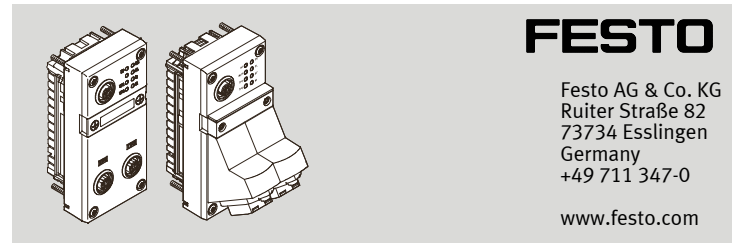


CPX-(M)-FB33/34/35

Bus node



Brief instructions

8106916
2019-11c
[8106918]



Translation of the original instructions

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1 About this document

1.1 Applicable Documents

All available documents for the product → www.festo.com/sp.

Document	Contents
CPX system description (CPX-SYS-...)	Detailed information on the CPX terminal
Brief instructions for bus node	Essential information on the product
Operating instructions for bus node	Detailed information on the product

Tab. 1 Applicable Documents

2 Safety

2.1 Safety Instructions

- Only use the product in original status without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Observe labelling on the product.
- Store the product in a cool, dry, UV-protected and corrosion-protected environment. Ensure that storage times are kept to a minimum.
- Before working on the product, switch off the power supply and secure it against being switched on again.
- This product can generate high frequency malfunctions, which may make it necessary to implement interference suppression measures in residential areas.
- Comply with the handling specifications for electrostatically sensitive devices.

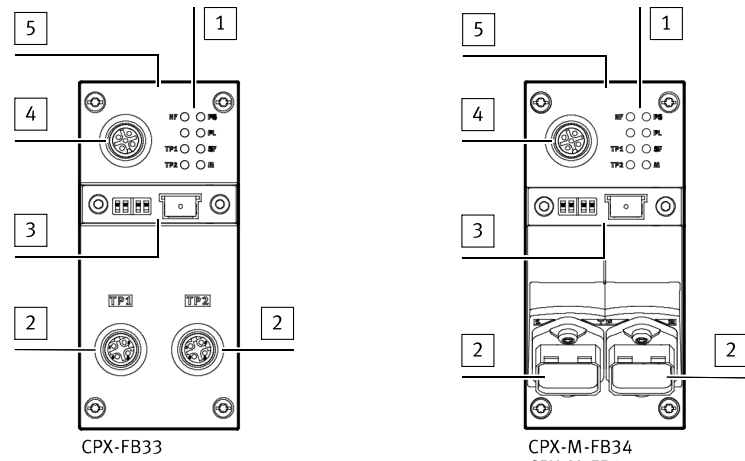
2.2 Intended Use

The bus node is intended exclusively for operation as a station (IO Device) in the industrial Ethernet system PROFINET IO.

The product may only be used in combination with the CPX Terminal in an industrial environment.

3 Configuration

3.1 Product design



- 1 LED displays
- 2 Network connection
- 3 DIL switch and memory card
- 4 Service interface
- 5 Product labelling

Fig. 1 Connection and display components

3.2 Product variants

The product labelling shows the MAC-ID and the revision number of the bus node (Rev...).

Hardware and firmware revision numbers for using the functions

Function	Bus bus node revision number	
	Software	Hardware
Priority start-up (Fast Start-up)	Rev 12 and from Rev 14	From Rev 1
	Rev 13	From Rev 8
Identification & Maintenance (I&M)	From Rev 14	From Rev 1
PROFenergy	From Rev 20	From Rev 1

Tab. 2 Required revision numbers for using the functions

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The revision numbers of the hardware and software for the bus node can be checked with the control software, the Festo Maintenance Tool (FMT) or the Festo Field Device Tool (FFT).

3.3 LED displays

LED	Network status LEDs		LED	CPX-specific LEDs	
	NF	Network Failure (red)		PS	Power System (green)
	M/P	Maintenance/PROFenergy (green or yellow)		PL	Power Load (green)
	TP1	Link/Traffic 1 (green)		SF	System Failure (red)
	TP2	Link/Traffic 2 (green)		M	Modify (yellow)

Tab. 3 LEDs on the bus node

3.4 Control elements

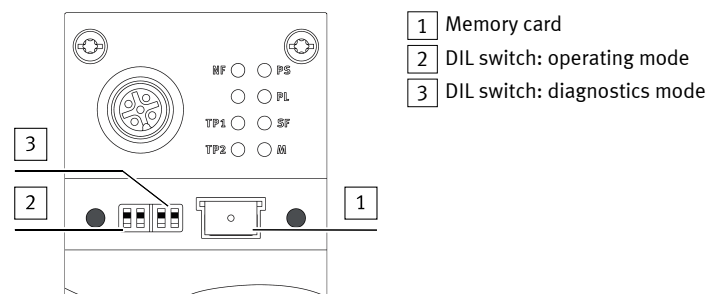


Fig. 2 Control elements for PROFINET

DIL switch

A bus node must be operated as a master in the CPX terminal. The "Remote I/O" operating mode must be set on this bus node. The "Remote Controller" operating mode must be set on all other bus nodes.

The DIL switch is used to set the operating mode :

DIL switch 2	Description
	Remote I/O operating mode All functions of the CPX terminal are controlled by the PROFINET IO controller.
	Remote Controller operating mode A CPX-CEC-xx takes over the I/O open-loop control. Requirement: CPX Terminal with CEC.

Tab. 4 Setting the operating mode

The diagnostics mode or the data field size is set with the **3** DIL switch depending on the operating mode:

DIL switch 3	Description	Remote I/O	Remote controller
	Diagnostics switched off.		Data field size: 8 bytes I/8 bytes O
	Status bits switched on		Data field size: 16 bytes I/16 bytes O
	I/O diagnostics interface switched on		Data field size: 32 bytes I/32 bytes O
	Reserved		Reserved

Tab. 5 Setting the diagnostics mode

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Reserved DIL switches are blocked for future functions and must not be used.

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The setting of the DIL switches for operating mode and diagnostics mode must match the settings in the open-loop control.

Memory card

The memory card serves as a carrier for configuration data, such as the fieldbus device name. This makes it easy to replace a bus node. Detailed information on use → Bus node operating instructions.

NOTICE!

Malfunction or Damage to the Memory Card.

Inserting or removing the memory card while the power supply is switched on can result in malfunctions or of damage to the memory card.

- Disconnect the power supply before you insert or remove the memory card.

3.5 Connecting elements

Pin allocation of the network interface of the CPX-FB33 bus node (M12)

Socket	Pin	Signal	Explanation
M12, D-coded 	1	TD+	Transmitted data (Transmit Data) +
	2	RD+	Received data (Receive Data) +
	3	TD-	Transmitted data -
	4	RD-	Received data -
	Housing	Shield/FE	Shield/functional earth

Tab. 6 Network interface of the CPX-FB33 bus node

Pin allocation of the network interface of the CPX-M-FB34 bus node (RJ45)

Socket	Pin	Signal	Explanation
RJ45, Push-pull 	1	TD+	Transmitted data (Transmit Data) +
	2	TD-	Transmitted data -
	3	RD+	Received data (Receive Data) +
	4	n.c.	not connected
	5	n.c.	not connected
	6	RD-	Received data -
	7	n.c.	not connected
	8	n.c.	not connected
Housing	Shield/FE	Shield/functional earth	

Tab. 7 Network interface of the CPX-M-FB34 bus node

Pin allocation of the network interface of the CPX-M-FB35 bus node (SCRJ)

Socket	Pin	Signal	Explanation
SCRJ, Push-pull 	1	TX	Transmitted data
	2	RX	Received data

Tab. 8 Network interface of the CPX-M-FB35 bus node

Overview of connections and plug

Bus node	Connection technology	Network connectors
CPX-FB33	2 x M12, D-coded, female, 4-pin, in accordance with IEC 61076-2	NECU-MS-D12G4-C2-ET
CPX-M-FB34	2 x RJ45, push-pull, Cu, AIDA, in accordance with IEC 60603, IEC 61076-3	FBD-RJ45-PP-GS
CPX-M-FB35	2 x SCRJ, push-pull, 650 nm, AIDA, in accordance with IEC 61754-24	FBD-SCRJ-PP-GS

Tab. 9 Connection technology and network connectors

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In the following table, the cable lengths were used in accordance with the specifications for PROFINET networks.

Network connectors	Cable specification
NECU-MS-D12G4-C2-ET	Ethernet cable, shielded, Cat 5/5e, 6 ... 8 mm, 0.14 ... 0.75 mm ² (max. 100 m PROFINET end-to-end link; 22 AWG)
FBD-RJ45-PP-GS	Ethernet cable, shielded, Cat 5/Cat 5e, 5 ... 8 mm, 0.13 ... 0.36 mm ² (≈ approx. 26 ... 22 AWG) (max. 100 m PROFINET end-to-end link; 22 AWG)
FBD-SCRJ-PP-GS	POF fibre-optic cable, 980/1000 µm, 6.5 ... 9.5 mm (max. 50 m PROFINET end-to-end link; ≤ 12.5 dB)

Tab. 10 Cable specification for network connectors

Service interface

An operator unit, e.g. CPX-MMI-1, can be connected to the service interface.

4 Assembly

The bus node is mounted in an interlinking block of the CPX terminal.

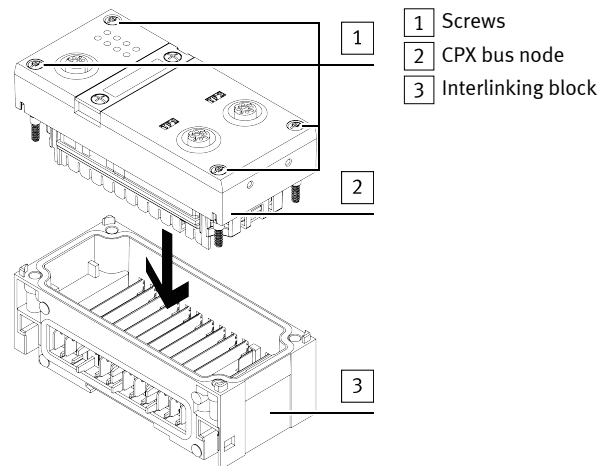


Fig. 3 Mounting the bus node in an interlinking block

- Before working on the product, switch off the power supply and secure it against being switched on again.
- CPX M-FB34: metal interlinking block only is permitted.

Disassembly

1. Unscrew screws.
2. Carefully lift the bus node.

Assembly

1. Check seal and sealing surfaces and insert the bus node.
2. Screws must be placed so that the self-tapping threads are used. Tighten the screws by hand cross-wise.
Tightening torque: 0.9 ... 1.1 Nm.

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Use suitable screws for the interlinking block.

- Plastic interlinking block: thread-grooving self-tapping screws.
- Metal interlinking block: screws with metric thread.

NOTICE!**Malfunction due to incorrect switch-on sequence.**

- First switch on the operating voltage supply of all network stations and then the operating power supply of the open-loop control.

**CPX- M-FB34: cyclical process data exchange can freeze in exceptional cases in applications with increased electrostatic load.**

This results in an entry in the diagnostic memory with error number FN150.

- Restart to ensure normal operation.
- Reduce electrostatic charges in the vicinity of the product or use a CPX Terminal with metal interlinking (order code 51E).

6 Technical data**6.1 General**

Characteristics	CPX-FB33	CPX-M-FB34	CPX-M-FB35
Module code in the CPX Terminal			
– Remote I/O	215	216	217
– Remote Controller	164	165	166
Module identification			
– Remote I/O	FB33-RIO PROFINET remote I/O	FB34-RIO PROFINET RJ45 remote I/O	FB35-RIO PROFINET LWL remote I/O
– Remote Controller	FB33-RC PROFINET I/O bus node	FB34-RC PROFINET RJ45 bus node	FB35-RC PROFINET LWL bus node
Power supply	→ CPX system description (CPX-SYS-...)		
Operating voltage/load voltage	→ CPX system description (CPX-SYS-...)		
Intrinsic current consumption at nominal operating voltage 24 V DC, from operating voltage supply for electronics/sensors ($U_{EL/SEN}$)	typ. 120 mA (internal electronics)	typ. 120 mA (internal electronics)	typ. 150 mA (internal electronics)
Separation of the PROFINET interfaces to $U_{EL/SEN}$	electrically isolated by transformer (up to 1500 V)	electrically isolated by transformer (up to 1500 V)	electrically isolated by fibre-optic cable
Mains buffering time	10 ms	10 ms	10 ms

Tab. 11 Special characteristics

6.2 Network

Characteristics	CPX-FB33	CPX-M-FB34	CPX-M-FB35
Transmission rate	100 Mbit/s	100 Mbit/s	100 Mbit/s
Wavelength	–	–	650 nm (suitable for POF fibre-optic cable)
Network connections	2 x M12 sockets, D-coded, 4-pin	2 x RJ45 sockets, push-pull, AIDA-conforming	2 x SCRJ sockets, push-pull, AIDA-conforming
Crossover detection	Auto MDI	Auto MDI	–
Max. addressing volume of outputs/inputs, operating mode-independent	64 bytes I, 64 bytes O	64 bytes I, 64 bytes O	64 bytes I, 64 bytes O

Tab. 12 Special network characteristics