Modular electrical terminal CPX

FESTO

Key features

Key features

Installation concept

- Choice of several valve terminals for different applications:
  - MPA-S
  - MPA-L
  - VTSA/VTSA-F/VTSA-F-CB
- Economical from the smallest configuration up to the maximum number of modules
- Up to 9 electrical input/output modules plus bus node and pneumatic interface/electronics modules for valves
- Extensive range of functions and connection options for the electrical modules
- Choice of connection technology for technically and economically optimised connections
- Can be used as a dedicated remote I/O module

Electrics

- High operating voltage tolerance (±25%)
- Choice of M12x1, M18, 7/8" or AIDA push-pull connection for power supply
- Open to all fieldbus protocols and Ethernet
- Optional function and technology modules for preprocessing
- IT services and TCP/IP such as remote maintenance, remote diagnostics, web server, SMS and e-mail alert
- Digital inputs and outputs, 4-/8-/16-way, optionally available with individual channel diagnostics
- Analogue inputs and outputs, 2-way/4-way, optionally with HART protocol
- Pressure inputs
- Temperature inputs
- Controllers for pneumatic and electric axes
- IP65 and IP67 or IP20

Mounting

- Wall or H-rail mounting, also on mobile units
- Conversions/extensions are possible at any time, individual linking with CPX metal design
- Modular system offering a range of configuration options
- Fully assembled and tested unit
- Reduced costs for selection, ordering, assembly and commissioning thanks to the central CPX terminal
- Choice of pneumatic components for optimised control chain
- Decentralised, subordinate CPI installation system improves cycle times by up to 30%
- Safe and convenient earthing thanks to earthing plate

Operation

- Fast troubleshooting thanks to an extensive selection of LEDs (some of which are multi-coloured) on the bus node and on all I/O modules
- Supports module and channel-oriented diagnostics
- Fieldbus/Ethernet remote diagnostics
- Innovative diagnostic support with integrated web server/web monitor or maintenance tool with USB adapter for PC
- Optimised commissioning thanks to parameterisable functions
- Reliable servicing with connection blocks and modules that are quick to replace without changing the wiring

Key features

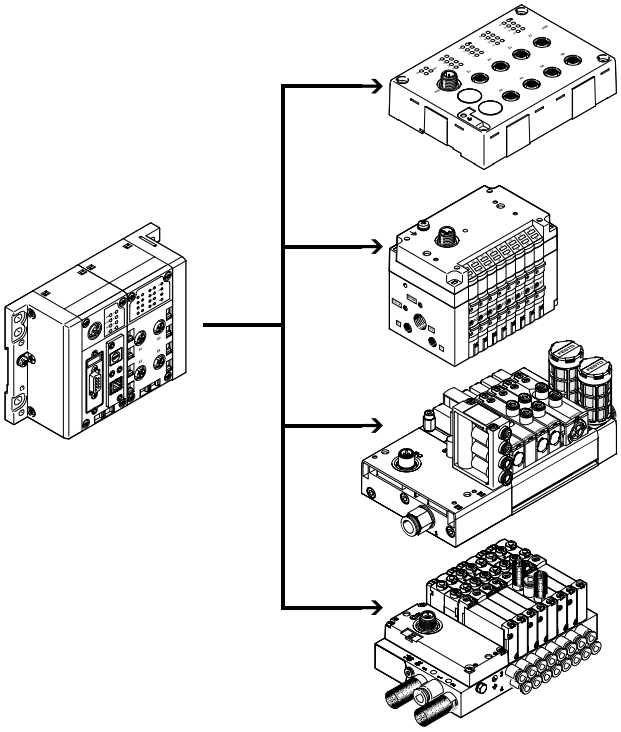
Pneumatic variants of the CPX terminal

The electrical terminal CPX is a modular peripheral system for valve terminals.

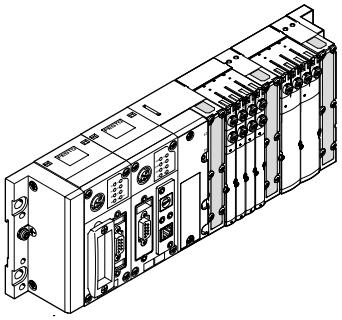
The system is specifically designed so that the valve terminal can be adapted to suit a wide range of different applications.

The modular system design lets you configure the number of valves, inputs and additional outputs to suit the application.

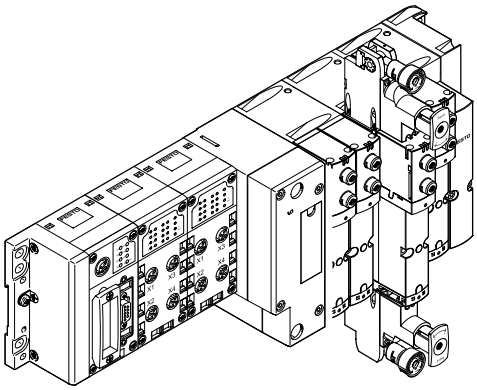
With valve terminal – decentralised



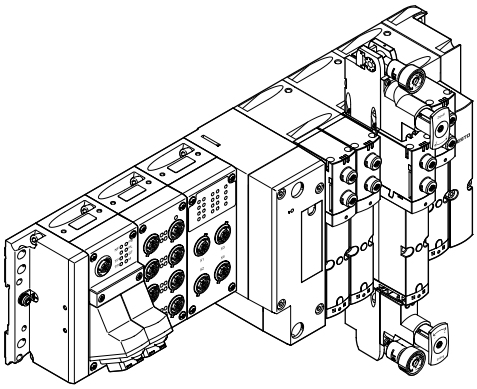
With valve terminal MPA-S – centralised



With valve terminal VTSA – centralised



In metal design with valve terminal VTSA – centralised



Key features

Variants of the CPX terminal controller (with bus node, without preprocessing)

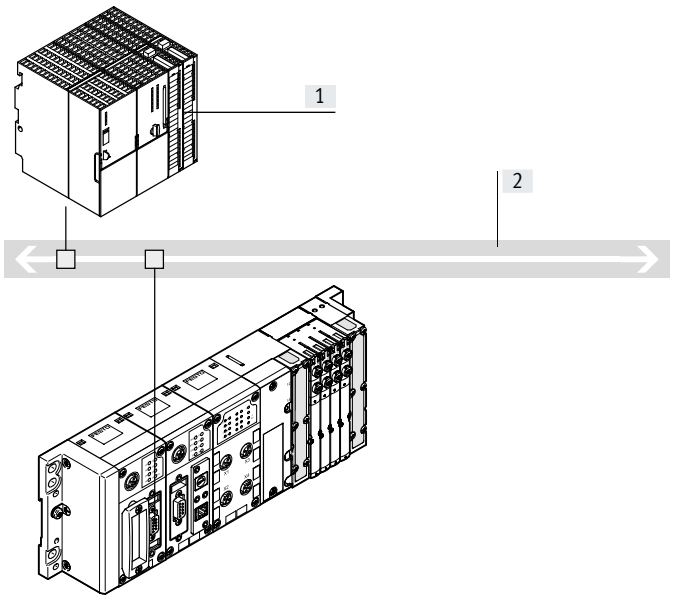
Bus node

Different bus nodes are used for integration in the control systems of various manufacturers.
The CPX terminal can therefore be operated on over 90% of the most commonly used fieldbus systems:
- PROFIBUS DP
- PROFINET
- DeviceNet
- CANopen
- CC-Link

Integration in universal networks based on Ethernet opens up new possibilities. Faster data transmission, real-time capability and above all additional IT services such as file transfer, web server, web monitor as integrated website in the CPX terminal, text message/e-mail alerts, etc. open up a wide range of synergies.
These include standardised and universal communication technology across all areas, including operating level, management level and field level in the production environment, with protection to IP65, IP67.

The following protocols are supported:
- EtherNet/IP
- Modbus/TCP
- PROFINET
- POWERLINK
- EtherCAT
- Sercos III

Bus node



[1] Higher-order controller (PLC)
[2] Fieldbus

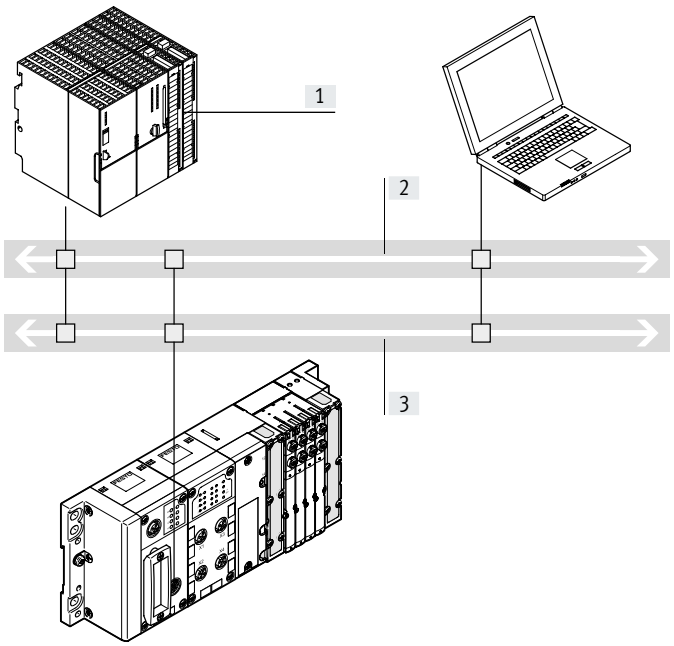
- Communication with the higher-order controller via fieldbus
- No preprocessing
- Fieldbus protocol dependent on CPX bus node used
- More than 90 I/Os, depending on bus node used

Note

Every electrical interface can be combined with an appropriate number of I/O modules and/or pneumatic components, depending on its address capacity.

Likewise, every pneumatic variant of the CPX terminal can be operated with every electrical interface variant.

Industrial Ethernet bus node



[1] Higher-order controller (PLC)
[2] Fieldbus
[3] IT services:
- Web
- Email
- Data transmission

- Connection to a higher-order controller directly via EtherNet/IP, Modbus/TCP, POWERLINK, EtherCAT or PROFINET
- No preprocessing
- Monitoring via Ethernet and web applications
- More than 300 I/Os

Key features

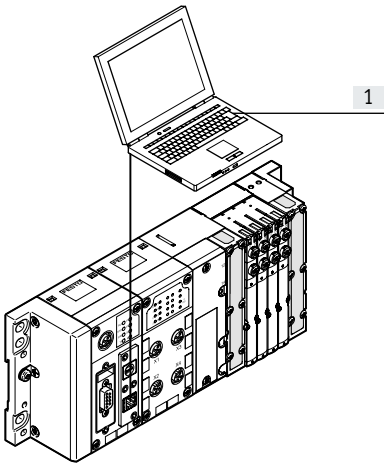
Variants of the CPX terminal controller (with preprocessing in the control block)
Control block

The optional front end controllers CPX-CEC enable simultaneous access via Ethernet, in parallel with a bus node, as well as stand-alone preprocessing.

Access via Modbus/TCP and EasyIP is also possible.

Commissioning, programming, and diagnostics using the Festo software tool FST with hardware configurator.

With control block in stand-alone mode



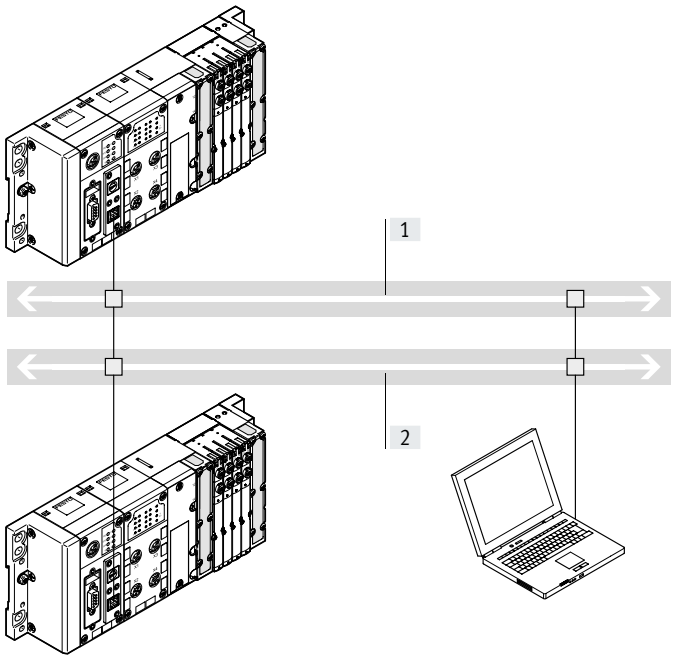
[1] CODESYS/FST

- Decentralised controller with direct machine mounting
- Downloading programs via Ethernet (or via the programming interface)
- Supports full expansion of all CPX peripherals
- More than 300 I/Os

Can be successfully used in the follow applications:

- Stand-alone individual workstations
- Interlinked, stand-alone sub-systems
- Automation using IT technology

With control block in Festo EasyIP mode



[1] Industrial Ethernet
[2] IT services:
- Web
- Email
- Data transmission

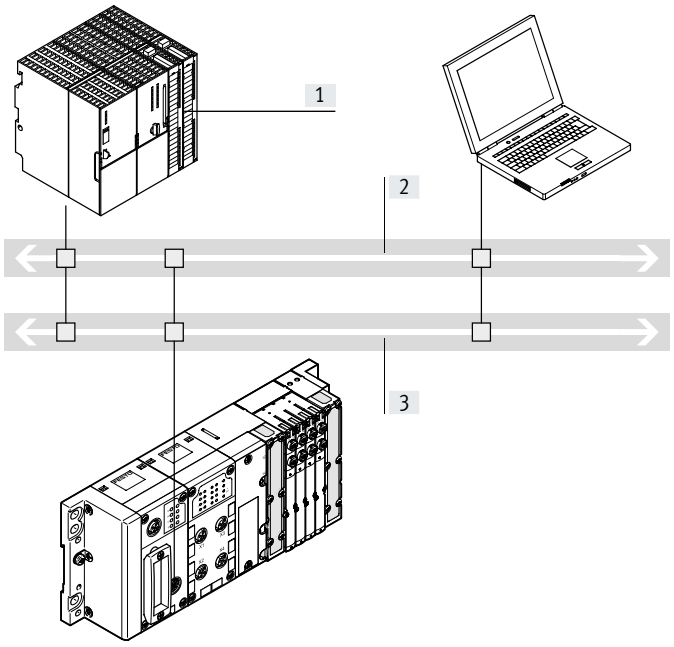
- Fast preprocessing of the CPX peripherals in the control block
- Exchange of any data between the control blocks via EasyIP
- Remote diagnostics
- No higher-order controller is required
- More than 300 I/Os per CPX control block

Key features

Variants of the CPX terminal controller (with preprocessing in the control block)

With control block as remote controller on Ethernet

Remote controller via Ethernet as the preprocessing unit for decentralised, stand-alone sub-systems using IT technology.

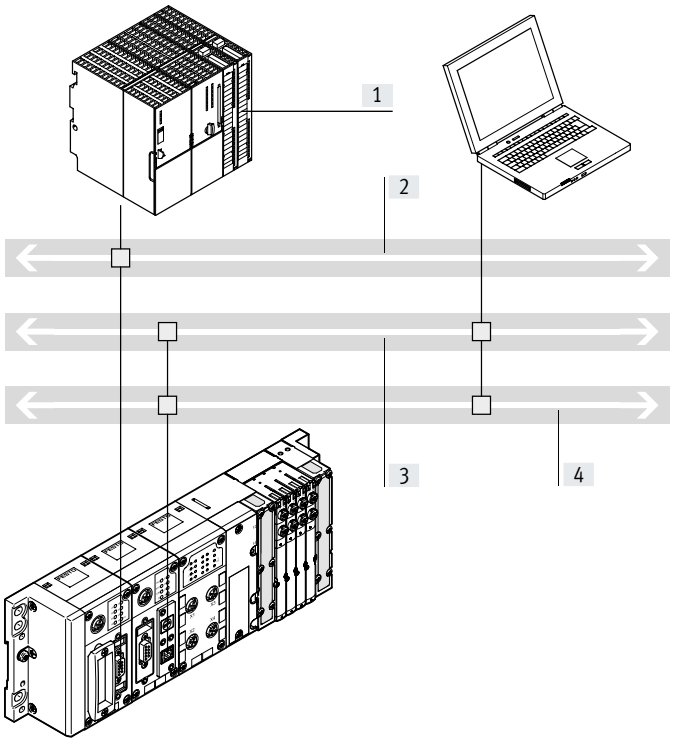


[1] Higher-order controller (PLC)
[2] Industrial Ethernet
[3] IT services:
- Web
- Email
- Data transmission

- Connection to a higher-order controller via Ethernet, no further bus node is required
- Monitoring via Ethernet and web applications
- Preprocessing of the CPX peripherals by CPX control block
- More than 300 I/Os

With control block as remote controller on the fieldbus

Fieldbus remote controller (combination with bus nodes for PROFIBUS DP, PROFINET, CANopen, DeviceNet, CC-Link, POWERLINK, Sercos III or EtherCAT) as the preprocessing unit for decentralised, stand-alone subsystems.

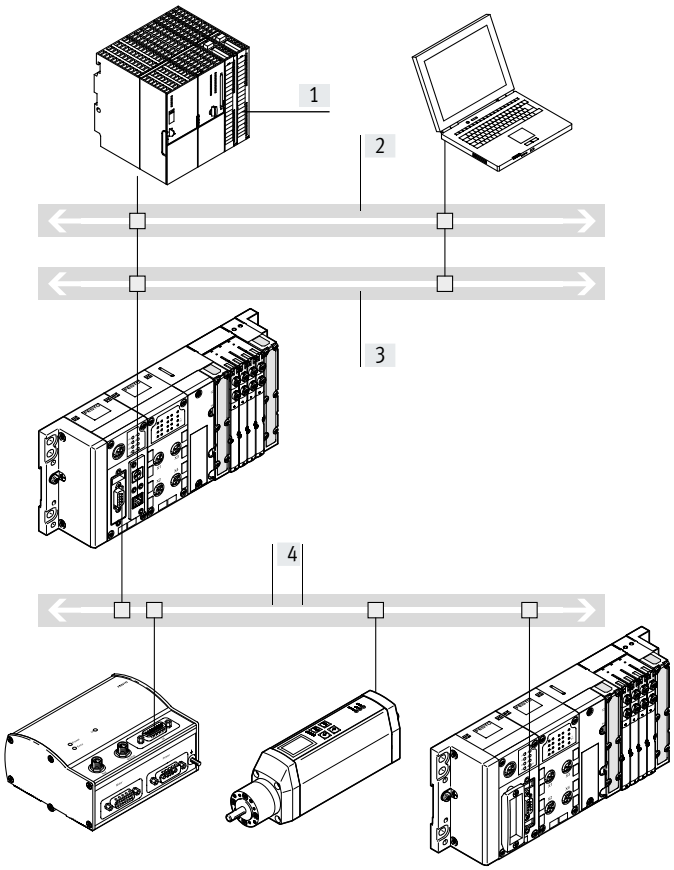


[1] Higher-order controller (PLC)
[2] Fieldbus
[3] Industrial Ethernet
[4] IT services:
- Web
- Email
- Data transmission

- Fast preprocessing of the CPX peripherals in the control block
- Communication with the higher-order controller via fieldbus
- Optional additional monitoring via Ethernet and web applications
- Downloading programs via programming interface
- More than 300 I/Os, bus node is only used for communication with the higher-order PLC
- Option of two bus nodes for redundant communication configuration

Key features

Variants of the CPX terminal controller (with preprocessing in the control block)
With control block as CANopen fieldbus master



[1] Higher-order controller (PLC)
[2] Industrial Ethernet
[3] IT services:
- Web
- Email
- Data transmission

[4] Fieldbus (CANopen)

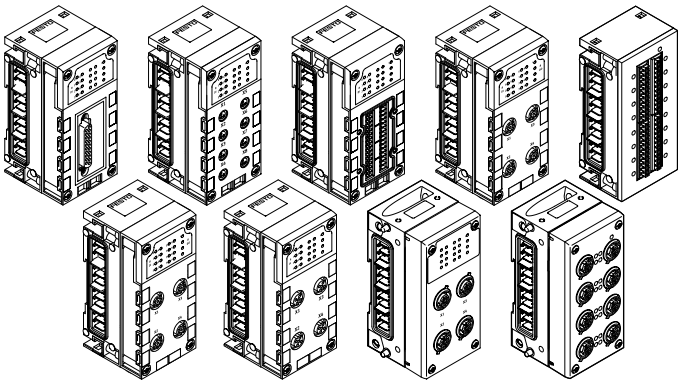
Features:
- Connection to a higher-order controller via Ethernet, no further bus node is required
- Monitoring via Ethernet
- Preprocessing of the CPX peripherals by CPX control block
- More than 300 I/Os
- Up to 128 stations with repeater technology on CANopen

Operating modes:
- Remote controller on Ethernet
- Control block in Festo EasyIP mode

Key features

Connection of inputs and outputs to the CPX terminal

Digital and analogue CPX I/O modules

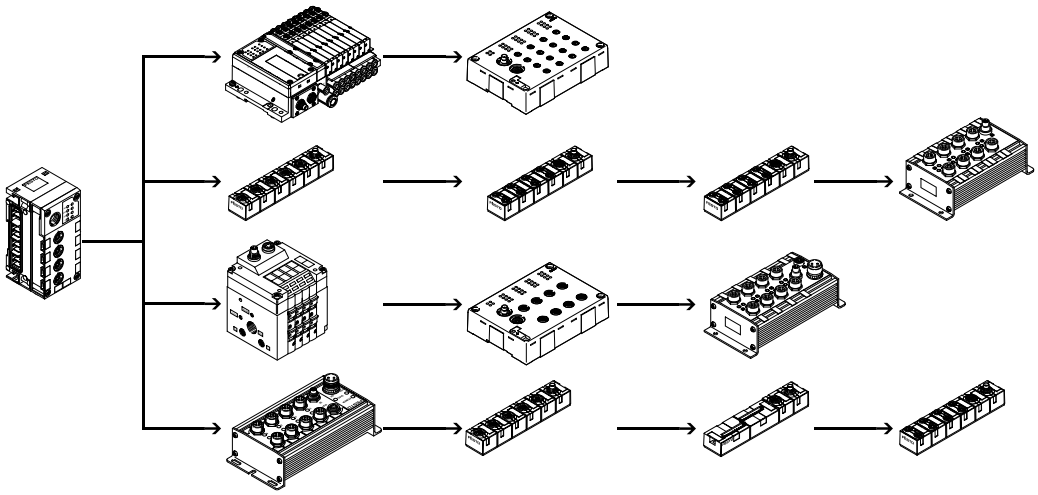


Electrical connection

The connection technology for sensors and additional actuators offers a wide range of digital and analogue input and output modules and is freely selectable – as appropriate to your standard or the application. Plastic or metal connection blocks can be combined as required:

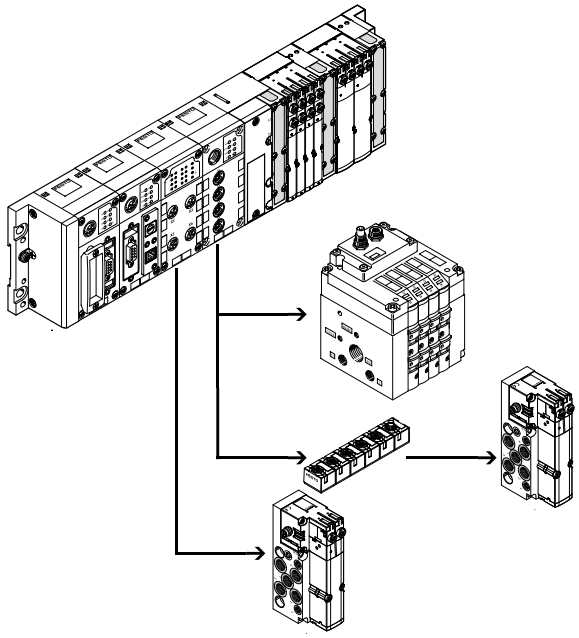
- Metal version
  - M12-5POL
- Plastic version:
  - M12-5POL
  - M12-5-PIN with quick lock and metal thread
  - M12-8POL
  - M8-3POL
  - M8-4POL
  - Sub-D
  - CageClamp®
    (with cover also to IP65, IP67)
  - Screw/spring-loaded terminal

With CPX-CP interface



- Up to 4 strings per CP interface possible.
- Up to 4 subordinate CP modules can be combined in one string.
- Up to 32 I/Os can be connected per string.
- Modules with M8, M12 and terminal connection
- Several CP interface modules can be combined in one CPX terminal (depending on the controller used).
- Combination of centralised CPX I/O modules and decentrally mounted I/O modules of the installation system CPI.

Combined centralised and decentralised electrical connection (valve terminal with CP interface/output module)

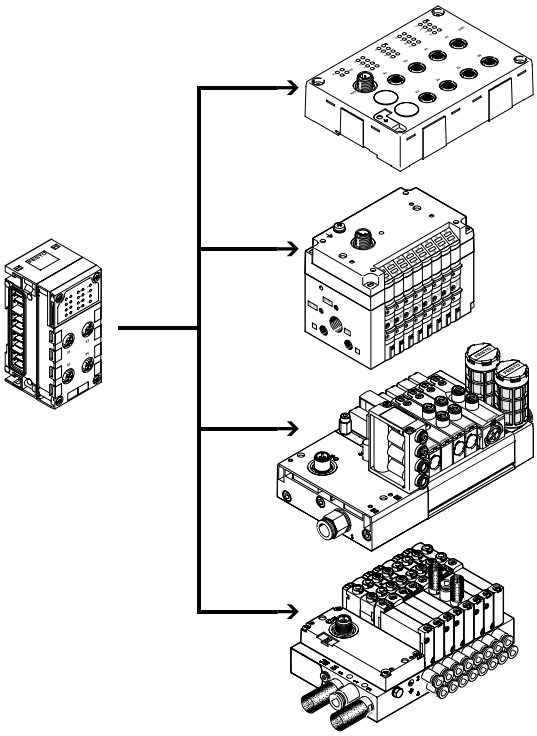


- Scalable to different requirements within a system
- One control interface in the system, reduces installation complexity with closely and widely spaced actuators
- Enables an optimum electrical and pneumatic control chain

Key features

Connection of inputs and outputs to the CPX terminal

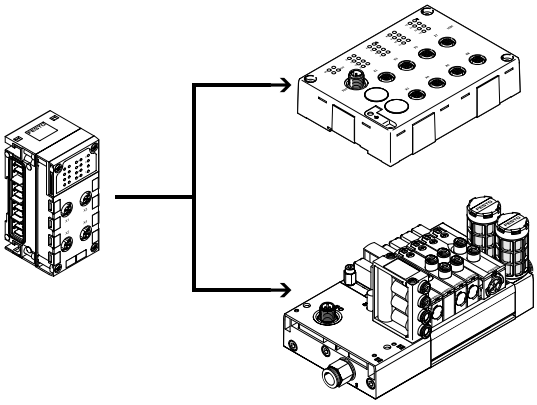
With CPX-CTEL interface



- Up to 4 devices with individual electronic protection per CPX CTEL master
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m.
- Input modules with 16 digital inputs (connection technology M8 3-pin and M12 5-pin)
- Valve terminals with I-Port interface (up to 48 solenoid coils, different valve functions)

Several CPX CTEL masters can be combined on one CPX terminal (depending on the controller used).
Combination of central CPX I/O modules and decentrally mounted I/O modules with I-Port interface.

With CPX-CTEL-2 interface



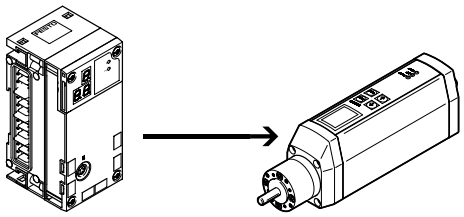
- Up to 2 IO-Link devices with individual electronic protection per CPX-CTEL-2 interface
- Max. 16-byte inputs/16-byte outputs per IO-Link device
- The maximum length of a string is 20 m.

Several CPX-CTEL-2 interfaces can be combined on one CPX terminal (depending on the controller used).
Combination of central CPX I/O modules and decentrally mounted I/O modules with IO-Link interface.

Key features

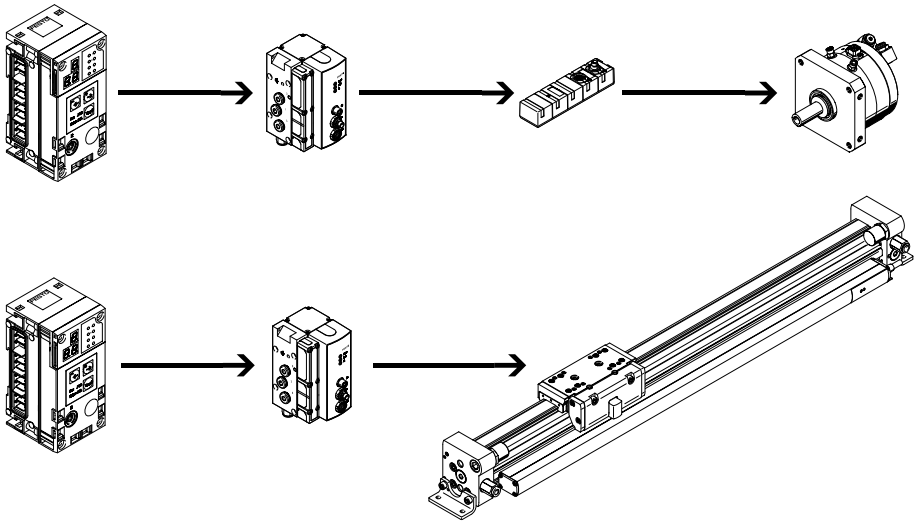
Connection of inputs and outputs to the CPX terminal

Electric drives with axis interface CPX-CM-HPP



- Max. 4 individual electric axes possible per CPX-CM-HPP
- No programming required
- Standardised communication with the drives via the Festo Handling and Positioning Profile (FHPP)
- The control component is independent of the bus node used

Pneumatic drives with CPX-CMAX/CMPX



CPX-CMAX

- Position and force control, directly actuated or selected from one of 64 configurable positioning sets
- The configurable record sequencing function enables simple functional sequences to be realised
- Auto identification detects every station with its device data on the controller
- Control of a brake or clamping unit via the proportional directional control valve VPWP
- Up to 7 modules (max. 7 axes) can be operated in parallel and independently of each other
- Commissioning via the Festo configuration software FCT or via fieldbus

CPX-CMPX

- Fast travel between the mechanical end stops of the cylinder, stopping gently and without impact in the end position
- Fast commissioning via control panel, fieldbus or handheld terminal
- Improved downtime control
- Control of a brake or clamping unit via the proportional directional control valve VPWP
- Max. 9 end-position controllers can be actuated depending on the fieldbus
- All system data can be read and written via the fieldbus, including the mid-positions, for example:

Key features

Ordering

The CPX terminal with valve terminal is fully assembled according to your order specifications and individually tested. The finished valve terminal consists of the electrical peripherals including the desired actuation and the selected components of the VTSA (ISO), VTSA-F, VTSA-F-CB, MPA-S or MPA-L modules. The CPX terminal with valve terminal is ordered using two separate order codes.

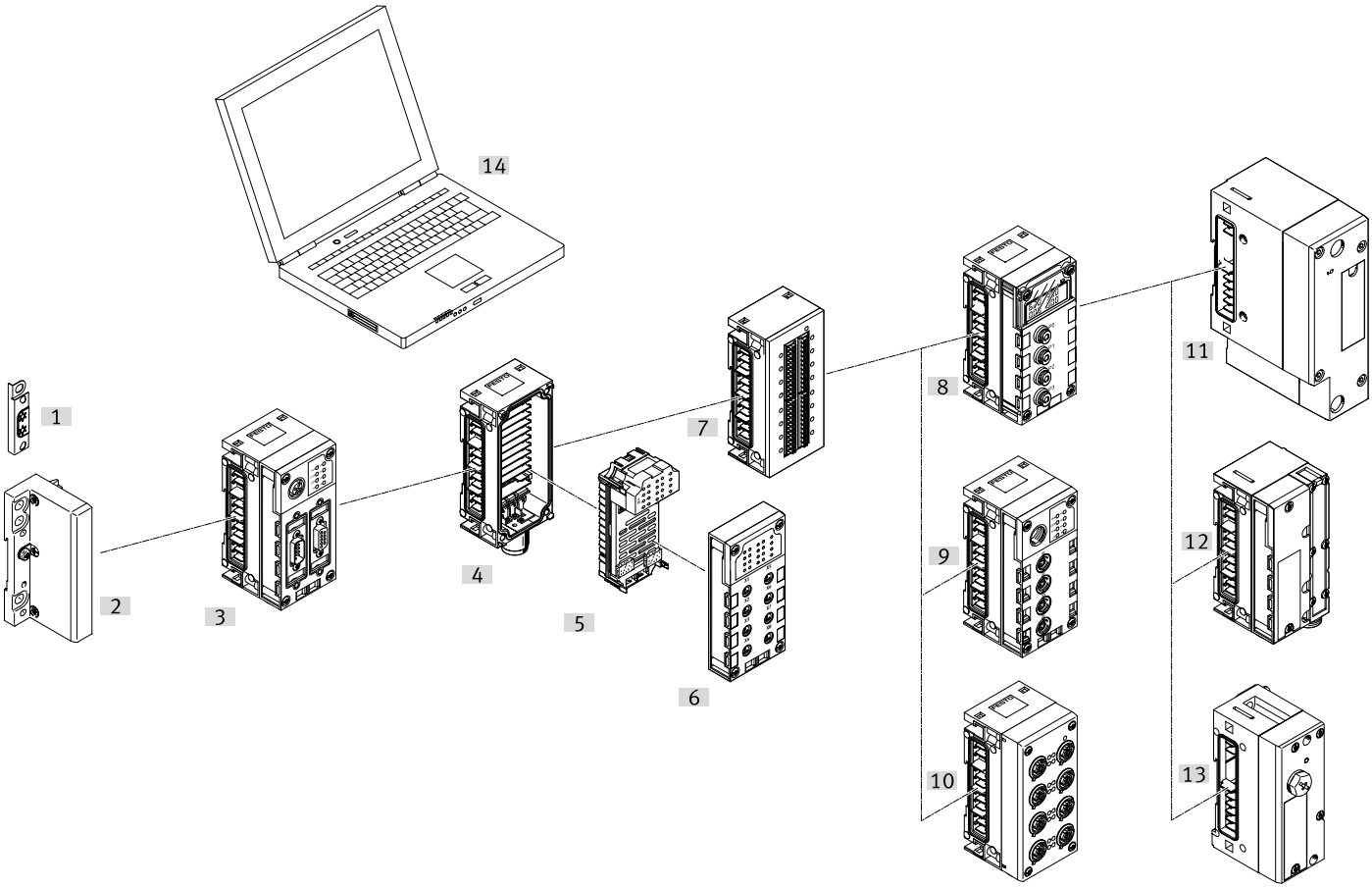
One order code defines the electrical peripherals type CPX, while the other specifies the pneumatic components of the valve terminal.
The electrical peripherals type CPX can also be configured without a valve terminal and can be used on a fieldbus. To order this, only the order code for the electrical peripherals is required.

The order lists for the pneumatic components can be found at
➔ Internet: vtsa
(Valve terminal VTSA)
➔ Internet: vtsa-f
(Valve terminal VTSA-F)
➔ Internet: vtsa-f-cb
(Valve terminal VTSA-F-CB)
➔ Internet: mpa-s
(Valve terminal MPA-S)
➔ Internet: mpa-l
(Valve terminal MPA-L)

The order lists for the CP/CPI components can be found at
➔ Internet: cpi
(Installation system CPI)

The order lists for the CTEU/CTEL components can be found at
➔ Internet: cteu
(I-Port interface/IO-Link)

Peripherals overview



Designation		Type	Description	→ Page/Internet
[1]	Earthing component	CPX-EPFE-EV	For right/left end plate	52
[2]	End plate	CPX-EP	• Mounting holes for wall mounting • Functional earth connection • Special earthing plate for safe and easy connection to the machine bed or H-rail • External power supply for the entire system	52
[3]	Busknoten	CPX-FB CPX-M-FB	• Fieldbus/Industrial Ethernet connection using various types of connection technology • Setting fieldbus parameters via DIL switch • Display of fieldbus and peripheral equipment status via LED • PROFINET to AIDA standard in metal housing, fast start-up	72
	Control block	CPX-CEC	• Preprocessing, stand-alone controller or remote unit CPX-CEC • Connection via Ethernet TCP/IP or Sub-D programming interface • Setting operating modes via DIL switch and program selection via rotary switch • CPX-CMX products for controlling axes	65
	Gateway	CPX-IOT	• Separate CPX combination • Data gathering for connected components • Secure data transfer to a central storage location (MQTT broker)	58
[4]	Plastic interlinking block	CPX-GE	• Internal linking of the power supply and serial communication • External power supply for the entire system or for outputs or valves • Connection accessories for M18, 7/8" • Linking with tie rods	51
	Interlinking block, metal	CPX-M-GE	• Internal linking of the power supply and serial communication • External power supply for the entire system or for outputs • Transmission of the power supply • Connection accessories for M12x1, 7/8" or AIDA push-pull • Individual linking with M6 screws, individually expandable	51

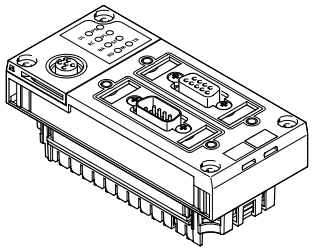
Peripherals overview

Designation		Type	Description	→ Page/Internet
[5]	Electronics module	CPX-4DE	Input module with 4 digital inputs, positive logic (PNP)	145
		CPX-8DE	Input module with 8 digital inputs, positive logic (PNP)	
		CPX-8DE-D	Input module with 8 digital inputs, positive logic (PNP), enhanced diagnostic function	
		CPX-8NDE	Input module with 8 digital inputs, negative logic (NPN)	
		CPX-P-8DE-N	NAMUR input module with 8 digital inputs	150
		CPX-F8DE-P	PROFIsafe input module with 8 digital inputs	154
		CPX-16DE	Input module with 16 digital inputs, internal electronic fuse per module	160
		CPX-M-16DE-D	Input module with 16 digital inputs, internal electronic fuse per channel pair, for CPX in metal	
		CPX-4DA	Output module with 4 digital outputs, 1 A per channel	166
		CPX-8DA	Output module with 8 digital outputs, 0.5 A per channel	
		CPX-8DA-H	Output module with 8 digital outputs, 2.1 A per channel pair	
		CPX-8DE-8DA	Input/output module with 8 digital inputs and 8 digital outputs	172
		CPX-2ZE2DA	Counter module with 2 digital inputs and 2 digital outputs	177
		CPX-4AE-4AA-H	HART input/output module with 4 analogue input/outputs	181
		CPX-2AE-U-I	Input module with 2 analogue current and/or voltage inputs	186
		CPX-4AE-U-I	Input module with 4 analogue current and/or voltage inputs	
		CPX-4AE-I	Input module with 4 analogue current inputs	
		CPX-4AE-T	Input module for temperature inputs	193
		CPX-4AE-TC	Input module for temperature inputs with cold junction compensation	197
		CPX-2AA-U-I	Output module with 2 analogue current or voltage outputs	201
		CPX-FVDA-P2	PROFIsafe shut-off module for shutting off the supply voltage for valves, with two digital outputs	205
[6]	Plastic connection block	CPX-AB	• Choice of 8 connection technology variants • Degree of protection IP65, IP67 or IP20 • Can be combined with the electronics modules • Connection accessories for M8/M12/Sub-D • M8/M12/Sub-D, etc. connecting cables • Modular system for M8/M12 connecting cables	–
[7]	Connection block including electronics module and interlinking block	CPX-L	• Spring-loaded terminal • Degree of protection IP20 • Digital input module with 16 inputs • Digital I/O module with 8 inputs and 8 outputs • Plastic connection block	–
[8]	Analogue electronics module for pressure inputs	CPX-4AE-P	• Pneumatic connection QS-4 • Degree of protection IP 65, IP67 • 4 analogue pressure inputs (0 ... 10 bar, –1 ... +1 bar)	191
[9]	CP interface	CPX-CP	• Interfaces for decentralised installation systems, thus optimising the pneumatic control chains (short tubes/short cycle times) • Actuation for I/O modules and valve terminals • Power supply and bus interface via the same cable • M9, M12 connection technology • Degree of protection IP 65, IP67	117
	CTEL interface	CPX-CTEL		122
[10]	Metal connection block	CPX-M-AB	• Can be combined with the electronics modules • Connection technology M12x1, 5-pin • Degree of protection IP 65, IP67 • Connection accessories for M12 • Connecting cable M12, • Modular system for choice of connecting cables M12	–
[11]	Pneumatic interface VTSA	VABA-S6	• Control of valve terminal VTSA/VTSA-F/VTSA-F-CB • Control of pressure sensors	236
[12]	Pneumatic interface MPA-S	VMPA-FB	• Control of valve terminal MPA-S • Control of pressure sensors • Control of proportional pressure regulators	231
[13]	Pneumatic interface MPA-L	VMPAL-EPL-CPX	Control of valve terminal MPA-L	234
[14]	Web monitor	–	• Website integrated in the CPX terminal • Dynamic status indication • Online diagnostics and SMS/e-mail alert	–

Peripherals overview

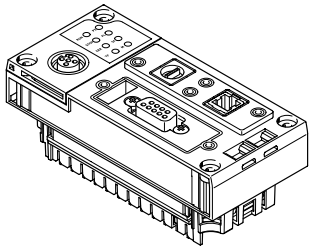
Individual overview of modules

Bus node → Page 72



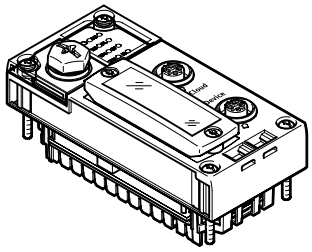
Bus node for
- PROFIBUS DP
- DeviceNet
- CANopen
- CC-Link
- EtherNet/IP
- PROFINET
- POWERLINK
- EtherCAT
- Sercos III

Control block → Page 65



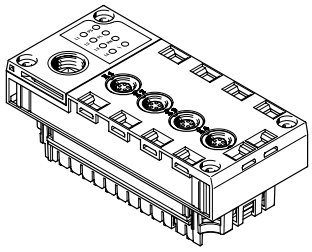
CPX-CEC
- Programming with CODESYS
- Ethernet interface
- Modbus/TCP
- EasyIP
- CANopen master

Gateway → Page 58



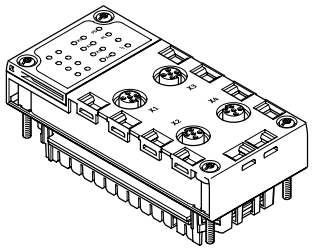
CPX-IOT
- Continuous transfer of operating data from connected Festo components to a central storage location (user-specific MQTT broker)
- Ethernet interface

CP interface → Page 117



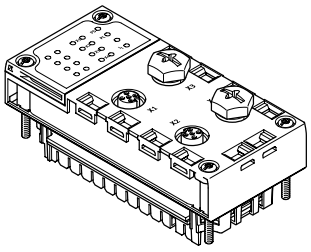
Interface CPX-CP
- 4 CP strings
- Max. 4 modules per string
- 32 inputs/32 outputs per string
- CPI functionality

CTEL interface → Page 122



CPX-CTEL interface
- CTEL master
- Max. 4 devices with individual electronic protection
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m

Electrical interface CPX-CTEL-2 → Page 128

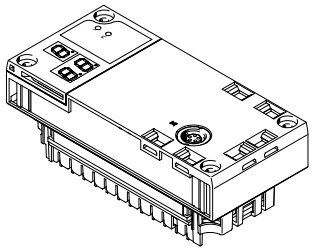


CPX-CTEL-2 interface
- Master for IO-Link
- Max. 2 devices with individual electronic protection
- Process data length of the inputs and outputs is limited to 16 bytes for inputs and 16 bytes for outputs per port
- The maximum length of a string is 20 m

Peripherals overview

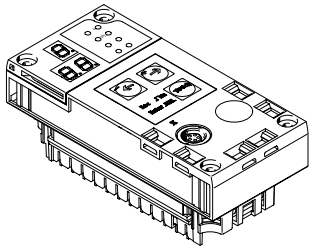
Individual overview of modules

Modules for actuating electric drive units → Page 133



CPX-CM-HPP
- Axis interface
- CAN bus for up to 4 individual electric axes

Modules for controlling pneumatic drive units → Page 136

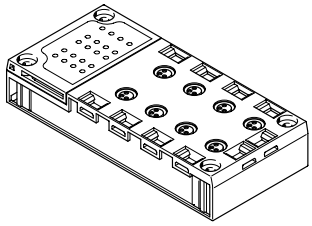


CPX-CMAX
- Axis controller
- Position and force control
- 64 configurable positioning records
- Auto-identification
- Control of a brake or clamping unit via the proportional directional control valve VPWP

CPX-CMPX
- End-position controller
- Fast travel between the mechanical end stops of the cylinder
- Smooth travel into the end position
- Improved downtime control
- Control of a brake via the proportional directional control valve VPWP

CPX-CMIX
- Measuring module
- CAN input (Festo specification) for measuring signal
- Recording the absolute position values or speed values of the connected drive

Plastic connection block

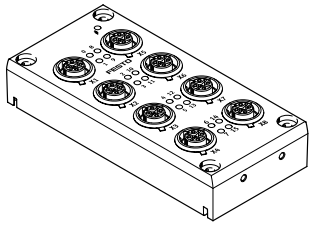


Direct machine mounting
(degree of protection IP65, IP67)
- M8-3POL
- M8-4POL
- M12-5POL
- M12-5POL quick lock, shielded with metal thread
- M12-8POL
- Sub-D
- Spring-loaded terminal with cover

Protected fitting space
(degree of protection IP20)
- Spring-loaded terminal

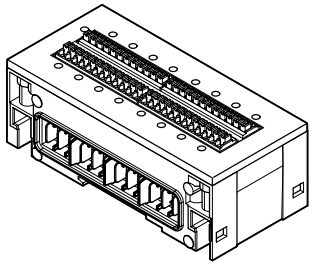
Shielding concept
- Optional screening plate for connection blocks with M12 connection technology

Metal connection block



Direct machine mounting
(degree of protection IP65, IP67)
- M12-5POL

Connection block including electronics module and interlinking block

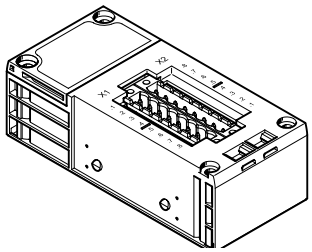


Installation in the control cabinet
(degree of protection IP20)
- Plastic connection block
- Spring-loaded terminal
- Digital input module with 16 inputs
- Digital I/O module with 8 inputs and 8 outputs

Peripherals overview

Individual overview of modules

Connection block for NAMUR sensors and HART input/output module

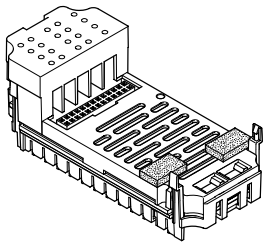


Direct machine mounting
(connection block to IP65)
- M12-4POL

Protected fitting space
(connection block to IP20)
- Screw terminal
- Spring-loaded terminal

Digital electronics module for inputs/outputs

→ Page 145



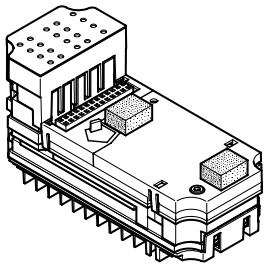
Digital inputs
- 4 digital inputs
- 8 digital inputs NPN
- 8 digital inputs PNP
- 8 digital inputs PNP with individual channel diagnostics
- 16 digital inputs
- 16 digital inputs with individual channel diagnostics

Digital outputs
- 4 digital outputs (1 A per channel, individual channel diagnostics)
- 8 digital outputs (0.5 A per channel, individual channel diagnostics)
- 8 digital outputs (2.1 A/50 W lamp load per channel pair, individual channel diagnostics)

Multi I/O modules
- 8 digital inputs and 8 digital outputs
- 2 digital inputs (counter channels, connection to various encoders) and 2 digital outputs (directly controlled by the input values)

Digital electronics module for NAMUR sensors

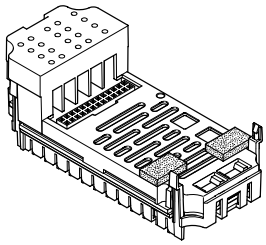
→ Page 150



Digital inputs
- 8 digital inputs for NAMUR sensors or wired mechanical contacts

Analogue electronics module for inputs/outputs

→ Page 186



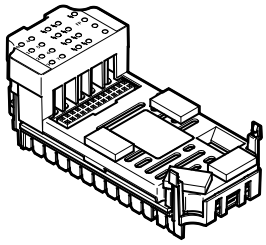
Analogue inputs
- 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue inputs (1 ... 5 V, 0 ... 10 V, −5 ... +5 V, −10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, −20 ... +20 mA)
- 4 analogue inputs with HART protocol

Analogue temperature inputs
- 4 analogue inputs for temperature measurement (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni500, Ni1000)
- 4 analogue inputs for temperature measurement (thermocouple and PT1000 sensor for cold-junction compensation)

Analogue outputs
- 2 analogue outputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue outputs with HART protocol

PROFIsafe input module

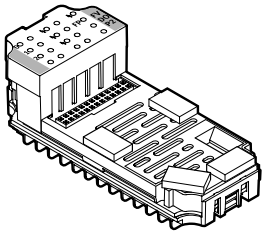
→ Page 154



Digital inputs
- 8 digital inputs
- 11 function modes
- 5 independent clock outputs

PROFIsafe shut-off module

→ Page 205

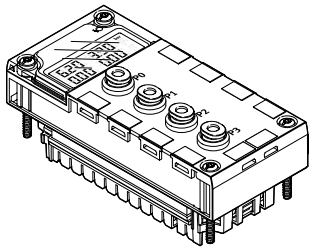


Digital outputs
- 2 digital outputs
- Supply voltage for valves can be shut off

Peripherals overview

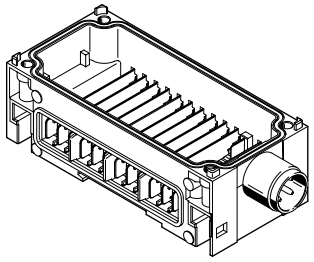
Individual overview of modules

Analogue electronics module for pressure inputs ➔ Page 191



Analogue inputs
- 4 analogue pressure inputs (0 ... 10 bar, –1 ... +1 bar)

Plastic interlinking block – Interlinking using tie rods ➔ Page 214



System linking
- Different voltages for supplying the modules
- Serial communication between the modules

System supply
- M18, 4-pin
- 7/8" 4-pin or 5-pin

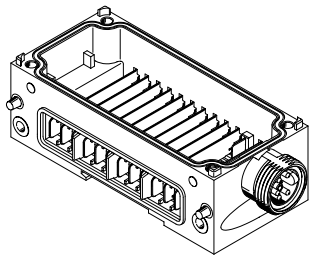
In addition to system linking, power supply for the
- Electronics plus sensors (16 A)
- Valves plus actuators (16 A)

Additional supply
In addition to system linking, power supply for the
- Actuators (16 A per supply)

Power supply for the
- Valves (16 A per supply)

Expandability
- Can be expanded using an interlinking block with tie rod CPX-ZA-1-E

Metal interlinking block – Individual linking ➔ Page 215



System linking
- Different voltages for supplying the modules
- Serial communication between the modules

System supply
- 7/8" 4-pin or 5-pin
- M12x1, L-coded, 5-pin
- AIDA push-pull

In addition to system linking, power supply for the
- Electronics plus sensors (16 A)
- Valves plus actuators (16 A)

Additional supply
In addition to system linking, power supply for the
- Actuators (16 A per supply)

Power supply for the
- Valves (16 A per supply)

System forwarding
In addition to system linking, transmission of power supply from the
- Electronics plus sensors (16 A)
- Valves plus actuators (16 A)

to a further CPX terminal or another consuming device.

Expandability
- Can be expanded as required by up to 10 interlinking blocks

Note

Plastic interlinking blocks (tie rods) and metal interlinking blocks (individual linked) cannot be combined due to their different interlinking systems.

Note

The 7/8" supply is subject to the following restrictions due to the available accessories:
- 5-pin 8 A
- 4-pin 10 A

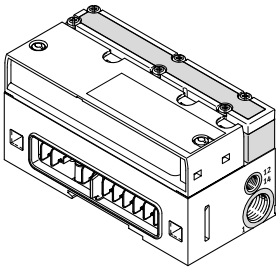
Note

Appropriate interlinking blocks (CPX-...-VL) must be used in ATEX environments as per the certification (➔ page 49). The maximum supply is limited to 8 A for these modules.

Peripherals overview

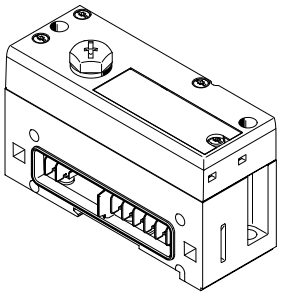
Individual overview of modules

Pneumatic interface MPA-S → Page 231



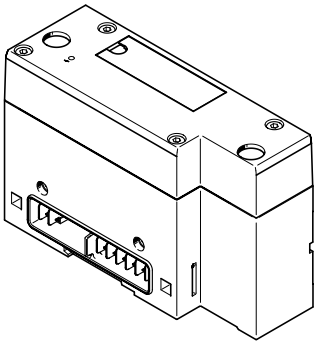
Valve terminal
- MPA1 (360 l/min)
- MPA14 (550 l/min)
- MPA2 (700 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- For CPX plastic design
- For CPX metal design
- Actuation of pressure sensors
- Proportional pressure regulators
- Pressure sensors
- Proportional pressure regulators

Pneumatic interface MPA-L → Page 234



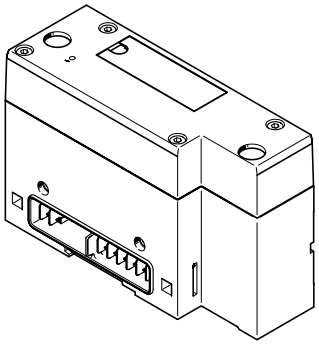
Valve terminal
- MPA1 (360 l/min)
- MPA14 (670 l/min)
- MPA2 (870 l/min)
- Up to 32 solenoid coils
- For CPX plastic design

Pneumatic interface VTSA/VTSA-F → Page 236



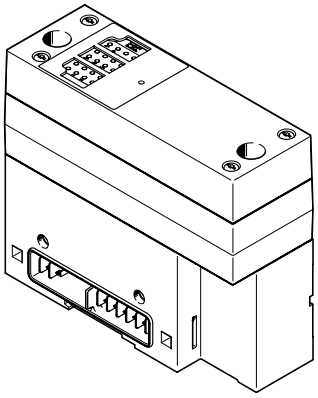
Valve terminal (valve flow rate according to width)
- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- 65 mm (4000 l/min)
- Max. 32 valve positions/max. 32 solenoid coils
- For CPX plastic design
- For CPX metal design

Pneumatic interface VTSA-F-CB → Page 238



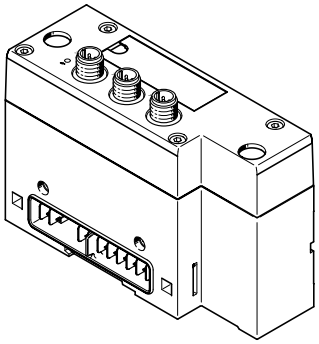
Valve terminal (valve flow rate according to width)
- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- Max. 24 valve positions/max. 24 solenoid coils
- For CPX plastic design
- For CPX metal design

Pneumatic interface VTSA-F-CB → Page 238



Valve terminal (valve flow rate according to width)
- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- Max. 24 valve positions/max. 24 solenoid coils
- For CPX metal design
- With 3 voltage zones within the valve terminal that can be securely shut down via fieldbus
- With 2 voltage zones within the valve terminal that can be securely shut down via fieldbus and one power supply for external consuming devices that can be securely shut down via fieldbus

Pneumatic interface VTSA-F-CB → Page 238

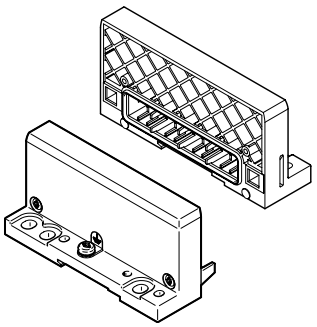


Valve terminal (valve flow rate according to width)
- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- Max. 24 valve positions/max. 24 solenoid coils
- For CPX plastic design
- For CPX metal design
- 3 external voltage supplies for voltage zones within the valve terminal that can be shut down individually

Peripherals overview

Individual overview of modules

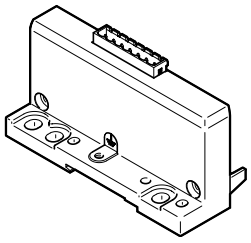
End plate for plastic/metal design



End plate
- Left-hand
- Right-hand (for using the CPX terminal without valves)

End plate with system supply

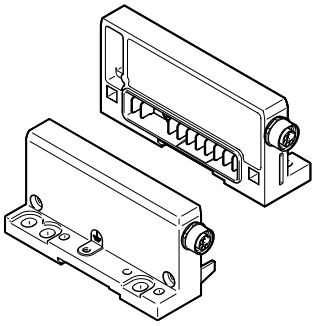
➔ Page 210



End plate
- Left-hand
- For plastic design
- Different voltages for supplying the CPX terminal

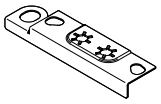
End plate with extension

➔ Page 212



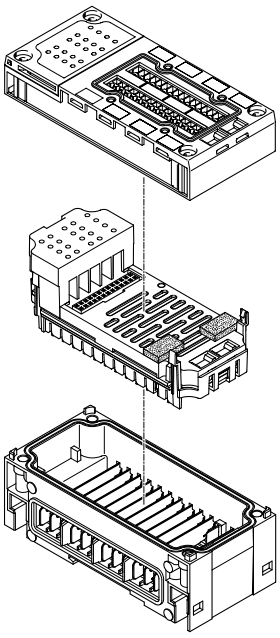
End plate
- Left-hand
- Right-hand
- Enables the CPX terminal to be separated into two interconnected units (series)
- Simplifies control cabinet installation
- For plastic or metal design

Earthing plate (for end plate for plastic design)



Earthing plate
- For safe and easy connection to the machine bed or H-rail, suitable for right-hand and left-hand end plate
- Assembly and earthing in a single processing step, which means:
  – 50% time saving
  – No additional material required

General basic data and guidelines



Max. 11 modules in total:
- One bus node and/or one control block,
  freely positionable
- Up to 9 additional input/output modules,
  freely positionable
- An additional pneumatic interface always positioned as the last module on the right-hand side
  – For VTSA, VTSA-F:
    Fixed operating range, set using DIL switch
  – For VTSA-F-CB:
    Fixed operating range
  – For MPA-S:
    16 MPA modules can be configured
  – For MPA-L:
    Fixed operating range, set using rotary switch
- Address capacity max. 512 inputs and 512 outputs,
  depending on bus node or control block
- One interlinking block with system supply
- Multiple interlinking blocks with additional supplies
  Always positioned to the right of the interlinking block with system supply
- With just a few exceptions, the connection blocks can be freely combined with the electronics modules for inputs/outputs, either in metal or plastic design
  (➔ table below)
- The electronics modules for inputs/outputs can be combined with various interlinking blocks
- Plastic interlinking blocks (tie rods) and metal interlinking blocks (individual linked) cannot be combined due to their different interlinking systems.

Peripherals overview

Combinations of connection blocks and digital input modules						
	Digital electronics modules					
	CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE	CPX-P-8DE-N	CPX-F8DE-P
Connection blocks, plastic design						
CPX-AB-8-M8-3POL	■	■	■	■	–	–
CPX-AB-8-M8X2-4POL	–	–	–	–	–	–
CPX-P-AB-4XM12-4POL	–	–	–	–	■	–
CPX-AB-4-M12x2-5POL	■	■	■	■	–	–
CPX-AB-4-M12x2-5POL-R	■	■	■	■	–	–
CPX-AB-8-M12X2-5POL	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	–	■
CPX-P-AB-2XKL-8POL	–	–	–	–	■	–
CPX-AB-1-SUB-BU-25POL	■	■	■	■	–	–
CPX-AB-ID-P	–	–	–	–	–	■
Connection blocks, metal design						
CPX-M-AB-4-M12X2-5POL	■	■	■	■	–	■
CPX-M-AB-4-M12X2-5POL-T	–	–	–	–	–	■
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–

Combinations of connection blocks and digital input modules			
	Digital electronics modules		
	CPX-16DE	CPX-L-16DE	CPX-M-16DE-D
Connection blocks, plastic design			
CPX-AB-8-M8-3POL	–	–	–
CPX-AB-8-M8X2-4POL	■	–	–
CPX-P-AB-4XM12-4POL	–	–	–
CPX-AB-4-M12x2-5POL	–	–	–
CPX-AB-4-M12x2-5POL-R	–	–	–
CPX-AB-8-M12X2-5POL	–	–	■
CPX-AB-4-M12-8POL	–	–	–
CPX-AB-8-KL-4POL	■	–	–
CPX-P-AB-2XKL-8POL	–	–	–
CPX-AB-1-SUB-BU-25POL	■	–	–
CPX-AB-ID-P	–	–	–
Connection blocks, metal design			
CPX-M-AB-4-M12X2-5POL	–	–	–
CPX-M-AB-4-M12X2-5POL-T	–	–	–
CPX-M-AB-8-M12X2-5POL	–	–	■

Peripherals overview

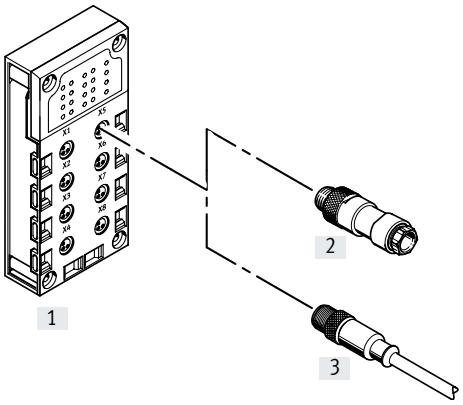
Combinations of connection blocks and digital output modules or multi I/O modules							
	Digital electronics modules						
	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-8DE-8DA	CPX-L-8DE-8DA	CPX-2ZE2DA	CPX-FVDA-P2
Connection blocks, plastic design							
CPX-AB-8-M8-3POL	■	■	–	–	–	–	–
CPX-AB-8-M8X2-4POL	■	■	■	–	–	–	–
CPX-P-AB-4XM12-4POL	–	–	–	–	–	–	–
CPX-AB-4-M12x2-5POL	■	■	–	–	–	–	–
CPX-AB-4-M12x2-5POL-R	■	■	■	–	–	–	–
CPX-AB-8-M12X2-5POL	–	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	■	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	–	–	■
CPX-P-AB-2XKL-8POL	–	–	–	–	–	–	–
CPX-AB-1-SUB-BU-25POL	■	■	■	■	–	–	–
CPX-AB-ID-P	–	–	–	–	–	–	–
Connection blocks, metal design							
CPX-M-AB-4-M12X2-5POL	■	■	■	–	–	–	■
CPX-M-AB-4-M12X2-5POL-T	–	–	–	–	–	–	–
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–	–

Combinations of connection blocks and analogue electronics modules for inputs/outputs								
	Analogue electronics modules							
	CPX-4AE-4AA-H	CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I	CPX-2AA-U-I	CPX-4AE-P	CPX-4AE-T	CPX-4AE-TC
Connection blocks, plastic design								
CPX-AB-8-M8-3POL	–	–	–	–	–	–	–	–
CPX-AB-8-M8X2-4POL	–	–	–	–	–	–	–	–
CPX-P-AB-4XM12-4POL	■	–	–	–	–	–	–	–
CPX-AB-4-M12x2-5POL	–	■	■	■	■	–	■	■
CPX-AB-4-M12x2-5POL-R	–	■	■	■	■	–	■	■
CPX-AB-8-M12X2-5POL	–	–	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	–	–	–	–	–
CPX-AB-8-KL-4POL	–	■	■	■	■	–	■	■
CPX-P-AB-2XKL-8POL	■	–	–	–	–	–	–	–
CPX-AB-1-SUB-BU-25POL	–	■	■	■	■	–	–	–
CPX-AB-ID-P	–	–	–	–	–	–	–	–
Connection blocks, metal design								
CPX-M-AB-4-M12X2-5POL	–	■	■	■	■	–	■	■
CPX-M-AB-4-M12X2-5POL-T	–	–	–	–	–	–	–	–
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–	–	–

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-8-M8-3POL with connection socket M8, 3-pin



- Compact for pre-assembled individual connection
- 8 sockets
- 3-pin design for connecting one channel per socket

Note

Festo delivers pre-assembled M8/M12 connecting cables (NEBU modular system) on request:

- Tailored to the application
- Perfectly fitting
- Easy to install

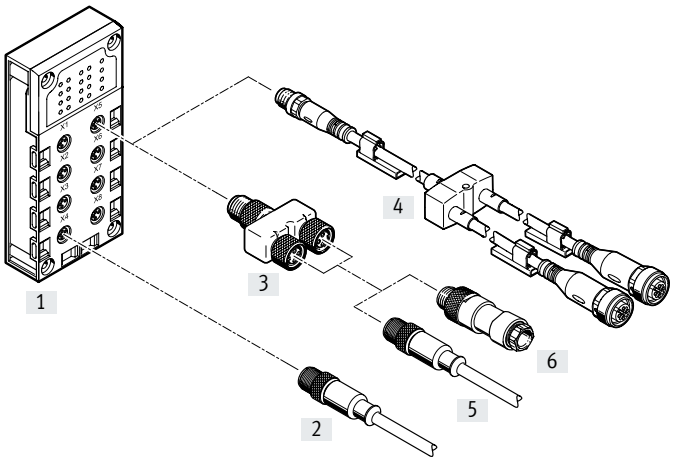
Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-8-M8-3POL	Socket M8, 3-pin	[2] SEA-GS-M8	Solder lugs
		[2] SEA-3GS-M8-S	Screw terminals
		[3] NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M8, 3-pin
			Socket, M8, 4-pin
			Socket, M12, 5-pin
			Open cable end

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-8-M8X2-4POL with connection socket M8, 4-pin



- Compact for pre-assembled individual connection
- 8 sockets
- 4-pin design for connection of 2 channels per socket

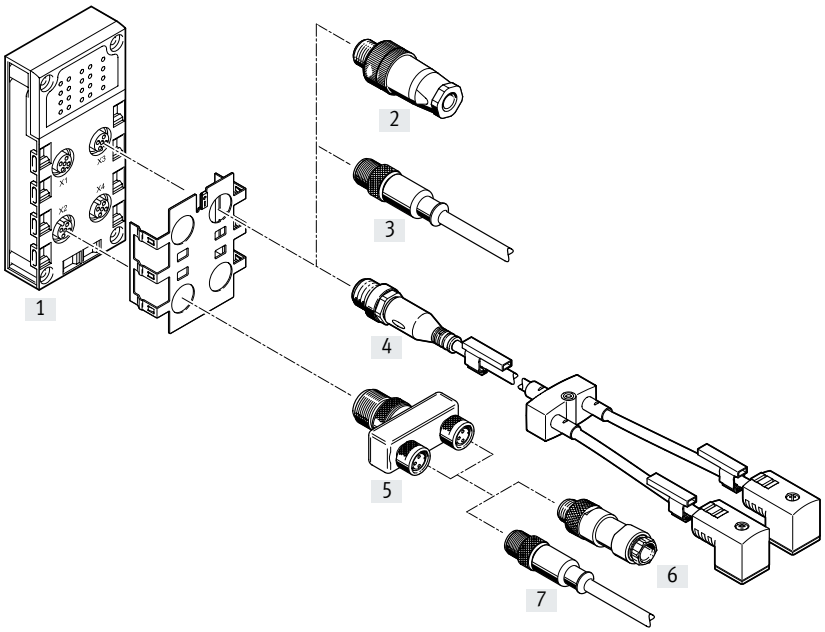
Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-8-M8X2-4POL	Socket, M8, 4-pin	[2] NEBU-...-M8G4 (modular system for choice of connecting cables)	Socket, M8, 3-pin	–	–
			Socket M8, 4-pin	–	–
			Socket, M12, 5-pin	–	–
			Open cable end	–	–
		[3] NEDY-L2R1-V1-M8G3-N-M8G4 (T-adapter)	1x plug M8, 4-pin to 2x socket, M8, 3-pin	[6] SEA-GS-M8	Solder lugs
				[6] SEA-3GS-M8-S	Screw terminals
				[5] NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M8, 3-pin
					Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end
		[4]NEDY-... (modular system for all types of sensor/ actuator distributor)	2x socket, M8, 3-pin	–	–
			2x socket, M8, 4-pin	–	–
			2x socket, M12, 5-pin	–	–
			2x socket, type A	–	–
			2x socket, type B	–	–
			2x socket, type C	–	–
			2x socket, plug pattern H	–	–
			2x socket, plug pattern ZB	–	–
			2x socket, plug pattern ZC	–	–
			2x open cable end	–	–

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-4-M12x2-5POL and CPX-AB-4-M12x2-5PPOL-R with connection socket M12, 5-pin



- Suitable for self-assembly and sturdy with 2 channels per connection
- 4 sockets
- 5-pin design per connection
- Version ...-R with quick lock technology and metal thread for shielding
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter and conventional cables with M8 connection.

Key features – Electrical components

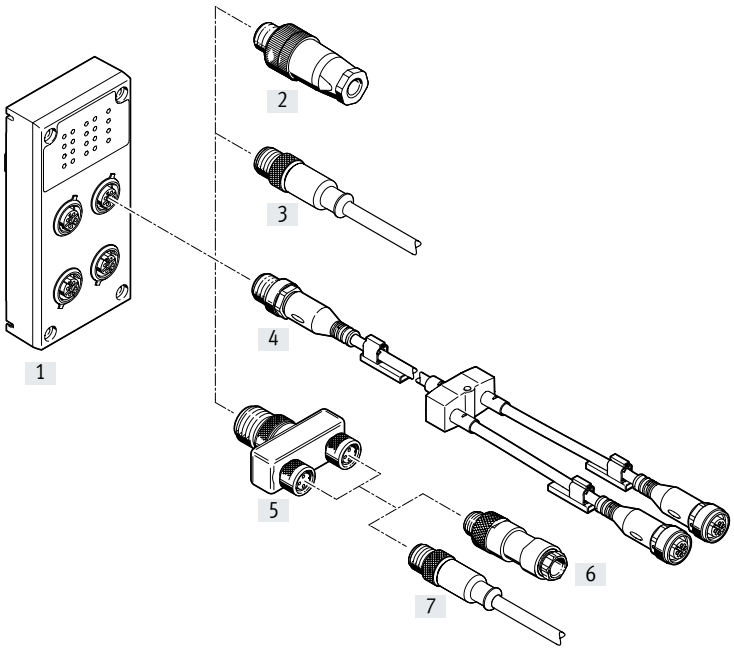
Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-4-M12x2-5POL CPX-AB-4-M12x2-5POL-R	Socket, M12, 5-pin	[2] SEA-GS-7	Screw terminals	–	–
		[2] SEA-4GS-7-2.5	Screw terminals	–	–
		[2] SEA-GS-9	Screw terminals	–	–
		[2] SEA-M12-5GS-PG7	Screw terminals	–	–
		[2] SEA-GS-11-DUO	Screw terminals, for two cables	–	–
		[2] SEA-5GS-11-DUO	Screw terminals, for two cables	–	–
		[3] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin	–	–
			Socket, M12, 5-pin	–	–
			Open cable end	–	–
		[4] NEDY-... (modular system for all types of sensor/ actuator distributor)	2x socket, M8, 3-pin	–	–
			2x socket, M8, 4-pin	–	–
			2x socket, M12, 5-pin	–	–
			2x socket, type A	–	–
			2x socket, type B	–	–
			2x socket, type C	–	–
			2x socket, plug pattern H	–	–
			2x socket, plug pattern ZB	–	–
			2x socket, plug pattern ZC	–	–
			2x open cable end	–	–
		[5] NEDY-L2R1-V1-M8G3-N-M12G4 (T-adapter)	Plug M12, 4-pin to 2x socket, M8, 3-pin	[6] SEA-GS-M8	Solder lugs
				[6] SEA-3GS-M8-S	Screw terminals
				[7] NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M8, 3-pin
					Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end
		[5] NEDY-L2R1-V1-M12G5-N-M12G4 (T-adapter)	Plug M12, 4-pin to 2x socket M12, 5-pin	[6] SEA-GS-7	Screw terminals
				[6] SEA-4GS-7-2.5	Screw terminals
				[6] SEA-GS-9	Screw terminals
				[6] SEA-M12-5GS-PG7	Screw terminals
				[6] SEA-GS-11-DUO	Screw terminals, for two cables
				[6] SEA-5GS-11-DUO	Screw terminals, for two cables
				[7] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end

Key features – Electrical components

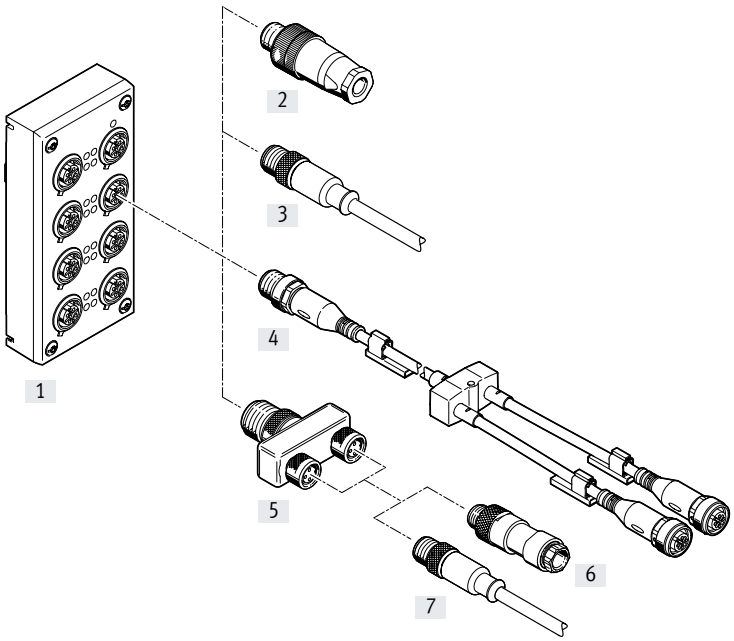
Electrical connection – Connection block (metal design)

CPX-M-AB-4-M12X2-5POL and CPX-M-AB-4-M12X2-5POL-T with connection socket M12, 5-pin



- Suitable for self-assembly and sturdy with 2 channels per connection
- 4 sockets
- 5-pin design per connection
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter and conventional cables with M8 connection.

CPX-M-AB-8-M12X2-5POL and CPX-AB-8-M12X2-5POL with connection socket M12, 5-pin



- Suitable for self-assembly and sturdy with 2 channels per connection
- 8 sockets
- 5-pin design per socket
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter and conventional connecting cables with M8 connection.

Note

Max. 4 T-adapters (NEDY) can be mounted on a connection block.

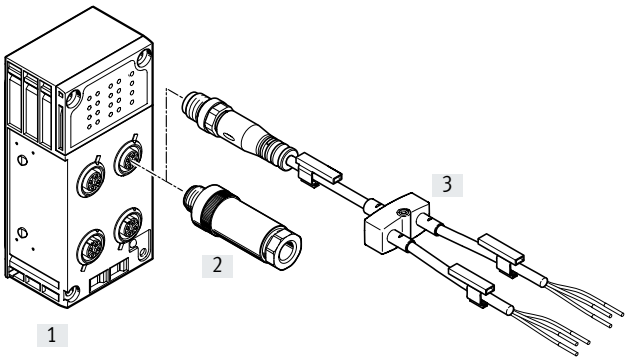
Key features – Electrical components

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-M-AB-4-M12X2-5POL CPX-M-AB-4-M12X2-5POL-T CPX-M-AB-8-M12X2-5POL CPX-AB-8-M12X2-5POL	Socket, M12, 5-pin	[2] SEA-GS-7	Screw terminals	–	–
		[2] SEA-4GS-7-2.5	Screw terminals	–	–
		[2] SEA-GS-9	Screw terminals	–	–
		[2] SEA-M12-5GS-PG7	Screw terminals	–	–
		[2] SEA-GS-11-DUO	Screw terminals, for two cables	–	–
		[2] SEA-5GS-11-DUO	Screw terminals, for two cables	–	–
		[3] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin	–	–
			Socket, M12, 5-pin	–	–
			Open cable end	–	–
		[4] NEDY-... (modular system for all types of sensor/ actuator distributor)	2x socket, M8, 3-pin	–	–
			2x socket, M8, 4-pin	–	–
			2x socket, M12, 5-pin	–	–
			2x socket, type A	–	–
			2x socket, type B	–	–
			2x socket, type C	–	–
			2x socket, plug pattern H	–	–
			2x socket, plug pattern ZB	–	–
			2x socket, plug pattern ZC	–	–
			2x open cable end	–	–
		[5] NEDY-L2R1-V1-M8G3-N-M12G4 (T-adapter)	Plug M12, 4-pin to 2x socket, M8, 3-pin	[6] SEA-GS-M8	Solder lugs
				[6] SEA-3GS-M8-S	Screw terminals
				[7] NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M8, 3-pin
					Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end
		[5] NEDY-L2R1-V1-M12G5-N-M12G4 (T-adapter)	Plug M12, 4-pin to 2x socket M12, 5-pin	[6] SEA-GS-7	Screw terminals
				[6] SEA-4GS-7-2.5	Screw terminals
				[6] SEA-GS-9	Screw terminals
				[6] SEA-M12-5GS-PG7	Screw terminals
				[6] SEA-GS-11-DUO	Screw terminals, for two cables
				[6] SEA-5GS-11-DUO	Screw terminals, for two cables
				[7] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end

Key features – Electrical components

Electrical connection – Connection block with M12, 4-pin connection
CPX-P-AB-4XM12-4POL

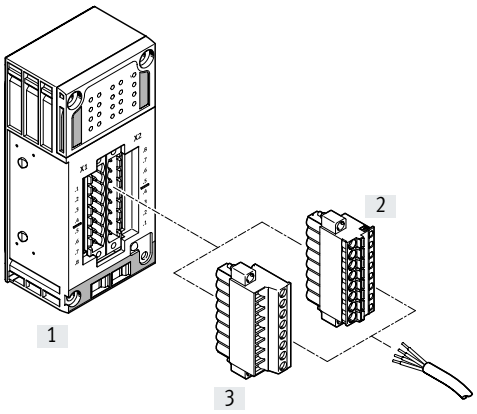


- Suitable for self-assembly and sturdy
- 4 sockets
- 4-pin design per connection

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-P-AB-4XM12-4POL	Socket, M12, 4-pin	[2] SEA-GS-HAR-4POL	Insulation displacement connector
		[2] SEA-4GS-7-2.5	Screw terminal
		[2] SEA-GS-7	Screw terminal
		[2] SEA-GS-9	Screw terminal
		[3] NEDY-... (modular system for all types of sensor/actuator distributor)	2x open cable end

Electrical connection – Connection block with clamping connector
CPX-P-AB-2XKL-8POL



- Quick connection technology for use in control cabinets
- Spring-loaded terminals or screw terminals
- Wire cross sections 0.2 ... 2.5 mm^2

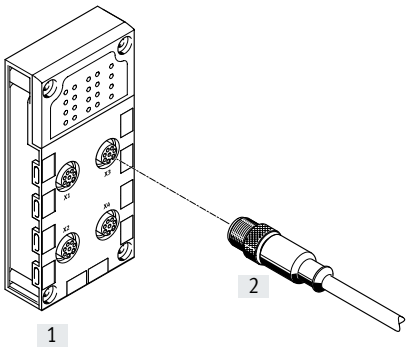
Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-P-AB-2XKL-8POL	Plug, 8-pin	[2] NECU-L3G8-C1	Spring-loaded terminals
		[3] NECU-L3G8-C2	Screw terminals

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-4-M12-8POL with connection socket M12, 8-pin

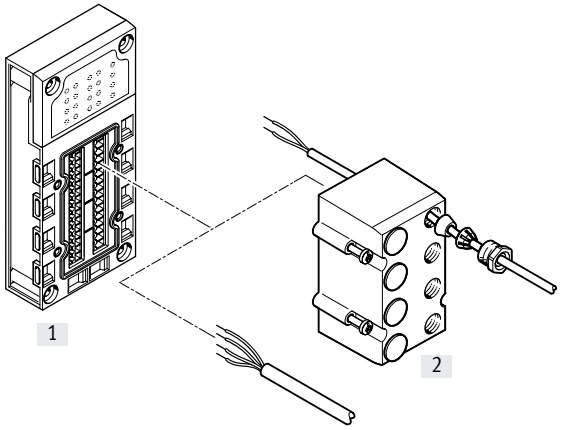


- Connection to cylinder/valve combinations with max. 3 inputs and 2 outputs
- 4 sockets
- 8-pin design per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-4-M12-8POL	Socket, M12, 8-pin	[2] KM12-8GD8GS-2-PU (pre-assembled connecting cable)	Socket, M12, 8-pin

CPX-AB-8-KL-4POL, CPX-2ZE2DA with spring-loaded terminal connection



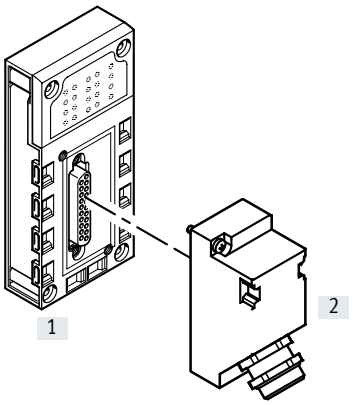
- Quick connection technology for use in control cabinets
- 32 spring-loaded terminals
- 4 spring-loaded terminals per channel
- Wire cross-sections 0.05 ... 1.5 mm^2
- Optional cover with fittings for IP65, IP67 connection
  - 8 through-holes M9
  - 1 through-hole M16
  - Blanking plug
  - For I/O distributors, control desks or individual sensors/actuators

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-8-KL-4POL CPX-2ZE2DA	Spring-loaded terminals, 32-pin	[2] AK-8KL (cover)	–

Key features – Electrical components

Electrical connection – Connection block
CPX-AB-1-SUB-BU-25POL with Sub-D connection, 25-pin



- Multi-pin connection for I/O distributor or control desk
- One socket
- 25-pin design

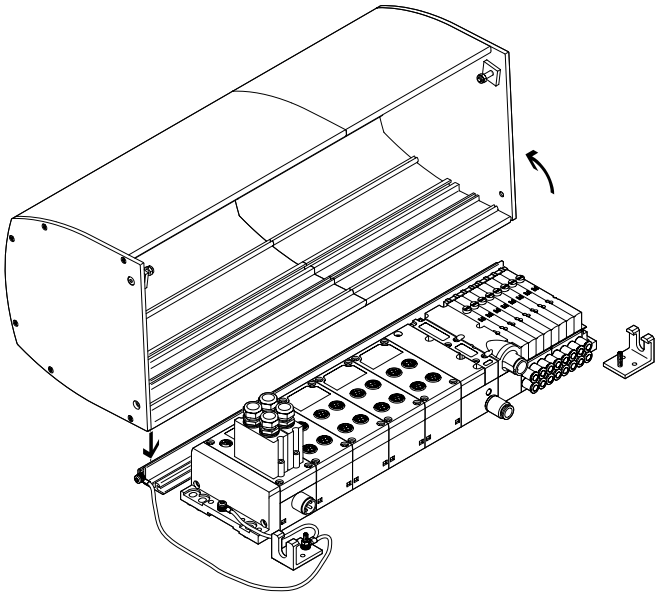
Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-1-SUB-BU-25POL	Sub-D socket, 25-pin	[2] SD-SUB-D-ST25	Crimp contacts

Key features – Mounting

Hood

Description → Page 248



The CPX hood CAFC is a space- and cost-saving alternative to a control cabinet.
It is designed as an extruded aluminium profile and is installed on a mounting plate.
The valve terminal (CPX with MPA-S or MPA-L) is well protected and is quick to install without the need for complex cabinet through feed for connecting cables and tubing.

The rail and the two mounting brackets are mounted on a base plate. The hood is attached to the retaining rail and secured with two screws. There is also a stand-by position (latching of the hood in the open position).
The hood is locked using two side screws (which meet the requirements for a special lock in compliance with ATEX).
The CPX hood can be ordered online using the valve terminal configurator.

Advantages of the CPX hood

- Impact protection (min. 7 J) for the modules underneath in combination with a suitable mounting plate provided by the user
- Protection against electrostatic discharge by using electrically conductive materials and the option of connecting an earth wire
- Protection against disconnection of live plugs (by securing the hood with at least one special fastener to EN 60079-0, 9.2 and 20)
- UV protection for the CPX and MPA modules underneath

Points to note when using the CPX hood

- Only in combination with valve terminal MPA-S and MPA-L
- No bus nodes with push-pull connection (CPX-M-FB45)
- CPX power supply via angled plugs, no T plugs, no push-pull
- Electrical supply plate/additional supply only possible with angled plug
- No MPA vertical stacking
- Use of larger fittings (for tubing O.D. 12 mm and larger) only possible with the angled design
- Ducted exhaust air only with elbow connector
- The permissible ambient temperature range of the valve terminal is reduced by 5°C.

Note

The CPX hood has no influence on the ATEX classification of the valve terminal or of the CPX terminal.

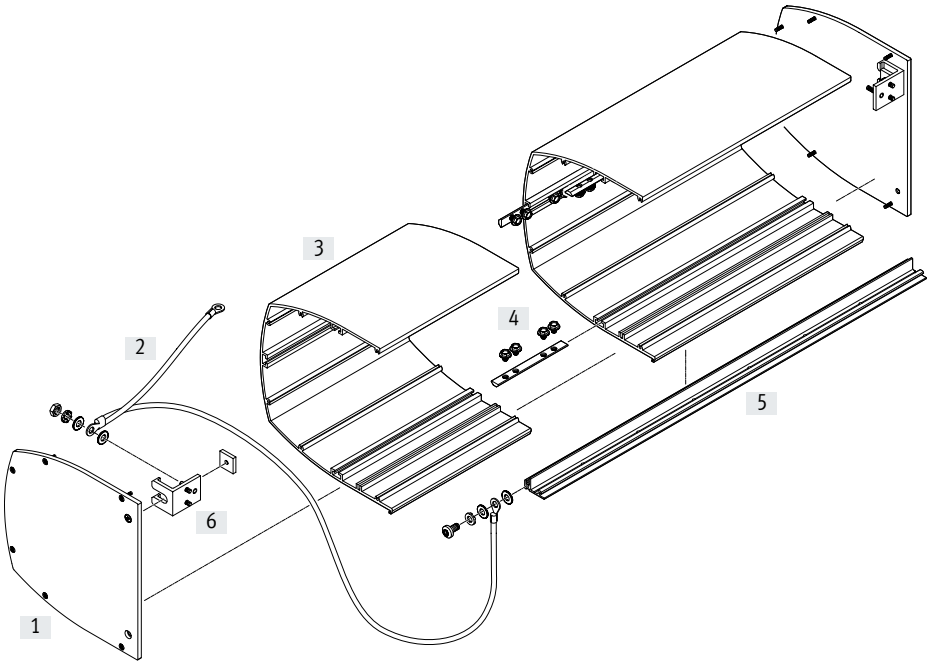
The CPX hood has no influence on the IP degree of protection of the valve terminal or of the CPX terminal.

The CPX hood does not protect against the effects of the weather in installations that are not in enclosed spaces.

Key features – Mounting

Hood

Mounting



Procedure:
- Assemble the rail and mounting bracket included in the mounting kit
- Attach the earthing cable
- Assemble the hood (if applicable, screw together several hood sections and attach the side covers)
- Attach and secure the hood

[1] Side cover
[2] Earthing cable
[3] Hood section
[4] Slot nut with screws, for joining the hood sections
[5] Rail
[6] Mounting bracket

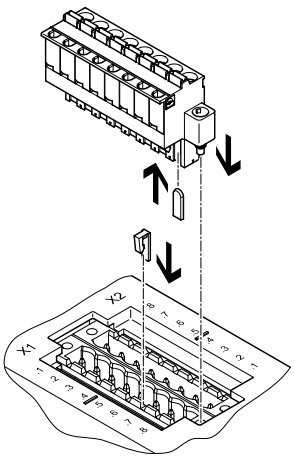
Technical data

Weight:
- Hood: approx. 500 g per 100 mm of length
- Mounting rail: approx. 550 g per 1000 mm of length
- Side pieces: approx. 500 g per side

- Ambient temperature –5 ... +50°C

- RoHS-compliant

Plug coding



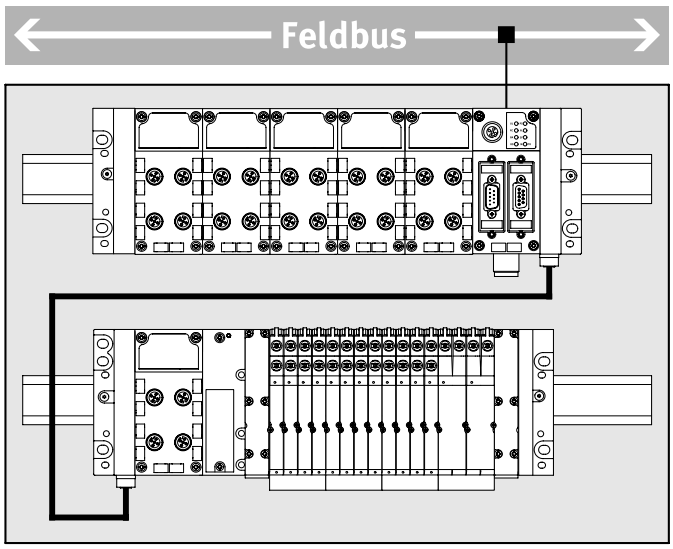
The connection block CPX-P-AB-2XKL-8POL and the sockets NECU-L3G8 can be matched to one another using the coding elements CPX-P-KDS-AB-2XKL.

This reduces the possibility of the socket being plugged back into an incorrect slot after being disconnected from the CPX terminal (connection safeguard).

Key features – Mounting

Extension

Functional principle



The extension enables the CPX terminal to be separated into or configured as two interconnected units (series). The two parts are controlled by a common bus node or control block.
A comprehensive CPX terminal can fit into limited installation spaces more easily as two more compact units.

Applications:
- Installation in a control cabinet on two levels, one beneath the other
- Installation in two separate control cabinets
- Installation of part of the CPX terminal inside and part outside the control cabinet
- Spatial separation of electrics and pneumatics

Performance limits

- A maximum of 10 CPX modules can be installed in the first row
- A maximum of 8 CPX modules and a pneumatic interface can be installed in the second row

The number of CPX modules and solenoid coils is also limited by:
- the address space made available by the control block/bus node
- their address requirement
- their current consumption

Optimisation

The maximum possible performance or maximum number of modules can only be achieved if the following conditions are observed:
- The control block/bus node is installed in the first row, on the far right, on an interlinking block with system supply
- The connecting cable between the first and second row is max. 2 m long
- An interlinking block with additional supply for valves is situated in the second row

Configuration rules

The extension limits the power supply for the sensors and electronics for the CPX terminal as a whole as follows:
- First row max. 6 A
- Second row max. 2 A
- First and second row together, max. 6 A

If the 3 m connecting cable is used, the following restrictions apply:
- There can only be one CPX module in the second row
- An additional supply for valves is required in order to connect a valve terminal

When positioning output modules in the second row, a corresponding power supply in the second row is required:
- Install an interlinking block with additional supply for outputs in the second row to the left of the first output module

Key features – Mounting

Extension – Permissible CPX modules

	Type	First row	Second row
Control blocks	CPX-CEC	Permissible, at least one control block or bus node required	Not permissible
Bus node	CPX-FB CPX-M-FB	Permissible, at least one control block or bus node required	Not permissible
Gateway	CPX-IOT	Not permissible	Not permissible
Technology modules	CPX-CP CPX-CTEL CPX-CTEL-2 CPX-CM-HPP CPX-CMAX CPX-CMPX CPX-CMIX	Permissible	Not permissible
Input/output modules	CPX	Permissible	Permissible
PROFIsafe shut-off module	CPX-FVDA-P2	Not permissible	Not permissible
Interlinking block/end plate with system supply	CPX-EPL-EV-S CPX-GE-EV-S CPX-M-GE-EV-S	Permissible, at least one interlinking block/end plate with system supply required	Not permissible
Interlinking block with additional supply	CPX-GE-EV-Z CPX-M-GE-EV-Z CPX-GE-EV-V	Permissible	Permissible
Interlinking block without power supply	CPX-GE-EV CPX-M-GE-EV	Permissible	Permissible
Interlinking block with system forwarding	CPX-M-GE-EV-W	Not permissible	Not permissible
Pneumatic interface	VMPA-FB	Not permissible	Permissible
	VMPAL-EPL-CPX	Not permissible	Permissible
	VABA-S6-1	Not permissible	Permissible
	VABA-S6-1...CB	Not permissible	Not permissible

Key features – Mounting

Extension – Maximum number of CPX modules/solenoid coils		
Special features of the design	First row	Second row
CPX terminal with valve terminal		
Connecting cable 3 m	10 CPX modules	Valve terminal MPA-S with: • Pneumatic interface for CPX metal interlinking module • Electrical supply plate VMPA-FB-SP directly after the pneumatic interface • Electronics modules with galvanic isolation • 128 solenoid coils (64 valve positions)
		Valve terminal VTSA/VTSA-F with: • 1 CPX module with interlinking block with additional supply for valves • 32 solenoid coils (32 valve positions)
CPX terminal without valve terminal		
• Control block/bus node not in position on the far right of the first row	10 CPX modules	• 2 ... 5 CPX modules, depending on the control block/bus node used
• Control block/bus node in position on the far right of the first row	10 CPX modules	• 4 ... 8 CPX modules, depending on the control block/bus node used
CPX terminal with valve terminal MPA-S		
–	10 CPX modules	• 2 ... 5 CPX modules and connection blocks MPA-S, depending on the control block/bus node used
• Electrical supply plates VMPA-FB-SP • Electronics modules with galvanic isolation	10 CPX modules	• 2 ... 5 CPX modules, depending on the control block/bus node used • Up to 128 solenoid coils (64 valve positions)
• Control block/bus node in position on the far right of the first row • CPX-FB11 or CPX-CEC not possible	10 CPX modules	• 4 ... 5 CPX modules and connection blocks MPA-S, depending on the control block/bus node used
• CPX-FB13 or CPX-FB36 • Control block/bus node in position on the far right of the first row • Interlinking block with system supply in position on the far right of the first row	10 CPX modules	• 8 CPX modules and connection blocks MPA-S
• CPX-FB13 or CPX-FB36 • Control block/bus node in position on the far right of the first row • Interlinking block with additional supply for valves in position on the far right of the first row	10 CPX modules	• 8 CPX modules and connection blocks MPA-S
• CPX-FB13 or CPX-FB36 • Control block/bus node in position on the far right of the first row • Interlinking block with additional supply for valves in second row	10 CPX modules	• 8 CPX modules and connection blocks MPA-S

Key features – Mounting

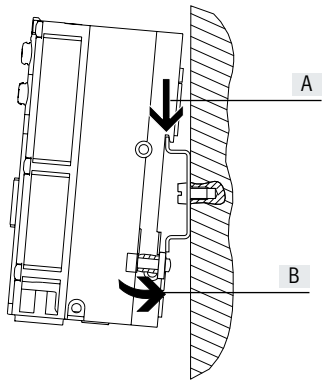
Extension – Maximum number of CPX modules/solenoid coils Special features of the design	First row	Second row
CPX terminal with valve terminal MPA-L		
–	10 CPX modules	• 2 CPX modules (at least one CPX module required) • 16 solenoid coils (valve widths 10 mm and 14 mm) or 8 solenoid coils (valve width 20 mm)
• Interlinking block with additional supply for valves in second row	10 CPX modules	• 2 CPX modules (at least one CPX module required) • 32 solenoid coils (32 valve positions)
CPX terminal with valve terminal VTSA/VTSA-F		
–	10 CPX modules	• 2 CPX modules • 12 solenoid coils (valve widths 18 mm, 26 mm and 42 mm) or 6 solenoid coils (valve widths 52 mm and 65 mm)
• Interlinking block with additional supply for valves in second row	10 CPX modules	• 2 CPX modules • 32 solenoid coils (32 valve positions)

Key features – Mounting

Mounting options

Valve terminals with CPX terminal support different mounting options for direct machine mounting with a high degree of protection and control cabinet installation.

H-rail mounting

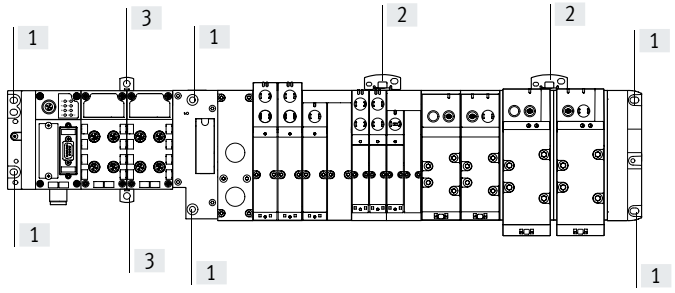


The H-rail mounting is part of the rear profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting kit. The CPX terminal is first hooked onto the H-rail (see arrow [A]), then swivelled onto the H-rail and secured in place with the clamping element (see arrow [B]).
The optional earthing plate enables a connection to be established to the machine potential/earth in one easy step.

The following mounting kit is needed for H-rail mounting:
- CPX-CPA-BG-NRH

This facilitates mounting of the CPX terminal on H-rails to EN 60715.
An additional mounting kit may be required for combination with valve terminals.

Wall mounting



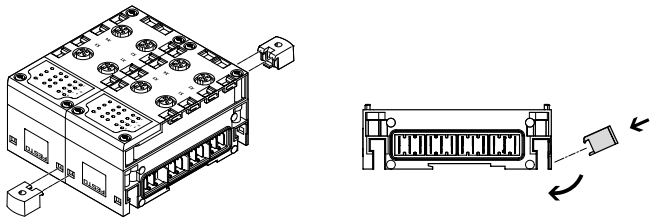
The end plates of the CPX terminal, the valve terminal and the pneumatic interface include mounting holes [1] for wall mounting. Additional mountings [2] for the CPX terminal are available for longer valve terminals.
These mountings differ depending on the design of the CPX terminal (plastic or metal).

In the case of 4 and more interlinking blocks, additional wall mountings must be used every 100 ...150 mm:
- Type CPX-M-BG-RW (metal design). These wall mountings are screwed in at the top on the CPX module.
- Type CPX-BG-RW (plastic design). These wall mountings are hooked in at the top and bottom between the CPX modules.

Key features – Mounting

CPX terminal in plastic design

Additional mountings

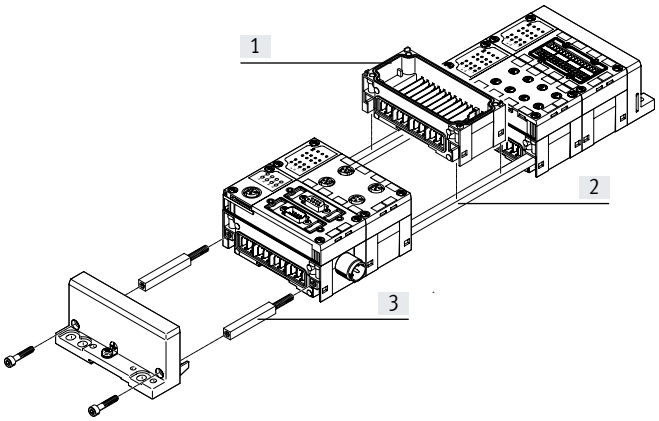


For longer valve terminals, there are additional mounting components for the CPX terminal that can be fitted between two modules.

Note

For CPX terminals with 4 or more interlinking blocks,
you need additional mounting components of type CPX-BG-RW every 100 or 150 mm. These are supplied pre-assembled.

Interlinking with tie rods

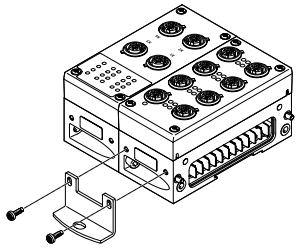


The mechanical connection between the CPX modules is created using special tie rods [2]. The entire unit can be assembled using two screws in the end plates.
The tie rod ensures that the unit has a high mechanical load-bearing capacity and is therefore the mechanical "backbone" of the CPX terminal.

The open design allows interlinking blocks [1] to be replaced when already mounted.
With the tie rod extension kit [3] an extra module can be added to the CPX terminal.

CPX terminal in metal design

Additional mountings

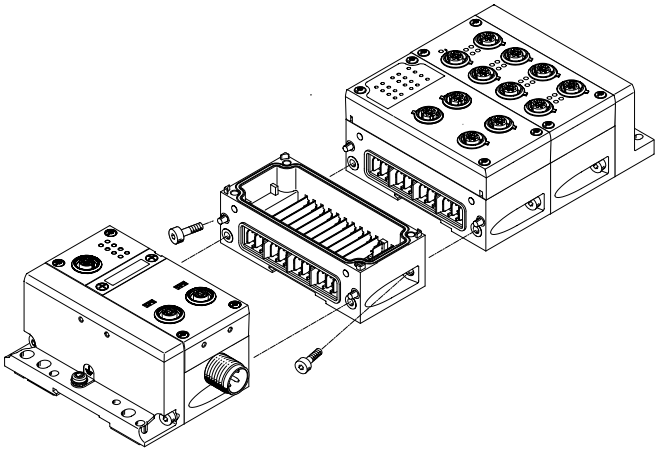


For longer valve terminals, there are additional mounting brackets for the CPX terminal that can be screwed onto the interlinking blocks.
The mounting bracket CPX-M-BG-VT-2X enables a CPX terminal with valve terminal VTSA/VTSA-F/VTSA-F-CB to be mounted on a support system.

Note

In the case of CPX terminals with 4 or more interlinking blocks, additional mounting brackets of the type CPX-M-BG-RW must be used every 100 or 150 mm. These are supplied pre-assembled.

Linking with screws

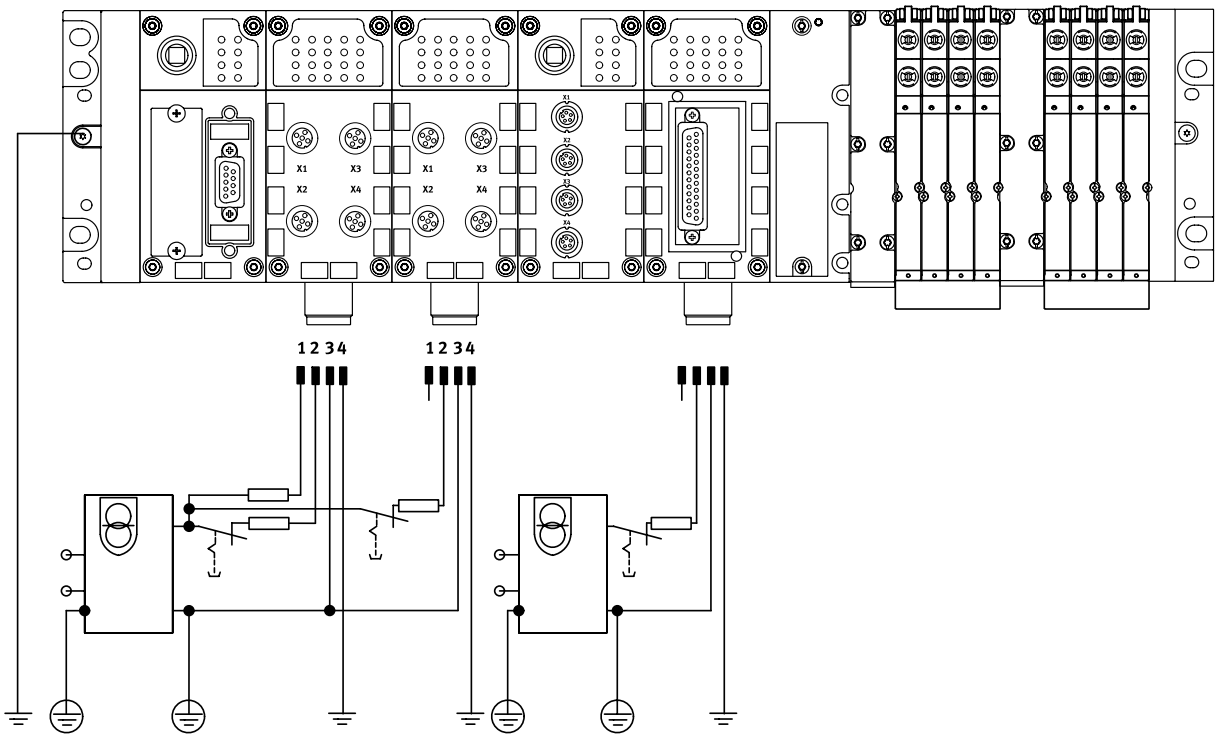


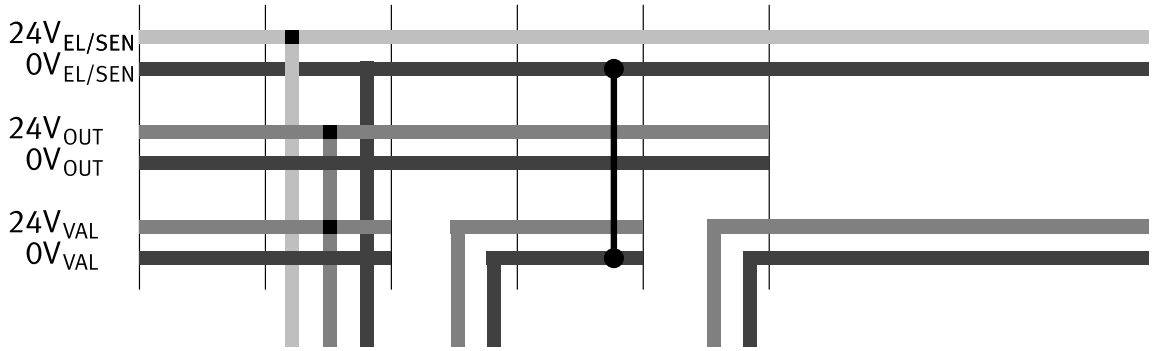
The CPX modules are mechanically connected using an angled fitting.
The CPX terminal can thus be expanded at any time.

Key features – Power supply

Power supply concept

General





The use of decentralised devices on the fieldbus – particularly with a high degree of protection for direct machine mounting – demands a flexible power supply concept.

A valve terminal with CPX is, in principle, supplied with all voltages via a single connection.

A distinction is made between the supply for
- Electronics plus sensors
- Valves plus actuators

in this case.

Selectable connection technology:
- M18
- 7/8“
- M12x1
- AIDA push-pull

Interlinking blocks

Interlinking blocks represent the backbone of the CPX terminal with all supply lines. They provide the power supply for the modules used on them as well as their bus connections.

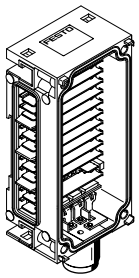
Many applications require the CPX terminal to be separated into voltage zones. This applies in particular to the separate disconnection of solenoid coils and outputs.

The interlinking blocks provide either an easy-to-install central power supply for the entire CPX terminal or galvanically isolated, all-pin disconnectable potential groups/voltage segments.

Key features – Power supply

Interlinking blocks

With system supply



Plastic design
- CPX-GE-EV-S
- CPX-GE-EV-S-7/8-4POL
- CPX-GE-EV-S-7/8-5POL

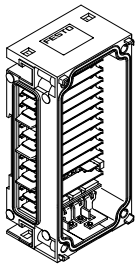
Metal design
- CPX-M-GE-EV-S-7/8-CIP-4P
- CPX-M-GE-EV-S-7/8-5POL
- CPX-M-GE-EV-S-M12-5POL
- CPX-M-GE-EV-S-PP-5POL

Connection technology
- M18, 4-pin
- 7/8" 4-pin
- 7/8" 5-pin

Connection technology
- 7/8" 4-pin
- 7/8" 5-pin
- M12x1, L-coded, 5-pin
- AIDA push-pull, 5-pin

Power supply
- For CPX terminal modules and connected sensors
- For valves that are connected to the CPX terminal via a pneumatic interface
- For actuators that are connected to the output modules of the CPX terminal

Without power supply



Plastic design
- CPX-GE-EV

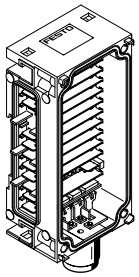
Metal design
- CPX-M-GE-EV
- CPX-M-GE-EV-FVO

–

–

–

With additional supply for outputs



Plastic design
- CPX-GE-EV-Z
- CPX-GE-EV-Z-7/8-4POL
- CPX-GE-EV-Z-7/8-5POL

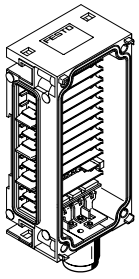
Metal design
- CPX-M-GE-EV-Z-7/8-5POL
- CPX-M-GE-EV-Z-PP-5POL

Connection technology
- M18, 4-pin
- 7/8" 4-pin
- 7/8" 5-pin

Connection technology
- 7/8" 5-pin
- AIDA push-pull, 5-pin

Power supply
- For actuators that are connected to output modules of the CPX terminal

With additional supply for valves



Plastic design
- CPX-GE-EV-V
- CPX-GE-EV-V-7/8-4POL

Connection technology
- M18, 4-pin
- 7/8" 4-pin

Power supply
- For valves that are connected to the CPX terminal via a pneumatic interface

Note

For 7/8":
- Commercially available accessories are often limited to max. 8 A

Note

The valve terminal MPA-S has either a 7/8" 5-pin, 7/8" 4-pin, 3-pin M18 or 5-pin AIDA push-pull power supply for one or more valve voltage zones. Galvanically isolated, all-pin disconnectable with voltage monitoring in the following MPA module.

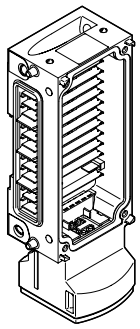
Note

Suitable versions of the interlinking blocks with M18 and 7/8", 5-pin connection are available (CPX-GE-EV-...-VL and CPX-M-GE-EV-...-VL) for use in ATEX environments as per certification (→ page 49). The maximum current supply for these interlinking blocks is 8 A.

Key features – Power supply

Interlinking blocks

With system forwarding



Metal design
- CPX-M-GE-EV-W-M12-5POL

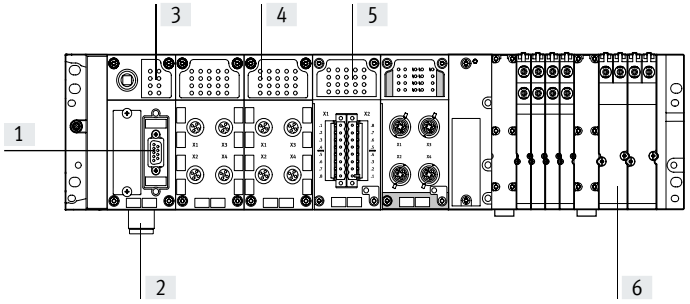
Connection technology
- M12x1, L-coded, 5-pin

Voltage transmission
- For a further CPX terminal

Key features – Diagnostics

Diagnostics

System performance



[1] Diagnostics via bus interface
[2] Undervoltage monitoring
[3] Diagnostic overview LED
- Fieldbus status
- CPX status

[4] Status and diagnostic LED for module and I/O channels
[5] Module and channel-specific diagnostics
[6] Valve-specific diagnostic module and solenoid coils
[7] MPA pressure sensor – integrated solution on the fieldbus
- Pre-assembled for channels 1, 3, 5 and external pressures

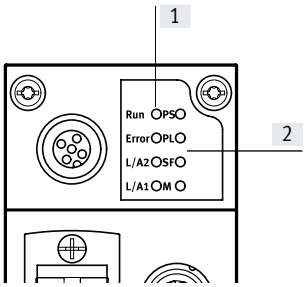
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on-the-spot diagnostics using LEDs or a diagnostic interface and diagnostics using a bus interface.

The CPX terminal supports on-the-spot diagnostics via a row of LEDs. This is separate from the connection area and therefore provides good visual access to status and diagnostic information.

Module and channel-specific diagnostics are supported, for example:
- Undervoltage detection for outputs and valves
- Short circuit detection for sensors, outputs and valves
- Open-load detection for a missing solenoid coil
- Storage of the last 40 causes of errors with error start and error end

The diagnostic messages can be read out via the bus interface in the higher-order controller and visualised for the central recording and evaluation of error causes. This is done using the individual fieldbus-specific channels.
CPX-CECs also offer the option of access via the integrated Ethernet interface (remote maintenance via PC/web applications).

Overview of LEDs on the bus node



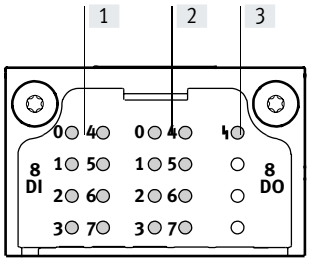
[1] Fieldbus-specific LEDs

On each bus node, a maximum of 4 fieldbus-specific LEDs display the fieldbus communication status of the CPX terminal with the higher-order controller.

[2] CPX-specific LEDs

A further 4 CPX-specific LEDs provide non-fieldbus-specific information about the status of the CPX terminal, for example:
- Power system
- Power load
- System fault
- Modify parameters

Input/output module status and diagnostic LEDs



[1] Status LEDs for the inputs and outputs
Each input and output channel is assigned a status LED.

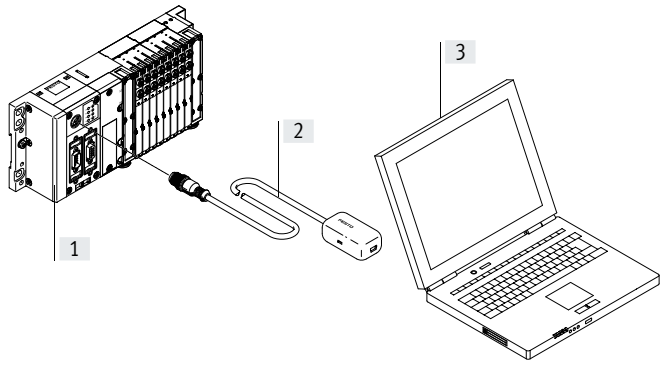
[2] Channel-oriented diagnostic LEDs
Depending on the module design, another diagnostic LED is available for each I/O channel

[3] Group diagnostic LEDs
An LED displays the group diagnostics for each module

Key features – Diagnostics

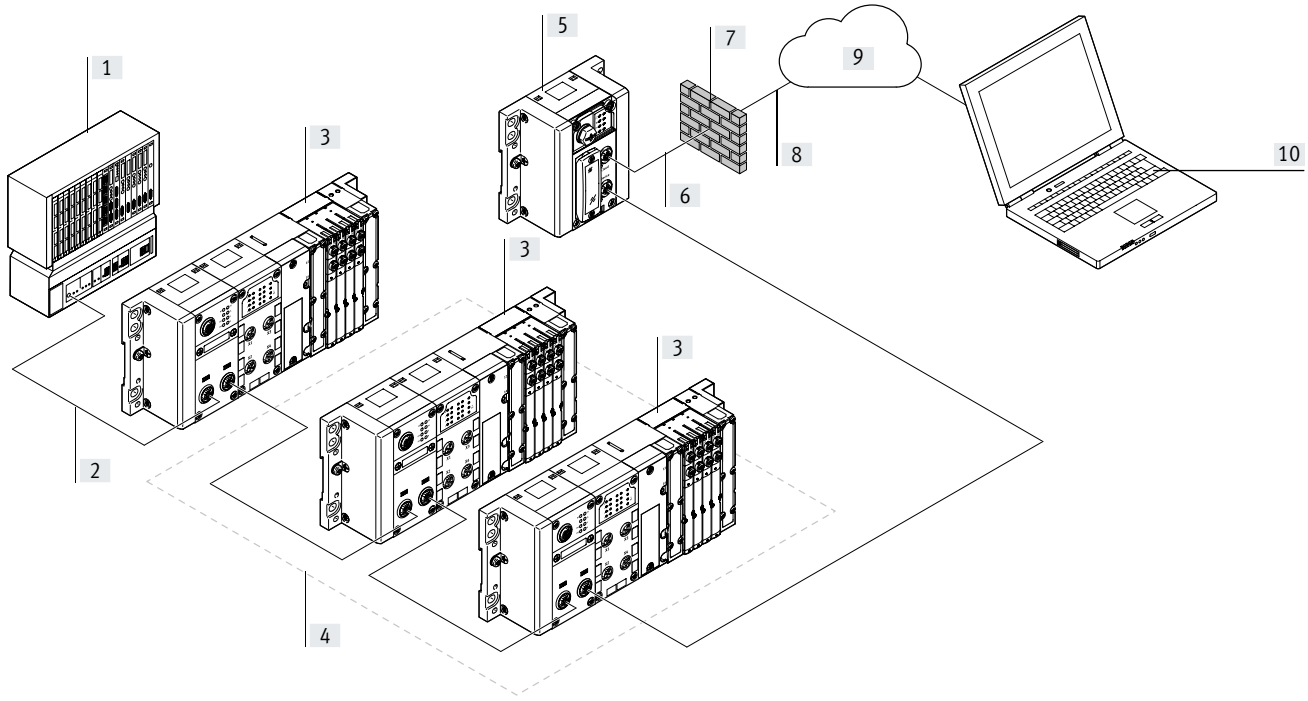
Diagnostics

Display on a PC



[1] CPX terminal with valve terminal
[2] Adapter diagnostic interface to USB
[3] Laptop/portable device with USB interface and installed FMT software
- Fault location and type
- Without programming
- Storing the configuration
- Preparing screenshots

Data gathering via gateway



[1] PLC to machine/system controller (no direct internet connection)
[2] Bus system from the controller to the system parts (e.g. PROFINET)
[3] Festo components with bus connection with serial linking
[4] Components from which the CPX-IOT is collecting and transferring data
[5] Gateway CPX-IOT
[6] Internet connection
[7] Customer firewall or other security precautions
[8] Transferring data to a central storage location (MQTT broker) using secure protocols
[9] Central storage location (user-specific MQTT broker) provided by Festo
[10] Simple decentralised evaluation of data using adapted programs (apps) for the components that are being monitored

Key features – Parameterisation

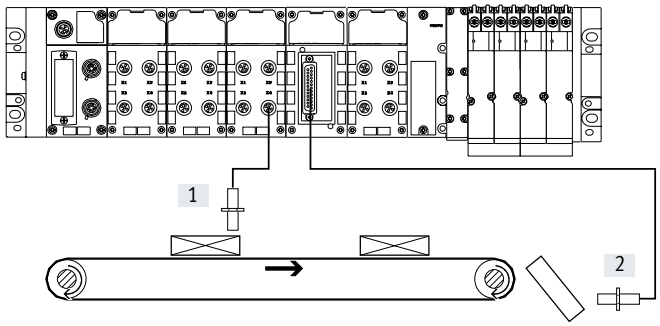
Parameterisation

Changes to the application are often required during commissioning. The parameterisable characteristics of the CPX modules mean that functions can be very easily changed using configuration software. This reduces the number of modules needed and, consequently, the amount of storage space required.

It is therefore possible, for example, to reduce the input debounce time for an input module – normally 3 ms – to 0.1 ms on a "fast" input module for faster processes, or to set the response of a valve following a fieldbus interruption.

Depending on the modules used, parameterisation can be carried out via the following interfaces:

- Ethernet
- Fieldbus
- Control block direct interface (programming interface)



[1] Input debounce time 3 ms
[2] Input debounce time 0.1 ms

Key features – Addressing

Addressing

The various CPX modules occupy a different number of I/O addresses within the CPX system. The maximum address space for bus nodes depends on the performance of the fieldbus systems.

Maximum system configuration:
- 1 bus node or control block
- 9 I/O modules
- 1 pneumatic interface (e.g. pneumatic interface MPA-S with up to 16 MPA connection blocks)

The maximum system configuration can be limited in individual cases by exceeding the address space.

Note

Please refer to the detailed description of the configuration/addressing rules in the technical data for CPX bus nodes.

Overview – Address space for CPX bus node and control block

	Protocol	Max. total		Max. digital		Max. analogue	
		Inputs	Outputs	Inputs	Outputs	Inputs	Outputs
CPX-CEC	• CODESYS Level 2 • TCP/IP • Easy IP • Modbus TCP	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB11	DeviceNet	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB13	PROFIBUS	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB14	CANopen	256 bits	256 bits	64 DI (+ 64 DI)	64 DO (+ 64 DO)	8 AI (+ 8 AI)	8 AO (+ 8 AO)
CPX-FB23-24	CC-Link	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB36	EtherNet/IP	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB37	EtherCAT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB39	Sercos III	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB40	POWERLINK	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB43	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB44	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB45	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO

Note

The bandwidth of the bus nodes can be restricted by the choice of module and the maximum number of modules.

Example – CPX-FB43 (PROFINET RT)

	Digital inputs	Digital outputs	Remarks
1x CPX-CM-HPP	256	256	• The address space is occupied by 7 CPX I/O modules plus pneumatic interface • No additional modules can be configured
2x CPX-2ZE2DA	192	192	
4x CPX-16DE	64	–	
8x VMPA1	–	64	
Allocated address space	512	512	

DI = Digital inputs (1 bit) DO = Digital outputs (1 bit) AO = Analogue outputs (16 bits) AI = Analogue inputs (16 bits)

Key features – Addressing

Overview – Allocated addresses for CPX modules

	Inputs [bit]	Outputs [bit]
CPX-CP-4-FB	16, 32, 48, 64, 80, 96, 128[1)]	16, 32, 48, 64, 80, 96, 128[1)]
CPX-CTEL-4-M12-5POL	0, 64, 128, 192, 256[1)]	0, 64, 128, 192, 256[1)]
CPX-CTEL-2-M12-5POL-LK	64, 128, 192, 256[1)]	64, 128, 192, 256[1)]
CPX-CM-HPP	256	256
CPX-CMAX-C1-1	64	64
CPX-CMPX-C-1-H1	48	48
CPX-CMIX-M1-1	48	48
CPX-4DE	4	–
CPX-8DE	8	–
CPX-8DE-D	8	–
CPX-8NDE	8	–
CPX-P-8DE-N	16	8
CPX-P-8DE-N (inputs configured as counter)	80	16
CPX-F8DE-P	48	56
CPX-16DE	16	–
CPX-M-16DE-D	16	–
CPX-L-16DE-16-KL-3POL	16	–
CPX-4DA	–	4
CPX-8DA	–	8
CPX-8DA-H	–	8
CPX-8DE-8DA	8	8
CPX-L-8DE-8DA-16-KL-3POL	8	8
CPX-2ZE2DA	96	96
CPX-4AE-4AA-H	0, 16, 32, 48, 64, 128, 144, 160, 176, 192[1)]	0, 16, 32, 48, 64[1)]
CPX-2AE-U-I	2 x 16	–
CPX-4AE-U-I	4 x 16	–
CPX-4AE-I	4 x 16	–
CPX-4AE-P-B2	4 x 16	–
CPX-4AE-P-D10	4 x 16	–
CPX-4AE-T	4 x 16	–
CPX-4AE-TC	4 x 16	–
CPX-2AA-U-I	–	2 x 16
CPX-FVDA-P2	48	48
VMPA1-FB-EMS-8	–	8
VMPA1-FB-EMG-8	–	8
VMPA2-FB-EMS-4	–	4
VMPA2-FB-EMG-4	–	4
VMPA1-FB-EMS-D2-8	–	8
VMPA1-FB-EMG-D2-8	–	8
VMPA2-FB-EMS-D2-4	–	4
VMPA2-FB-EMG-D2-4	–	4
VMPA-FB-PS-1	16	–
VMPA-FB-PS-3/5	16	–
VMPA-FB-PS-P1	16	–
VMPA-FB-EMG-P1	16	16
VMPAL-EPL-CPX	–	4, 8, 16, 24, 32[1)]
VABA-S6-1-X1	–	8, 16, 24, 32[1)]
VABA-S6-1-X2	–	8, 16, 24, 32[1)]
VABA-S6-1-X2-D	8, 16, 24, 32[1)]	8, 16, 24, 32[1)]
VABA-S6-1-X1-CB	–	8, 16, 24[1)]
VABA-S6-1-X2-CB	–	8, 16, 24[1)]
VABA-S6-1-X2-F1-CB	–	8, 16, 24[1)]
VABA-S6-1-X2-F2-CB	–	8, 16, 24[1)]
VABA-S6-1-X1-3V-CB	–	8, 16, 24[1)]
VABA-S6-1-X2-3V-CB	–	8, 16, 24[1)]

1) Dependent on the DIL switch setting on the module

Data sheet

Module width
50 mm

Note

The data given here apply to the CPX system. If components that conform to lower values are used in the system, the specification for the entire system is reduced to the values for those components.

Example

Degree of protection IP65/IP67 applies only to the fully assembled system with fitted plugs or covers (which must also conform to IP65/IP67).

If components with a lower degree of protection are used, the protection level of the entire system is reduced to the degree of protection of the component with the lowest degree of protection, for example CageClamp connection block with degree of protection IP20 or MPA pneumatics with degree of protection IP65.

General technical data			
Module no.			197330
Max. number of modules[1)]	Control block		1
	Bus node		1
	I/O modules/CP interface/CTEL interface/electrical interface CPX-CTEL-2/multi-axis interface		9
	Pneumatic interface		1
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
Internal cycle time		[ms]	< 1
Configuration support			Fieldbus-specific
LED displays	Bus node/control block/gateway		Up to 4 LEDs, bus-specific 4 LEDs, CPX-specific • PS = Power system • PL = Power load • SF = System fault • M = Modify parameter/forcing active
	I/O modules		Min. one centralised diagnostic LED Channel-oriented status and diagnostic LED, depending on module
	Pneumatic interface		One centralised diagnostic LED Valve status LED on valve
Diagnostics			• Channel and module-oriented diagnostics for inputs/outputs and valves • Detection of module undervoltage for the different potential values • Storage of the last 40 errors with timestamp (acyclic access)

1) A maximum of 11 modules in total can be combined (e.g. 1 control block + 9 I/O modules + 1 pneumatic interface, or 1 control block + 1 bus node + 8 I/O modules + 1 pneumatic interface)

Data sheet

General technical data			
Module no.			197330
Parameterisation			Module-specific and entire system, for example: • Diagnostic behaviour • Condition monitoring • Profile of inputs • Fail-safe response of outputs and valves
Commissioning support			Forcing of inputs and outputs
Degree of protection to EN 60529			IP65, IP67
Nominal operating voltage		[V DC]	24
Operating voltage range		[V DC]	18 ... 30
Power supply	Interlinking block with system supply		
	Electronics plus sensors		
	Actuators plus valves	[A]	16 (8/10 with 7/8" supply, 5-pin/4-pin)
		[A]	16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional supply		
	Actuators	[A]	16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional supply for valves	[A]	16 (10 with 7/8" supply, 4-pin)
Current consumption			Depending on system configuration
Mains buffering (bus electronics only)		[ms]	10
Power supply connection			M18, 4-pin
			7/8" 5-pin
			7/8" 4-pin
			AIDA push-pull, 5-pin
Fuse concept			Per module with electronic fuses
Tests	Vibration test to DIN IEC 68		• With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
	Shock test to DIN IEC 68		• With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
PWIS conformity			VDMA24364-B2-L
Immunity to interference			EN 61000-6-2 (industry)
Emitted interference			EN 61000-6-4 (industry)
Isolation test for galvanically isolated circuits to IEC 1131 Part 2		[V DC]	500
Galvanic isolation of electrical voltages		[V DC]	80
Protection against direct and indirect contact			PELV
Materials			End plates: Die-cast aluminium
Grid dimension		[mm]	50

Operating and environmental conditions		
Module no.		197330
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70

Data sheet

Certifications and approvals – Maximum values		
Module no.		197330
ATEX category gas		II 3G
Type of ignition protection for gas		Ex nA IIC T4 X Gc
Explosion-proof ambient temperature	[°C]	−5 ≤ Ta ≤ +50
CE marking (see declaration of conformity)[2]		To EU Explosion Protection Directive (ATEX)
		To EU EMC Directive[1]
		To EU RoHS Directive
UKCA marking (see declaration of conformity)[2]		To UK EX instructions
		To UK instructions for EMC
		To UK RoHS instructions
KC mark		KC EMC
Degree of protection to EN 60529		IP65, IP67
Certification		c UL us - Recognized (OL)
		RCM
Explosion protection certification outside the EU		EPL Gc (Ru)

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... ➔ Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

2) Additional information at: www.festo.com/catalogue/... ➔ Support/Downloads.

Note

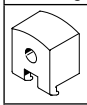
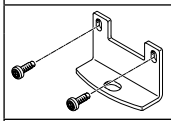
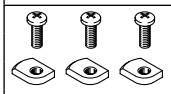
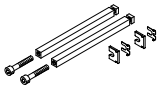
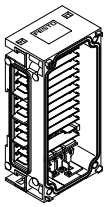
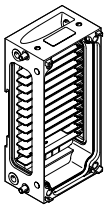
The values indicated represent the maximum performance limits that can be achieved with the fully assembled product. Depending on the individual components used, the value actually achieved for the overall product may be lower.
You can select e.g. the individual components required to achieve the ATEX category by choosing the corresponding features in the online product configurator:
➔ Internet:cpx

Data sheet

Weights [g]						
Control block	CEC	155	CP interface	CP	139
	CEC...V3	135	CTEL interface	CTEL	110
Bus node	–	–	Electrical interface	CTEL-2	110
	FB11	120	Axis interface	CM-HPP	140
	FB13	115	Axis controller	CMAX	140
	FB14	115	End-position controller	CMPX	140
	–	–	Measuring module	CMIX	140
	FB23-24	115	Plastic connection block	8-way, M8 3-pin	62
	–	–		8-way, M8 4-pin	65
	–	–		4-way, M12 5-pin	60
	–	–		4-way, M12 5-pin, quick lock, shielded with metal thread	87
	FB36	125		8-way, M12 5-pin	76
	FB37	125		4-way, M12 8-pin	65
	FB39	125		Spring-loaded terminal, 32-pin	75
	FB40	125		Sub-D 25-pin	72
	FB43	185		8-way, DIL switch	57
	FB44	280			
	FB45	280			
Gateway	IOT	130	Connection block for NAMUR and HART module	4-way, M12 4-pin	120
I/O module	4 digital outputs	42		Clamping connector 8-pin	100
	4 digital inputs	39	Metal connection block	4-way, M12 5-pin	112
	8 digital inputs	39		4-way, M12 5-pin, pulsed sensor supply	110
	8 digital inputs, positive logic (PNP), enhanced diagnostic function	45		8-way, M12 5-pin	152
	8 digital inputs, negative logic (NPN)	40	Plastic interlinking block	Without power supply	108
				System supply	125
	8 digital inputs to NAMUR	100	Interlinking block, metal	Without power supply	169
	16 digital inputs, internal electronic fuse per module	41		System supply, 7/8" 4-pin	228
				System supply, 7/8" 5-pin	187
	16 digital inputs, internal electronic fuse per channel pair, for CPX in metal	46		System supply, M12x1	279
				System supply, push-pull	279
				System forwarding, M12x1	279
	16 digital inputs, for CPX in plastic, including interlinking block and connection block with spring-loaded terminals	167	Tie rods	1-way	41
				2-way	71
				3-way	97
				4-way	127
	8 digital inputs, 8 digital outputs	48		5-way	156
	8 digital inputs, 8 digital outputs, for CPX in plastic, including interlinking block and connection block with spring-loaded terminals	171		6-way	173
				7-way	199
				8-way	247
				9-way	274
	8 digital outputs, power supply 0.5 A per channel	49		10-way	301
			End plate for plastic design	Left-hand	110
	8 digital outputs, power supply 2.1 A per channel pair	48		Left-hand, with system supply	145
				Right-hand	110
	2 analogue current or voltage inputs	48	End plate for metal design	Left-hand	113
				Right-hand	113
	4 analogue current inputs	47	End plate with extension	Left-hand	190
	2 analogue current or voltage outputs	49		Right-hand	175
			Pneumatic interface	MPA-S	238.4
	4 analogue inputs/outputs, HART	77.4		VTSA/VTSA-F	590
	2 or 4 analogue temperature inputs	47		VTSA-F-CB without voltage zones	560
	4 analogue temperature inputs, with 2-wire connection for a PT1000 sensor for cold junction compensation	46		VTSA-F-CB with safe voltage zones	734
				VTSA-F-CB with safe voltage zones and power supply for external consuming devices	754
	4 analogue pressure inputs	115			
PROFIsafe	Shut-off module	50			
	Input module	46		VTSA-F-CB with external power supply	580
Counter module	2ZE2DA	130			

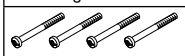
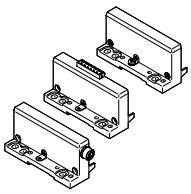
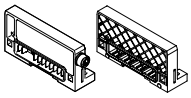
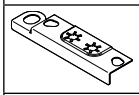
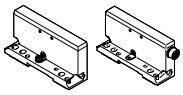
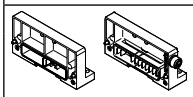
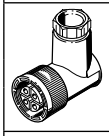
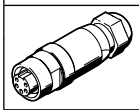
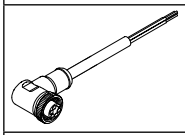
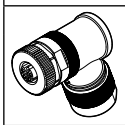
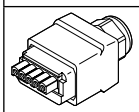
Data sheet

Ordering data – Accessories

Designation			Part no.	Type
Mounting				
	Attachment for wall mounting (for long valve terminals, 10 pieces), design for plastic manifold sub-bases		**529040**	**CPX-BG-RW-10x**
	Attachment for wall mounting, version for metal manifold sub-bases	2 mounting brackets, 4 screws	**550217**	**CPX-M-BG-RW-2X**
		1 mounting bracket, 2 screws	**2721419**	**CPX-M-BG-VT-2X**
	Mounting for H-rail	CPX without pneumatic components	**526032**	**CPX-CPA-BG-NRH**
		CPX-VTSA		
		CPX-VTSA-F		
		CPX-MPA		
Tie rod				
	Tie rod CPX	Extension, 1 module	**525418**	**CPX-ZA-1-E**
		1-module	**195718**	**CPX-ZA-1**
		2-module	**195720**	**CPX-ZA-2**
		3-module	**195722**	**CPX-ZA-3**
		4-module	**195724**	**CPX-ZA-4**
		5-module	**195726**	**CPX-ZA-5**
		6-module	**195728**	**CPX-ZA-6**
		7-module	**195730**	**CPX-ZA-7**
		8-module	**195732**	**CPX-ZA-8**
		9-module	**195734**	**CPX-ZA-9**
		10-module	**195736**	**CPX-ZA-10**
Plastic interlinking block				
	Without power supply	–	**195742**	**CPX-GE-EV**
	With system supply	M18	**195746**	**CPX-GE-EV-S**
		M18, for ATEX environment	**8022170**	**CPX-GE-EV-S-VL**
		7/8" – 4-pin	**541248**	**CPX-GE-EV-S-7/8-4POL**
		7/8" – 5-pin	**541244**	**CPX-GE-EV-S-7/8-5POL**
		7/8" – 5-pin, for ATEX environment	**8022172**	**CPX-GE-EV-S-7/8-5POL-VL**
	With additional supply for outputs	M18	**195744**	**CPX-GE-EV-Z**
		M18, for ATEX environment	**8022166**	**CPX-GE-EV-Z-VL**
		7/8" – 4-pin	**541250**	**CPX-GE-EV-Z-7/8-4POL**
		7/8" – 5-pin	**541246**	**CPX-GE-EV-Z-7/8-5POL**
		7/8" – 5-pin, for ATEX environment	**8022173**	**CPX-GE-EV-Z-7/8-5POL-VL**
	With additional supply for valves	M18	**533577**	**CPX-GE-EV-V**
		M18, for ATEX environment	**8022171**	**CPX-GE-EV-V-VL**
		7/8" – 4-pin	**541252**	**CPX-GE-EV-V-7/8-4POL**
Interlinking block, metal				
	Without power supply	–	**550206**	**CPX-M-GE-EV**
		For CPX-FVDA-P2 only	**567806**	**CPX-M-GE-EV-FVO**
	With system supply	7/8" – 4-pin	**568956**	**CPX-M-GE-EV-S-7/8-CIP-4P**
		7/8" – 5-pin	**550208**	**CPX-M-GE-EV-S-7/8-5POL**
		7/8" – 5-pin, for ATEX environment	**8022165**	**CPX-M-GE-EV-S-7/8-5POL-VL**
		M12x1, L-coded, 5-pin	**8098392**	**CPX-M-GE-EV-S-M12-5POL**
		Push-pull – 5-pin	**563057**	**CPX-M-GE-EV-S-PP-5POL**
	With additional supply for outputs	7/8" – 5-pin	**550210**	**CPX-M-GE-EV-Z-7/8-5POL**
		7/8" – 5-pin, for ATEX environment	**8022158**	**CPX-M-GE-EV-Z-7/8-5POL-VL**
		Push-pull – 5-pin	**563058**	**CPX-M-GE-EV-Z-PP-5POL**
	With system forwarding	M12x1, L-coded, 5-pin	**8098391**	**CPX-M-GE-EV-W-M12-5POL**

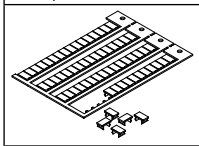
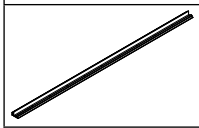
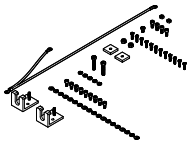
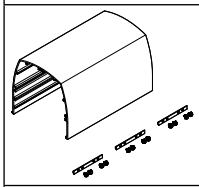
Data sheet

Ordering data – Accessories

Designation			Part no.	Type
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**
End plates for plastic design				
	Left-hand end plate	–	**195716**	**CPX-EPL-EV**
		With system supply	**576315**	**CPX-EPL-EV-S**
		With extension	**576314**	**CPX-EPL-EV-X**
	Right-hand end plate	–	**195714**	**CPX-EPR-EV**
		With extension	**576313**	**CPX-EPR-EV-X**
	Earthing component for right-hand/left-hand end plate	5 pieces	**538892**	**CPX-EPFE-EV**
End plates for metal design				
	Left-hand end plate	–	**550212**	**CPX-M-EPL-EV**
		With extension	**576317**	**CPX-M-EPL-EV-X**
	Right-hand end plate	–	**550214**	**CPX-M-EPR-EV**
		With extension	**576316**	**CPX-M-EPR-EV-X**
Power supply				
	Plug socket for mains connection M18x1, straight, 4-pin	For 1.5 mm²	**18493**	**NTSD-GD-9**
		For 2.5 mm²	**18526**	**NTSD-GD-13.5**
	Plug socket for mains connection M18x1, angled, 4-pin	For 1.5 mm²	**18527**	**NTSD-WD-9**
		For 2.5 mm²	**533119**	**NTSD-WD-11**
	Plug socket for mains connection 7/8", straight, 5-pin	0.25 ... 2.0 mm²	**543107**	**NECU-G78G5-C2**
	Plug socket for mains connection 7/8", straight, 4-pin	0.25 ... 2.0 mm²	**543108**	**NECU-G78G4-C2**
	Plug socket for mains connection 7/8", angled, 5-pin – open cable end, 5-wire	2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
	Power supply socket M12x1, L-coded, straight	5-pin	**8166793**	**NECL-L12G5-C2-Q10**
	Power supply plug M12x1, L-coded, straight	5-pin	**8166791**	**NECL-S-L12G5-C2-Q10**
	Power supply socket M12x1, L-coded, angled	5-pin	**8166794**	**NECL-L12W5-C2-Q10**
	Power supply plug M12x1, L-coded, angled	5-pin	**8166792**	**NECL-S-L12W5-C2-Q10**
	Push-pull power supply socket, plug pattern PP, fulfils requirements to AIDA	5-pin	**5195383**	**NECU-M-PPG5PP-C1-PN**
	Straight plug, spring-loaded terminal, for left-hand end plate with system supply	7-pin	**576319**	**NECU-L3G7-C1**

Data sheet

Ordering data – Accessories

Designation			Part no.	Type
Inscription labels				
	Inscription labels 6x10 mm, 64 pieces, in frame		**18576**	**IBS-6x10**
Hood				
	Mounting rail for attaching the hood	1000 mm	**572256**	**CAFC-X1-S**
	Mounting kit for CPX hood		**572257**	**CAFC-X1-BE**
	Hood section for CPX terminal including mounting attachments for connecting several hood sections in series.	200 mm	**572258**	**CAFC-X1-GAL-200**
		300 mm	**572259**	**CAFC-X1-GAL-300**
User documentation				
	CPX system manual	German	**526445**	**P.BE-CPX-SYS-DE**
		English	**526446**	**P.BE-CPX-SYS-EN**
		Spanish	**526447**	**P.BE-CPX-SYS-ES**
		French	**526448**	**P.BE-CPX-SYS-FR**
		Italian	**526449**	**P.BE-CPX-SYS-IT**

Data sheet

User documentation – General information

Comprehensive user documentation is vital for the fast and reliable use of fieldbus components.
The manuals provided by Festo contain step-by-step instructions for using the CPX terminal:

1. Installation
2. Commissioning and parameterisation
3. Diagnostics

Application-oriented explanations are provided for integrating the CPX terminal in the programming and configuration software of the various controller manufacturers.
Use the order code to select the language you want.
The manuals for the configuration you have ordered are supplied automatically.

The documents can be downloaded quickly and easily from the Festo website ➔ www.festo.com.

Overview – User documentation

Type	Title	Description
Pneumatics		
P.BE-VTSA-44-...	Valve terminals with VTSA and VTSA-F pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the VTSA and VTSA-F pneumatic components.
P.BE-MPA-...	Valve terminals with MPA-S pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MPA-S pneumatic components.
MPAL-VI-...	Valve terminal	Instructions on assembly, installation, commissioning and diagnostics of the MPA-L pneumatic components.

Data sheet

Overview – User documentation

Type	Title	Description
Electronics		
P.BE-CPX-SYS-...	System description, installation and commissioning	Overview of the design, components and mode of operation of the CPX terminal; installation and commissioning instructions as well as basic principles of parameterisation.
CPX-FVDA-P2-...	PROFIsafe shut-off module	Connection technology and assembly, installation and commissioning instructions for the PROFIsafe shut-off module of the type CPX-FVDA-P2.
P.BE-CPX-EA-...	CPX-EA modules, digital	Connection technology and assembly, installation and commissioning instructions for digital input and output modules of type CPX-... as well as the VTSA/VTSA-F and MPA-S/L pneumatic interface.
P.BE-CPX-P-EA-...	Input module CPX-P-8DE-N	Connection technology and assembly, installation and commissioning instructions for the digital input module for NAMUR sensors of type CPX-P-8DE-N.
CPX-F8DE-P-...	Input module CPX-F8DE-N	Connection technology and assembly, installation and commissioning instructions for the PROFIsafe input module of type CPX-F8DE-P.
P.BE-CPX-2ZE2DA-...	I/O-module CPX-2ZE2DA	Connection technology and assembly, installation and commissioning instructions for counter modules of type CPX-2ZE2DA.
P.BE-CPX-AX-...	CPX-EA modules, analogue	Connection technology and assembly, installation and commissioning instructions for analogue input and output modules of type CPX-... as well as pressure sensors and proportional pressure regulators.
P.BE-CPX-CP...	CPX CP interface	Instructions on assembly, installation, commissioning and diagnostics of the CP interface.
P.BE-CPX-CTEL...	CPX CTEL interface	Instructions on assembly, installation, commissioning and diagnostics of the CPX CTEL master.
P.BE-CPX-CTEL-LK...	Electrical interface CPX-CTEL-2	Instructions on assembly, installation, commissioning and diagnostics for the CPX electrical interface for IO-Link.
CPX-CM-HPP...	CPX axis interface	Instructions on assembly, installation, commissioning and diagnostics of the CPX axis interface (CM-HPP).
P.BE-CPX-CMAX-SYS...	CPX axis controller	Instructions on assembly, installation, commissioning and diagnostics of the CPX axis controller (CMAX).
P.BE-CPX-CMAX-CONTROL...	CPX axis controller	Information on control, diagnostics and parameterisation of the axis controller via the fieldbus.
P.BE-CPX-CMPX-SYS...	CPX end-position controller	Instructions on assembly, installation, commissioning and diagnostics of the CPX end-position controller (CMPX).
P.BE-CPX-CMIX...	CPX measuring module	Instructions on assembly, installation, commissioning and diagnostics of the CPX measuring module (CMIX).
P.BE-CPX-FB... CPX-...	CPX bus node	Instructions on assembly, installation, commissioning and diagnostics of the relevant bus node.
CPX-(M)-FB33_35/43_45...	CPX bus node for PROFINET	Instructions on assembly, installation, commissioning and diagnostics of the relevant bus node.
P.BE-CPX-CEC...	CPX CODESYS controller (control block)	Instructions on assembly, installation, commissioning and diagnostics of the relevant control block.

User documentation – GSD, EDS, ...

Device description files and icons are used to explain the integration of the CPX terminal in the configuration software of the various controller manufacturers.

These can be downloaded quickly and easily from www.festo.com.

Data sheet – CPX Maintenance Tool

Function
The CPX Maintenance Tool (CPX-FMT) combines service software with a connecting adapter. The service software is a tool for the design, parameterisation and online diagnostics of the CPX terminal.
The USB-to-M12 adapter features built-in galvanic isolation (between CPX and PC) and enables a PC to be connected to the diagnostic interface of the CPX terminal.

- Adapters
- Software on CD-ROM

Application
Only from Festo

The CPX-FMT software enables access to CPX valve terminals via Ethernet with the bus nodes EtherNet/IP (FB 36), Sercos III (FB 39) and PROFINET (FB 33, FB 34, FB 35, FB 41, FB 45). The bus nodes or control blocks can be connected directly to a PC via a USB adapter from Festo. Diagnostic data such as the error trace or module diagnostics can be read out and parameters can be modified in plain text.

The data can be used directly on a PC. There is an option, for example, to send screenshots of a configuration or the current error trace directly via e-mail. In addition, CPX configurations can also be saved and archived directly as a CPX-FMT project. Undocumented changes can subsequently be identified using the online/offline comparison function.

On-site tests such as the actuation of valves or the emulation of sensor feedback (in both cases called "forcing"), for example, can be carried out without an existing controller infrastructure.

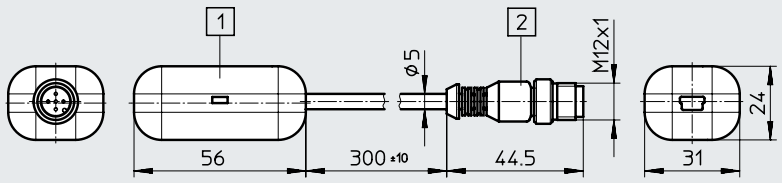
It must be noted that with the CPX-FMT, only local parameters on the CPX valve terminal can be changed and saved. The configuration of the networks or controller software cannot be influenced.

General technical data			
Type			NEFC-M12G5-0.3-U1G5
System requirements	PC		IBM-compatible
	Drive		CD-ROM
	Interfaces		USB port (specification USB 1.1 or higher)
	Operating system		Microsoft Windows 2000 or XP
Function range			• Configuration and parameterisation • Reading out of system, module, channel diagnostics and error trace • Saving of the configuration as a project • Integration of plug-ins/links to self-executing programs
Scope of delivery			• Adapter, M12, 5-pin to mini USB socket • CD-ROM with installation program
Type of mounting			Screw-in
Electrical connection			Plug M12x1, 5-pin
Adapter cable composition			4 x 0.34 mm^2
Cable length		[m]	0.3
Degree of protection to EN 60529			IP20
CE marking (see declaration of conformity)[1)]			To EU RoHS Directive
UKCA marking (see declaration of conformity)[1)]			To UK RoHS instructions
Ambient temperature		[°C]	–5 ... +50
Material	Housing		ABS
	Cable sheath		PUR
	Pin contact		Gold-plated brass
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L

1) Additional information: www.festo.com/catalogue/... → Support/Downloads.

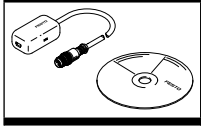
Data sheet – CPX Maintenance Tool

Dimensions Download CAD data ➔ www.festo.com



[1] Mini B 5P USB port
[2] Plug M12x1, 5-pin

Ordering data

Designation		Part no.	Type
	CPX Maintenance Tool (CPX-FMT), software and USB-to-M12 adapter	**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – CPX-IOT gateway

- Industrial Ethernet
- TCP/IP
- OPC UA
- Web interface

Gateway for continuous transfer of operating data from connected Festo components to a central storage location (MQTT broker).
Comprehensive status information for the gateway is displayed using 7 specific LEDs.

The gateway can only be used as a combination with end plates and an interlinking block; no additional CPX modules are possible.

Application

Data collection

The CPX-IOT gateway gathers information and transfers it to a central storage location (user-specific MQTT broker).
The transfer takes place using secure protocols. The customer can only connect to the internet via a firewall.
The extent of the data gathered and transferred is determined by the evaluation software (app).

Advantages:
- The central controller of the machine or system does not require an internet connection
- Operating data are available outside the system

Prerequisites
- Connected components must have corresponding evaluation software (app)
- Internet connection
- Components to be monitored have an Industrial Ethernet interface
- MQTT broker

Information that can be evaluated (depending on the software):
- (Energy) consumption monitoring
- Preventive maintenance
- Visualisation of overall equipment effectiveness
- Identification data
- Diagnostic data
- Parameter data
- Operating status data

Interfaces

Onward communication between the gateway and the central storage location (MQTT broker) is via an Industrial Ethernet interface with M12x1 plug, D-coded to IEC 947-5-2.

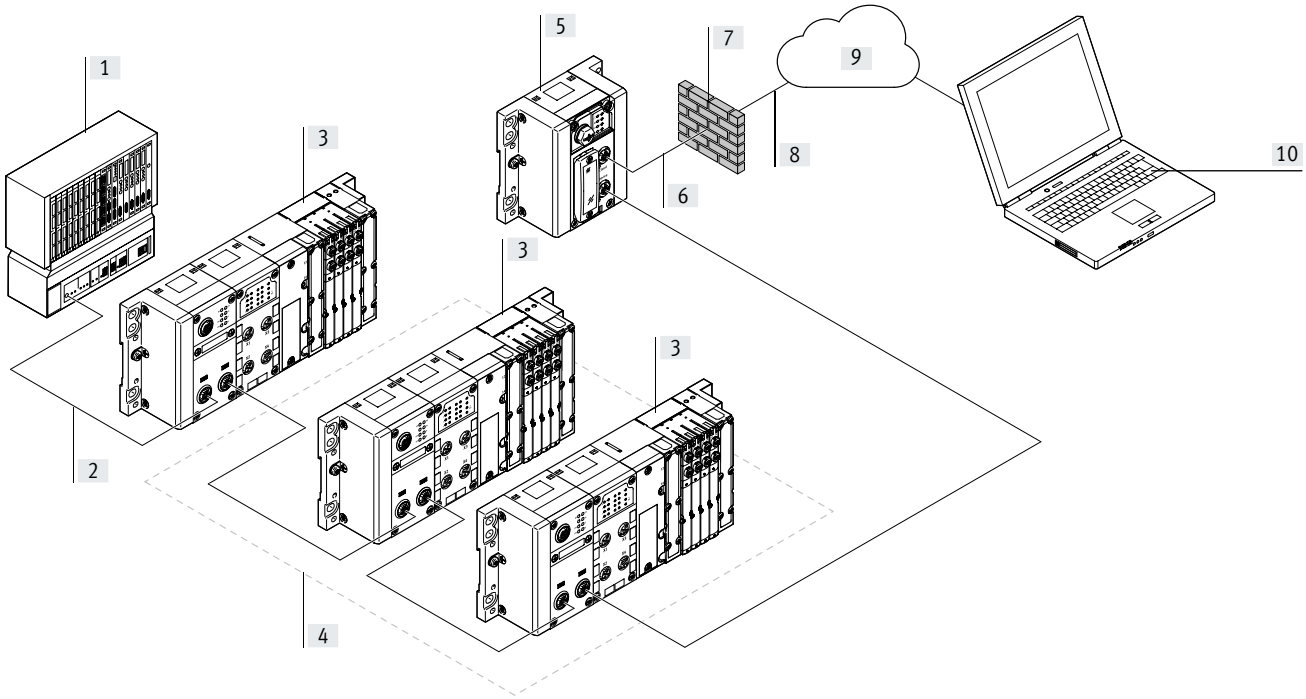
The operating mode of the gateway is set using a rotary switch. This enables simple interruption of this network connection on site.

Communication with the components being monitored is also via an Industrial Ethernet interface with M12x1 plug, D-coded to IEC 947-5-2.

Both connections have auto-negotiation and crossover detection as factory settings.

Data sheet – CPX-IOT gateway

Design



[1] PLC to machine/system controller (no direct internet connection)
[2] Bus system from the controller to the system parts (e.g. PROFINET)
[3] Festo components with bus connection with serial linking
[4] Components from which the CPX-IOT is collecting and transferring data
[5] Gateway CPX-IOT
[6] Internet connection
[7] Customer firewall or other security precautions
[8] Transferring data to a central storage location (MQTT broker) using secure protocols
[9] Central storage location (user-specific MQTT broker) provided by Festo
[10] Simple decentralised evaluation of data using adapted programs (apps) for the components that are being monitored

Data sheet – CPX-IOT gateway

General technical data			
Type			CPX-IOT
Fieldbus interface	Protocol		Ethernet
			OPC UA
	Function		Bus connection to Ethernet-based Festo devices
	Connection type		Socket
	Connection technology		M12x1, D-coded to EN 61076-2-101
	Number of pins/wires		4
	Galvanic isolation		Yes
	Transmission rate	[Mbps]	100
Ethernet interface	Protocol		TCP/IP
	Function		Connection to MQTT broker
	Connection type		Socket
	Connection technology		M12x1, D-coded to EN 61076-2-101
	Number of pins/wires		4
	Transmission rate	[Mbps]	10
		[Mbps]	100
CPU data			Dual core 533 MHz
			256 MB RAM
Configuration support			Integrated web server
Diagnostics via LED			Modify
			Module location
			Network status
			Network status port 1
			Network status port 2
			Power supply, electronics/sensors
			Power supply load
			System error
			Connection to the cloud
Control elements			Rotary switch for setting operating mode
			DIL switch for resetting to delivery status
IP address setting			DHCP
			Static via web server

Technical data – Electrics		
Nominal operating voltage DC for electronics/sensors	[V DC]	24
Permissible voltage fluctuations for electronic system/sensors	[%]	±25
Power failure buffering	[ms]	10
Intrinsic current consumption at nominal operating voltage for electronic system/ sensors	[mA]	Typically 80
Protection against direct and indirect contact		PELV

Technical data – Mechanical components		
Type of mounting		With H-rail
Product weight	[g]	130
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 50

Materials	
Housing	PA
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

Data sheet – CPX-IOT gateway

Operating and environmental conditions		
Ambient temperature	[°C]	– 5... +50
Storage temperature	[°C]	– 20... +70
Relative humidity	[%]	95
		Non-condensing
Corrosion resistance class CRC[1)]		0
CE marking (see declaration of conformity)[3)]		To EU EMC Directive[2)]
Degree of protection		IP65
		IP67

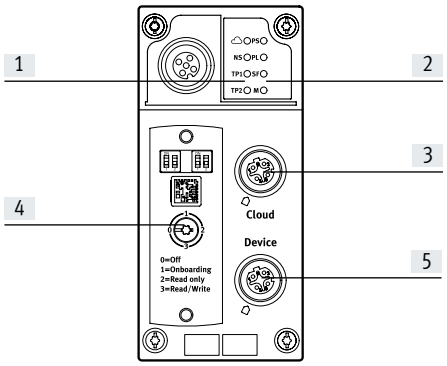
1) Additional information: www.festo.com/x/topic/kbk

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... ➔ Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

3) Additional information: www.festo.com/catalogue/... ➔ Support/Downloads.

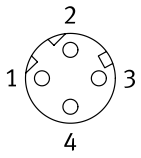
Safety characteristics	
Shock resistance	Shock test with severity level 1 to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 1 to FN 942017-4 and EN 60068-2-6

Connection and display components



[1] Network-specific LED displays
[2] Gateway-specific LED displays
[3] Connection to MQTT broker (M12x1 socket, 4-pin, D-coded)
[4] Transparent switch cover
[5] Bus connection to Ethernet-based Festo devices (M12x1 socket, 4-pin, D-coded)

Pin allocation for MQTT broker connection and bus connection to Ethernet-based Festo devices

Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	Shielding	Connected to functional earth (FE) via RC link

Data sheet – CPX-IOT gateway

Combinations of interlinking blocks and gateway

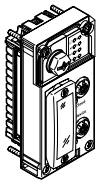
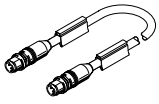
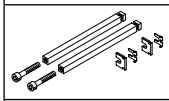
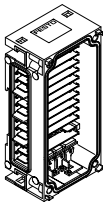
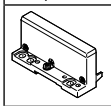
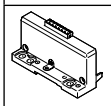
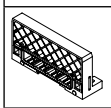
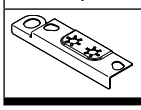
Interlinking blocks	Part no.	Gateway
		CPX-IOT
CPX-GE-EV-S	**195746**	■
CPX-GE-EV-S-VL	**8022170**	–
CPX-GE-EV-S-7/8-4POL	**541248**	–
CPX-GE-EV-S-7/8-5POL	**541244**	■
CPX-GE-EV-S-7/8-5POL-VL	**8022172**	–
CPX-M-GE-EV-S-7/8-CIP-4P	**568956**	–
CPX-M-GE-EV-S-7/8-5POL	**550208**	–
CPX-M-GE-EV-S-7/8-5POL-VL	**8022165**	–
CPX-M-GE-EV-S-PP-5POL	**563057**	–
CPX-GE-EV	**195742**	■
CPX-M-GE-EV	**550206**	–
CPX-M-GE-EV-FVO	**567806**	–
CPX-GE-EV-Z	**195744**	–
CPX-GE-EV-Z-VL	**8022166**	–
CPX-GE-EV-Z-7/8-4POL	**541250**	–
CPX-GE-EV-Z-7/8-5POL	**541246**	–
CPX-GE-EV-Z-7/8-5POL-VL	**8022173**	–
CPX-M-GE-EV-Z-7/8-5POL	**550210**	–
CPX-M-GE-EV-Z-7/8-5POL-VL	**8022158**	–
CPX-M-GE-EV-S-M12-5POL	**8098392**	–
CPX-M-GE-EV-Z-PP-5POL	**563058**	–
CPX-GE-EV-V	**533577**	–
CPX-GE-EV-V-VL	**8022171**	–
CPX-GE-EV-V-7/8-4POL	**541252**	–
CPX-M-GE-EV-W-M12-5POL	**8098391**	–

Combinations of end plates and gateway

End plates	Part no.	Gateway
		CPX-IOT
CPX-EPL-EV	**195716**	■
CPX-EPL-EV-S	**576315**	■
CPX-EPL-EV-X	**576314**	–
CPX-EPR-EV	**195714**	■
CPX-EPR-EV-X	**576313**	–

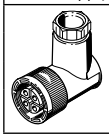
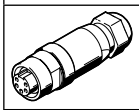
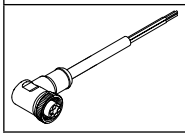
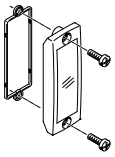
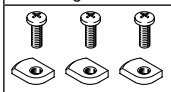
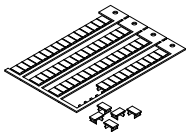
Data sheet – CPX-IOT gateway

Ordering data

Designation				Part no.	Type
Gateway					
				**8069773**	**CPX-IOT**
Bus connection					
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Cover cap for sealing unused bus connections (10 pieces)			**165592**	**ISK-M12**
Tie rod					
	Tie rod CPX	Tie rod CPX	1-module	**195718**	**CPX-ZA-1**
Interlinking block					
	Without power supply		–	**195742**	**CPX-GE-EV**
	With system supply		M18	**195746**	**CPX-GE-EV-S**
			7/8" – 5-pin	**541244**	**CPX-GE-EV-S-7/8-5POL**
End plates					
	Left-hand end plate	Without supply		**195716**	**CPX-EPL-EV**
		With system supply		**576315**	**CPX-EPL-EV-S**
	Right-hand end plate	–		**195714**	**CPX-EPR-EV**
	Earthing component for right-hand/left-hand end plate		5 pieces	**538892**	**CPX-EPFE-EV**

Data sheet – CPX-IOT gateway

Ordering data

Designation				Part no.	Type
Power supply					
	Plug socket for mains connection M18x1, 4-pin	Straight	For 1.5 mm²	**18493**	**NTSD-GD-9**
			For 2.5 mm²	**18526**	**NTSD-GD-13.5**
		Angled	For 1.5 mm²	**18527**	**NTSD-WD-9**
			For 2.5 mm²	**533119**	**NTSD-WD-11**
	Plug socket for mains connection 7/8", straight, 5-pin		0.25 ... 2.0 mm²	**543107**	**NECU-G78G5-C2**
	Plug socket for mains connection 7/8", angled, 5-pin – open cable end, 5-wire		2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
	Straight plug, spring-loaded terminal, for left-hand end plate with system supply		7-pin	**576319**	**NECU-L3G7-C1**
Cover					
	Inspection cover, transparent			**533334**	**AK-SUB-9/15-B**
Mounting					
	Mounting for H-rail			**526032**	**CPX-CPA-BG-NRH**
Inscription labels					
	Inscription labels 6x10 mm, 64 pieces, in frame			**18576**	**IBS-6x10**

Data sheet – CODESYS controller

- Industrial Ethernet
- TCP/IP
- EasyIP
- Web interface
- Email
- Data transfer

The CODESYS controller is a modern control system for CPX terminals that enables programming with CODESYS to IEC 61131-3.
The power supply to and communication with other modules takes place via the interlinking block.
In addition to network connections, LEDs are also provided for the bus status, operating status of the PLC and CPX peripherals information, as are switching elements and a diagnostic interface for CPX-FMT.

Application

Bus connection

The CPX-CEC is a remote controller that can be connected to a higher-order PLC via the bus nodes of the CPX terminal or via Ethernet.

At the same time, it is possible to operate the CPX-CEC as a compact stand-alone controller directly on the machine.

Communication protocols

- Fieldbus via CPX bus nodes
- Modbus/TCP
- EasyIP

Operating modes

- Stand-alone
- Remote controller, fieldbus
- Remote controller, Ethernet

Setting options

The CPX-CEC has the following interfaces for monitoring, programming and commissioning:

- For the CPX-FMT
- Ethernet interface for IT applications
- Remote diagnostics

The operating mode and fieldbus protocol are set using the DIL switch on the CPX-CEC.

The integrated web server offers a convenient means of querying data saved in the CPX-CEC.

Features

- Easy control of valve terminal configurations with MPA, VTSA
- Diagnostics with flexible monitoring options for pressure, flow rate, cylinder operating time, air consumption
- Activation of decentralised installation systems on the basis of CPI control of applications in proportional pneumatics
- AS-Interface control via gateway
- Connection to all fieldbuses as a remote controller and for preprocessing
- Control of electric actuators as individual axes via CANopen (CPX-CEC-C1/-M1)
- Early warnings and visualisation options
- Servo-pneumatic applications

Data sheet – CODESYS controller

General technical data			
Protocol			CODESYS Level 2
			EasyIP
			Modbus TCP
			TCP/IP
Processing time			Approx. 200 µs/1 k instructions
Programming software			CODESYS provided by Festo
Programming language			To IEC 61131-3
			Sequential function chart (SFC)
			Instruction list (IL)
			Function chart (FCH), additional continuous function chart (CFC)
			Ladder diagram (LD)
			Structured text (ST)
Programming	Operating language		German, English
	Support for file handling		Yes
Device-specific diagnostics			Diagnostic memory
			Channel and module-oriented diagnostics
			Undervoltage/short-circuit modules
LED displays	Bus-specific		TP: Link/traffic
	Product-specific		RUN: PLC status
			STOP: PLC status
			ERR: PLC runtime error
			PS: Electronics supply, sensor supply
			PL: Load supply
			SF: System fault
			M: Modify/forcing active
IP address setting			DHCP
			Via CODESYS
			Via MMI
Function blocks			CPX diagnostic status, copy CPX diagnostic trace, read CPX module diagnostics, and more
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 55

Materials		
Housing		PA-reinforced
		PC
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Relative humidity	[%]	95, non-condensing
Corrosion resistance class CRC[1)]		2

1) Additional information: www.festo.com/x/topic/kbk

Electrical data			
Nominal operating voltage		[V DC]	24
Load voltage	Nominal operating voltage	[V DC]	24
	With pneumatics type VTSA	[V DC]	21.6 ... 26.4
	With pneumatics type MPA	[V DC]	18 ... 30
	Without pneumatics	[V DC]	18 ... 30
Power failure buffering		[ms]	10
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 85
Degree of protection to EN 60529			IP65, IP67

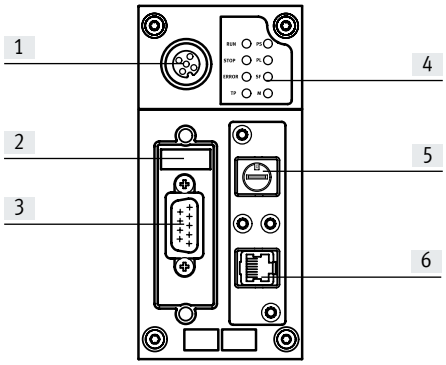
Data sheet – CODESYS controller

Technical data					
Type			CPX-CEC-C1	CPX-CEC-C1-V3	CPX-CEC-M1-V3
Additional functions			Motion functions for electric drives		SoftMotion functions for electric drives
CPU data	Flash	[MB]	32	32	32
	RAM	[MB]	32	256	256
	Processor	[MHz]	400	800	800
Control interface			CAN bus	CAN bus	CAN bus
Parameterisation			CODESYS V2.3	CODESYS V3	CODESYS V3
Configuration support			CODESYS V2.3	CODESYS V3	CODESYS V3
Program memory, user program		[MB]	4	16	16
Flags			CODESYS variable concept		
	Remanent data	[kB]	30	28	28
	Global data memory	[MB]	8	–	–
Control elements			DIL switch for CAN termination		
			Rotary switch for RUN/STOP		
Total number of axes			31	127	31
Ethernet	Number		1		
	Connection technology		RJ45 socket, 8-pin		
	Data transmission speed	[Mbps]	10/100		
	Supported protocols		TCP/IP, EasyIP, Modbus TCP		
Fieldbus interface	Number		1		
	Connection technology		Sub-D plug, 9-pin		
	Data transmission speed, can be set via software	[kbps]	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000
	Supported protocols		CAN bus		
	Galvanic isolation		Yes		

Technical data				
Type			CPX-CEC	CPX-CEC-S1-V3
CPU data	Flash	[MB]	32	32
	RAM	[MB]	32	256
	Processor	[MHz]	400	800
Parameterisation			CODESYS V2.3	CODESYS V3
Configuration support			CODESYS V2.3	CODESYS V3
Additional functions			Diagnostic functions	
			RS232 communication function	
Program memory, user program		[MB]	4	16
Flags			CODESYS variable concept	CODESYS variable concept
	Remanent data	[kB]	30	28
	Global data memory	[MB]	8	–
Control elements			Rotary switch for RUN/STOP	
Ethernet	Number		1	
	Connection technology		RJ45 socket, 8-pin	
	Data transmission speed	[Mbps]	10/100	
	Supported protocols		TCP/IP, EasyIP, Modbus TCP	
Data interface	Number		1	
	Connection technology		Sub-D socket, 9-pin	
	Data transmission speed	[kbps]	9.6 ... 230.4	
	Supported protocols		RS232 interface	
	Max. cable length	[m]	–	30
	Galvanic isolation		Yes	

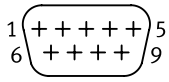
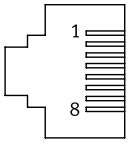
Data sheet – CODESYS controller

Connection and display elements CPX-CEC-C1/-M1



[1] CPX-FMT connection
[2] DIL switch
[3] Fieldbus interface (Sub-D plug, 9-pin)
[4] Status LEDs, bus-specific and product-specific
[5] RUN/STOP rotary switch
[6] Ethernet interface (RJ45 socket, 8-pin)

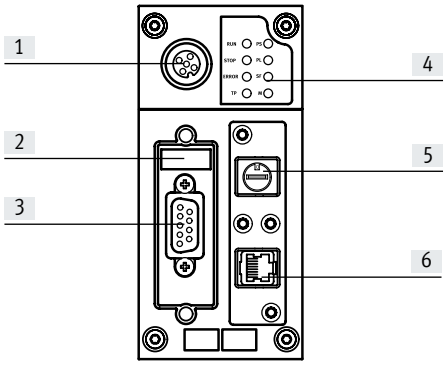
Pin allocation – CPX-CEC-C1/-M1

	Pin	Signal	Meaning
Fieldbus interface, Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	CAN_GND	CAN ground
	4	n.c.	Not connected
	5	CAN_SHLD	Connection to functional earth FE
	6	CAN_GND	CAN ground (optional)[1]
	7	CAN_H	CAN high
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	Shielding	Plug housing must be connected to FE
Ethernet interface, RJ45 plug			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received 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	Shielding	Shielding

1) If a servo drive is connected to an external power supply, CAN ground (optional), pin 6, cannot be used on the CPX-CEC-C1/-M1.

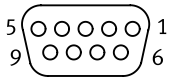
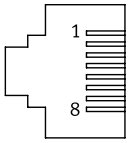
Data sheet – CODESYS controller

Connection and display elements CPX-CEC/CPX-CEC-S1-V3



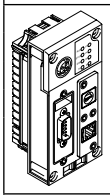
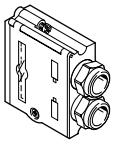
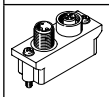
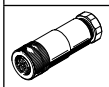
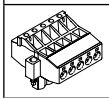
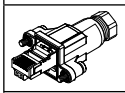
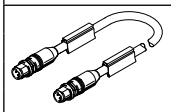
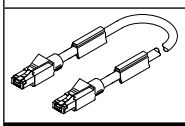
[1] CPX-FMT connection
[2] DIL switch
[3] RS232 interface (Sub-D socket, 9-pin)
[4] Status LEDs, bus-specific and product-specific
[5] RUN/STOP rotary switch
[6] Ethernet interface (RJ45 socket, 8-pin)

Pin allocation – CPX-CEC/CPX-CEC-S1-V3

	Pin	Signal	Meaning
RS 232 interface, Sub-D socket			
	1	n.c.	Not connected
	2	RxD	Received data
	3	TxD	Transmitted data
	4	n.c.	Not connected
	5	GND	Data reference potential
	6	n.c.	Not connected
	7	n.c.	Not connected
	8	n.c.	Not connected
	9	n.c.	Not connected
	Shielding	Shielding	Connection to functional earth
Ethernet interface, RJ45 plug			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received 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	Shielding	Shielding

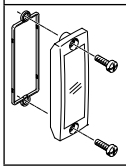
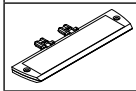
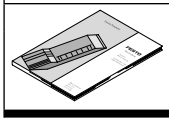
Data sheet – CODESYS controller

Ordering data

Designation					Part no.	Type
Control block						
	Motion functions for electric drives		CODESYS V2.3	155 g	**567347**	**CPX-CEC-C1**
			CODESYS V3	135 g	**3473128**	**CPX-CEC-C1-V3**
	SoftMotion functions for electric drives		CODESYS V3	135 g	**3472765**	**CPX-CEC-M1-V3**
	RS232 communication function		CODESYS V2.3	155 g	**567346**	**CPX-CEC**
			CODESYS V3	135 g	**3472425**	**CPX-CEC-S1-V3**
Fieldbus interface						
	Sub-D plug, 9-pin, for CANopen				**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Micro style bus connection, 2xM12 for DeviceNet/CANopen				**525632**	**FBA-2-M12-5POL**
	Socket for micro style connection, M12				**18324**	**FBSD-GD-9-5POL**
	Plug for micro style connection, M12				**175380**	**FBS-M12-5GS-PG9**
	Open style bus connection for 5-pin terminal strip for DeviceNet/CANopen				**525634**	**FBA-1-SL-5POL**
	Terminal strip for open style connection, 5-pin				**525635**	**FBSD-KL-2x5POL**
Ethernet interface						
	RJ45 plug		Degree of protection IP 65, IP67		**534494**	**FBS-RJ45-8-GS**
	Cover for RJ45 connection		Degree of protection IP 65, IP67		**534496**	**AK-RJ45**
	Straight plug, RJ45, 8-pin	Straight plug, M12x1, 4-pin, D-coded	Degree of protection IP20	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
				3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
				5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
				10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
	Straight plug, RJ45, 8-pin	Straight plug, RJ45, 8-pin	Degree of protection IP20	1 m	**8040455**	**NEBC-R3G4-ES-1-S-R3G4-ET**

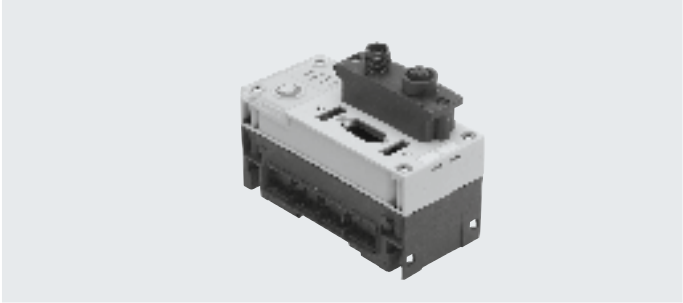
Data sheet – CODESYS controller

Ordering data

Designation			Part no.	Type
Covers and attachments				
	Inspection cover, transparent, for Sub-D connection		**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
User documentation				
	Manual for control block CPX-CEC	German	**569121**	**P.BE-CPX-CEC-DE**
		English	**569122**	**P.BE-CPX-CEC-EN**

Data sheet – DeviceNet bus node

Bus node for handling communication between the electrical terminal CPX and a DeviceNet network.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the three DeviceNet-specific LEDs.



Application

Bus connection

The bus connection can be selected when ordering, either micro style as 2xM12 round plugs or open style as a terminal strip with IP20 protection.

Both connection types have the function of an integrated T-distributor with incoming and outgoing bus line.

DeviceNet implementation

The CPX-FB11 operates with the Predefined Master/Slave Connection Set as a Group 2 Only Server.
The polled I/O, change of state or cyclic method is used for the transmission of cyclic I/O data. The type of transmission can be selected in the network configuration.

The device diagnostics for all bus nodes CPX-FB11 is effectively gathered via strobed I/O and displayed in the input table of the controller.
In addition to cyclic data transmission, acyclic communication is supported through explicit messaging, which enables detailed device diagnostics and parameterisation.

A comprehensive EDS file supports the display of acyclic data. It is also possible to display system information and assign parameters while the controller is running via the user program or the configuration software.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.
With its address capacity of 64 byte inputs and 64 byte outputs, the CPX-FB11 supports any configuration of I/O modules, including pneumatic interface.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – DeviceNet bus node

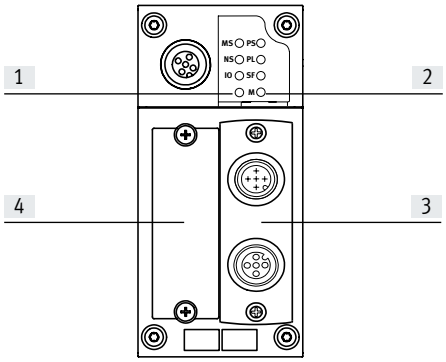
General technical data			
Type			CPX-FB11
Fieldbus interface			Either • Micro style bus connection: 2xM12 with degree of protection IP65, IP67 • Open style bus connection: 5-pin terminal strip, IP20
Baud rate		[kbps]	125, 250, 500
Addressing range			0 ... 63 Set using DIL switch
Product	Type		Communication adapter (12 dec.)
	Code		4554 dec.
Types of communication			Polled I/O, change of state/cyclic, strobed I/O and explicit messaging
Configuration support			EDS file and bitmaps
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status
Device-specific diagnostics			Module and channel-oriented diagnostics via manufacturer-specific diagnostic object
Parameterisation			• Module and system parameterisation via configuration interface in plain text (EDS) • Online in run or program mode
Additional functions			• Storage of the last 40 errors with timestamp (access via EDS) • 8-bit system status in image table for inputs • 2-byte inputs and 2-byte outputs, system diagnostics in process image
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	120

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

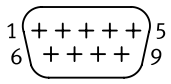
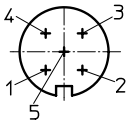
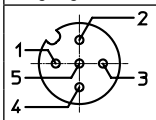
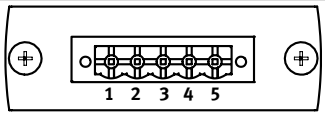
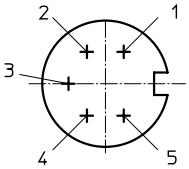
Data sheet – DeviceNet bus node

Connection and display components



[1] Bus-specific LEDs
[2] CPX-specific status LEDs
[3] Selectable fieldbus interface
– Micro style
– Open style
[4] DIL switch cover

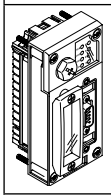
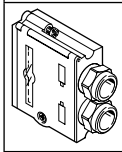
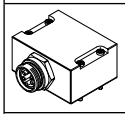
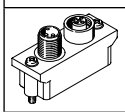
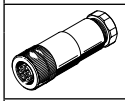
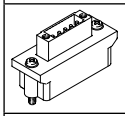
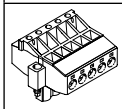
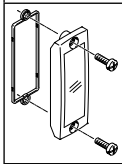
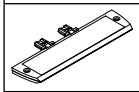
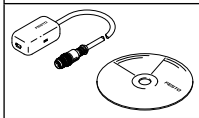
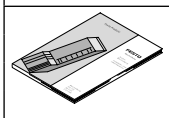
Pin allocation for the DeviceNet interface

Terminal allocation	Pin	Signal-specific wire colour[1)]	Signal	Designation
Sub-D plug				
	1	–	n.c.	Not connected
	2	Blue	CAN_L	Received/transmitted data low
	3	Black	0 V bus	0 V CAN interface
	4	–	n.c.	Not connected
	5	Bare	Shielding	Connection to housing
	6	–	n.c.	Not connected
	7	White	CAN_H	Received/transmitted data high
	8	–	n.c.	Not connected
	9	Red	24 V DC bus	24 V DC supply CAN interface
Micro style bus connection (M12), incoming/outgoing				
Incoming	1	Bare	Shielding	Connection to housing
	2	Red	24 V DC bus	24 V DC supply CAN interface
	3	Black	0 V bus	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Blue	CAN_L	Received/transmitted data low
Outgoing	1	Bare	Shielding	Connection to housing
	2	Red	24 V DC bus	24 V DC supply CAN interface
	3	Black	0 V bus	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Blue	CAN_L	Received/transmitted data low
Open style bus connection				
	1	Black	0 V bus	0 V CAN interface
	2	Blue	CAN_L	Received/transmitted data low
	3	Bare	Shielding	Connection to housing
	4	White	CAN_H	Received/transmitted data high
	5	Red	24 V DC bus	24 V DC supply CAN interface
7/8" bus connection				
	1	Black	Shielding	Connection to housing
	2	Blue	24 V DC	24 V DC supply CAN interface
	3	Bare	0 V	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Red	CAN_L	Received/transmitted data low

1) Typical of DeviceNet connecting cables

Data sheet – DeviceNet bus node

Ordering data

Designation			Part no.	Type
Bus node				
	DeviceNet bus node		**526172**	**CPX-FB11**
Bus connection				
	Sub-D plug		**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Connection block, 9-pin Sub-D socket, 5-pin 7/8" plug		**571052**	**CPX-AB-1-7/8-DN**
	Micro style bus connection, 2xM12		**525632**	**FBA-2-M12-5POL**
	Socket for micro style connection, M12		**18324**	**FBSD-GD-9-5POL**
	Plug for micro style connection, M12		**175380**	**FBS-M12-5GS-PG9**
	Open style bus connection for 5-pin terminal strip		**525634**	**FBA-1-SL-5POL**
	Terminal strip for open style connection, 5-pin		**525635**	**FBSD-KL-2x5POL**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation				
	User documentation for bus node CPX-FB11	German	**526421**	**P.BE-CPX-FB11-DE**
		English	**526422**	**P.BE-CPX-FB11-EN**
		Spanish	**526423**	**P.BE-CPX-FB11-ES**
		French	**526424**	**P.BE-CPX-FB11-FR**
		Italian	**526425**	**P.BE-CPX-FB11-IT**

Data sheet – PROFIBUS bus node

Bus node for handling communication between the electrical terminal CPX and a higher-order master via PROFIBUS DP.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the PROFIBUS-specific error LED.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket with a typical PROFIBUS allocation (to EN 50170).

The bus connector plug (with degree of protection IP65/IP67 from Festo or degree of protection IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

An active bus terminal can be connected using the DIL switch integrated in the plug.

The Sub-D interface is designed for controlling network components with a fibre-optic cable connection.

PROFIBUS DP implementation

The CPX-FB13 supports the PROFIBUS DP protocol to EN 50170 Volume 2 for cyclic I/O exchange, parameterisation and diagnostic functions (DPV0).

In addition to DPV0, acyclic communication to the advanced specification DPV1 is supported. DPV1 provides acyclic access to advanced system information and allows parameterisation while the controller is running via the user program.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity of 64 byte inputs and 64 byte outputs, the CPX-FB13 supports any configuration of I/O modules, including pneumatic interface.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – PROFIBUS bus node

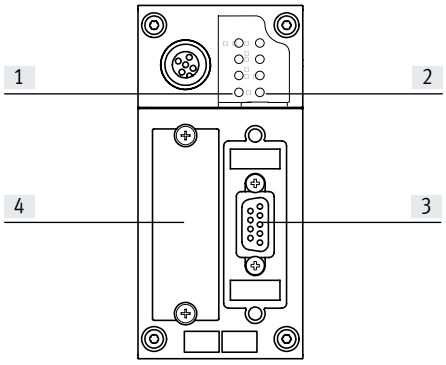
General technical data			
Type			CPX-FB13
Fieldbus interface			Sub-D socket, 9-pin (EN 50170) Galvanically isolated 5 V
Baud rate		[Mbps]	0.0096 ... 12
Addressing range			1 ... 125 Set using DIL switch
Product family			4: Valves
ID number			0x059E
Types of communication			DPV0: Cyclic communication DPV1: Acyclic communication
Configuration support			GSD file and bitmaps
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays (bus-specific)			BF: Bus fault
Device-specific diagnostics			Identifier and channel-oriented diagnostics to EN 50170 (PROFIBUS standard)
Parameterisation			• Start-up parameterisation via configuration interface in plain text (GSD) • Acyclic parameterisation via DPV1
Additional functions			• Storage of the last 40 errors with timestamp (access via DPV1) • 8-bit system status in image table for inputs • 2-byte inputs and 2-byte outputs, system diagnostics in process image
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	115

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

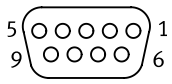
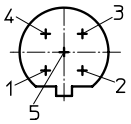
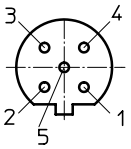
Data sheet – PROFIBUS bus node

Connection and display components



[1] Bus status LEDs/bus fault
[2] CPX-specific status LEDs
[3] Fieldbus interface (Sub-D socket, 9-pin)
[4] DIL switch cover

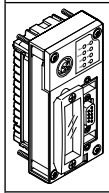
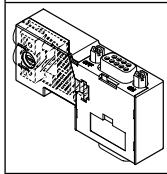
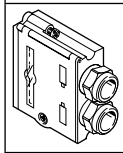
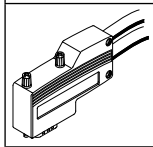
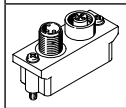
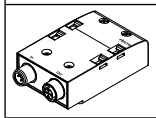
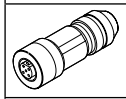
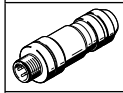
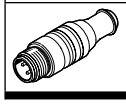
Pin allocation for PROFIBUS DP interface

Terminal allocation	Pin	Signal	Designation
Sub-D socket			
	1	n.c.	Not connected
	2	n.c.	Not connected
	3	RxD/TxD-P	Received/transmitted data P
	4	CNTR-P[1)]	Repeater control signal
	5	DGND	Data reference potential (M5V)
	6	VP	Supply voltage (P5V)
	7	n.c.	Not connected
	8	RxD/TxD-N	Received/transmitted data N
	9	n.c.	Not connected
	Housing	Shielding	Connection to housing
Bus connection M12 adapter (B-coded)			
Incoming	1	n.c.	Not connected
	2	RxD/TxD-N	Received/transmitted data N
	3	n.c.	Not connected
	4	RxD/TxD-P	Received/transmitted data P
	5 and M12	Shielding	Connection to FE (functional earth)
Outgoing	1	VP	Supply voltage (P5V)
	2	RxD/TxD-N	Received/transmitted data N
	3	DGND	Data reference potential (M5V)
	4	RxD/TxD-P	Received/transmitted data P
	5 and M12	Shielding	Connection to FE (functional earth)

1) The repeater control signal CNTR-P is realised as a TTL signal.

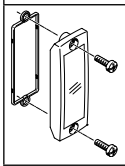
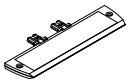
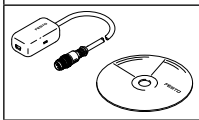
Data sheet – PROFIBUS bus node

Ordering data

Designation		Part no.	Type
Bus node			
	PROFIBUS bus node	**195740**	**CPX-FB13**
Bus connection			
	Sub-D plug, straight, with terminating resistor and programming interface	**574589**	**NECU-S1W9-C2-APB**
	Sub-D plug, straight	**532216**	**FBS-SUB-9-GS-DP-B**
	Sub-D plug, angled	**533780**	**FBS-SUB-9-WS-PB-K**
	Bus connection M12 adapter (B-coded)	**533118**	**FBA-2-M12-5POL-RK**
	Connection block M12 adapter (B-coded)	**541519**	**CPX-AB-2-M12-RK-DP**
	5-pin M12x1 straight socket, for self-assembly of a connecting cable compatible with FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP	**1067905**	**NECU-M-B12G5-C2-PB**
	Plug M12x1, 5-pin, straight, for self-assembly of a connecting cable compatible with FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP	**1066354**	**NECU-M-S-B12G5-C2-PB**
	Terminating resistor, M12, B-coded for PROFIBUS	**1072128**	**CACR-S-B12G5-220-PB**

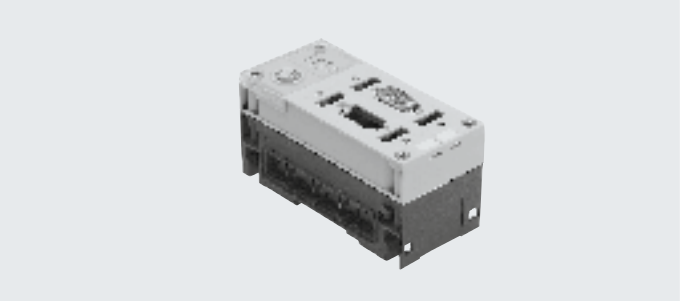
Data sheet – PROFIBUS bus node

Ordering data

Designation			Part no.	Type
Bus connection				
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block M12		**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation				
	User documentation for bus node CPX-FB13	German	**526427**	**P.BE-CPX-FB13-DE**
		English	**526428**	**P.BE-CPX-FB13-EN**
		Spanish	**526429**	**P.BE-CPX-FB13-ES**
		French	**526430**	**P.BE-CPX-FB13-FR**
		Italian	**526431**	**P.BE-CPX-FB13-IT**

Data sheet – CANopen bus node

Bus node for handling communication between the electrical terminal CPX and a CANopen network master or CANopen network.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The different CANopen statuses and the fieldbus communication status are visualised via 3 additional LEDs.



Application

Bus connection

The bus connection is established via a 9-pin Sub-D plug (pin) as per the CAN in Automation (CiA) specification DS 102 with additional 24 V CAN transceiver supply (option as per DS 102).

The bus connector plug (with degree of protection IP65/IP67 from Festo or degree of protection IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

There are 4 contacts available for the 4 wires (CAN_L, CAN_H, 24 V, 0 V) of the incoming and outgoing bus cables respectively.

CANopen implementation

The CPX-FB14 supports the CANopen protocol in accordance with the specifications DS 301 V4.01 and DS 401 V2.0.
Implementation is based on the CiA Predefined Connection Set.
There are 4 PDOs available for fast I/O data exchange.

Enhanced system information can also be accessed via SDO communication.
SDO communication also facilitates parameterisation before network start-up or while the controller is running via the user program.
An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity, the CPX-FB14 supports a large number of I/O module configurations, including pneumatic interface.
By default, 8 byte digital inputs and 8 byte digital outputs can be addressed via PDO 1.

8 analogue input channels and 8 analogue output channels can be addressed via PDO 2 and 3. Status and diagnostic information can be evaluated via PDO 4.
Additional 8 byte digital inputs and outputs as well as 8 analogue input and output channels can be addressed via mapping.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – CANopen bus node

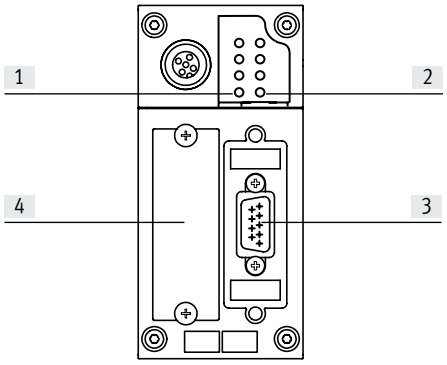
General technical data			
Type			CPX-FB14
Fieldbus interface			Sub-D plug, 9-pin (to DS 102) Bus interface galvanically isolated via optocoupler 24 V supply for CAN interface via bus
Baud rate		[kbps]	125, 250, 500 and 1000 can be set via DIL switch
Addressing range			Node ID 1 ... 127 Set using DIL switch
Product family			Digital inputs and outputs
Communication profile			DS 301, V4.01
Device profile			DS 401, V2.0
Number	PDO		4 Tx/4 Rx
	SDO		1 server SDO
Configuration support			EDS file and bitmaps
Max. address capacity	Inputs	[byte]	16 digital, 16 analogue channels
	Outputs	[byte]	16 digital, 16 analogue channels
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status
Device-specific diagnostics			Via emergency message Object 1001, 1002 and 1003
Parameterisation			Via SDO
Additional functions			• Storage of the last 40 errors with timestamp (access via SDO) • 8-bit system status via transmit PDO 4 (default) • 2-byte inputs and 2-byte outputs, system diagnostics via PDO 4 • Minimum boot-up • Variable PDO mapping • Emergency message • Node guarding • Heart beat
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	115

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

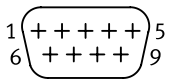
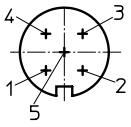
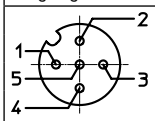
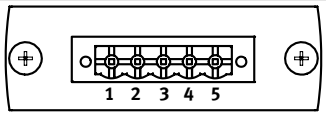
Data sheet – CANopen bus node

Connection and display components



[1] Bus-specific LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (Sub-D plug, 9-pin)
[4] DIL switch cover

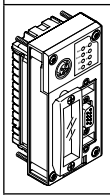
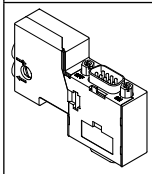
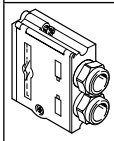
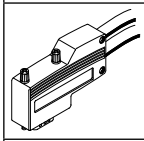
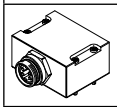
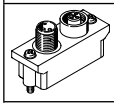
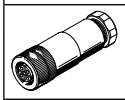
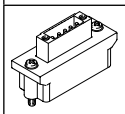
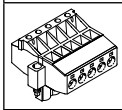
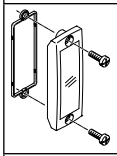
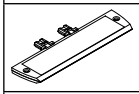
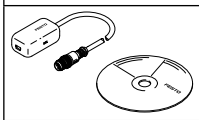
Pin allocation of the CANopen interface

Terminal allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	Received/transmitted data low
	3	CAN_GND	0 V CAN interface
	4	n.c.	Not connected
	5	CAN_SHLD	Optional shielded connection
	6	GND	Ground[1)]
	7	CAN_H	Received/transmitted data high
	8	n.c.	Not connected
	9	CAN_V+	24 V DC supply CAN interface
	Housing	Shielding	Connection to FE (functional earth)
Micro style bus connection (M12)			
Incoming	1	Shielding	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Outgoing	1	Shielding	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Open style bus connection			
	1	CAN_GND	0 V CAN interface
	2	CAN_L	Received/transmitted data low
	3	Shielding	Connection to FE (functional earth)
	4	CAN_H	Received/transmitted data high
	5	CAN_V+	24 V DC supply CAN interface

1) Connected internally via Pin 3

Data sheet – CANopen bus node

Ordering data

Designation			Part no.	Type
Bus node				
	CANopen bus node		**526174**	**CPX-FB14**
Bus connection				
	Sub-D socket for CANopen with terminating resistor and programming interface		**574588**	**NECU-S1W9-C2-ACO**
	Sub-D socket		**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Sub-D socket, angled		**533783**	**FBS-SUB-9-WS-CO-K**
	Connection block, 9-pin Sub-D socket, 5-pin 7/8" plug		**571052**	**CPX-AB-1-7/8-DN**
	Micro style bus connection, 2xM12, 5-pin		**525632**	**FBA-2-M12-5POL**
	Fieldbus socket for micro style connection, M12, 5-pin		**18324**	**FBSD-GD-9-5POL**
	Plug for micro style connection, M12, 5-pin		**175380**	**FBS-M12-5GS-PG9**
	Open style bus connection		**525634**	**FBA-1-SL-5POL**
	Terminal strip for open style connection, 5-pin		**525635**	**FBSD-KL-2x5POL**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation				
	User documentation for bus node CPX-FB14	German	**526409**	**P.BE-CPX-FB14-DE**
		English	**526410**	**P.BE-CPX-FB14-EN**
		Spanish	**526411**	**P.BE-CPX-FB14-ES**
		French	**526412**	**P.BE-CPX-FB14-FR**
		Italian	**526413**	**P.BE-CPX-FB14-IT**

Data sheet – CC-Link bus node

CC-Link

Bus node for handling communication between the electrical terminal CPX and a higher-order master for Control & Communication-Link (CC-Link) from Mitsubishi.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 CC-Link-specific LEDs.

Application

Bus connection

The bus connection can be selected when ordering and is established via a screw terminal with degree of protection IP20, a Sub-D plug with degree of protection IP65/IP67 from Festo or degree of protection IP20 from other manufacturers.

Both connection types have the function of an integrated T-distributor and thus support the connection of an incoming and outgoing bus cable.

CC-Link implementation

The CPX bus node CPX-FB23-24 optionally supports the CC-Link versions 2.0 (as function module F24) and 1.1 (as function module F23).
These designations are also found in the system diagram for the CPX Maintenance Tool (CPX-FMT) from Festo.

Function module F24 corresponds to CC-Link version 2.0 and supports a maximum of four stations per slave, up to an address capacity of 64 bytes of digital I/O and 64 bytes of analogue I/O in each case.
It is possible to optimise the configuration of the addressing in terms of either cycle time or station.

Function module F23 corresponds to CC-Link version 1.1 and supports a maximum of four stations per slave, up to an address capacity of 32 bytes of digital I/O and 14 bytes of analogue I/O in each case.

The function module and option are set using the DIL switch on the CPX bus node.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – CC-Link bus node

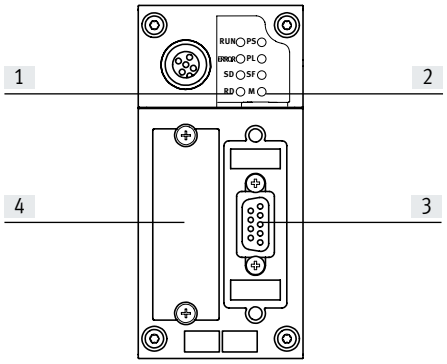
General technical data				
Type				CPX-FB23-24
Fieldbus interface				Either • Sub-D socket, 9-pin • Sub-D plug, for self-assembly • Screw terminal strip, IP20
Baud rate			[kbps]	156 ... 10000
Protocol				CC-Link
Max. address capacity, inputs	FB23	RWr	[byte]	32
		Rx	[byte]	14
	FB24	RWr	[byte]	64
		Rx	[byte]	64
Max. address volume for outputs	FB23	RWw	[byte]	32
		Ry	[byte]	14
	FB24	RWw	[byte]	64
		Ry	[byte]	64
LED displays (bus-specific)				RUN = Communication status ERROR = Communication error SD = Send data RD = Receive data
Device-specific diagnostics				• Diagnostic memory • Channel and module-oriented diagnostics • Undervoltage of modules
Parameterisation				• Diagnostic behaviour • Fail-safe response • Forcing of channels • Signal setup • System parameters
Additional functions				• System status can be displayed using process data • Additional diagnostic interface for operator units
Control elements				DIL switch
Operating voltage	Nominal value		[V DC]	24
	Permissible range		[V DC]	18 ... 30
Current consumption			[mA]	Typically 200
Degree of protection to EN 60529				IP65, IP67
Temperature range	Operation		[°C]	–5 ... +50
	Storage/transport		[°C]	–20 ... +70
Materials				Reinforced PA, PC
PWIS conformity				VDMA24364-B2-L
Grid dimension			[mm]	50
Dimensions (including interlinking block) W x L x H			[mm]	50 x 107 x 50
Product weight			[g]	115

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

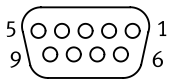
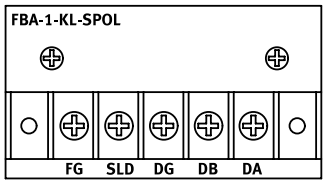
Data sheet – CC-Link bus node

Connection and display components



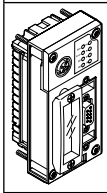
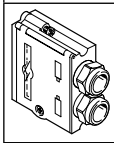
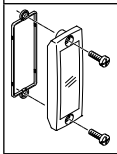
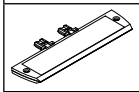
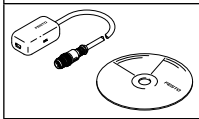
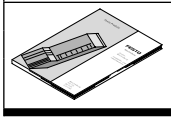
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (Sub-D socket, 9-pin)
[4] DIL switch cover

Pin allocation for the CC-Link interface

Terminal allocation	Pin	Signal	Designation
Sub-D socket			
	1	n.c.	Not connected
	2	DA	Data A
	3	DG	Data reference potential
	4	n.c.	Not connected
	5	FE[1)]	Functional earth
	6	n.c.	Not connected
	7	DB	Data B
	8	n.c.	Not connected
	9	n.c.	Not connected
Screw terminal bus connection			
	1	FG	Functional earth/housing
	2	SLD	Shielding
	3	DG	Data reference potential
	4	DB	Data B
	5	DA	Data A

Data sheet – CC-Link bus node

Ordering data

Designation			Part no.	Type
Bus node				
	CC-Link bus node		**526176**	**CPX-FB23-24**
Bus connection				
	Sub-D plug		**532220**	**FBS-SUB-9-GS-2x4POL-B**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation				
	User documentation for bus node CPX-FB23-24	German	**526403**	**P.BE-CPX-FB23-24-DE**
		English	**526404**	**P.BE-CPX-FB23-24-EN**
		Chinese	**8026069**	**P.BE-CPX-FB23-24-ZH**

Data sheet – PROFINET bus node, M12, D-coded

Bus node for operating the CPX valve terminal on PROFINET.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via three bus-specific LEDs.

Application

Bus connection

The bus connection is established via two M12 sockets, D-coded to IEC 61076-2-101 with degree of protection IP65, IP67.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality (crossover and patch cables can be used) that are brought together via an internal switch.

- Maximum segment length 100 m
- Transmission rate 100 Mbps

PROFINET implementation

The bus nodes support the PROFINET protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.
This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred. The Ethernet bandwidth is sufficient to transfer both data types (real-time and non-real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements and a diagnostic interface. PROFINET provides the user with access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, dependent on the function, changed via CPX-FMT.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – PROFINET bus node, M12, D-coded

General technical data			
Type			CPX-FB43
Fieldbus interface			2x socket, M12, 4-pin, D-coded
Baud rate		[Mbps]	100
Protocol			PROFINET RT
			PROFINET IRT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	(bus-specific)		M/P = Maintenance/PROFIenergy NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			GSDML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• Start-up parameterisation in plain text via fieldbus • Fast start-up (FSU) • Channel-oriented diagnostics via fieldbus • Acyclic data access via fieldbus and via Ethernet • System status can be displayed using process data • Additional diagnostic interface for operator unit
			• I&M • LLDP • MRP • MRPD • MQTT • PROFIsafe • PROFIenergy • S2 system redundancy
Control elements			• DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Current consumption		[mA]	Typically 70
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Certification			RCM
Materials	Housing		Die-cast aluminium
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	185

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

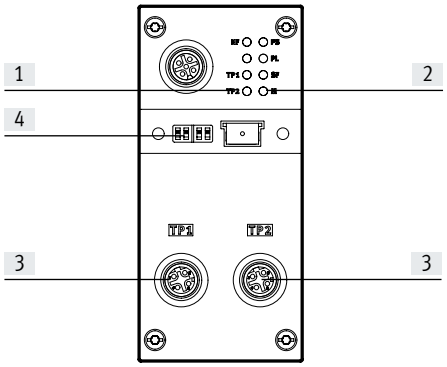
Note

Always use the correct screws for the interlinking block; this depends on whether the block is made of metal or plastic:

- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

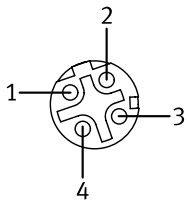
Data sheet – PROFINET bus node, M12, D-coded

Connection and display components



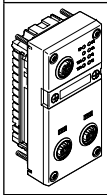
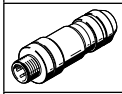
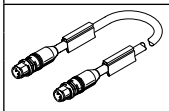
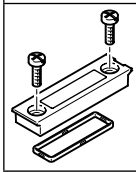
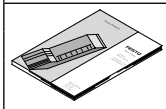
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (M12 socket, 4-pin, D-coded)
[4] Transparent cover for DIL switch

Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
Socket, M12, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing		Shielding

Data sheet – PROFINET bus node, M12, D-coded

Ordering data

Designation				Part no.	Type
Bus node					
	PROFINET bus node		• I&M • LLDP • MRP • MRPD • PROFIenergy • S2 system redundancy	**8110369**	**CPX-FB43**
Bus connection					
	Plug M12x1, 4-pin, D-coded			**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Transparent cover for DIL switch			**548757**	**CPX-AK-P**
	Cover cap for sealing unused bus connections (10 pieces)			**165592**	**ISK-M12**
User documentation					
	Electronics manual, CPX bus node		German	**548759**	**CPX-(M)-FB33_35/43_45-DE**
			English	**548760**	**CPX-(M)-FB33_35/43_45-EN**
			Spanish	**548761**	**CPX-(M)-FB33_35/43_45-ES**
			French	**548762**	**CPX-(M)-FB33_35/43_45-FR**
			Italian	**548763**	**CPX-(M)-FB33_35/43_45-IT**

Data sheet – PROFINET bus node, push-pull RJ45

Bus node for operating the CPX valve terminal on PROFINET.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 bus-specific LEDs.

Application

Bus connection

The bus connection is established via two RJ45 push-pull sockets to IEC 61076-3-106 and IEC 60603 with degree of protection IP65, IP67.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality (crossover and patch cables can be used) that are brought together via an internal switch.

- Maximum segment length 100 m
- Transmission rate 100 Mbps

PROFINET implementation

The bus nodes support the PROFINET protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.
This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred.
The Ethernet bandwidth is sufficient to transfer both data types (real-time and non-real-time) in parallel.

The bus nodes feature LEDs for bus status and CPX peripheral information as well as switch elements and a diagnostic interface. PROFINET provides the user with access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, dependent on the function, changed via CPX-FMT.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
- 8/16 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56/48 byte inputs
- 56/48 byte outputs

Data sheet – PROFINET bus node, push-pull RJ45

General technical data			
Type			CPX-M-FB44
Fieldbus interface			2x RJ45 push-pull socket, AIDA
Baud rate		[Mbps]	100
Protocol			PROFINET RT PROFINET IRT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	(bus-specific)		M/P = Maintenance/PROFIenergy NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			GSDML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• Start-up parameterisation in plain text via fieldbus • Fast start-up (FSU) • Channel-oriented diagnostics via fieldbus • Acyclic data access via fieldbus and via Ethernet • System status can be displayed using process data • Additional diagnostic interface for operator unit
			• I&M • LLDP • MRP • MRPD • MQTT • PROFIsafe • PROFIenergy • S2 system redundancy
Control elements			• DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 70
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Certification			RCM
Housing material			Die-cast aluminium
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 80
Product weight		[g]	280

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

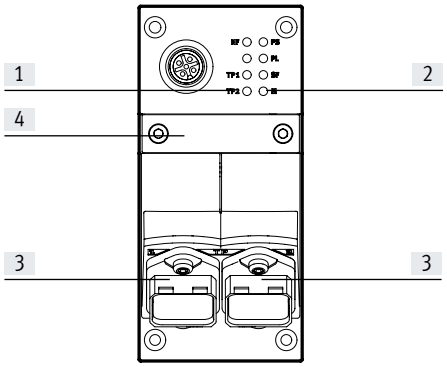
Note

Always use the correct screws for the interlinking block; this depends on whether the block is made of metal or plastic:

- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

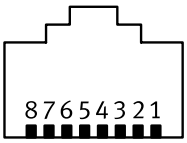
Data sheet – PROFINET bus node, push-pull RJ45

Connection and display components



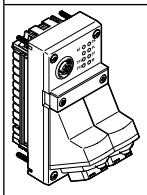
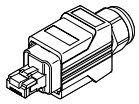
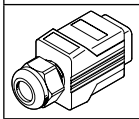
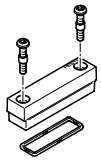
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (RJ45 socket, 8-pin)
[4] DIL switch

Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
RJ45 socket			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received 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	Shielding	Shielding

Data sheet – PROFINET bus node, push-pull RJ45

Ordering data

Designation			Part no.	Type
Bus node				
	PROFINET bus node	• I&M • LLDP • MRP • MRPD • PROFIenergy • S2 system redundancy	**8110370**	**CPX-M-FB44**
Bus connection				
	RJ45 plug, 8-pin, push-pull		**552000**	**FBS-RJ45-PP-GS**
	Cover cap for bus connection		**548753**	**CPX-M-AK-C**
	Cover cap for bus connection		**2873540**	**CPX-M-AK-D**
	Cover for DIL switch		**548754**	**CPX-M-AK-M**
User documentation				
	Electronics manual, CPX bus node	German	**548759**	**CPX-(M)-FB33_35/43_45-DE**
		English	**548760**	**CPX-(M)-FB33_35/43_45-EN**
		Spanish	**548761**	**CPX-(M)-FB33_35/43_45-ES**
		French	**548762**	**CPX-(M)-FB33_35/43_45-FR**
		Italian	**548763**	**CPX-(M)-FB33_35/43_45-IT**

Data sheet – PROFINET bus node, push-pull SCRJ

Bus node for operating the CPX valve terminal on PROFINET.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via three bus-specific LEDs.

Application

Bus connection

The bus connection is established via SCRJ push-pull sockets to IEC 61754-24 (fibre-optic cable, AIDA standard) with degree of protection IP65, IP67.

The connections on the CPX bus node are equivalent 100BaseFX Ethernet ports that are brought together via an internal switch.

Fibre-optic cables made from plastic (POF, 980/1000 µm) are also suitable for transmission.

- Maximum segment length 50 m
- Transmission rate 100 Mbps
- Supports LLDP and SNMP

PROFINET implementation

The bus nodes support the PROFINET protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.
This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred.
The Ethernet bandwidth is sufficient to transfer both data types (real-time and non-real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements and a diagnostic interface. PROFINET provides the user with access to all peripheral, diagnostic and parameter data for the CPX valve terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, dependent on the function, changed via CPX-FMT.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
- 8/16 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56/48 byte inputs
- 56/48 byte outputs

Data sheet – PROFINET bus node, push-pull SCRJ

General technical data			
Type			CPX-M-FB45
Fieldbus interface			2x SCRJ push-pull socket, AIDA
Baud rate		[Mbps]	100
Protocol			PROFINET RT
			PROFINET IRT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	(bus-specific)		M/P = Maintenance/PROFIenergy NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			GSDML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• Start-up parameterisation in plain text via fieldbus • Fast start-up (FSU) • Channel-oriented diagnostics via fieldbus • Acyclic data access via fieldbus and via Ethernet • System status can be displayed using process data • Additional diagnostic interface for operator unit
			• I&M • LLDP • MRP • MRPD • MQTT • PROFIsafe • PROFIenergy • S2 system redundancy
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 145
Certification			RCM
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Housing material			Die-cast aluminium
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 80
Product weight		[g]	280

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

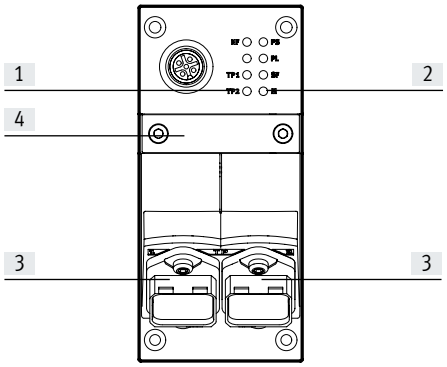
Note

Always use the correct screws for the interlinking block; this depends on whether the block is made of metal or plastic:

- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

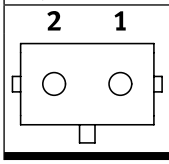
Data sheet – PROFINET bus node, push-pull SCRJ

Connection and display components



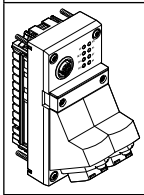
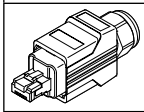
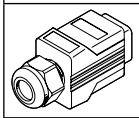
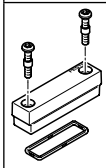
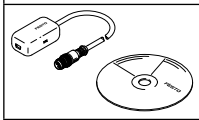
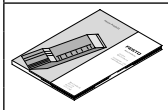
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (SCRJ socket, 2-pin)
[4] DIL switch

Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
SCRJ socket			
	1	TX	Outgoing
	2	Rx	Incoming

Data sheet – PROFINET bus node, push-pull SCRJ

Ordering data

Designation			Part no.	Type
Bus node				
	2x SCRJ push-pull socket, AIDA	• I&M • LLDP • MRP • MRPD • PROFIenergy • S2 system redundancy	**8110371**	**CPX-M-FB45**
Bus connection				
	SCRJ plug, 2-pin, push-pull		**571017**	**FBS-SCRJ-PP-GS**
	Cover cap for bus connection		**548753**	**CPX-M-AK-C**
	Cover cap for bus connection		**2873540**	**CPX-M-AK-D**
	Cover for DIL switch		**548754**	**CPX-M-AK-M**
	Screws for attaching an inscription label to the bus node (12 pieces)		**550222**	**CPX-M-M2.5X8-12X**
	5-pin M12 to mini USB socket adapter and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation				
	Electronics manual, CPX bus node	German	**548759**	**CPX-(M)-FB33_35/43_45-DE**
		English	**548760**	**CPX-(M)-FB33_35/43_45-EN**
		Spanish	**548761**	**CPX-(M)-FB33_35/43_45-ES**
		French	**548762**	**CPX-(M)-FB33_35/43_45-FR**
		Italian	**548763**	**CPX-(M)-FB33_35/43_45-IT**

Data sheet – EtherNet/IP bus node

- Industrial Ethernet
- EtherNet/IP
- Web interface

Bus node for handling communication between the electrical terminal CPX and the Ethernet/IP network.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.

Application

Bus connection

The bus connection is established via an M12 plug, D-coded to IEC 947-5-2 with degree of protection IP65, IP67.

EtherNet/IP is an open bus system based on the Ethernet standard and TCP/IP technology (IEEE802.3).

EtherNet/IP implementation

The CPX-FB36 supports the two operating modes: remote I/O and remote controller.
In remote I/O operating mode, all functions of the CPX valve terminal are directly controlled by the Ethernet/IP master (host).
In addition to activation via a bus system, it is possible to use IT technologies. An integrated web server enables diagnostic data to be visualised via HTML. Various programs support direct access to the device data from the automation network.
The Ethernet/IP node for CPX supports the transmission technology that conforms to DIN EN 50173/CAT 5 as an integrated interface.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – EtherNet/IP bus node

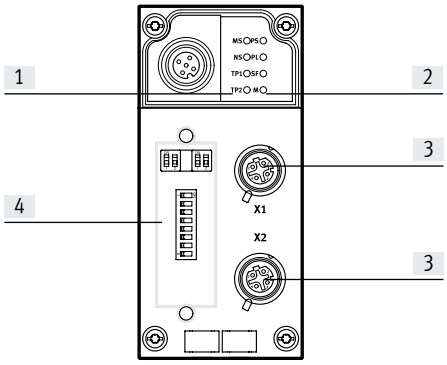
General technical data			
Type			CPX-FB36
Fieldbus interface			2x M12x1 socket, 4-pin, D-coded
Baud rate		[Mbps]	10/100
Protocol			EtherNet/IP
			Modbus TCP
Max. address capacity, inputs		[byte]	64
Max. address volume for outputs		[byte]	64
LED displays (bus-specific)			MS = Module status NS = network status TP1 = Network active port 1 TP2 = Network active port 2
Device-specific diagnostics			• Module and channel-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			• EDS file • L5K export with CPX-FMT
Parameterisation			• Diagnostic behaviour • Fail-safe response • Forcing of channels • Idle mode characteristics • Signal setup • System parameters
Additional functions			• EtherNet/IP Quickconnect • Ring topology (DLR) • Acyclic data access via "Explicit Message" and Ethernet • Integrated switch • IP addressing via DHCP, DIL switch or operator unit • Channel-oriented diagnostics via fieldbus • Start-up parameterisation in plain text via fieldbus • System status can be displayed using process data • Additional diagnostic interface for operator units
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Current consumption at nominal voltage		[mA]	Typically 100
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials			PA-reinforced
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	125

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

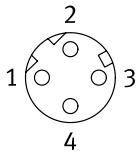
Data sheet – EtherNet/IP bus node

Connection and display components



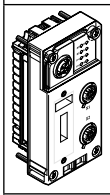
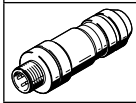
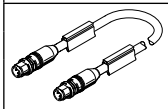
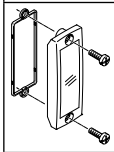
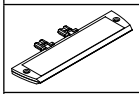
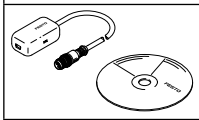
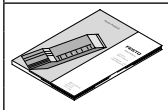
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (M12 socket, 4-pin, D-coded)
[4] Transparent DIL switch cover

Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
Socket, M12, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	FE	Shielding

Data sheet – EtherNet/IP bus node

Ordering data

Designation				Part no.	Type
Bus node					
	EtherNet/IP bus node			**1912451**	**CPX-FB36**
Bus connection					
	Plug M12x1, 4-pin, D-coded			**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Inspection cover, transparent			**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	User documentation for bus node CPX-FB36		German	**8024074**	**CPX-FB36-DE**
			English	**8024075**	**CPX-FB36-EN**
			Spanish	**8024076**	**CPX-FB36-ES**
			French	**8024077**	**CPX-FB36-FR**
			Italian	**8024078**	**CPX-FB36-IT**
			Chinese	**8024079**	**CPX-FB36-ZH**

Data sheet – EtherCAT bus node

Bus node for operating the CPX valve terminal on EtherCAT.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 bus-specific LEDs.

Application

Bus connection

The bus connection is established via two sockets M12x1, D-coded to IEC 61076-2-101 with degree of protection IP65, IP67.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality (crossover and patch cable can be used) that are brought together via an internal switch.

- Maximum segment length 100 m
- Transmission rate 100 Mbps

EtherCAT implementation

The CPX-FB37 supports the EtherCAT protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.
This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred.
The data bandwidth is sufficient to transfer both data types (real-time and non-real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements and a diagnostic interface. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, dependent on the function, changed via CPX-FMT.
The functions MDP (modular device profile) and CoE (CAN over EtherCAT) enable easy access to parameters and diagnostic data via EtherCAT.

Specific EtherCAT functions:

- CoE (parameters and diagnostics or fail-safe mode): all module parameters can be set
- FoE (file over EtherCAT) makes it possible to download firmware easily
- EoE (Ethernet over EtherCAT): diagnostic data can be retrieved easily using a browser
- MDP (modular device profile): easy configuration using a module selection box
- Hot Connect, easy replacement of an EtherCAT CPX terminal
- DC (distributed clocks), time-synchronised data transmission

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
- 8/16 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56/48 byte inputs
- 56/48 byte outputs

Data sheet – EtherCAT bus node

General technical data			
Type			CPX-FB37
Fieldbus interface			2x M12x1 socket, 4-pin, D-coded
Baud rate		[Mbps]	100
Protocol			EtherCAT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	Bus-specific		Error = Communication error L/A1 = Network active port 1 L/A2 = Network active port 2 Run = Communication status
	Product-specific		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			ESI file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• System status can be displayed using process data • Additional diagnostic interface for operator units • Emergency message • Acyclic data access via fieldbus • Diagnostics object • Compatibility mode with CPX-FB38 • Modular device profile (MDP) • Variable PDO mapping
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Current consumption		[mA]	Typically 100
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials	Housing		PA-reinforced
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	125

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

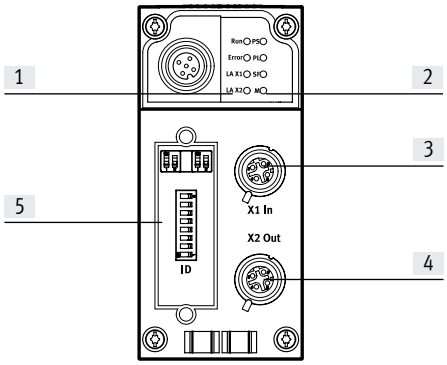
Note

Always use the correct screws for the interlinking block; this depends on whether the block is made of metal or plastic:

- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

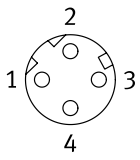
Data sheet – EtherCAT bus node

Connection and display components



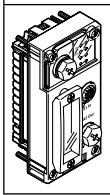
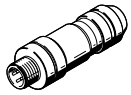
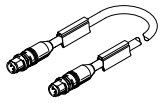
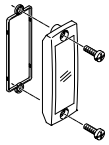
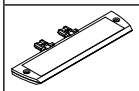
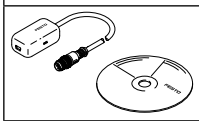
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface, input (socket M12x1, 4-pin, D-coded)
[4] Fieldbus interface, output (socket M12x1, 4-pin, D-coded)
[5] DIL switch

Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	FE	Shielding

Data sheet – EtherCAT bus node

Ordering data

Designation				Part no.	Type
Bus node					
	EtherCAT bus node			**2735960**	**CPX-FB37**
Bus connection					
	Plug M12x1, 4-pin, D-coded			**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Inspection cover, transparent			**533334**	**AK-SUB-9/15-B**
	Cover cap for sealing unused bus connections (10 pieces)			**165592**	**ISK-M12**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	Electronics manual, CPX bus node, type CPX-FB37		German	**8029674**	**P.BE-CPX-FB37-DE**
			English	**8029675**	**P.BE-CPX-FB37-EN**
			Spanish	**8029676**	**P.BE-CPX-FB37-ES**
			French	**8029677**	**P.BE-CPX-FB37-FR**
			Italian	**8029678**	**P.BE-CPX-FB37-IT**
			Chinese	**8029679**	**P.BE-CPX-FB37-ZH**

Data sheet – Sercos III bus node

- Sercos
- Web interface

Bus node for handling communication between the electrical terminal CPX and the Sercos III network.
The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.

Application

Bus connection

The bus connection is established via two M12x1 plugs, D-coded to IEC 947-5-2 with degree of protection to IP65, IP67. The connections are equipped with automatic detection for the incoming and outgoing connection.

The Sercos III bus node can be used to connect the CPX valve terminal to the standardised Sercos III bus.
Sercos III uses the Ethernet standard (IEEE802.3) and TCP/IP technology for communication in an industrial environment.

Industry-compatible Sercos III devices enable data to be exchanged with a higher data transmission rate, such as data from sensors, actuators or controllers.

Non-real-time critical information, such as diagnostics or configuration information, can also be transferred.

Web servers

In addition to activation via a bus system, it is possible to use IT technologies. An integrated web server enables diagnostic data to be visualised via HTML. Various programs support direct access to the device data from the automation network.

Points to note in connection with CPX-CEC

The CPX-FB39 supports the operating modes remote I/O and remote controller.
In remote I/O operating mode, all functions of the CPX valve terminal are directly controlled by the Sercos controller.
When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.
In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
- 8/16 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56/48 byte inputs
- 56/48 byte outputs

Data sheet – Sercos III bus node

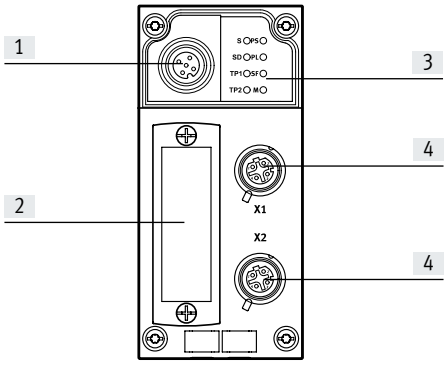
General technical data			
Type			CPX-FB39
Fieldbus interface			2x M12x1 socket, D-coded, 4-pin
Baud rate		[Mbps]	100 full/half duplex
Protocol			Sercos III
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	Bus-specific		S = Sercos LED SD = Sercos sub-device LED TP1 = Network active port 1 TP2 = Network active port 2
	Product-specific		M = Modify, parameterisation PL = Load supply PS = Electronics supply, sensor supply SF = System fault
Device-specific diagnostics			• Module and channel-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			SDDML file
Parameterisation			• Diagnostic behaviour • Fallback output data • Forcing of channels • Signal setup • System parameters
Additional functions			• Acyclic and cyclic data access via Sercos • IP addressing via Sercos parameters or operator unit • Channel-oriented diagnostics via fieldbus • Start-up parameterisation in plain text via fieldbus • System status can be displayed using process data • Additional diagnostic interface for operator units
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Current consumption at nominal voltage		[mA]	Typically 100
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials			PA-reinforced
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	125

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

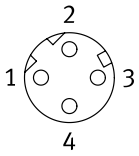
Data sheet – Sercos III bus node

Connection and display components



[1] Service interface for PC with CPX maintenance tool NEFC-M12G5-0.3-U1G5
[2] Transparent DIL switch cover
[3] Status LED, bus-specific and CPX-specific
[4] Fieldbus interface (M12x1 socket, 4-pin, D-coded)

Pin allocation for the fieldbus interface

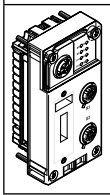
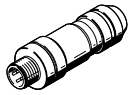
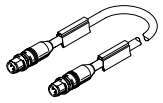
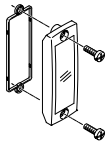
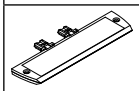
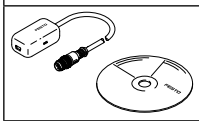
Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	FE	Shielding

Note

The CPX-FB39 can automatically detect transmitter and receiver cables (auto-MDI/MDI-X auto-crossover).
RD and TD signal pairs are automatically swapped if required.

Data sheet – Sercos III bus node

Ordering data

Designation				Part no.	Type
Bus node					
	Ethernet Sercos III bus node			**2093101**	**CPX-FB39**
Bus connection					
	Plug M12x1, 4-pin, D-coded			**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Inspection cover, transparent			**533334**	**AK-SUB-9/15-B**
	Cover cap for sealing unused bus connections (10 pieces)			**165592**	**ISK-M12**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	User documentation for bus node CPX-FB39		German	**8028632**	**P.BE-CPX-FB39-DE**
			English	**8028633**	**P.BE-CPX-FB39-EN**
			Spanish	**8028634**	**P.BE-CPX-FB39-ES**
			French	**8028635**	**P.BE-CPX-FB39-FR**
			Italian	**8028636**	**P.BE-CPX-FB39-IT**
			Chinese	**8028637**	**P.BE-CPX-FB39-ZH**

Data sheet – POWERLINK bus node

- Ethernet POWERLINK
- Web interface

Bus node for handling communication between the electrical terminal CPX and the Ethernet POWERLINK network. The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.

Application

Bus connection

The bus connection is established via an M12x1 plug, D-coded to IEC 947-5-2 with degree of protection IP65, IP67. Ethernet POWERLINK uses the Ethernet standards and TCP/IP technology (IEEE802.3) for communication in an industrial environment and integrates all CANopen mechanisms.

It includes all the key features of standard Ethernet, including internode communication, hotplug capability and free selection of network topology. Ethernet POWERLINK fulfils the real-time requirements using a mix of timeslot and polling procedures. In other words, defined times are reserved on the Ethernet cable exclusively for transferring real-time data. Only network participants which have previously been prompted by the controller are able to transmit data during these timeslots.

Ethernet POWERLINK implementation

The CPX-FB40 supports the two operating modes: remote I/O and remote controller.
In remote I/O operating mode, all functions of the CPX valve terminal are directly controlled by the Ethernet POWERLINK master (host).
In addition to activation via a bus system, it is possible to use IT technologies. An integrated web server enables diagnostic data to be visualised via HTML. Various programs support direct access to the device data from the automation network.
The Ethernet POWERLINK node for CPX supports the transmission technology that conforms to DIN EN 50173/CAT 5 as an integrated interface.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Data sheet – POWERLINK bus node

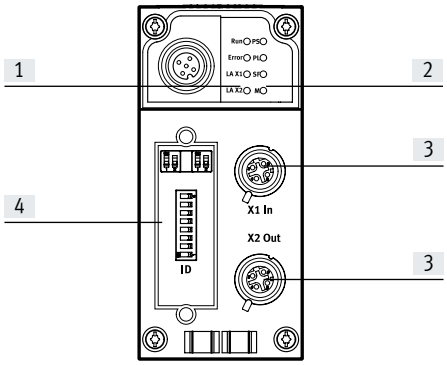
General technical data			
Type			CPX-FB40
Fieldbus interface			2x M12x1 socket, D-coded, 4-pin
Baud rate		[Mbps]	100
Protocol			Ethernet PowerLink V2
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	Bus-specific		BE = POWERLINK error BS = POWERLINK status L/A1 = Link/activity port 1 L/A2 = Link/activity port 2
	Product-specific		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Module and channel-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			• XDC file • XDD file
Parameterisation			• Diagnostic behaviour • Fail-safe response • Forcing of channels • Signal setup • System parameters
Additional functions			• Acyclic data access via "SDO" and Ethernet • Integrated hub • IP addressing via DHCP, DIL switch or operator unit • Channel-oriented diagnostics via fieldbus • Start-up parameterisation in plain text via fieldbus • System status can be displayed using process data • Additional diagnostic interface for operator units
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Reverse polarity protection		For operating voltage
Current consumption at nominal voltage		[mA]	Typically 100
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials			PA-reinforced
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	125

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

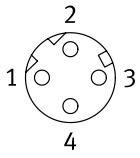
Data sheet – POWERLINK bus node

Connection and display components



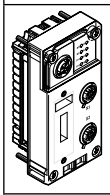
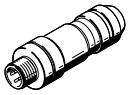
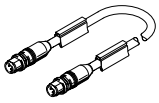
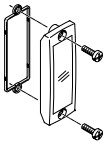
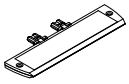
[1] Bus-specific status LEDs
[2] CPX-specific status LEDs
[3] Fieldbus interface (M12x1 socket, 4-pin, D-coded)
[4] Transparent DIL switch cover

Pin allocation for the fieldbus interface

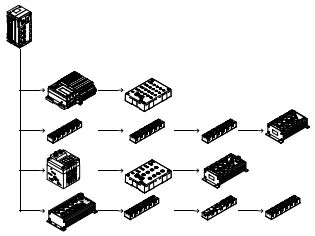
Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	FE	Shielding

Data sheet – POWERLINK bus node

Ordering data

Designation				Part no.	Type
Bus node					
	Ethernet POWERLINK bus node			**2474896**	**CPX-FB40**
Bus connection					
	Plug M12x1, 4-pin, D-coded			**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Inspection cover, transparent			**533334**	**AK-SUB-9/15-B**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
	5-pin M12 to mini USB socket adapter and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	User documentation for bus node CPX-FB40		German	**8028650**	**P.BE-CPX-FB40-DE**
			English	**8028651**	**P.BE-CPX-FB40-EN**
			Spanish	**8028652**	**P.BE-CPX-FB40-ES**
			French	**8028653**	**P.BE-CPX-FB40-FR**
			Italian	**8028654**	**P.BE-CPX-FB40-IT**
			Chinese	**8028655**	**P.BE-CPX-FB40-ZH**

Data sheet – Interface for CPI system



The electrical interface CPX-CP establishes the connection to CP modules of the installation system CPI via pre-assembled connecting cables. The I/O data of the connected valve terminals with CP string extension and CP input and output modules are transferred to the connected CPX bus node and thus via fieldbus to the higher-order controller.
This enables modular centralised and compact decentralised concepts to be established with one system.

Application

CP connection

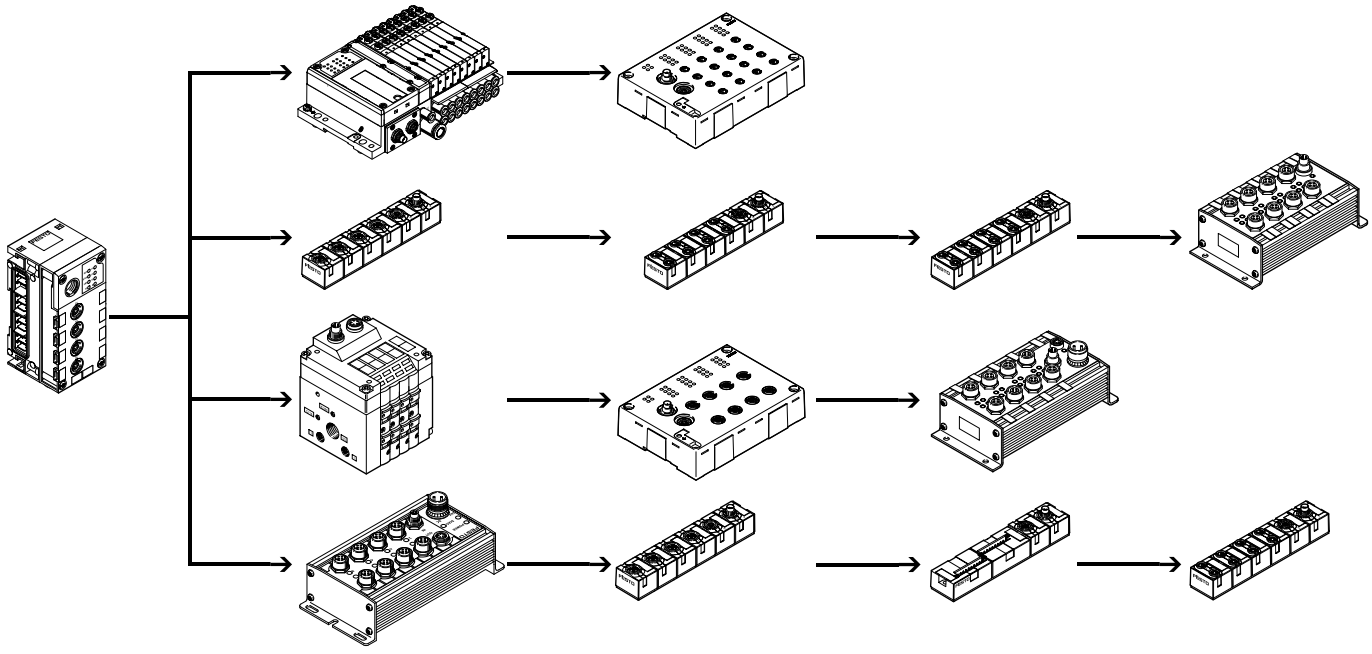
As well as transmitting the communication data, the max. 4 CP strings of a CPX-CP interface also transmit the power supply to the connected sensors and the load supply to the valves (or outputs). Both circuits are supplied separately with 24 V but using a common reference potential.

The valve terminals with CP string extension (or outputs) are supplied with voltage for the electronics and valves by the interlinking block.

The CP interface allows the following combinations:

- Centralised analogue and digital inputs and outputs of the CPX terminal
- Decentralised digital inputs and outputs of the CP installation system
- Valve/valve terminals that can be connected both centrally and decentrally

Configuration example – CP interface with CP modules



Data sheet – Interface for CPI system

Implementation

The CPX-CP interface supports the CPI system:
- Max. 4 individual electronically protected CP strings
- Max. 4 CP modules per string
- Max. 32 inputs/32 outputs per string
- The maximum length of a string is 10 m. If the CP interface is positioned centrally, the CP system can cover an area of 20 m in diameter.
- Modules with CPI functionality

Note

When arranging the CP modules it should be taken into consideration that CP input modules without CPI functionality should always be placed at the end of a string.

The following CP module variants are available:
- Input modules with 8 or 16 digital inputs (connection technology M8, M12 and CageClamp)
- Output modules with 4 or 8 digital outputs (connection technology M12)
- Valve terminals with CP string extension (up to 32 solenoid coils, different valve functions)

CPI modules support the following functions:
- Module-oriented diagnostics
- Module/channel-oriented parameterisation
- Support of all functions by the CPX-FMT
- Module can be positioned anywhere within the string

Several CP interface modules can be combined in one CPX terminal, depending on the address capacity of the bus node.
Example:
- CPX-FB13 (512 I/O)
- Max. 4 CP interface modules (128 I/O each) possible

Configuration

The following rules apply for a string of a CPX-CP interface:
- Max. one output module or one valve terminal without CPI functionality
- Max. one output module without CPI functionality or one valve terminal with CP string extension
- Any number of CP modules with CPI functionality, up to the maximum limit of 4 modules and/or 32 inputs/32 outputs per string

Note

The remanent saving of configuration data means that changes in the configuration or faulty modules are still displayed even after a voltage failure.

- Maximum extension:
- 4 input modules and 4 valve terminals/output modules without CPI functionality
- 16 CP modules with CPI functionality

The configuration of the strings with respect to the module type and position of the modules in the string is entered by activating the SAVE key in the CPX-CP interface and saved there remanently.
Saved data are retained even when the CP interface is isolated from the power supply.

The representation of the CP interface within a CPX terminal and thus at the fieldbus is dependent on the characteristics of the relevant fieldbus system. In addition to input and output addressing, this also applies to the representation of the diagnostics and parameterisation of the CP module and the characteristics of the CPI system.

Data sheet – Interface for CPI system

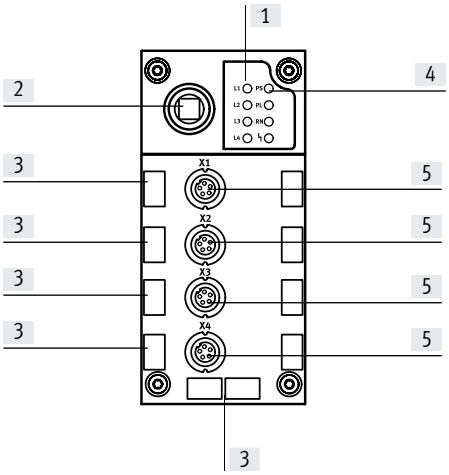
General technical data			
Type			CPX-CP-4-FB
Brief description			CP interface
Max. number of	CP strings		4
	CP modules per string		4
	Outputs per string		32
	Inputs per string		32
CP connection			Socket M9, 5-pin
Baud rate		[kbps]	1000
Cycle time	CP modules without CPI functionality	[ms]	4
	CP modules with CPI functionality	[ms]	2
LED displays			L1 ... 4= Status of the CP string 1 ... 4 PS = Electronics supply, sensor supply PL = Load supply RN = Status of the CP system SF = System fault
Device-specific diagnostics			Via bus node
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Sensor supply voltage		[V DC]	24 ±25% coming from bus node
Actuator load voltage		[V DC]	24 ±10% coming from bus node
Current consumption	Without CP modules	[A]	Max. 0.2
	Per CP string	[A]	Max. 1.6
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			PA
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 45
Product weight		[g]	139

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

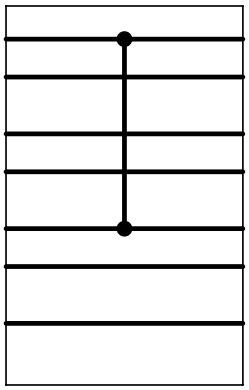
Data sheet – Interface for CPI system

Connection and display components



[1] CP string LEDs
[2] SAVE key
[3] Holders for inscription labels (IBS 6x10)
[4] CPX-specific status LEDs
[5] CP connections for up to 4 strings (0 ... 3)

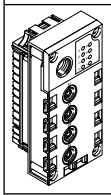
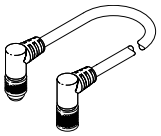
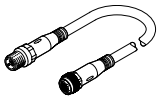
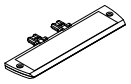
Power supply



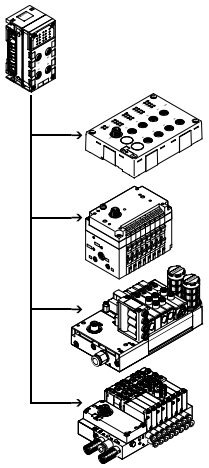
The module combines the 0 V potential of the power supply for electronics and sensors with the 0 V potential of the power supply for valves.
If all pins of the valves of a pneumatic interface connected to the right of the CP interface are to be switched off, an appropriate interlinking block with additional supply for valves must be used to the right of the CP interface.

Data sheet – Interface for CPI system

Ordering data

Designation			Part no.	Type
CP interface				
	Interface for max. 16 I/O modules and valve terminals of the CPI system		**526705**	**CPX-CP-4-FB**
Bus connection				
	Cover cap	M12	**165592**	**ISK-M12**
	Connecting cable, angled plug, angled socket	0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
		0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
		2 m	**540329**	**KVI-CP-3-WS-WD-2**
		5 m	**540330**	**KVI-CP-3-WS-WD-5**
		8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable, straight plug, straight socket	2 m	**540332**	**KVI-CP-3-GS-GD-2**
		5 m	**540333**	**KVI-CP-3-GS-GD-5**
		8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
User documentation				
	User documentation for CPX-CP interface	German	**539293**	**P.BE-CPX-CP-EN**
		English	**539294**	**P.BE-CPX-CP-EN**
		Spanish	**539295**	**P.BE-CPX-CP-ES**
		French	**539296**	**P.BE-CPX-CP-FR**
		Italian	**539297**	**P.BE-CPX-CP-IT**

Data sheet – I-Port interface



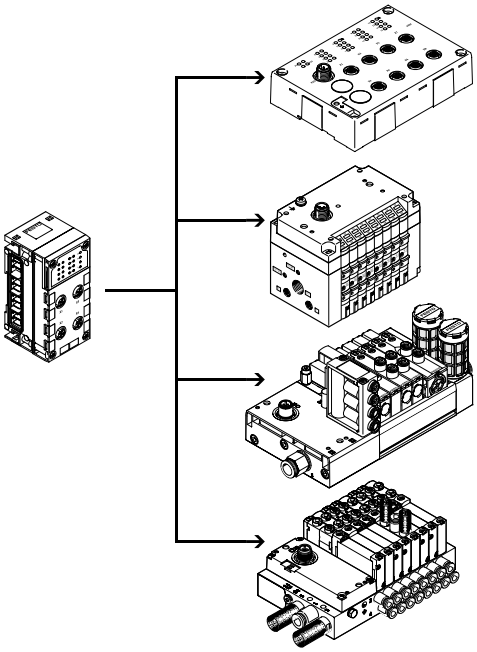
The electrical interface CPX CTEL master establishes the connection to modules of the CTEL/CTEU series that have an I-Port interface (device). The I/O data from the connected devices are transmitted to the connected CPX bus node and thus to the higher-order controller via fieldbus.
A maximum of 4 devices can be connected to a CPX CTEL master via corresponding M12 interfaces.

Application

I-Port interface

As well as transmitting the communication data, the I-Port interfaces of a CPX CTEL master also transmit the power supply to the connected sensors and the load supply to the valves (or outputs). Both circuits are supplied separately with 24 V, using a separate reference potential.
The connecting cables with a dual function as signal cable and supply cable must meet the corresponding increased requirements.

Configuration example – CPX CTEL master with CTEL modules



The CPX CTEL master provides 4 external I-Port interfaces, each of which can be connected to a device. I-Port is an interface for exchanging serial data for connecting decentralised modules or valve terminals from Festo. The I-Port interface is based on IO-Link and is compatible with it in certain areas.
The connection type corresponds to a star topology. In other words, only one module or valve terminal can be connected to each I-Port.

The limitations with respect to IO-Link include:

- Permanently set baud rate of 230.4 kbps
- SIO mode is not supported
- Max. 32 bytes of input data and 32 bytes of output data
- Only one dump of the master commands is used
- Configuration via IODD is not supported.

Data sheet – I-Port interface

Implementation

The CPX CTEL master from Festo enables modules with an I-Port interface to be connected to a CPX system:
- Max. 4 devices with individual electronic protection
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m.

The following device variants are available:
- Input modules with 16 digital inputs (connection technology M8 3-pin and M12 5-pin)
- Valve terminals with I-Port interface (up to 48 solenoid coils, different valve functions)

The decentralised arrangement of the modules and valve terminals with I-Port enables them to be mounted close to the cylinders and actuators or sensors to be controlled. This means that the compressed air supply lines and sensor connecting cables used can be shortened, and it may be possible to use smaller valves, thereby saving costs.

Several CPX CTEL masters can be combined in one CPX terminal, depending on the address capacity of the bus node.
Example:
- CPX-FB13 (512 I/O)
- A maximum of 2 CPX CTEL masters is possible (each with 256 I/O)

Configuration

Settings

The exact amount of the I/O bytes made available depends on the requirements of the connected devices or of the correspondingly selected operating mode.
The operating mode or preset configuration of the CPX CTEL master can be specified by the user.
Selecting the operating mode and setting the manual configuration takes place via the DIL switches. These DIL switches are not required during continuous operation and are only accessible in the disassembled state.

Manual configuration

In the case of manual configuration (tool change mode), the volume of inputs and outputs in the process image of the CPX system or of the higher-order fieldbus can be defined manually using the DIL switches.

The process image then always has the same scope, regardless of the connected devices.
The I/O length specified always applies to all four I-Ports (max. 8 bytes per I-Port).

Automatic configuration

In the case of automatic configuration, the I/O length for each I-Port is determined individually and this value is used to select the appropriate or next highest configuration preset.

Power supply for I-Port devices

The CPX-CTEL master provides two separate power supplies for the connected devices:
- For operating the device and the inputs connected to it
- For the outputs and valves that are connected to the device

The power supply for the devices and the inputs is provided by the power supply for the electronics and sensors of the CPX terminal.
The power supply for the outputs and valves is provided by the power supply for the valves of the CPX terminal.

The interlinking block with additional supply ensures a separate supply voltage for the valves and outputs. This means it is possible to disconnect this supply voltage separately.
The valves and outputs of the connected I-Port devices can therefore be disconnected separately without disconnecting the devices.

Data sheet – I-Port interface

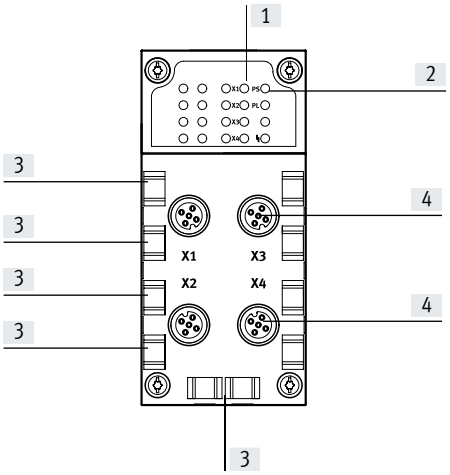
General technical data			
Type			CPX-CTEL-4-M12-5POL
Protocol			I-Port
Max. address capacity	Outputs	[bit]	256
	Inputs	[bit]	256
I-Port connection			4x socket M12, 5-pin, A-coded
Number of I-Port interfaces			4
Maximum cable length		[m]	20
Internal cycle time		[ms]	1 per 8 bits of user data
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes, with intermediate supply
LED displays			X1 ... 4 = Status of the I-Port interface 1 ... 4 PS = Electronic supply PL = Load supply ⌁ = Module error
Diagnostics			• Communication error • Module short circuit • Module-oriented diagnostics • Undervoltage
Parameterisation			• Diagnostic behaviour • Failsafe per channel • Forcing per channel • Idle mode per channel • Module parameters • Tool change mode
Additional functions			Tool change mode
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 65
Max. power supply per channel		[A]	4x 1.6
Max. residual current of outputs per channel		[A]	4x 1.6
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 55
Product weight		[g]	110

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

Data sheet – I-Port interface

Connection and display components

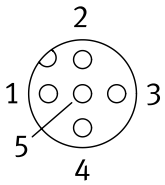


[1] Status LEDs for I-Port interfaces
[2] CPX-specific status LEDs
[3] Holders for inscription labels (IBS 6x10)
[4] I-Port interfaces for up to 4 devices

Combinations of bus nodes/control blocks with interface CPX-CTEL

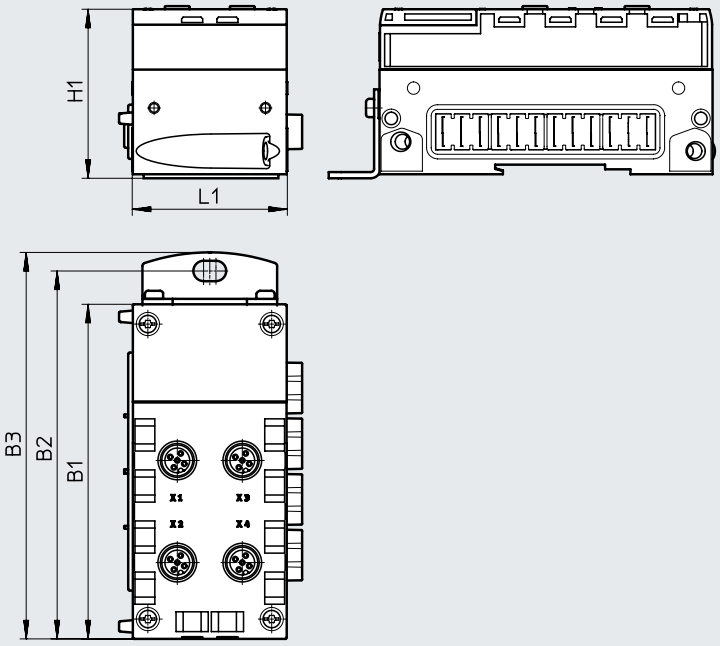
Bus node/control block	Part no.	Interface
		CPX-CTEL-4-M12-5POL
CPX-CEC-C1	**567347**	■
CPX-CEC-C1-V3	**3473128**	■
CPX-CEC-M1-V3	**3472765**	■
CPX-CEC	**567346**	■
CPX-CEC-S1-V3	**3472425**	■
CPX-FB11	**526172**	■
CPX-FB13	**195740**	■
CPX-FB14	**526174**	■
CPX-FB23-24	**526176**	■
CPX-FB36	**1912451**	■
CPX-FB37	**2735960**	■
CPX-FB39	**2093101**	■
CPX-FB40	**2474896**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**	■
CPX-M-FB45	**8110371**	■

Pin allocation – I-Port interface

Terminal allocation	Pin	Signal	Designation
	1	24 V_{SEN}	24 V DC supply voltage for electronics and inputs
	2	24 V_{VAL}	24 V DC load voltage supply for valves and outputs
	3	0 V_{SEN}	0 V DC supply voltage for electronics and sensors
	4	C/Q $_{I\text{-}Port}$	Communication signal C/Q, data transmission line
	5	0 V_{VALVES}	0 V DC load voltage supply for valves and outputs

Data sheet – I-Port interface

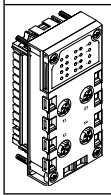
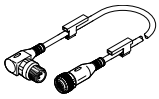
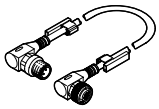
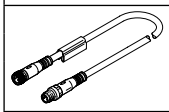
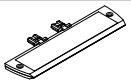
Dimensions Download CAD data ➔ www.festo.com



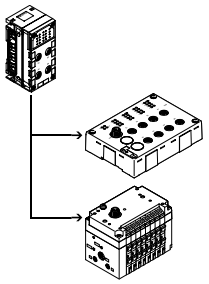
Type	B1	B2	B3	H1	L1
CPX-CTEL-4-M12-5POL	108.1	118.9	124.9	55.1	50

Data sheet – I-Port interface

Ordering data

Designation				Part no.	Type
CPX-CTEL master					
	Interface for a maximum of 4 I/O modules and valve terminals with I-Port interface (devices)			**1577012**	**CPX-CTEL-4-M12-5POL**
Bus connection					
	Cover cap	M12		**165592**	**ISK-M12**
	Connecting cable M12-M12, 5-pin • Straight socket • Angled plug	Cable characteristic: standard	0.5 m	**8003617**	**NEBU-M12G5-K-0.5-M12W5**
			2 m	**8003618**	**NEBU-M12G5-K-2-M12W5**
	Connecting cable M12-M12, 5-pin • Angled socket • Angled plug	Cable characteristic: standard	0.5 m	**570733**	**NEBU-M12W5-K-0.5-M12W5**
			2 m	**570734**	**NEBU-M12W5-K-2-M12W5**
	Connecting cable M12-M12, 5-pin • Straight socket • Straight plug	Cable characteristic: suitable for use with energy chains	5 m	**574321**	**NEBU-M12G5-E-5-Q8N-M12G5**
			7.5 m	**574322**	**NEBU-M12G5-E-7.5-Q8N-M12G5**
			10 m	**574323**	**NEBU-M12G5-E-10-Q8N-M12G5**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
User documentation					
	User documentation CPX CTEL master	German		**574600**	**P.BE-CPX-CTEL-DE**
		English		**574601**	**P.BE-CPX-CTEL-EN**
		Spanish		**574602**	**P.BE-CPX-CTEL-ES**
		French		**574603**	**P.BE-CPX-CTEL-FR**
		Italian		**574604**	**P.BE-CPX-CTEL-IT**

Data sheet – IO-Link interface



The electrical interface CPX-CTEL-2-... enables the connection of modules with IO-Link interface (IO-Link device) to the CPX terminal. The I/O data from the connected devices are transmitted to the connected CPX bus node and thus to the higher-order controller via fieldbus.
A maximum of two IO-Link devices can be connected to an electrical interface CPX-CTEL-2-... via the corresponding M12 interfaces.

Application

The communication system IO-Link is used to exchange serial data from decentralised function modules (devices) at the field level.
The electrical interface CPX-CTEL-2-... provides two external IO-Link interfaces, each of which can be connected to a device.
The connection type corresponds to a star topology, which means that only one device can be connected to each port.

The address space that the module makes available and assigns accordingly in the CPX system can be configured according to various presettings. Selecting the operating mode and setting the manual configuration takes place via the DIL switches.

These DIL switches are not required during continuous operation and are only accessible in the disassembled state.

Restrictions

The interfaces (ports) of electrical interface CPX-CTEL-2-... support the connection of IO-Link devices with few limitations.

- The process data length of the inputs and outputs is limited to 16 bytes each per port
- The driver strength on the C/Q line is limited to 250 mA
- SIO mode is not supported

Power supply for devices

The electrical interface CPX-CTEL-2-... provides two separate power supplies for the connected devices:
- For operating the device and the inputs connected to it
- For the outputs and valves that are connected to the device

The power supply for the devices and the inputs is provided by the power supply for the electronics and sensors of the CPX terminal.
The power supply for the outputs and valves is provided by the power supply for the valves of the CPX terminal.
The interlinking block with additional supply ensures a separate supply voltage for the valves and outputs. This means it is possible to disconnect this supply voltage separately.
The valves and outputs of the connected I-Port devices can therefore be disconnected separately without disconnecting the devices.

Data sheet – IO-Link interface

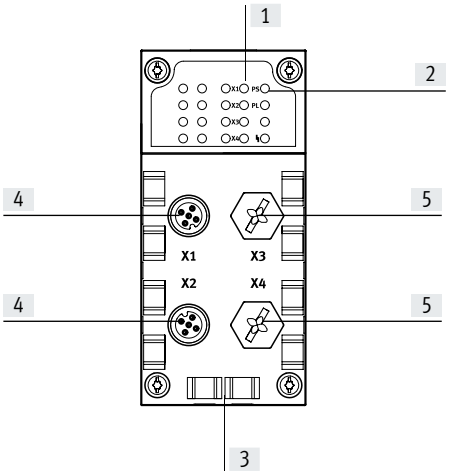
General technical data			
Type			CPX-CTEL-2-M12-5POL-LK
Protocol			IO-Link, master version V 1.0
Max. address capacity	Outputs	[bit]	256
	Inputs	[bit]	256
I-Port connection			2x socket M12, 5-pin, A-coded
Number of IO-Link interfaces			2
Maximum cable length		[m]	20
Internal cycle time		[ms]	1 per 8 bits of user data
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes, with intermediate supply
LED displays			X1 ... 2 = Status of the IO-Link interface 1 ... 2 PS = Electronic supply PL = Load supply ⌐┐ = Module error
Diagnostics			• Communication error • Module short circuit • Module-oriented diagnostics • Undervoltage
Parameterisation			• Diagnostic behaviour • Failsafe per channel • Forcing per channel • Idle mode per channel • Module parameters
Additional functions			–
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 65
Max. power supply per channel		[A]	2x 1.6
Max. residual current of outputs per channel		[A]	2x 1.6
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 55
Product weight		[g]	110

Note

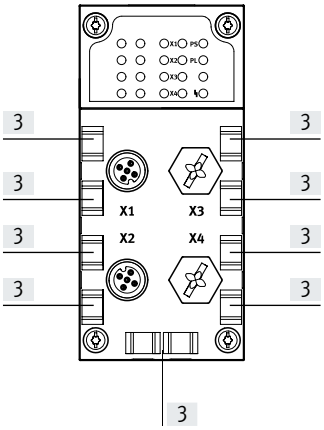
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Data sheet – IO-Link interface

Connection and display components



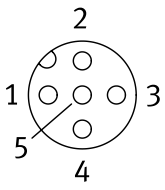
[1] Status LEDs for I-Port interfaces
[2] CPX-specific status LEDs
[3] Holders for inscription labels (IBS 6x10)
[4] IO-Link interfaces for up to 2 devices
[5] Unused connections



Combinations of bus nodes/control blocks with interface CPX-CTEL-2

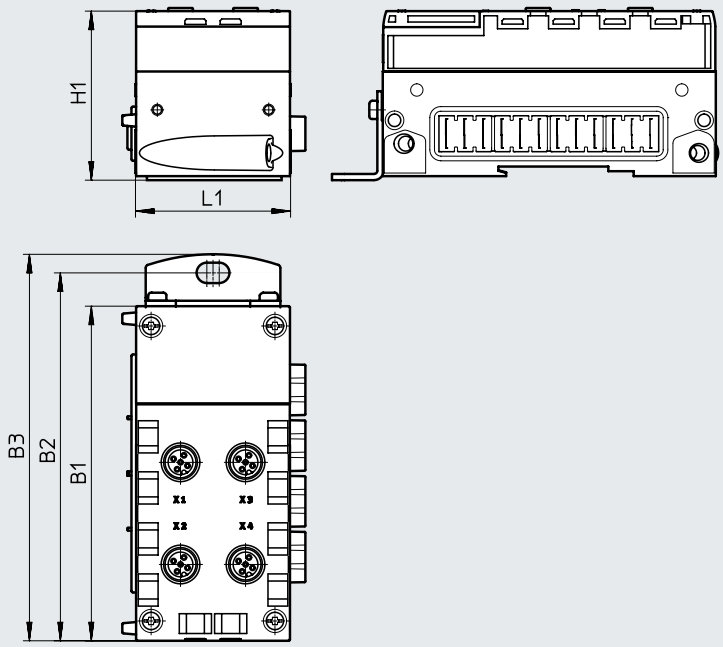
Bus node/control block	Part no.	Interface
		CPX-CTEL-2-M12-5POL-LK
CPX-CEC-C1-V3	**3473128**	■
CPX-CEC-M1-V3	**3472765**	■
CPX-CEC-S1-V3	**3472425**	■
CPX-FB36	**1912451**	■
CPX-FB39	**2093101**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**	■
CPX-M-FB45	**8110371**	■

Pin allocation of IO-Link interface

Terminal allocation	Pin	Signal	Designation
	1	24 V_{SEN}	24 V DC supply voltage for electronics and inputs
	2	24 V_{VAL}	24 V DC load voltage supply for valves and outputs
	3	0 V_{SEN}	0 V DC supply voltage for electronics and sensors
	4	C/Q $_{I\text{-}Port}$	Communication signal C/Q, data transmission line
	5	0 V_{VALVES}	0 V DC load voltage supply for valves and outputs

Data sheet – IO-Link interface

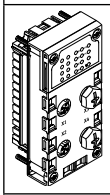
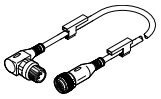
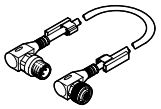
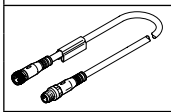
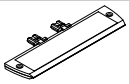
Dimensions Download CAD data ➔ www.festo.com



Type	B1	B2	B3	H1	L1
CPX-CTEL-2-M12-5POL-LK	108.1	118.9	124.9	55.1	50

Data sheet – IO-Link interface

Ordering data

Designation				Part no.	Type
CPX CTEL master, IO-Link					
	Interface for max. 2 I/O modules and valve terminals with IO-Link interface (devices)			**2900543**	**CPX-CTEL-2-M12-5POL-LK**
Bus connection					
	Cover cap	M12		**165592**	**ISK-M12**
	Connecting cable M12-M12, 5-pin • Straight socket • Angled plug	Cable characteristic: standard	0.5 m	**8003617**	**NEBU-M12G5-K-0.5-M12W5**
			2 m	**8003618**	**NEBU-M12G5-K-2-M12W5**
	Connecting cable M12-M12, 5-pin • Angled socket • Angled plug	Cable characteristic: standard	0.5 m	**570733**	**NEBU-M12W5-K-0.5-M12W5**
			2 m	**570734**	**NEBU-M12W5-K-2-M12W5**
	Connecting cable M12-M12, 5-pin • Straight socket • Straight plug	Cable characteristic: suitable for use with energy chains	5 m	**574321**	**NEBU-M12G5-E-5-Q8N-M12G5**
			7.5 m	**574322**	**NEBU-M12G5-E-7.5-Q8N-M12G5**
			10 m	**574323**	**NEBU-M12G5-E-10-Q8N-M12G5**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
User documentation					
	User documentation CPX CTEL master	German		**8034115**	**P.BE-CPX-CTEL-LK-DE**
		English		**8034116**	**P.BE-CPX-CTEL-LK-EN**
		Spanish		**8034117**	**P.BE-CPX-CTEL-LK-ES**
		French		**8034118**	**P.BE-CPX-CTEL-LK-FR**
		Italian		**8034119**	**P.BE-CPX-CTEL-LK-IT**
		Swedish		**8034120**	**P.BE-CPX-CTEL-LK-ZH**

Data sheet – Axis controller for 4 electric axes

The control block CPX-CM-HPP is a module in the CPX terminal for controlling electric drives.
The control component is independent of the bus node used.
This means that Festo's electric drive technology is compatible with all industrial communication interfaces.
The control block does not need to be programmed.

- Max. 4 individual electric axes can be controlled via CAN bus
- No programming required
- Standardised communication with the drives via the Festo Handling and Positioning Profile (FHPP)
- Quick configuration and diagnostics via CPX-FMT
- Simple, flexible and cost-effective

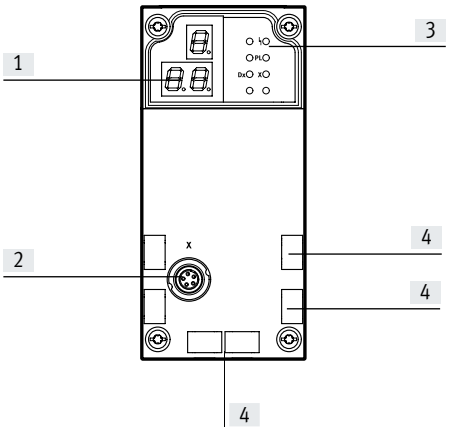
General technical data		
Fieldbus interface		1x socket M9, 5-pin
Protocol		FHPP
Max. address capacity inputs	[byte]	32
Max. address volume for outputs	[byte]	32
LED display (product-specific)		Error: Fault
		PL: Power supply
Device-specific diagnostics		Diagnostic memory
		Channel and module-oriented diagnostics
		Undervoltage/short circuit of modules
Parameterisation		Forcing of channels
		System parameters
Configuration support		Operator unit CPX-MMI
Total number of axes		4
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Power failure buffering	[ms]	10
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 80
Degree of protection to EN 60529 (with plug inserted)		IP65/IP67
Dimensions W x L x H (including interlinking block)	[mm]	50 x 107 x 55
Product weight (without interlinking block)	[g]	140
Materials		
Housing		PA-reinforced
		PC
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L

Technical data – Interfaces		
Interface		
Control interface		CAN bus
Baud rate	[Mbps]	1

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
CE marking (see declaration of conformity)		To EU Low Voltage Directive

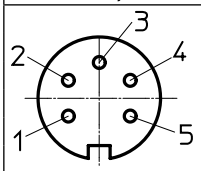
Data sheet – Axis controller for 4 electric axes

Connection and display components



[1] 3-digit display
[2] Control interface
[3] LED display (product-specific)
[4] Inscription labels

Pin allocation – Control interface

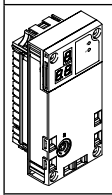
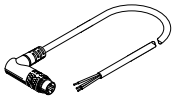
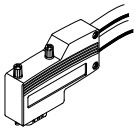
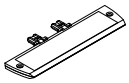
	Pin	Signal	Meaning
Socket M9, 5-pin			
	1	n.c.	Not connected
	2	n.c.	Not connected
	3	CAN_GND	CAN ground
	4	CAN_H	CAN high
	5	CAN_L	CAN low
	Housing	Shielding	Cable shield must be connected to functional earth (FE)

Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. number of CPX-CM-HPP modules
CPX-CEC...	–	0
CPX-FB11	DeviceNet	2
CPX-FB13	PROFIBUS	2
CPX-FB14	CANopen	1
CPX-FB23-24	CC-Link	1 (as function module F23)
		0 (as function module F24)
CPX-FB36	EtherNet/IP	2
CPX-FB37	EtherCAT	2
CPX-FB39	Sercos III	2
CPX-FB40	POWERLINK	2
CPX-FB43	PROFINET RT, M12	2
CPX-M-FB44	PROFINET RT, RJ45	2
CPX-M-FB45	PROFINET RT, SCRJ	2

Data sheet – Axis controller for 4 electric axes

Ordering data – Bus connection

Designation			Part no.	Type
Control block				
	For actuating up to 4 electric drives via CAN bus		**562214**	**CPX-CM-HPP**
Connecting cable				
	Connecting cable	2 m	**563711**	**NEBC-M9W5-K-2-N-LE3**
		5 m	**563712**	**NEBC-M9W5-K-5-N-LE3**
	Plug for CAN bus interface; Sub-D, 9-pin, without terminating resistor		**533783**	**FBS-SUB-9-WS-CO-K**
Inscription labels				
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
User documentation				
	Manual – Control block CPX-CM-HPP	German	**568683**	**CPX-CM-HPP-DE**
		English	**568684**	**CPX-CM-HPP-EN**

Data sheet – Axis controller for 1 electric axis

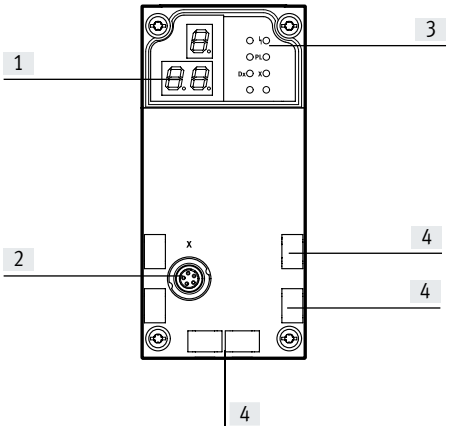
The axis controller CPX-CMAX is intended exclusively for use in valve terminals CPX.

General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	200
Fuse protection (short circuit)			Electronic
Power failure buffering		[ms]	10
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Permissible load current		[A]	2.5
Fuse protection (short circuit)			Electronic
Number of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. number of modules			7
Display			7-segment display
Assigned addresses	Outputs	[bit]	8x8
	Inputs	[bit]	8x8
Operating modes			Record mode
			Direct mode
Controller types			Position control
			Force control
Diagnostics			Module-orientated
			Via local 7-segment display
Status indication			Module status
			Power load
			Display/Error Axis X
			MC Axis X
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			PA-reinforced
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Product weight		[g]	240
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Data sheet – Axis controller for 1 electric axis

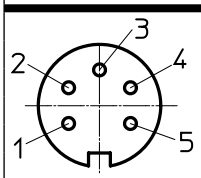
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

Connection and display components



[1] 3-digit display
[2] Control interface
[3] Status LEDs
[4] Inscription labels

Pin allocation – Control interface



Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN high
5	CAN_L	CAN low
Housing	Shielding	Cable shielding

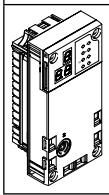
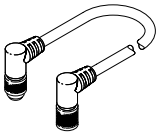
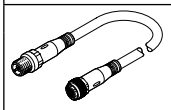
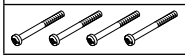
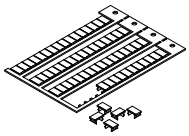
Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. number of CMAX modules
CPX-CEC...	–	8
CPX-FB11	DeviceNet[1)]	8
CPX-FB13	PROFIBUS[2)]	8
CPX-FB14	CANopen	4
CPX-FB23-24	CC-Link	4 (as function module F23)
		8 (as function module F24)
CPX-FB36	EtherNet/IP	8
CPX-FB37	EtherCAT	8
CPX-FB39	Sercos III	8
CPX-FB40	POWERLINK	8
CPX-FB43	PROFINET RT, M12	8
CPX-M-FB44	PROFINET RT, RJ45	8
CPX-M-FB45	PROFINET RT, SCRJ	8

1) As of revision 20 (R20)
2) As of revision 23 (R23)

Data sheet – Axis controller for 1 electric axis

Ordering data

	Brief description		Part no.	Type
Axis controller				
	Order code in the CPX configurator: T21		**548932**	**CPX-CMAX-C1-1**
Connecting cables				
	Connecting cable with angled plug and angled socket	0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
		0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
		2 m	**540329**	**KVI-CP-3-WS-WD-2**
		5 m	**540330**	**KVI-CP-3-WS-WD-5**
		8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2 m	**540332**	**KVI-CP-3-GS-GD-2**
		5 m	**540333**	**KVI-CP-3-GS-GD-5**
		8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting component for cabinet through feed		**543252**	**KVI-CP-3-SSD**
Screws				
	For mounting on the metal interlinking block		**550219**	**CPX-M-M3X22-4X**
Inscription labels				
	Inscription labels 6x10, in frames	64 pieces	**18576**	**IBS-6x10**
User documentation				
	Manual – Axis controller CPX-CMAX[1)]	German	**559750**	**P.BE-CPX-CMAX-SYS-DE**
		English	**559751**	**P.BE-CPX-CMAX-SYS-EN**
		Spanish	**559752**	**P.BE-CPX-CMAX-SYS-ES**
		French	**559753**	**P.BE-CPX-CMAX-SYS-FR**
		Italian	**559754**	**P.BE-CPX-CMAX-SYS-IT**

1) User documentation in paper form is not included in the scope of delivery.

Data sheet – End-position controller

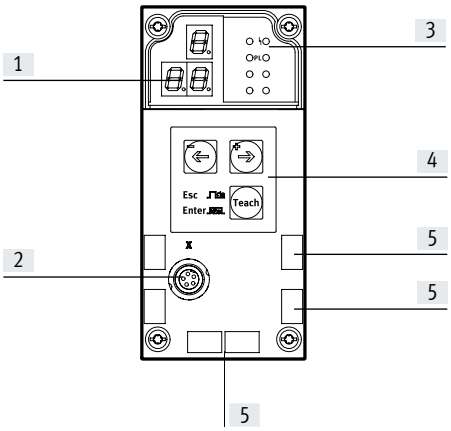
The end-position controller CPX-CMPX is intended exclusively for use in valve terminals CPX.

General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	80
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Permissible load current		[A]	2.5
Number of axes per module			1
Length of connecting cable to axis		[m]	≤ 30
Max. number of modules			9
Display			7-segment display
Control elements			3 buttons
Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8
Diagnostics			Module-orientated
			Via local 7-segment display
Status indication			Module status
			Power load
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			PA-reinforced
PWIS conformity			VDMA24364-B2-L
Product weight		[g]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Data sheet – End-position controller

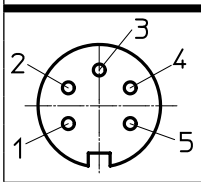
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65
CE marking (see declaration of conformity)		To EU EMC Directive

Connection and display components



[1] 3-digit display
[2] Control interface
[3] Status LEDs
[4] Operating buttons
[5] Inscription labels

Pin allocation – Control interface



Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN high
5	CAN_L	CAN low
Housing	Shielding	Cable shielding

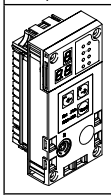
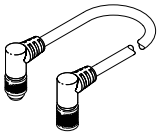
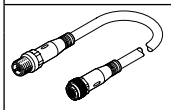
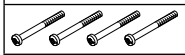
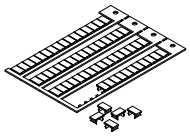
Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. no. of CMPX modules
CPX-CEC...	–	9
CPX-FB11	DeviceNet[1)]	9
CPX-FB13	PROFIBUS[2)]	9
CPX-FB14	CANopen	5
CPX-FB23-24	CC-Link	5 (as function module F23)
		9 (as function module F24)
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-FB43	PROFINET RT, M12	9
CPX-M-FB44	PROFINET RT, RJ45	9
CPX-M-FB45	PROFINET RT, SCRJ	9

1) As of revision 20 (R20)
2) As of revision 23 (R23)

Data sheet – End-position controller

Ordering data

	Brief description		Part no.	Type
End-position controller				
	Order code in the CPX configurator: T20		**548931**	**CPX-CMPX-C-1-H1**
Connecting cables				
	Connecting cable with angled plug and angled socket	0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
		0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
		2 m	**540329**	**KVI-CP-3-WS-WD-2**
		5 m	**540330**	**KVI-CP-3-WS-WD-5**
		8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2 m	**540332**	**KVI-CP-3-GS-GD-2**
		5 m	**540333**	**KVI-CP-3-GS-GD-5**
		8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting component for cabinet through feed		**543252**	**KVI-CP-3-SSD**
Screws				
	For mounting on the metal interlinking block		**550219**	**CPX-M-M3X22-4X**
Inscription labels				
	Inscription labels 6x10, in frames	64 pieces	**18576**	**IBS-6x10**
User documentation				
	Manual – End-position controller CPX-CMPX[1)]	German	**555479**	**P.BE-CPX-CMPX-SYS-DE**
		English	**555480**	**P.BE-CPX-CMPX-SYS-EN**
		Spanish	**555481**	**P.BE-CPX-CMPX-SYS-ES**
		French	**555482**	**P.BE-CPX-CMPX-SYS-FR**
		Italian	**555483**	**P.BE-CPX-CMPX-SYS-IT**

1) User documentation in paper form is not included in the scope of delivery.

Data sheet – Measuring module for displacement encoder

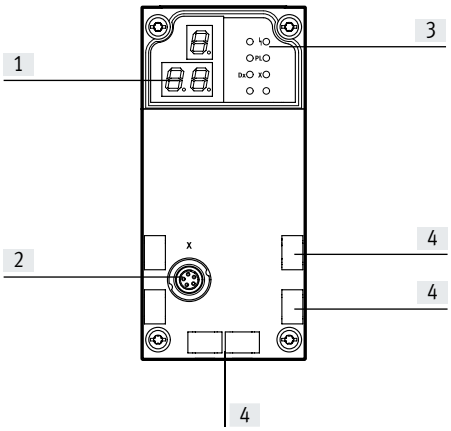
The measuring module CPX-CMIX is intended exclusively for use in valve terminals CPX.

General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	80
Short circuit current rating			Yes
Power failure buffering		[ms]	10
Number of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. number of modules			9
Display			7-segment display
Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8
Diagnostics			Channel and module-oriented
			Via local 7-segment display
			Undervoltage of modules
			Undervoltage of measuring system
Status indication			Power load
			Error
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			PA-reinforced
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Product weight		[g]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Data sheet – Measuring module for displacement encoder

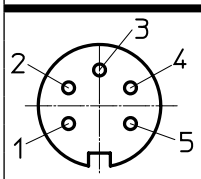
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

Connection and display components



[1] 3-digit display
[2] Control interface
[3] Status LEDs
[4] Inscription labels

Pin allocation – Control interface



Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN high
5	CAN_L	CAN low
Housing	Shielding	Cable shielding

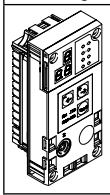
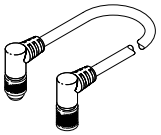
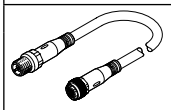
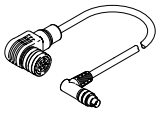
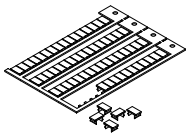
Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. number of CMIX modules
CPX-CEC...	–	9
CPX-FB11	DeviceNet[1)]	9
CPX-FB13	PROFIBUS[2)]	9
CPX-FB14	CANopen	5
CPX-FB23-24	CC-Link	5 (as function module F23)
		9 (as function module F24)
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-FB43	PROFINET RT, M12	9
CPX-M-FB44	PROFINET RT, RJ45	9
CPX-M-FB45	PROFINET RT, SCRJ	9

1) As of revision 20 (R20)
2) As of revision 23 (R23)

Data sheet – Measuring module for displacement encoder

Ordering data

	Brief description		Part no.	Type
Measuring module				
	Order code in the CPX configurator: T23		**567417**	**CPX-CMIX-M1-1**
Connecting cables				
	Connecting cable with angled plug and angled socket	0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
		0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
		2 m	**540329**	**KVI-CP-3-WS-WD-2**
		5 m	**540330**	**KVI-CP-3-WS-WD-5**
		8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2 m	**540332**	**KVI-CP-3-GS-GD-2**
		5 m	**540333**	**KVI-CP-3-GS-GD-5**
		8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting component for cabinet through feed		**543252**	**KVI-CP-3-SSD**
	For displacement encoder MME: Connection between displacement encoder MME and measuring module CPX-CMIX	2 m	**575898**	**NEBP-M16W6-K-2-M9W5**
Screws				
	For mounting on the metal interlinking block		**550219**	**CPX-M-M3X22-4X**
Inscription labels				
	Inscription labels 6x10, in frames	64 pieces	**18576**	**IBS-6x10**
User documentation				
	Manual – Measuring module CPX-CMIX[1)]	German	**567053**	**P.BE-CPX-CMIX-DE**
		English	**567054**	**P.BE-CPX-CMIX-EN**
		Spanish	**567055**	**P.BE-CPX-CMIX-ES**
		French	**567056**	**P.BE-CPX-CMIX-FR**
		Italian	**567057**	**P.BE-CPX-CMIX-IT**

1) User documentation in paper form is not included in the scope of delivery.

Data sheet – Input module, digital

Function

Digital input modules enable the connection of two-wire and three-wire sensors (proximity switches, inductive or capacitive sensors, etc.).
Depending on the connection block selected, the module supports various connection concepts with different numbers of sockets (single or double allocation).

Area of application

- Input modules for 24 V DC sensor supply voltage
- PNP or NPN logic
- Supports connection blocks with M12, M8, Sub-D and terminal connection
- Module features can be parameterised
- The input module receives the supply voltage for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic protection

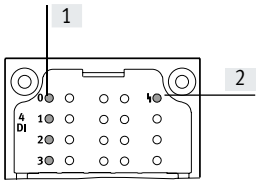
General technical data

Type			CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
Number of inputs			4	8	8	8
Max. residual current of inputs per module		[A]	0.7	1	0.7	0.7
Fuse protection			Internal electronic fuse per module	Internal electronic fuse per module	Internal electronic fuse per channel	Internal electronic fuse per module
Intrinsic current consumption at operating voltage		[mA]	Typically 15			
Operating voltage	Nominal value	[V DC]	24			
	Permissible range	[V DC]	18 ... 30			
Galvanic isolation	Channel – channel		No			
	Channel – internal bus		No			
Switching level	Signal 0	[V DC]	≤ 5			≥ 11
	Signal 1	[V DC]	≥ 11			≤ 5
Input debounce time		[ms]	3 (0.1, 10, 20 parameterisable)			
Input characteristic			IEC 1131-T2			
Switching logic			Positive logic (PNP)			Negative logic (NPN)
LED displays	Group diagnostics		1	1	1	1
	Channel diagnostics		–	–	8	–
	Channel status		4	8	8	8
Diagnostics			Short circuit/overload per channel			
Parameterisation			• Module monitoring • Behaviour after short circuit • Input debounce time • Signal extension time			
Degree of protection to EN 60529			Depending on connection block			
Temperature range	Operation	[°C]	–5 ... +50			
	Storage/transport	[°C]	–20 ... +70			
Materials			Reinforced PA, PC			
PWIS conformity			VDMA24364-B2-L			
Grid dimension		[mm]	50			
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50			
Product weight		[g]	39	39	45	40

Data sheet – Input module, digital

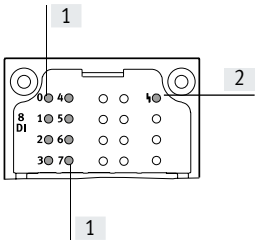
Connection and display components

CPX-4DE



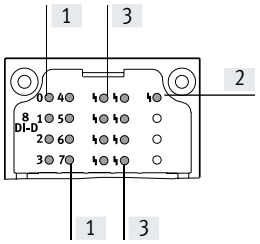
[1] Status LEDs (green)

CPX-8DE



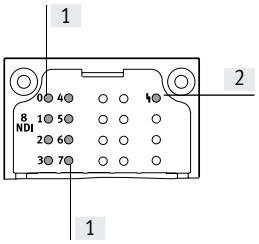
[2] Error LED (red, module error)

CPX-8DE-D



[3] Channel-related error LEDs (red)

CPX-8NDE

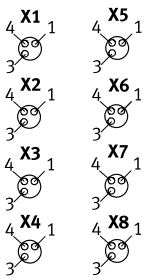
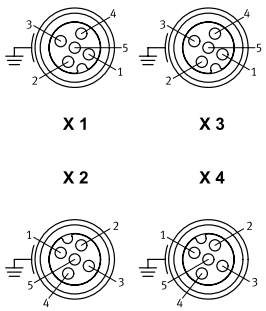


For allocation to inputs
➔ Pin allocation for module

Combinations of connection blocks and digital input modules

Connection blocks	Part no.	Digital input modules			
		CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
CPX-AB-8-M8-3POL	**195706**	■	■	■	■
CPX-AB-4-M12X2-5POL	**195704**	■	■	■	■
CPX-AB-4-M12X2-5POL-R	**541254**	■	■	■	■
CPX-AB-8-KL-4POL	**195708**	■	■	■	■
CPX-AB-1-SUB-BU-25POL	**525676**	■	■	■	■
CPX-M-AB-4-M12X2-5POL	**549367**	■	■	■	■

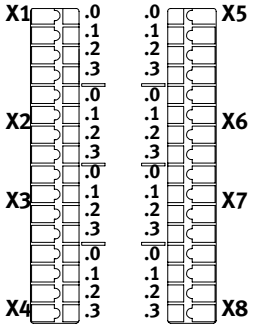
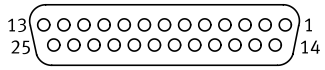
Pin allocation

Connection block inputs	CPX-4DE		CPX-8DE, CPX-8DE-D and CPX-8NDE	
CPX-AB-8-M8-3POL				
	X1.1: 24 V_{SEN} X1.3: 0 V_{SEN} X1.4: Input x	X5.1: 24 V_{SEN} X5.3: 0 V_{SEN} X5.4: Input x+2	X1.1: 24 $V_{SEN\ x}$ X1.3: 0 $V_{SEN\ x}$ X1.4: Input x	X5.1: 24 $V_{SEN\ x+4}$ X5.3: 0 $V_{SEN\ x+4}$ X5.4: Input x+4
	X2.1: 24 V_{SEN} X2.3: 0 V_{SEN} X2.4: Input x+1	X6.1: 24 V_{SEN} X6.3: 0 V_{SEN} X6.4: Input x+3	X2.1: 24 $V_{SEN\ x+1}$ X2.3: 0 $V_{SEN\ x+1}$ X2.4: Input x+1	X6.1: 24 $V_{SEN\ x+5}$ X6.3: 0 $V_{SEN\ x+5}$ X6.4: Input x+5
	X3.1: 24 V_{SEN} X3.3: 0 V_{SEN} X3.4: Input x+1	X7.1: 24 V_{SEN} X7.3: 0 V_{SEN} X7.4: Input x+3	X3.1: 24 $V_{SEN\ x+2}$ X3.3: 0 $V_{SEN\ x+2}$ X3.4: Input x+2	X7.1: 24 $V_{SEN\ x+6}$ X7.3: 0 $V_{SEN\ x+6}$ X7.4: Input x+6
	X4.1: 24 V_{SEN} X4.3: 0 V_{SEN} X4.4: n.c.	X8.1: 24 V_{SEN} X8.3: 0 V_{SEN} X8.4: n.c.	X4.1: 24 $V_{SEN\ x+3}$ X4.3: 0 $V_{SEN\ x+3}$ X4.4: Input x+3	X8.1: 24 $V_{SEN\ x+7}$ X8.3: 0 $V_{SEN\ x+7}$ X8.4: Input x+7
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1] and CPX-M-AB-4-M12X2-5POL				
	X1.1: 24 V_{SEN} X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X1.5: FE	X3.1: 24 V_{SEN} X3.2: Input x+3 X3.3: 0 V_{SEN} X3.4: Input x+2 X3.5: FE	X1.1: 24 $V_{SEN\ x}$ X1.2: Input x+1 X1.3: 0 $V_{SEN\ x}$ X1.4: Input x X1.5: FE	X3.1: 24 $V_{SEN\ x+4}$ X3.2: Input x+5 X3.3: 0 $V_{SEN\ x+4}$ X3.4: Input x+4 X3.5: FE
	X2.1: 24 V_{SEN} X2.2: n.c. X2.3: 0 V_{SEN} X2.4: Input x+1 X2.5: FE	X4.1: 24 V_{SEN} X4.2: n.c. X4.3: 0 V_{SEN} X4.4: Input x+3 X4.5: FE	X2.1: 24 $V_{SEN\ x+2}$ X2.2: Input x+3 X2.3: 0 V_{SENx+2} X2.4: Input x+2 X2.5: FE	X4.1: 24 $V_{SEN\ x+6}$ X4.2: Input x+7 X4.3: 0 $V_{SEN\ x+6}$ X4.4: Input x+6 X4.5: FE

1) Speedcon quick lock, additional shielding on metal thread

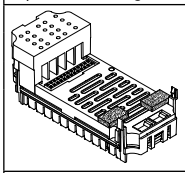
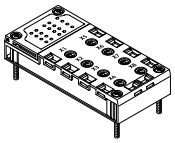
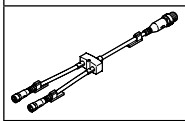
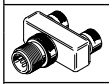
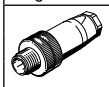
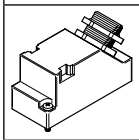
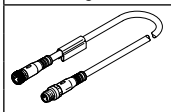
Data sheet – Input module, digital

Pin allocation

Connection block inputs	CPX-4DE		CPX-8DE, CPX-8DE-D and CPX-8NDE	
CPX-AB-8-KL-4POL				
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE X2.0: 24 V_{SEN} X2.1: 0 V_{SEN} X2.2: Input x+1 X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input x+1 X3.3: FE X4.0: 24 V_{SEN} X4.1: 0 V_{SEN} X4.2: n.c. X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input x+2 X5.3: FE X6.0: 24 V_{SEN} X6.1: 0 V_{SEN} X6.2: Input x+3 X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input x+3 X7.3: FE X8.0: 24 V_{SEN} X8.1: 0 V_{SEN} X8.2: n.c. X8.3: FE	X1.0: 24 V_{SEN} x X1.1: 0 $V_{SEN\ x}$ X1.2: Input x X1.3: FE X2.0: 24 $V_{SEN\ x+1}$ X2.1: 0 $V_{SEN\ x+1}$ X2.2: Input x+1 X2.3: FE X3.0: 24 $V_{SEN\ x+2}$ X3.1: 0 $V_{SEN\ x+2}$ X3.2: Input x+2 X3.3: FE X4.0: 24 $V_{SEN\ x+3}$ X4.1: 0 $V_{SEN\ x+3}$ X4.2: Input x+3 X4.3: FE	X5.0: 24 $V_{SEN\ x+4}$ X5.1: 0 $V_{SEN\ x+4}$ X5.2: Input x+4 X5.3: FE X6.0: 24 $V_{SEN\ x+5}$ X6.1: 0 $V_{SEN\ x+5}$ X6.2: Input x+5 X6.3: FE X7.0: 24 $V_{SEN\ x+6}$ X7.1: 0 $V_{SEN\ x+6}$ X7.2: Input x+6 X7.3: FE X8.0: 24 $V_{SEN\ x+7}$ X8.1: 0 $V_{SEN\ x+7}$ X8.2: Input x+7 X8.3: FE
CPX-AB-1-SUB-BU-25POL				
	1: Input x 2: Input x+1 3: Input x+1 4: n.c. 5: 24 V_{SEN} 6: 0 V_{SEN} 7: 24 V_{SEN} 8: 0 V_{SEN} 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: FE	14: Input x+2 15: Input x+3 16: Input x+3 17: n.c. 18: 24 V_{SEN} 19: 24 V_{SEN} 20: 24 V_{SEN} 21: 24 V_{SEN} 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE Housing: FE	1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: 24 $V_{SEN\ x+1}$ 6: 0 $V_{SEN\ x+1}$ 7: 24 $V_{SEN\ x+3}$ 8: 0 $V_{SEN\ x+3}$ 9: 24 V_{SEN} x 10: 24 $V_{SEN\ x+2}$ 11: 0 $V_{SEN\ x}$ 12: 0 $V_{SEN\ x+2}$ 13: FE	14: Input x+4 15: Input x+5 16: Input x+6 17: Input x+7 18: 24 $V_{SEN\ x+4}$ 19: 24 $V_{SEN\ x+5}$ 20: 24 $V_{SEN\ x+6}$ 21: 24 $V_{SEN\ x+7}$ 22: 0 $V_{SEN\ x+2\ u.\ 3}$ 23: 0 $V_{SEN\ x+2\ u.\ 3}$ 24: 0 $V_{SEN\ x+2\ u.\ 3}$ 25: FE Housing: FE

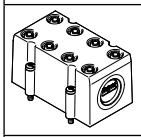
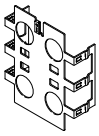
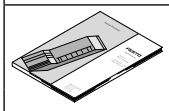
Data sheet – Input module, digital

Ordering data

Designation				Part no.	Type
Input module, digital					
	4 digital inputs, positive logic (PNP)			**195752**	**CPX-4DE**
	8 digital inputs, positive logic (PNP)			**195750**	**CPX-8DE**
	8 digital inputs, positive logic (PNP), enhanced diagnostic function			**541480**	**CPX-8DE-D**
	8 digital inputs, negative logic (NPN)			**543813**	**CPX-8NDE**
Connection block					
	Plastic	8x socket M8, 3-pin		**195706**	**CPX-AB-8-M8-3POL**
		4x socket M12, 5-pin		**195704**	**CPX-AB-4-M12X2-5POL**
		4x socket, M12 with quick-lock technology, 5-pin		**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
	1x plug M12, 4-pin	2x socket M8, 3-pin		**8005311**	**NEDY-L2R1-V1-M8G3-N-M12G4**
		2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Plug					
	Plug	M8, 3-pin	Solderable	**18696**	**SEA-GS-M8**
			Screw-in	**192009**	**SEA-3GS-M8-S**
		M12, 4-pin, PG7		**18666**	**SEA-GS-7**
		M12, PG7, 4-pin for cable Ø 2.5 mm		**192008**	**SEA-4GS-7-2.5**
		M12, 4-pin, PG9		**18778**	**SEA-GS-9**
		M12, 4 pin for 2 cables		**18779**	**SEA-GS-11-DUO**
		M12 for 2 cables, 5-pin		**192010**	**SEA-5GS-11-DUO**
		M12, 5-pin		**175487**	**SEA-M12-5GS-PG7**
	Sub-D plug, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	Connecting cable M8-M8		0.5 m	**541346**	**NEBU-M8G3-K-0.5-M8G3**
			1.0 m	**541347**	**NEBU-M8G3-K-1-M8G3**
			2.5 m	**541348**	**NEBU-M8G3-K-2.5-M8G3**
			5.0 m	**541349**	**NEBU-M8G3-K-5-M8G3**
	Modular system for a choice of connecting cables			–	**NEBU-...** → Internet: nebu

Data sheet – Input module, digital

Ordering data

Designation			Part no.	Type
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
User documentation				
	User documentation	German	**526439**	**P.BE-CPX-EA-DE**
		English	**526440**	**P.BE-CPX-EA-EN**
		Spanish	**526441**	**P.BE-CPX-EA-ES**
		French	**526442**	**P.BE-CPX-EA-FR**
		Italian	**526443**	**P.BE-CPX-EA-IT**

Data sheet – Input module, digital, NAMUR

Function
Digital input modules enable the connection of up to 8 NAMUR sensors (or wired mechanical contacts). In addition, the first 4 channels can alternatively be used as counters or for frequency measurement.
M12 and terminal strip connection technology can be used.

Area of application
- Input modules for 24 V DC sensor supply voltage
- Module features can be parameterised
- The input module receives the supply voltage for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic protection in each channel

General technical data			
Type			CPX-P-8DE-N
Number of inputs			8
Maximum cable length		[m]	200
Input debounce time		[ms]	3 (0, 10, 20 parameterisable)
Fuse protection (short circuit)			Internal electronic fuse per channel
Module current consumption (power supply for electronics)		[mA]	Typically 75
Nominal operating voltage		[V DC]	24 (reverse polarity protected)
Permissible voltage fluctuations		[%]	±25
Power failure buffering		[ms]	20
Residual ripple		[Vss]	0.4
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes
Input characteristics			To EN 60947-5-6
Switching level			To EN 60947-5-6
LED displays	Group diagnostics		1
	Channel diagnostics		8
	Channel status		8
Diagnostics			Wire break per channel
			Limit value violation per channel
			Parameterisation error
			Overload per channel
Parameterisation			Data format
			Input debounce time per channel
			Input function per channel
			Replacement value in diagnostic case per channel
			Upper limit value per channel
			Signal extension time per channel
			Gate time per channel
			Monitoring of limit values per channel
			Monitoring of short circuit per channel
			Monitoring of wire break per channel
			Monitoring of parameters
			Lower limit value per channel
			Upper limit value per channel
			Counter configuration per channel
Control elements			DIL switch
Additional functions			Frequency measurement
			Counter function
Degree of protection to EN 60529			Depending on the connection block

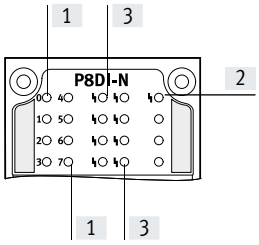
Data sheet – Input module, digital, NAMUR

General technical data		
Grid dimension	[mm]	50
Dimensions (including interlinking block and connection block) W x L x H	[mm]	50 x 107 x 70
Product weight	[g]	100

Materials	
Housing	PA-reinforced
	PC
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364 zone III

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Relative humidity	[%]	95, non-condensing

Connection and display components



[1] Status LEDs (green): for allocation to the inputs ➔ pin allocation of the module
[2] Error LED (red, module error)
[3] Channel-related error LEDs (red)

Combinations of bus nodes/control blocks with digital input module

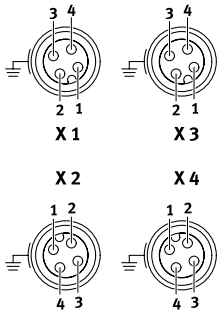
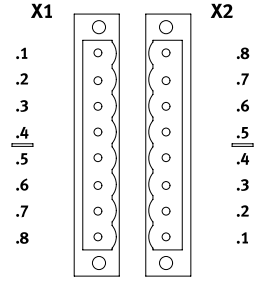
Bus node/control block	Part no.	Digital input module
		CPX-P-8DE-N
CPX-CEC-C1-V3	**3473128**	■
CPX-CEC-M1-V3	**3472765**	■
CPX-CEC-S1-V3	**3472425**	■
CPX-FB11	**526172**	■
CPX-FB13	**195740**	■
CPX-FB14	**526174**	■
CPX-FB36	**1912451**	■
CPX-FB37	**2735960**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**	■
CPX-M-FB45	**8110371**	■

Combinations of connection block and digital input module

Connection blocks	Part no.	Digital input module
		CPX-P-8DE-N
CPX-P-AB-4XM12-4POL	**565706**	■
CPX-P-AB-2XKL-8POL	**565704**	■

Data sheet – Input module, digital, NAMUR

Pin allocation

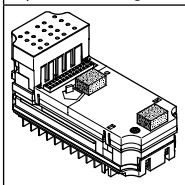
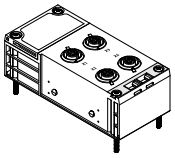
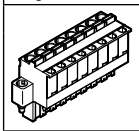
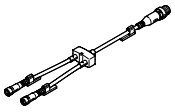
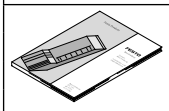
Connection block inputs	CPX-P-8DE-N	
CPX-P-AB-4XM12-4POL		
	X1.1: BN+ [0] X1.2: BU– [0] X1.3: BN+ [1] X1.4: BU– [1] X2.1: BN+ [2] X2.2: BU– [2] X2.3: BN+ [3] X2.4: BU– [3]	X3.1: BN+ [4] X3.2: BU– [4] X3.3: BN+ [5] X3.4: BU– [5] X4.1: BN+ [6] X4.2: BU– [6] X4.3: BN+ [7] X4.4: BU– [7]
CPX-P-AB-2XKL-8POL		
	X1.1: BN+ [0] X1.2: BU– [0] X1.3: BN+ [1] X1.4: BU– [1] X1.5: BN+ [2] X1.6: BU– [2] X1.7: BN+ [3] X1.8: BU– [3]	X2.1: BN+ [4] X2.2: BU– [4] X2.3: BN+ [5] X2.4: BU– [5] X2.5: BN+ [6] X2.6: BU– [6] X2.7: BN+ [7] X2.8: BU– [7]

Combinations of interlinking block/digital input module

Interlinking blocks	Part no.	Digital input module
		CPX-P-8DE-N
CPX-GE-EV-S	**195746**	–
CPX-GE-EV-S-VL	**8022170**	–
CPX-GE-EV-S-7/8-4POL	**541248**	–
CPX-M-GE-EV-S-7/8-CIP-4P	**568956**	–
CPX-GE-EV-S-7/8-5POL	**541244**	–
CPX-GE-EV-S-7/8-5POL-VL	**8022172**	–
CPX-M-GE-EV-S-7/8-5POL	**550208**	■
CPX-M-GE-EV-S-7/8-5POL-VL	**8022165**	■
CPX-M-GE-EV-S-M12-5POL	**8098392**	–
CPX-M-GE-EV-S-PP-5POL	**563057**	–
CPX-GE-EV	**195742**	–
CPX-M-GE-EV	**550206**	■
CPX-GE-EV-Z	**195744**	–
CPX-GE-EV-Z-VL	**8022166**	–
CPX-GE-EV-Z-7/8-4POL	**541250**	–
CPX-GE-EV-Z-7/8-5POL	**541246**	–
CPX-GE-EV-Z-7/8-5POL-VL	**8022173**	–
CPX-M-GE-EV-Z-7/8-5POL	**550210**	■
CPX-M-GE-EV-Z-7/8-5POL-VL	**8022158**	■
CPX-M-GE-EV-Z-PP-5POL	**563058**	–
CPX-GE-EV-V	**533577**	–
CPX-GE-EV-V-VL	**8022171**	–
CPX-GE-EV-V-7/8-4POL	**541252**	–
CPX-M-GE-EV-W-M12-5POL	**8098391**	–

Data sheet – Input module, digital, NAMUR

Ordering data

Designation				Part no.	Type
Input module, digital, NAMUR					
	8 digital inputs			**565933**	**CPX-P-8DE-N**
Connection block					
	Plastic	4x socket, M12, 4-pin		**565706**	**CPX-P-AB-4XM12-4POL**
		2x plug, 8-pin		**565704**	**CPX-P-AB-2XKL-8POL**
Plug					
	Socket	8-pin	Spring-loaded terminal	**565712**	**NECU-L3G8-C1**
			Screw terminal	**565710**	**NECU-L3G8-C2**
	Plug M12x1, 4-pin, straight, A-coded	Screw terminal	Connection cross section 0.14 ... 0.5 mm²	**192008**	**SEA-4GS-7-2.5**
			Nominal conductor cross section 0.14 ... 0.75 mm² Permissible cable ⌀ 4 ... 6 mm	**18666**	**SEA-GS-7**
			Connection cross section 0.75 mm² Permissible cable ⌀ 6 ... 8 mm	**18778**	**SEA-GS-9**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
Cover					
	Cover cap for closing off unused connections (10 pieces)		For M12 connections	**165592**	**ISK-M12**
Coding element					
	To ensure that a coded socket NECU-L3G8 can only be inserted in the matching coded connection block CPX-P-AB-2XKL (96 of each)		For NECU-L3G8	**565713**	**CPX-P-KDS-AB-2XKL**
User documentation					
	User documentation		German	**575378**	**P.BE-CPX-P-EA-DE**
			English	**575379**	**P.BE-CPX-P-EA-EN**
			Spanish	**575380**	**P.BE-CPX-P-EA-ES**
			French	**575381**	**P.BE-CPX-P-EA-FR**
			Italian	**575382**	**P.BE-CPX-P-EA-IT**
			Swedish	**575383**	**P.BE-CPX-P-EA-SV**

Data sheet – Input module, digital, PROFIsafe

Function
The PROFIsafe input module has 8 input channels whose signal status is detected for safety reasons, with the information transmitted to a suitable safety controller using the PROFIsafe safety protocol in combination with the appropriate fieldbus (PROFINET or PROFIBUS). This function is exclusively available for safety controllers using the PROFIsafe protocol, profile version 2.4.

Area of application
- Input module for 24 V DC sensor supply voltage
- Supports connection blocks with M12 and terminal connection
- Module features can be parameterised
- The input module receives the supply voltage for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic protection

Description

Module-based passivation

While channel-based passivation is disabled, the input module, in accordance with PROFIsafe specification, switches all information in the input image to the safe status, even when there is only one channel error.

Channel-based passivation

In the case of channel-based passivation, when a channel error occurs, the input module switches the input information of the affected channel pair to 0, depending on the function mode.

- The input information for unaffected channel pairs does not change
- The input module remains integrated.
- The input module indicates the current channel error status to the control unit via the input image.

Applications

The inputs on the PROFIsafe input module can be combined for multi-channel sensor applications. Every two inputs form a channel pair, which is set separately with one of 11 function modes.

The function mode has an influence on the evaluation of the input signals, and optionally on the generation of clock signals.

There are 5 independent clock outputs available for safe operation of passive sensors; the pulse patterns are used in some operating modes to detect crossovers in the signal paths.

The entire input module is designed to ensure that the input channels provide either secure data or no data at all, even when an error is present in the system

Range of applications

- Use as an input module for a higher-order safety controller. Several input modules can be used together and these monitor mutually independent sensors
- Use of multi-channel sensor applications with up to 8 secure inputs, which can be grouped and are suitable for configuration with the help of 11 different function modes
- Connection of various switches and sensors within the safety chain
- Output of an identifier coded by DIL switch in the connection block CPX-AB-ID-P

Note
The safety integrity level, Performance Level and category for the system as a whole correspond to that of the component in the safety chain with the lowest characteristic value.

Application examples

- Two-hand control device for starting a function
- Emergency stop switch for incidents
- Operating mode selector switch with four positions
- Rotary indexing table
- Light curtain
- Acknowledge button with request
- End-position switch
- Protective door with two NO switches

Data sheet – Input module, digital, PROFIsafe

General technical data			
Type			CPX-F8DE-P
Number of inputs			8
Safety function			Reliable detection and evaluation of input statuses
Max. address capacity	Inputs	[byte]	6
	Outputs	[byte]	7
Maximum cable length		[m]	200
Max. power supply	Per module	[A]	3
Current consumption of module		[mA]	Typically 35 (power supply for electronics)
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	20.4 ... 28.8
Voltage drop per channel		[V]	0.6
Residual ripple		[Vss]	2 within voltage range
Galvanic isolation	Channel – channel		No
Input characteristics			To IEC 61131-2, type 2
Switching logic	Inputs		PNP (positive switching)
Safety integrity level	As per EN 62061		Reliable detection and evaluation of input statuses up to SIL CL3
	As per EN 61508		Reliable detection and evaluation of input statuses up to SIL3
Performance Level	As per ISO 13849		Reliable detection and evaluation of input statuses up to Cat 4 and PL e
Failure rate per hour (PFH)			1.0×10^{-9}
Certificate issuing authority			01/205/5444.01/21
LED displays	Group diagnostics		1
	Channel diagnostics		8
	Channel status		8
	Failsafe protocol active		1
Diagnostics			• Short circuit per channel • Undervoltage • Overvoltage • Excessive temperature • Crossover per channel • Wire break per channel • Communication • Process data error • Self-test
Control elements			DIL switch
Degree of protection to EN 60529			Depending on connection block
Grid dimension		[mm]	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 55
Product weight		[g]	46

Data sheet – Input module, digital, PROFIsafe

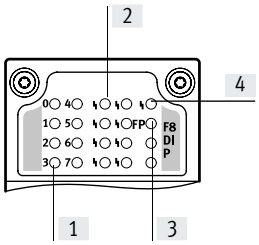
Materials	
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
CE marking (see declaration of conformity)[1)]		To EU Machinery Directive
		To EU EMC Directive
		To EU RoHS Directive
UKCA marking (see declaration of conformity)[1)]		To UK instructions for machines
		To UK instructions for EMC
		To UK RoHS instructions
Certification		c UL us - Recognized (OL)

1) Additional information at: www.festo.com/catalogue/... → Support/Downloads.

Connection and display components

CPX-F8DE-P



[1] Channel-related status LEDs (green)
[2] Channel-related error LEDs (red)
[3] Fail-safe protocol active (green)
[4] Error LED (red, module error)

Combinations of bus nodes/control blocks with PROFIsafe input module		
Bus node/control block	Part no.	PROFIsafe input module
		CPX-F8DE-P
CPX-FB13	**195740**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**	■
CPX-M-FB45	**8110371**	■

Note

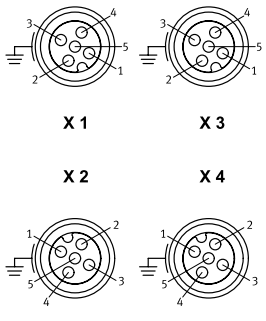
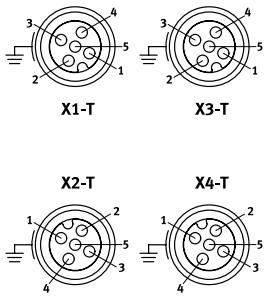
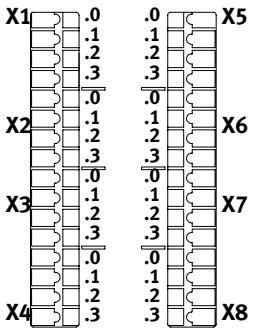
The PROFIsafe input module CPX-F8DE-P can only be integrated as of software release 21 or release 30 (in the case of CPX-FB13).

Data sheet – Input module, digital, PROFIsafe

Combinations of connection blocks and PROFIsafe input module

Connection blocks	Part no.	PROFIsafe input module
		CPX-F8DE-P
CPX-M-AB-4-M12X2-5POL	**549367**	■
CPX-M-AB-4-M12X2-5POL-T	**2639560**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-AB-ID-P	**2639571**	■

Pin allocation

Connection block inputs	CPX-F8DE-P	
CPX-M-AB-4-M12X2-5POL		
	X1.1: 24 V_{SEN} X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X1.5: FE	X3.1: 24 V_{SEN} X3.2: Input x+5 X3.3: 0 V_{SEN} X3.4: Input x+4 X3.5: FE
	X2.1: 24 V_{SEN} X2.2: Input x+3 X2.3: 0 V_{SEN} X2.4: Input x+2 X2.5: FE	X4.1: 24 V_{SEN} X4.2: Input x+7 X4.3: 0 V_{SEN} X4.4: Input x+6 X4.5: FE
CPX-M-AB-4-M12X2-5POL-T		
	X1-T.1: 24 $V_{SEN\ x}$ X1-T.2: Input x+1 X1-T.3: 0 V_{SEN} X1-T.4: Input x X1-T.5: 24 $V_{SEN\ x+1}$	X3-T.1: 24 $V_{SEN\ x+4}$ X3-T.2: Input x+5 X3-T.3: 0 V_{SEN} X3-T.4: Input x+4 X3-T.5: 24 $V_{SEN\ x+5}$
	X2-T.1: 24 $V_{SEN\ x+2}$ X2-T.2: Input x+3 X2-T.3: 0 V_{SEN} X2-T.4: Input x+2 X2-T.5: 24 $V_{SEN\ x+3}$	X4-T.1: 24 $V_{SEN\ x+6}$ X4-T.2: Input x+7 X4-T.3: 0 V_{SEN} X4-T.4: Input x+6 X4-T.5: 24 $V_{SEN\ x+7}$
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input x+4 X5.3: FE
	X2.0: 24 $V_{SEN\ x}$ X2.1: 24 $V_{SEN\ x+1}$ X2.2: Input x+1 X2.3: FE	X6.0: 24 $V_{SEN\ x+4}$ X6.1: 24 $V_{SEN\ x+5}$ X6.2: Input x+5 X6.3: FE
	X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input x+2 X3.3: FE	X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input x+6 X7.3: FE
	X4.0: 24 $V_{SEN\ x+2}$ X4.1: 24 $V_{SEN\ x+3}$ X4.2: Input x+3 X4.3: FE	X8.0: 24 $V_{SEN\ x+6}$ X8.1: 24 $V_{SEN\ x+7}$ X8.2: Input x+7 X8.3: FE

Data sheet – Input module, digital, PROFIsafe

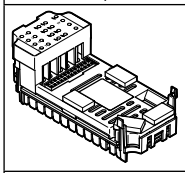
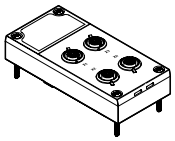
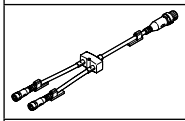
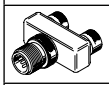
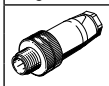
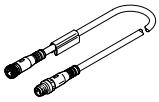
General technical data		
Type		CPX-AB-ID-P
Certificate issuing authority		01/205/5444.00/15
		German Technical Control Board (TÜV) Rh. UK 01/205U/5444.00/22
Degree of protection to EN 60529		IP65
Housing material		PA
		PC
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L
Corrosion resistance class CRC[1)]		1
Product weight	[g]	57

1) Additional information: www.festo.com/x/topic/kbk

Combinations of interlinking blocks and PROFIsafe input module		
Interlinking blocks	Part no.	PROFIsafe input module
		CPX-F8DE-P
CPX-GE-EV-S	**195746**	–
CPX-GE-EV-S-VL	**8022170**	–
CPX-GE-EV-S-7/8-4POL	**541248**	–
CPX-GE-EV-S-7/8-5POL	**541244**	–
CPX-GE-EV-S-7/8-5POL-VL	**8022172**	–
CPX-M-GE-EV-S-7/8-CIP-4P	**568956**	■
CPX-M-GE-EV-S-7/8-5POL	**550208**	■
CPX-M-GE-EV-S-7/8-5POL-VL	**8022165**	■
CPX-M-GE-EV-S-M12-5POL	**8098392**	■
CPX-M-GE-EV-S-PP-5POL	**563057**	■
CPX-GE-EV	**195742**	–
CPX-M-GE-EV	**550206**	■
CPX-M-GE-EV-FVO	**567806**	–
CPX-GE-EV-Z	**195744**	–
CPX-GE-EV-Z-VL	**8022166**	–
CPX-GE-EV-Z-7/8-4POL	**541250**	–
CPX-GE-EV-Z-7/8-5POL	**541246**	–
CPX-GE-EV-Z-7/8-5POL-VL	**8022173**	–
CPX-M-GE-EV-Z-7/8-5POL	**550210**	■
CPX-M-GE-EV-Z-7/8-5POL-VL	**8022158**	■
CPX-M-GE-EV-Z-PP-5POL	**563058**	■
CPX-GE-EV-V	**533577**	–
CPX-GE-EV-V-VL	**8022171**	–
CPX-GE-EV-V-7/8-4POL	**541252**	–
CPX-M-GE-EV-W-M12-5POL	**8098391**	■

Data sheet – Input module, digital, PROFIsafe

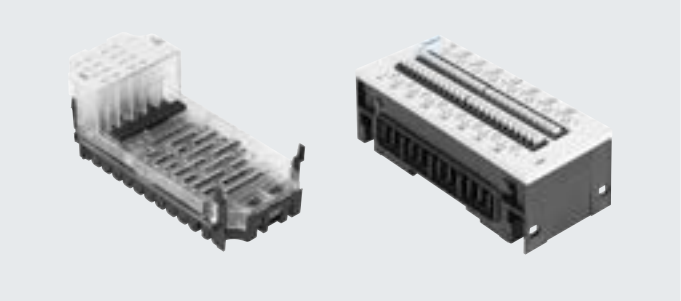
Ordering data

	Description			Part no.	Type
PROFIsafe input module					
	8 digital inputs, positive logic (PNP), for reliable detection and evaluation of input statuses			**2597424**	**CPX-F8DE-P**
Connection block					
	Plastic	Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		8-way DIL switch		**2639571**	**CPX-AB-ID-P**
	Metal	4x socket M12, 5-pin	Unpulsed sensor supply	**549367**	**CPX-M-AB-4-M12X2-5POL**
			Pulsed sensor supply	**2639560**	**CPX-M-AB-4-M12X2-5POL-T**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** ➔ Internet: nedy
	1x plug M12, 4-pin	2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Plug					
	Plug	M12, PG7		**18666**	**SEA-GS-7**
		M12, PG7, 4-pin for cable ⌀ 2.5 mm		**192008**	**SEA-4GS-7-2.5**
		M12, PG9		**18778**	**SEA-GS-9**
		M12 for 2 cables		**18779**	**SEA-GS-11-DUO**
		M12 for 2 cables, 5-pin		**192010**	**SEA-5GS-11-DUO**
		M12, 5-pin		**175487**	**SEA-M12-5GS-PG7**
Connecting cable					
	Modular system for a choice of connecting cables			–	**NEBU-...** ➔ Internet: nebu
User documentation					
	User documentation for PROFIsafe input module		German	**8035496**	**CPX-F8DE-P-DE**
			English	**8035497**	**CPX-F8DE-P-EN**
			Spanish	**8035498**	**CPX-F8DE-P-ES**
			French	**8035499**	**CPX-F8DE-P-FR**
			Italian	**8035500**	**CPX-F8DE-P-IT**
			Chinese	**8035501**	**CPX-F8DE-P-ZH**

Data sheet – Input module, digital, 16 inputs

Function
Digital input modules enable the connection of two-wire and three-wire sensors (proximity switches, inductive or capacitive sensors, etc.).
Depending on the connection block selected, the module supports various connection concepts with different numbers of sockets (single or double allocation).

Area of application
- Input modules for 24 V DC sensor supply voltage
- PNP logic
- Module features can be parameterised
- The input module receives the supply voltage for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic protection



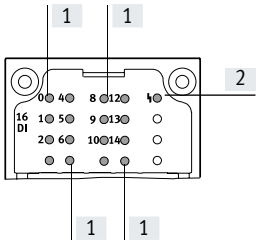
General technical data

Type			CPX-16DE	CPX-M-16DE-D	CPX-L-16DE
Number of inputs			16	16	16
Max. residual current of inputs per module		[A]	1.8	1.8	1.8
Intrinsic current consumption at operating voltage		[mA]	Typically 15	Typically 34	Typically 15
Fuse protection			Internal electronic fuse per module	Internal electronic fuse per channel pair, additional safety fuse	Internal electronic fuse per module
Nominal operating voltage		[V DC]	24	24	24
Operating voltage range		[V DC]	18 ... 30	18 ... 30	18 ... 30
Galvanic isolation	Channel – channel		No	No	No
	Channel – internal bus		No	No	No
Switching level	Signal 0	[V DC]	≤ 5	≤ 5	≤ 5
	Signal 1	[V DC]	≥ 11	≥ 11	≥ 15
Input debounce time		[ms]	3 (0.1 ms, 10 ms, 20 ms parameterisable)		
Input characteristic			IEC 1131-T2	IEC 1131-T2	IEC 1131-T2, type 01
Switching logic			Positive logic (PNP)	Positive logic (PNP)	Positive logic (PNP)
LED displays	Group diagnostics		1	1	1
	Channel diagnostics		–	16	–
	Channel status		16	16	16
Diagnostics			Short circuit/overload per channel		
Parameterisation			• Module monitoring • Behaviour after short circuit • Input debounce time • Signal extension time		
Degree of protection to EN 60529			Depending on connection block	Depending on connection block	IP20
Temperature range	Operation	[°C]	–5 ... +50	–5 ... +50	–5 ... +50
	Storage/transport	[°C]	–20 ... +70	–20 ... +70	–20 ... +70
Certification			–	–	c UL us - Listed (OL)
Materials			Reinforced PA, PC	Reinforced PA, PC	PA-reinforced
Note on materials			–	–	RoHS-compliant
PWIS conformity			VDMA24364-B2-L	VDMA24364-B2-L	VDMA24364-B2-L
Grid dimension		[mm]	50	50	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	50 x 107 x 50	50 x 107 x 41
Product weight		[g]	41	46	167

Data sheet – Input module, digital, 16 inputs

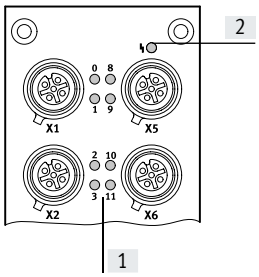
Connection and display components

CPX-16DE



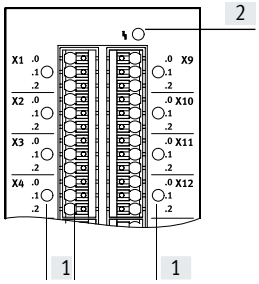
[1] Status LEDs (green): for allocation to the inputs ➔ pin allocation of the module
[2] Error LED (red, module error)

CPX-M-16DE-D



[1] Common status LEDs (green)/error LEDs (red) for each input signal
[2] Error LED (red, module error)

CPX-L-16DE



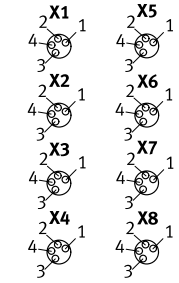
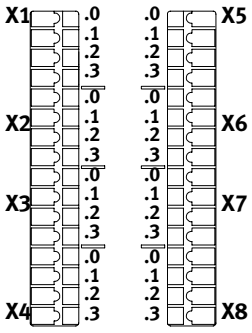
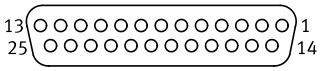
[1] Status LEDs (green) for each input signal
[2] Error LED (red, module error)

Combinations of connection blocks and digital input modules

Connection blocks	Part no.	Digital input modules		
		CPX-16DE	CPX-M-16DE-D	CPX-L-16DE
CPX-AB-8-M8X2-4POL	**541256**	■	–	–
CPX-AB-8-M12X2-5POL	**3606900**	–	■	–
CPX-AB-8-KL-4POL	**195708**	■	–	–
CPX-AB-1-SUB-BU-25POL	**525676**	■	–	–
CPX-M-AB-8-M12X2-5POL	**549335**	–	■	–

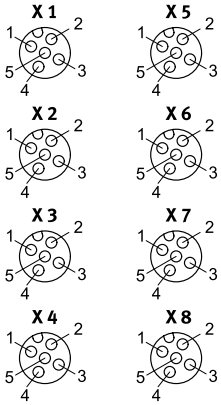
Data sheet – Input module, digital, 16 inputs

Pin allocation

Connection block inputs	CPX-16DE	
CPX-AB-8-M8x2-4POL		
	X1.1: 24 V_{SEN} X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X2.1: 24 V_{SEN} X2.2: Input x+3 X2.3: 0 V_{SEN} X2.4: Input x+2 X3.1: 24 V_{SEN} X3.2: Input x+5 X3.3: 0 V_{SEN} X3.4: Input x+4 X4.1: 24 V_{SEN} X4.2: Input x+7 X4.3: 0 V_{SEN} X4.4: Input x+6	X5.1: 24 V_{SEN} X5.2: Input x+9 X5.3: 0 V_{SEN} X5.4: Input x+8 X6.1: 24 V_{SEN} X6.2: Input x+11 X6.3: 0 V_{SEN} X6.4: Input x+10 X7.1: 24 V_{SEN} X7.2: Input x+13 X7.3: 0 V_{SEN} X7.4: Input x+12 X8.1: 24 V_{SEN} X8.1: Input x+15 X8.3: 0 V_{SEN} X8.4: Input x+14
CPX-AB-8-KL-4POL		
	X1.0: Input x+8 X1.1: 24 V_{SEN} X1.2: Input x X1.3: FE X2.0: Input x+9 X2.1: 24 V_{SEN} X2.2: Input x+1 X2.3: FE X3.0: Input x+10 X3.1: 24 V_{SEN} X3.2: Input x+2 X3.3: FE X4.0: Input x+11 X4.1: 24 V_{SEN} X4.2: Input x+3 X4.3: FE	X5.0: Input x+12 X5.1: 0 V_{SEN} X5.2: Input x+4 X5.3: FE X6.0: Input x+13 X6.1: 0 V_{SEN} X6.2: Input x+5 X6.3: FE X7.0: Input x+14 X7.1: 0 V_{SEN} X7.2: Input x+6 X7.3: FE X8.0: Input x+15 X8.1: 0 V_{SEN} X8.2: Input x+7 X8.3: FE
CPX-AB-1-SUB-BU-25POL		
	1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: Input x+9 6: 24 V_{SEN} 7: Input x+11 8: 24 V_{SEN} 9: Input x+8 10: Input x+10 11: 24 V_{SEN} 12: 24 V_{SEN} 13: FE	14: Input x+4 15: Input x+5 16: Input x+6 17: Input x+7 18: Input x+12 19: Input x+13 20: Input x+14 21: Input x+15 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE Housing: FE

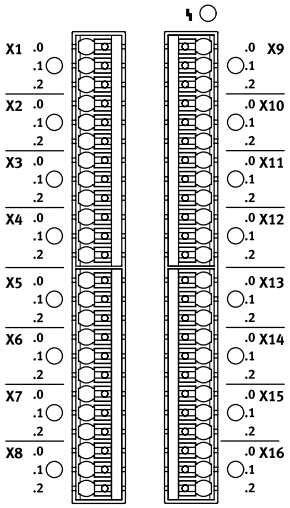
Data sheet – Input module, digital, 16 inputs

Pin allocation

Connection block inputs	CPX-M-16DE-D	
CPX-M-AB-8-M12X2-5POL and CPX-AB-8-M12X2-5POL		
	X1.1: 24 V_{Sx} X1.2: Input x+1 X1.3: 0 V_{Sx} X1.4: Input x X1.5: FE	X5.1: 24 V_{Sx+8} X5.2: Input x+9 X5.3: 0 V_{Sx+8} X5.4: Input x+8 X5.5: FE
	X2.1: 24 V_{Sx+2} X2.2: Input x+3 X2.3: 0 V_{Sx+2} X2.4: Input x+2 X2.5: FE	X6.1: 24 V_{Sx+10} X6.2: Input x+11 X6.3: 0 V_{Sx+10} X6.4: Input x+10 X6.5: FE
	X3.1: 24 V_{Sx+4} X3.2: Input x+5 X3.3: 0 V_{Sx+4} X3.4: Input x+4 X3.5: FE	X7.1: 24 V_{Sx+12} X7.2: Input x+13 X7.3: 0 V_{Sx+12} X7.4: Input x+12 X7.5: FE
	X4.1: 24 V_{Sx+6} X4.2: Input x+7 X4.3: 0 V_{Sx+6} X4.4: Input x+6 X4.5: FE	X8.1: 24 V_{Sx+14} X8.2: Input x+15 X8.3: 0 V_{Sx+14} X8.4: Input x+14 X8.5: FE

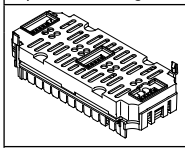
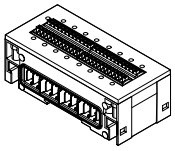
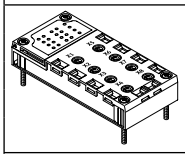
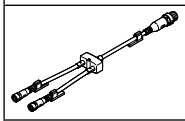
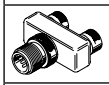
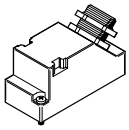
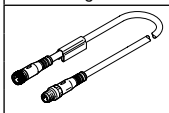
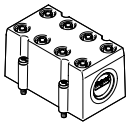
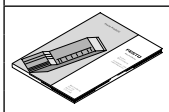
Data sheet – Input module, digital, 16 inputs

Pin allocation

Connection block inputs	CPX-L-16DE	
	X1.0: 24 V_{SEN} X1.1: Input x X1.2: 0 V_{SEN}	X9.0: 24 V_{SEN} X9.1: Input x+8 X9.2: 0 V_{SEN}
	X2.0: 24 V_{SEN} X2.1: Input x+1 X2.2: 0 V_{SEN}	X10.0: 24 V_{SEN} X10.1: Input x+9 X10.2: 0 V_{SEN}
	X3.0: 24 V_{SEN} X3.1: Input x+2 X3.2: 0 V_{SEN}	X11.0: 24 V_{SEN} X11.1: Input x+10 X11.2: 0 V_{SEN}
	X4.0: 24 V_{SEN} X4.1: Input x+3 X4.2: 0 V_{SEN}	X12.0: 24 V_{SEN} X12.1: Input x+11 X12.2: 0 V_{SEN}
	X5.0: 24 V_{SEN} X5.1: Input x+4 X5.2: 0 V_{SEN}	X13.0: 24 V_{SEN} X13.1: Input x+12 X13.2: 0 V_{SEN}
	X6.0: 24 V_{SEN} X6.1: Input x+5 X6.2: 0 V_{SEN}	X14.0: 24 V_{SEN} X14.1: Input x+13 X14.2: 0 V_{SEN}
	X7.0: 24 V_{SEN} X7.1: Input x+6 X7.2: 0 V_{SEN}	X15.0: 24 V_{SEN} X15.1: Input x+14 X15.2: 0 V_{SEN}
	X8.0: 24 V_{SEN} X8.1: Input x+7 X8.2: 0 V_{SEN}	X16.0: 24 V_{SEN} X16.1: Input x+15 X16.2: 0 V_{SEN}

Data sheet – Input module, digital, 16 inputs

Ordering data

Designation				Part no.	Type
Input module, digital					
	16 digital inputs, internal electronic fuse per module			**543815**	**CPX-16DE**
	16 digital inputs, internal electronic fuse per channel pair, for CPX in metal			**550202**	**CPX-M-16DE-D**
	16 digital inputs, internal electronic fuse per module, for CPX in plastic, including interlinking block and connection block with spring-loaded terminals			**572606**	**CPX-L-16DE-16-KL-3POL**
Connection block					
	Plastic	8x socket M8, 4-pin		**541256**	**CPX-AB-8-M8X2-4POL**
		8x socket M12, 5-pin		**3606900**	**CPX-AB-8-M12X2-5POL**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	8x socket M12, 5-pin		**549335**	**CPX-M-AB-8-M12X2-5POL**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** ➔ Internet: nedy
	1x plug M8, 4-pin	2x socket M8, 3-pin		**8005312**	**NEDY-L2R1-V1-M8G3-N-M8G4**
Plug					
	Plug M8, 3-pin		Solderable	**18696**	**SEA-GS-M8**
			Screw-in	**192009**	**SEA-3GS-M8-S**
	Sub-D plug, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	Connecting cable M8-M8		0.5 m	**541346**	**NEBU-M8G3-K-0.5-M8G3**
			1.0 m	**541347**	**NEBU-M8G3-K-1-M8G3**
			2.5 m	**541348**	**NEBU-M8G3-K-2.5-M8G3**
			5.0 m	**541349**	**NEBU-M8G3-K-5-M8G3**
	Modular system for a choice of connecting cables			–	**NEBU-...** ➔ Internet: nebu
Cover					
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug			**538219**	**AK-8KL**
	Fittings kit			**538220**	**VG-K-M9**
User documentation					
	User documentation		German	**526439**	**P.BE-CPX-EA-DE**
			English	**526440**	**P.BE-CPX-EA-EN**
			Spanish	**526441**	**P.BE-CPX-EA-ES**
			French	**526442**	**P.BE-CPX-EA-FR**
			Italian	**526443**	**P.BE-CPX-EA-IT**

Data sheet – Output module, digital

Function
Digital outputs control actuators such as individual valves, hydraulic valves, heating controllers and many more. Separate circuits are created using an additional supply. Parallel connection of the outputs of a module enables consuming devices to be controlled with up to 4 A.

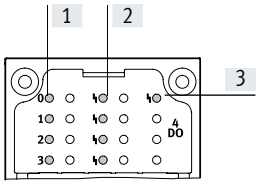
Area of application
- Output module for 24 V DC supply voltage
- PNP logic
- Module features can be parameterised
- The output module receives the voltage supply for the electronics and the outputs from the interlinking block
- Module protection and diagnostics through integrated electronic protection in each channel

General technical data					
Type			CPX-4DA	CPX-8DA	CPX-8DA-H
Number of outputs			4	8	8
Max. power supply	Per module	[A]	4		8.4
	Per channel	[A]	1 (24 W lamp load, 4 channels can be connected in parallel)	0.5 (12 W lamp load, 8 channels can be connected in parallel)	2.1 (50 W lamp load), per channel pair
Fuse protection (short circuit)			Internal electronic fuse per channel		
Module current consumption (power supply for electronics)		[mA]	Typically 16		Typically 34
Operating voltage	Nominal value	[V DC]	24		
	Permissible range	[V DC]	18 ... 30		
Galvanic isolation	Channel – channel		No		
	Channel – internal bus		Yes, with intermediate supply		
Output characteristic			Based on IEC 1131-2		
Switching logic			Positive logic (PNP)		
LED displays	Group diagnostics		1	1	1
	Channel diagnostics		4	8	8
	Channel status		4	8	8
Diagnostics			• Short circuit/overload, channel x • Undervoltage of outputs		
Parameterisation			• Module monitoring • Behaviour after short circuit • Fail-safe channel x • Forcing channel x • Idle mode channel x		
Degree of protection to EN 60529			Depending on connection block		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage/transport	[°C]	–20 ... +70		
Materials			Reinforced PA, PC		
PWIS conformity			VDMA24364-B2-L		
Grid dimension		[mm]	50		
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50		
Product weight		[g]	42	49	48

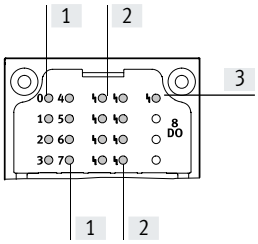
Data sheet – Output module, digital

Connection and display components

CPX-4DA



CPX-8DA

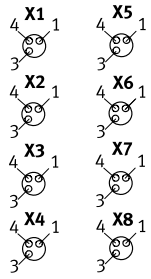


[1] Status LEDs (yellow): for allocation to outputs ➔ pin allocation of the module
[2] Channel-related error LEDs (red)
[3] Error LED (red, module error)

Combinations of connection block and digital output module

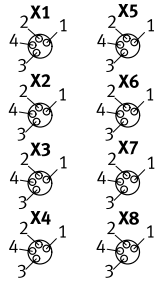
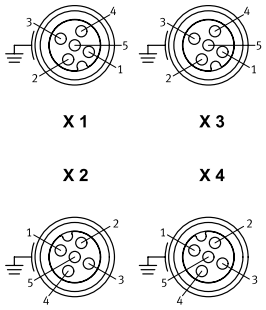
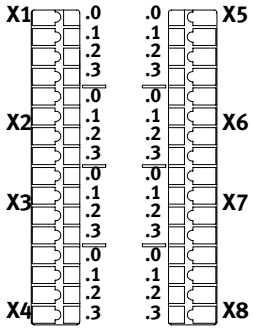
Connection blocks	Part no.	Digital output module		
		CPX-4DA	CPX-8DA	CPX-8DA-H
CPX-AB-8-M8-3POL	**195706**	■	■	–
CPX-AB-8-M8X2-4POL	**541256**	■	■	■
CPX-AB-4-M12X2-5POL	**195704**	■	■	–
CPX-AB-4-M12X2-5POL-R	**541254**	■	■	■
CPX-AB-8-KL-4POL	**195708**	■	■	■
CPX-AB-1-SUB-BU-25POL	**525676**	■	■	■
CPX-M-AB-4-M12X2-5POL	**549367**	■	■	■

Pin allocation

Connection block outputs	CPX-4DA		CPX-8DA	
CPX-AB-8-M8-3POL				
	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+2	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+4
	X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1	X6.1: n.c. X6.3: 0 V_{OUT} X6.4: Output x+3	X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1	X6.1: n.c. X6.3: 0 V_{OUT} X6.4: Output x+5
	X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+1	X7.1: n.c. X7.3: 0 V_{OUT} X7.4: Output x+3	X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+2	X7.1: n.c. X7.3: 0 V_{OUT} X7.4: Output x+6
	X4.1: n.c. X4.3: 0 V_{OUT} X4.4: n.c.	X8.1: n.c. X8.3: 0 V_{OUT} X8.4: n.c.	X4.1: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3	X8.1: n.c. X8.3: 0 V_{OUT} X8.4: Output x+7

Data sheet – Output module, digital

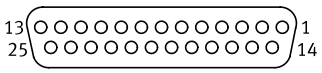
Pin allocation

Connection block outputs	CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-8-M8X2-4POL				
	X1.1: 0 V_{OUT} X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x	X5.1: 0 V_{OUT} X5.2: n.c. X5.3: 0 V_{OUT} X5.4: n.c.	X1.1: 0 V_{OUT} X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x	X5.1: 0 V_{OUT} X5.2: n.c. X5.3: 0 V_{OUT} X5.4: n.c.
	X2.1: 0 V_{OUT} X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1	X6.1: 0 V_{OUT} X6.2: n.c. X6.3: 0 V_{OUT} X6.4: n.c.	X2.1: 0 V_{OUT} X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2	X6.1: 0 V_{OUT} X6.2: n.c. X6.3: 0 V_{OUT} X6.4: n.c.
	X3.1: 0 V_{OUT} X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2	X7.1: 0 V_{OUT} X7.2: n.c. X7.3: 0 V_{OUT} X7.4: n.c.	X3.1: 0 V_{OUT} X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4	X7.1: 0 V_{OUT} X7.2: n.c. X7.3: 0 V_{OUT} X7.4: n.c.
	X4.1: 0 V_{OUT} X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3	X8.1: 0 $V_{OUT\,x+1}$ X8.2: n.c. X8.3: 0 $V_{OUT\,x+3}$ X8.4: n.c.	X4.1: 0 V_{OUT} X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6	X8.1: 0 V_{OUT} X8.2: n.c. X8.3: 0 V_{OUT} X8.4: n.c.
CPX-AB-4-M12X2-5POL[1] and CPX-AB-4-M12X2-5POL-R[2]				
	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2 X3.5: FE	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4 X3.5: FE
	X2.1: n.c. X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X2.5: FE	X4.1: n.c. X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3 X4.5: FE	X2.1: n.c. X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2 X2.5: FE	X4.1: n.c. X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6 X4.5: FE
CPX-AB-8-KL-4POL				
	X1.0: n.c. X1.1: 0 V_{OUT} X1.2: Output x X1.3: FE	X5.0: n.c. X5.1: 0 V_{OUT} X5.2: Output x+2 X5.3: FE	X1.0: n.c. X1.1: 0 V_{OUT} X1.2: Output x X1.3: FE	X5.0: n.c. X5.1: 0 V_{OUT} X5.2: Output x+4 X5.3: FE
	X2.0: n.c. X2.1: 0 V_{OUT} X2.2: Output x+1 X2.3: FE	X6.0: n.c. X6.1: 0 V_{OUT} X6.2: Output x+3 X6.3: FE	X2.0: n.c. X2.1: 0 V_{OUT} X2.2: Output x+1 X2.3: FE	X6.0: n.c. X6.1: 0 V_{OUT} X6.2: Output x+5 X6.3: FE
	X3.0: n.c. X3.1: 0 V_{OUT} X3.2: Output x+1 X3.3: FE	X7.0: n.c. X7.1: 0 V_{OUT} X7.2: Output x+3 X7.3: FE	X3.0: n.c. X3.1: 0 V_{OUT} X3.2: Output x+2 X3.3: FE	X7.0: n.c. X7.1: 0 V_{OUT} X7.2: Output x+6 X7.3: FE
	X4.0: n.c. X4.1: 0 V_{OUT} X4.2: n.c. X4.3: FE	X8.0: n.c. X8.1: 0 V_{OUT} X8.2: n.c. X8.3: FE	X4.0: n.c. X4.1: 0 V_{OUT} X4.2: Output x+3 X4.3: FE	X8.0: n.c. X8.1: 0 V_{OUT} X8.2: Output x+7 X8.3: FE

1) Not suitable for CPX-8DA-H.
2) Speedcon quick lock, additional shielding on metal thread

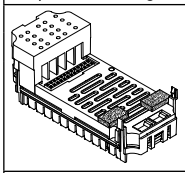
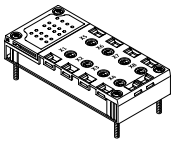
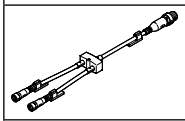
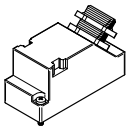
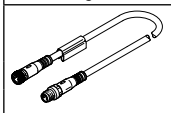
Data sheet – Output module, digital

Pin allocation

Connection block outputs	CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-1-SUB-BU-25POL				
	1: Output x	14: Output x+2	1: Output x	14: Output x+4
	2: Output x+1	15: Output x+3	2: Output x+1	15: Output x+5
	3: Output x+1	16: Output x+3	3: Output x+2	16: Output x+6
	4: n.c.	17: n.c.	4: Output x+3	17: Output x+7
	5: n.c.	18: n.c.	5: n.c.	18: n.c.
	6: 0 V_{OUT}	19: n.c.	6: 0 V_{OUT}	19: n.c.
	7: n.c.	20: n.c.	7: n.c.	20: n.c.
	8: 0 V_{OUT}	21: n.c.	8: 0 V_{OUT}	21: n.c.
	9: n.c.	22: 0 V_{OUT}	9: n.c.	22: 0 V_{OUT}
	10: n.c.	23: 0 V_{OUT}	10: n.c.	23: 0 V_{OUT}
	11: 0 V_{OUT}	24: 0 V_{OUT}	11: 0 V_{OUT}	24: 0 V_{OUT}
	12: 0 V_{OUT}	25: FE	12: 0 V_{OUT}	25: FE
	13: FE	Housing: FE	13: FE	Housing: FE

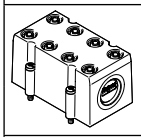
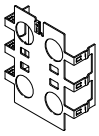
Data sheet – Output module, digital

Ordering data

Designation				Part no.	Type
Output module, digital					
	4 digital outputs, power supply 1 A per channel			**195754**	**CPX-4DA**
	8 digital outputs, power supply 0.5 A per channel			**541482**	**CPX-8DA**
	8 digital outputs, power supply 2.1 A per channel pair			**550204**	**CPX-8DA-H**
Connection block					
	Plastic	8x socket M8, 3-pin		**195706**	**CPX-AB-8-M8-3POL**
		8x socket M8, 4-pin		**541256**	**CPX-AB-8-M8X2-4POL**
		4x socket M12, 5-pin		**195704**	**CPX-AB-4-M12X2-5POL**
		4x socket, M12 with quick-lock technology, 5-pin		**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
	1x plug M8, 4-pin		2x socket M8, 3-pin	**8005312**	**NEDY-L2R1-V1-M8G3-N-M8G4**
	1x plug M12, 4-pin		2x socket M8, 3-pin	**8005311**	**NEDY-L2R1-V1-M8G3-N-M12G4**
			2x socket M12, 5-pin	**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Plug					
	Plug	M8 3-pin	Solderable	**18696**	**SEA-GS-M8**
			Screw-in	**192009**	**SEA-3GS-M8-S**
		M12, PG7		**18666**	**SEA-GS-7**
		M12, PG7, 4-pin for cable ø 2.5 mm		**192008**	**SEA-4GS-7-2.5**
		M12, PG9		**18778**	**SEA-GS-9**
		M12 for 2 cables		**18779**	**SEA-GS-11-DUO**
		M12 for 2 cables, 5-pin		**192010**	**SEA-5GS-11-DUO**
		M12, 5-pin		**175487**	**SEA-M12-5GS-PG7**
	Sub-D plug, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	Connecting cable M8-M8		0.5 m	**541346**	**NEBU-M8G3-K-0.5-M8G3**
			1.0 m	**541347**	**NEBU-M8G3-K-1-M8G3**
			2.5 m	**541348**	**NEBU-M8G3-K-2.5-M8G3**
			5.0 m	**541349**	**NEBU-M8G3-K-5-M8G3**
	Modular system for a choice of connecting cables			–	**NEBU-...** → Internet: nebu

Data sheet – Output module, digital

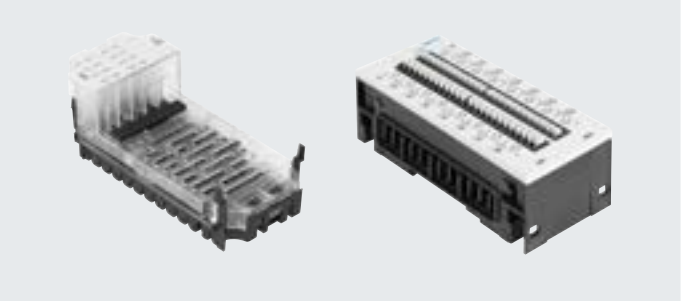
Ordering data

Designation			Part no.	Type
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
User documentation				
	User documentation	German	**526439**	**P.BE-CPX-EA-DE**
		English	**526440**	**P.BE-CPX-EA-EN**
		Spanish	**526441**	**P.BE-CPX-EA-ES**
		French	**526442**	**P.BE-CPX-EA-FR**
		Italian	**526443**	**P.BE-CPX-EA-IT**

Data sheet – Input/output module, digital

Area of application

- Digital multi I/O module for 24 V DC supply voltage
- Supports connection blocks with Sub-D, terminal connection and M12 connection (8-pin)
- As CPX-L with connection via spring-loaded terminals
- Module features can be parameterised
- The inputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive the voltage supply for the electronics and the outputs from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection for the sensor power supply and integrated electronic fuse protection in each output channel

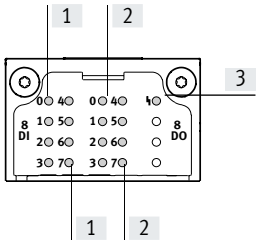


General technical data				
Type			CPX-8DE-8DA	CPX-L-8DE-8DA
Number	Inputs		8	8
	Outputs		8	8
Max. power supply	Sensor supply	[A]	0.7	1.8
Per module	Outputs	[A]	4	2
Max. power supply per channel		[A]	0.5 (12 W lamp load, channels A0 ... A03 can be connected in parallel to A4 ... A7)	0.25 (6 W lamp load)
Fuse protection (short circuit)			Internal electronic fuse per channel	
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 22	Typically 15
Operating voltage	Nominal value	[V DC]	24	24
	Permissible range	[V DC]	18 ... 30	18 ... 30
Galvanic isolation, inputs	Channel – channel		No	No
	Channel – internal bus		No	No
Galvanic isolation, outputs	Channel – channel		No	No
	Channel – internal bus		Yes, with intermediate supply	No
Characteristic curve	Inputs		IEC 1131-T2	IEC 1131-T2, type 01
	Outputs		IEC 1131-T2	IEC 1131-T2
Switching level, inputs	Signal 0	[V DC]	≤ 5	≤ 5
	Signal 1	[V DC]	≥ 11	≥ 15
Input debounce time		[ms]	3 (0.1 ms, 10 ms, 20 ms parameterisable)	
Switching logic			Positive logic (PNP)	Positive logic (PNP)
LED displays	Group diagnostics		1	1
	Channel diagnostics		–	–
	Channel status		16	16
Diagnostics			• Short circuit/overload per channel • Undervoltage of outputs	
Parameterisation			• Input debounce time • Failsafe per channel • Forcing per channel • Idle mode per channel • Signal extension time • Module monitoring • Behaviour after short circuit	
Degree of protection to EN 60529			Depending on connection block	IP20
Temperature range	Operation	[°C]	–5 ... +50	–5 ... +50
	Storage/transport	[°C]	–20 ... +70	–20 ... +70
Certification			–	c UL - Recognized (OL)
Materials			Reinforced PA, PC	PA-reinforced
Note on materials			–	RoHS-compliant
PWIS conformity			VDMA24364-B2-L	VDMA24364-B2-L
Grid dimension		[mm]	50	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	50 x 107 x 41
Product weight		[g]	48	171

Data sheet – Input/output module, digital

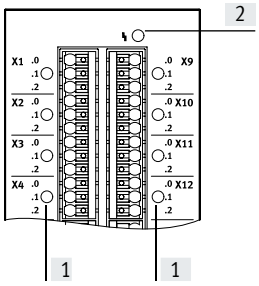
Connection and display components

CPX-8DE-8DA



[1] Status LEDs (green): for allocation to the inputs ➔ pin allocation of the module
[2] Status LEDs (yellow): for allocation to the inputs ➔ pin allocation of the module
[3] Error LED (red) (module error)

CPX-L-8DE-8DA

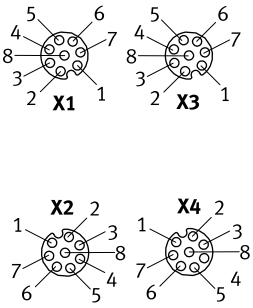


[1] Status LEDs (green) for each input signal
[2] Error LED (red, module error)

Connection block/digital I/O module combinations

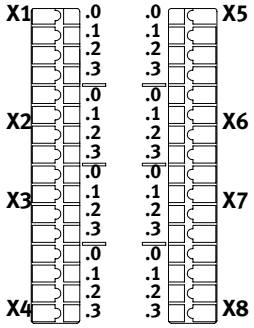
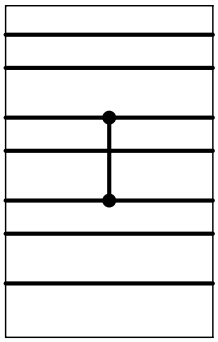
Connection blocks	Part no.	Digital I/O module	
		CPX-8DE-8DA	CPX-L-8DE-8DA
CPX-AB-4-M12-8POL	**526178**	■	–
CPX-AB-8-KL-4POL	**195708**	■	–
CPX-AB-1-SUB-BU-25POL	**525676**	■	–

Pin allocation

Connection block inputs/outputs	CPX-8DE-8DA	
CPX-AB-4-M12-8POL		
	X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}
	X1.2: Input x	X3.2: Input x+4
	X1.3: Input x+1	X3.3: Input x+5
	X1.4: 0 V_{SEN}	X3.4: 0 V_{SEN}
	X1.5: Output x	X3.5: Output x+4
	X1.6: Output x+1	X3.6: Output x+5
	X1.7: Input x+4	X3.7: n.c.
	X1.8: 0 V_{OUT}	X3.8: 0 V_{OUT}
	X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}
	X2.2: Input x+2	X4.2: Input x+6
	X2.3: Input x+3	X4.3: Input x+7
	X2.4: 0 V_{SEN}	X4.4: 0 V_{SEN}
	X2.5: Output x+2	X4.5: Output x+6
	X2.6: Output x+3	X4.6: Output x+7
	X2.7: Input x+6	X4.7: n.c.
	X2.8: 0 V_{OUT}	X4.8: 0 V_{OUT}

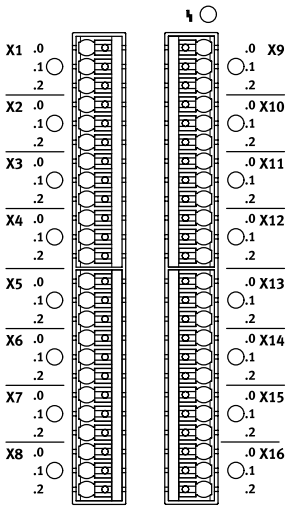
Data sheet – Input/output module, digital

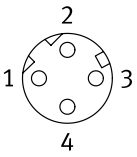
Pin allocation

Connection block inputs/outputs	CPX-8DE-8DA	
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE X2.0: Input x+4 X2.1: Input x+5 X2.2: Input x+1 X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input x+2 X3.3: FE X4.0: Input x+6 X4.1: Input x+7 X4.2: Input x+3 X4.3: FE	X5.0: Output x+4 X5.1: 0 V_{OUT} X5.2: Output x X5.3: FE X6.0: Output x+5 X6.1: 0 V_{OUT} X6.2: Output x+1 X6.3: FE X7.0: Output x+6 X7.1: 0 V_{OUT} X7.2: Output x+2 X7.3: FE X8.0: Output x+7 X8.1: 0 V_{OUT} X8.2: Output x+3 X8.3: FE
CPX-AB-1-SUB-BU-25POL		
	1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: Input x+4 6: Input x+5 7: Input x+6 8: Input x+7 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: FE	14: Output x 15: Output x+1 16: Output x+2 17: Output x+3 18: Output x+4 19: Output x+5 20: Output x+6 21: Output x+7 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE Housing: FE

Data sheet – Input/output module, digital

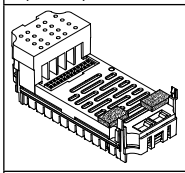
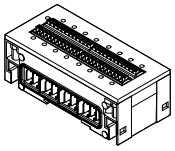
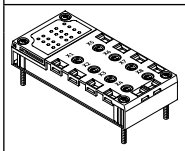
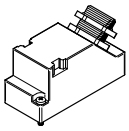
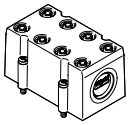
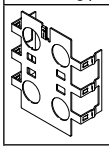
Pin allocation

Connection block inputs	CPX-L-8DE-8DA	
	X1.0: 24 V_{SEN} X1.1: Input x X1.2: 0 V_{SEN}+out	X9.0: 24 V_{SEN} X9.1: Output x X9.2: 0 V_{SEN}+out
	X2.0: 24 V_{SEN} X2.1: Input x+1 X2.2: 0 V_{SEN}+out	X10.0: 24 V_{SEN} X10.1: Output x+1 X10.2: 0 V_{SEN}+out
	X3.0: 24 V_{SEN} X3.1: Input x+2 X3.2: 0 V_{SEN}+out	X11.0: 24 V_{SEN} X11.1: Output x+2 X11.2: 0 V_{SEN}+out
	X4.0: 24 V_{SEN} X4.1: Input x+3 X4.2: 0 V_{SEN}+out	X12.0: 24 V_{SEN} X12.1: Output x+3 X12.2: 0 V_{SEN}+out
	X5.0: 24 V_{SEN} X5.1: Input x+4 X5.2: 0 V_{SEN}+out	X13.0: 24 V_{SEN} X13.1: Output x+4 X13.2: 0 V_{SEN}+out
	X6.0: 24 V_{SEN} X6.1: Input x+5 X6.2: 0 V_{SEN}+out	X14.0: 24 V_{SEN} X14.1: Output x+5 X14.2: 0 V_{SEN}+out
	X7.0: 24 V_{SEN} X7.1: Input x+6 X7.2: 0 V_{SEN}+out	X15.0: 24 V_{SEN} X15.1: Output x+6 X15.2: 0 V_{SEN}+out
	X8.0: 24 V_{SEN} X8.1: Input x+7 X8.2: 0 V_{SEN}+out	X16.0: 24 V_{S7} X16.1: Output x+7 X16.2: 0 V_{SEN}+out

Interlinking block	**CPX-L-8DE-8DA**	
	The module combines the 0 V potential of the power supply for electronics and sensors with the 0 V potential of the power supply for outputs in the CPX interlinking module.	If all pins of the outputs of an output module connected to the right of the input/output module are to be switched off, an appropriate interlinking block with additional supply for outputs must be used to the right of the input/output module.

Data sheet – Input/output module, digital

Ordering data

Designation			Part no.	Type
Input/output module, digital				
	8 digital inputs, 8 digital outputs		**526257**	**CPX-8DE-8DA**
	8 digital inputs, 8 digital outputs, for CPX in plastic, including interlinking block and connection block with spring-loaded terminals		**572607**	**CPX-L-8DE-8DA-16-KL-3POL**
Connection block				
	Plastic	4x socket M12, 8-pin	**526178**	**CPX-AB-4-M12-8POL**
		Spring-loaded terminal, 32-pin	**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin	**525676**	**CPX-AB-1-SUB-BU-25POL**
Plug				
	Sub-D plug, 25-pin		**527522**	**SD-SUB-D-ST25**
Connecting cable				
	Connecting cable M12		**525617**	**KM12-8GD8GS-2-PU**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
User documentation				
	User documentation	German	**526439**	**P.BE-CPX-EA-DE**
		English	**526440**	**P.BE-CPX-EA-EN**
		Spanish	**526441**	**P.BE-CPX-EA-ES**
		French	**526442**	**P.BE-CPX-EA-FR**
		Italian	**526443**	**P.BE-CPX-EA-IT**

Data sheet – Counter module, digital

Function

The counter module has two channels. Depending on the parameterisation, these can independently be used as counter inputs or as incremental value encoder inputs or SSI. The counter module additionally has one output per channel. The outputs can either be controlled by a counter channel or an incremental value encoder channel, i.e. through an event such as "Comparative value reached". Alternatively, outputs can also be controlled via process data.

Area of application

- Continuous counting
- One-off counting to count limit
- One-off counting to count limit, return to load value
- Periodic counting
- Measurement of frequencies
- Measurement of rotational speeds
- Measurement of duty cycle
- Measurement of position
- Measurement of speed
- Measuring with pulse generators
- Measurement with pulse generators and direction encoders
- Measurement with incremental encoders
- Measurement with SSI absolute encoders

Description

Applications

- Recording travel and speed of a conveyor
- Position and speed synchronisation of conveyors and pick & place applications
- Counting goods e.g. in packaging installations
- Systems for filling by weight and volume
- Monitoring motor speeds
- Measuring equipment for determining the position of axis systems (linear, rotational)
- Controlling fast-switching valves
- Controlling the opening time of a valve
- Activating semiconductor relays
- Temperature monitoring and rotational speed control for drives
- Change of direction in fast drives
- Control of motors with pulse-width modulation (PWM)

Supported devices

- 5 V incremental encoder, single-ended or differential, with two 90° phase offset tracks
- 24 V incremental encoder, single-ended, with two 90° phase offset tracks
- 24 V pulse generator with or without direction level
- 24 V direct current motors
- Absolute encoder with SSI interface (13 bits to 25 bits)

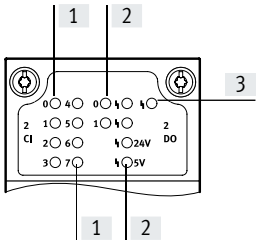
Data sheet – Counter module, digital

General technical data			
Type			CPX-2ZE2DA
Number	Inputs		2
	Outputs		2
Max. power supply	Inputs	[A]	2
Per module	Outputs	[A]	10
Max. power supply per channel		[A]	5 (adjustable, 20 W lamp load)
Max. cable length		[m]	30
Fuse protection (short circuit)			Internal electronic fuse per channel
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 35
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Galvanic isolation, inputs	Channel – channel		No
	Channel – internal bus		No
Galvanic isolation, outputs	Channel – channel		No
	Channel – internal bus		Yes, with intermediate supply
Characteristic curve	Inputs		To IEC 1131-2, type 02
	Outputs		IEC 1131-T2
Switching level	Signal 0	[V DC]	≤ 5
	Signal 1	[V DC]	≥ 11
Input debounce time		[µs]	0.1 (0.2 µs, 0.4 µs, 0.8 µs, 1 µs, 2 µs, 4 µs, 8 µs, 10 µs, 50 µs, 100 µs, 500 µs, 1 ms, 3 ms, 10 ms, 20 ms parameterisable)
Switching logic	Inputs		Positive logic (PNP)
	Outputs		• Negative logic (NPN) • Positive logic (PNP) • Push-pull driver
LED displays	Group diagnostics		1
	Channel diagnostics		2
	Channel status		10
	Module diagnostics		2
Diagnostics			Operating mode-dependent diagnostics
Parameterisation			• Switch-on/off delay • Frequency output • Speed measurement • Impulse output • Pulse train • Rotational speed measurement • Frequency measurement • Period duration measurement • Motor operating mode • Determine position • Pulse width modulation • One-off counting • Continuous counting • Periodic counting
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Certification			UL – Recognized (OL)
Information on materials: Housing			Plastic
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	130

Data sheet – Counter module, digital

Connection and display components

CPX-2ZE2DA

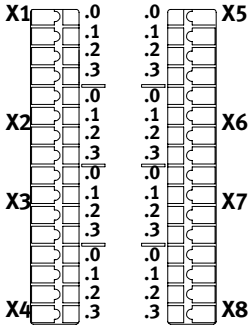


[1] Status LEDs (green): for allocation to the inputs ➔ pin allocation of the module

[2] Status LEDs (yellow, red): for allocation to the inputs a pin allocation of the module

[3] Error LED (red) (module error)

Pin allocation

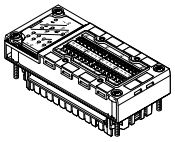
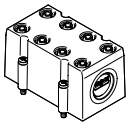
Inputs/outputs	CPX-2ZE2DA	
	**Channel 0**	**Channel 1**
	X1.0: Input	X5.0: Input
	X1.1: Input	X5.1: Input
	X1.2: Input	X5.2: Input
	X1.3: Input	X5.3: Input
	X2.0: Input	X6.0: Input
	X2.1: Input	X6.1: Input
	X2.2: 5 V DC	X6.2: 5 V DC
	X2.3: 0 V	X6.3: 0 V
	X3.0: 24 V DC	X7.0: 24 V DC
	X3.1: 0 V	X7.1: 0 V
	X3.2: 24 V DC for digital input DI	X7.2: 24 V DC for digital input DI
	X3.3: Digital input DI	X7.3: Digital input DI
	X4.0: 0 V for digital input DI	X8.0: 0 V for digital input DI
	X4.1: Digital output DO	X8.1: Digital output DO
	X4.2: Reference potential for DO	X8.2: Reference potential for DO
	X4.3: FE	X8.3: FE

Note

The allocation and designation of inputs differs fundamentally depending on which type of encoder is connected. Appropriate allocation diagrams can be found in the user documentation for the counter module.

Data sheet – Counter module, digital

Ordering data

Designation		Part no.	Type
Counter module, digital			
	2 digital inputs, 2 digital outputs	**576046**	**CPX-2ZE2DA**
Cover			
	Cover for CPX-2ZE2DA (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug	**538219**	**AK-8KL**
	Fittings kit	**538220**	**VG-K-M9**
User documentation			
	User documentation for counter module CPX-2ZE2DA, German	**8035733**	**P.BE-CPX-2ZE2DA-DE**
	English	**8035734**	**P.BE-CPX-2ZE2DA-EN**
	Spanish	**8035735**	**P.BE-CPX-2ZE2DA-ES**
	French	**8035736**	**P.BE-CPX-2ZE2DA-FR**
	Italian	**8035737**	**P.BE-CPX-2ZE2DA-IT**
	Chinese	**8035738**	**P.BE-CPX-2ZE2DA-ZH**

Data sheet – HART input/output module

Function

The HART input/output module allows the connection of up to 4 sensors or actuators. The corresponding communication channel is made available for sensors or actuators that communicate using the HART protocol.

With the HART protocol, a conventional analogue 4 ... 20 mA current signal is modulated by a second frequency-modulated signal.

Each of the 4 connections of the module can be configured as inputs or outputs.

Area of application

- Multi I/O module for 24 V DC supply voltage
- Supports connection blocks with M12 and terminal connection
- Module features can be parameterised
- The module receives the voltage supply for the electronics, outputs and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic protection

General technical data					
Type			CPX-4AE-4AA-H		
Protocol			HART		
Number of selectable analogue inputs/outputs			4		
Type of sensor			0 ... 20 mA	4 ... 20 mA	4 ... 20 mA with HART
Operating voltage	Nominal value	[V DC]	24		
	Permissible range	[V DC]	18 ... 30		
Power failure buffering		[ms]	10		
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 170		
Maximum short circuit current		[mA]	22		
Maximum open circuit voltage		[V]	28.8		
Minimum available sensor voltage			20.7 V DC at 20 mA		
Fuse protection (short circuit)			Internal electronic fuse per channel		
Reverse polarity protection			For all electrical connections		
Galvanic isolation	Channel – channel		No		
	Channel – internal bus		Yes		
Signal range			0 ... 20 mA	4 ... 20 mA	4 ... 20 mA with HART
Data format			15 bits + prefix		
			Scalable to 15 bits		
Maximum load		[Ω]	750		
Maximum input resistance		[Ω]	300		
Maximum cable length		[m]	500		
Basic error limit at 25°C		[%]	±0.1		
Operating error limit related to the ambient temperature range		[%]	±0.3		
Repetition accuracy			0.05% at 20°C		
LED displays	Group diagnostics		1		
	Channel diagnostics		4		
	Channel status		4		
Control elements			DIL switch		
Diagnostics			• Wire break per channel • Limit value violation per channel • Short circuit/overload per channel • Parameterisation error • Overflow/underflow • Limit value violation to NE43 per channel		

Data sheet – HART input/output module

General technical data	
Parameterisation	• Data format • Failsafe per channel • Forcing per channel • Limit value monitoring per channel • Idle mode per channel • Measured value smoothing • Signal range per channel • Monitoring overflow/underflow • Monitoring to NE43, inputs • Monitoring of wire break per channel • Wire break per channel • Limit value violation per channel • Short circuit/overload per channel • Parameterisation error • Overflow/underflow • Limit value violation to NE43 per channel • Number of HART repetitions • Hysteresis for limit values • HART variables (4 pieces) • Behaviour after short circuit/overload
Degree of protection to EN 60529	Depending on connection block

Technical data – Mechanical components		
Type of mounting		On interlinking block
Product weight	[g]	77.4
Grid dimension	[mm]	50
Dimensions (including interlinking block and connection block) W x L x H	[mm]	50 x 107 x 70

Materials	
Housing	Reinforced PA, PC
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

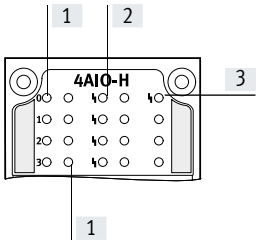
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Relative humidity	[%]	95, non-condensing
Corrosion resistance class CRC[1)]		1 (when installed)
CE marking (see declaration of conformity)[3)]		To EU EMC Directive[2)]

1) Additional information: www.festo.com/x/topic/kbk
2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.
3) Additional information: www.festo.com/catalogue/... → Support/Downloads.

Safety characteristics	
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

Data sheet – HART input/output module

Connection and display components
CPX-4EA-4AA-H



[1] Status LEDs:
– Inputs (green)
– Outputs (yellow)
➔ Pin allocation for module

[2] Error LEDs (red): for allocation to the inputs ➔ pin allocation of the module

[3] Error LED (red) (module error)

Combinations of bus nodes/control blocks with HART input/output module

Bus node/control block	Part no.	Protocol	Can be combined as of release	HART variables in process image only	Full HART functionality
CPX-CEC-C1-V3	**3473128**	CODESYS Level 2	3.5.12.174	–	■
CPX-CEC-M1-V3	**3472765**	CODESYS Level 2	3.5.12.174	–	■
CPX-CEC-S1-V3	**3472425**	CODESYS Level 2	3.5.12.174	–	■
CPX-FB11	**526172**	DeviceNet	25	■	–
CPX-FB13	**195740**	PROFIBUS	34	–	■
CPX-FB14	**526174**	CANopen	30	■	–
CPX-FB36	**1912451**	EtherNet/IP	15	–	■
CPX-FB37	**2735960**	EtherCAT	7	■	–
CPX-FB43	**8110369**	PROFINET RT, M12	45	–	■
CPX-M-FB44	**8110370**	PROFINET RT, RJ45	45	–	■
CPX-M-FB45	**8110371**	PROFINET RT, SCRJ	45	–	■

Combinations of connection blocks with HART input/output module

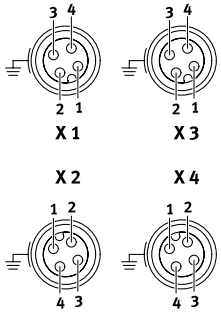
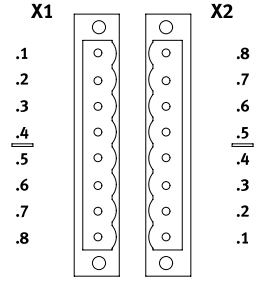
Connection blocks	Part no.	HART input/output module
		CPX-4EA-4AA-H
CPX-P-AB-4XM12-4POL	**565706**	■
CPX-P-AB-2XKL-8POL	**565704**	■

Combinations of connection blocks with interlinking block

Connection blocks	Part no.	Plastic interlinking block	Metal interlinking block
		CPX-GE...	CPX-M-GE...
CPX-P-AB-4XM12-4POL	**565706**	–	■
CPX-P-AB-2XKL-8POL	**565704**	■	■

Data sheet – HART input/output module

Pin allocation

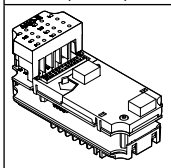
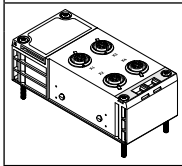
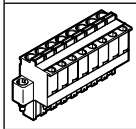
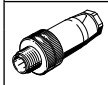
Connection block inputs/outputs	CPX-4AE-4AA-H			
	Inputs		Outputs	
CPX-P-AB-4XM12-4POL				
	X1.1: 24 $V_{SEN\ x}$ X1.2: 0 V X1.3: Input x X1.4: 0 V X2.1: 24 $V_{SEN\ x+1}$ X2.2: 0 V X2.3: Input x+1 X2.4: 0 V	X3.1: 24 $V_{SEN\ x+2}$ X3.2: 0 V X3.3: Input x+2 X3.4: 0 V X4.1: 24 $V_{SEN\ x+3}$ X4.2: 0 V X4.3: Input x+3 X4.4: 0 V	X1.1: Output I0+ X1.2: 0 V X1.3: – X1.4: 0 V X2.1: Output I1+ X2.2: 0 V X2.3: – X2.4: 0 V	X3.1: Output I2+ X3.2: 0 V X3.3: – X3.4: 0 V X4.1: Output I3+ X4.2: 0 V X4.3: – X4.4: 0 V
CPX-P-AB-2XKL-8POL				
	X1.1: 24 $V_{SEN\ x}$ X1.2: 0 V X1.3: Input x X1.4: 0 V X1.5: 24 $V_{SEN\ x+1}$ X1.6: 0 V X1.7: Input x+1 X1.8: 0 V	X2.1: 24 $V_{SEN\ x+2}$ X2.2: 0 V X2.3: Input x+2 X2.4: 0 V X2.5: 24 $V_{SEN\ x+3}$ X2.6: 0 V X2.7: Input x+3 X2.8: 0 V	X1.1: Output I0+ X1.2: 0 V X1.3: – X1.4: 0 V X1.5: Output I1+ X1.6: 0 V X1.7: – X1.8: 0 V	X2.1: Output I2+ X2.2: 0 V X2.3: – X2.4: 0 V X2.5: Output I3+ X2.6: 0 V X2.7: – X2.8: 0 V

Note

In the case of mixed operation of inputs and outputs in one module, the connections are first assigned input signals and then output signals, in ascending order.

Data sheet – HART input/output module

Ordering data

Designation					Part no.	Type
HART input/output module						
	4 analogue inputs/outputs				**8059847**	**CPX-4AE-4AA-H**
Connection block						
	Plastic	4x socket, M12, 4-pin			**565706**	**CPX-P-AB-4XM12-4POL**
		2x plug, 8-pin			**565704**	**CPX-P-AB-2XKL-8POL**
Plug						
	8-pin socket	Spring-loaded terminal	Connection cross section 0.2 ... 2.5 mm²		**565712**	**NECU-L3G8-C1**
		Screw terminal	Connection cross section 0.2 ... 2.5 mm²		**565710**	**NECU-L3G8-C2**
	Plug M12x1, 4-pin, straight, A-coded	Screw terminal	Connection cross section 0.14 ... 0.5 mm²		**192008**	**SEA-4GS-7-2.5**
			Nominal conductor cross section 14 ... 0.75 mm² Permissible cable ⌀ 4 ... 6 mm		**18666**	**SEA-GS-7**
			Connection cross section 0.75 mm² Permissible cable ⌀ 6 ... 8 mm		**18778**	**SEA-GS-9**
Cover						
	Cover cap for sealing unused connections M12x1 (10 pieces)				**165592**	**ISK-M12**
Coding element						
	To ensure that a coded socket NECU-L3G8 can only be inserted in the matching coded connection block CPX-P-AB-2XKL (96 of each)			For NECU-L3G8	**565713**	**CPX-P-KDS-AB-2XKL**

Data sheet – Input module, analogue

Function

Analogue modules control devices with a standardised analogue interface such as pressure switches, temperature, flow rate, filling level, etc. Depending on the connection block selected, the analogue module supports various connection concepts with different numbers of sockets or terminals.

Area of application

- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with Sub-D, terminal connection and M12 connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without galvanic isolation possible
- The analogue module receives the voltage supply for the electronics and the sensors from the interlinking block
- Analogue module protection and diagnostics through integrated electronic fuse protection

General technical data

Type		CPX-2AE-U-I		CPX-4AE-U-I		CPX-4AE-I
		Voltage input	Current input	Voltage input	Current input	Current input
Number of analogue inputs		2		4		4
Max. power supply per module	[A]	0.7				
Fuse protection		Internal electronic fuse				
Current consumption from 24 V sensor supply (quiescent current)	[mA]	Typically 50				
Current consumption from 24 V sensor supply (at full load)	[A]	Max. 0.7				
Nominal operating voltage for load voltage	[V DC]	24 ±2%				
Nominal operating voltage	[V DC]	24				
Operating voltage range	[V DC]	18 ... 30				
Signal range (parameterisable for each channel with DIL switch or software)		0 ... 10 V	0 ... 20 mA 4 ... 20 mA	1 ... 5 V 0 ... 10 V −5 ... +5 V −10 ... +10 V	0 ... 20 mA 4 ... 20 mA −20 ... +20 mA	0 ... 20 mA 4 ... 20 mA
Operational error limit	[%]	±0.5	–	±0.3	±0.3	±0.6
Basic error limit (at 25°C)	[%]	±0.3	–	±0.2	±0.2	±0.5
Repetition accuracy (at 25°C)	[%]	0.15	0.15	0.1	0.1	0.15
Input resistance		100 kΩ	≤ 100 Ω	100 kΩ	≤ 100 Ω	≤ 100 Ω
Max. permissible input voltage	[V DC]	30	–	−30 ... +30	–	–
Max. permissible input current	[mA]	–	40	–	Internally limited to 60	40
Conversion time per channel	[µs]	Typically 150				
Cycle time (module)	[ms]	≤ 4		≤ 0.5		≤ 10
Data format		12 bits + prefix		15 bits + prefix		12 bits + prefix
		Scalable to 15 bits		Scalable to 15 bits		Scalable to 15 bits
Cable length	[m]	Max. 30 (shielded)				

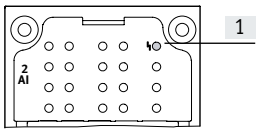
Data sheet – Input module, analogue

General technical data					
Type			CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I
Galvanic isolation	Channel – channel		No		
	Channel – internal bus		Yes, with external sensor supply		
LED displays	Group diagnostics		1		
	Channel diagnostics		Via flashing frequency of group diagnostics	4	Via flashing frequency of group diagnostics
Diagnostics			Wire break per channel		
			Limit value violation per channel		
			Parameterisation error		
			Short circuit, input signal	Overload at input	Short circuit, input signal
			–	Overflow/underflow	–
			–	Short circuit in sensor supply	–
Parameterisation			Data format		
			Forcing per channel		
			Limit value monitoring per channel		
			Measured value smoothing		
			Signal range per channel		
			Monitoring of wire break per channel		
			Behaviour after short circuit		
			–	Behaviour after overload at input	–
			–	Sensor supply active	–
Degree of protection to EN 60529			Depending on connection block		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage/transport	[°C]	–20 ... +70		
Materials			Reinforced PA, PC		
Note on materials			–	RoHS-compliant	–
PWIS conformity			VDMA24364-B2-L	VDMA24364-B2-L	VDMA24364-B2-L
Grid dimension		[mm]	50		
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50		
Product weight		[g]	48	46	47

Data sheet – Input module, analogue

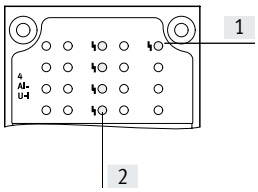
Connection and display components

CPX-2AE-U-I and CPX-4AE-I



[1] Error LED (red; module error)

CPX-4AE-U-I



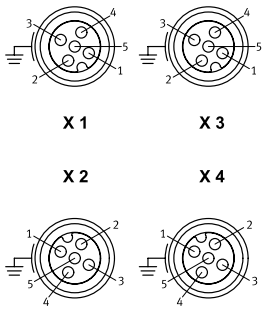
[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

Combinations of connection blocks and analogue module

Connection blocks	Part no.	Analogue module		
		CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I
CPX-AB-4-M12X2-5POL	**195704**	■	■	■
CPX-AB-4-M12X2-5POL-R	**541254**	■	■	■
CPX-AB-8-KL-4POL	**195708**	■	■	■
CPX-AB-1-SUB-BU-25POL	**525676**	■	■	■
CPX-M-AB-4-M12X2-5POL	**549367**	■	■	■

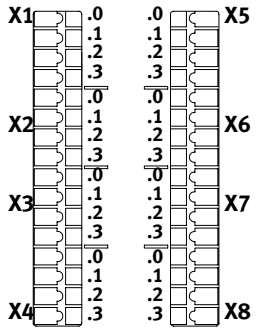
Pin allocation

CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1] and CPX-M-AB-4-M12X2-5POL



Connection block inputs	CPX-2AE-U-I		CPX-4AE-U-I		CPX-4AE-I	
X1	X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}	X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}	X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}
	X1.2: Input U0+	X3.2: Input U1+	X1.2: Input 0+	X3.2: Input 2+	X1.2: Input I0+	X3.2: Input I2+
	X1.3: 0 V_{SEN}	X3.3: 0 V_{SEN}	X1.3: 0 V_{SEN}	X3.3: 0 V_{SEN}	X1.3: 0 V_{SEN}	X3.3: 0 V_{SEN}
	X1.4: Input U0–	X3.4: Input U1–	X1.4: Input 0–	X3.4: Input 2–	X1.4: Input I0–	X3.4: Input I2–
	X1.5: FE[2]	X3.5: FE[2]	X1.5: FE[2]	X3.5: FE[2]	X1.5: FE[2]	X3.5: FE[2]
X2	X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}	X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}	X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}
	X2.2: Input I0+	X4.2: Input I1+	X2.2: Input 1+	X4.2: Input 3+	X2.2: Input I1+	X4.2: Input I3+
	X2.3: 0 V_{SEN}	X4.3: 0 V_{SEN}	X2.3: 0 V_{SEN}	X4.3: 0 V_{SEN}	X2.3: 0 V_{SEN}	X4.3: 0 V_{SEN}
	X2.4: Input I0–	X4.4: Input I1–	X2.4: Input 1–	X4.4: Input 3–	X2.4: Input I1–	X4.4: Input I3–
	X2.5: FE[2]	X4.5: FE[2]	X2.5: FE[2]	X4.5: FE[2]	X2.5: FE[2]	X4.5: FE[2]

CPX-AB-8-KL-4POL

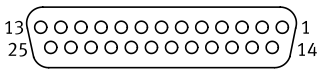


X1	X1.0: 24 V_{SEN}	X5.0: 24 V_{SEN}	X1.0: 24 V_{SEN}	X5.0: 24 V_{SEN}	X1.0: 24 V_{SEN}	X5.0: 24 V_{SEN}
	X1.1: 0 V_{SEN}	X5.1: 0 V_{SEN}	X1.1: 0 V_{SEN}	X5.1: 0 V_{SEN}	X1.1: 0 V_{SEN}	X5.1: 0 V_{SEN}
	X1.2: Input U0–	X5.2: Input U1–	X1.2: Input 0–	X5.2: Input 2–	X1.2: Input I0–	X5.2: Input I2–
	X1.3: FE	X5.3: FE	X1.3: FE	X5.3: FE	X1.3: FE	X5.3: FE
X2	X2.0: n.c.	X6.0: n.c.	X2.0: n.c.	X6.0: n.c.	X2.0: n.c.	X6.0: n.c.
	X2.1: n.c.	X6.1: n.c.	X2.1: n.c.	X6.1: n.c.	X2.1: n.c.	X6.1: n.c.
	X2.2: Input U0+	X6.2: Input U1+	X2.2: Input 0+	X6.2: Input 2+	X2.2: Input I0+	X6.2: Input I2+
	X2.3: FE	X6.3: FE	X2.3: FE	X6.3: FE	X2.3: FE	X6.3: FE
X3	X3.0: 24 V_{SEN}	X7.0: 24 V_{SEN}	X3.0: 24 V_{SEN}	X7.0: 24 V_{SEN}	X3.0: 24 V_{SEN}	X7.0: 24 V_{SEN}
	X3.1: 0 V_{SEN}	X7.1: 0 V_{SEN}	X3.1: 0 V_{SEN}	X7.1: 0 V_{SEN}	X3.1: 0 V_{SEN}	X7.1: 0 V_{SEN}
	X3.2: Input I0–	X7.2: Input I1–	X3.2: Input 1–	X7.2: Input 3–	X3.2: Input I1–	X7.2: Input I3–
	X3.3: FE	X7.3: FE	X3.3: FE	X7.3: FE	X3.3: FE	X7.3: FE
X4	X4.0: n.c.	X8.0: n.c.	X4.0: n.c.	X8.0: n.c.	X4.0: n.c.	X8.0: n.c.
	X4.1: n.c.	X8.1: n.c.	X4.1: n.c.	X8.1: n.c.	X4.1: n.c.	X8.1: n.c.
	X4.2: Input I0+	X8.2: Input I1+	X4.2: Input 1+	X8.2: Input 3+	X4.2: Input I1+	X8.2: Input I3+
	X4.3: FE	X8.3: FE	X4.3: FE	X8.3: FE	X4.3: FE	X8.3: FE

1) Speedcon quick lock, additional shielding on metal thread
2) FE/shield additionally on metal thread

Data sheet – Input module, analogue

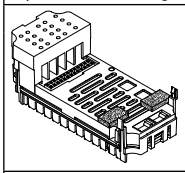
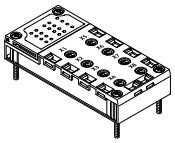
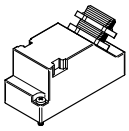
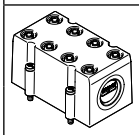
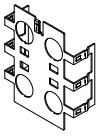
Pin allocation

Connection block inputs	CPX-2AE-U-I				CPX-4AE-U-I				CPX-4AE-I			
CPX-AB-1-SUB-BU-25POL												
	1:	Input U0–	14:	Input U1–	1:	Input 0–	14:	Input 2–	1:	Input I0–	14:	Input I2–
	2:	Input U0+	15:	Input U1+	2:	Input 0+	15:	Input 2+	2:	Input I0+	15:	Input I2+
	3:	Input I0–	16:	Input I1–	3:	Input 1–	16:	Input 3–	3:	Input I1–	16:	Input I3–
	4:	Input I1+	17:	Input I1+	4:	Input 1+	17:	Input 3+	4:	Input I1+	17:	Input I3+
	5:	n.c.	18:	24 V_{SEN}	5:	n.c.	18:	24 V_{SEN}	5:	n.c.	18:	24 V_{SEN}
	6:	n.c.	19:	n.c.	6:	n.c.	19:	n.c.	6:	n.c.	19:	n.c.
	7:	n.c.	20:	24 V_{SEN}	7:	n.c.	20:	24 V_{SEN}	7:	n.c.	20:	24 V_{SEN}
	8:	n.c.	21:	n.c.	8:	n.c.	21:	n.c.	8:	n.c.	21:	n.c.
	9:	24 V_{SEN}	22:	0 V_{SEN}	9:	24 V_{SEN}	22:	0 V_{SEN}	9:	24 V_{SEN}	22:	0 V_{SEN}
	10:	24 V_{SEN}	23:	0 V_{SEN}	10:	24 V_{SEN}	23:	0 V_{SEN}	10:	24 V_{SEN}	23:	0 V_{SEN}
	11:	0 V_{SEN}	24:	0 V_{SEN}	11:	0 V_{SEN}	24:	0 V_{SEN}	11:	0 V_{SEN}	24:	0 V_{SEN}
	12:	0 V_{SEN}	25:	FE	12:	0 V_{SEN}	25:	FE	12:	0 V_{SEN}	25:	FE
	13:	Shielding[1]	Housing: FE		13:	Shielding[1]	Housing: FE		13:	Shielding[1]	Housing: FE	

1) Connect shield to functional earth FE

Data sheet – Input module, analogue

Ordering data

				Part no.	Type
Input module, analogue					
	2 analogue current or voltage inputs			**526168**	**CPX-2AE-U-I**
	4 analogue current or voltage inputs			**573710**	**CPX-4AE-U-I**
	4 analogue current inputs			**541484**	**CPX-4AE-I**
Connection block					
	Plastic	4x socket M12, 5-pin		**195704**	**CPX-AB-4-M12X2-5POL**
		4x socket, M12 with quick-lock technology, 5-pin		**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Plug					
	Plug M12, 5-pin			**175487**	**SEA-M12-5GS-PG7**
	Sub-D plug, 25-pin			**527522**	**SD-SUB-D-ST25**
Cover					
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug			**538219**	**AK-8KL**
	Fittings kit			**538220**	**VG-K-M9**
Screening plate					
	Screening plate for M12 connections			**526184**	**CPX-AB-S-4-M12**
User documentation					
	User documentation		German	**526415**	**P.BE-CPX-AX-DE**
			English	**526416**	**P.BE-CPX-AX-EN**
			Spanish	**526417**	**P.BE-CPX-AX-ES**
			French	**526418**	**P.BE-CPX-AX-FR**
			Italian	**526419**	**P.BE-CPX-AX-IT**

Data sheet – Input module, analogue, with pressure sensors

Function

The pressure input modules make it possible to process a maximum of 4 pressures. The internal measured value of the sensor (analogue value with 10-bit resolution) is converted into an internal numerical format as appropriate to the parameterisation and made available to the bus node as a process image. It is additionally also possible to combine 2 channels in each case to form a differential pressure channel.

Area of application

- Measuring range: 0 ... 10 bar or −1 ... +1 bar
- Choice of units of measurement
- Processing a maximum of 4 pressures per module
- Pressure indication via LCD display
- Direct connection via QS4 push-in connectors
- Error message via CPX
- Channel-oriented diagnostics

General technical data

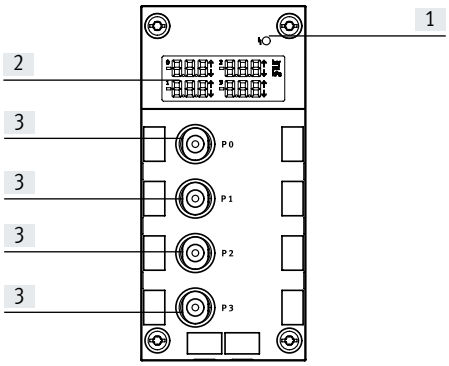
Type			CPX-4AE-P-B2	CPX-4AE-P-D10
Number of analogue inputs			4	
Pneumatic connection			QS-4	
Nominal operating voltage		[V DC]	24	
Operating voltage range		[V DC]	18 ... 30	
Intrinsic current consumption		[mA]	Typically 50	
Measured variable			4 x relative or 2 x differential pressure measurement	
Displayable units			• kPa • mbar • psi	
Pressure measuring range	Start value	[bar]	−1	0
	Final value	[bar]	1	10
Internal cycle time		[ms]	5	
Data format			• 15 bits + prefix • Binary notation in mbar, kPa, psi	
LED displays			Group diagnostics	
Diagnostics			• Limit value violation per channel • Parameterisation error • Sensor limit per channel	
Parameterisation			• Diagnostic delay per channel • Hysteresis per module • Unit of measurement • Measured value smoothing per channel • Limit value monitoring per channel • Sensor limit per channel • Measurement of relative/differential pressure	
Degree of protection to EN 60529			IP65, IP67	
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium			Lubricated operation possible (in which case lubricated operation will always be required)	
Ambient temperature		[°C]	−5 ... 50	
Storage temperature		[°C]	−20 ... 70	
Temperature of medium		[°C]	0 ... 50	
Note on materials			RoHS-compliant	
Materials			Reinforced PA, PC	
PWIS conformity			VDMA24364-B2-L	
Grid dimension		[mm]	50	
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 55	
Product weight		[g]	115	

Note

Extreme pneumatic conditions, e.g. high cycle rate with high pressure amplitudes, can damage the sensors.

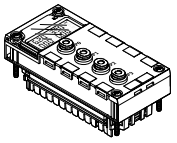
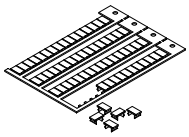
Data sheet – Input module, analogue, with pressure sensors

Connection and display components



[1] Error LED (red; module error)
[2] LCD display with permanent display of the four measured pressures, unit of measurement and if applicable limit value violation
[3] QS connections

Ordering data

Designation			Part no.	Type
Input module, analogue				
	4 analogue pressure inputs, pressure range –1 ... +1 bar		**560361**	**CPX-4AE-P-B2**
	4 analogue pressure inputs, pressure range 0 ... 10 bar		**560362**	**CPX-4AE-P-D10**
Inscription labels				
	Inscription labels 6x10 mm, 64 pieces, in frame		**18576**	**IBS-6x10**
User documentation				
	User documentation	German	**526415**	**P.BE-CPX-AX-DE**
		English	**526416**	**P.BE-CPX-AX-EN**
		Spanish	**526417**	**P.BE-CPX-AX-ES**
		French	**526418**	**P.BE-CPX-AX-FR**
		Italian	**526419**	**P.BE-CPX-AX-IT**

Data sheet – Input module, analogue, for temperature inputs

Function

The CPX-PT100 analogue input module with 4 channels for temperature measurement enables the connection of up to 4 temperature sensors of the type PT100-PT1000, Ni100-Ni1000, etc. The temperature module supports various connection concepts with different numbers of sockets or terminals as appropriate to the connection block selected.

Area of application

- Temperature module for temperature sensors PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni500, Ni1000
- Supports connection blocks with M12 and terminal connection
- Temperature module features can be parameterised
- 2-wire, 3-wire and 4-wire connection
- The temperature module is provided with voltage supply for the electronics and the sensors via the interlinking block
- Temperature module protection and diagnostics through integrated electronic fuse protection

General technical data

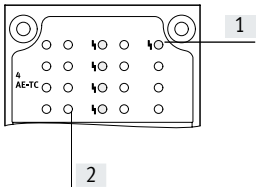
Type			CPX-4AE-T
			Temperature input
Number of analogue inputs			Choice of 2 or 4
Max. power supply per module		[A]	0.7
Fuse protection			Internal electronic fuse for sensor supply
Current consumption from 24 V sensor supply (quiescent current)		[mA]	Typically 50
Sensor supply voltage		[V DC]	24 ±25%
Sensor type (parameterisable for each channel with DIL switch)			PT100, PT200, PT500, PT1000 Ni100, Ni120, Ni500, Ni1000
Temperature range	Pt standard	[°C]	–200 ... +850
	Pt climatic	[°C]	–120 ... +130
	Ni	[°C]	–60 ... +180
Sensor connection technology			2-wire, 3-wire and 4-wire technology
Resolution			15 bits + prefix
Operating error limit relative to input range		[%]	±0.06
Basic error limit (25°C)	Standard	[K]	±0.6
	Pt climatic	[K]	±0.2
Temperature errors relative to input range		[%]	±0.001
Linearity errors (no software scaling)		[%]	±0.02
Repetition accuracy (at 25°C)		[%]	±0.05
Max. line resistance per conductor		[Ω]	10
Max. permissible input voltage		[V]	±30
Cycle time (module)		[ms]	≤ 250

Data sheet – Input module, analogue, for temperature inputs

General technical data			
Data format			15 bits + prefix, complement of two, binary notation in tenths of a degree
Cable length		[m]	Max. 200 (shielded)
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes
LED displays	Group diagnostics		1
	Channel diagnostics		4
Diagnostics			• Short circuit/overload, channel • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break
Parameterisation			• Unit of measurement and interference frequency suppression • Diagnostic message in the event of a wire break or short circuit • Limit monitoring per channel • Sensor connection technology • Sensor type/temperature coefficient, temperature range • Limit value per channel • Measured value smoothing
Degree of protection to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	47

Connection and display components

CPX-4AE-T



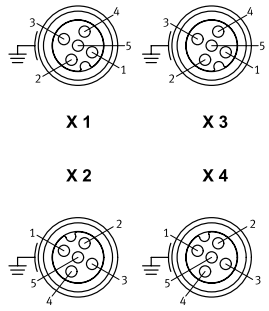
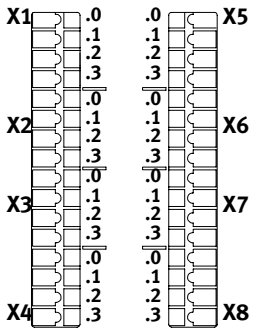
[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

Combinations of connection blocks and analogue module

Connection blocks	Part no.	Temperature module
		CPX-4AE-T
CPX-AB-4-M12X2-5POL	**195704**	■
CPX-AB-4-M12X2-5POL-R	**541254**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-M-AB-4-M12X2-5POL	**549367**	■

Data sheet – Input module, analogue, for temperature inputs

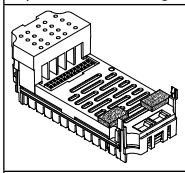
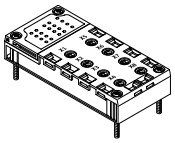
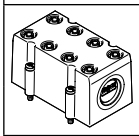
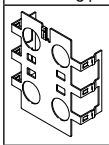
Pin allocation

Connection block inputs	CPX-4AE-T	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1] and CPX-M-AB-4-M12X2-5POL		
	X1.1: Input I0+ X1.2: Input U0+ X1.3: Input I0– X1.4: Input U0– X1.5: FE[2]	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2– X3.5: FE[2]
	X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1– X2.5: FE[2]	X4.1: Input I3+ X4.2: Input U3+ X4.3: Input I3– X4.4: Input U3– X4.5: FE[2]
CPX-AB-8-KL-4POL		
	X1.0: Input I0+ X1.1: Input I0– X1.2: Input U0– X1.3: FE	X5.0: Input I2+ X5.1: Input I2– X5.2: Input U2– X5.3: FE
	X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: InputUI2+ X6.3: FE
	X3.0: Input I1+ X3.1: Input I1– X3.2: Input U1– X3.3: FE	X7.0: Input I3+ X7.1: Input I3– X7.2: Input U3– X7.3: FE
	X4.0: n.c. X4.1: n.c. X4.2: Input U1+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Input U3+ X8.3: FE

1) Speedcon quick lock, additional shielding on metal thread
2) FE/shield additionally on metal thread

Data sheet – Input module, analogue, for temperature inputs

Ordering data

Designation			Part no.	Type
Input module, analogue				
	2 or 4 analogue temperature inputs		**541486**	**CPX-4AE-T**
Connection block				
	Plastic	4x socket M12, 5-pin	**195704**	**CPX-AB-4-M12X2-5POL**
		4x socket, M12 with quick-lock technology, 5-pin	**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin	**195708**	**CPX-AB-8-KL-4POL**
	Metal	4x socket M12, 5-pin	**549367**	**CPX-M-AB-4-M12X2-5POL**
Plug				
	Plug M12, 5-pin		**175487**	**SEA-M12-5GS-PG7**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
User documentation				
	User documentation	German	**526415**	**P.BE-CPX-AX-DE**
		English	**526416**	**P.BE-CPX-AX-EN**
		Spanish	**526417**	**P.BE-CPX-AX-ES**
		French	**526418**	**P.BE-CPX-AX-FR**
		Italian	**526419**	**P.BE-CPX-AX-IT**

Data sheet – Input module, analogue, for thermocouple

Function

The CPX-4AE-TC analogue input module with 4 channels for temperature measurement enables up to 4 thermocouple sensors to be connected.
The channels feature wire break and short circuit detection.
If no cold junction compensation sensor is being used, an internal theoretical value of 25°C can be used (accuracy is impaired).

Area of application

- Supports connection blocks with M12 and terminal connection
- Temperature module features can be parameterised
- 2-wire connection
- 2-wire connection for a PT1000 sensor for cold junction compensation
- The temperature module is provided with voltage supply for the electronics and the sensors via the interlinking block
- Temperature module protection and diagnostics through integrated electronic fuse protection

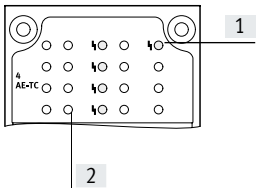
General technical data		
Type		CPX-4AE-TC
		Temperature input
Number of analogue inputs		4
Fuse protection (short circuit)		Internal electronic fuse per channel
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Sensor type (parameterisable for each channel with software)		• Type B +400 ... +1820°C, 8 µV/°C • Type E –270 ... +900°C, 60 µV/°C • Type J –200 ... +1200°C, 51 µV/°C • Type K –200 ... +1370°C, 40 µV/°C • Type N –200 ... +1300°C, 38 µV/°C • Type R 0 ... +1760°C, 12 µV/°C • Type S 0 ... +1760°C, 11 µV/°C • Type T –200 ... +400°C, 40 µV/°C
Sensor connection technology		2-wire technology
Operating error limit relative to ambient temperature	[%]	Max. ±0.6
Basic error limit (at 25°C)	[%]	Max. ±0.4
Repetition accuracy (at 25°C)	[%]	±0.05
Max. line resistance per conductor	[Ω]	10
Max. residual current per module	[mA]	30
Max. permissible input voltage	[V]	±30
Internal cycle time (module)	[ms]	250

Data sheet – Input module, analogue, for thermocouple

General technical data			
Data format			• 15 bits + prefix, complement of two • Binary notation in tenths of a degree
Cable length		[m]	Max. 50 (shielded)
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes
LED displays	Group diagnostics		1
	Channel diagnostics		4
Diagnostics			• Parameterisation error • Wire break per channel • Limit value violation per channel
Parameterisation			• Monitoring of wire break per channel • Unit of measurement • Cold-junction compensation • Sensor type per channel • Limit value monitoring per channel • Measured value smoothing
Degree of protection to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Product weight		[g]	46

Connection and display components

CPX-4AE-TC

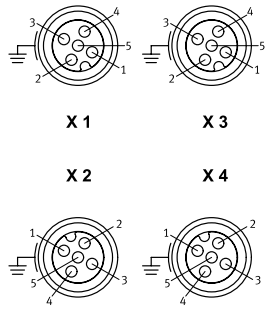
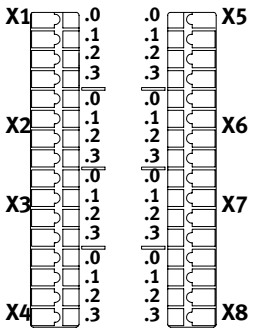


[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

Combinations of connection blocks and analogue module		
Connection blocks	Part no.	Temperature module
		CPX-4AE-TC
CPX-AB-4-M12X2-5POL	**195704**	■
CPX-AB-4-M12X2-5POL-R	**541254**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-M-AB-4-M12X2-5POL	**549367**	■

Data sheet – Input module, analogue, for thermocouple

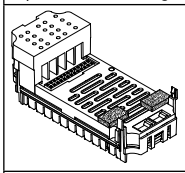
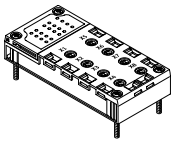
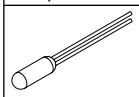
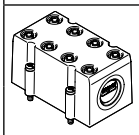
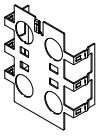
Pin allocation

Connection block inputs	CPX-4AE-TC	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1] and CPX-M-AB-4-M12X2-5POL		
	X1.1: Cold junction compensation 0+ X1.2: Input signal U0+ X1.3: Cold junction compensation 0– X1.4: Input signal U0– X1.5: FE[2]	X3.1: Cold junction compensation 2+ X3.2: Input signal U2+ X3.3: Cold junction compensation 2– X3.4: Input signal U2– X3.5: FE[2]
	X2.1: Cold junction compensation 1+ X2.2: Input signal U1+ X2.3: Cold junction compensation 1– X2.4: Input signal U1– X2.5: FE[2]	X4.1: Cold junction compensation 3+ X4.2: Input signal U3+ X4.3: Cold junction compensation 3– X4.4: Input signal U3– X4.5: FE[2]
CPX-AB-8-KL-4POL		
	X1.0: Cold junction compensation 0+ X1.1: Cold junction compensation 0– X1.2: Input signal U0– X1.3: FE	X5.0: Cold junction compensation 2+ X5.1: Cold junction compensation 2– X5.2: Input signal U2– X5.3: FE
	X2.0: n.c. X2.1: n.c. X2.2: Input signal U0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: Input signal U2+ X6.3: FE
	X3.0: Cold junction compensation 1+ X3.1: Cold junction compensation 1– X3.2: Input signal U1– X3.3: FE	X7.0: Cold junction compensation 3+ X7.1: Cold junction compensation 3– X7.2: Input signal U3– X7.3: FE
	X4.0: n.c. X4.1: n.c. X4.2: Input signal U1+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Input signal U3+ X8.3: FE

1) Speedcon quick lock, additional shielding on metal thread
2) FE/shield additionally on metal thread

Data sheet – Input module, analogue, for thermocouple

Ordering data

Designation			Part no.	Type
Input module, analogue				
	4 analogue temperature inputs, with 2-wire connection for a PT1000 sensor for cold junction compensation		**553594**	**CPX-4AE-TC**
Connection block				
	Plastic	4x socket M12, 5-pin	**195704**	**CPX-AB-4-M12X2-5POL**
		4x socket, M12 with quick-lock technology, 5-pin	**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin	**195708**	**CPX-AB-8-KL-4POL**
	Metal	4x socket M12, 5-pin	**549367**	**CPX-M-AB-4-M12X2-5POL**
Cold junction compensation				
	PT1000 temperature sensor for cold junction compensation		**553596**	**CPX-W-PT1000**
Plug				
	Plug M12, 5-pin		**175487**	**SEA-M12-5GS-PG7**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
User documentation				
	User documentation	German	**526415**	**P.BE-CPX-AX-DE**
		English	**526416**	**P.BE-CPX-AX-EN**
		Spanish	**526417**	**P.BE-CPX-AX-ES**
		French	**526418**	**P.BE-CPX-AX-FR**
		Italian	**526419**	**P.BE-CPX-AX-IT**

Data sheet – Output module, analogue

Function

Analogue modules control devices with a standard analogue interface such as proportional valves, etc.
Depending on the connection block selected, the analogue module supports various connection concepts with different numbers of sockets or terminals.

Area of application

- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with Sub-D, terminal connection and M12 connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without galvanic isolation possible
- The analogue module receives the voltage supply for the electronics and the actuators from the interlinking block
- Analogue module protection and diagnostics through integrated electronic fuse protection

General technical data

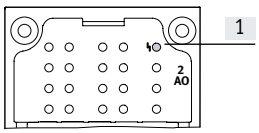
Type			CPX-2AA-U-I	
			Voltage output	Current output
Number of analogue outputs			2	
Max. actuator supply per module		[A]	2.8	
Fuse protection			Internal electronic fuse for actuator supply	
Current consumption from 24 V sensor supply (at full load)		[mA]	Max. 150	
Current consumption from 24 V actuator supply (at full load)		[A]	4 ... 10	
Supply voltage for actuators		[V DC]	24 ±25%	
Signal range (parameterisable for each channel with DIL switch or software)			0 ... 10 V DC	0 ... 20 mA 4 ... 20 mA
Resolution		[bit]	12	
Number of units			4096	
Absolute accuracy		[%]	±0.6	
Linearity errors (no software scaling)		[%]	±0.1	
Repetition accuracy (at 25°C)		[%]	0.05	
Encoder selection	Load resistance for ohmic load	[kΩ]	Min. 1	Max. 0.5
	Load resistance for capacitive load	[µF]	Max. 1	–
	Load resistance for inductive load	[mH]	–	Max. 1
	Short circuit protection for analogue output		Yes	–
	Short circuit current of analogue output	[mA]	Approx. 20	–
	Open circuit voltage	[V DC]	–	18
	Destruction limit against externally applied voltage	[V DC]	15	
	Actuator connection		2 wires	
Cycle time (module)		[ms]	≤ 4	

Data sheet – Output module, analogue

General technical data				
Type			CPX-2AA-U-I	
			Voltage output	Current output
Response time	For ohmic load	[ms]	0.1	0.1
	For capacitive load	[ms]	0.7	–
	For inductive load	[ms]	–	0.5
Data format			15 bits + prefix, linear scaling 12 bits right-justified 12 bits left-justified, S7 compatible 12 bits left-justified, S5 compatible	
Cable length		[m]	Max. 30 (shielded)	
LED displays	Group diagnostics		1	
	Channel diagnostics		Yes, via flashing frequency of group diagnostics	
Diagnostics			• Short circuit/overload, actuator supply • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break	
Parameterisation			• Short circuit monitoring, actuator supply • Short circuit monitoring, analogue output • Behaviour after short circuit, actuator supply • Data format • Lower limit value/full-scale value • Upper limit value/full-scale value • Monitoring value falling below nominal range/full-scale value • Monitoring value exceeding nominal range/full-scale value • Monitoring wire break • Signal range	
Degree of protection to EN 60529			Depending on connection block	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			Reinforced PA, PC	
PWIS conformity			VDMA24364-B2-L	
Grid dimension		[mm]	50	
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Product weight		[g]	49	

Connection and display components

CPX-2AA-U-I

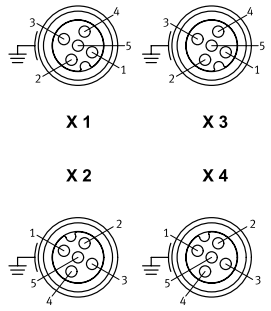
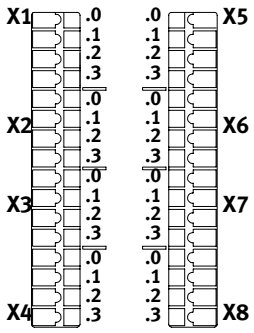
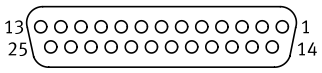


[1] Error LED (red; module error)

Combinations of connection blocks and analogue module		
Connection blocks	Part no.	Analogue module
		CPX-2AA-U-I
CPX-AB-4-M12X2-5POL	**195704**	■
CPX-AB-4-M12X2-5POL-R	**541254**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-AB-1-SUB-BU-25POL	**525676**	■
CPX-M-AB-4-M12X2-5POL	**549367**	■

Data sheet – Output module, analogue

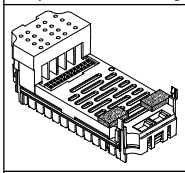
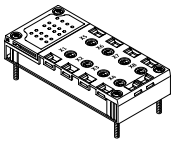
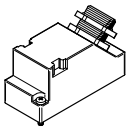
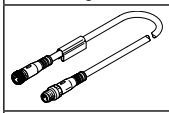
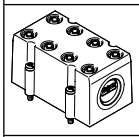
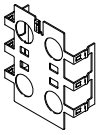
Pin allocation

Connection block outputs	CPX-2AA-U-I	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1], CPX-M-AB-4-M12X2-5POL		
	X1.1: 24 V_{OUT} X1.2: Output U0+ X1.3: 0 V_{OUT} X1.4: Output GND X1.5: FE[2]	X3.1: 24 V_{OUT} X3.2: Output U1+ X3.3: 0 V_{OUT} X3.4: Output GND X3.5: FE[2]
	X2.1: 24 V_{OUT} X2.2: Output I0+ X2.3: 0 V_{OUT} X2.4: Output GND X2.5: FE[2]	X4.1: 24 V_{OUT} X4.2: Output I1+ X4.3: 0 V_{OUT} X4.4: Output GND X4.5: FE[2]
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{OUT} X1.1: 0 V_{OUT} X1.2: Output GND X1.3: FE	X5.0: 24 V_{OUT} X5.1: 0 V_{OUT} X5.2: Output GND X5.3: FE
	X2.0: n.c. X2.1: n.c. X2.2: Output U0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: Output U1+ X6.3: FE
	X3.0: 24 V_{OUT} X3.1: 0 V_{OUT} X3.2: Output GDN X3.3: FE	X7.0: 24 V_{OUT} X7.1: 0 V_{OUT} X7.2: Output GND X7.3: FE
	X4.0: n.c. X4.1: n.c. X4.2: Output I0+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Output I1+ X8.3: FE
CPX-AB-1-SUB-BU-25POL		
	1: Output GND 2: Output U0+ 3: Output GND 4: Output I0+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{OUT} 10: 24 V_{OUT} 11: 0 V_{OUT} 12: 0 V_{OUT} 13: Shielding[3]	14: Output GND 15: Output U1+ 16: Output GND 17: Output I1+ 18: 24 V_{OUT} 19: n.c. 20: 24 V_{OUT} 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE Housing: FE

1) Speedcon quick lock, additional shielding on metal thread
2) FE/shield additionally on metal thread
3) Connect shield to functional earth FE

Data sheet – Output module, analogue

Ordering data

Designation				Part no.	Type
Output module, analogue					
	2 analogue current or voltage outputs			**526170**	**CPX-2AA-U-I**
Connection block					
	Plastic	4x socket M12, 5-pin		**195704**	**CPX-AB-4-M12X2-5POL**
		4x socket, M12 with quick-lock technology, 5-pin		**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Plug					
	Plug M12, 5-pin			**175487**	**SEA-M12-5GS-PG7**
	Sub-D plug, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	Modular system for a choice of connecting cables			–	**NEBU-...** → Internet: nebu
Cover					
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug			**538219**	**AK-8KL**
	Fittings kit			**538220**	**VG-K-M9**
Screening plate					
	Screening plate for M12 connections			**526184**	**CPX-AB-S-4-M12**
User documentation					
	User documentation		German	**526415**	**P.BE-CPX-AX-DE**
			English	**526416**	**P.BE-CPX-AX-EN**
			Spanish	**526417**	**P.BE-CPX-AX-ES**
			French	**526418**	**P.BE-CPX-AX-FR**
			Italian	**526419**	**P.BE-CPX-AX-IT**

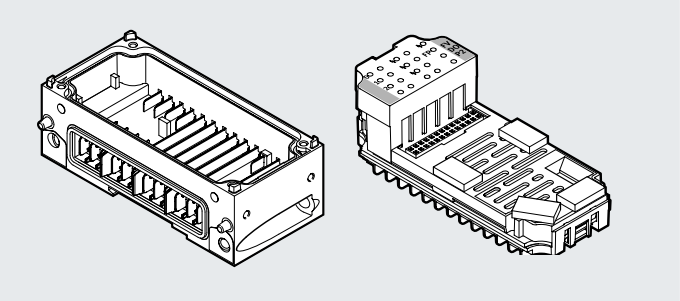
Data sheet – PROFIsafe shut-off module

Function

The PROFIsafe shut-off module interrupts the contact rails of the interlinking block for valves and outputs. The supply voltage for valves can be switched by the module within the CPX terminal and via a connection block to two consuming devices. Actuation takes place via the bus node (PROFINET) of the CPX terminal.

Area of application

- Output module for 24 V DC supply voltage
- Shut-off module for supply voltage for valves
- Can only be used with PROFINET or PROFIBUS bus nodes
- The shut-off module is supplied with voltage for the electronics and the outputs by the interlinking block
- The outputs are supplied from the power supply for valves (V_{Valves})



General technical data			
Type			CPX-FVDA-P2
Number of outputs			2
Note on outputs			1 internal channel for switching off the supply voltage for valves
			2 external outputs
Max. address capacity	Inputs	[B]	6
	Outputs	[B]	6
Maximum cable length		[m]	200
Max. power supply	Per module	[A]	5
	Per channel	[A]	1.5
Fuse protection (short circuit)			Internal electronic fuse per channel
Current consumption of module		[mA]	Typically 65 (power supply for valves)
		[mA]	Typically 25 (power supply for electronics)
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	20.4 ... 28.8
Voltage drop per channel		[V]	0.6
Residual ripple		[Vss]	2 within voltage range
Load capacity to FE		[nF]	400
Max. response time to shut-off command		[ms]	23
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes, with intermediate supply
Switching logic	Outputs		P-M switching
Safety integrity level			Safe switch-off, SIL3
Performance Level			Safe switch-off/category 3, Performance Level e
Failure rate per hour (PFH)			1.0x 10^{-9}
Certificate issuing authority			01/205/50294/13
LED displays	Group diagnostics		1
	Channel diagnostics		3
	Channel status		3
	Failsafe protocol active		1
Diagnostics			• Short circuit/overload per channel • Undervoltage of valves • Cross circuit • Wire break per channel
Parameterisation			• Monitoring of wire break per channel • Diagnostic behaviour
Degree of protection to EN 60529			Depending on connection block
Grid dimension		[mm]	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 55
Product weight		[g]	50

Data sheet – PROFIsafe shut-off module

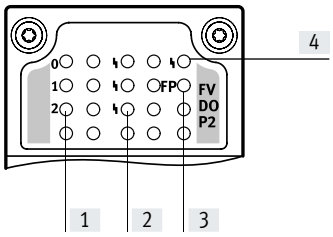
Materials	
Housing	Reinforced PA, PC
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
CE marking (see declaration of conformity)[1)]		To EU Machinery Directive
		To EU EMC Directive
		To EU RoHS Directive
UKCA marking (see declaration of conformity)[1)]		To UK instructions for machines
		To UK instructions for EMC
		To UK RoHS instructions
Certification		c UL us - Recognized (OL)

1) Additional information at: www.festo.com/catalogue/... → Support/Downloads.

Connection and display components

CPX-FVDA-P2



[1] Status LEDs (yellow):
0: Supply voltage for valves
1: X1
2: X2

[2] Channel-related error LEDs (red)
[3] Fail-safe protocol active (green)
[4] Error LED (red, module error)

Combinations of bus nodes/control blocks and PROFIsafe shut-off module

Bus node/control block	Part no.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-FB13	**195740**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**	■
CPX-M-FB45	**8110371**	■

Note

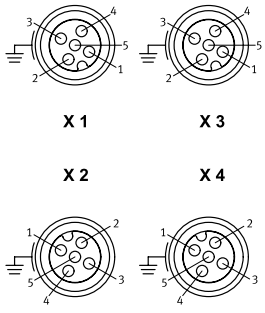
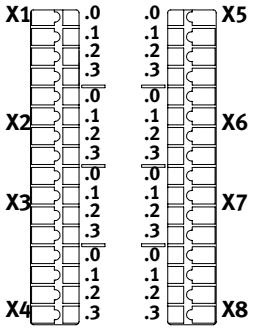
The PROFIsafe shut-off module CPX-FVDA-P2 can only be integrated as of software release 21 or release 30 (in the case of CPX-FB13).

Data sheet – PROFIsafe shut-off module

Combinations of connection blocks and PROFIsafe shut-off module

Connection blocks	Part no.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-M-AB-4-M12X2-5POL	**549367**	■
CPX-AB-8-KL-4POL	**195708**	■

Pin allocation

Connection block outputs	CPX-FVDA-P2	
CPX-M-AB-4-M12X2-5POL		
	X1.1: 0 V_{OUT} 1 (cannot be switched off) X1.2: 24 V_{OUT} 1 (cannot be switched off) X1.3: 0 V_{OUT} 1 (can be switched off via fieldbus) X1.4: 24 V_{OUT} 1 (can be switched off via fieldbus) X1.5: FE X2.1: 0 V_{OUT} 2 (cannot be switched off) X2.2: 24 V_{OUT} 2 (cannot be switched off) X2.3: 0 V_{OUT} 2 (can be switched off via fieldbus) X2.4: 24 V_{OUT} 2 (can be switched off via fieldbus) X2.5: FE	X3.1: n.c. X3.2: n.c. X3.3: n.c. X3.4: n.c. X3.5: FE X4.1: n.c. X4.2: n.c. X4.3: n.c. X4.4: n.c. X4.5: FE
CPX-AB-8-KL-4POL		
	X1.0: 0 V_{OUT} 1 (cannot be switched off) X1.1: 0 V_{OUT} 1 (can be switched off via fieldbus) X1.2: 24 V_{OUT} 1 (can be switched off via fieldbus) X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: 24 V_{OUT} 1 (cannot be switched off) X2.3: FE X3.0: 0 V_{OUT} 2 (cannot be switched off) X3.1: 0 V_{OUT} 2 (can be switched off via fieldbus) X3.2: 24 V_{OUT} 2 (can be switched off via fieldbus) X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: 24 V_{OUT} 2 (cannot be switched off) X4.3: FE	X5.0: n.c. X5.1: n.c. X5.2: n.c. X5.3: n.c. X6.0: n.c. X6.1: n.c. X6.2: n.c. X6.3: n.c. X7.0: n.c. X7.1: n.c. X7.2: n.c. X7.3: n.c. X8.0: n.c. X8.1: n.c. X8.2: n.c. X8.3: n.c.

Data sheet – PROFIsafe shut-off module

Combinations of interlinking blocks and PROFIsafe shut-off module

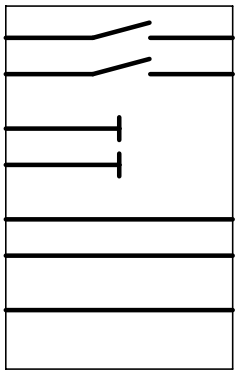
Interlinking blocks	Part no.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-GE-EV-S	**195746**	–
CPX-GE-EV-S-VL	**8022170**	–
CPX-GE-EV-S-7/8-4POL	**541248**	–
CPX-GE-EV-S-7/8-5POL	**541244**	–
CPX-GE-EV-S-7/8-5POL-VL	**8022172**	–
CPX-M-GE-EV-S-7/8-CIP-4P	**568956**	–
CPX-M-GE-EV-S-7/8-5POL	**550208**	–
CPX-M-GE-EV-S-7/8-5POL-VL	**8022165**	–
CPX-M-GE-EV-S-M12-5POL	**8098392**	–
CPX-M-GE-EV-S-PP-5POL	**563057**	–
CPX-GE-EV	**195742**	–
CPX-M-GE-EV	**550206**	–
CPX-M-GE-EV-FVO	**567806**	■
CPX-GE-EV-Z	**195744**	–
CPX-GE-EV-Z-VL	**8022166**	–
CPX-GE-EV-Z-7/8-4POL	**541250**	–
CPX-GE-EV-Z-7/8-5POL	**541246**	–
CPX-GE-EV-Z-7/8-5POL-VL	**8022173**	–
CPX-M-GE-EV-Z-7/8-5POL	**550210**	–
CPX-M-GE-EV-Z-7/8-5POL-VL	**8022158**	–
CPX-M-GE-EV-Z-PP-5POL	**563058**	–
CPX-GE-EV-V	**533577**	–
CPX-GE-EV-V-VL	**8022171**	–
CPX-GE-EV-V-7/8-4POL	**541252**	–
CPX-M-GE-EV-W-M12-5POL	**8098391**	–

General technical data

Type		CPX-M-GE-EV-FVO
Nominal operating voltage	[V DC]	24
Acceptable current load (per contact/contact rail)	[A]	16
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Certification		c UL us - Recognized (OL)
Note on materials		RoHS-compliant
Materials		Die-cast aluminium
PWIS conformity		VDMA24364-B2-L
Type of mounting		Angled fitting
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35
Product weight	[g]	170

Pin allocation

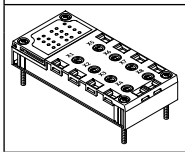
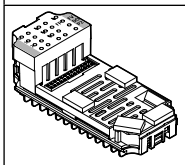
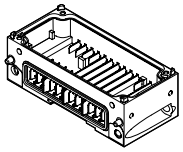
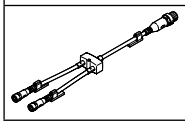
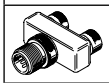
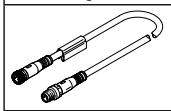
Circuitry



	Pin	Allocation
	–	–
	–	–
	–	–
	–	–

Data sheet – PROFIsafe shut-off module

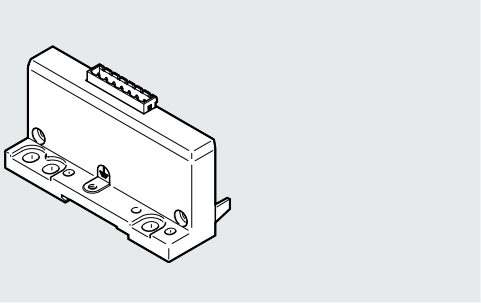
Ordering data

	Description			Part no.	Type
PROFIsafe shut-off module					
	Metal connection block	4x socket, M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
	Plastic connection block	Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
	Electronics module (can only be used with CPX-M-GE-EV-FVO)	PROFINET, PROFIBUS		**1971599**	**CPX-FVDA-P2**
	Metal interlinking block (for CPX-FVDA-P2 only)			**567806**	**CPX-M-GE-EV-FVO**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** ➔ Internet: nedy
	1x plug M12, 4-pin	2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Plug					
	Plug	M12, PG7		**18666**	**SEA-GS-7**
		M12, PG7, 4-pin for cable ⌀ 2.5 mm		**192008**	**SEA-4GS-7-2.5**
		M12, PG9		**18778**	**SEA-GS-9**
		M12 for 2 cables		**18779**	**SEA-GS-11-DUO**
		M12 for 2 cables, 5-pin		**192010**	**SEA-5GS-11-DUO**
		M12, 5-pin		**175487**	**SEA-M12-5GS-PG7**
Connecting cable					
	Modular system for a choice of connecting cables			–	**NEBU-...** ➔ Internet: nebu
User documentation					
	User documentation for PROFIsafe shut-off module		German	**8022606**	**CPX-FVDA-P2-DE**
			English	**8022607**	**CPX-FVDA-P2-EN**
			Spanish	**8022608**	**CPX-FVDA-P2-ES**
			French	**8022609**	**CPX-FVDA-P2-FR**
			Italian	**8022610**	**CPX-FVDA-P2-IT**
			Chinese	**8022611**	**CPX-FVDA-P2-ZH**

Data sheet – End plate with system supply

Function
End plates form the outer edge of the CPX terminal.
The earth connection and mounting holes for wall or H-rail mounting are located on the left-hand end plate.
The end plate with system supply has contact rails from which the other CPX components on the interlinking modules are supplied with power.

Area of application
- 24 V DC supply voltage for the electronics of the CPX terminal
- 24 V DC supply voltage for inputs
- 24 V DC supply voltage for valves
- 24 V DC supply voltage for outputs

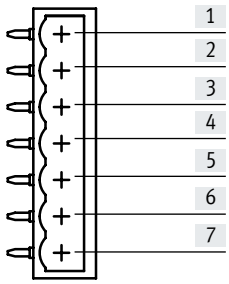


General technical data		
Electrical connection		Plug, 7-pin
Type of mounting		Tie rods
Power supply		System supply
Maximum power supply	[A]	12
Product weight	[g]	145

Materials	
Housing	Die-cast aluminium, painted
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

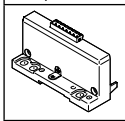
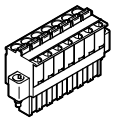
Operating and environmental conditions	
Certification	c UL us - Recognized (OL)

Pin allocation

Circuitry	Pin	Allocation
Plug, 7-pin		
	[1]	0 V power supply for valves
	[2]	24 V DC load voltage supply for valves
	[3]	0 V power supply for outputs
	[4]	24 V DC load voltage supply for outputs
	[5]	0 V power supply for electronics and sensors
	[6]	24 V DC power supply for electronics and sensors
	[7]	FE

Data sheet – End plate with system supply

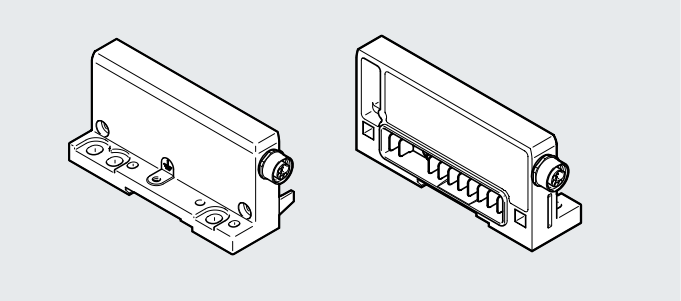
Ordering data

			Part no.	Type
End plate with system supply				
	End plate for CPX terminal in plastic design		**576315**	**CPX-EPL-EV-S**
Terminal strip				
	Plug, 7-pin, straight	Spring-loaded terminal	**576319**	**NECU-L3G7-C1**

Data sheet – End plate with extension

Function
End plates form the outer edge of the CPX terminal.
The earth connection and mounting holes for wall or H-rail mounting are located on the left-hand end plates.
The end plates with extension enable the CPX terminal to be separated into two interconnected terminals. Control is provided via a common bus node or control block.

Area of application
- Separation of long CPX terminals into two shorter units
- Adaptation for installation in a control cabinet



General technical data			
Type		CPX-EP...	CPX-M-EP...
Type of mounting		Tie rods	Angled fitting
Maximum power supply	[A]	6	6

Materials		
Type	CPX-EP...	CPX-M-EP...
Housing	Die-cast aluminium, painted	Die-cast aluminium
Note on materials	RoHS-compliant	RoHS-compliant
PWIS conformity	VDMA24364-B2-L	VDMA24364-B2-L

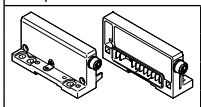
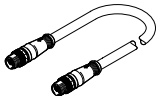
Operating and environmental conditions	
Certification	c UL us - Recognized (OL)

Data sheet – End plate with extension

Pin allocation – End plate with extension

Circuitry	Pin	Allocation	Pin	Circuitry
Right-hand end plate (first row)	**Round plug, 8-pin**			**Left-hand end plate (second row)**
	M12			
	1	0 V DC supply voltage for electronics and sensors	1	
	2	0 V DC load voltage supply for valves	2	
	3	24 V DC load voltage supply for valves	3	
	4	24 V DC power supply for electronics and sensors	4	
	5	Bus signal	5	
	6	Bus signal	6	
	7	Bus signal	7	
	8	Bus signal	8	
	Housing	FE	Housing	

Ordering data

				Weight [g]	Part no.	Type
End plate with extension						
	For CPX terminal in plastic design	First row, right-hand end plate		190	**576313**	**CPX-EPR-EV-X**
		Second row, left-hand end plate		175	**576314**	**CPX-EPL-EV-X**
	For CPX terminal in metal design	First row, right-hand end plate		190	**576316**	**CPX-M-EPR-EV-X**
		Second row, left-hand end plate		175	**576317**	**CPX-M-EPL-EV-X**
Connecting cable						
	8-pin		0.25 m	47	**564189**	**NEBC-F12G8-KH-0.25-N-S-F12G8**
			0.5 m	69	**564190**	**NEBC-F12G8-KH-0.5-N-S-F12G8**
			1 m	113	**564191**	**NEBC-F12G8-KH-1-N-S-F12G8**
			1.5 m	154	**564192**	**NEBC-F12G8-KH-1.5-N-S-F12G8**
			2 m	200	**576015**	**NEBC-F12G8-KH-2-N-S-F12G8**
			3 m	280	**576636**	**NEBC-F12G8-KH-3-N-S-F12G8**

Data sheet – Interlinking block with system supply

Function
Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power. Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Area of application
- 24 V DC supply voltage for the electronics of the CPX terminal
- 24 V DC supply voltage for inputs
- 24 V DC supply voltage for valves
- 24 V DC supply voltage for outputs

General technical data		
Nominal operating voltage	[V DC]	24
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35

Technical data – Plastic interlinking blocks							
Type			CPX-GE-EV-S				
				-VL	-7/8-4POL	-7/8-5POL	-7/8-5POL-VL
Electrical connection			M18	M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Power supply	Sensors and electronics	[A]	Max. 16	Max. 8	Max. 10	Max. 8	Max. 8
	Valves and outputs	[A]	Max. 16	Max. 8	Max. 10	Max. 8	Max. 8
Corrosion resistance class CRC[1)]			1				
Type of mounting			Tie rods				
Materials			PA-reinforced				
Product weight		[g]	125				

1) Additional information: www.festo.com/x/topic/kbk

Data sheet – Interlinking block with system supply

Technical data – Metal interlinking blocks							
Type			CPX-M-GE-EV-S				
			-7/8-CIP-4P	-7/8-5POL	-M12-5POL	-7/8-5POL-VL	-PP-5POL
Electrical connection			7/8", 4-pin	7/8", 5-pin	Plug M12x1 5-pin L-coded	7/8", 5-pin	AIDA push-pull, 5-pin
Power supply	Sensors and electronics	[A]	Max. 10	Max. 8	Max. 16	Max. 8	Max. 16
	Valves and outputs	[A]	Max. 10	Max. 8	Max. 16	Max. 8	Max. 16
Corrosion resistance class CRC[1)]			0				
Type of mounting			Angled fitting				
Materials			Die-cast aluminium				
Certification			–	–	c UL - Recognized (OL)	–	–
Product weight		[g]	187	187	266	187	279

1) Additional information: www.festo.com/x/topic/kbk

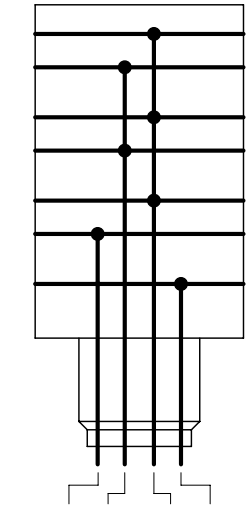
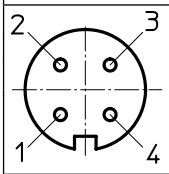
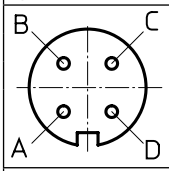
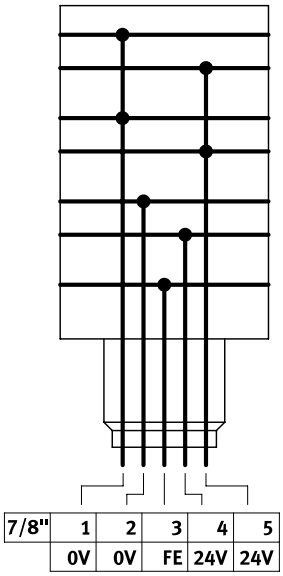
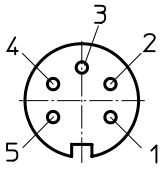
Note

Points to note about the interlinking block CPX-M-GE-EV-S-7/8-CIP-4P:

- Must be mounted as the first module to the right of the left-hand end plate
- The functional earth (FE) must be connected via the left-hand end plate
- Only permitted as an interlinking block to a bus node

Data sheet – Interlinking block with system supply

Pin allocation – Plastic interlinking blocks

Circuitry		Pin	Allocation
Round plug, 4-pin			
	**M18**		
		1	24 V DC power supply for electronics and sensors
		2	24 V DC load voltage supply for valves and outputs
		3	0 V
		4	FE
	7/8"		
		A	24 V DC supply voltage for electronics and sensors
		B	24 V DC load voltage supply for valves and outputs
		C	FE
		D	0V
Round plug, 5-pin			
	**7/8"**		
		1	0 V valves and outputs
		2	0 V electronics and sensors
		3	FE
		4	24 V DC power supply for electronics and sensors
		5	24 V DC load voltage supply for valves and outputs

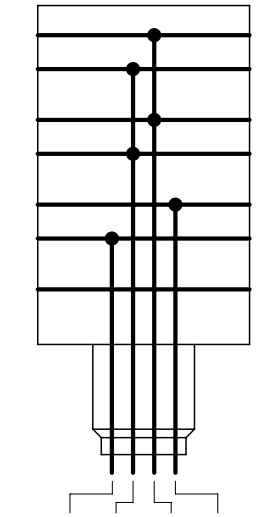
M18	1	2	3	4
7/8"	A	B	D	C
	24V	24V	0V	FE

7/8"	1	2	3	4	5
	0V	0V	FE	24V	24V

Data sheet – Interlinking block with system supply

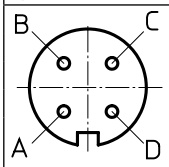
Pin allocation – Metal interlinking blocks

Round plug, 4-pin



7/8"	A	B	D	C
	24V	24V	0V	0V

7/8"

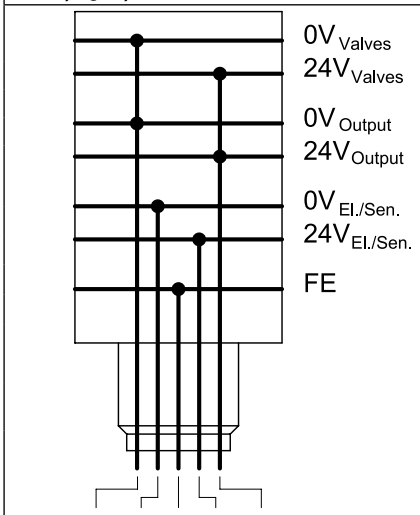


Pin	Allocation
A	24 V DC supply voltage for electronics and sensors
B	24 V DC load voltage supply for valves and outputs
C	0 V DC supply voltage for electronics and sensors
D	0 V DC load voltage supply for valves and outputs

Note

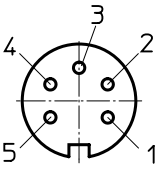
The functional earth (FE) must be connected via the left-hand end plate.

Round plug, 5-pin



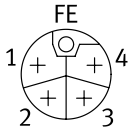
7/8"	1	2	3	4	5
M12	2	3	5	1	4
	0V	0V	FE	24V	24V

7/8"



Pin	Allocation
1	0 V valves and outputs
2	0 V electronics and sensors
3	FE
4	24 V DC power supply for electronics and sensors
5	24 V DC load voltage supply for valves and outputs

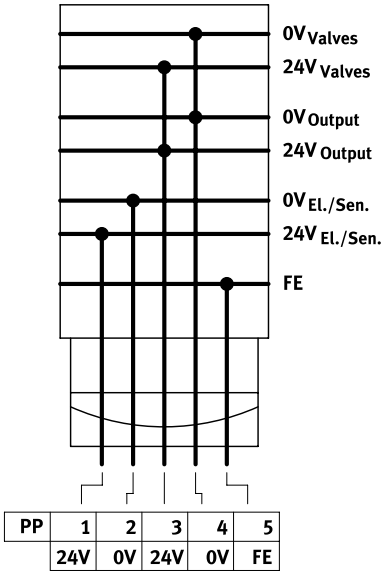
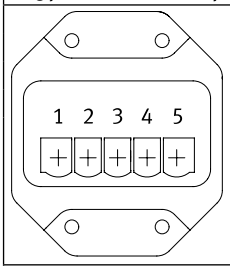
M12



Pin	Allocation
1	24 V DC power supply for electronics and sensors
2	0 V valves and outputs
3	0 V electronics and sensors
4	24 V DC load voltage supply for valves and outputs
FE	FE

Data sheet – Interlinking block with system supply

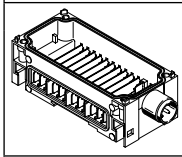
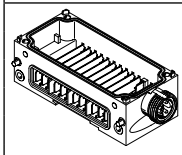
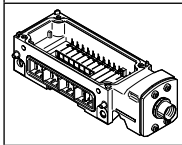
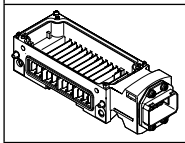
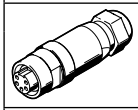
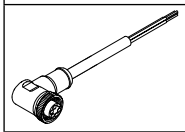
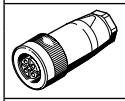
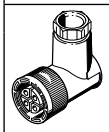
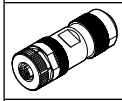
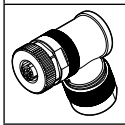
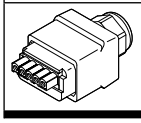
Pin allocation – Metal interlinking blocks

Circuitry		Pin	Allocation
5-pin push-pull plug			
	**Plug pattern to PROFINET specification** 	1	24 V DC power supply for electronics and sensors
		2	0 V electronics and sensors
		3	24 V DC load voltage supply for valves and outputs
		4	0 V valves and outputs
		5	FE

PP	1	2	3	4	5
	24V	0V	24V	0V	FE

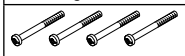
Data sheet – Interlinking block with system supply

Ordering data

Designation				Part no.	Type
Interlinking block with system supply					
	M18 connection, plastic interlinking block	4-pin	–	**195746**	**CPX-GE-EV-S**
			For ATEX environment	**8022170**	**CPX-GE-EV-S-VL**
	7/8" connection, plastic interlinking block	4-pin	–	**541248**	**CPX-GE-EV-S-7/8-4POL**
		5-pin	–	**541244**	**CPX-GE-EV-S-7/8-5POL**
			For ATEX environment	**8022172**	**CPX-GE-EV-S-7/8-5POL-VL**
	7/8" connection, metal interlinking block	4-pin	–	**568956**	**CPX-M-GE-EV-S-7/8-CIP-4P**
		5-pin	–	**550208**	**CPX-M-GE-EV-S-7/8-5POL**
			For ATEX environment	**8022165**	**CPX-M-GE-EV-S-7/8-5POL-VL**
	M12x1 L-coded connection, metal interlinking block	5-pin	–	**8098392**	**CPX-M-GE-EV-S-M12-5POL**
	Push-pull plug connection (AIDA), metal interlinking block	5-pin	–	**563057**	**CPX-M-GE-EV-S-PP-5POL**
Connection sockets 7/8"					
	Power supply socket	5-pin		**543107**	**NECU-G78G5-C2**
		4-pin		**543108**	**NECU-G78G4-C2**
	Angled socket, 5-pin – open cable end, 5-wire	2 m		**573855**	**NEBU-G78W5-K-2-N-LE5**
M18 connection sockets					
	Straight socket, screw terminal	4-pin	PG9	**18493**	**NTSD-GD-9**
			PG13.5	**18526**	**NTSD-GD-13.5**
	Angled socket, screw terminal	4-pin	PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin	PG11	**533119**	**NTSD-WD-11**
Power supply sockets M12					
	Straight socket, screw terminal		5-pin	**8166793**	**NECL-L12G5-C2-Q10**
	Angled socket, screw terminal		5-pin	**8166794**	**NECL-L12W5-C2-Q10**
Push-pull power supply socket					
	Socket, spring-loaded terminal, plug pattern PP, fulfils requirements to AIDA	5-pin		**5195383**	**NECU-M-PPG5PP-C1-PN**

Data sheet – Interlinking block with system supply

Ordering data

Designation			Part no.	Type
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**

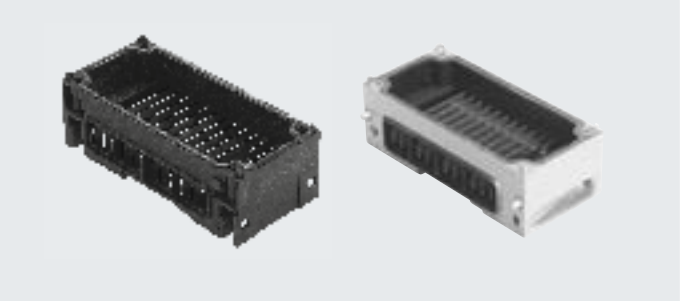
Data sheet – Interlinking block without power supply

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power. Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Area of application

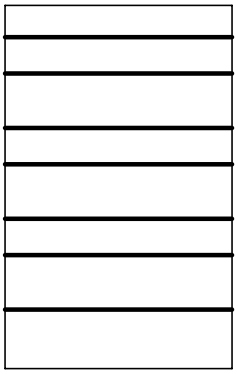
- All voltages are fed through to the next module by means of the interlinking blocks without supply.
- The connected electronics module for inputs/outputs or bus node taps off the required voltage.



General technical data

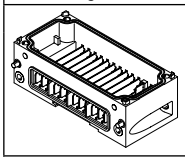
Type		CPX-GE-EV	CPX-M-GE-EV
Electrical connection		–	–
Nominal operating voltage	[V DC]	24	24
Acceptable current load (per contact/contact rail)	[A]	16	16
Degree of protection to EN 60529		Depending on connection block	
Ambient temperature	[°C]	–5 ... +50	
Note on materials		RoHS-compliant	
Materials		PA-reinforced	Aluminium
PWIS conformity		VDMA24364-B2-L	
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	
Product weight	[g]	108	169

Pin allocation

Circuitry		Pin	Allocation
		–	–
		–	–
		–	–
		–	–

Data sheet – Interlinking block without power supply

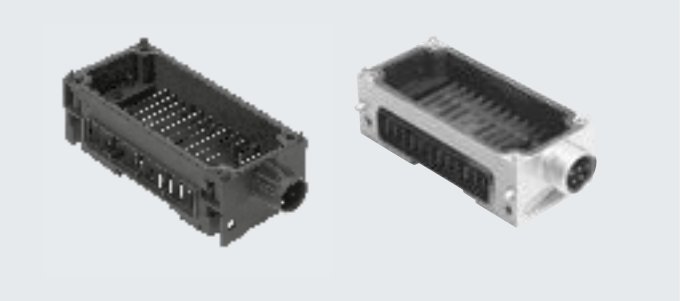
Ordering data

Designation			Part no.	Type
Interlinking block without power supply				
	Plastic interlinking block		**195742**	**CPX-GE-EV**
	Metal interlinking block		**550206**	**CPX-M-GE-EV**
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**

Data sheet – Interlinking block with additional supply for outputs

Function
Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power. Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Area of application
- 24 V DC supply voltage for outputs



General technical data		
Nominal operating voltage	[V DC]	24
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35

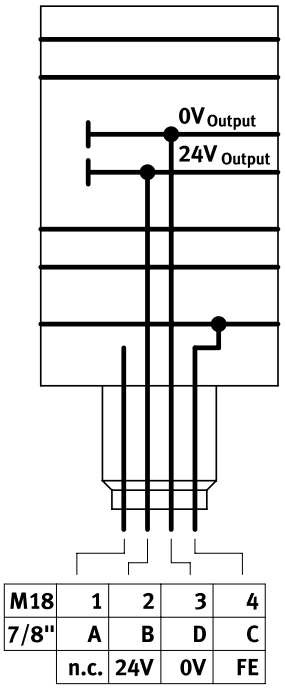
Technical data – Plastic interlinking blocks							
Type			CPX-GE-EV-Z				
				-VL	-7/8-4POL	-7/8-5POL	-7/8-5POL-VL
Electrical connection			M18	M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Power supply	Outputs	[A]	Max. 16	Max. 8	Max. 10	Max. 8	Max. 8
Materials			PA-reinforced				
Product weight		[g]	125				

Technical data – Metal interlinking blocks					
Type			CPX-M-GE-EV-Z		
			-7/8-5POL	-7/8-5POL-VL	-PP-5POL
Electrical connection			7/8", 5-pin	7/8", 5-pin	AIDA push-pull, 5-pin
Power supply	Outputs	[A]	Max. 8	Max. 8	Max. 16
Materials			Die-cast aluminium		
Product weight		[g]	187	187	279

Data sheet – Interlinking block with additional supply for outputs

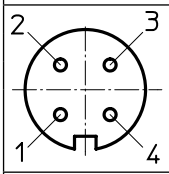
Pin allocation – Plastic interlinking blocks

Round plug, 4-pin



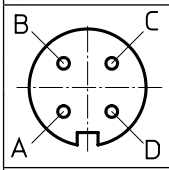
M18	1	2	3	4
7/8"	A	B	D	C
	n.c.	24V	0V	FE

M18



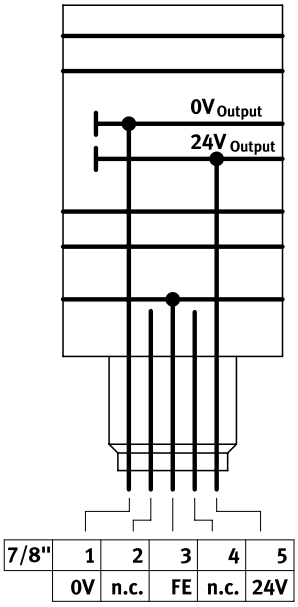
Pin	Allocation
1	n.c.
2	24 V DC load voltage supply for outputs
3	0 V
4	FE

7/8"



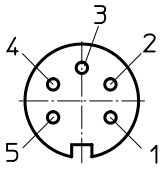
Pin	Allocation
A	n.c.
B	24 V DC load voltage supply for outputs
C	FE
D	0V

Round plug, 5-pin



7/8"	1	2	3	4	5
	0V	n.c.	FE	n.c.	24V

7/8"

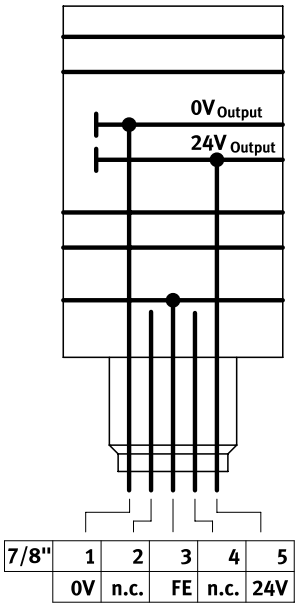


Pin	Allocation
1	0 V outputs
2	n.c.
3	FE
4	n.c.
5	24 V DC load voltage supply for outputs

Data sheet – Interlinking block with additional supply for outputs

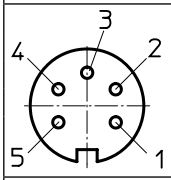
Pin allocation – Metal interlinking blocks

Round plug, 5-pin



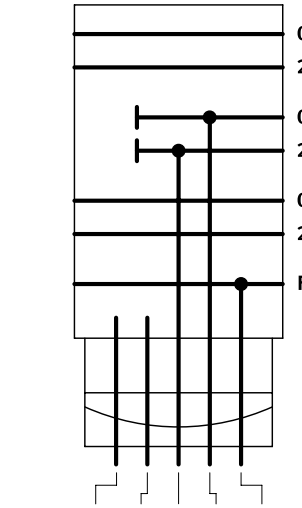
7/8"	1	2	3	4	5
	0V	n.c.	FE	n.c.	24V

7/8"



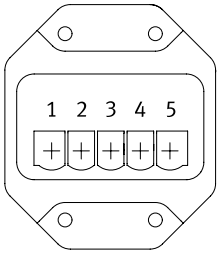
Pin	Allocation
1	0 V outputs
2	n.c.
3	FE
4	n.c.
5	24 V DC load voltage supply for outputs

5-pin push-pull plug



PP	1	2	3	4	5
	n.c.	n.c.	24V	0V	FE

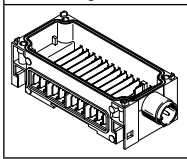
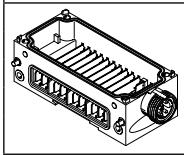
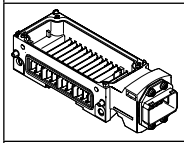
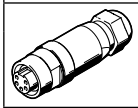
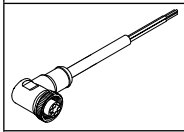
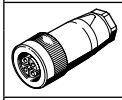
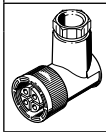
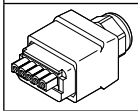
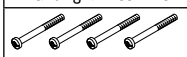
Plug pattern to PROFINET specification



Pin	Allocation
1	n.c.
2	n.c.
3	24 V DC load voltage supply for outputs
4	0 V outputs
5	FE

Data sheet – Interlinking block with additional supply for outputs

Ordering data

Designation				Part no.	Type
Interlinking block with additional supply for outputs					
	M18 connection, plastic interlinking block	4-pin	–	**195744**	**CPX-GE-EV-Z**
	M18 connection, plastic interlinking block	4-pin	For ATEX environment	**8022166**	**CPX-GE-EV-Z-VL**
	7/8" connection, plastic interlinking block	4-pin	–	**541250**	**CPX-GE-EV-Z-7/8-4POL**
		5-pin	–	**541246**	**CPX-GE-EV-Z-7/8-5POL**
		5-pin	For ATEX environment	**8022173**	**CPX-GE-EV-Z-7/8-5POL-VL**
	7/8" connection, metal interlinking block	5-pin	–	**550210**	**CPX-M-GE-EV-Z-7/8-5POL**
		5-pin	For ATEX environment	**8022158**	**CPX-M-GE-EV-Z-7/8-5POL-VL**
	Push-pull plug connection (AIDA), metal interlinking block	5-pin	–	**563058**	**CPX-M-GE-EV-Z-PP-5POL**
Connection sockets 7/8"					
	Power supply socket	5-pin		**543107**	**NECU-G78G5-C2**
		4-pin		**543108**	**NECU-G78G4-C2**
	Angled socket, 5-pin – open cable end, 5-wire	2 m		**573855**	**NEBU-G78W5-K-2-N-LE5**
M18 connection sockets					
	Straight socket, screw terminal	4-pin	PG9	**18493**	**NTSD-GD-9**
			PG13.5	**18526**	**NTSD-GD-13.5**
	Angled socket, screw terminal	4-pin	PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin	PG11	**533119**	**NTSD-WD-11**
Push-pull power supply socket					
	Socket, spring-loaded terminal, plug pattern PP, fulfils requirements to AIDA	5-pin		**5195383**	**NECU-M-PPG5PP-C1-PN**
Mounting accessories					
	Screws for mounting the bus node/connection block on the plastic interlinking block	Bus node/metal connection block		**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/plastic connection block		**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block		**550216**	**CPX-M-M3x22-S-4x**

Data sheet – Interlinking block with additional supply for valves

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power. Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

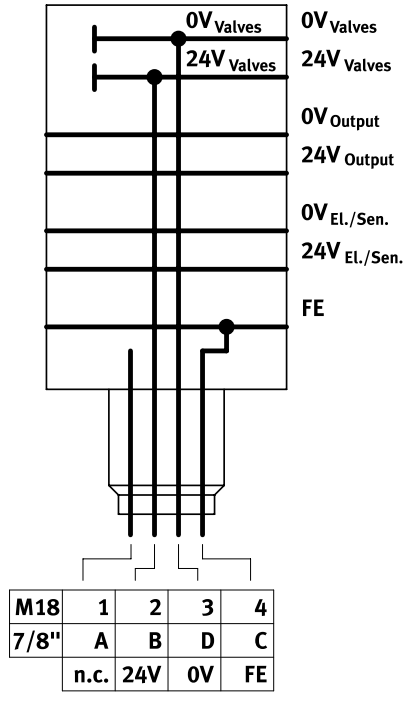
Area of application

- 24 V DC supply voltage for valves

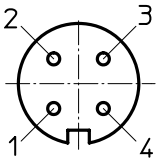
General technical data				
Type		CPX-GE-EV-V	CPX-GE-EV-V-VL	CPX-GE-EV-V-7/8-4POL
Electrical connection		M18		7/8", 4-pin
Nominal operating voltage	[V DC]	24		
Acceptable current load (per contact/contact rail)	[A]	16	8	10
Degree of protection to EN 60529		Depending on connection block		
Ambient temperature	[°C]	–5 ... +50		
Note on materials		RoHS-compliant		
Materials		PA-reinforced		
PWIS conformity		VDMA24364-B2-L		
Grid dimension	[mm]	50		
Dimensions W x L x H	[mm]	50 x 107 x 35		
Product weight	[g]	125		

Pin allocation – Plastic interlinking blocks

Round plug, 4-pin

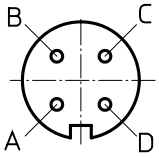


M18



Pin	Allocation
1	n.c.
2	24 V DC load voltage supply for valves
3	0 V
4	FE

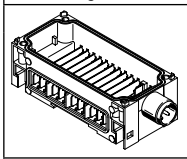
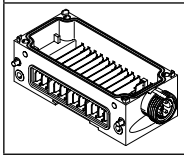
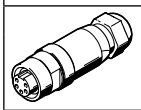
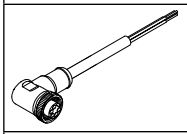
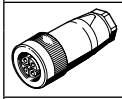
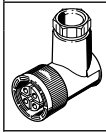
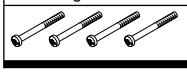
7/8"



Pin	Allocation
A	n.c.
B	24 V DC load voltage supply for valves
C	FE
D	0V

Data sheet – Interlinking block with additional supply for valves

Ordering data

Designation				Part no.	Type
Interlinking block with additional supply for valves					
	M18 connection, plastic interlinking block	4-pin	–	**533577**	**CPX-GE-EV-V**
			For ATEX environment	**8022171**	**CPX-GE-EV-V-VL**
	7/8" connection, plastic interlinking block	4-pin	–	**541252**	**CPX-GE-EV-V-7/8-4POL**
Connection sockets 7/8"					
	Power supply socket	5-pin		**543107**	**NECU-G78G5-C2**
		4-pin		**543108**	**NECU-G78G4-C2**
	Angled socket, 5-pin – open cable end, 5-wire	2 m		**573855**	**NEBU-G78W5-K-2-N-LE5**
M18 connection sockets					
	Straight socket, screw terminal	4-pin	PG9	**18493**	**NTSD-GD-9**
		4-pin	PG13.5	**18526**	**NTSD-GD-13.5**
	Angled socket, screw terminal	4-pin	PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin	PG11	**533119**	**NTSD-WD-11**
Mounting accessories					
	Screws for mounting the bus node/connection block on the plastic interlinking block	Bus node/metal connection block		**550218**	**CPX-DPT-30X32-S-4X**

Data sheet – Interlinking block with system forwarding

Function
Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power. Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Area of application
- Forwarding of 24 V DC supply voltage for the electronics of the CPX terminal
- Forwarding of 24 V DC supply voltage for inputs
- Forwarding of 24 V DC supply voltage for valves
- Forwarding of 24 V DC supply voltage for outputs

General technical data		
Nominal operating voltage	[V DC]	24
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35

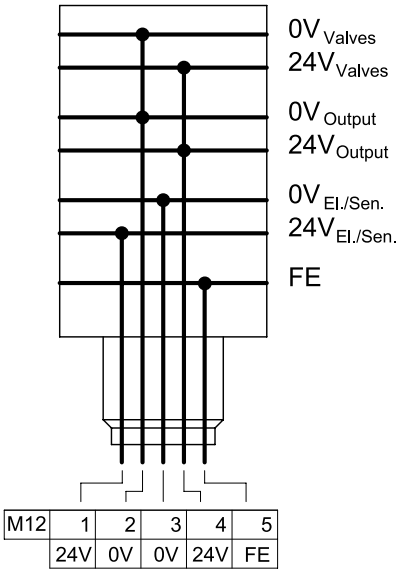
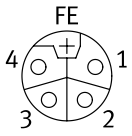
Technical data – Metal interlinking blocks			
Type			CPX-M-GE-EV-W-M12-5POL
Electrical connection			Socket
			M12x1
			5-pin
			L-coded
Power supply	Sensors and electronics	[A]	Max. 16
	Valves and outputs	[A]	Max. 16
Corrosion resistance class CRC[1)]			0
Type of mounting			Angled fitting
Materials			Die-cast aluminium
Certification			c UL - Recognized (OL)
Product weight		[g]	266

1) Additional information: www.festo.com/x/topic/kbk

Note
Points to note about the interlinking block CPX-M-GE-EV-W-M12-5POL:
- Must be mounted as the first module to the right or to the left of the system supply
- Only one interlinking block permitted per CPX terminal

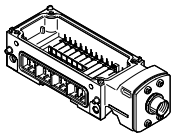
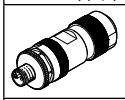
Data sheet – Interlinking block with system forwarding

Pin allocation – Metal interlinking blocks

Circuitry		Pin	Allocation
Round plug, 5-pin			
	**M12** 	1	24 V DC power supply for electronics and sensors
		2	0 V valves and outputs
		3	0 V electronics and sensors
		4	24 V DC load voltage supply for valves and outputs
		FE	FE

M12	1	2	3	4	5
	24V	0V	0V	24V	FE

Ordering data

Designation			Part no.	Type
Interlinking block with system forwarding				
	M12x1 L-coded connection, metal interlinking block	5-pin	**8098391**	**CPX-M-GE-EV-W-M12-5POL**
Power supply plugs M12				
	Straight plug, screw terminal	5-pin	**8166791**	**NECL-S-L12G5-C2-Q10**
	Angled plug, screw terminal	5-pin	**8166792**	**NECL-S-L12W5-C2-Q10**

Data sheet – Pneumatic interface for valve terminal MPA-S

Function

The pneumatic interface VMPA-FB establishes the electromechanical connection between the CPX terminal and the valve terminal MPA-S.
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA-S via the integrated CPX bus.
The bus signal for activating the solenoid coils is converted in the electronics module for max. 8 coils.
From a technical point of view, the individual MPA pneumatic modules each represent a separate electrical module with digital outputs. Valves, which are galvanically isolated, can be supplied with power via the interlinking block CPX-GE-EV-V.

Area of application

- Interface to the valve terminal MPA-S
- Max. 128 solenoid coils
- Characteristics of the electronics module of the valve terminal MPA-S can be parameterised; for example, status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe), individual channel diagnostics can be activated, condition monitoring can be activated individually for each valve
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electronics modules of the valve terminal MPA-S
- Electronics modules of the valve terminal MPA-S:
  - Undervoltage of valves
  - Short circuit of valves
  - Open load of valves
  - Counter preset reached in condition monitoring

General technical data			
Type		VMPA-FB-EPL-G	VMPA-FB-EPL-E
Valve terminal design		Modular, valve sizes can be mixed	
Maximum number of valve positions		64	
Maximum number of pressure zones		17	
Signal status indication		LED	
Pilot air supply		Internal	External
Operating pressure	[MPa]	0.3 ... 0.8	–0.09 ... 1
	[bar]	3 ... 8	–0.9 ... 10
Pilot pressure	[MPa]	0.3 ... 0.8	0.3 ... 0.8
	[bar]	3 ... 8	3 ... 8
Product weight	[g]	320	
Degree of protection		IP67	

Technical data – Electrics		
Nominal operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±25

Materials	
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Accessories – Pneumatic interface for valve terminal MPA-S

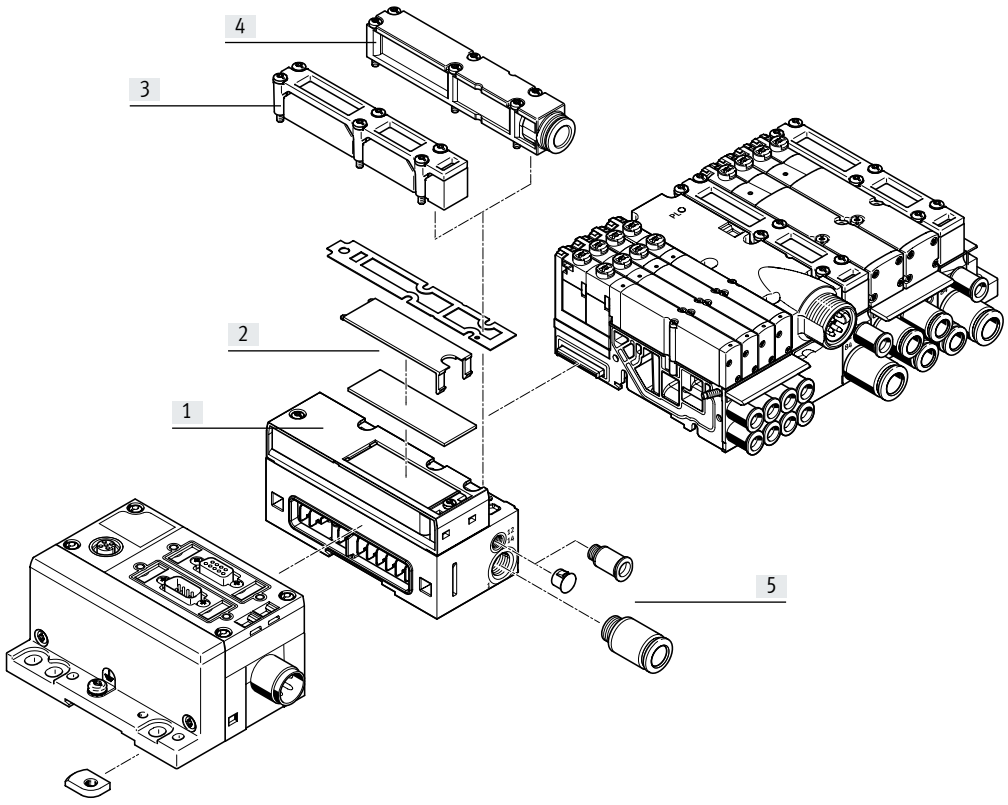
Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–5 ... +50
Temperature of medium	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +40
Relative humidity		Max. 90% at 40°C
Corrosion resistance class CRC[1)]		1
CE marking (see declaration of conformity)		To EU EMC Directive[2)]
		To EU RoHS Directive
		To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)		To UK EMC regulations
		To UK RoHS regulations
		To UK regulations for explosions
KC marking		KC EMC
Certification		RCM compliance mark
		c UL us - Recognized (OL)
Certificate-issuing authority		DNV 15.0193 X

1) More information www.festo.com/x/topic/crc

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... ➔ Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

ATEX		
ATEX category for gas		II 3G
Type of (ignition) protection for gas		Ex ec IIC T4 Gc X
Explosion ambient temperature	[°C]	–5 ≤ Ta ≤ +50
Explosion protection certification outside the EU		EPL Db (GB)
		EPL Gb (GB)

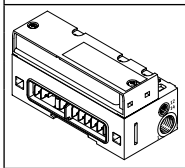
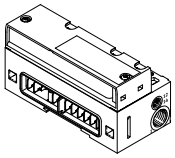
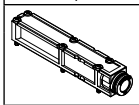
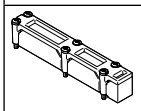
Overview – Pneumatic interface VMPA-FB



[1] Pneumatic interface VMPA-FB
[2] Inscription label
[3] Flat plate silencer
[4] Exhaust plate for ducted exhaust air
[5] Fittings

Accessories – Pneumatic interface for valve terminal MPA-S

Ordering data

Designation		Part no.	Type
Pneumatic interface for CPX plastic interlinking module			
	Ducted exhaust air, internal pilot air	**533370**	**VMPA-FB-EPL-G**
	Ducted exhaust air, external pilot air	**533369**	**VMPA-FB-EPL-E**
	Flat plate silencer, internal pilot air	**533372**	**VMPA-FB-EPL-GU**
	Flat plate silencer, external pilot air	**533371**	**VMPA-FB-EPL-EU**
Pneumatic interface for CPX metal interlinking module			
	Ducted exhaust air, internal pilot air	**552286**	**VMPA-FB-EPLM-G**
	Ducted exhaust air, external pilot air	**552285**	**VMPA-FB-EPLM-E**
	Flat plate silencer, internal pilot air	**552288**	**VMPA-FB-EPLM-GU**
	Flat plate silencer, external pilot air	**552287**	**VMPA-FB-EPLM-EU**
Exhaust plate			
	For ducted exhaust air, with 10 mm push-in connector	**533375**	**VMPA-AP**
	For ducted exhaust air, with QS-3/8 connector	**541629**	**VMPA-AP-3/8**
	Flat plate silencer	**533374**	**VMPA-APU**

Data sheet – Pneumatic interface for valve terminal MPA-L

Function

The pneumatic interface VMPAL establishes the electromechanical connection between the terminal CPX and the valve terminal MPA-L.
The bus signal for actuating the solenoid coils is converted in the pneumatic interface for the entire valve terminal.
The interlinking within the valve terminal is identical with the interlinking with multi-pin plug connections.

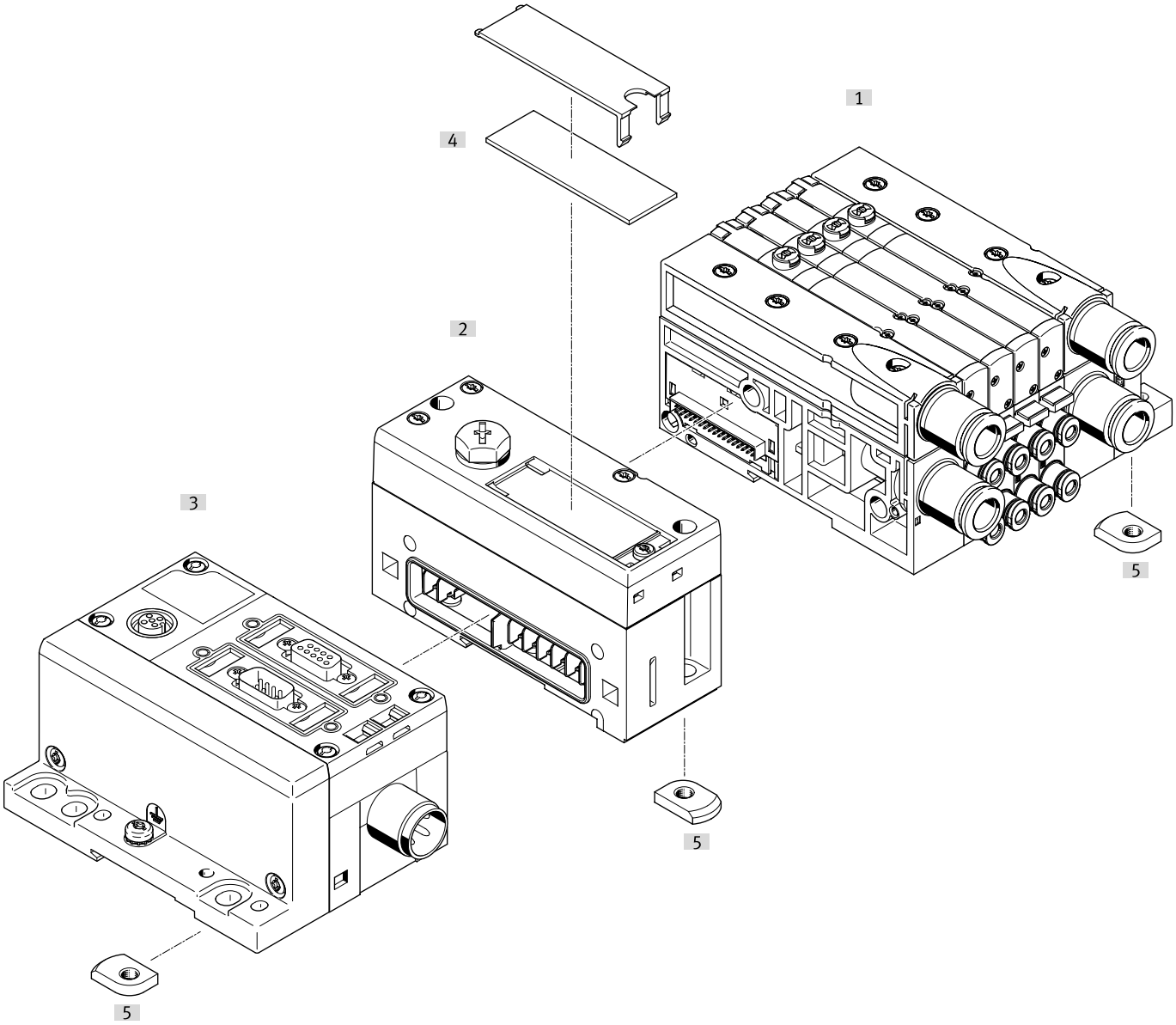
Area of application

- Actuation of the valve terminal MPA-L
- Max. 32 solenoid coils
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electrical modules of the valve terminal MPA-L

General technical data		
Type		VMPAL-EPL-CPX
Number of solenoid coils		32
Operating pressure	[bar]	–0.9 ... 10
Pilot pressure	[bar]	3 ... 8
Nominal operating voltage	[V DC]	24
Degree of protection to EN 60529		IP67
Ambient temperature	[°C]	–5 ... +50
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B1/B2-L

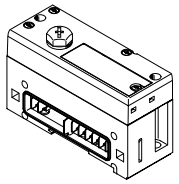
Data sheet – Pneumatic interface for valve terminal MPA-L

Overview – Pneumatic interface VMPAL



[1] Valve terminal MPA-L
[2] Pneumatic interface VMPAL
[3] Terminal CPX
[4] Inscription label
[5] Mounting for H-rail

Ordering data

Designation		Part no.	Type
	Pneumatic interface for CPX plastic interlinking module	**570783**	**VMPAL-EPL-CPX**

Data sheet – Pneumatic interface for valve terminal VTSA/VTSA-F

Function

The pneumatic interface VTSA provides the electromechanical connection between the terminal CPX and valve terminal VTSA/VTSA-F.

A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the CPX terminal.

Different circuits for valves and electrical outputs are implemented using an additional supply. The integrated valve diagnostics enable the causes of errors to be found quickly, increasing system availability.

Area of application

- Interface to the valve terminal VTSA and VTSA-F
- Max. 32 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Properties of the pneumatic interface can be parameterised, e.g. status of the solenoid coil in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- Detection of missing solenoid coils and short circuit monitoring for the valves

General technical data			
Max. no. of valve positions			16 with double solenoid valves
			32 with single solenoid valves
Valve terminal interface			Type 44, VTSA
Electrical control			Fieldbus
Electrical connection			Via CPX
Diagnostics			Undervoltage of valves
Parameterisation			Failsafe per channel
			Forcing per channel
			Idle mode per channel
			Module monitoring
LED displays			1 group diagnostics
			Channel status on valves
Fuse protection (short circuit)			Internal electronic fuse per valve output
Galvanic isolation channel – internal bus			Yes, when using an additional supply for the valves
Nominal operating voltage		[V DC]	24
Operating voltage range		[V DC]	21.6 ... 26.4
Intrinsic current consumption at nominal operating voltage	Electronics	[mA]	Typically 15
	Valves	[mA]	Typically 50
Max. power supply per channel		[A]	0.2
Max. residual current per module		[A]	4
Degree of protection			IP65
			NEMA 4
Product weight		[g]	590

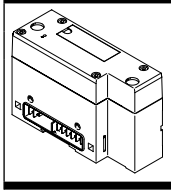
Data sheet – Pneumatic interface for valve terminal VTSA/VTSA-F

Materials	
Housing	Die-cast aluminium
Cover	PA
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Corrosion resistance class CRC[1)]		0

1) Additional information: www.festo.com/x/topic/kbk

Ordering data

Designation			Part no.	Type
	For plastic interlinking block		**543416**	**VABA-S6-1-X1**
	For metal interlinking block	Diagnostics via fieldbus	**550663**	**VABA-S6-1-X2**
		Diagnostics via process data image	**573613**	**VABA-S6-1-X2-D**

Data sheet – Pneumatic interface for valve terminal VTSA-F-CB

Function

The pneumatic interface provides the electromechanical connection between the terminal CPX and valve terminal VTSA-F-CB.

A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the CPX terminal.

Different circuits for valves and electrical outputs are implemented using an additional supply. The integrated valve diagnostics enable the causes of errors to be found quickly, increasing system availability.

Area of application

- Interface to valve terminal VTSA-F-CB
- Max. 24 solenoid coils
- Properties of the pneumatic interface can be parameterised, e.g. status of the solenoid coil in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- The supply voltage for the valves is provided from the left-hand interlinking block or externally
- Detection of missing solenoid coils and short circuit monitoring for the valves

General technical data				
		Pneumatic interface		
		Without voltage zones	With safe voltage zones	With external power supply to the valves
Max. no. of valve positions		12 with double solenoid valves		
		24 with single solenoid valves		
Valve terminal interface		Type 44, VTSA		
Electrical control		Fieldbus		
Electrical connection		Via CPX		
Electrical connection output	Function	–	Safe digital output	–
	Connection type	–	Socket	–
	Connection technology	–	M12x1, A-coded to EN 61076-2-101	–
	Number of pins/wires	–	5	–
Electrical connection, power supply to valves	Function	–	–	–
	Connection type	–	–	Plug
	Connection technology	–	–	3x M12x1, A-coded
	Number of pins/wires	–	–	5
Diagnostics		Wire break per valve coil		
		Short circuit of valves		
		Undervoltage of valves		
Parameterisation		Failsafe per channel		
		Forcing per channel		
		Idle mode per channel		
		Module monitoring		
LED displays		1 group diagnostics	1 group diagnostics	1 group diagnostics
		Channel status on valves	–	Channel status on valves
		–	–	3 load supply

Data sheet – Pneumatic interface for valve terminal VTSA-F-CB

Technical data – Electrics

			Pneumatic interface		
			Without voltage zones	With safe voltage zones	With external power supply to the valves
Nominal operating voltage		[V DC]	24		
Operating voltage range		[V DC]	21.6 ... 26.4		
Intrinsic current consumption at nominal operating voltage	Electronics	[mA]	Typically 11	• Typically 45 for electronics without CPX-FVDA-P2 • Typically 110 for electronics with CPX-FVDA-P2	Typically 11
	Valves	[mA]	Typically 45	• Typically 25 for valves without CPX-FVDA-P2 • Typically 90 for valves with CPX-FVDA-P2	Typically 45
Max. power supply per channel		[A]	0.2	0.2	0.2
Max. residual current per module		[A]	6	4.5	6
Fuse protection (short circuit)			Internal electronic fuse per valve output	Internal electronic fuse per valve output	Internal electronic fuse per valve output
Galvanic isolation channel – internal bus			Yes, when using an additional supply for the valves	Yes, when using an additional supply for the valves	Yes

Materials

	Pneumatic interface		
	Without voltage zones	With safe voltage zones	With external power supply to the valves
Housing	Die-cast aluminium	–	Die-cast aluminium
Cover	PA	PA	PA
Sub-base	–	Die-cast aluminium	–
Seals	–	NBR	–
Screws	–	Steel	–
Note on materials	RoHS-compliant	RoHS-compliant	RoHS-compliant
PWIS conformity	VDMA24364-B1/B2-L	VDMA24364-B1/B2-L	VDMA24364-B1/B2-L

Operating and environmental conditions

		Pneumatic interface		
		Without voltage zones	With safe voltage zones	With external power supply to the valves
Ambient temperature	[°C]	–5 ... +50	–5 ... +50	–5 ... +50
Storage temperature	[°C]	–	–20 ... +60	–
Corrosion resistance class CRC[1)]		0	0	0
Shock resistance		–	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	–
Vibration resistance		–	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	–
CE marking (see declaration of conformity)[3)]		–	To EU EMC Directive[2)]	–
		–	To EU RoHS Directive	–
UKCA marking (see declaration of conformity)[3)]		–	To UK instructions for EMC	–
		–	To UK RoHS instructions	–
Degree of protection		IP65	IP65	IP65
		NEMA 4	–	NEMA 4

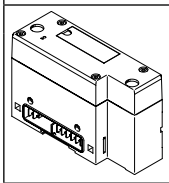
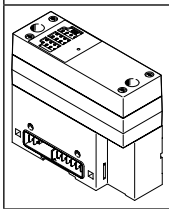
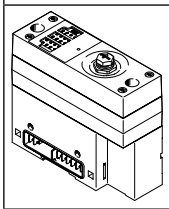
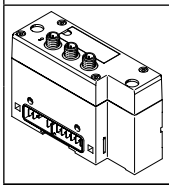
1) Additional information: www.festo.com/x/topic/kbk
2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.
3) Additional information: www.festo.com/catalogue/... → Support/Downloads.

Data sheet – Pneumatic interface for valve terminal VTSA-F-CB

Combinations of bus nodes/control blocks with pneumatic interface

Bus node/control block	Part no.	Pneumatic interface			
		VABA-...-X1-CB	VABA-...-X2-CB	VABA-...-X2-F1-CB	VABA-...-X2-F2-CB
CPX-FB13	**195740**	■	■	■	■
CPX-FB36	**1912451**	■	■	–	–
CPX-FB37	**2735960**	■	■	–	–
CPX-FB43	**8110369**	■	■	■	■
CPX-M-FB44	**8110370**	■	■	■	■

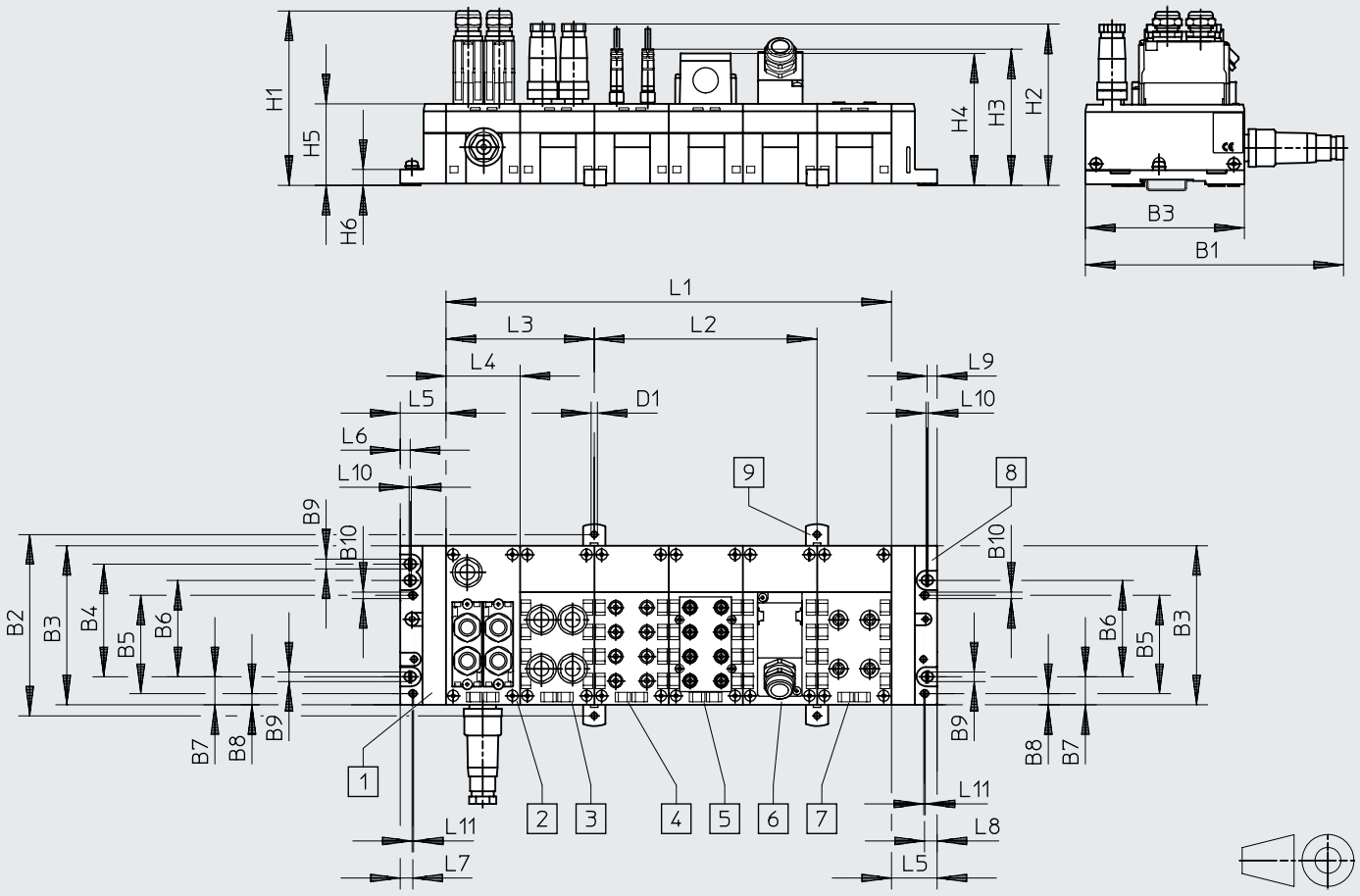
Ordering data

	Description		Product weight [g]	Part no.	Type
Pneumatic interface without voltage zones					
	For plastic interlinking block		560	**8082877**	**VABA-S6-1-X1-CB**
	For metal interlinking block		560	**8082876**	**VABA-S6-1-X2-CB**
Pneumatic interface with voltage zones					
	For metal interlinking block	Division of the connected valves into up to 3 safe voltage zones	734	**8068240**	**VABA-S6-1-X2-F1-CB**
	For metal interlinking block	• Division of the connected valves into up to 2 safe voltage zones • 1 external safe voltage zone	754	**8068241**	**VABA-S6-1-X2-F2-CB**
	For plastic interlinking block	• Division of the connected valves into up to 3 voltage zones • External power supply for each voltage zone	580	**8082879**	**VABA-S6-1-X1-3V-CB**
	For metal interlinking block	• Division of the connected valves into up to 3 voltage zones • External power supply for each voltage zone	580	**8082878**	**VABA-S6-1-X2-3V-CB**

Data sheet

Dimensions – Plastic interlinking module Download CAD data ➔ www.festo.com

With bus nodes and connection blocks



[1] Left-hand end plate (earthing plate optional)
[2] Bus node
[3] Connection block CPX-AB-4-M12-8POL
[4] Connection block CPX-AB-8-M8-3POL
[5] Connection block CPX-AB-8-KL-4POL
[6] Connection block CPX-AB-1-SUB-BU-25POL
[7] Connection block CPX-AB-4-M12-8POL
[8] Right-hand end plate
[9] Mounting clip for wall mounting (required every 2 ... 3 connection blocks)
n Number of CPX modules

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	D1 ø
CPX-M	175	122.3	107.3	78	66.3	65	18.9	7.5	6.6	4.4	4.3

Type	H1	H2	H3	H4	H5	H6
CPX-M	118	110	92	89.1	55.1	10.8

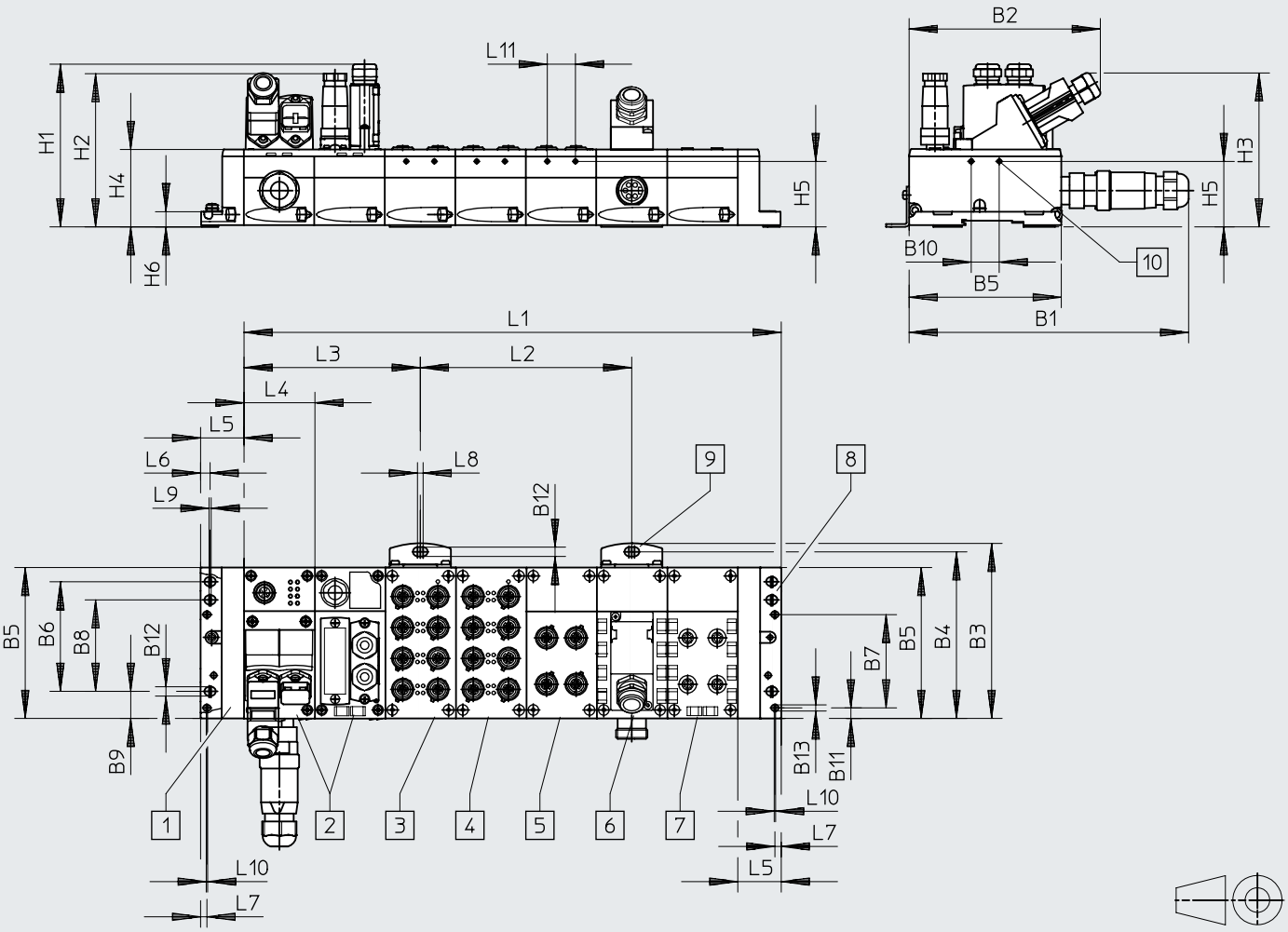
Type	L1[1)]	L2	L3[2)]	L4	L5[3)]	L6	L7	L8	L9	L10	L11
CPX-M	nx50.1	150.3	100.2	50.1	30.8	7.1	8.8	8.5	6.8	1.5	1

1) n = Number of CPX modules

Data sheet

Dimensions – Metal interlinking block Download CAD data ➔ www.festo.com

With bus nodes and connection blocks



[1] Left-hand end plate
[2] Bus node
[3] Connection block CPX-M-AB-8-M12X2-5POL
[4] Connection block CPX-M-AB-8-M12X2-5POL
[5] Connection block CPX-M-AB-4-M12X2-5POL
[6] Connection block CPX-AB-1-SUB-BU-25POL
[7] Connection block CPX-AB-4-M12-8POL
[8] Right-hand end plate
[9] Mounting bracket for wall mounting
[10] Hole for self-tapping screw M2.5

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
CPX-M	199	136	124.9	118.85	108.1	77.95	66.3	65	19.25	20	7.9	6.6	4.4

Type	H1	H2	H3	H4	H5	H6
CPX-M	116	109	109.5	55.1	46.55	10.8

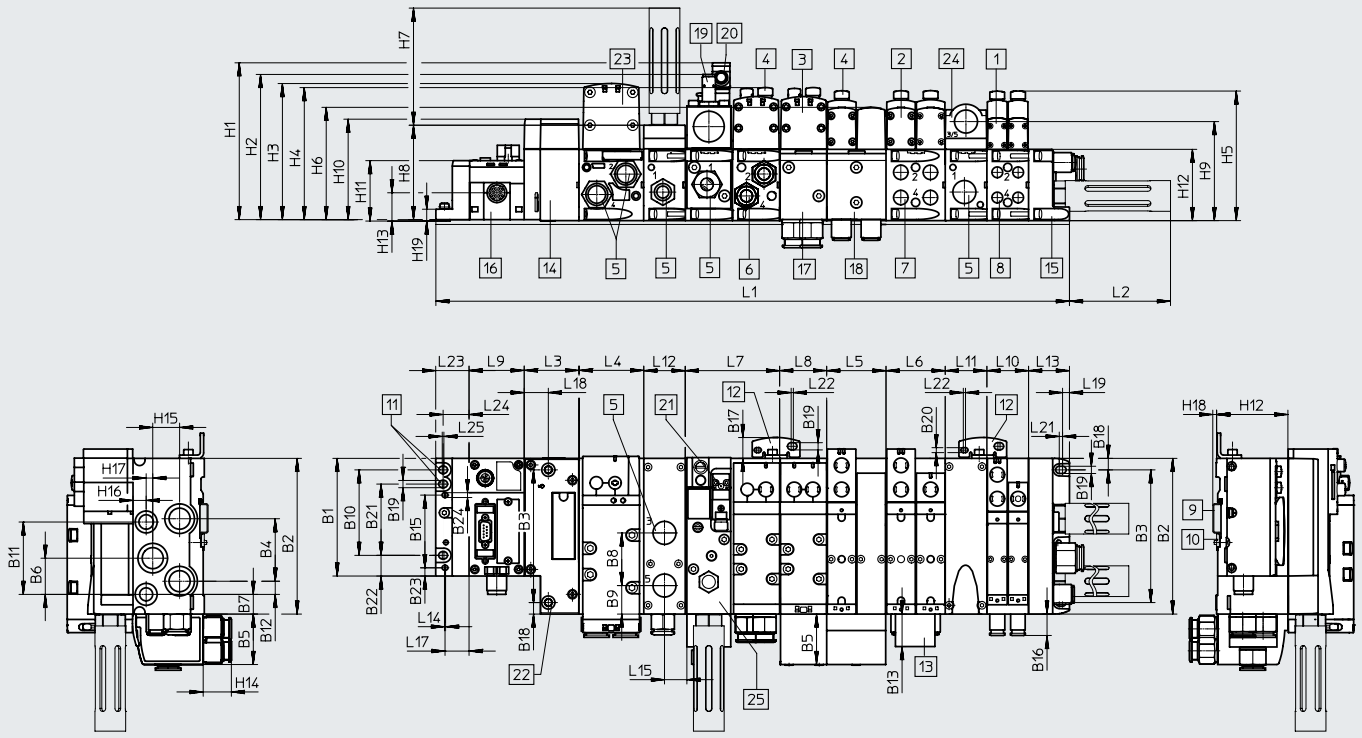
Type	L1[1)]	L2	L3[2)]	L4	L5[3)]	L6	L7	L8	L9	L10	L11
CPX-M	nx50.1+30.4	150.3	125.25	50.1	30.4	6.75	4.5	4	1.5	1	20

1) n = Number of CPX modules

Data sheet

Dimensions Download CAD data ➔ www.festo.com

With bus node and valve terminal VTSA/VTSA-F/VTSA-F-CB



[1] Solenoid valve, width 18 mm
[2] Solenoid valve, width 26 mm
[3] Solenoid valve, width 42 mm
[4] Cover cap/manual override
[5] Threaded connection G1/2
[6] Threaded connection G3/8
[7] Threaded connection G1/4
[8] Threaded connection G1/8
[9] H-rail
[10] H-rail mounting
[11] Mounting hole
[12] Additional mounting bracket
[13] Inscription label holder
[14] Pneumatic interface CPX
[15] End plate
[16] CPX module/bus node
[17] 90°-connection plate 43 mm, G3/8
[18] 90°-connection plate 54 mm, G1/4
[19] Proximity switch M12x1
[20] Plug socket M12x1
[21] Electrical connection to EN 175301-803, type C
[22] Additional mounting bracket
[23] Hole for additional mounting, diameter 6.4 2x
[24] Solenoid valve, width 52 mm
[25] Supply plate
[26] Soft-start valve

Dim.	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B16	B18	B19	B20	B21	B22	B23	B24
[mm]	107.3	142	121	57	46	33	18	48	26	78	66	12	29.6	23	19.5	10.5	6.6	4.5	65	18.9	7.5	4.4

Dim.	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L17	L18	L19	L20	L21	L22
[mm]	92.4	50	n2x59	n01x54	54	n1x43	43	mx50.1	n02x38	nx38	38	37.3	1	20.5	22	22	6.3	5.5	3	2

Dim.	L23	L24	L25	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19
[mm]	30.4	23.7	1.5	143.9	133.3	125	121.3	118.2	103	106.8	87	90.3	92.9	55.1	65	25.8	25.7	24.5	12	6	3.5	10.8

Width	L1[1)]
40 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n x 38 + 37.3
26 mm	30.4 + m x 50.1 + 50 + n01 x 54 + n x 38 + 37.3
42 mm	30.4 + m x 50.1 + 50 + n1 x 43 + n x 38 + 37.3
52 mm	30.4 + m x 50.1 + 50 + n2 x 59 + n x 38 + 37.3
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n01 x 54 + n1 x 43 + n2x59 + n x 38 + 37.3

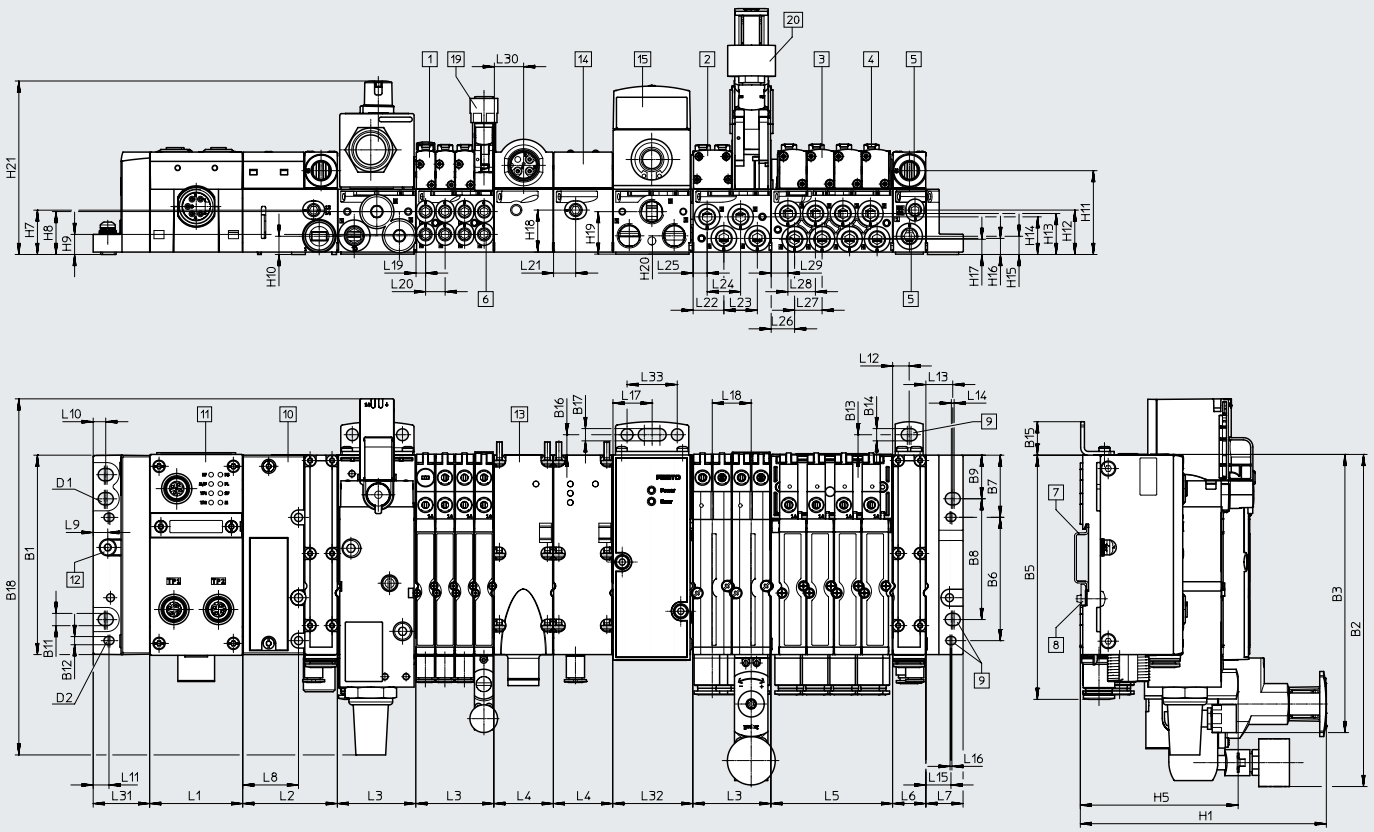
1) n02 Number of manifold sub-bases 38 mm
n01 Number of manifold sub-bases 54 mm
n1 Number of manifold sub-bases 43 mm
n2 Number of manifold sub-bases 59 mm
n Number of supply plates (only with end plate with pilot air selector)
m Number of CPX modules

Note: This product conforms to ISO 1179-1 and ISO 228-1.

Data sheet

Dimensions Download CAD data ➔ www.festo.com

With bus node and valve terminal MPA-S



[1] Solenoid valve, width 10 mm
[2] Solenoid valve, width 20 mm
[3] Solenoid valve, width 14 mm
[4] Manual override
[5] Supply/exhaust ports
[6] Working ports
[7] H-rail
[8] H-rail mounting
[9] Mounting holes
[10] Pneumatic interface VMPA□FB
[11] CPX module
[12] Earthing screw
[13] Electrical supply plate
[14] Pressure sensor
[15] Proportional pressure regulator
[19] Vertical stacking MPA1
[20] Vertical stacking MPA2

Type	B1	B2	B3	B5	B6	B7	B8	B9	B11	B12	B13	B14	B15	B16	B17	D1	D2
MPA-S	107.3	178	149.2	129	66.4	33.5	65	23.5	6.6	4.4	11	6.6	18	11	6.6	M6	M4

Type	H1	H5	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20	H21
MPA-S	132.3	84.9	23.9	23.1	10.8	9.8	45.1	23.9	22.1	20.3	9.8	8.7	8.2	22.6	22.9	9.9	93.4

Type	L1[1]	L2	L3[2]	L4	L5[3]	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
MPA-S	m x 50.1	51.3	n x 42	32	o x 65.5	17.9	20	30	7.9	6.8	8.5	9	14.5	1.5	13.5	1

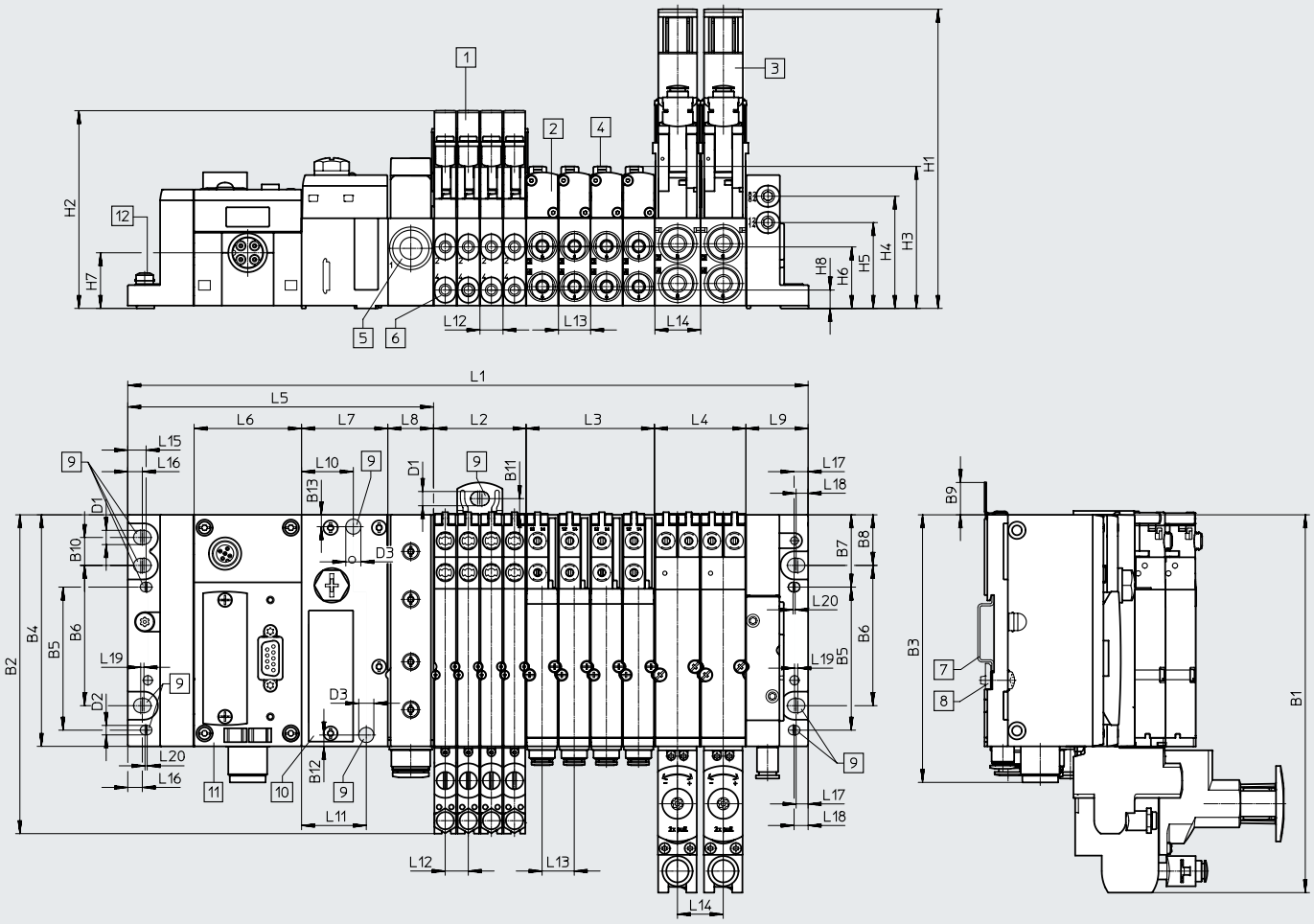
Type	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33
MPA-S	21	21	5.3	10.5	11.9	16.6	18	18	7.6	12.6	14.8	14.8	9	15.8	30.4	42	27

1) m = Number of CPX modules
2) n = number of sub-bases with 4 valve positions (width 10 mm) or 2 valve positions (width 20 mm)
3) o = number of sub-bases with 4 valve positions (width 14 mm)

Data sheet

Dimensions Download CAD data ➔ www.festo.com

With bus node and valve terminal MPA-L



[1] Solenoid valve VMPA1
[2] Solenoid valve VMPA14
[3] Solenoid valve VMPA2
[4] Manual override
[5] Supply module
[6] Working ports
[7] H-rail
[8] H-rail mounting
[9] Mounting holes
[10] Pneumatic interface, CPX terminal
[11] CPX module
[12] Earthing screw

Type	L1[1]	L2[1]	L3[1]	L4[1]	L5	L6	L7	L8	L9
MPA-L	170.65 + L2 + L3 + L4	m x 10.7	n x 14.9	o x 21.2	142	50	40.1	21.2	28.8

Type	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	L20
MPA-L	24	30	10.7	14.9	21.2	8.5	6.75	5.55	6.5	1.5	1

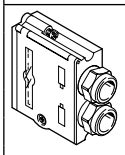
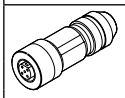
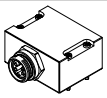
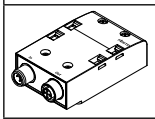
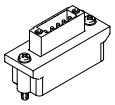
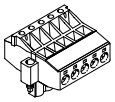
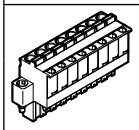
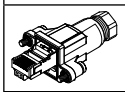
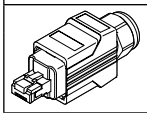
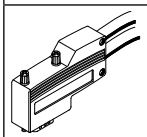
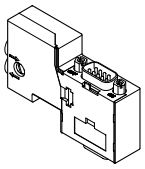
Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
MPA-L	175.1	147.8	124	107.3	66.3	65	33.5	23.45	15	12.95	7.5	5.25	5.5

Type	D1	D2	D3	H1	H2	H3	H4	H5	H6	H7	H8
MPA-L	6.6	4.4	7	138.7	92.6	65.7	52	39.8	28.5	25.8	8.5

1) m, n, o = number of sub-bases/valve positions (m = width 10 mm, n = width 14 mm, o = width 20 mm)

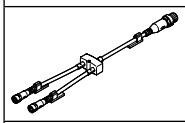
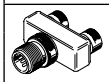
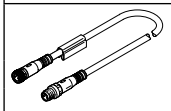
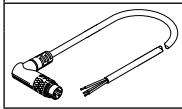
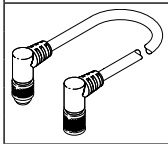
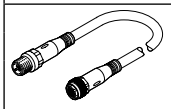
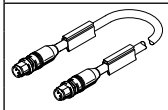
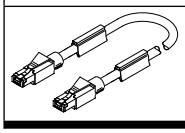
Accessories

Ordering data – Accessories

Designation				Part no.	Type
Connectors and accessories					
	Sub-D plug for INTERBUS		Incoming	**532218**	**FBS-SUB-9-BU-IB-B**
			Outgoing	**532217**	**FBS-SUB-9-GS-IB-B**
	Sub-D plug for DeviceNet/CANopen			**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Sub-D plug for PROFIBUS DP			**532216**	**FBS-SUB-9-GS-DP-B**
	Sub-D plug for CC-Link			**532220**	**FBS-SUB-9-GS-2x4POL-B**
	Sub-D plug			**534497**	**FBS-SUB-9-GS-1x9POL-B**
	Bus connection M12 adapter (B-coded) for PROFIBUS DP			**533118**	**FBA-2-M12-5POL-RK**
	Micro style bus connection, 2xM12 for DeviceNet/CANopen			**525632**	**FBA-2-M12-5POL**
	For micro style connection, M12		Socket	**18324**	**FBSD-GD-9-5POL**
			Plug	**175380**	**FBS-M12-5GS-PG9**
	M12x1 bus connection, 4-pin (D-coded) for Ethernet			**543109**	**NECU-M-S-D12G4-C2-ET**
	For FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP, M12x1, 5-pin, straight		Socket	**1067905**	**NECU-M-B12G5-C2-PB**
			Plug	**1066354**	**NECU-M-S-B12G5-C2-PB**
	Plug M12x1, 4-pin, straight, A-coded	Screw terminal	Connection cross section 0.14 ... 0.5 mm²	**192008**	**SEA-4GS-7-2.5**
			Permissible cable Ø 4 ... 6 mm	**18666**	**SEA-GS-7**
			Permissible cable Ø 6 ... 8 mm	**18778**	**SEA-GS-9**
	Connection block, 9-pin Sub-D socket, 5-pin 7/8" plug for DeviceNet			**571052**	**CPX-AB-1-7/8-DN**
	Connection block M12 adapter (B-coded)		For PROFIBUS DP	**541519**	**CPX-AB-2-M12-RK-DP**
	Open style bus connection for 5-pin terminal strip for DeviceNet/CANopen			**525634**	**FBA-1-SL-5POL**
	Terminal strip for open style connection, 5-pin			**525635**	**FBSD-KL-2x5POL**
	8-pin socket		Spring-loaded terminal	**565712**	**NECU-L3G8-C1**
			Screw terminal	**565710**	**NECU-L3G8-C2**
	RJ45/plug			**534494**	**FBS-RJ45-8-GS**
	RJ45 plug, 8-pin, push-pull			**552000**	**FBS-RJ45-PP-GS**
	Plug SCRJ, 2-pin, push-pull, for CPX-M-FB45			**571017**	**FBS-SCRJ-PP-GS**
	Plug for CAN bus interface, electric axes Sub-D, 9-pin, without terminating resistor			**533783**	**FBS-SUB-9-WS-CO-K**
	Sub-D socket with terminating resistor and programming interface		For CANopen	**574588**	**NECU-S1W9-C2-ACO**
	Sub-D plug, straight, with terminating resistor and programming interface		For PROFIBUS	**574589**	**NECU-S1W9-C2-APB**

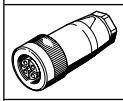
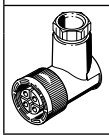
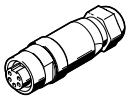
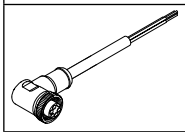
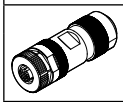
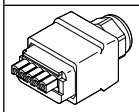
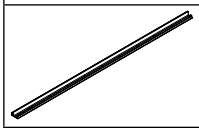
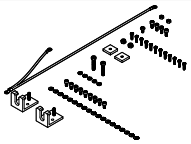
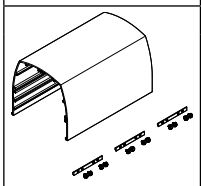
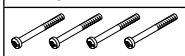
Accessories

Ordering data – Accessories

Designation				Part no.	Type
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
	Push-in T-connector	1x plug M8, 4-pin	2x socket M8, 3-pin	**8005312**	**NEDY-L2R1-V1-M8G3-N-M8G4**
		1x plug M12, 4-pin	2x socket M8, 3-pin	**8005311**	**NEDY-L2R1-V1-M8G3-N-M12G4**
			2x socket M12, 5-pin	**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Connecting cables					
	Modular system for a choice of connecting cables			–	**NEBU-...** → Internet: nebu
	Connecting cable M8-M8, straight plug/straight socket		0.5 m	**541346**	**NEBU-M8G3-K-0.5-M8G3**
			1.0 m	**541347**	**NEBU-M8G3-K-1-M8G3**
			2.5 m	**541348**	**NEBU-M8G3-K-2.5-M8G3**
			5.0 m	**541349**	**NEBU-M8G3-K-5-M8G3**
	Connecting cable M12-M12, 5-pin, straight plug/straight socket		1.5 m	**529044**	**KV-M12-M12-1.5**
			3.5 m	**530901**	**KV-M12-M12-3.5**
	Connecting cable for CPX-CTEL, M12-M12, 5-pin, straight plug/straight socket		5 m	**574321**	**NEBU-M12G5-E-5-Q8N-M12G5**
			7.5 m	**574322**	**NEBU-M12G5-E-7.5-Q8N-M12G5**
			10 m	**574323**	**NEBU-M12G5-E-10-Q8N-M12G5**
	Connecting cable M12-M12, 8-pin, straight plug/straight socket		2.0 m	**525617**	**KM12-8GD8GS-2-PU**
	Connecting cable M9, 5-pin, angled plug/open cable end 3-pin		2 m	**563711**	**NEBC-M9W5-K-2-N-LE3**
			5 m	**563712**	**NEBC-M9W5-K-5-N-LE3**
	Connecting cable M9, angled plug/angled socket		0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
			0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
			2 m	**540329**	**KVI-CP-3-WS-WD-2**
			5 m	**540330**	**KVI-CP-3-WS-WD-5**
			8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable M9, Straight plug/straight socket		2 m	**540332**	**KVI-CP-3-GS-GD-2**
			5 m	**540333**	**KVI-CP-3-GS-GD-5**
			8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-wire	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Connecting cable, Straight plug, RJ45, 8-pin	Straight plug, RJ45, 8-pin	1 m	**8040455**	**NEBC-R3G4-ES-1-S-R3G4-ET**

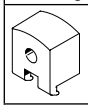
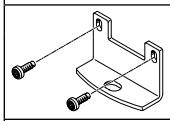
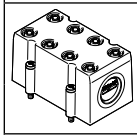
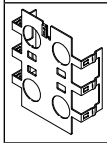
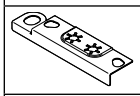
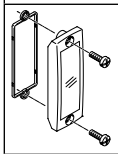
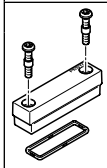
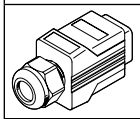
Accessories

Ordering data – Accessories

Designation			Part no.	Type
Connectors and accessories – Power supply				
	Plug socket for mains connection M18, straight	For 1.5 mm²	**18493**	**NTSD-GD-9**
		For 2.5 mm²	**18526**	**NTSD-GD-13.5**
	Plug socket for mains connection M18, angled	For 1.5 mm²	**18527**	**NTSD-WD-9**
		For 2.5 mm²	**533119**	**NTSD-WD-11**
	Power supply socket, straight	7/8" connection, 5-pin	**543107**	**NECU-G78G5-C2**
		7/8" connection, 4-pin	**543108**	**NECU-G78G4-C2**
	7/8" power supply socket, 5-pin, angled socket/open cable end, 5-wire	2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
	Power supply socket M12x1, L-coded, straight	5-pin	**8166793**	**NECL-L12G5-C2-Q10**
	Power supply plug M12x1, L-coded, straight	5-pin	**8166791**	**NECL-S-L12G5-C2-Q10**
	Power supply socket M12x1, L-coded, angled	5-pin	**8166794**	**NECL-L12W5-C2-Q10**
	Power supply plug M12x1, L-coded, angled	5-pin	**8166792**	**NECL-S-L12W5-C2-Q10**
	Push-pull power supply socket, plug pattern PP, fulfils requirements to AIDA	5-pin	**5195383**	**NECU-M-PPG5PP-C1-PN**
	Straight plug, spring-loaded terminal, for left-hand end plate with system supply	7-pin	**576319**	**NECU-L3G7-C1**
Hood				
	Mounting rail for attaching the hood	1000 mm	**572256**	**CAFC-X1-S**
	Mounting kit for CPX hood		**572257**	**CAFC-X1-BE**
	Hood section for CPX terminal including mounting attachments for connecting several hood sections in series	200 mm	**572258**	**CAFC-X1-GAL-200**
		300 mm	**572259**	**CAFC-X1-GAL-300**
Screws				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**
	Screws for mounting an inscription label on the bus node CPX-M-FB45	12 pieces	**550222**	**CPX-M-M2.5X8-12X**

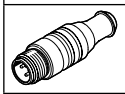
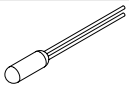
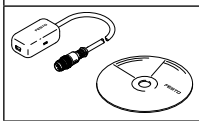
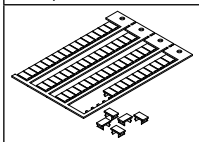
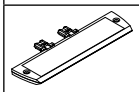
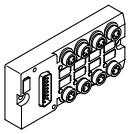
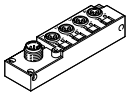
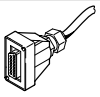
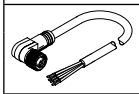
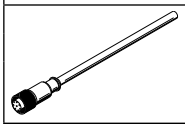
Accessories

Ordering data – Accessories

Designation			Part no.	Type
Mounting				
	Attachment for wall mounting (for long valve terminals, 10 pieces)	Version for manifold sub-bases	**529040**	**CPX-BG-RW-10x**
	Attachment for wall mounting, version for metal manifold sub-bases	2 mounting brackets, 4 screws	**550217**	**CPX-M-BG-RW-2X**
		1 mounting bracket, 2 screws	**2721419**	**CPX-M-BG-VT-2X**
Covers and attachments				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
	Earthing element (5 pieces), for right-hand/left-hand end plate (plastic interlinking blocks)		**538892**	**CPX-EPFE-EV**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Transparent cover for DIL switch		**548757**	**CPX-AK-P**
	Cover for DIL switch		**548754**	**CPX-M-AK-M**
	Cover for RJ45 connection		**534496**	**AK-RJ45**
	Cover cap for RJ45 push-pull connection		**548753**	**CPX-M-AK-C**
	Cover cap for bus connection		**2873540**	**CPX-M-AK-D**
	Cover cap for closing off unused connections (10 pieces)	For M8 connections	**177672**	**ISK-M8**
		For M12 connections	**165592**	**ISK-M12**
	Coding element, so that a coded socket NECU-L3G8 can only be inserted in the matching coded connection block CPX-P-AB-2XKL (96 of each)	For NECU-L3G8	**565713**	**CPX-P-KDS-AB-2XKL**

Accessories

Ordering data – Accessories

Designation			Part no.	Type
Function blocks				
	Terminating resistor, M12, B-coded for PROFIBUS		**1072128**	**CACR-S-B12G5-220-PB**
	PT1000 temperature sensor for cold junction compensation		**553596**	**CPX-W-PT1000**
	5-pin M12 to mini USB socket adapter and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
Inscription labels				
	Inscription labels 6x10 mm, 64 pieces, in frame		**18576**	**IBS-6x10**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
Multi-pin plug distributor				
	Sub-D plug, 15-pin	8x socket M8, 3-pin	**177669**	**MPV-E/A08-M8**
		12x socket M8, 3-pin	**177670**	**MPV-E/A12-M8**
	Plug M12, 8 pin	4x socket M8, 3-pin	**574586**	**NEDU-L4R1-M8G3L-M12G8**
		6x socket, M8, 3-pin	**574587**	**NEDU-L6R1-M8G3L-M12G8**
Connecting cable for multi-pin plug distributor				
	Sub-D socket, 15-pin Open cable end, 15-wire	5 m	**177673**	**KMPV-SUB-D-15-5**
		10 m	**177674**	**KMPV-SUB-D-15-10**
	Angled socket, M12, 8-pin, Open cable end, 8-wire	Length: 2 m	**542256**	**NEBU-M12W8-K-2-N-LE8**
		Length: 5 m	**542257**	**NEBU-M12W8-K-5-N-LE8**
		Length: 10 m	**570007**	**NEBU-M12W8-K-10-N-LE8**
	Straight socket, M12, 8-pin, Open cable end, 8-wire	Length: 2 m	**525616**	**SIM-M12-8GD-2-PU**
		Length: 5 m	**525618**	**SIM-M12-8GD-5-PU**
		Length: 10 m	**570008**	**SIM-M12-8GD-10-PU**