

Intelligent Building Solutions

Installation Manual



CHB 23 D NETWORK HUB

- up to 8 BUS lines
- DIN-rail mounting

CIB-tech

Introduction

The CHB 23 D is a 8-channel CIB-tech network hub, it has no sensing or control functions. Its purpose is to extend the maximum length of the CIB-tech network and to simplify the CIB-tech wiring by allowing star-type topologies. It connects the backbone bus of the CIB-tech network and up to 8 different CIB-tech bus lines¹.

Technical Specifications

Electrical characteristics

● Power Supply

The CHB 23 D can be powered from two sources: remotely from the backbone cable of the CIB-tech network via the IBB-bus connector or locally through its terminal strip connections. The CHB 23 D favors local power supply over remote power and uses it automatically if available; should the local power supply fail, the CHB 23 D switches back automatically to backbone-supplied power. It should be noted that this is not a desirable scenario unless the network is designed to be backbone-powered in the first place, since the increased load on the backbone cable may lead to insufficient voltage on the network section connected to the inadvertently remote-powered hub and / or may cause overheating of the backbone cable itself.

- Input voltage range: 20 to 28V DC (nominal 24V DC)
- Own power consumption (no hub-powered network segments connected)
 - Power supply via IBB-bus connector
 - Standby current (I_{HS1}) 40mA
 - Maximum current (I_{HM1}) 90mA
 - Power supply via dedicated power connector
 - Standby current (I_{HS2}) 50mA
 - Maximum current (I_{HM2}) 110mA

● Power output

- Output voltage = Input voltage – 0.3V
- Maximum output current:
 - Via backbone bus connector (I_{BBM}) 3A
 - Via bus connectors, each (I_{BM}) 400mA

Power consumption of a hub is a function of the requirements of the network segments it is itself supplying with power and can be found as the sum of all the network's and its own power consumption. At full load on all segments, including power for other hubs via the output backbone connector (OBB), this would become:

$$I_{HUBM1} = I_{HM1} + I_{BBM} + 8 \times I_{BM} = 6.29A \text{ for remotely powered hubs (via IBB) or}$$
$$I_{HUBM2} = I_{HM2} + I_{BBM} + 8 \times I_{BM} = 6.31A \text{ for locally powered hubs}$$

However, if the hub is remotely powered from another hub via the backbone, its I_{HUBM} cannot exceed the output power rating of the hub that powers it (I_{BBM}), therefore such a remotely powered hub may not be loaded to its full load. For such a hub, the sum of all the power it's expected to deliver and consume must be less than the amount of power available to it (I_{BBM}):

$$I_{HUBM1} = I_{HM1} + I_{BB} + I_{B1} + I_{B2} + I_{B3} + I_{B4} + I_{B5} + I_{B6} + I_{B7} + I_{B8} < I_{BBM}$$

Locally powered hubs have no such limit and can be loaded to the maximum rating of their backbone and bus outputs.

¹ See "CIB-tech installation manual" for details.

Mechanical characteristics

The CHB 23 D has a standard 3-module wide enclosure for M36 type DIN-Rail

- Dimensions: 120mm W x 53mm L x 60mm D
- Weight: 130g

Environmental characteristics

- Operating temperature: -10°C to 85°C
- Storage temperature: -25°C to 100°C

Key Features

- Connects backbone with up to 8 bus lines
- Can be powered via backbone bus connector or via dedicated power connector
- Provides power via the bus lines to the connected devices
- Can provide power to other CIB-tech hubs
- Internal power LED (active for both remote or local power)

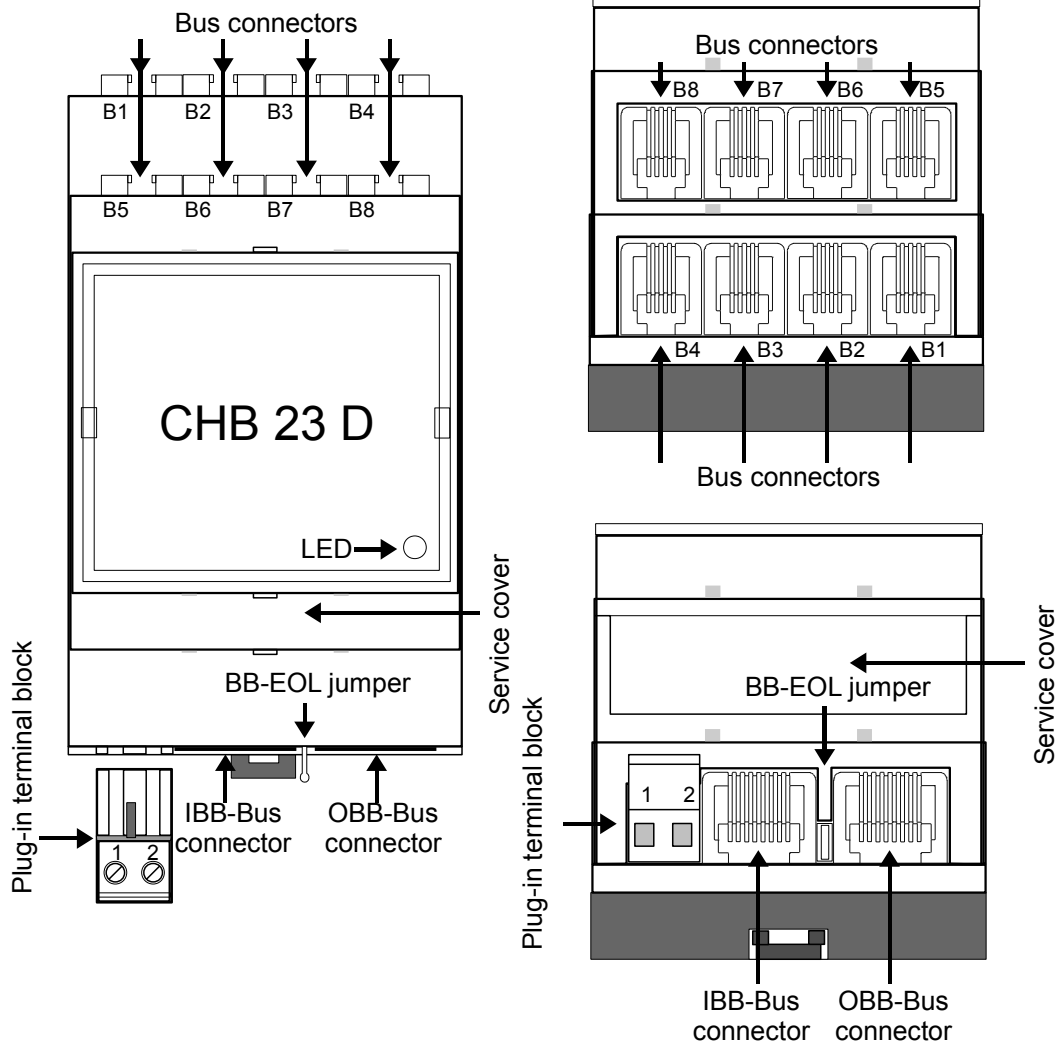
Installation

The CHB 23 D is meant to be installed on a standard M36 type DIN-Rail.

Part description

- **Bus connectors:**
 - 4P4C modular jack connectors for connecting CIB-tech bus lines (other CIB-tech devices)¹
 - The CHB 23 D has 8 (B1 to B8) functionally identical bus connectors
- **IBB bus connector:**
 - “Input backbone bus connector”- 8P8C (RJ45) modular jack connector for connecting the CHB 23 D device to the backbone of the CIB-tech network
 - A CHB 23 D device can be powered remotely via this connector
- **OBB bus connector:**
 - “Output backbone bus connector”- 8P8C (RJ45) modular jack connector for connecting the CHB 23 D device to the backbone of the CIB-tech network
 - Power can be delivered to other CIB-tech devices (mostly other hubs) via this connector
- **BB-EOL jumper:**
 - End Of Line jumper for the CIB-tech system's backbone bus¹
- **LED:**
 - Power-on LED
- **Service cover:**
 - removable cover for on-site network timing adjustments.
- **DIN-rail release lever:**
 - lever for removing the device from the M36 DIN-Rail
- **Plug-in terminal block:**
 - main power supply connector (if the device is powered via this connector it disconnects from the IBB bus supplied remote power):
 1. +24V
 2. GND

¹ See “CIB-tech installation manual” for details.



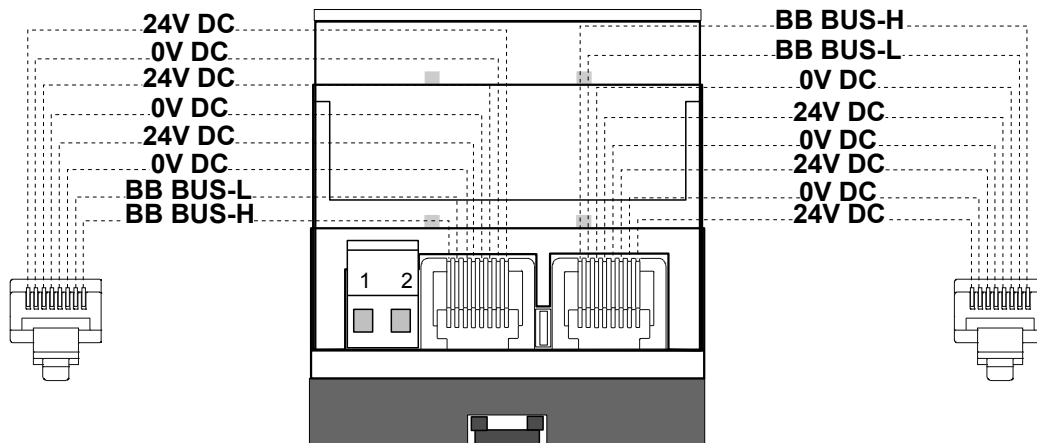
Wiring diagrams

Connection to the backbone bus of the CIB-tech system:

Use the CHB 23 D device's two 8P8C (RJ45) modular jack connectors to connect it to the CIB-tech systems (chain like) backbone bus. Do not forget to remove the BB-EOL jumper if the device is not the last element of the backbone¹;

NOTE: In small CIB-tech systems installations, where no backbone is present (the CHB 23 D is not connected to other hubs) the BB bus connectors are not used and the BB-EOL jumper must be present on the CHB 23 D (should not be removed).

¹ See "CIB-tech installation manual" for details.

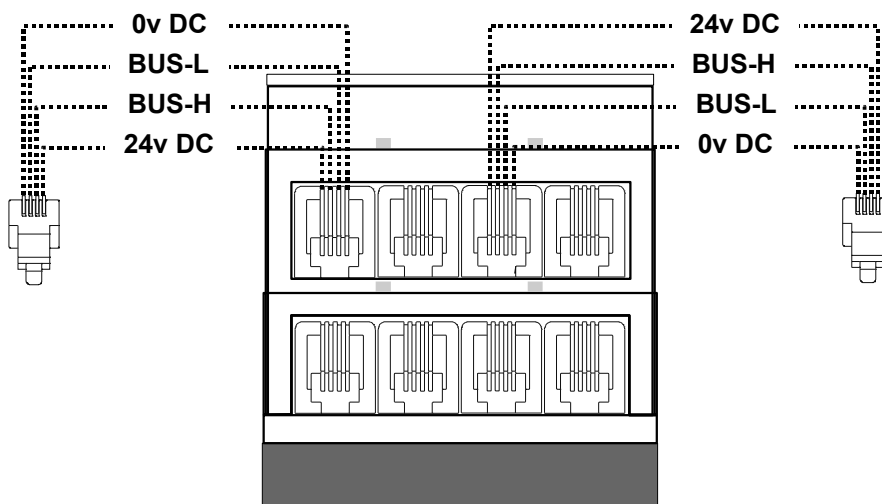


Connection to CIB-tech systems bus lines (other devices):

Use the CHB 23 D device's 8 4P4C modular jack connectors to unite up to 8 CIB-tech bus lines into one CIB-tech network connected with other bus lines of other hubs via the backbone;

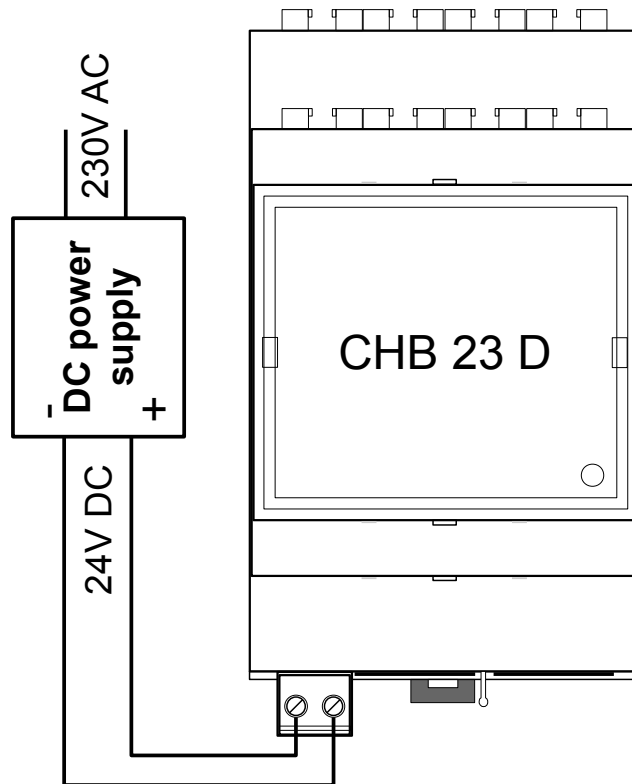
Please check the power consumption of the individual bus lines: the maximum power output supplied by each 4P4C connector on the CHB 23 D device is 400mA at 24V.

NOTE: No other CIB-tech hub may be connected to the bus lines.



Connecting the power supply

The CHB 23 D can be powered via its local power connector:



NOTE: Power supply with battery backup is recommended.

Adjusting bus timing

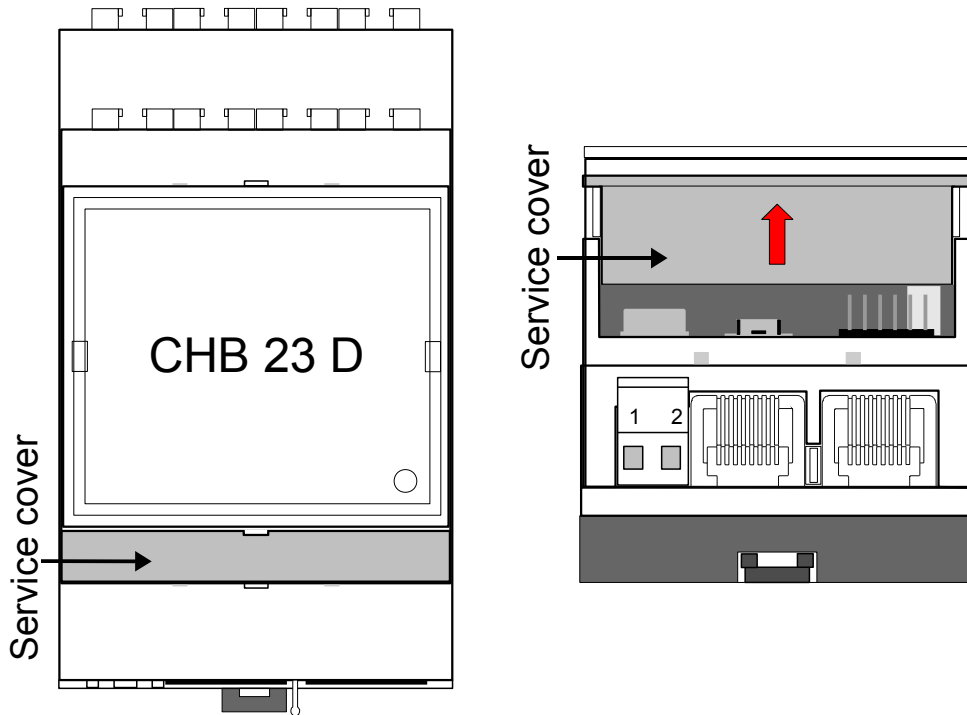
To insure correct operation of the CIB-tech network, the CIB-tech hubs have a built-in timing circuit used to counter the effects of bus capacitance and end-of-line signal reflections. The factory default setting should be adequate in most cases, but signal quality depends on actual cabling circumstances and in case of poor bus performance the timing might need adjustment.

Changing bus timing is possible using the timing selection switch located under the service cover. The CHB 23 D's timing selection switch has 16 positions, marked 0 to 15(F), with hexadecimal numbers. The typical values in use are 3 to 7 with the default value of 4. Values outside of this range should only be used in extreme cases, 0 is factory reserved and should never be used.

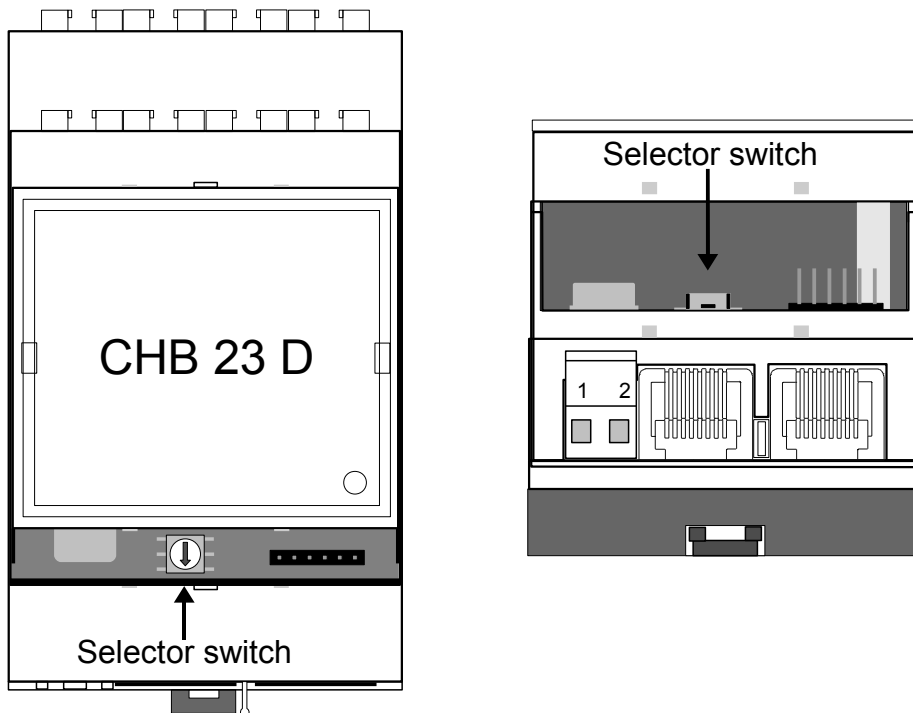
NOTE: Before changing the default setting be sure that you understand the terms in the "CIB-tech Installation Manual" or contact IBS tech support.

Setting the selector switch

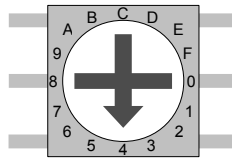
In order to gain access to the calibrator switch, remove the service cover:



Locate the selector switch:



Use a small screwdriver to rotate the selector switch to the desired value (pointed-to by the arrow-shaped tip of the switch):



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