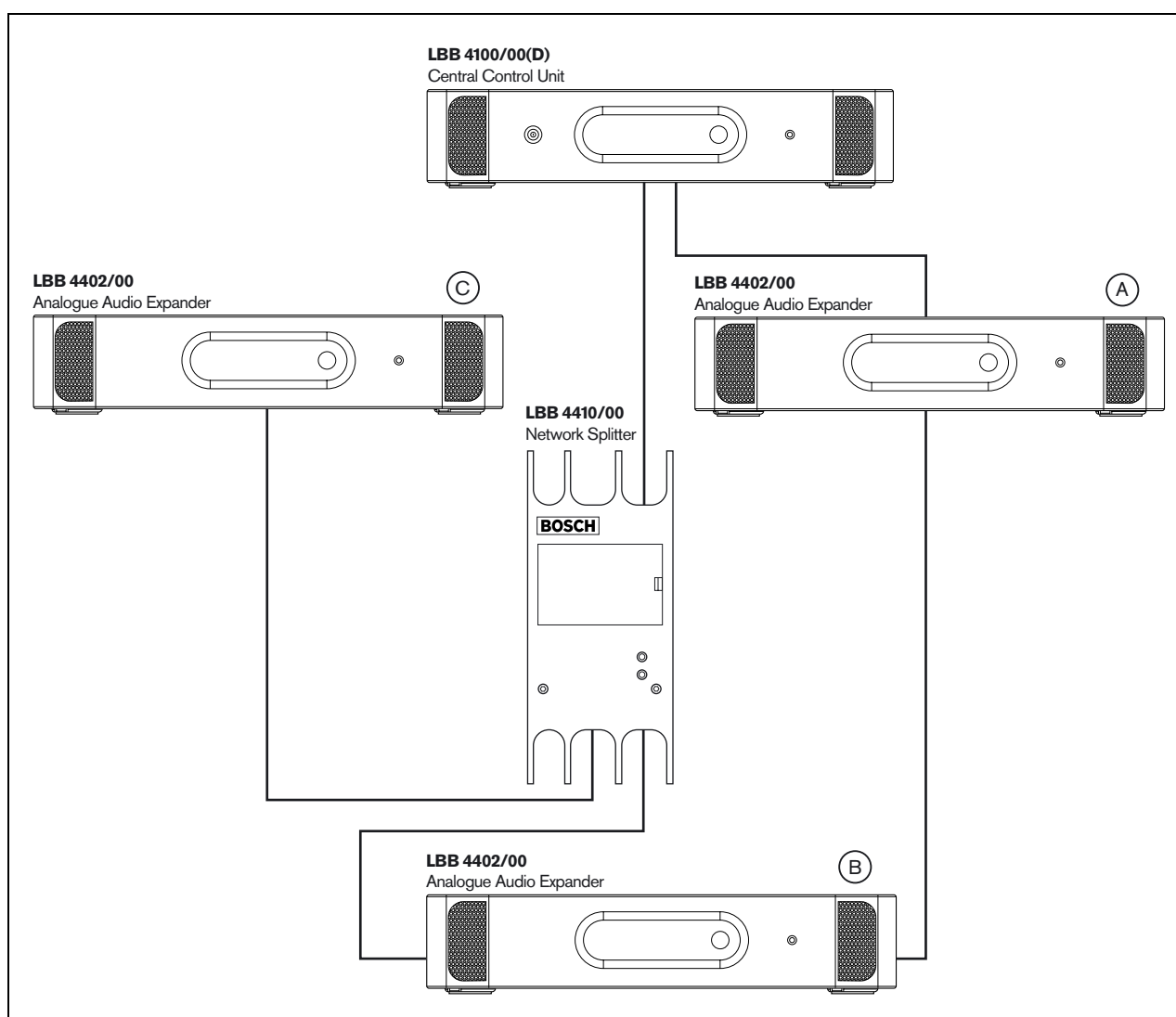


figure 27.8: Redundant optical network with tap-off

## 28 Interconnecting Interpretation Equipment

### 28.1 Interpreter desks

The interpreter desks (LBB4120/00) have a 2 m long DCN cable and a DCN socket to loop themselves through in the DCN.

### 28.2 Booths

A maximum of 6 desks can be installed per booth. These desks can be used stand-alone or as part of a more comprehensive system. In figure 28.1 and figure 28.2 are two typical examples using either trunk splitters (LBB4114/00) or tap-off units (LBB4115/00).

Using a trunk splitter, a multiple of units can be connected in series (see figure 28.1). Using tap-off units (see figure 28.2), only one interpreter desk can be connected to a single tap-off, allowing in total only two interpreter desks to be connected.

In the event of a unit failure, other interpreter desks connected to the same line can be affected. Using the tap-off unit method, only one booth is affected. However, using the trunk splitter method, all units connected may be affected.

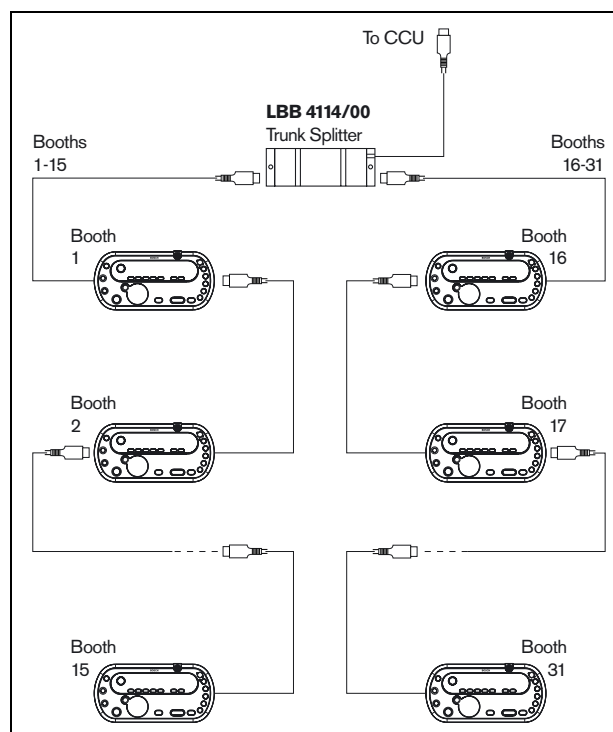


figure 28.1: Interconnecting booths with trunk splitter

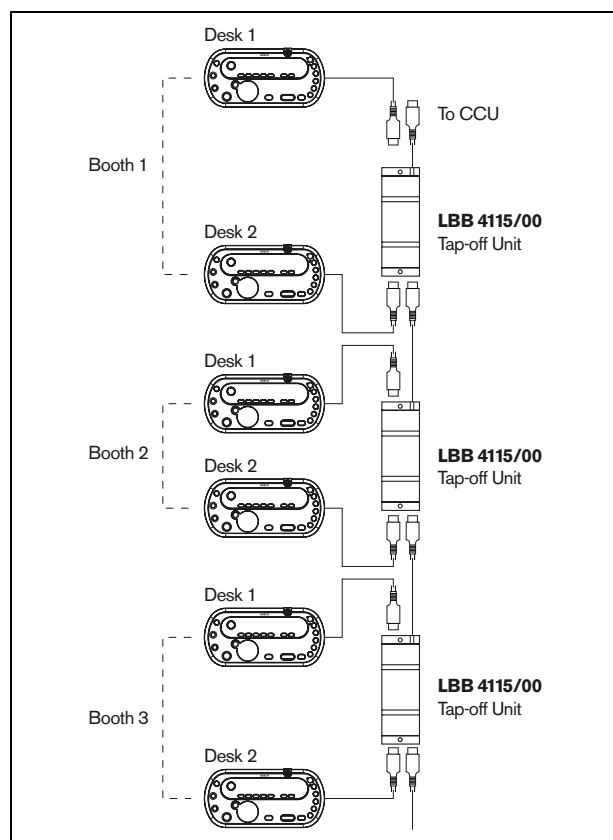


figure 28.2: Interconnecting booths with tap-off units

## 29 Wireless Language Distribution

The system can be connected to an Integrus digital infra-red language distribution system. This system comprises an infra-red transmitter, several radiators and infra-red receivers carried by delegates. A well-balanced installation should be based on sufficient direct radiation intensity for the area to be covered. Each situation demands its own solution to maintain a high enough signal-to-noise ratio in order to ensure good clear reception within the conference area. Optimally positioned radiators both minimize installation and running costs.

**Note**

See the Integrus Digital Infra-red Language Distribution Installation and Operating Manual (3122 475 2201x) for more information.



*figure 29.1: Integrus systems*

## Section 6 - System Set-up and Operation

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## 30 Initialization

### 30.1 Introduction

When all units in the system have been installed, the system must be initialized and made ready for use. The initialisation procedure enables all installed units to be recognized by the CCU (LBB4100/00). Recognition is given in the form of an address, allocated by the CCU to each active unit in the system. A de-init switch located at the units is used to clear the units allocated address when conflicts occur.

### 30.2 Stand-alone system



#### Note

Step 1 is normally not required for systems that are powered up for the first time. These systems are already de-initialized, therefore proceed with step 3 after switching on the CCU for the first time.

#### Step 1: Clearing addresses

Switch on the CCU and use the 'turn-and-push' menu button to go to submenu 3B of the interactive menu:

3B Initialize...

Push the button to enter the *Initialize* submenu. The following question is shown:

3B Initialize  
Are you sure?No

Turn the button to select *Yes*:

3B Initialize  
Are you sure?Yes

Push the button to confirm the choice to clear the addresses allocated to the units (i.e. de-initialize the units). After the address of a unit has been cleared, its LEDs illuminate.



#### Note

If the LEDs do not illuminate, remove the power from the system and repeat step 1.

#### Step 2: Allocating addresses

After all addresses have been cleared, new addresses must be assigned to the units in the system (i.e. they have to be initialized).

To initialize a unit, press the microphone key of the unit while all LEDs are lit. Once pressed and the LEDs go out, the unit is recognized by the CCU.



#### Note

Initialize all units one-by-one to avoid addressing problems.



#### Note

Preferably, the initialisation of all units is carried out by one person to avoid addressing problems.

### 30.3 PC based system

The initialisation of a PC-based system is identical to that of a stand-alone system.

## 31 DCN Configuration

The S600 series of internal CCU dip switches (see section) take care of the configuration of the DCN.



### Caution

The electronics inside the CCU are susceptible to electrostatic discharges. Wear an anti-ESD bracelet when setting the dip switches.

table 31.1: S600 Dip switch settings (\* = default)

| Switch | Position | Description                                                                                                                                                                         |
|--------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S600-1 | ON*      | Reserved.                                                                                                                                                                           |
|        | OFF      |                                                                                                                                                                                     |
| S600-2 | ON       | Reserved.                                                                                                                                                                           |
|        | OFF*     |                                                                                                                                                                                     |
| S600-3 | ON       | Reserved.                                                                                                                                                                           |
|        | OFF*     |                                                                                                                                                                                     |
| S600-4 | ON       | Reserved                                                                                                                                                                            |
|        | OFF*     |                                                                                                                                                                                     |
| S600-5 | ON       | Reserved.                                                                                                                                                                           |
|        | OFF*     |                                                                                                                                                                                     |
| S600-6 | ON       | Reserved.                                                                                                                                                                           |
|        | OFF*     |                                                                                                                                                                                     |
| S600-7 | ON       | Reserved.                                                                                                                                                                           |
|        | OFF*     |                                                                                                                                                                                     |
| S600-8 | ON       | Switching on the CCU activates the boot software, this makes a new download possible. All memory settings will be reset to their default values. The unit addresses are not erased. |
|        | OFF*     | Normal operation                                                                                                                                                                    |

## 32 PC Control

### 32.1 Requirements

The control PC must comply to the following requirements:

**Operating system:**

Windows 2000

Windows XP Professional

**Ethernet:**

Ethernet for use in multi PC systems.

**Serial ports (RS232):**

Serial ports (RS232) for connection to CCU, label printer, error logging, printing microphone activity.

**Parallel port**

Parallel printer port for connection to a printer.

### 32.2 Connecting to the CCU

By default, RS232 port 1 of the CCU is configured for connection to a PC. See chapter 8 for information about the configuration of the ports. Connect the PC to the CCU using a RS232 wire-to-wire cable (see section 8.3.8)

## 32.3 Connecting peripheral devices

### 32.3.1 Overview

The next figure give an overview of the printer and COM port settings of a Control PC.

|                 |                                | Laser printer<br>LPT 1 (IRQ = 7) |                                              | Matrix printer<br>COM 1 (IRQ = 4) |                                                 |
|-----------------|--------------------------------|----------------------------------|----------------------------------------------|-----------------------------------|-------------------------------------------------|
| Software module |                                | Windows print manager            |                                              | = ASCII + CR + LF                 |                                                 |
| LBB 4190        | Start-up                       | ↑                                | Error messages<br>printing                   | ↑                                 | Error logging<br>real-time<br>sent to auxiliary |
| LBB 4185        | System<br>installation         | —                                | Seat numbers<br>printing                     | —                                 |                                                 |
|                 |                                | —                                | Channel<br>assignment<br>printing            | —                                 |                                                 |
| LBB 4172        | Simultaneous<br>interpretation | —                                | Desk language<br>assignment<br>auto printing | —                                 |                                                 |
|                 |                                | —                                | Channel language<br>assignment<br>printing   | —                                 |                                                 |

figure 32.1: PC port settings

The next table contains the default port settings for COM 1 of a Control PC. The COM port settings can be changed from the Windows Control Panel, whereas the COM port assignments can be changed in the *dcnng.ini* file (located in the Windows directory).

table 32.1: COM 1 default settings

| Setting      | Value |
|--------------|-------|
| Baudrate     | 9600  |
| Data bits    | 8     |
| Parity       | None  |
| Flow control | None  |

### 32.3.2 Matrix printer

A matrix printer can be connected through COM 1 of a Control PC, to provide hard copy data for speaker logging and printing card labels. The print function within different software modules can be activated.

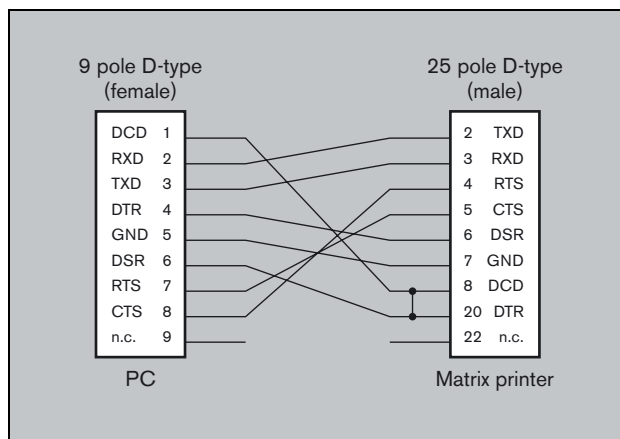


figure 32.2: Matrix printer connection diagram (1)

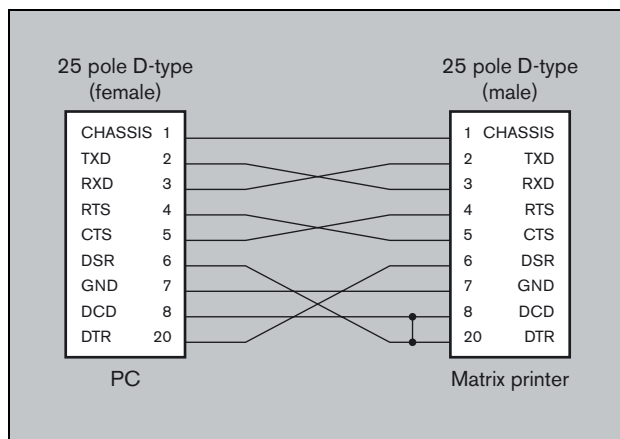


figure 32.3: Matrix printer connection diagram (2)

## Section 7 - Appendices

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## A Kycon KPP-4P connector

### A.1 Introduction

This appendix contains assembly instructions and a connection diagram for the Kycon KPP-4P connector that is used to connect the LBB4410/00 Network Splitter and the LBB4414/00 Fiber Interface to back-up power supplies.

### A.2 Assembly

The connector consists of the following (see figure A.1):

- A Customer Cable
- B Strain Relief
- C Plastic Enclosure
- D Metal Spring
- E Plastic Guide
- F Top Metal Cover
- G Pin Mold
- H Lower Metal Sleeve
- I Plastic Coupling

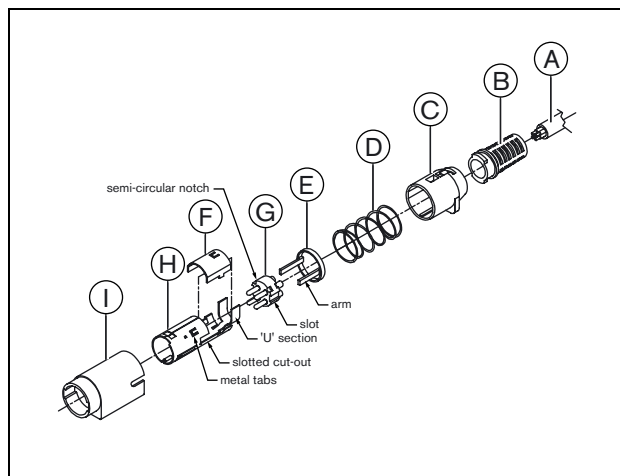


figure A.1: Assembly drawing

Proceed as follows to assembly a Kycon KPP-4P connector:

- 1 Attach Strain Relief (B) to Plastic Enclosure (C).
- 2 Pass Cable (A) through Strain Relief (B)/Plastic Enclosure (C) assembly, Metal Spring (D) and Plastic Guide Ring (E).
- 3 Solder cable wires to solder cups on Pin Mold (G).
- 4 Properly align Pin Mold (G) with Lower Metal Sleeve (H). The slotted sections on the sides of the Pin Mold (G) must line up with the slotted cut-outs on the Lower Metal Sleeve (H) and the 3 semi-circular notches around the perimeter of the Pin Mold (G) must line up with the 3 metal tabs inside the Lower Metal Sleeve (H).
- 5 Push Pin Mold (G) forward into the Lower Metal Sleeve (H) until it locks into place.
- 6 Manually press the 3 metal tabs on the Lower Metal Sleeve (H) into the notches in the Pin Mold (G).
- 7 Crimp 'U' section of Lower Metal Sleeve (H) onto Cable (A).
- 8 Fit Plastic Ring Guide (E) into Lower Metal Sleeve (H) by placing plastic arms into the appropriate slots on the sides of the sleeve.
- 9 Attach Top Metal Cover (F) onto Lower Metal Sleeve (H). Be sure to align all tabs and securely install cover.
- 10 Push Metal Spring (D) onto the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. This will help to hold the assembly together.
- 11 Push Strain Relief (B)/Plastic Enclosure (C) assembly onto the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. The two assemblies must be properly aligned as shown in the drawing. Be sure to check that the Metal Spring (D) remains in place and does not go underneath either the Plastic Enclosure (C) or the Plastic Guide (E) or twists during assembly. A significant amount of force may be necessary to lock the two assemblies together.
- 12 Check to make sure that the Strain Relief (B)/Plastic Enclosure (C) assembly is securely locked into place over the Top Metal Cover (F)/Lower Metal Sleeve (H) assembly. The two assemblies should not be able to be pulled apart.
- 13 Properly align the new assembly with the Plastic Coupling (I) as shown in the drawing. Push assembly into Plastic Coupling (I) until it locks properly into place. The entire plug assembly is now complete.

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