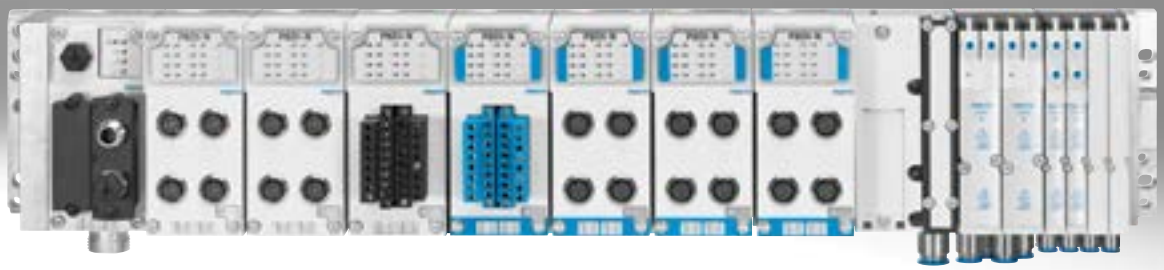
Terminal CPX-P



Key features

Key features

Installation concept

- 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%)
- Open to all fieldbus protocols and Ethernet
- IT services and TCP/IP such as remote maintenance, remote diagnostics, web server, SMS and e-mail alert
- Digital inputs and outputs, 4-way/8-way/16-way, optionally available with individual channel diagnostics
- Analogue inputs and outputs, 2-way/4-way
- Analogue inputs and outputs with HART protocol
- Input modules for connecting NAMUR sensors
- Pressure inputs
- Temperature inputs
- IP65 or IP20

Mounting

- Wall or H-rail mounting, also on mobile units
- Conversions/extensions are possible at any time, individual linking
- 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-P terminal
- Choice of pneumatic components for optimised control chain

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
- Suitable for direct machine mounting (IP65/IP67) or in a control cabinet with a terminal connection (IP20)
- Supports module and channel-oriented diagnostics
- Fieldbus/Ethernet remote diagnostics
- Innovative diagnostic support with integrated web server/web monitor or Festo Maintenance Tool (CPX-FMT) with USB adapter (NEFC) 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

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

Bus node

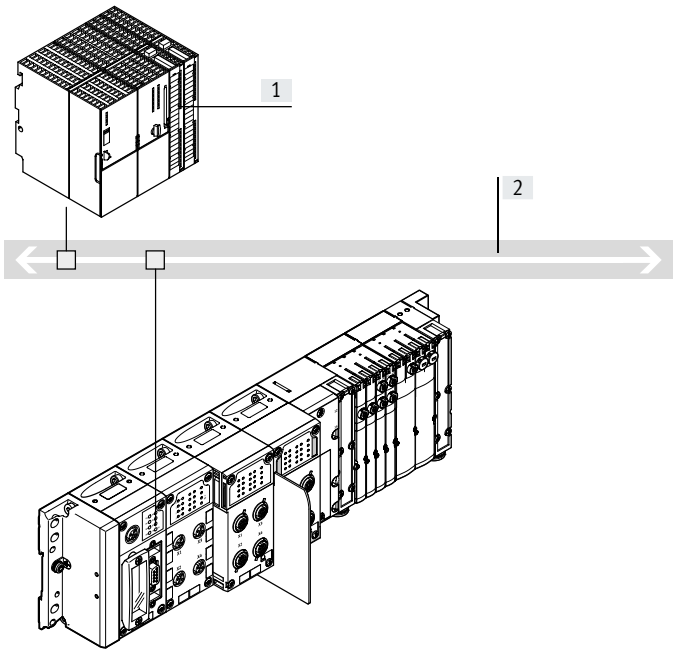
Different bus nodes are used for integration in the control systems of various manufacturers.
The CPX-P terminal can therefore be operated on commonly used fieldbus systems:

- PROFIBUS-DP
- PROFINET
- DeviceNet
- CANopen

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, as website integrated in the CPX-P 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.
The following protocols are supported:

- EtherNet/IP
- Modbus/TCP
- PROFINET
- EtherCAT

Bus node



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

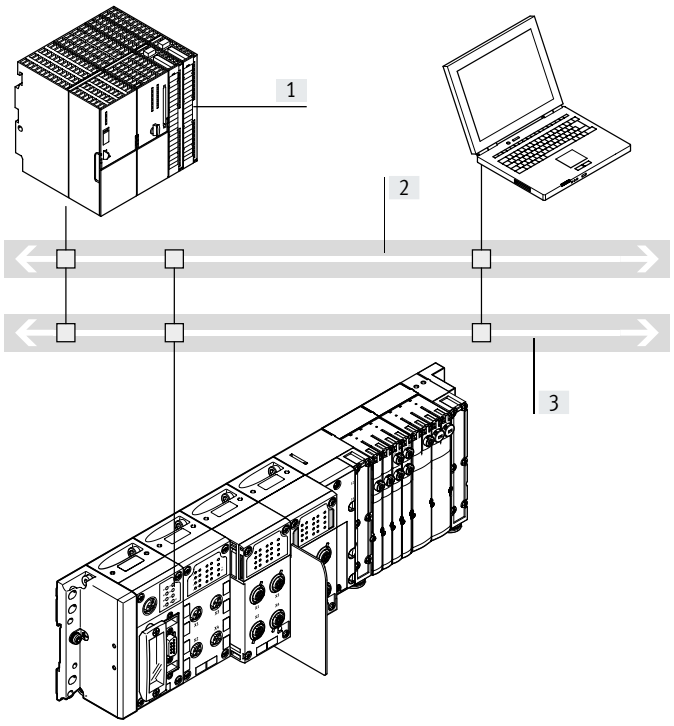
- Communication with the higher-order controller via fieldbus
- No preprocessing
- Fieldbus protocol dependent on CPX bus node used
- More than 90 I/Os, depending on bus node used

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-P terminal can be operated with every electrical interface variant.

Industrial Ethernet bus node



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

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

Key features

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

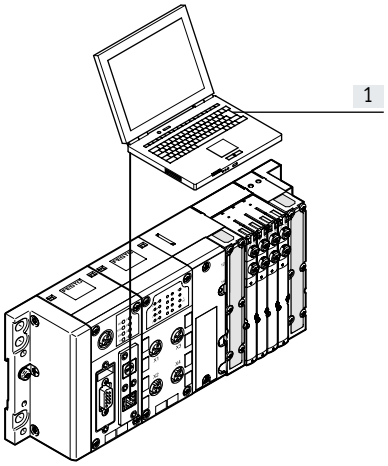
Control block

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



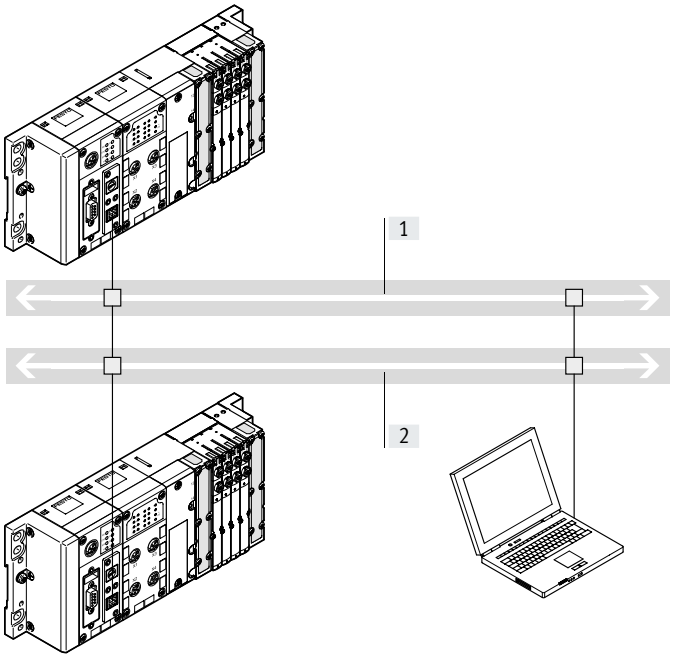
[1] CODESYS/FST

- 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

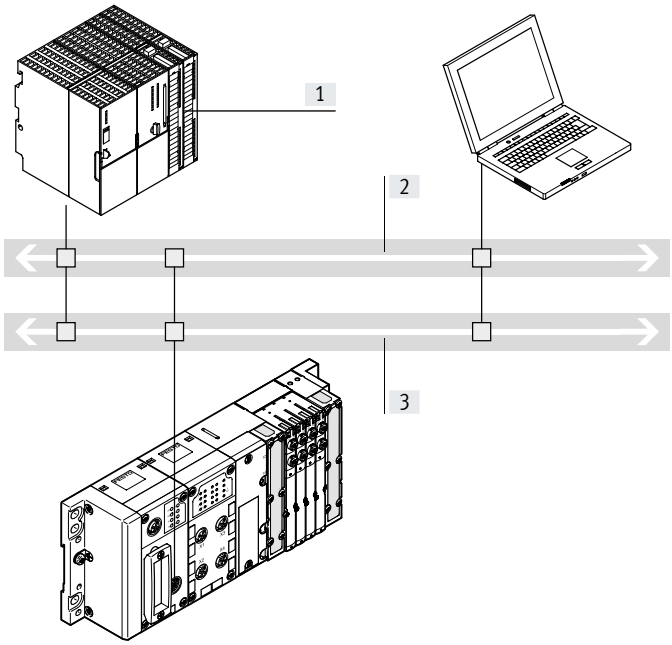
- Fast preprocessing of the CPX-P peripherals in the control block
- Exchange of any data between the control blocks via EasyIP
- Remote diagnostics
- No higher-order controller is required
- More than 300 I/Os per CPX-P control block

Key features

Variants of the CPX-P 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.

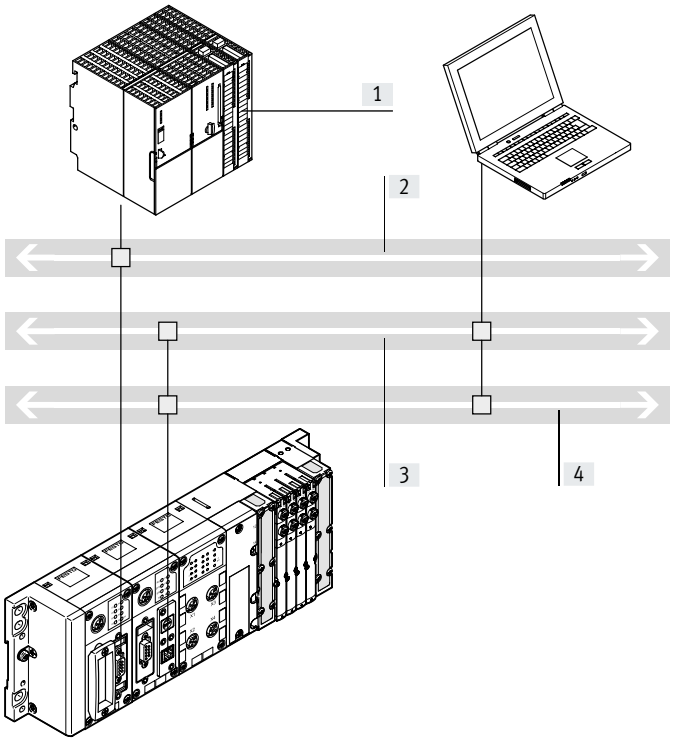


[1] Higher-order controller (PLC)
[2] Industrial Ethernet
[3] IT services:
- Web
- Email
- Data transmission

- Connection to a higher-order controller via Ethernet, no further bus node is required
- Monitoring via Ethernet and web applications
- Preprocessing of the CPX-P peripherals by CPX-P 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 or EtherCAT) as the preprocessing unit for decentralised, stand-alone subsystems.

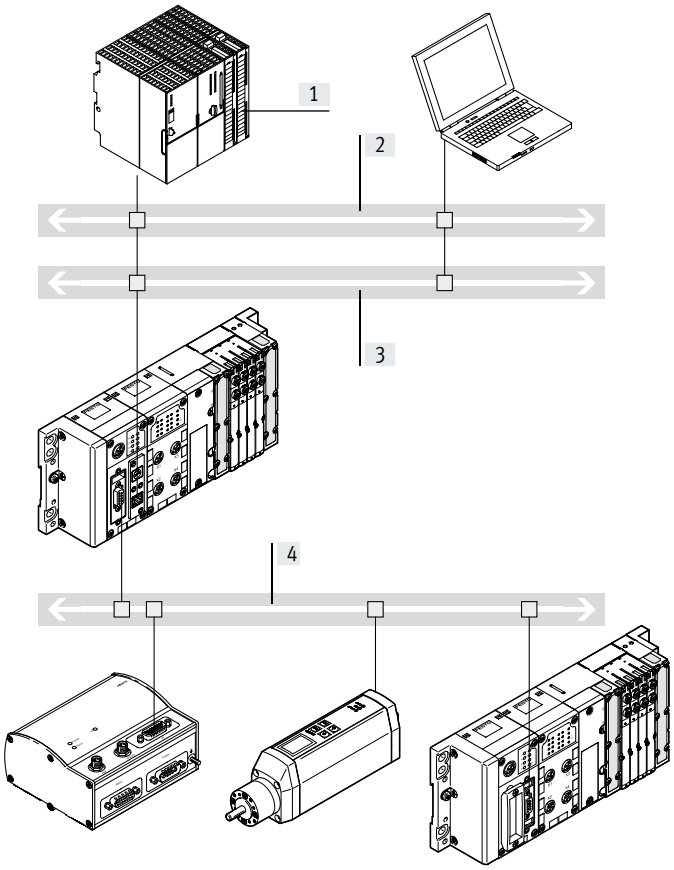


[1] Higher-order controller (PLC)
[2] Fieldbus
[3] Industrial Ethernet
[4] IT services:
- Web
- Email
- Data transmission

- Fast preprocessing of the CPX-P 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-P 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)

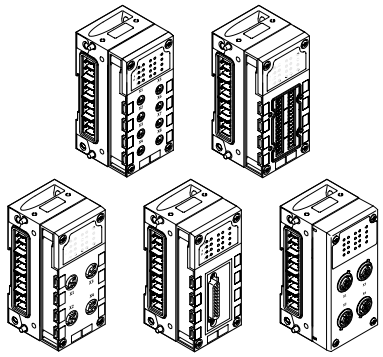
Features:
- Connection to a higher-order controller via Ethernet, no further bus node is required
- Monitoring via Ethernet
- Preprocessing of the CPX-P peripherals by CPX-P control block
- More than 300 I/Os
- Up to 128 stations with repeater technology on CANopen

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

Key features

Interface of inputs and outputs to the CPX-P terminal

Digital and analogue CPX-P I/O modules

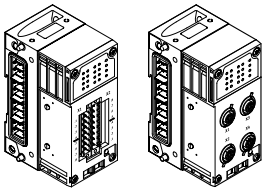


Electrical connection

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.
The input/output modules can be combined as required with the connection blocks:

- M12, 5-pin
- M12 5-pin, with quick lock and metal thread
- M12, 8-pin
- M8, 3-pin
- M8, 4-pin
- Sub-D 25-pin
- CageClamp®
  (with cover also to IP65/67)
- Screw terminal and spring-loaded terminal

CPX modules for NAMUR sensors

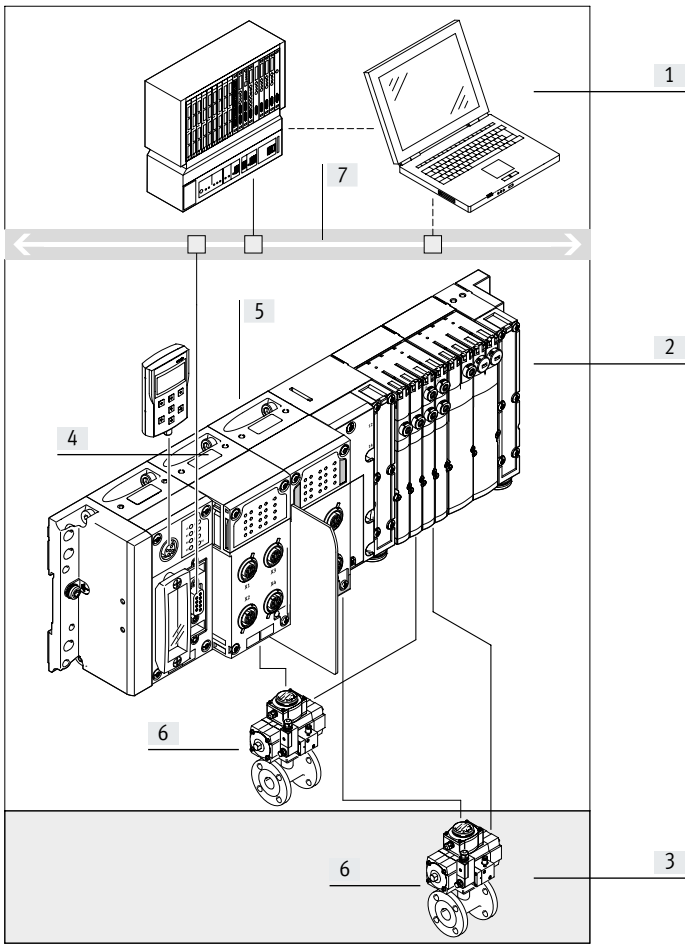


Electrical connection

The electronics modules for NAMUR sensors can only be combined with certain connection blocks.
The input modules can be combined as required with the connection blocks:

- M12, 4-pin
- Screw terminal and spring-loaded terminal

CPX modules for NAMUR sensors, intrinsically safe circuits for ATEX applications



[1] Higher-order controller (PLC)
[2] Non-ATEX zone; non-intrinsically safe circuits are permitted
[3] ATEX zone; only intrinsically safe circuits are permitted
[4] CPX input module for NAMUR sensors, non-intrinsically safe design
[5] CPX input module for NAMUR sensors, intrinsically safe design
[6] Actuator/machine component with NAMUR sensors
[7] Fieldbus

Note

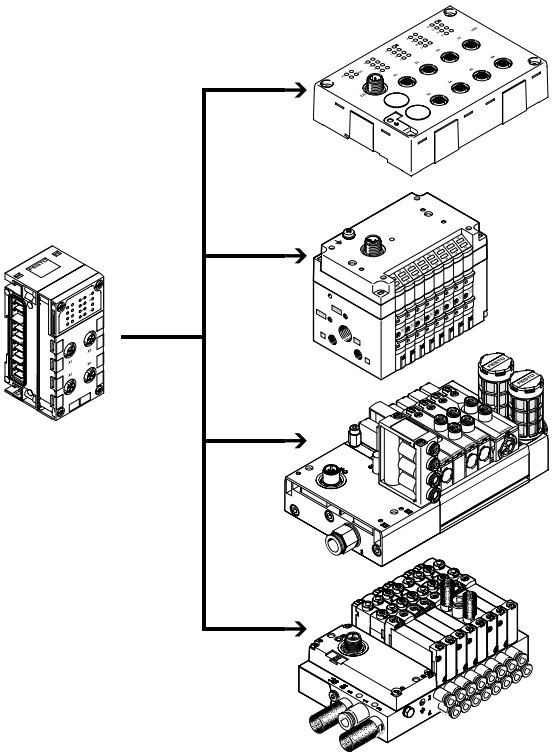
Intrinsically safe circuits are circuits which release so little energy during operation, or in the event of certain faults under specified test conditions, that no ignition can occur in a particular potentially explosive atmosphere.

CPX-P modules are suitable for configuring intrinsically safe or non-intrinsically safe circuits, depending on the design selected.
This enables components from both safe and potentially explosive zones to be connected to the CPX-P terminal.
The components for the intrinsically safe zone are marked in blue or entirely coloured blue to distinguish them visually.

Key features

Interface of inputs and outputs to the CPX-P terminal

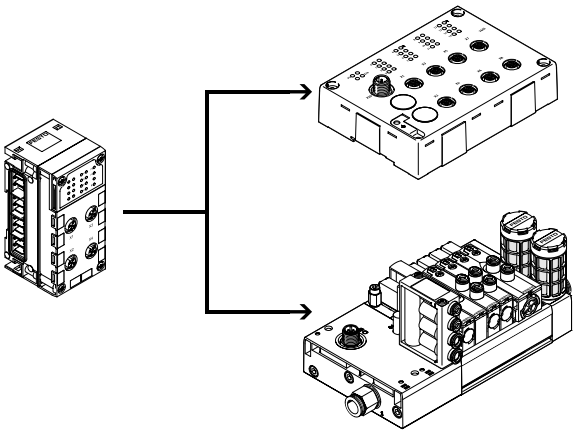
With CPX-CTEL interface



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

With CPX-CTEL-2 interface



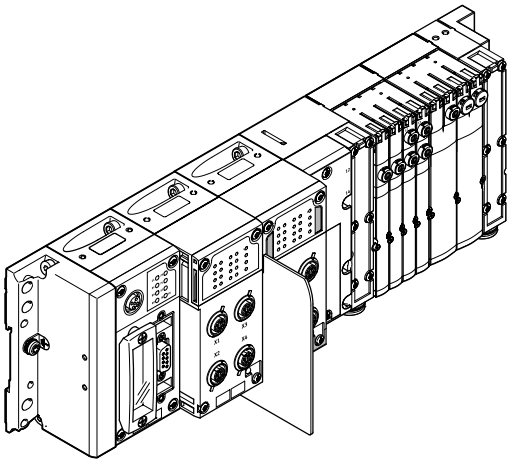
- Up to 2 IO-Link devices with individual electronic protection per CPX-CTEL-2 interface
- Max. 16-byte inputs/16-byte outputs per IO-Link device
- The maximum length of a string is 20 m.

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

Key features

Pneumatic variants of the CPX-P terminal

With valve terminal MPA-S – centralised



The electrical terminal CPX-P is a modular peripheral system for valve terminals.
The system is specifically designed so that the valve terminal can be adapted to suit different applications.

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

Ordering

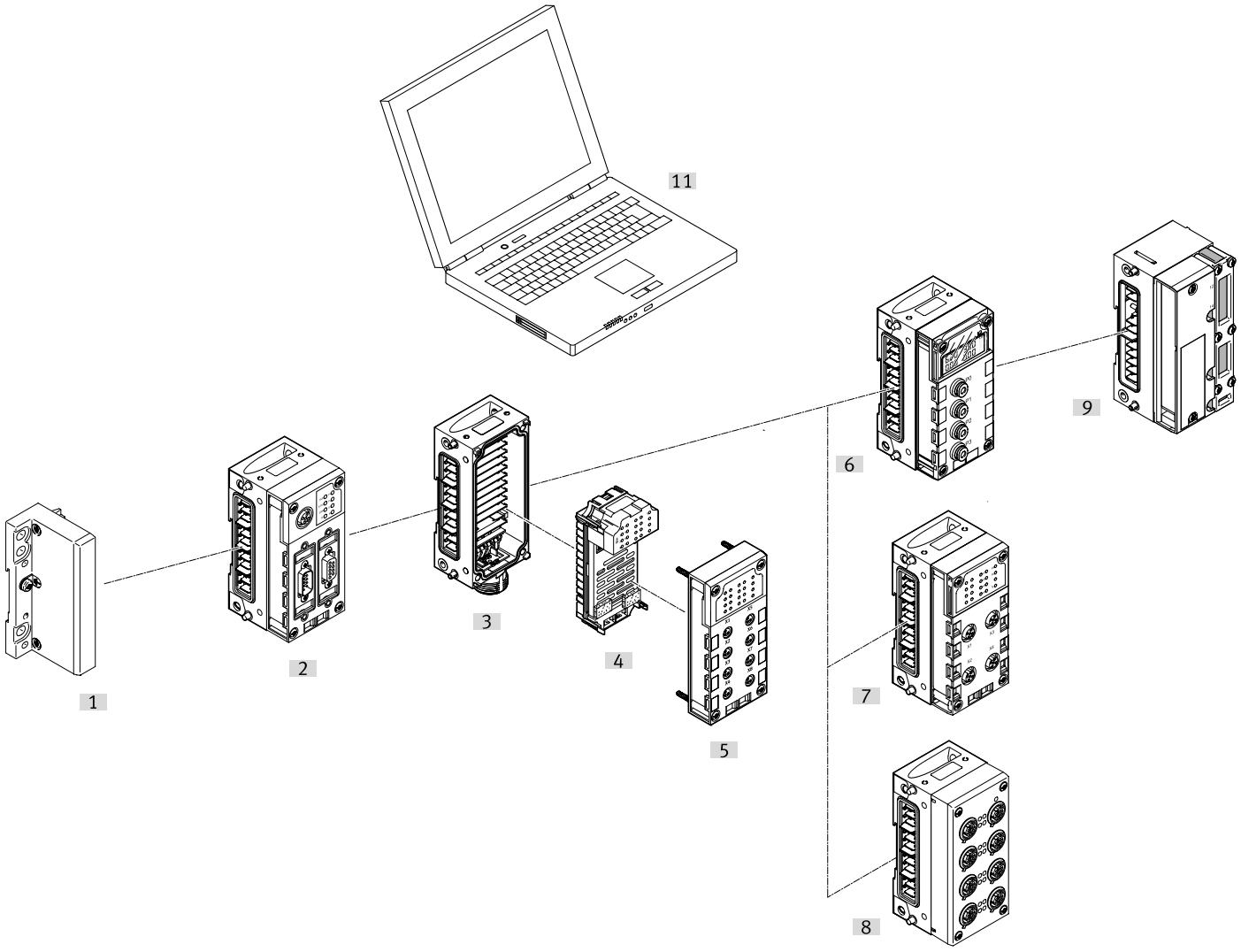
The CPX-P terminal with valve terminal is fully assembled according to your order specifications and individually tested. It consists of the electrical peripherals including the desired actuation and the selected components from the MPA-S modular system.

The CPX-P terminal with valve terminal is ordered using two separate order codes. One order code defines the electrical peripherals type CPX-P, while the other specifies the pneumatic components of the valve terminal.

The electrical peripherals type CPX-P 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: mpa-s
(valve terminal MPA-S)

Peripherals overview



Designation		Type	Description	→ Page/Internet
[1]	End plate	CPX-M-EPR-EV CPX-M-EPL-EV	• Mounting holes for wall mounting • Functional earth connection • Special earthing plate for safe and easy connection to the machine bed or H-rail	
[2]	Bus node	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	
	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	
[3]	Interlinking block	CPX-M-GE	• Internal linking of the power supply and serial communication • External power supply for the entire system or for outputs • Connection accessories for 7/8" • Individual linking with M6 screws, individually expandable	

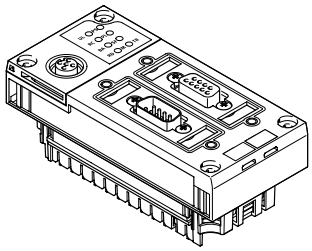
Peripherals overview

Designation		Type	Description	→ Page/Internet
[4]	Electronics module	CPX-4DE	Input module with 4 digital inputs, positive logic (PNP)	
		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	
		CPX-P-8DE-N-IS	Input module to NAMUR standard with 8 digital inputs, intrinsically safe version	
		CPX-F8DE-P	PROFIsafe input module with 8 digital inputs	
		CPX-16DE	Input module with 16 digital inputs, internal electronic fuse per module	
		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	
		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	
		CPX-2ZE2DA	Counter module with 2 digital inputs and 2 digital outputs	
		CPX-4AE-4AA-H	HART input/output module with 4 analogue input/outputs	
		CPX-2AE-U-I	Input module with 2 analogue current or voltage inputs	
		CPX-4AE-U-I	Input module with 4 analogue current or voltage inputs	
		CPX-4AE-I	Input module with 4 analogue current inputs	
		CPX-4AE-T	Input module for temperature inputs	
		CPX-4AE-TC	Input module for temperature inputs with cold junction compensation	
		CPX-2AA-U-I	Output module with 2 analogue current or voltage outputs	
		CPX-FVDA-P2	PROFIsafe shut-off module for shutting off the supply voltage for valves, with two digital outputs	
[5]	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	–
[6]	Analogue electronics module for pressure inputs	CPX-4AE-P	• Pneumatic connection QS-4 • Degree of protection IP65, IP67 • 4 analogue pressure inputs (0 ... 10 bar, –1 ... +1 bar)	
[7]	CTEL interface	CPX-CTEL	• 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 IP65, IP67	
[8]	Metal connection block	CPX-M-AB	• Can be combined with the electronics modules • Connection technology M12x1, 5-pin • Degree of protection IP65, IP67 • Connection accessories for M12 • Connecting cables M12 • Modular system for choice of connecting cables M12	–
[9]	Pneumatic interface MPA-S	VMPA-FB	• Control of valve terminal MPA-S • Control of pressure sensors • Control of proportional pressure regulators	
[11]	Web monitor	–	• Website integrated in the CPX terminal • Dynamic status indication • Online diagnostics and SMS/e-mail alert	–

Peripherals overview

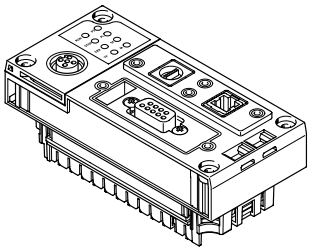
Individual overview of modules

Bus node → Page 52



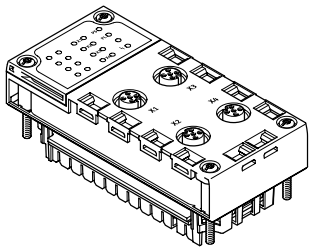
Bus node for
- PROFIBUS-DP
- DeviceNet
- CANopen
- EtherNet/IP
- PROFINET
- EtherCAT

Control block → Page 45



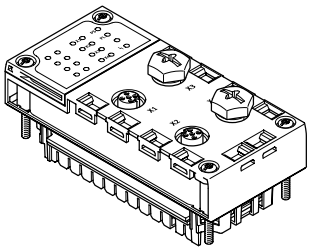
CPX-CEC
- Programming with CODESYS
- Ethernet interface
- Modbus/TCP
- EasyIP
- CANopen master

CTEL interface → Page 86



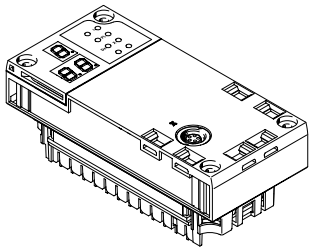
Interface CPX-CTEL
- CTEL master
- Max. 4 devices with individual electronic protection
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m

Electrical interface CPX-CTEL-2 → Page 92



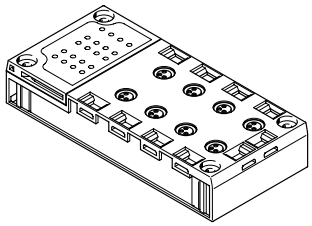
Interface CPX-CTEL-2
- Master for IO-Link
- Max. 2 devices with individual electronic protection
- Process data length of the inputs and outputs is limited to 16 bytes for inputs and 16 bytes for outputs per port
- The maximum length of a string is 20 m

Modules for controlling pneumatic drive units → Page 97



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

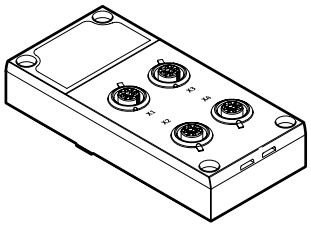


Direct machine mounting
(connection block to IP65/IP67)
- M8, 3-pin
- M8, 4-pin
- M12, 5-pin
- M12 5-pin quick lock, shielded with metal thread
- M12, 8-pin
- Sub-D 25-pin
- Spring-loaded terminal with cover

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

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

Metal connection block

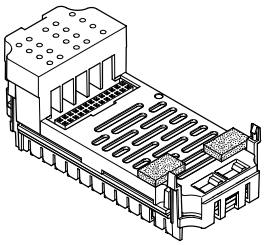


Direct machine mounting
(connection block to IP65/IP67)
- M12, 5-pin

Peripherals overview

Individual overview of modules

Digital electronics module for inputs/outputs → Page 104

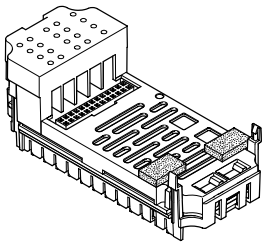


Digital inputs
- 4 digital inputs
- 8 digital inputs
- 16 digital inputs

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)

Analogue electronics module for inputs/outputs → Page 139

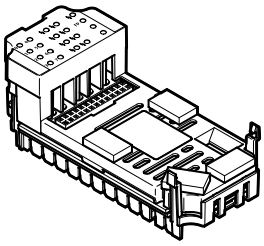


Analogue inputs
- 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue inputs (1 ... 5 V, 0 ... 10 V, −5 ... +5 V, −10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, −20 ... +20 mA)
- 4 analogue inputs with HART protocol

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)

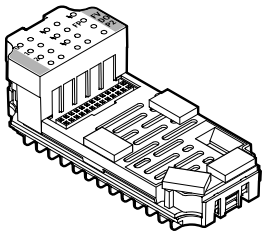
Analogue outputs
- 2 analogue outputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue outputs with HART protocol

PROFIsafe input module → Page 115



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

PROFIsafe shut-off module → Page 158

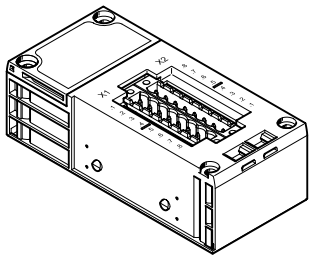


Digital outputs
- 2 digital outputs
- Supply voltage for valves can be shut off

Peripherals overview

Individual overview of modules

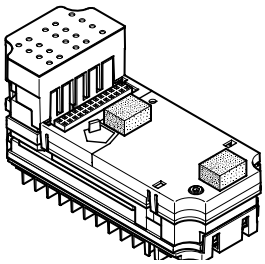
Connection block for NAMUR sensors and HART input/output module



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

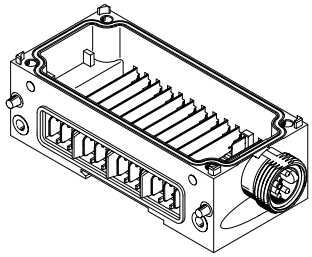
Protected fitting space
(connection block to IP20)
- Screw terminal
- Spring-loaded terminal

Digital electronics module for NAMUR sensors → Page 100



Digital inputs
- 8 digital inputs for NAMUR sensors or wired mechanical contacts
- Intrinsically safe design with additional protective measures in the event of failure

Metal interlinking block – Individual linking → Page 163



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

System supply
- 7/8" 5-pin

In addition to system linking, power supply for the
- Electronics plus sensors (8 A)
- Valves plus actuators (8 A)

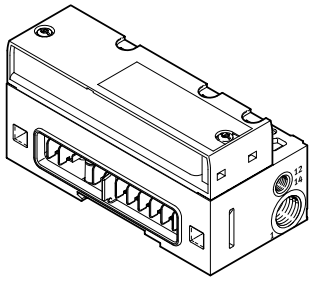
Additional supply
In addition to system linking, power supply for the
- Actuators (8 A per supply)

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

Note

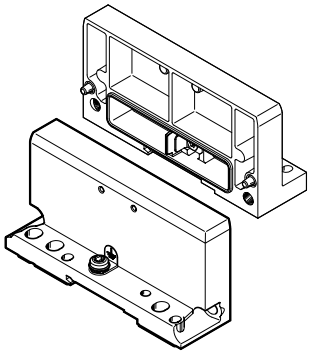
The 7/8" supply is subject to the following restrictions due to the available accessories:
- 5-pin 8 A

Pneumatic interface MPA-S → Page 169



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

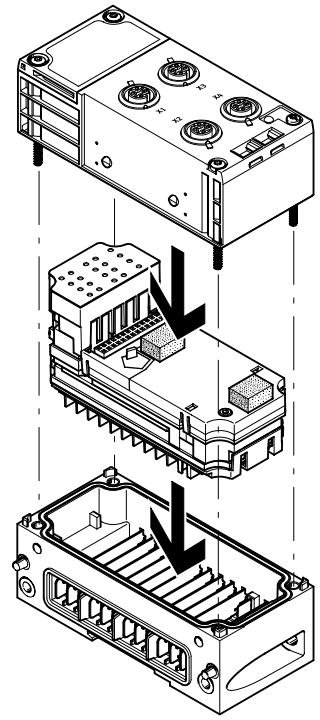
End plate



End plate
- Left
- Right (for use without valves)

Peripherals overview

General basic data and guidelines



Max. 11 modules in total:
- One bus node and/or one control block
- Up to 9 additional input/output modules
- In addition a pneumatic interface
  - Always positioned as the last module on the right-hand side
  - 16 MPA modules can be configured
- 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
- The connection blocks can be combined with the electronics modules for inputs/outputs, with restrictions (→ table below)
- The electronics modules for inputs/outputs can be combined with various interlinking blocks

Combinations of connection blocks and digital input modules

	Digital electronics modules						
	CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE	CPX-F8DE-P	CPX-16DE	CPX-M-16DE-D
Connection blocks, plastic design							
CPX-AB-8-M8-3POL	■	■	■	■	–	–	–
CPX-AB-8-M8X2-4POL	–	–	–	–	–	■	–
CPX-AB-4-M12x2-5POL	■	■	■	■	–	–	–
CPX-AB-4-M12x2-5POL-R	■	■	■	■	–	–	–
CPX-P-AB-4XM12-4POL	–	–	–	–	–	–	–
CPX-P-AB-4XM12-4POL-8DE-N-IS	–	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	–	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	■	■	–
CPX-P-AB-2XKL-8POL	–	–	–	–	–	–	–
CPX-P-AB-2XKL-8POL-8DE-N-IS	–	–	–	–	–	–	–
CPX-AB-1-SUB-BU-25POL	■	■	■	■	–	■	–
Connection blocks, metal design							
CPX-M-AB-4-M12X2-5POL	■	■	■	■	■	–	–
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–	■

Peripherals overview

Combination of connection blocks and digital input modules for NAMUR sensors		
	Digital electronics modules	
	CPX-P-8DE-N	CPX-P-8DE-N-IS
Connection blocks, plastic design		
CPX-AB-8-M8-3POL	–	–
CPX-AB-8-M8X2-4POL	–	–
CPX-AB-4-M12x2-5POL	–	–
CPX-AB-4-M12x2-5POL-R	–	–
CPX-P-AB-4XM12-4POL	■	–
CPX-P-AB-4XM12-4POL-8DE-N-IS	–	■
CPX-AB-4-M12-8POL	–	–
CPX-AB-8-KL-4POL	–	–
CPX-P-AB-2XKL-8POL	■	–
CPX-P-AB-2XKL-8POL-8DE-N-IS	–	■
CPX-AB-1-SUB-BU-25POL	–	–
Connection blocks, metal design		
CPX-M-AB-4-M12X2-5POL	–	–
CPX-M-AB-8-M12X2-5POL	–	–

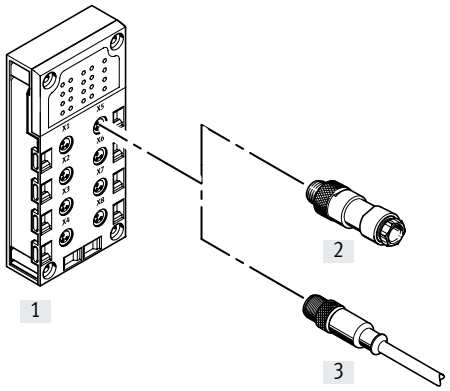
Combinations of connection blocks and digital output modules or multi I/O modules						
	Digital electronics modules					
	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-8DE-8DA	CPX-2ZE2DA	CPX-FVDA-P2
Connection blocks, plastic design						
CPX-AB-8-M8-3POL	■	■	–	–	–	–
CPX-AB-8-M8X2-4POL	■	■	■	–	–	–
CPX-AB-4-M12x2-5POL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

Peripherals overview

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-AB-4-M12x2-5POL	–	■	■	■	■	–	■	■
CPX-AB-4-M12x2-5POL-R	–	■	■	■	■	–	■	■
CPX-P-AB-4XM12-4POL	■	–	–	–	–	–	–	–
CPX-P-AB-4XM12-4POL-8DE-N-IS	–	–	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	–	–	–	–	–
CPX-AB-8-KL-4POL	–	■	■	■	■	–	■	■
CPX-P-AB-2XKL-8POL	■	–	–	–	–	–	–	–
CPX-P-AB-2XKL-8POL-8DE-N-IS	–	–	–	–	–	–	–	–
CPX-AB-1-SUB-BU-25POL	–	■	■	■	■	–	–	–
Connection blocks, metal design								
CPX-M-AB-4-M12X2-5POL	–	■	■	■	■	–	■	■
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–	–	–

Key features – Electrical components

Electrical connection – Connection block with M8, 3-pin connection
CPX-AB-8-M8-3POL



- 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:

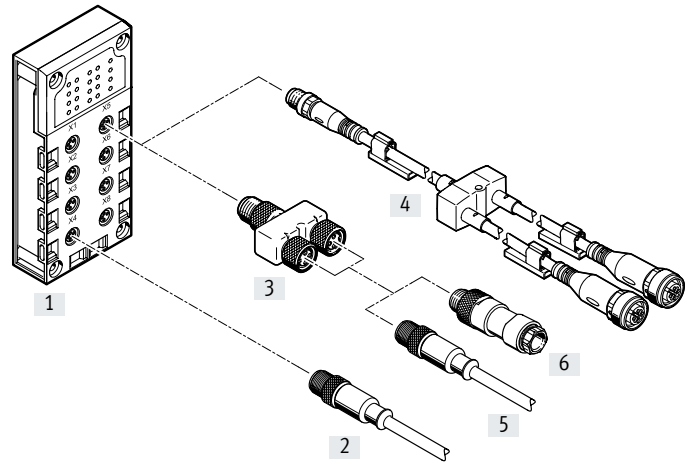
- Tailored to the application
- Perfectly fitting
- Easy to install

Combination of connection block and electrical connection technology

Connection block	Connection technology		Plug/connecting cable	Selectable 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 with M8, 4-pin connection
CPX-AB-8-M8X2-4POL



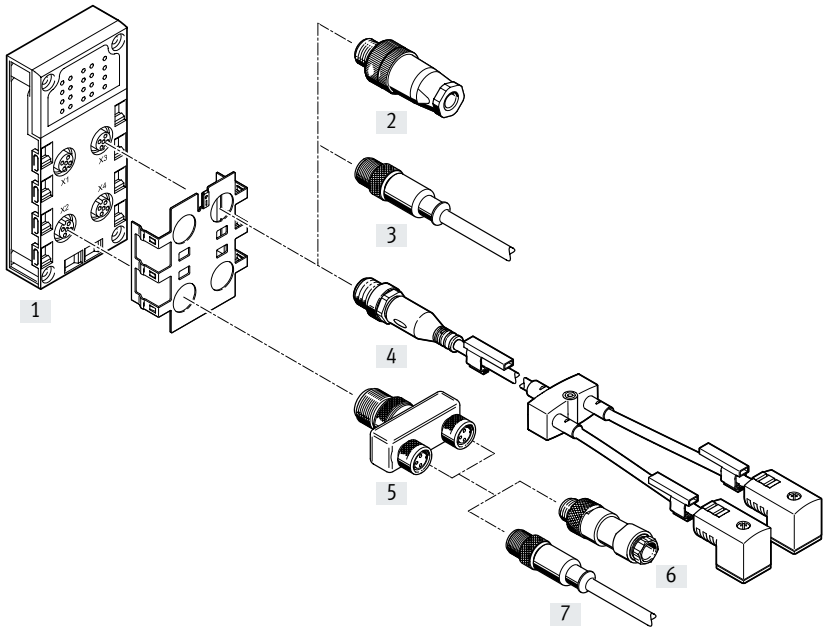
- Compact for pre-assembled individual connection
- 8 sockets
- 4-pin design for connection of 2 channels per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology	Plug/connecting cable	Selectable 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 with M12, 5-pin connection
CPX-AB-4-M12x2-5POL and CPX-AB-4-M12x2-5POL-R, plastic



- 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

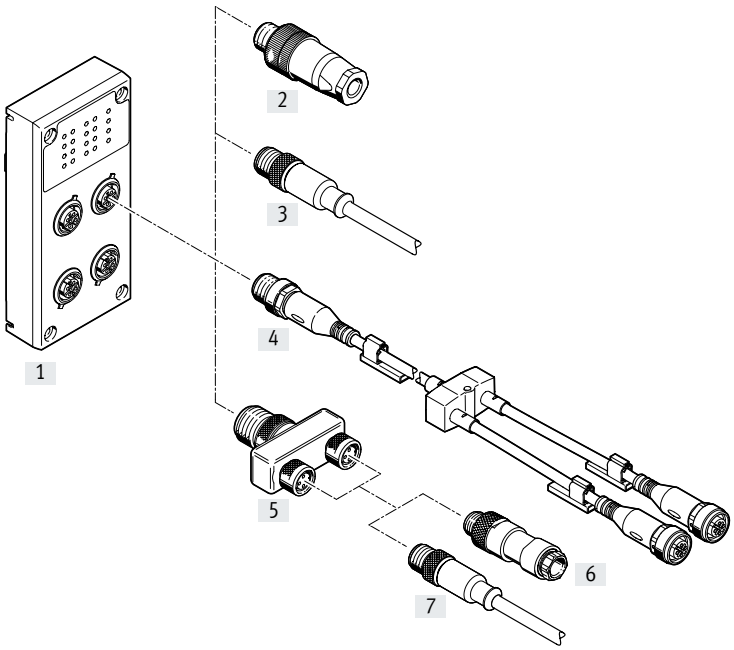
Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology	Plug/connecting cable	Selectable 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

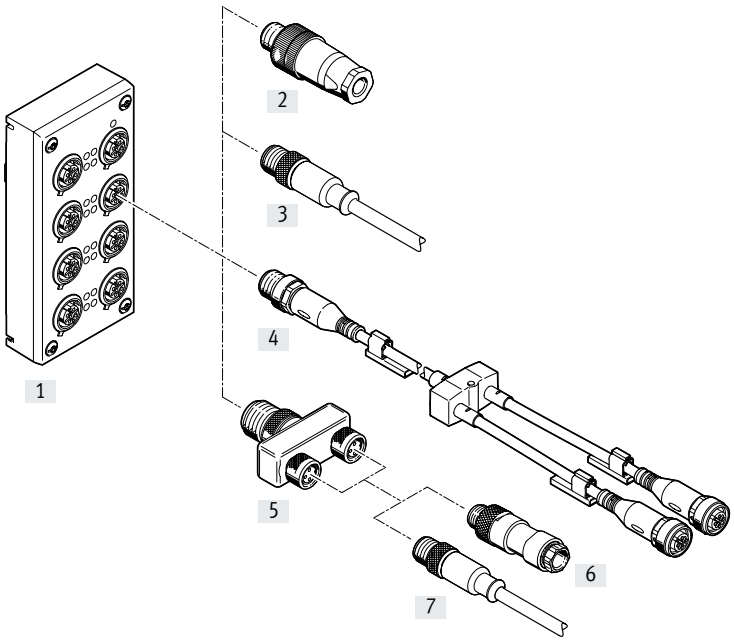
Electrical connection – Connection block (metal design)

CPX-M-AB-4-M12X2-5POL 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 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.

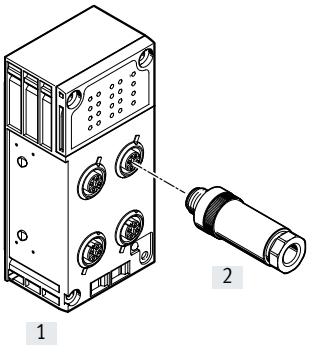
Key features – Electrical components

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-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

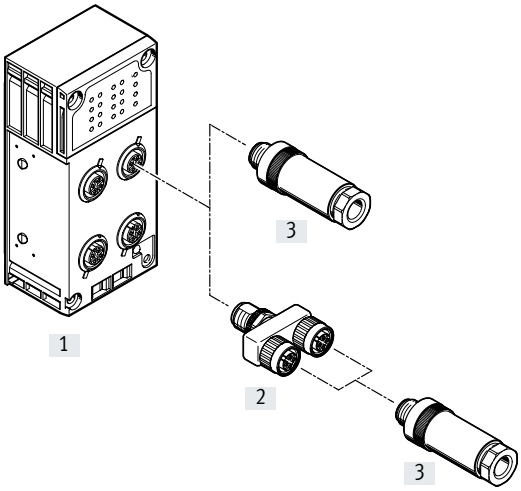


- Suitable for self-assembly and sturdy
- 4 sockets
- 4-pin design per connection

Combination of connection block and electrical connection technology

Connection block	Connection technology		Plug/connecting cable	Selectable 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

Electrical connection – Connection block with M12, 4-pin connection
CPX-P-AB-4XM12-4POL-8DE-N-IS



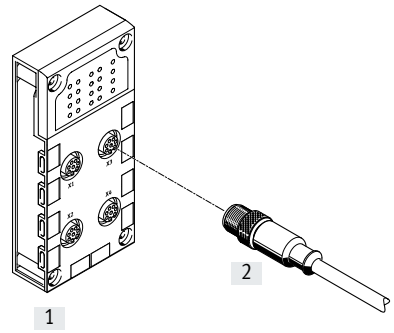
- Suitable for self-assembly and sturdy with 2 channels per connection
- 4 sockets
- 4-pin design per connection
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter.

Combination of connection block and electrical connection technology

Connection block	Connection technology		Plug/connecting cable	Selectable connection technology		Plug/connecting cable	Selectable connection technology
[1] CPX-P-AB-4XM12-4POL-8DE-N-IS	Socket, M12, 4-pin		[3] NECU-M-S-A12G4-IS	Plug, M12, 4-pin		–	–
			[3] NECU-S-M12G4-...-IS	Plug, M12, 4-pin		–	–
			[2] NEDU-M12D4-M12T4-IS (T-adapter)	1x plug M12, 4-pin to 2x socket M12, 4-pin		[3] NECU-S-M12G4-...-IS	Plug, M12, 4-pin

Key features – Electrical components

Electrical connection – Connection block with M12, 8-pin connection
CPX-AB-4-M12-8POL

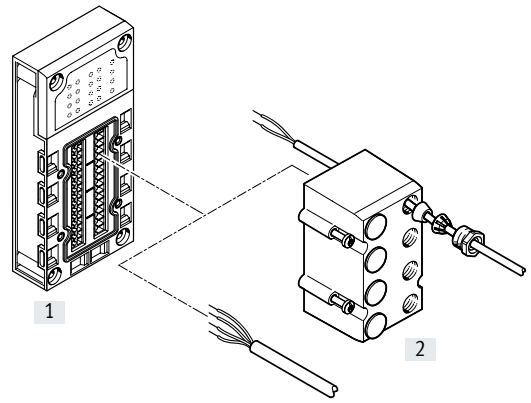


- Connection to cylinder/valve combinations with max. 3 inputs and 2 outputs
- 4 sockets
- 8-pin design per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology		Plug/connecting cable	Selectable 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

Electrical connection – Connection block with spring-loaded terminal connection
CPX-AB-8-KL-4POL



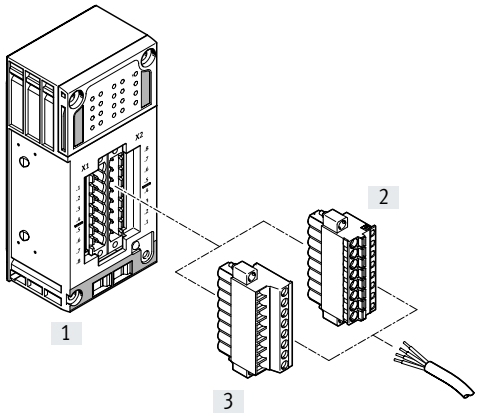
- Quick connection technology for use in control cabinets
- 32 spring-loaded terminals
- 4 spring-loaded terminals per channel
- Wire cross-sections 0.05 ... 1.5 mm^2
- Optional cover with fittings for IP65/67 connection
  - 8 through-holes M9
  - 1 through-hole M16
  - Blanking plug
  - For I/O distributors, control desks or individual sensors/actuators

Combination of connection block and electrical connection technology

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

Key features – Electrical components

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

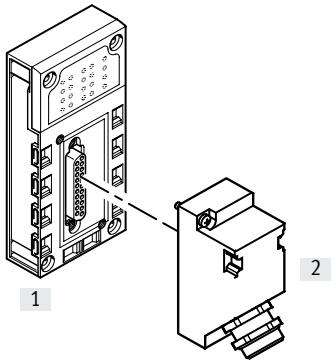


- Quick connection technology for use in control cabinets
- Spring-loaded terminals or screw terminals
- Wire cross sections 0.2 ... 2.5 mm²

Combination of connection block and electrical connection technology

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

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



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

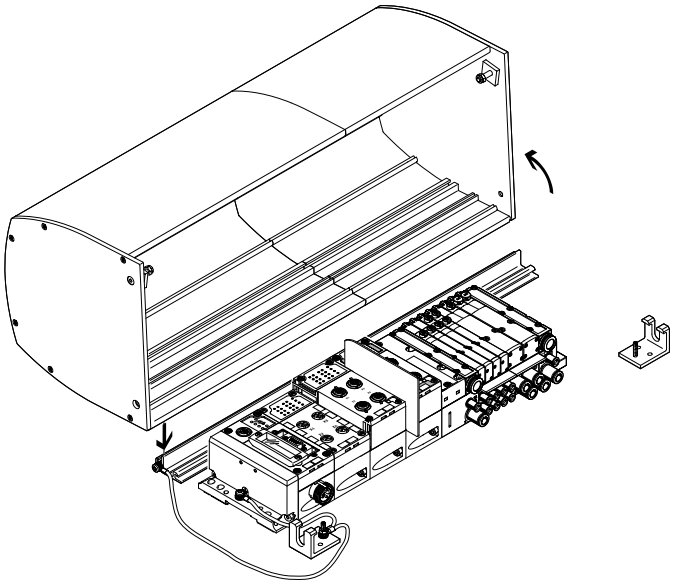
Combination of connection block and electrical connection technology

Connection block	Connection technology		Plug/connecting cable	Selectable 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 → 175



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 is well protected and is quick to install without the need for a complex cabinet through-feed for 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 (detent of the hood in the open position).
The hood is locked using two side screws (which meet the requirements for a special fastener 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-P and MPA modules underneath

Points to note when using the CPX hood

- CPX-P power supply via angled plugs, no T-plugs
- Electrical supply plate/additional supply only possible with angled plug
- No MPA vertical stacking
- Use of larger push-in fittings (for tubing O.D. larger than 12 mm) 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-P terminal.

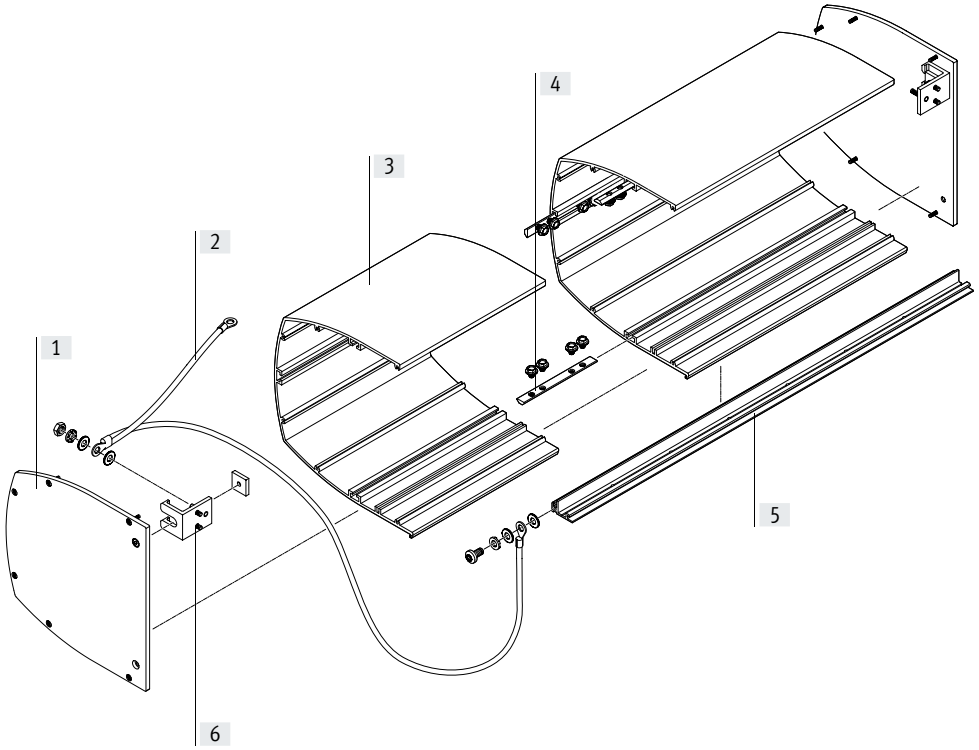
The CPX hood has no influence on the IP protection class of the valve terminal or of the CPX-P terminal.

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



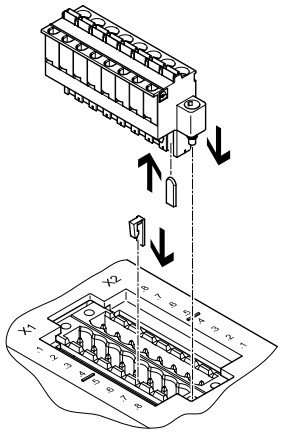
Procedure:
- Assemble the rail and mounting bracket included in the mounting kit
- Attach the earthing cable
- Assemble the hood (if applicable, screw together several hood sections and attach the side covers)
- Attach and secure the hood

[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 blocks CPX-P-AB-2XKL-8POL and CPX-P-AB-2XKL-8POL-8DE-N-IS, and the sockets NECU-L3G8, can be matched to one another using the coding elements CPX-P-KDS-AB-2XKL.

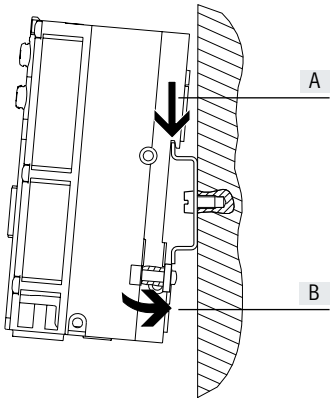
This reduces the possibility of the socket being plugged back into an incorrect slot after being disconnected from the CPX-P terminal (connection safeguard).

Key features – Mounting

Mounting options

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

H-rail mounting

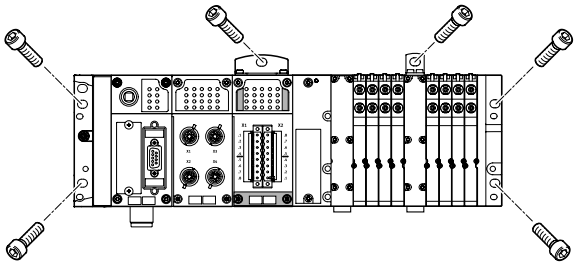


The H-rail mounting is part of the rear profile of the CPX-P interlinking blocks. The CPX-P terminal can be attached to the H-rail using the H-rail mounting kit.
The CPX-P terminal is mounted on the H-rail (see arrow A) and then swivelled onto the H-rail and secured in place with the clamping element (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

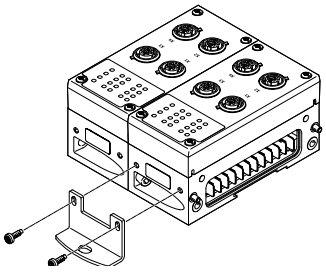
This allows the CPX-P terminal to be mounted to the H-rails to EN 60715. An additional mounting kit may be required for combination with valve terminals.

Wall mounting



The end plates of the CPX-P terminal, the valve terminal and the pneumatic interface include mounting holes for wall mounting. Additional mountings for the CPX-P terminal are available for longer valve terminals.

Additional mountings

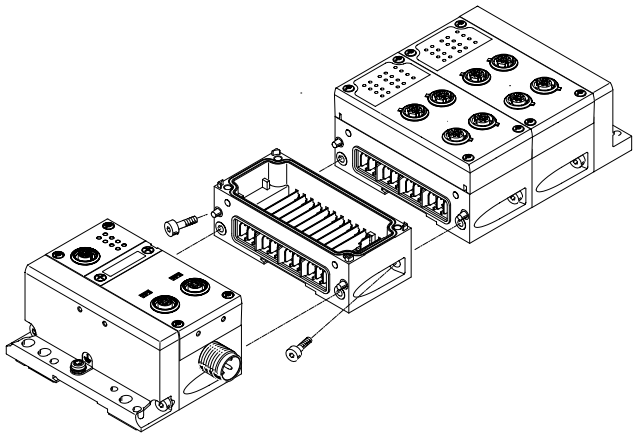


Additional mounting brackets for the CPX-P terminal that can be screwed onto the interlinking blocks are available for longer valve terminals.

Note

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

Linking with screws

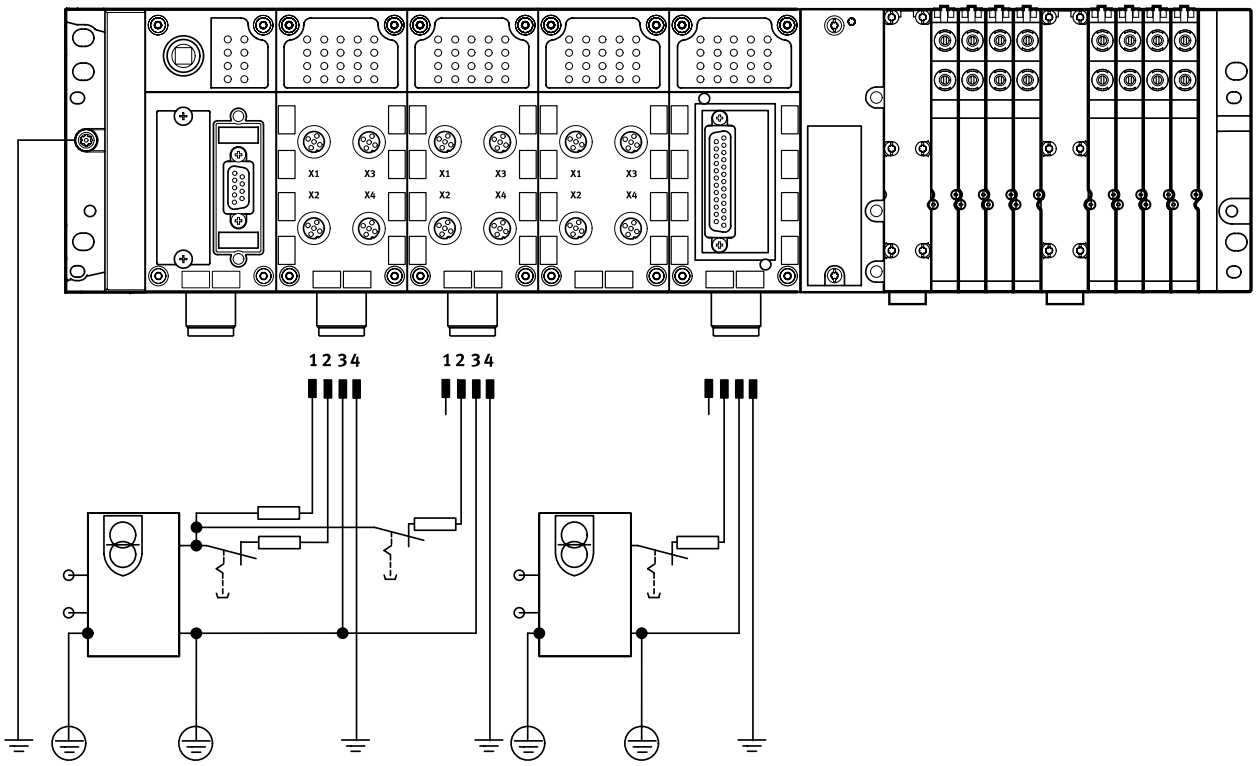


The CPX-P modules are mechanically connected using an angled fitting.
The CPX-P terminal can thus be expanded at any time.

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-P is, in principle, supplied with all voltages via a single connection.

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

Connection technology:
- 7/8"

Interlinking blocks

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

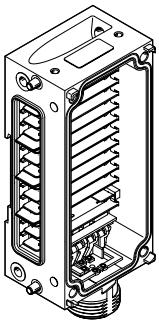
Many applications require the CPX-P terminal to be segmented into voltage zones. This applies in particular to the separate disconnection of the outputs.

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

Key features – Power supply

Interlinking blocks

With system supply



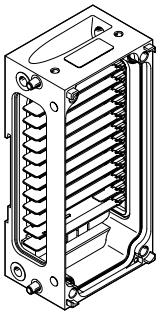
- CPX-M-GE-EV-S-7/8-5POL
- CPX-M-GE-EV-S-7/8-5POL-VL

Connection technology
- 7/8" 5-pin

- For CPX-P terminal modules and connected sensors
- For valves that are connected to the CPX-P terminal via a pneumatic interface

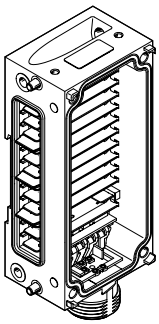
- For actuators that are connected to output modules of the CPX-P terminal

Without power supply



- CPX-M-GE-EV
- CPX-M-GE-EV-FVO

With additional supply for outputs



- CPX-M-GE-EV-Z-7/8-5POL
- CPX-M-GE-EV-Z-7/8-5POL-VL

Connection technology
- 7/8" 5-pin

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

Note

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

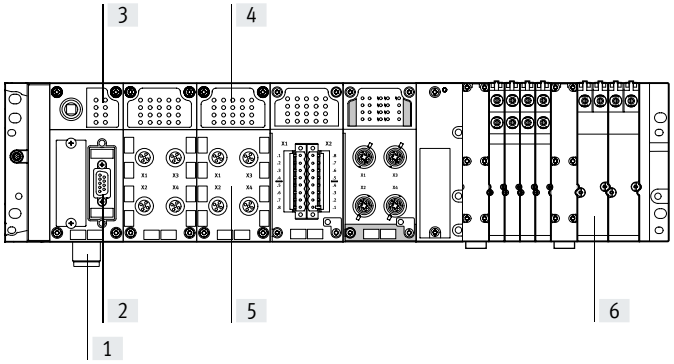
Note

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

Key features – Diagnostics

Diagnostics

System performance



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

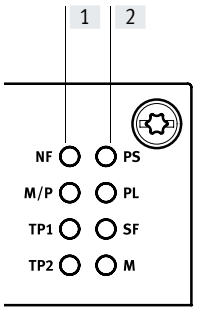
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on-the-spot diagnostics using LEDs or PC and diagnostics using a bus interface.

The CPX-P 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. The CPX-CEC also offers the option of access via the integrated Ethernet interface (remote maintenance via PC/web applications).

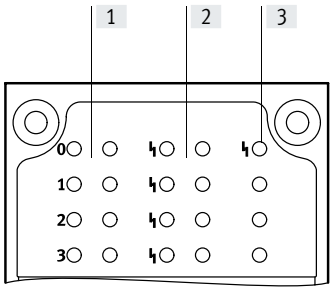
Overview of LEDs on the bus node



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

[2] CPX-P-specific LEDs
A further 4 CPX-P-specific LEDs provide non-fieldbus-specific information about the status of the CPX-P 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.

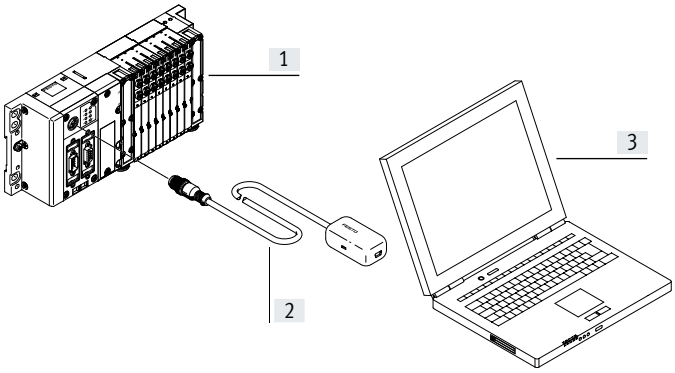
[2] Channel-oriented diagnostic LEDs
Depending on the module design, another diagnostic LED is available for each I/O channel

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

Key features – Parameterisation

Diagnostics

Display on a PC

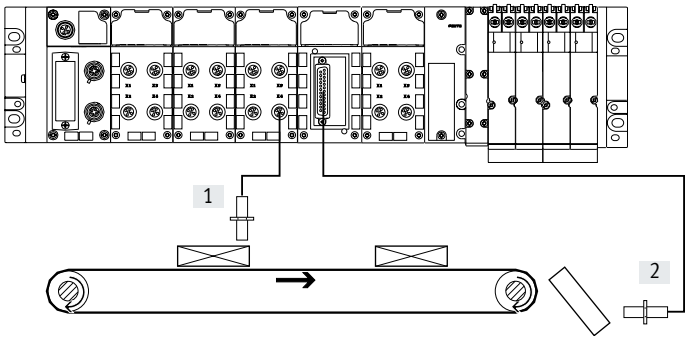


[1] CPX-P terminal with valve terminal
[2] Adapter diagnostic interface to USB
[3] Laptop/portable device with USB interface and installed CPX-P

Maintenance Tool (CPX-FMT) software
- Fault location and type
- Without programming
- Storing the configuration
- Preparing screenshots

Parameterisation

Changes to the application are often required during commissioning. The parameterisable characteristics of the CPX-P modules mean that functions can be very easily changed by 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 performed 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-P modules occupy a different number of I/O addresses within the CPX-P 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-P bus nodes.

Overview – Allocated addresses for CPX-P modules

	Inputs [bit]	Outputs [bit]
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-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-P-8DE-N-IS	16	8
CPX-P-8DE-N-IS (inputs configured as counter)	80	16
CPX-F8DE-P	48	56
CPX-16DE	16	–
CPX-M-16DE-D	16	–
CPX-4DA	–	4
CPX-8DA	–	8
CPX-8DA-H	–	8
CPX-8DE-8DA	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

1) Dependent on the DIL switch setting on the module

Key features – Addressing

Overview – Address space for CPX-P 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-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-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.

Data sheet

Module width
50 mm

Note

The data shown here apply to the CPX-P system. If components with lower values are used in the system, the specification for the entire system is reduced to the values of those components.

Example

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

General technical data			
Module no.			562818
Max. number of modules[1)]	Control block		1
	Bus node		1
	I/O modules		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		Up to 4 LEDs, bus-specific 4 LEDs, CPX-P-specific • PS = Power system • PL = Power load • SF = System fault • M = Modify parameter/forcing active
	I/O modules		Min. one group diagnostic LED Channel-oriented status and diagnostic LED, depending on module
	Pneumatic interface		One group diagnostics 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.			562818
Parameterisation			Diagnostic behaviour
			Fail-safe response
			Forcing of channels
			Signal setup
Commissioning support			Forcing of inputs and outputs
Nominal operating voltage		[V DC]	24
Permissible voltage fluctuations		[%]	±25
Power supply	Interlinking block with system supply		
	Electronics plus sensors	[A]	8
	Actuators plus valves	[A]	8
	Additional supply		
	Actuators	[A]	8
Current consumption			Depending on system configuration
Mains buffering (bus electronics only)		[ms]	10
Power supply connection			7/8" 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
Immunity to interference			EN 61000-6-2 (industry)
Interference emission			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
PWIS conformity			VDMA24364-B2-L
Grid dimension		[mm]	50

Operating and environmental conditions		
Module no.		562818
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70

Data sheet

Certifications and approvals – Maximum values		
Module no.		562818
ATEX category gas		II 3G
Type of ignition protection for gas		Ex nA IIC T4 Gc
Explosion-proof ambient temperature	[°C]	–5 ≤ Ta ≤ +50
CE marking (see declaration of conformity)[1]		To EU Explosion Protection Directive (ATEX)
		To EU EMC Directive[2]
		To EU RoHS Directive
UKCA marking (see declaration of conformity)[1]		To UK EX instructions
		To UK instructions for EMC
		To UK RoHS instructions
KC mark		KC EMC
Degree of protection to EN 60529		IP20, IP65
Certification		c UL us - Recognized (OL)
		RCM mark
Explosion protection certification outside the EU		EPL Gc (BR)
Certificate issuing authority		DNV 15.0193 X

1) More information: www.festo.com/catalogue/... ➔ Support/Downloads.

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.

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:

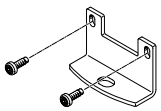
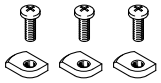
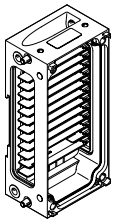
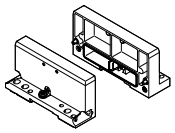
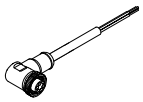
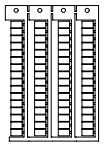
➔ Internet: cpx-p

Data sheet

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

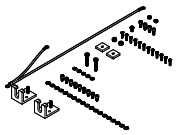
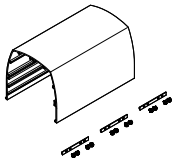
Data sheet

Ordering data – Accessories

Designation					Part no.	Type
Mounting						
	Attachment for wall mounting (for long valve terminals, 2 mounting brackets and 4 screws)				**550217**	**CPX-M-BG-RW-2x**
	Mounting for H-rail				**526032**	**CPX-CPA-BG-NRH**
Interlinking block						
	Without power supply		–		**550206**	**CPX-M-GE-EV**
	With system supply	7/8" connection, 5-pin	–		**550208**	**CPX-M-GE-EV-S-7/8-5POL**
			For ATEX environment		**8022165**	**CPX-M-GE-EV-S-7/8-5POL-VL**
	With additional supply for outputs	7/8" connection, 5-pin	–		**550210**	**CPX-M-GE-EV-Z-7/8-5POL**
			For ATEX environment		**8022158**	**CPX-M-GE-EV-Z-7/8-5POL-VL**
Mounting accessories						
	Screws for mounting the bus node/connection block on an 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						
	End plate		Right-hand		**550214**	**CPX-M-EPR-EV**
			Left-hand		**550212**	**CPX-M-EPL-EV**
Power supply						
	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-pin			2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
Inscription labels						
	Inscription labels 6x10 mm, 64 pieces, in frame				**18576**	**IBS-6x10**

Data sheet

Ordering data – Accessories

Designation			Part no.	Type
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-P 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-P 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

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-P terminal:
1. Installation
2. Commissioning and parameterisation
3. Diagnostics

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

Device description files and icons are provided to support the integration of the CPX-P terminal in the configuration software of the various controller manufacturers.

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

Overview – User documentation

Type	Title	Description
Pneumatics		
P.BE-MPA-...	Valve terminals with MPA-S pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MPA-S pneumatic components.
Electronics		
P.BE-CPX-SYS-...	System description, installation and commissioning	Overview of the design, components and mode of operation of the CPX-P terminal; installation and commissioning instructions as well as basic principles of parameterisation.
CPX-FVDA-P2-...	PROFIsafe shut-off module	Connection technology and assembly, installing and commissioning instructions for the PROFIsafe shut-off module of the type CPX-FVDA-P2.
P.BE-CPX-EA-...	CPX-P-EA modules, digital	Connection technology and assembly, installation and commissioning instructions for digital input and output modules of type CPX-... as well as the MPA pneumatic interface.
P.BE-CPX-P-EA-...	CPX-P-EA modules, NAMUR sensors	Connection technology and assembly, installation and commissioning instructions for digital input and output modules of type CPX-P-....
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-P-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-CTEL...	CPX CTEL interface	Instructions on assembly, installation, commissioning and diagnostics of the CTEL master.
P.BE-CPX-CTEL-LK...	Electrical interface CPX-CTEL-2	Instructions on assembly, installation, commissioning and diagnostics of the electrical interface for IO-Link.
P.BE-CPX-CMIX...	CPX measuring module	Instructions on assembly, installation, commissioning and diagnostics of the measuring module (CMIX).
P.BE-CPX-FB... CPX-FB...	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.

Data sheet – CPX-P 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-P terminal.
The USB-to-M12 adapter features built-in galvanic isolation (between CPX-P and PC) and enables a PC to be connected to the diagnostic interface of the CPX-P terminal.

- Adapters
- Software on CD-ROM

Application
Only from Festo

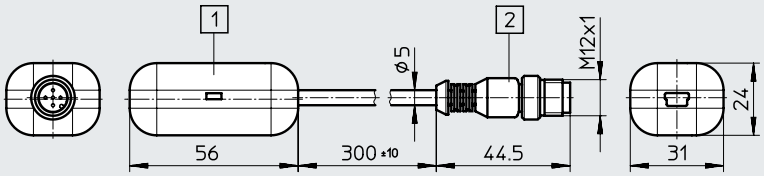
The CPX-FMT software enables access to CPX valve terminals via Ethernet with the bus nodes EtherNet/IP (FB 36) and PROFINET (FB 33, FB 34, FB 35). The bus nodes or control blocks can be connected directly to a PC via a USB adapter from Festo. Diagnostic data such as the error trace or module diagnostics 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 performed without an existing controller infrastructure. It must be noted that only local parameters on the CPX valve terminal can be changed and saved using the CPX-FMT. 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 mm²
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.

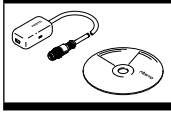
Data sheet – CPX-P Maintenance Tool

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-P Maintenance Tool (CPX-FMT), software and USB-to-M12 adapter	**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – CODESYS controller

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

The CODESYS controller is a modern control system for CPX-P 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-P 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-P 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-P 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.

Characteristics

- 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-P diagnostic status, copy CPX-P diagnostic trace, read CPX-P 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) More information: www.festo.com/x/topic/kbk

Electrical data

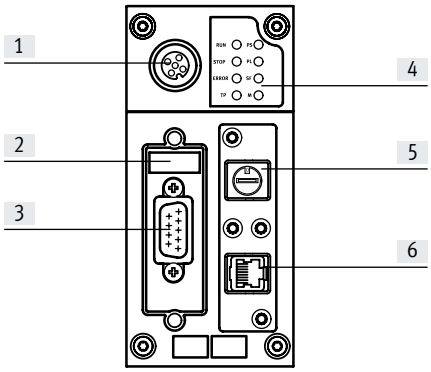
Nominal operating voltage		[V DC]	24
Load voltage	Nominal operating voltage	[V DC]	24
	With pneumatics type VTSA	[V DC]	21.6 ... 26.4
	With pneumatics type MPA	[V DC]	18 ... 30
	Without pneumatics	[V DC]	18 ... 30
Power failure buffering		[ms]	10
Intrinsic current consumption at nominal operating voltage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

Data sheet – CODESYS controller

Technical data					
Type			CPX-CEC-C1-V3	CPX-CEC-M1-V3	CPX-CEC-S1-V3
Additional functions			Motion functions for electric drives	SoftMotion functions for electric drives	Diagnostic functions RS232 communication function
CPU data	Flash	[MB]	32		
	RAM	[MB]	256		
	Processor	[MHz]	800		
Control interface			CAN bus	CAN bus	–
Parameterisation			CODESYS V3		
Configuration support			CODESYS V3		
Program memory, user program		[MB]	16		
Flags			CODESYS variable concept		
	Remanent data	[kB]	28		
Control elements			DIL switch for CAN termination		–
			Rotary switch for RUN/STOP		Rotary switch for RUN/STOP
Total number of axes			127	31	–
Ethernet	Number		1		
	Connection technology		RJ45 socket, 8-pin		
	Data transmission speed	[Mbps]	1 0/100		
	Supported protocols		TCP/IP, EasyIP, Modbus TCP		
Fieldbus interface	Number		1		1
	Connection technology		Sub-D plug, 9-pin		Sub-D socket, 9-pin
	Data transmission speed, can be set via software	[kbps]	125, 250, 500, 800, 1000		9.6 ... 230.4
	Supported protocols		CAN bus		RS232 interface
	Max. cable length	[m]	–		30
	Galvanic isolation		Yes		Yes

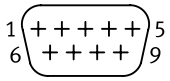
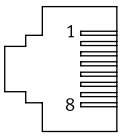
Data sheet – CODESYS controller

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)

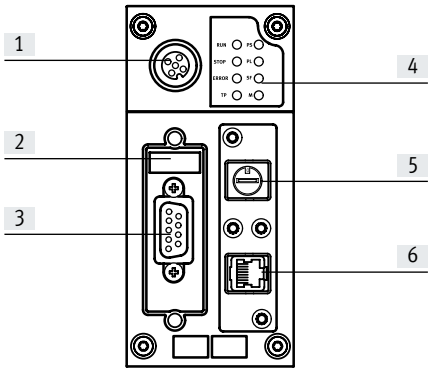
Pin allocation – CPX-CEC-C1/-M1

	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.

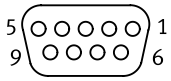
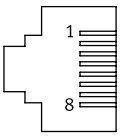
Data sheet – CODESYS controller

Connection and display elements CPX-CEC-S1



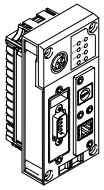
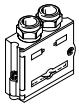
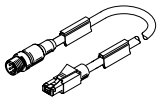
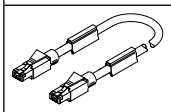
[1] CPX-FMT connection
[2] DIL switch
[3] RS232 interface (Sub-D socket, 9-pin)
[4] Status LEDs, bus-specific and product-specific
[5] RUN/STOP rotary switch
[6] Ethernet interface (RJ45 socket, 8-pin)

Pin allocation – CPX-CEC-S1

Terminal allocation	Pin	Signal	Designation
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

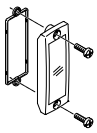
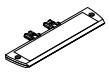
Data sheet – CODESYS controller

Ordering data

Designation					Part no.	Type
Control block						
	Motion functions for electric drives			135 g	**3473128**	**CPX-CEC-C1-V3**
	SoftMotion functions for electric drives			135 g	**3472765**	**CPX-CEC-M1-V3**
	RS232 communication function			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**

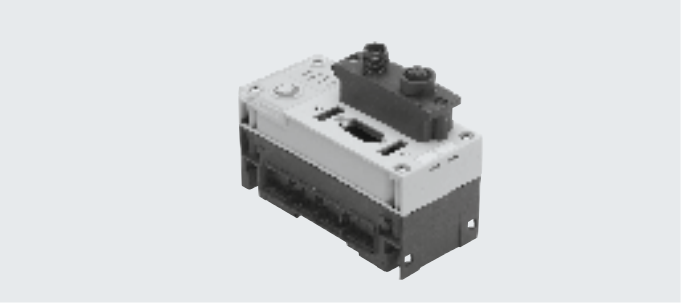
Data sheet – Control block CPX-CEC

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-P 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-P terminal is displayed as a common message via 4 CPX-P-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-P control block.

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

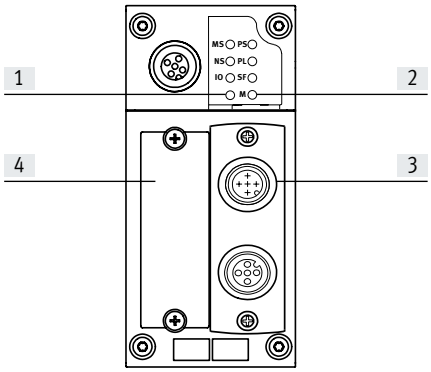
General technical data			
Type			CPX-FB11
Fieldbus interface			Either • Micro style bus connection: 2xM12 with degree of protection IP65/IP67 • Open style bus connection: 5-pin terminal strip, IP20
Baud rate		[kbps]	125, 250, 500
Addressing range			0 ... 63 Set using DIL switch
Product	Type		Communication 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 process image 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			PA-reinforced, 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.

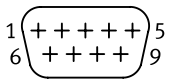
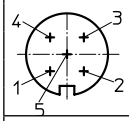
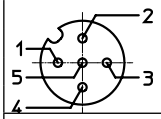
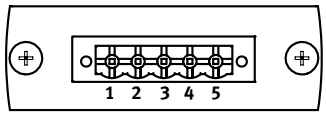
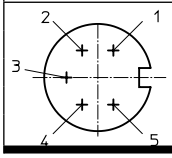
Data sheet – DeviceNet bus node

Connection and display components



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

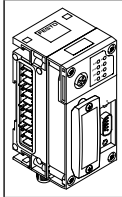
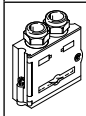
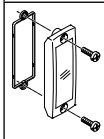
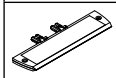
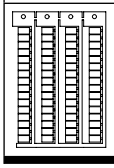
Pin allocation for the DeviceNet interface

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 for DeviceNet 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**
Covers			
	Cover cap for sealing unused M12 connections (10 pieces)	**165592**	**ISK-M12**
	Inspection cover, transparent, for Sub-D connection	**533334**	**AK-SUB-9/15-B**
Inscription label			
	Inscription label holder for connection block	**536593**	**CPX-ST-1**
	Inscription labels 6x10 mm, 64 pieces, in frame	**18576**	**IBS-6x10**

Data sheet – DeviceNet bus node

Ordering data

Designation			Part no.	Type
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**
Software				
	Adapter M12, 5-pin to mini USB socket, and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – PROFIBUS bus node

Bus node for handling communication between the electrical terminal CPX-P 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-P terminal is displayed as a common message via 4 CPX-P-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-P control block.

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

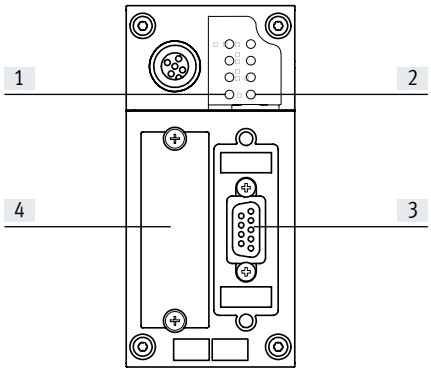
General technical data			
Type			CPX-FB13
Fieldbus interface			Sub-D socket, 9-pin (EN 50170) Galvanically isolated 5 V
Baud rate		[Mbps]	0.0096 ... 12
Addressing range			1 ... 125 Set using DIL switch
Product family			4: Valves
ID number			0x059E
Types of communication			DPV0: Cyclic communication DPV1: 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 process image 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			PA-reinforced, 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.

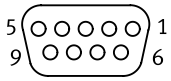
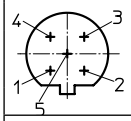
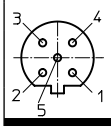
Data sheet – PROFIBUS bus node

Connection and display components



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

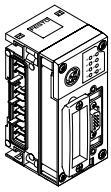
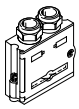
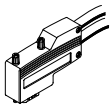
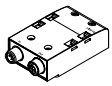
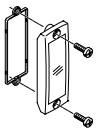
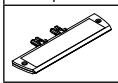
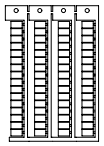
Pin allocation for PROFIBUS DP interface

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	**532216**	**FBS-SUB-9-GS-DP-B**
	Sub-D plug, angled	**533780**	**FBS-SUB-9-WS-PB-K**
	Bus connection, adapter from 9-pin Sub-D plug to 5-pin M12 plug/socket, B-coded	**533118**	**FBA-2-M12-5POL-RK**
	Connection block, adapter from 9-pin Sub-D plug to 5-pin M12 plug/socket, 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**
Covers			
	Cover cap for sealing unused M12 connections (10 pieces)	**165592**	**ISK-M12**
	Inspection cover, transparent, for Sub-D connection	**533334**	**AK-SUB-9/15-B**
Inscription label			
	Inscription label holder for connection block	**536593**	**CPX-ST-1**
	Inscription labels 6x10 mm, 64 pieces, in frame	**18576**	**IBS-6x10**

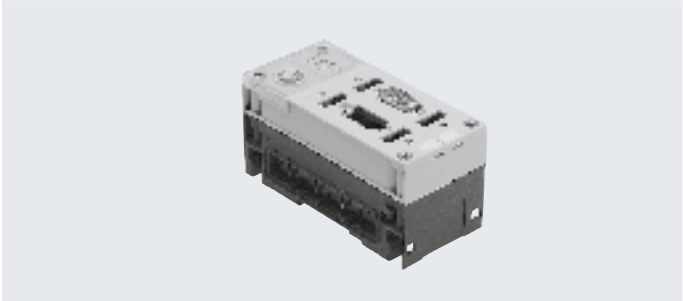
Data sheet – CPX-FB13 bus node, PROFIBUS DP

Ordering data

Designation			Part no.	Type
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**
Software				
	Adapter M12, 5-pin to mini USB socket, and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – CANopen bus node

Bus node for handling communication between the electrical terminal CPX-P 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-P terminal is displayed as a common message via 4 CPX-P-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-P control block.

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

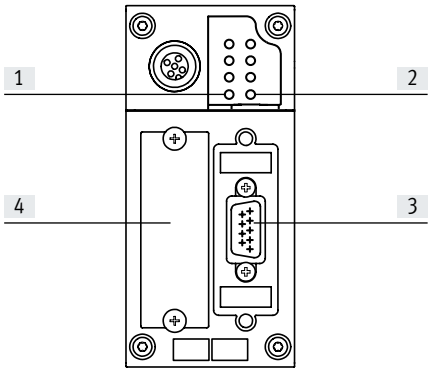
General technical data			
Type			CPX-FB14
Fieldbus interface			Sub-D plug, 9-pin (to DS 102) Bus interface galvanically isolated via optocoupler 24 V supply for CAN interface via bus
Baud rate		[kbps]	125, 250, 500 and 1000 can be set via DIL switch
Addressing range			Node ID 1 ... 127 Set using DIL 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			PA-reinforced, 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.

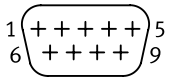
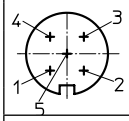
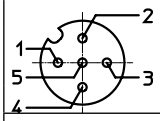
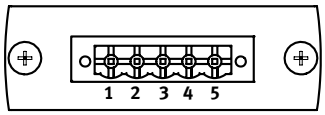
Data sheet – CANopen bus node

Connection and display components



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

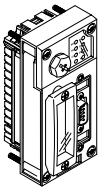
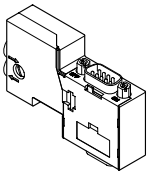
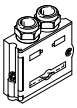
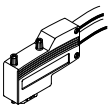
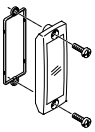
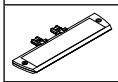
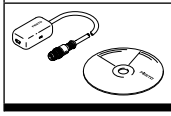
Pin allocation of the CANopen interface

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**
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**
Software				
	Adapter M12, 5-pin to mini USB socket, and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**

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

Bus node for operating the CPX-P 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-P terminal is displayed as a common message via 4 CPX-P-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 node supports 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-P 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-P valve terminal.
The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX-P can be read out and, depending on the function, changed via the diagnostic 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-P control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX-P bus node takes place by interlinking the CPX-P modules and takes up the following address capacity in the CPX-P 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 • System status can be displayed using process data • Additional diagnostic interface for operator units • Acyclic data access via Ethernet • 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.

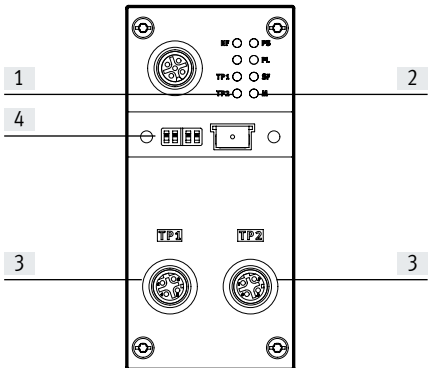
Note

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

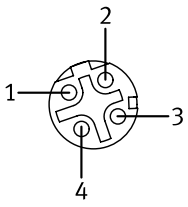
Data sheet – PROFINET bus node, M12, D-coded

Connection and display components



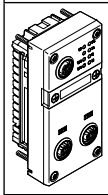
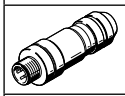
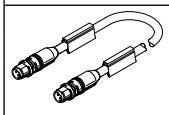
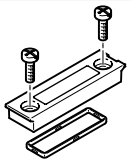
[1] Bus-specific status LEDs
[2] CPX-P-specific status LEDs
[3] Fieldbus interface (M12 socket, 4-pin, D-coded)
[4] Transparent cover for DIL switch

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-P 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-P terminal is displayed as a common message via 4 CPX-P-specific LEDs.
The fieldbus communication status is displayed via three 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 node supports 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-P peripheral information as well as switch elements and a diagnostic interface. PROFINET provides the user with access to all peripherals, diagnostic and parameter data of the CPX-P terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX-P can be read out and, depending on the function, changed via the diagnostic 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-P control block.

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

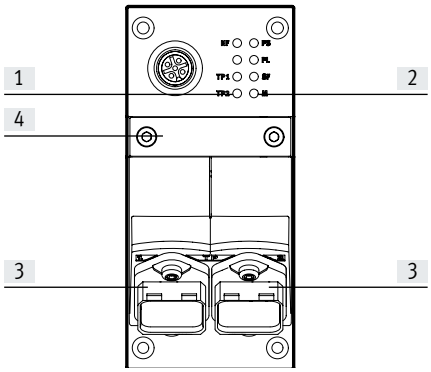
Note

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

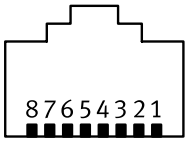
Data sheet – PROFINET bus node, push-pull RJ45

Connection and display components



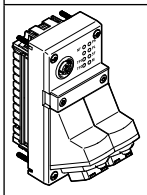
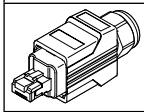
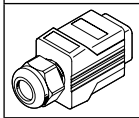
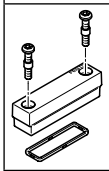
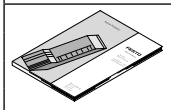
[1] Bus-specific status LEDs
[2] CPX-P-specific status LEDs
[3] Fieldbus interface (RJ45 socket, 8-pin)
[4] DIL switch (under cover)

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-P 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-P terminal is displayed as a common message via 4 CPX-P-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 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 node supports 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-P peripheral information as well as switch elements and a diagnostic interface. PROFINET provides the user with access to all peripherals, diagnostic and parameter data of the CPX-P terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX-P can be read out and, depending on the function, changed via the diagnostic 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-P control block.

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

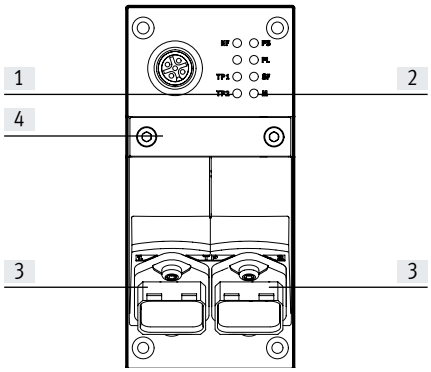
Note

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

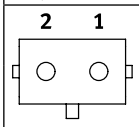
Data sheet – PROFINET bus node, push-pull SCRJ

Connection and display components



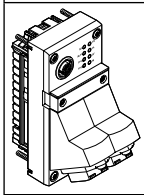
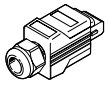
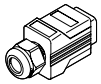
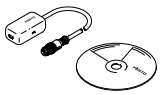
[1] Bus-specific status LEDs
[2] CPX-P-specific status LEDs
[3] Fieldbus interface (SCRJ socket, 2-pin)
[4] DIL switch (under cover)

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**
User documentation				
	Electronics manual, CPX-P 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**
Software				
	Adapter M12, 5-pin to mini USB socket, and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – EtherNet/IP bus node

- Industrial Ethernet
- EtherNet/IP
- Web

Bus node for handling communication between the electrical terminal CPX-P 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-P terminal is displayed as a common message via 4 CPX-P-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-P 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-P 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-P control block.

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

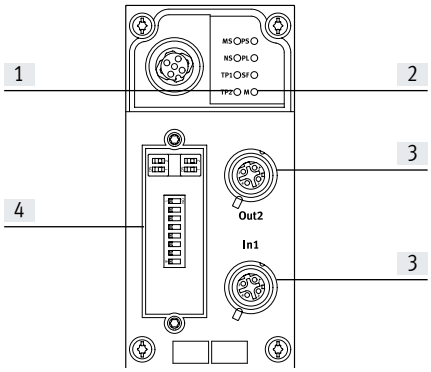
General technical data			
Type			CPX-FB36
Fieldbus interface			2x M12x1 socket, 4-pin, D-coded
Baud rate		[Mbps]	10/100
Protocol			EtherNet/IP Modbus TCP
Max. address capacity, inputs		[byte]	64
Max. address volume for outputs		[byte]	64
LED displays (bus-specific)			MS = Module status NS = network status 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.

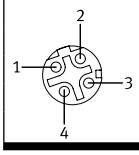
Data sheet – EtherNet/IP bus node

Connection and display components



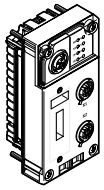
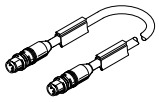
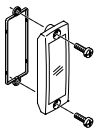
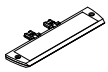
[1] Bus-specific status LEDs
[2] CPX-P-specific status LEDs
[3] Fieldbus interface (M12 socket, 4-pin, D-coded)
[4] Transparent DIL switch cover

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**
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**
Software					
	Adapter M12, 5-pin to mini USB socket, and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – EtherCAT bus node

Bus node for operating the CPX-P 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-P terminal is displayed as a common message via 4 CPX-P-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-P 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-P can be read out and, depending on the function, changed via the diagnostic interface.
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-P 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-P control block.

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

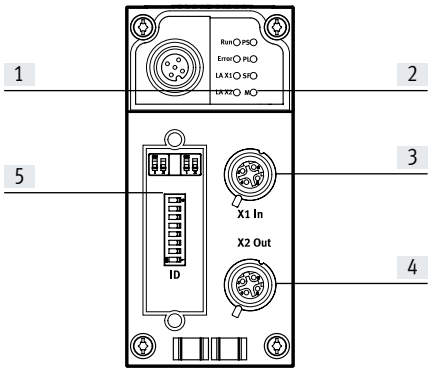
Note

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

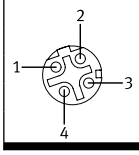
Data sheet – EtherCAT bus node

Connection and display components



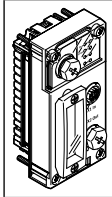
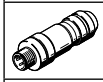
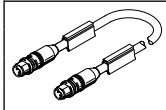
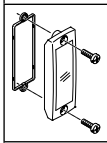
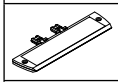
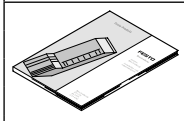
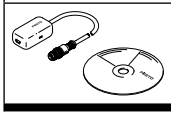
[1] Bus-specific status LEDs
[2] CPX-P-specific status LEDs
[3] Fieldbus interface, input (socket M12x1, 4-pin, D-coded)
[4] Fieldbus interface, output (socket M12x1, 4-pin, D-coded)
[5] DIL switch

Pin allocation for the fieldbus interface

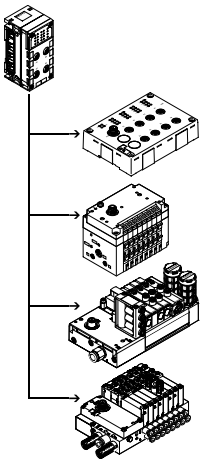
Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	FE	Shielding

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**
User documentation					
	Electronics manual, CPX-P 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**
Software					
	Adapter M12, 5-pin to mini USB socket, and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**

Data sheet – I-Port interface



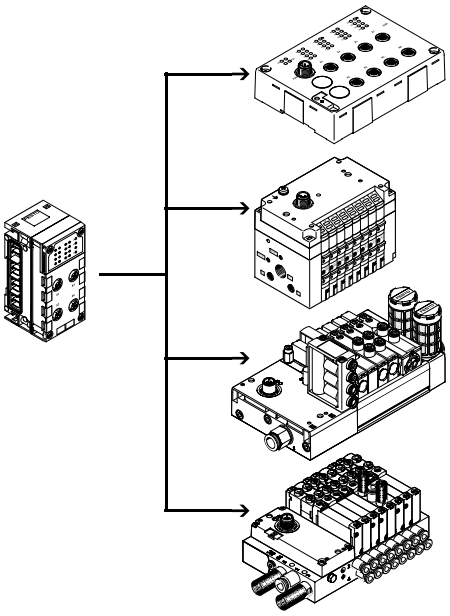
The electrical interface CPX-P CTEL master establishes the connection to modules of the CTEL/CTEU series that have an I-Port interface (device). The I/O data from the connected devices are transmitted to the connected CPX-P bus node and thus to the higher-order controller via fieldbus.
A maximum of 4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

Application

I-Port interface

As well as transmitting the communication data, the I-Port interfaces of a CPX-P 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-P CTEL master with CTEL modules



The CPX-P 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-P CTEL master from Festo enables modules with an I-Port interface to be connected to a CPX-P 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-P CTEL masters can be combined in one CPX-P terminal, depending on the address capacity of the bus node.
Example:
- CPX-FB13 (512 I/O)
- A maximum of 2 CPX-P CTEL masters is possible (each with 256 I/O)

Configuration

Settings

The precise number of the I/O bytes made available depends on the requirements of the connected devices or of the suitable selected operating mode.
The operating mode or preset configuration of the CPX-P 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-P 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 derived value is used to select the appropriate or next highest configuration preset.

Power supply for I-Port devices

The CPX-P 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-P terminal.
The power supply for the outputs and valves is provided by the power supply for the valves of the CPX-P 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

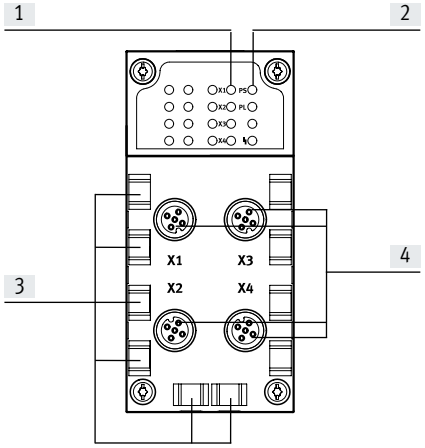
General technical data			
Type			CPX-CTEL-4-M12-5POL
Protocol			I-Port
Max. address capacity	Outputs	[bit]	256
	Inputs	[bit]	256
I-Port connection			4x socket M12, 5-pin, A-coded
Number of I-Port interfaces			4
Maximum cable length		[m]	20
Internal cycle time		[ms]	1 per 8 bits of user data
Galvanic 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 - ϟ - = 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			PA-reinforced, 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

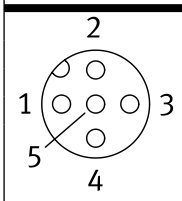


[1] Status LEDs for I-Port interfaces
[2] CPX-P-specific status LEDs
[3] Holders for inscription labels (IBS 6x10)
[4] I-Port interfaces for up to 4 devices

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

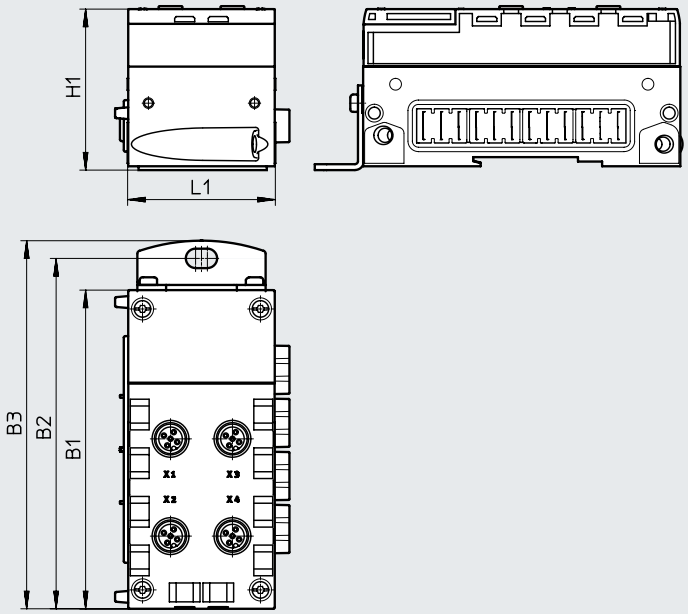
Bus node/control block	Part no.	Interface
		CPX-CTEL-4-M12-5POL
CPX-CEC-C1-V3	**3473128**	■
CPX-CEC-M1-V3	**3472765**	■
CPX-CEC-S1-V3	**3472425**	■
CPX-FB11	**526172**	■
CPX-FB13	**195740**	■
CPX-FB14	**526174**	■
CPX-FB36	**1912451**	■
CPX-FB37	**2735960**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**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

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

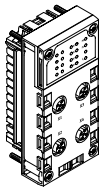
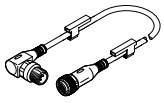
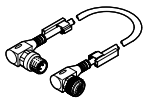
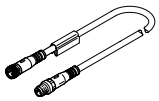
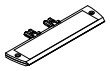
Dimensions Download CAD data ➔ www.festo.com



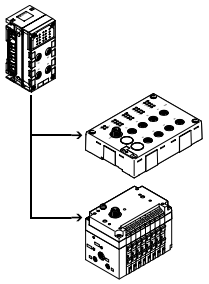
Type	B1	B2	B3	H1	L1
CPX-CTEL-4-M12-5POL	108.1	118.9	124.9	55.1	50

Data sheet – I-Port interface

Ordering data

Designation				Part no.	Type
CPX-P 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-P 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-P terminal. The I/O data from the connected devices are transmitted to the connected CPX-P 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 suitable M12 interfaces.

Application

IO-Link interface

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-P 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-P terminal.
The power supply for the outputs and valves is provided by the power supply for the valves of the CPX-P 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

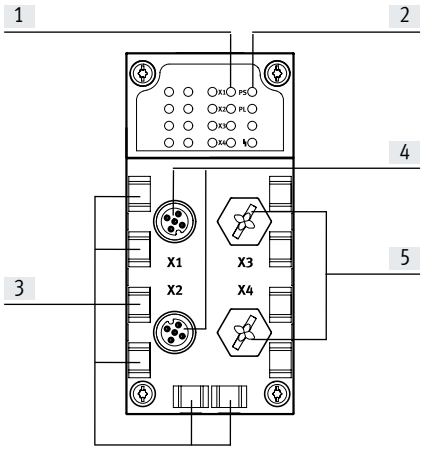
General technical data			
Type			CPX-CTEL-2-M12-5POL-LK
Protocol			IO-Link, master version V 1.0
Max. address capacity	Outputs	[bit]	256
	Inputs	[bit]	256
I-Port connection			2x socket M12, 5-pin, A-coded
Number of IO-Link interfaces			2
Maximum cable length		[m]	20
Internal cycle time		[ms]	1 per 8 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			PA-reinforced, 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

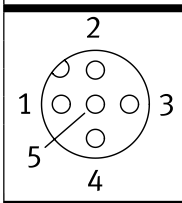


[1] Status LEDs for I-Port interfaces
[2] CPX-P-specific status LEDs
[3] Holders for inscription labels (IBS 6x10)
[4] IO-Link interfaces for up to 2 devices
[5] Unused connections

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

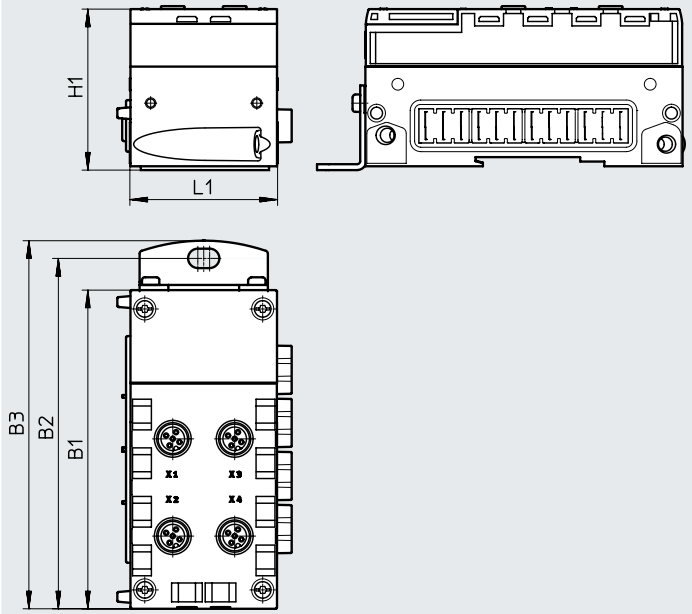
Bus node/control block	Part no.	Interface
		CPX-CTEL-2-M12-5POL-LK
CPX-CEC-C1-V3	**3473128**	■
CPX-CEC-M1-V3	**3472765**	■
CPX-CEC-S1-V3	**3472425**	■
CPX-FB36	**1912451**	■
CPX-FB43	**8110369**	■
CPX-M-FB44	**8110370**	■
CPX-M-FB45	**8110371**	■

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

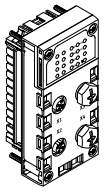
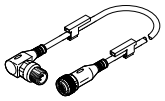
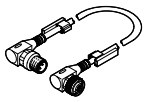
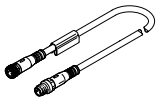
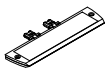
Dimensions Download CAD data ➔ www.festo.com



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-P 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 for CPX-P 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 – Measuring module for displacement encoder

The measuring module CPX-CMIX is intended exclusively for use in the CPX-P terminal.
If offers movement and measurement in one, as an integral component of the terminal CPX-P – the modular peripheral system for decentralised automation tasks.
The modular design means that valves, digital inputs and outputs, positioning modules, end-position controllers and measuring modules, as appropriate to the application, can be combined in almost any way on the CPX-P terminal.

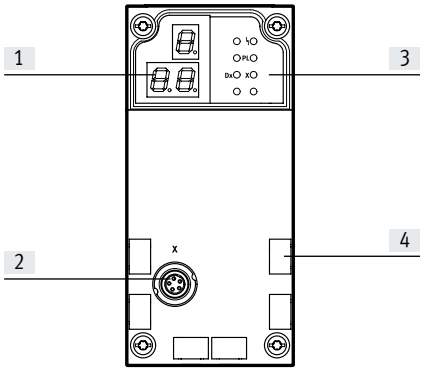
Advantages:
- Pneumatics and electrics – movement and measurement on one platform
- Innovative measurement technology – piston rod drives, rodless drives, rotary drives
- Actuation via fieldbus
- Remote maintenance, remote diagnostics, web server, text message and e-mail alert are all possible via TCP/IP
- Modules can be quickly exchanged and expanded without altering the wiring

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

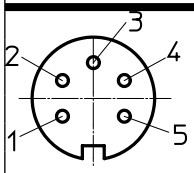
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

Connection and display components



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

Pin allocation – Control interface

Terminal allocation	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

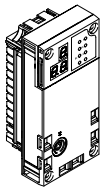
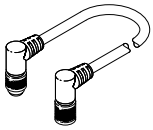
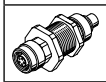
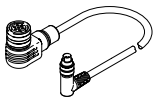
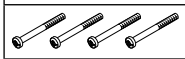
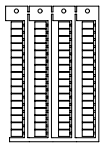
Permitted bus nodes/CEC

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-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	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

Designation			Part no.	Type
Measuring module				
	Order code in the CPX-P configurator: T2		**567417**	**CPX-CMIX-M1-1**
Connecting cable				
	Connecting cable M9-M9, 5-pin • Angled socket • Angled plug	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-M9, 5-pin • Straight socket • Straight plug	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 M9-M9, 5-pin, 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	Pack of 64	**18576**	**IBS-6x10**
User documentation				
	User documentation, 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, NAMUR

Function
Digital input modules enable the connection of up to eight NAMUR sensors (or wired mechanical contacts). In addition, the first four channels can alternatively be used as counters or for frequency measurement.
M12 and terminal strip connection technology can be used, in either intrinsically safe or non-intrinsically safe design.

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			
Number of inputs			8
Maximum cable length		[m]	200
Input debounce time		[ms]	3 (0, 10, 20 parameterisable)
Fuse protection (short circuit)			Per channel
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 75
Nominal operating voltage		[V DC]	24
Permissible voltage fluctuations		[%]	±25
Power failure buffering		[ms]	20
Residual ripple		[Vss]	0.4
Reverse polarity protection			For operating voltage
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
			Short circuit per channel
Parameterisation			Data format
			Input debounce time per channel
			Input function per channel
			Replacement value in diagnostic case 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			Depending on the connection block
Type of mounting			On interlinking block CPX-M-GE..
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

Data sheet – Input module, digital, NAMUR

Explosion protection parameters of the module inputs			
Type		CPX-P-8DE-N	CPX-P-8DE-N-IS
Maximum output power	[mW]	–	42
Maximum output voltage	[V]	–	10
Maximum output current	[mA]	–	16.8
Maximum external inductance	[mH]	–	125
Maximum external capacitance	[µF]	–	3

Certifications and approvals – Maximum values			
Type		CPX-P-8DE-N	CPX-P-8DE-N-IS
ATEX category gas		–	II (1) G
Type of ignition protection for gas		–	[Ex ia Ga] IIC
ATEX category for dust		–	II (1) D
Type of ignition protection for dust		–	[Ex ia Da] IIIC
Explosion protection certification outside the EU		–	EPL Ga (IEC-EX)
		–	EPL Da (IEC-EX)
		–	EPL Gc[Ga] (GB)
		–	EPL Dc[Da] (GB)
		–	EPL Ga (BR)
		–	EPL Da (BR)
Explosion-proof ambient temperature	[°C]	–	–5 ≤ Ta ≤ +70
Certificate issuing authority		–	ZELM 12 ATEX 0500 X
		–	IECEx ZLM 12.0007 X
		–	DNV 15.0192 X

Note

The module CPX-P-8DE-N-IS has additional safety measures for possible faults, such as non-resettable fuses, to ensure safe operation in accordance with the ignition protection type.
If the module is operated within the permissible parameters, these protective measures will be irrelevant.

Note

Only the end plate, the pneumatic interface or another module in intrinsically safe design are permitted directly to the right of modules in intrinsically safe design (CPX-P-8DE-N-IS) within the CPX-P terminal.

Note

The insulating plate CPX-P-AB-IP must be mounted between a module in intrinsically safe design (CPX-P-8DE-N-IS) and another, non-intrinsically safe CPX input or output module.

Note

The above-mentioned certifications for the module CPX-P-8DE-N-IS do not apply if the module is used outside the appropriately configured CPX-P terminal.

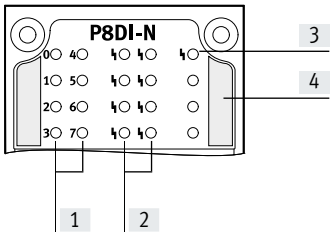
Materials	
Housing	PA-reinforced
	PC
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

Operating and environmental conditions			
Type		CPX-P-8DE-N	CPX-P-8DE-N-IS
Ambient temperature	[°C]	–5 ... +50	–5 ... +50
Storage temperature	[°C]	–20 ... +70	–20 ... +70
Relative humidity	[%]	95, non-condensing	95, non-condensing
Note on vibration resistance		–	SG1 on H-rail SG2 on direct mounting
Note on shock resistance		–	SG1 on H-rail SG2 on direct mounting
CE marking (see declaration of conformity)[1)]		–	To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)[1)]		–	To UK explosion regulations

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

Data sheet – Input module, digital, NAMUR

Connection and display components

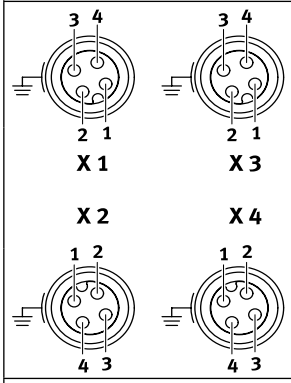
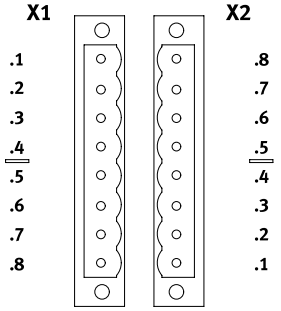


[1] Status LEDs (green)
For allocation to inputs
➔ Pin allocation for module
[2] Channel-related error LEDs (red)
[3] Error LED (red, module error)
[4] Marking for intrinsically safe variant, CPX-P-8DE-N-IS (blue)

Combinations of connection blocks and digital input modules

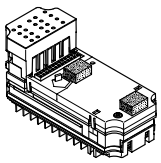
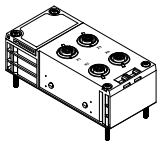
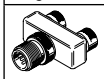
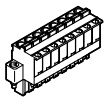
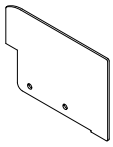
Connection blocks	Part no.	Digital input modules	
		CPX-P-8DE-N	CPX-P-8DE-N-IS
CPX-P-AB-4XM12-4POL	**565706**	■	–
CPX-P-AB-2XKL-8POL	**565704**	■	–
CPX-P-AB-4XM12-4POL-8DE-N-IS	**565705**	–	■
CPX-P-AB-2XKL-8POL-8DE-N-IS	**565703**	–	■

Pin allocation

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

Data sheet – Input module, digital, NAMUR

Ordering data

Designation					Part no.	Type
Input module, digital, to NAMUR						
	8 digital inputs				**565933**	**CPX-P-8DE-N**
	8 digital inputs, intrinsically safe design		- **Note** An intrinsically safe circuit may only be created using components and accessories approved for intrinsically safe operation.		**565934**	**CPX-P-8DE-N-IS**
Connection block						
	Plastic	4x socket, M12, 4-pin	For non-intrinsically safe design		**565706**	**CPX-P-AB-4XM12-4POL**
			For intrinsically safe design		**565705**	**CPX-P-AB-4XM12-4POL-8DE-N-IS**
		2x plug, 8-pin	For non-intrinsically safe design		**565704**	**CPX-P-AB-2XKL-8POL**
			For intrinsically safe design		**565703**	**CPX-P-AB-2XKL-8POL-8DE-N-IS**
Plug						
	Push-in T-connector	1x plug M12, 4-pin	2x socket M12, 4-pin		**562248**	**NEDU-M12D4-M12T4-IS**[1]
	Socket, 8-pin	Spring-loaded terminal		Black	**565712**	**NECU-L3G8-C1**
				Blue	**565711**	**NECU-L3G8-C1-IS**[1]
		Screw terminal		Black	**565710**	**NECU-L3G8-C2**
				Blue	**565709**	**NECU-L3G8-C2-IS**[1]
	Plug M12, 4-pin	Spring-loaded terminal	For cable Ø 4 ... 8 mm		**575719**	**NECU-M-S-A12G4-IS**[1]
		Screw terminal	For cable Ø 2.5 ... 2.9 mm		**570955**	**NECU-S-M12G4-P1-Q6-IS**[1]
			For cable Ø 4 ... 6 mm		**570953**	**NECU-S-M12G4-P1-IS**[1]
			For cable Ø 6 ... 8 mm		**570954**	**NECU-S-M12G4-P2-IS**[1]
			For cable Ø 2x3 mm or 2x5 mm		**570956**	**NECU-S-M12G4-D-IS**[1]
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**
Screening plate						
	Insulating plate for safe separation of intrinsically safe and non-intrinsically safe areas of the CPX terminal				**565708**	**CPX-P-AB-IP**
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**

1) Component preferred for operation in intrinsically safe circuits.

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).

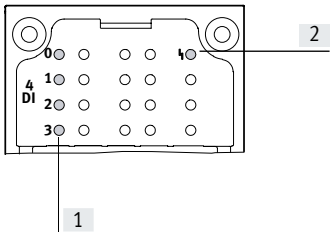
Area of application
- Input modules for 24 V DC sensor supply voltage
- PNP or NPN logic
- Supports connection blocks with M12, M8, Sub-D and terminal connection
- Module features can be parameterised
- The input module receives the supply voltage for the electronics and the sensors from the interlinking 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			PA-reinforced, 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

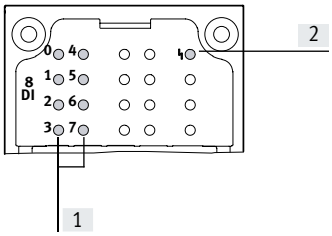
Connection and display components

CPX-4DE



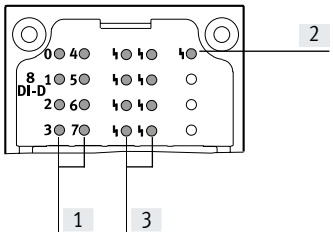
[1] Status LEDs (green)

CPX-8DE



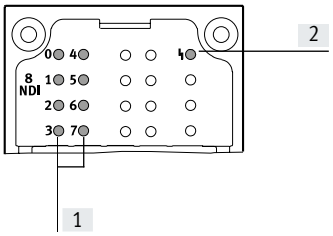
[2] Error LED (red, module error)

CPX-8DE-D



[3] Channel-related error LEDs (red)

CPX-8NDE

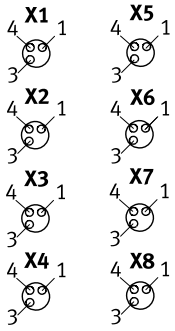
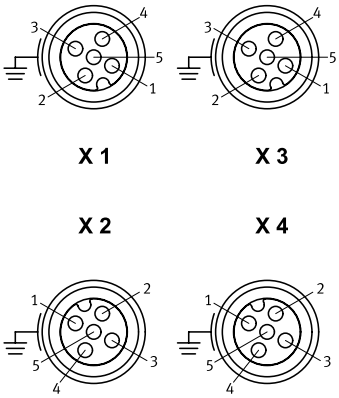


For allocation to inputs
→ Pin allocation for module

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**	■	■	■	■

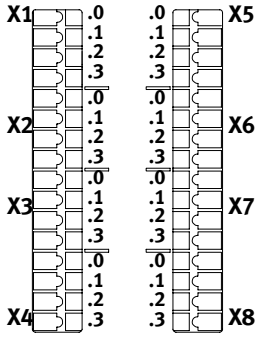
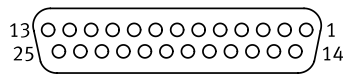
Pin allocation

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 X2.1: 24 V_{SEN} X2.3: 0 V_{SEN} X2.4: Input x+1 X3.1: 24 V_{SEN} X3.3: 0 V_{SEN} X3.4: Input x+1 X4.1: 24 V_{SEN} X4.3: 0 V_{SEN} X4.4: n.c.	X5.1: 24 V_{SEN} X5.3: 0 V_{SEN} X5.4: Input x+2 X6.1: 24 V_{SEN} X6.3: 0 V_{SEN} X6.4: Input x+3 X7.1: 24 V_{SEN} X7.3: 0 V_{SEN} X7.4: Input x+3 X8.1: 24 V_{SEN} X8.3: 0 V_{SEN} X8.4: n.c.	X1.1: 24 $V_{SEN\ x}$ X1.3: 0 $V_{SEN\ x}$ X1.4: Input x X2.1: 24 $V_{SEN\ x+1}$ X2.3: 0 $V_{SEN\ x+1}$ X2.4: Input x+1 X3.1: 24 $V_{SEN\ x+2}$ X3.3: 0 $V_{SEN\ x+2}$ X3.4: Input x+2 X4.1: 24 $V_{SEN\ x+3}$ X4.3: 0 $V_{SEN\ x+3}$ X4.4: Input x+3	X5.1: 24 $V_{SEN\ x+4}$ X5.3: 0 $V_{SEN\ x+4}$ X5.4: Input x+4 X6.1: 24 $V_{SEN\ x+5}$ X6.3: 0 $V_{SEN\ x+5}$ X6.4: Input x+5 X7.1: 24 $V_{SEN\ x+6}$ X7.3: 0 $V_{SEN\ x+6}$ X7.4: Input x+6 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 X2.1: 24 V_{SEN} X2.2: n.c. X2.3: 0 V_{SEN} X2.4: Input x+1 X2.5: FE	X3.1: 24 V_{SEN} X3.2: Input x+3 X3.3: 0 V_{SEN} X3.4: Input x+2 X3.5: FE X4.1: 24 V_{SEN} X4.2: n.c. X4.3: 0 V_{SEN} X4.4: Input x+3 X4.5: 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 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	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 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

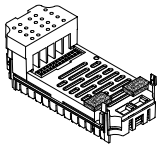
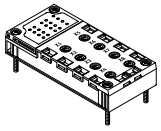
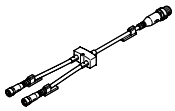
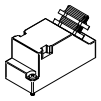
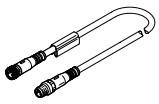
Data sheet – Input module, digital

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

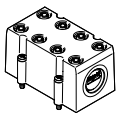
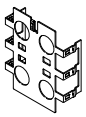
Data sheet – Input module, digital

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 Sub-D socket, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Distributor					
	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**
	Modular system for all types of sensor/actuator distributor			**–**	**NEDY-...** ➔ Internet: nedy
Plug					
	M8, 3-pin	Solderable		**18696**	**SEA-GS-M8**
		Screw-in		**192009**	**SEA-3GS-M8-S**
	M12, 4-pin	PG7, for cable Ø 4 ... 6 mm		**18666**	**SEA-GS-7**
		PG7, for cable Ø 2.5 ... 2.9 mm		**192008**	**SEA-4GS-7-2.5**
		PG9, for cable Ø 6 ... 8 mm		**18778**	**SEA-GS-9**
		PG11, for 2x cable Ø 3 ... 5 mm		**18779**	**SEA-GS-11-DUO**
	M12, 5-pin	PG7, for cable Ø 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
		PG11, for 2x cable Ø 2.5 ... 5 mm		**192010**	**SEA-5GS-11-DUO**
	Sub-D, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	1x socket M8, 3-pin	1x plug M8, 3-pin	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

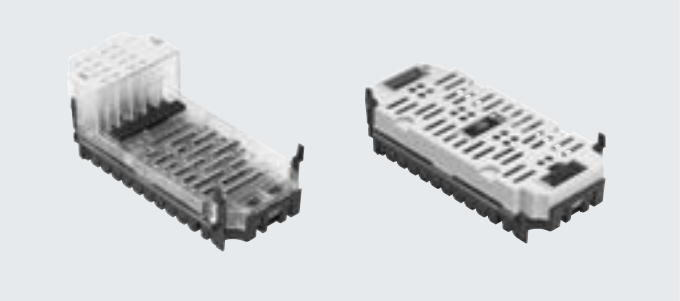
Ordering data

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, 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



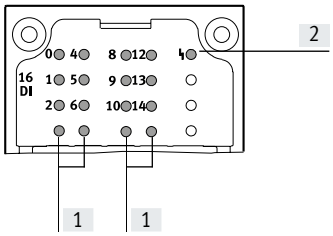
General technical data

Type			CPX-16DE	CPX-M-16DE-D
Number of inputs			16	16
Max. residual current of inputs per module		[A]	1.8	1.8
Intrinsic current consumption at operating voltage		[mA]	Typically 15	Typically 34
Fuse protection			Internal electronic fuse per module	Internal electronic fuse per channel pair, additional safety fuse
Nominal operating voltage		[V DC]	24	
Operating voltage range		[V DC]	18 ... 30	
Galvanic isolation	Channel – channel		No	
	Channel – internal bus		No	
Switching level	Signal 0	[V DC]	≤ 5	
	Signal 1	[V DC]	≥ 11	
Input debounce time		[ms]	3 (0.1, 10, 20 parameterisable)	
Input characteristic			IEC 1131-T2	
Switching logic			Positive logic (PNP)	
LED displays	Group diagnostics		1	1
	Channel diagnostics		–	16
	Channel status		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	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			PA-reinforced, 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]	41	46

Data sheet – Input module, digital, 16 inputs

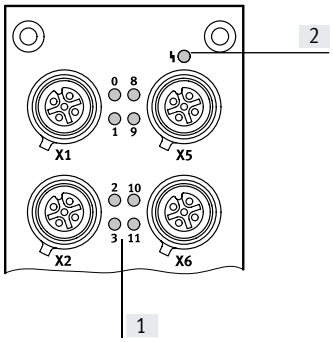
Connection and display components

CPX-16DE



[1] Status LEDs (green)
For allocation to inputs
➔ Pin allocation for module
[2] Error LED (red, module error)

CPX-M-16DE-D

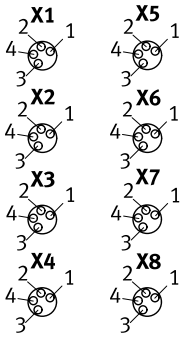


[1] Common status LEDs (green)/error LEDs (red) for each input signal
[2] Error LED (red, module error)

Combinations of connection blocks and digital input modules

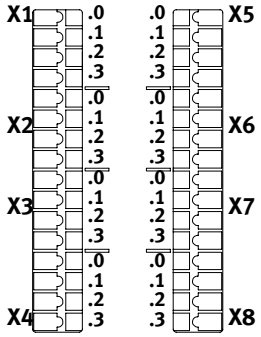
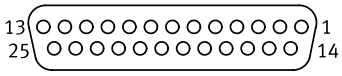
Connection blocks	Part no.	Digital input modules	
		CPX-16DE	CPX-M-16DE-D
CPX-AB-8-M8X2-4POL	**541256**	■	–
CPX-AB-8-KL-4POL	**195708**	■	–
CPX-AB-1-SUB-BU-25POL	**525676**	■	–
CPX-M-AB-8-M12X2-5POL	**549335**	–	■

Pin allocation

Connection block inputs	CPX-16DE	
CPX-AB-8-M8x2-4POL		
	X1.1: 24 V_{SEN}	X5.1: 24 V_{SEN}
	X1.2: Input x+1	X5.2: Input x+9
	X1.3: 0 V_{SEN}	X5.3: 0 V_{SEN}
	X1.4: Input x	X5.4: Input x+8
	X2.1: 24 V_{SEN}	X6.1: 24 V_{SEN}
	X2.2: Input x+3	X6.2: Input x+11
	X2.3: 0 V_{SEN}	X6.3: 0 V_{SEN}
	X2.4: Input x+2	X6.4: Input x+10
	X3.1: 24 V_{SEN}	X7.1: 24 V_{SEN}
	X3.2: Input x+5	X7.2: Input x+13
	X3.3: 0 V_{SEN}	X7.3: 0 V_{SEN}
	X3.4: Input x+4	X7.4: Input x+12
	X4.1: 24 V_{SEN}	X8.1: 24 V_{SEN}
	X4.2: Input x+7	X8.1: Input x+15
	X4.3: 0 V_{SEN}	X8.3: 0 V_{SEN}
	X4.4: Input x+6	X8.4: Input x+14

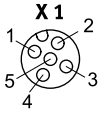
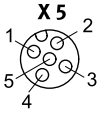
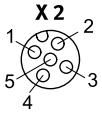
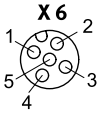
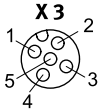
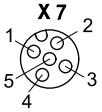
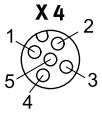
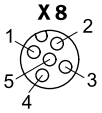
Data sheet – Input module, digital, 16 inputs

Pin allocation

Connection block inputs	CPX-16DE	
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

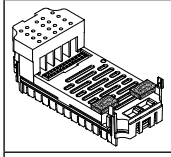
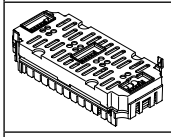
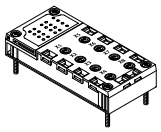
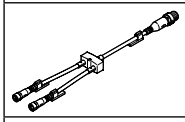
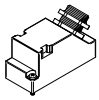
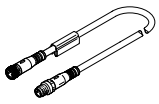
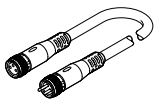
Data sheet – Input module, digital, 16 inputs

Pin allocation

Connection block inputs	CPX-M-16DE-D	
CPX-M-AB-8-M12X2-5POL		
X 1  **X 5** 	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
X 2  **X 6** 	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
X 3  **X 7** 	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
X 4  **X 8** 	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

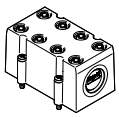
Data sheet – Input module, digital, 16 inputs

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			**550202**	**CPX-M-16DE-D**
Connection block					
	Plastic	8x socket, M8, 4-pin		**541256**	**CPX-AB-8-M8X2-4POL**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x Sub-D socket, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	8x socket M12, 5-pin		**549335**	**CPX-M-AB-8-M12X2-5POL**
Distributor					
	1x plug M8, 4-pin	2x socket M8, 3-pin		**8005312**	**NEDY-L2R1-V1-M8G3-N-M8G4**
	Modular system for all types of sensor/actuator distributor			**–**	**NEDY-...** ➔ Internet: nedy
Plug					
	M8, 3-pin	Solderable		**18696**	**SEA-GS-M8**
		Screw-in		**192009**	**SEA-3GS-M8-S**
	Sub-D, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	1x socket M8, 3-pin	1x plug M8, 3-pin	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, 16 inputs

Ordering data

Designation				Part no.	Type
Cover					
	Cover for CPX-AB-8-KL-4POL (IP65/67)	• 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit for cover AK-8KL			**538220**	**VG-K-M9**
	Cover cap for closing off unused M8 connections (10 pieces)			**177672**	**ISK-M8**
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, 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 five 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 there is a fault 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

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 4 positions
- Rotary indexing table
- Light curtain
- Acknowledge button with request
- End-position switch
- Safety door with two N/O 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
			TÜV Rh. UK 01/205U/5444.00/22
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

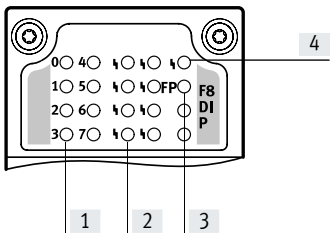
Materials	
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

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) More information: 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

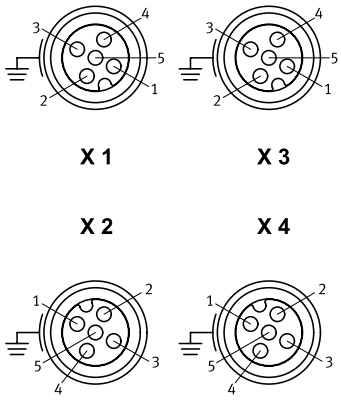
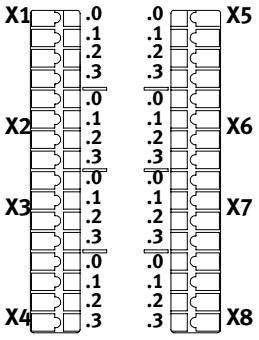
The PROFIsafe input module CPX-F8DE-P can only be connected as of software release 21 or release 30 (in the case of CPX-FB13).

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-AB-8-KL-4POL	**195708**	■

Pin allocation

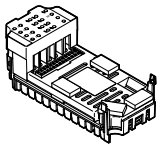
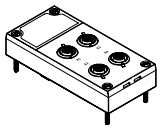
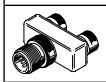
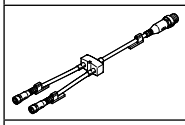
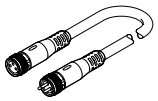
Connection block inputs	CPX-F8DE-P	
CPX-M-AB-4-M12X2-5POL		
	X1.1: 24 V_{SEN} X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X1.5: FE X2.1: 24 V_{SEN} X2.2: Input x+3 X2.3: 0 V_{SEN} X2.4: Input x+2 X2.5: FE	X3.1: 24 V_{SEN} X3.2: Input x+5 X3.3: 0 V_{SEN} X3.4: Input x+4 X3.5: FE X4.1: 24 V_{SEN} X4.2: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

Combinations of interlinking blocks and PROFIsafe input module

Interlinking blocks	Part no.	PROFIsafe input module
		CPX-F8DE-P
CPX-M-GE-EV-S-7/8-5POL	**550208**	■
CPX-M-GE-EV-S-7/8-5POL-VL	**8022165**	■
CPX-M-GE-EV	**550206**	■
CPX-M-GE-EV-FVO	**567806**	–
CPX-M-GE-EV-Z-7/8-5POL	**550210**	■
CPX-M-GE-EV-Z-7/8-5POL-VL	**8022158**	■

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**
	Metal	4x socket M12, 5-pin	Unpulsed sensor supply	**549367**	**CPX-M-AB-4-M12X2-5POL**
Distributor					
	1x plug M12, 4-pin	2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
	Modular system for all types of sensor/actuator distributor			**–**	**NEDY-...** → Internet: nedy
Plug					
	M12, 4-pin	PG7, for cable Ø 4 ... 6 mm		**18666**	**SEA-GS-7**
		PG7, for cable Ø 2.5 ... 2.9 mm		**192008**	**SEA-4GS-7-2.5**
		PG9, for cable Ø 6 ... 8 mm		**18778**	**SEA-GS-9**
		PG11, for 2x cable Ø 3 ... 5 mm		**18779**	**SEA-GS-11-DUO**
	M12, 5-pin	PG7, for cable Ø 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
		PG11, for 2x cable Ø 2.5 ... 5 mm		**192010**	**SEA-5GS-11-DUO**
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 – 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

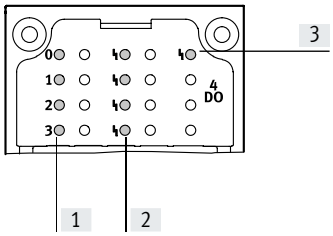
General technical data

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			PA-reinforced, 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

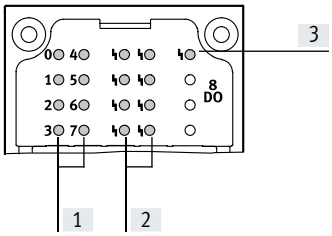
Data sheet – Output module, digital

Connection and display components

CPX-4DA



CPX-8DA

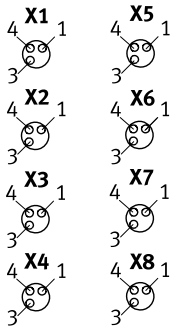


[1] Status LEDs (yellow)
For allocation to outputs
➔ Pin allocation for module
[2] Channel-related error LEDs (red)
[3] Error LED (red, module error)

Combinations of connection block and digital output module

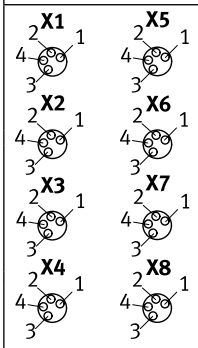
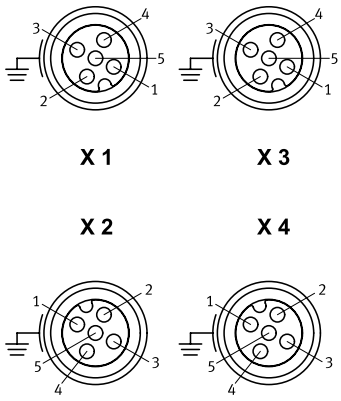
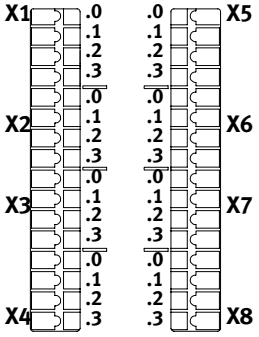
Connection blocks	Part no.	Digital output module		
		CPX-4DA	CPX-8DA	CPX-8DA-H
CPX-AB-8-M8-3POL	**195706**	■	■	–
CPX-AB-8-M8X2-4POL	**541256**	■	■	■
CPX-AB-4-M12X2-5POL	**195704**	■	■	–
CPX-AB-4-M12X2-5POL-R	**541254**	■	■	■
CPX-AB-8-KL-4POL	**195708**	■	■	■
CPX-AB-1-SUB-BU-25POL	**525676**	■	■	■
CPX-M-AB-4-M12X2-5POL	**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 X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+1 X4.1: n.c. X4.3: 0 V_{OUT} X4.4: n.c.	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+2 X6.1: n.c. X6.3: 0 V_{OUT} X6.4: Output x+3 X7.1: n.c. X7.3: 0 V_{OUT} X7.4: Output x+3 X8.1: n.c. X8.3: 0 V_{OUT} X8.4: n.c.	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+2 X4.1: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+4 X6.1: n.c. X6.3: 0 V_{OUT} X6.4: Output x+5 X7.1: n.c. X7.3: 0 V_{OUT} X7.4: Output x+6 X8.1: n.c. X8.3: 0 V_{OUT} X8.4: Output x+7

Data sheet – Output module, digital

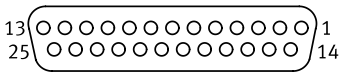
Pin allocation

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 X2.1: 0 V_{OUT} X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: 0 V_{OUT} X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2 X4.1: 0 V_{OUT} X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3	X5.1: 0 V_{OUT} X5.2: n.c. X5.3: 0 V_{OUT} X5.4: n.c. X6.1: 0 V_{OUT} X6.2: n.c. X6.3: 0 V_{OUT} X6.4: n.c. X7.1: 0 V_{OUT} X7.2: n.c. X7.3: 0 V_{OUT} X7.4: n.c. X8.1: 0 $V_{OUT\ x+1}$ X8.2: n.c. X8.3: 0 $V_{OUT\ x+3}$ X8.4: n.c.	X1.1: 0 V_{OUT} X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X2.1: 0 V_{OUT} X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2 X3.1: 0 V_{OUT} X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4 X4.1: 0 V_{OUT} X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6	X5.1: 0 V_{OUT} X5.2: n.c. X5.3: 0 V_{OUT} X5.4: n.c. X6.1: 0 V_{OUT} X6.2: n.c. X6.3: 0 V_{OUT} X6.4: n.c. X7.1: 0 V_{OUT} X7.2: n.c. X7.3: 0 V_{OUT} X7.4: n.c. 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] and CPX-M-AB-4-M12X2-5POL				
	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE X2.1: n.c. X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X2.5: FE	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2 X3.5: FE X4.1: n.c. X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3 X4.5: FE	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE X2.1: n.c. X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2 X2.5: FE	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4 X3.5: 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 X2.0: n.c. X2.1: 0 V_{OUT} X2.2: Output x+1 X2.3: FE X3.0: n.c. X3.1: 0 V_{OUT} X3.2: Output x+1 X3.3: FE X4.0: n.c. X4.1: 0 V_{OUT} X4.2: n.c. X4.3: FE	X5.0: n.c. X5.1: 0 V_{OUT} X5.2: Output x+2 X5.3: FE X6.0: n.c. X6.1: 0 V_{OUT} X6.2: Output x+3 X6.3: FE X7.0: n.c. X7.1: 0 V_{OUT} X7.2: Output x+3 X7.3: FE X8.0: n.c. X8.1: 0 V_{OUT} X8.2: n.c. X8.3: FE	X1.0: n.c. X1.1: 0 V_{OUT} X1.2: Output x X1.3: FE X2.0: n.c. X2.1: 0 V_{OUT} X2.2: Output x+1 X2.3: FE X3.0: n.c. X3.1: 0 V_{OUT} X3.2: Output x+2 X3.3: FE X4.0: n.c. X4.1: 0 V_{OUT} X4.2: Output x+3 X4.3: FE	X5.0: n.c. X5.1: 0 V_{OUT} X5.2: Output x+4 X5.3: FE X6.0: n.c. X6.1: 0 V_{OUT} X6.2: Output x+5 X6.3: FE X7.0: n.c. X7.1: 0 V_{OUT} X7.2: Output x+6 X7.3: 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

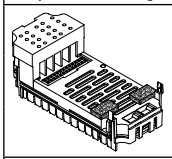
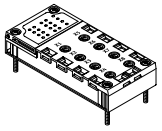
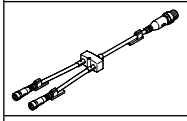
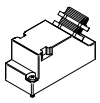
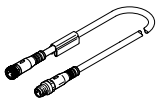
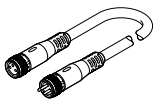
Data sheet – Output module, digital

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

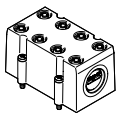
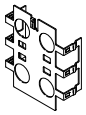
Data sheet – Output module, digital

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, 5-pin with quick-lock technology		**541254**	**CPX-AB-4-M12X2-5POL-R**
		Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		1x Sub-D socket, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket, M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Distributor					
	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**
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
Plug					
	M8, 3-pin	Solderable		**18696**	**SEA-GS-M8**
		Screw-in		**192009**	**SEA-3GS-M8-S**
		Insulation displacement connector	0.1 ... 0.14 mm²	**564945**	**NECU-S-M8G3-HX-Q3**
			0.14 ... 0.34 mm²	**562024**	**NECU-S-M8G3-HX**
	M12, 4-pin	PG7, for cable Ø 4 ... 6 mm		**18666**	**SEA-GS-7**
		PG7, for cable Ø 2.5 ... 2.9 mm		**192008**	**SEA-4GS-7-2.5**
		PG9, for cable Ø 6 ... 8 mm		**18778**	**SEA-GS-9**
		PG11, for 2x cable Ø 3 ... 5 mm		**18779**	**SEA-GS-11-DUO**
	M12, 5-pin	PG7, for cable Ø 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
		PG11, for 2x cable Ø 2.5 ... 5 mm		**192010**	**SEA-5GS-11-DUO**
	Sub-D, 25-pin			**527522**	**SD-SUB-D-ST25**
Connecting cable					
	1x socket M8, 3-pin	1x plug M8, 3-pin	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

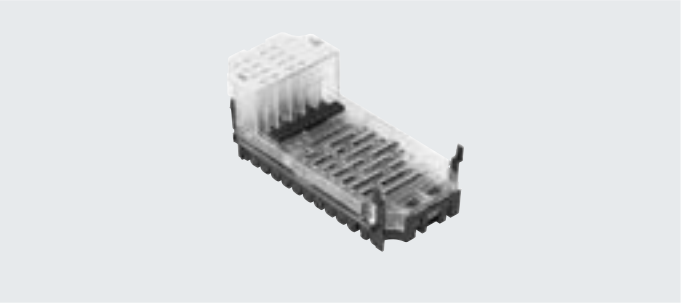
Ordering data

Designation				Part no.	Type
Cover					
	Cover for CPX-AB-8-KL-4POL (IP65/67)	• 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit, cover for AK-8KL			**538220**	**VG-K-M9**
	Cover cap for closing off unused connections (10 pieces)	For M8 connections		**177672**	**ISK-M8**
		For M12 connections		**165592**	**ISK-M12**
Screening plate					
	Screening plate for connection block • CPX-AB-4-M12X2-5POL • CPX-AB-4-M12X2-5POL-R			**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)
- 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



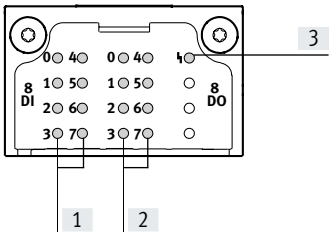
General technical data

Type			CPX-8DE-8DA
Number	Inputs		8
	Outputs		8
Max. power supply	Sensor supply	[A]	0.7
Per module	Outputs	[A]	4
Max. power supply per channel		[A]	0.5 (12 W lamp load, channels A0 ... A03 can be connected in parallel to A4 ... A7)
Fuse protection (short circuit)			Internal electronic fuse per channel
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 22
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		IEC 1131-T2
	Outputs		IEC 1131-T2
Switching level, inputs	Signal 0	[V DC]	≤ 5
	Signal 1	[V DC]	≥ 11
Input debounce time		[ms]	3 (0.1 ms, 10 ms, 20 ms parameterisable)
Switching logic			Positive logic (PNP)
LED displays	Group diagnostics		1
	Channel status		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
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			PA-reinforced, 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]	48

Data sheet – Input/output module, digital

Connection and display components

CPX-8DE-8DA



[1] Status LEDs (green)
For allocation to inputs
➔ Pin allocation for module

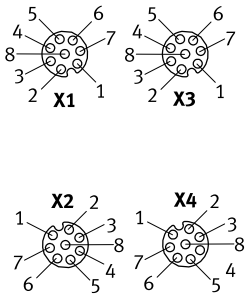
[2] Status LEDs (yellow)
For allocation to outputs
➔ Pin allocation for module

[3] Error LED (red, module error)

Connection block/digital I/O module combinations

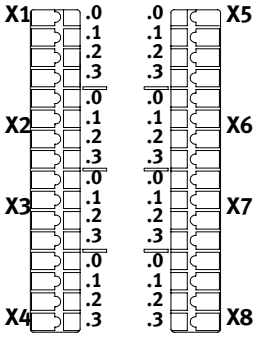
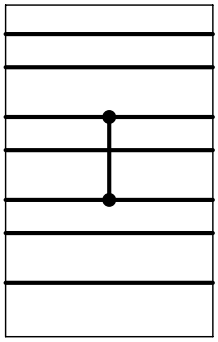
Connection blocks	Part no.	Digital I/O module
		CPX-8DE-8DA
CPX-AB-4-M12-8POL	**526178**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-AB-1-SUB-BU-25POL	**525676**	■

Pin allocation

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

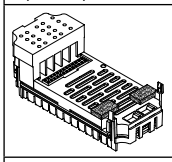
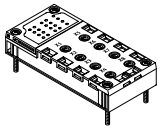
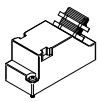
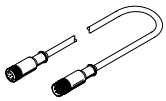
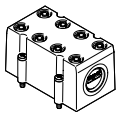
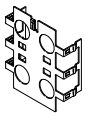
Data sheet – Input/output module, digital

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

Ordering data

Designation				Part no.	Type
Input/output module, digital					
	8 digital inputs, 8 digital outputs			**526257**	**CPX-8DE-8DA**
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, 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)

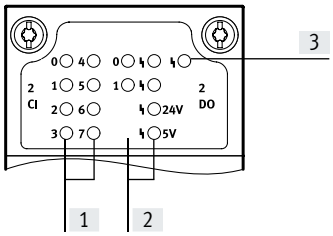
Data sheet – Counter module, digital

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, if an intermediate supply is used
Characteristic curve	Inputs		To IEC 1131-2, type 2
	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 inputs
➔ Pin allocation for module

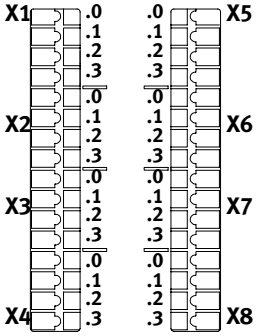
[2] Status LEDs (yellow, red)
For allocation to outputs
➔ Pin allocation for module

[3] Error LED (red, module error)

Pin allocation

Inputs/outputs

CPX-2ZE2DA



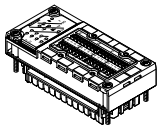
Channel 0	Duct 1
X1.0: Input	X5.0: Input
X1.1: Input	X5.1: Input
X1.2: Input	X5.2: Input
X1.3: Input	X5.3: Input
X2.0: Input	X6.0: Input
X2.1: Input	X6.1: Input
X2.2: 5 V DC	X6.2: 5 V DC
X2.3: 0 V	X6.3: 0 V
X3.0: 24 V DC	X7.0: 24 V DC
X3.1: 0 V	X7.1: 0 V
X3.2: 24 V DC for digital input DI	X7.2: 24 V 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**
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**

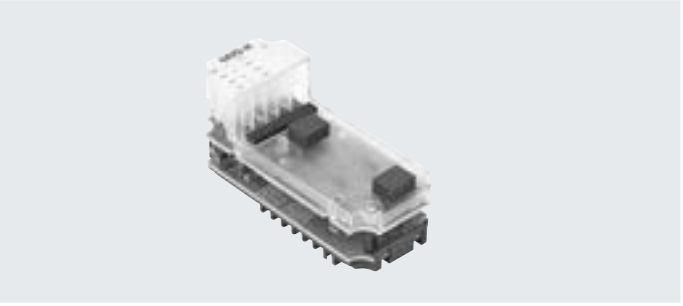
Data sheet – HART input/output module

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	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)]		1 (when installed)
CE marking (see declaration of conformity)[3)]		To EU EMC Directive[2)]

1) More 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.

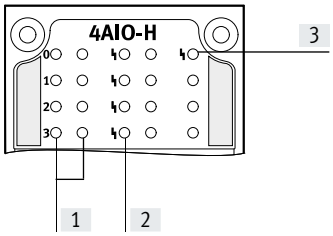
3) Additional information: www.festo.com/catalogue/... → Support/Downloads.

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)
Allocation to inputs/outputs

➔ Pin allocation for module

[3] Error LED (red, module error)

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

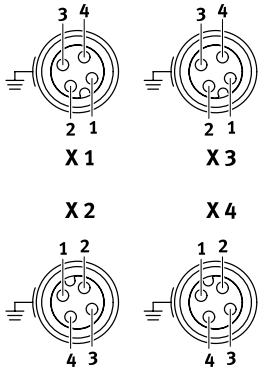
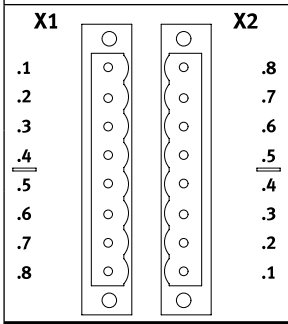
Bus node/control block	Part no.	Protocol	Can be combined as of release	HART variables in process image only	Full HART functionality
CPX-CEC-C1-V3	**3473128**	CODESYS Level 2	3.5.12.174	–	■
CPX-CEC-M1-V3	**3472765**	CODESYS Level 2	3.5.12.174	–	■
CPX-CEC-S1-V3	**3472425**	CODESYS Level 2	3.5.12.174	–	■
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**	■

Data sheet – HART input/output module

Pin allocation

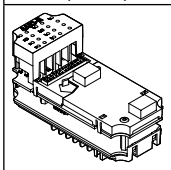
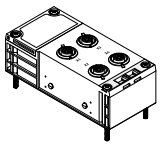
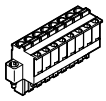
Connection block inputs/outputs	CPX-4AE-4AA-H			
	Inputs		Outputs	
CPX-P-AB-4XM12-4POL				
	X1.1: 24 $V_{SEN\ x}$ X1.2: 0 V X1.3: Input x X1.4: 0 V X2.1: 24 $V_{SEN\ x+1}$ X2.2: 0 V X2.3: Input x+1 X2.4: 0 V	X3.1: 24 $V_{SEN\ x+2}$ X3.2: 0 V X3.3: Input x+2 X3.4: 0 V X4.1: 24 $V_{SEN\ x+3}$ X4.2: 0 V 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**
Plugs						
	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 0.14 … 0.75 mm² Permissible cable Ø 4 … 6 mm		**18666**	**SEA-GS-7**
			Connection cross section 0.75 mm² Permissible cable Ø 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)				

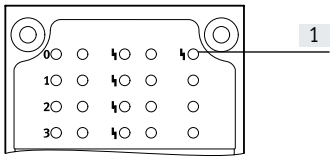
Data sheet – Input module, analogue

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			PA-reinforced, 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

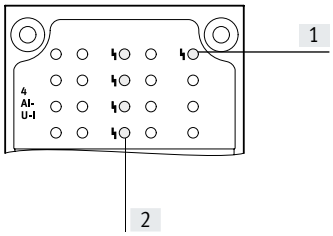
Connection and display components

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



[1] Error LED (red; module error)

CPX-4AE-U-I

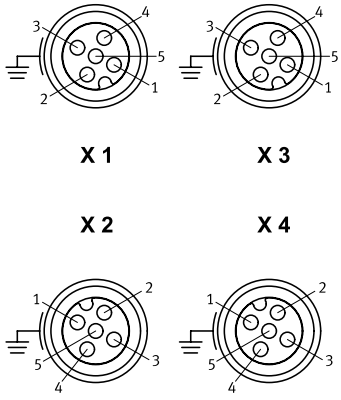
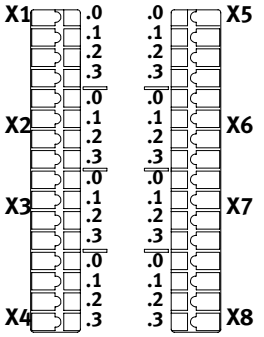


[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

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**	■	■	■

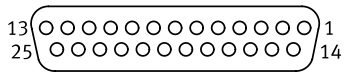
Pin allocation

Connection block inputs	CPX-2AE-U-I		CPX-4AE-U-I		CPX-4AE-I	
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 U0+ X1.3: 0 V_{SEN} X1.4: Input U0– X1.5: FE[2] X2.1: 24 V_{SEN} X2.2: Input I0+ X2.3: 0 V_{SEN} X2.4: Input I0– X2.5: FE[2]	X3.1: 24 V_{SEN} X3.2: Input U1+ X3.3: 0 V_{SEN} X3.4: Input U1– X3.5: FE[2] X4.1: 24 V_{SEN} X4.2: Input I1+ X4.3: 0 V_{SEN} X4.4: Input I1– X4.5: FE[2]	X1.1: 24 V_{SEN} X1.2: Input 0+ X1.3: 0 V_{SEN} X1.4: Input 0– X1.5: FE[2] X2.1: 24 V_{SEN} X2.2: Input 1+ X2.3: 0 V_{SEN} X2.4: Input 1– X2.5: FE[2]	X3.1: 24 V_{SEN} X3.2: Input 2+ X3.3: 0 V_{SEN} X3.4: Input 2– X3.5: FE[2] X4.1: 24 V_{SEN} X4.2: Input 3+ X4.3: 0 V_{SEN} X4.4: Input 3– X4.5: FE[2]	X1.1: 24 V_{SEN} X1.2: Input I0+ X1.3: 0 V_{SEN} X1.4: Input I0– X1.5: FE[2] X2.1: 24 V_{SEN} X2.2: Input I1+ X2.3: 0 V_{SEN} X2.4: Input I1– X2.5: FE[2]	X3.1: 24 V_{SEN} X3.2: Input I2+ X3.3: 0 V_{SEN} X3.4: Input I2– X3.5: FE[2] X4.1: 24 V_{SEN} X4.2: Input I3+ X4.3: 0 V_{SEN} X4.4: Input I3– X4.5: FE[2]
CPX-AB-8-KL-4POL						
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input U0– X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input I0– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input I0+ X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input U1– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Input U1+ X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input I1– X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Input I1+ X8.3: FE	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input 0– X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Input 0+ X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input 1– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input 1+ X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input 2– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Input 2+ X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input 3– X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Input 3+ X8.3: FE	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input I0– X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Input I0+ X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input I1– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input I1+ X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input I2– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Input I2+ X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input I3– X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Input I3+ X8.3: FE

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

Data sheet – Input module, analogue

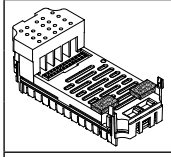
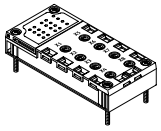
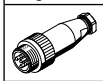
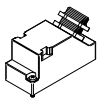
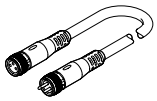
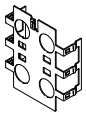
Pin allocation

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

Designation				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 Sub-D socket, 25-pin		**525676**	**CPX-AB-1-SUB-BU-25POL**
	Metal	4x socket, M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Plug					
	M12, 5-pin	PG7, for cable ⌀ 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
	Sub-D, 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 (IP65/67)	• 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit for cover AK-8KL			**538220**	**VG-K-M9**
	Cover cap for closing off unused M12 connections (10 pieces)			**165592**	**ISK-M12**
Screening plate					
	Screening plate for connection block • CPX-AB-4-M12X2-5POL • CPX-AB-4-M12X2-5POL-R			**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-P
- Channel-oriented diagnostics

General technical data

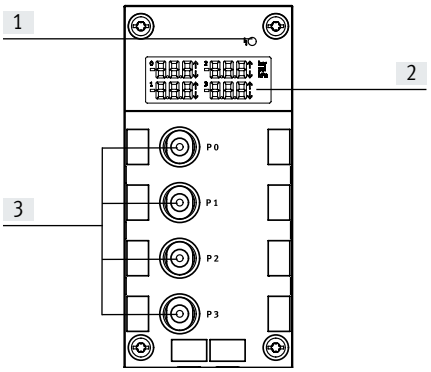
Type			CPX-4AE-P-B2	CPX-4AE-P-D10
Number of analogue inputs			4	
Pneumatic connection			QS-4	
Nominal operating voltage		[V DC]	24	
Operating voltage range		[V DC]	18 ... 30	
Intrinsic current consumption		[mA]	Typically 50	
Measured variable			4 x relative or 2 x differential pressure measurement	
Displayable 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	
Materials			PA-reinforced, 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]	115	

Note

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

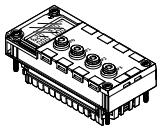
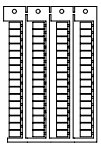
Data sheet – Input module, analogue, with pressure sensors

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

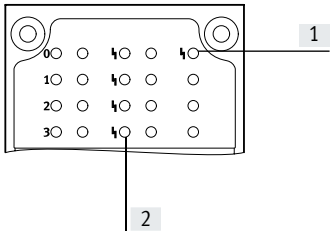
Type			CPX-4AE-T
			Temperature input
Number of analogue inputs			Choice of 2 or 4
Max. power supply per module		[A]	0.7
Fuse protection			Internal electronic fuse for sensor supply
Current consumption from 24 V sensor supply (quiescent current)		[mA]	Typically 50
Sensor supply voltage		[V DC]	24 ±25%
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			PA-reinforced, 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



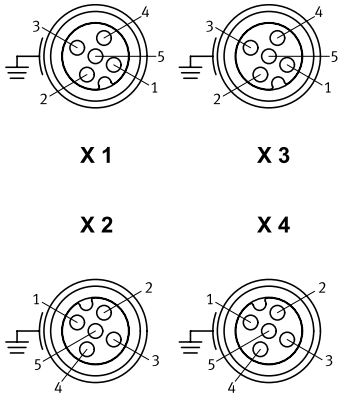
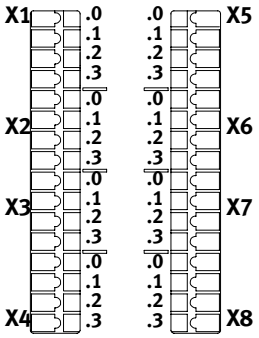
[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

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

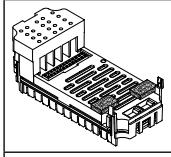
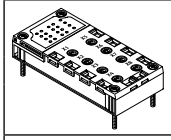
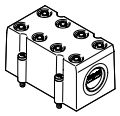
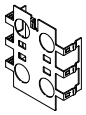
Pin allocation

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] X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1– X2.5: FE[2]	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2– X3.5: 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 X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE X3.0: Input I1+ X3.1: Input I1– X3.2: Input U1– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input U1+ X4.3: FE	X5.0: Input I2+ X5.1: Input I2– X5.2: Input U2– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: InputUI2+ X6.3: FE X7.0: Input I3+ X7.1: Input I3– X7.2: Input U3– X7.3: 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					
	M12, 5-pin	PG7, for cable ⌀ 4 ... 6 mm		**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

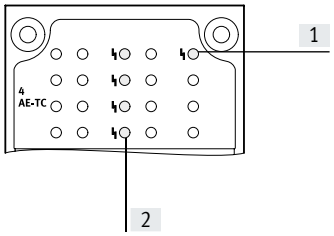
General technical data		
Type		CPX-4AE-TC
		Temperature input
Number of analogue inputs		4
Fuse protection (short circuit)		Internal electronic fuse per channel
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Sensor type (parameterisable for each channel with software)		• 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			PA-reinforced, 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



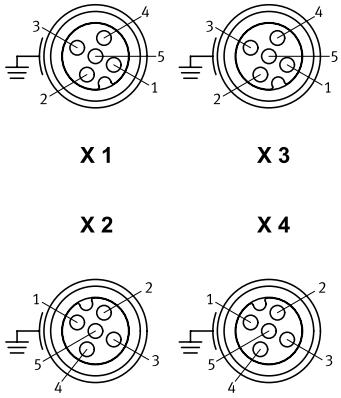
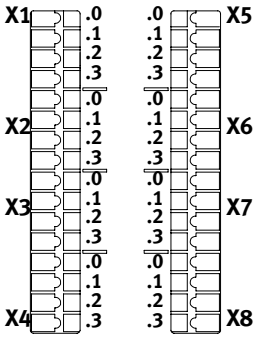
[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

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

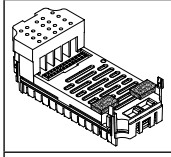
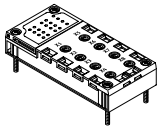
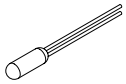
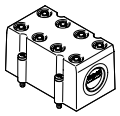
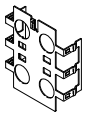
Pin allocation

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] 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]	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] 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 X2.0: n.c. X2.1: n.c. X2.2: Input signal U0+ X2.3: FE X3.0: Cold junction compensation 1+ X3.1: Cold junction compensation 1– X3.2: Input signal U1– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input signal U1+ X4.3: FE	X5.0: Cold junction compensation 2+ X5.1: Cold junction compensation 2– X5.2: Input signal U2– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Input signal U2+ X6.3: FE X7.0: Cold junction compensation 3+ X7.1: Cold junction compensation 3– X7.2: Input signal U3– X7.3: 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					
	M12, 5-pin	PG7, for cable ⌀ 4 ... 6 mm		**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

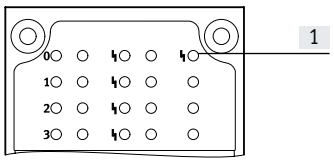
Type			CPX-2AA-U-I	
			Voltage output	Current output
Number of analogue outputs			2	
Max. actuator supply per module		[A]	2.8	
Fuse protection			Internal electronic fuse for actuator supply	
Current consumption from 24 V sensor supply (at full load)		[mA]	Max. 150	
Current consumption from 24 V actuator 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 ... 2 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			PA-reinforced, 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

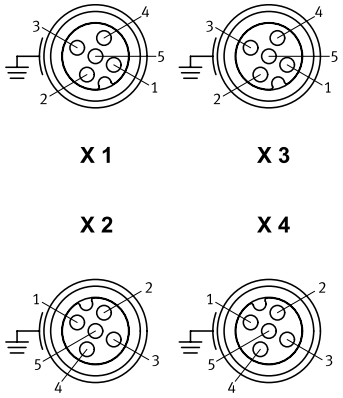
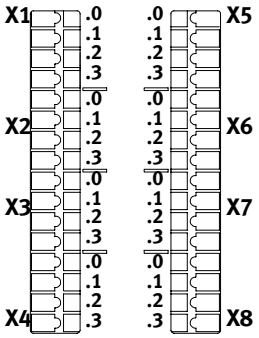
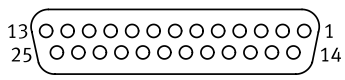


[1] Error LED (red; module error)

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

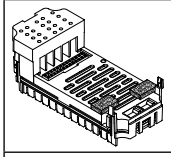
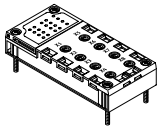
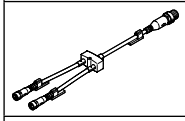
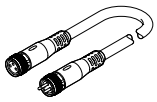
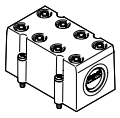
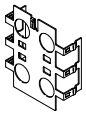
Pin allocation

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] X2.1: 24 V_{OUT} X2.2: Output I0+ X2.3: 0 V_{OUT} X2.4: Output GND X2.5: FE[2]	X3.1: 24 V_{OUT} X3.2: Output U1+ X3.3: 0 V_{OUT} X3.4: Output GND X3.5: FE[2] 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 X2.0: n.c. X2.1: n.c. X2.2: Output U0+ X2.3: FE X3.0: 24 V_{OUT} X3.1: 0 V_{OUT} X3.2: Output GDN X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Output I0+ X4.3: FE	X5.0: 24 V_{OUT} X5.1: 0 V_{OUT} X5.2: Output GND X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Output U1+ X6.3: FE X7.0: 24 V_{OUT} X7.1: 0 V_{OUT} X7.2: Output GND X7.3: 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 Sub-D socket, 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
Plug					
	M12, 5-pin	PG7, for cable ⌀ 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
	Sub-D, 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 (IP65/67)	• 8 cable through feeds M9 • 1 cable through feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit, cover for AK-8KL			**538220**	**VG-K-M9**
	Cover cap for closing off unused M12 connections (10 pieces)			**165592**	**ISK-M12**
Screening plate					
	Screening plate for connection block • CPX-AB-4-M12X2-5POL • CPX-AB-4-M12X2-5POL-R			**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**

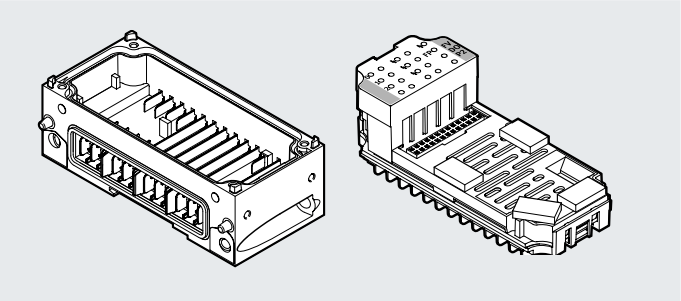
Data sheet – PROFIsafe shut-off module

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-P terminal and via a connection block to two consuming devices. Actuation takes place via the bus node (PROFINET) of the CPX-P 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	[byte]	6
	Outputs	[byte]	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			TÜV Rhld 01/205/5294.02/23
			TÜV Rhld 01/205U/5294.01/23
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

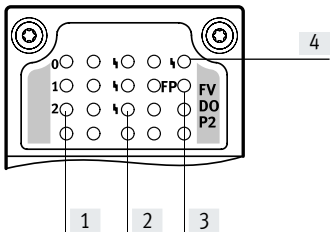
Materials	
Housing	PA-reinforced, PC
Note on materials	RoHS-compliant
PWIS conformity	VDMA24364-B2-L

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
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) More information: 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

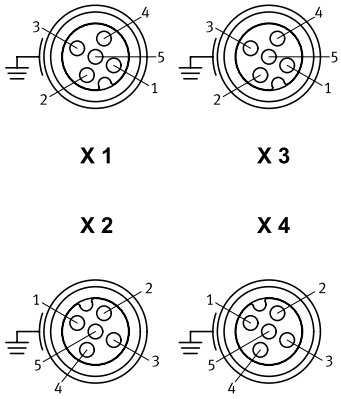
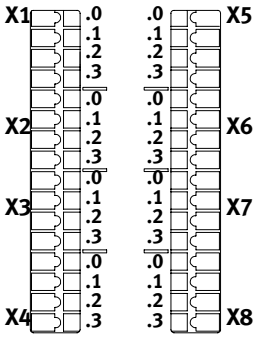
The PROFIsafe shut-off module CPX-FVDA-P2 can only be connected as of software release 21 or release 30 (in the case of CPX-FB13).

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

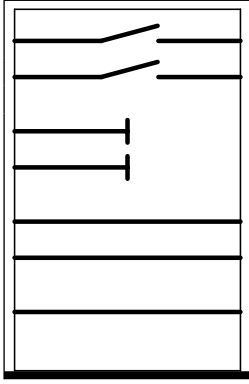
Combinations of interlinking blocks and PROFIsafe shut-off module

Interlinking blocks	Part no.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-M-GE-EV-S-7/8-5POL	**550208**	–
CPX-M-GE-EV-S-7/8-5POL-VL	**8022165**	–
CPX-M-GE-EV	**550206**	–
CPX-M-GE-EV-FVO	**567806**	■
CPX-M-GE-EV-Z-7/8-5POL	**550210**	–
CPX-M-GE-EV-Z-7/8-5POL-VL	**8022158**	–

General technical data

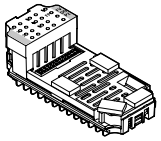
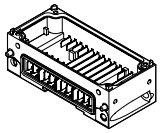
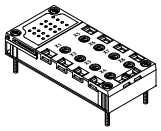
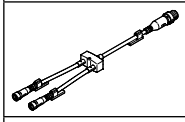
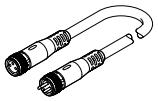
Type		CPX-M-GE-EV-FVO
Nominal operating voltage	[V DC]	24
Acceptable current load (per contact/contact rail)	[A]	16
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Materials		Die-cast aluminium
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L
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					
	Electronics module (can only be used with CPX-M-GE-EV-FVO)	PROFINET, PROFIBUS		**1971599**	**CPX-FVDA-P2**
	Metal interlinking block (exclusively for CPX-FVDA-P2)			**567806**	**CPX-M-GE-EV-FVO**
Connection block					
	Plastic	Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
	Metal	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
Distributor					
	1x plug M12, 4-pin	2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
	Modular system for all types of sensor/actuator distributor			**–**	**NEDY-...** → Internet: nedy
Plug					
	M12, 4-pin	PG7, for cable Ø 4 ... 6 mm		**18666**	**SEA-GS-7**
		PG7, for cable Ø 2.5 ... 2.9 mm		**192008**	**SEA-4GS-7-2.5**
		PG9, for cable Ø 6 ... 8 mm		**18778**	**SEA-GS-9**
		PG11, for 2x cable Ø 3 ... 5 mm		**18779**	**SEA-GS-11-DUO**
	M12, 5-pin	PG7, for cable Ø 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
		PG11, for 2x cable Ø 2.5 ... 5 mm		**192010**	**SEA-5GS-11-DUO**
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 – Interlinking block with system supply

Function

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

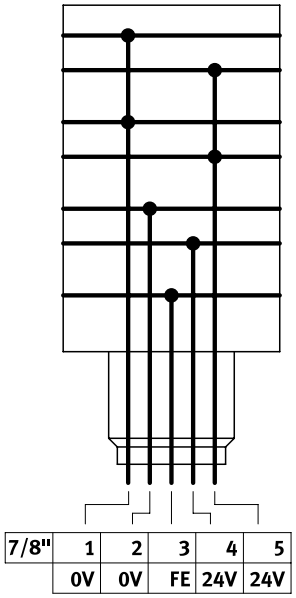
Area of application

- 24 V DC supply voltage for electronics of the CPX-P 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
Grid dimension		[mm]	50
Dimensions W x L x H		[mm]	50 x 107 x 35
Electrical connection			7/8", 5-pin
Power supply	Sensors and electronics	[A]	Max. 8
	Valves and outputs	[A]	Max. 8
Materials			Die-cast aluminium
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Product weight		[g]	187

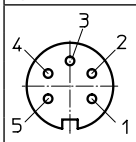
Pin allocation

Round plug, 5-pin



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

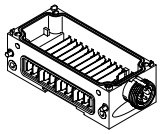
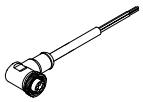
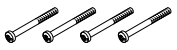
7/8"



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

Data sheet – Interlinking block with system supply

Ordering data

Designation					Part no.	Type
Interlinking block with system supply						
	7/8" connection, metal interlinking block	5-pin	–		**550208**	**CPX-M-GE-EV-S-7/8-5POL**
			For ATEX environment		**8022165**	**CPX-M-GE-EV-S-7/8-5POL-VL**
Connection sockets 7/8"						
	Power supply socket	5-pin			**543107**	**NECU-G78G5-C2**
	Angled socket, 5-pin	Open cable end, 5-pin		2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
Mounting accessories						
	Screws for mounting the bus node/connection block on an 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

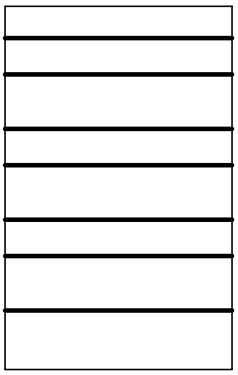
Interlinking blocks ensure the electrical supply of all other CPX-P modules. They have contact rails from which the other CPX-P components on the interlinking modules are supplied with current.
Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators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

Area of application

- All voltages are fed through to the next module via the interlinking blocks without supply.
- The connected electronics module for inputs/outputs or bus node taps off the required voltage.

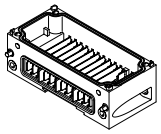
General technical data		
Electrical connection		–
Nominal operating voltage	[V DC]	24
Acceptable current load (per contact/contact rail)	[A]	16
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Materials		Aluminium
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35
Product weight	[g]	169

Pin allocation

Circuitry	Pin	Allocation
	–	–
	–	–
	–	–
	–	–

Data sheet – Interlinking block without power supply

Ordering data

Designation			Part no.	Type
Interlinking block without power supply				
	Metal interlinking block		**550206**	**CPX-M-GE-EV**
Mounting accessories				
	Screws for mounting the bus node/connection block on an 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

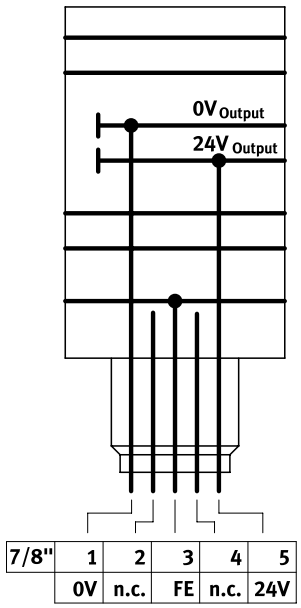
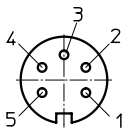
Function
Interlinking blocks ensure the electrical supply of all other CPX-P modules. They have contact rails from which the other CPX-P components on the interlinking modules are supplied with current.
Internal division of the power supply makes it possible to switch off specific areas of the sensors 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
Grid dimension		[mm]	50
Dimensions W x L x H		[mm]	50 x 107 x 35
Electrical connection			7/8", 5-pin
Power supply	Outputs	[A]	Max. 8
Materials			Die-cast aluminium
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Product weight		[g]	187

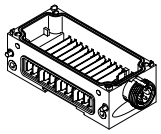
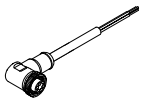
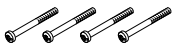
Pin allocation – Metal interlinking blocks

Circuitry	Pin	Allocation
Round plug, 5-pin		
		
7/8"		
	1	0 V outputs
	2	n.c.
	3	FE
	4	n.c.
	5	24 V DC load voltage supply for outputs

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

Data sheet – Interlinking block with additional supply for outputs

Ordering data

Designation					Part no.	Type
Interlinking block with additional supply for outputs						
	7/8" connection, metal interlinking block	5-pin	–		**550210**	**CPX-M-GE-EV-Z-7/8-5POL**
			For ATEX environment		**8022158**	**CPX-M-GE-EV-Z-7/8-5POL-VL**
Connection sockets 7/8"						
	Power supply socket	5-pin			**543107**	**NECU-G78G5-C2**
	Angled socket, 5-pin	Open cable end, 5-pin		2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
Mounting accessories						
	Screws for mounting the bus node/connection block on an 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 – Pneumatic interface for valve terminal MPA-S

Function

The pneumatic interface VMPA-FB establishes the electromechanical connection between the CPX-P 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-P 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. Galvanically isolated valves 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 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

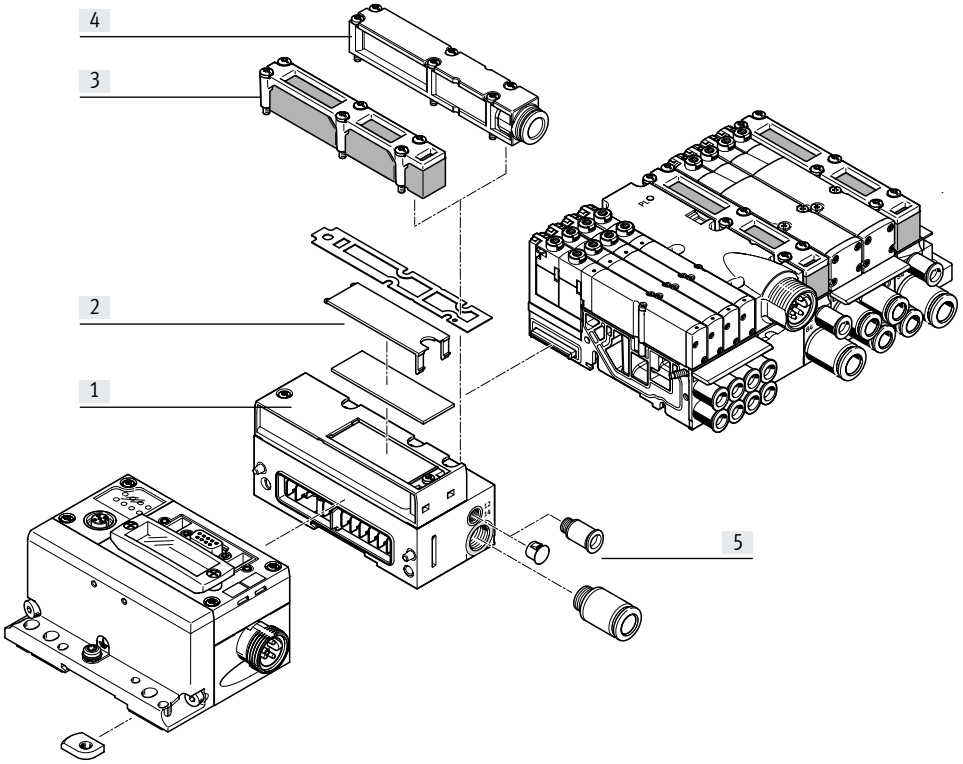
General technical data			
Type		VMPA-FB-EPL-G	VMPA-FB-EPL-E
Valve terminal design		Modular, valve sizes can be mixed	
Maximum number of valve positions		64	
Maximum number of pressure zones		17	
Signal status indication		LED	
Pilot air supply		Internal	External
Operating pressure	[MPa]	0.3 ... 0.8	–0.09 ... 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

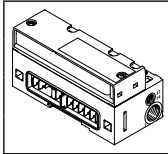
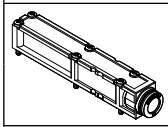
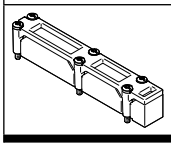
Data sheet – Pneumatic interface for valve terminal MPA-S

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

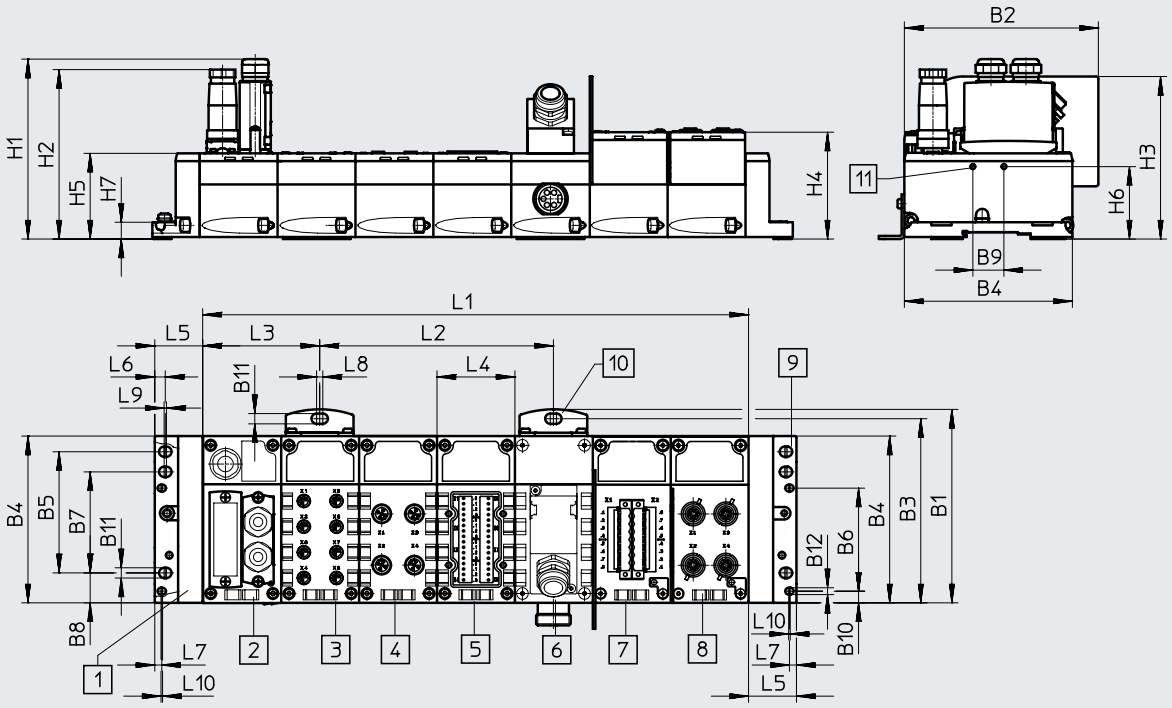
Ordering data

Designation			Part no.	Type
Pneumatic interface				
	Ducted exhaust air	Internal pilot air	**552286**	**VMPA-FB-EPLM-G**
		External pilot air	**552285**	**VMPA-FB-EPLM-E**
	Flat plate silencer	Internal pilot air	**552288**	**VMPA-FB-EPLM-GU**
		External pilot air	**552287**	**VMPA-FB-EPLM-EU**
Exhaust plate				
	For ducted exhaust air, with push-in connector	For tubing O.D. 10 mm	**533375**	**VMPA-AP**
		For tubing O.D. 3/8"	**541629**	**VMPA-AP-3/8**
	Flat plate silencer		**533374**	**VMPA-APU**

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-AB-8-M8-3POL
[4] Connection block CPX-AB-4-M12X2-5POL
[5] Connection block CPX-AB-8-KL-4POL
[6] Connection block CPX-AB-1-SUB-BU-25POL
[7] Connection block CPX-P-AB-4-2XKL-8POL
[8] Connection block CPX-P-AB-4XM12-4POL
[9] Right-hand end plate
[10] Mounting bracket for wall mounting
[11] Hole for self-tapping screw M2.5

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
CPX-P	124.9	124.6	118.9	108.1	78	66.3	65	19.3	20	7.9	6.6	4.4

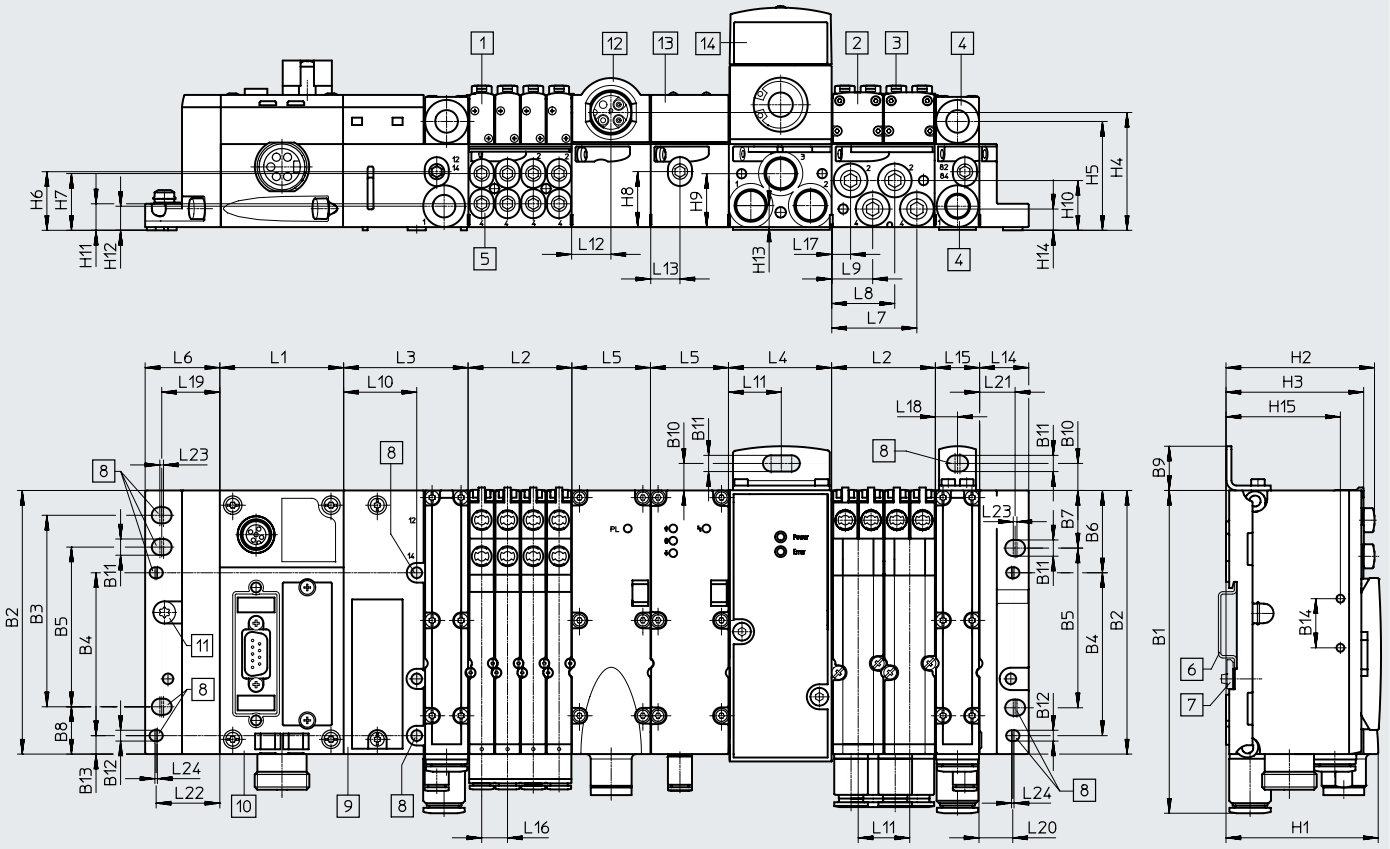
Type	H1	H2	H3	H4	H5	H6	H7
CPX-P	116	109	106.2	69.2	55.1	46.6	10.8

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
CPX-P	nx50.1	150.3	125.3	50.1	30.4	6.8	4.5	4	1.5	1

Data sheet

Dimensions Download CAD data ➔ www.festo.com

With bus node and valve terminal MPA-S



[1] Solenoid valve MPA1
[2] Solenoid valve MPA2
[3] Manual override
[4] Supply/exhaust ports
[5] Working ports
[6] H-rail
[7] H-rail mounting
[8] Mounting holes
[9] Pneumatic interface VMPA□FB
[10] CPX-P module
[11] Earthing screw
[12] Electrical supply plate
[13] Pressure sensor
[14] Proportional-pressure regulator
n Number of sub-bases in a grid of 4 MPA1 or 2 MPA2 valves
m Number of CPX-P modules

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14
CPX-P	131.4	107.3	78	66.3	65	33.5	23.5	19.3	18	11	6.6	4.4	7.5	20

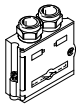
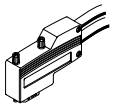
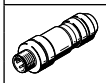
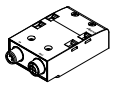
Type	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15
CPX-P	62	60.5	56	48	44.3	23.9	23.1	22.6	21.8	20.3	10.8	9.8	8.8	8.7	46.6

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
CPX-P	m x 50.1	n x 42	51.2	42	32	30.4	34.7	25.7	16.7	30	21	16

Type	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24
CPX-P	12	20	18	10.5	7.7	9	23.7	13.5	14.5	25.9	1.5	1

Accessories

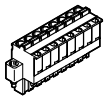
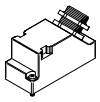
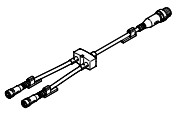
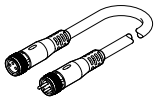
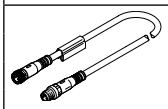
Ordering data

Designation					Part no.	Type
Plugs						
	Sub-D socket, 9-pin			For DeviceNet	**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Sub-D plug, 9-pin			For PROFIBUS DP	**532216**	**FBS-SUB-9-GS-DP-B**
	Sub-D plug, angled			For PROFIBUS DP	**533780**	**FBS-SUB-9-WS-PB-K**
	Bus connection, adapter to M12 plug/socket, 5-pin	Sub-D plug, 9-pin	B-coded	For PROFIBUS DP	**533118**	**FBA-2-M12-5POL-RK**
		Sub-D socket, 9-pin	Micro style	For DeviceNet	**525632**	**FBA-2-M12-5POL**
	M12 socket, 5-pin	Screw terminal	For FBA-2-M12-5POL		**18324**	**FBSD-GD-9-5POL**
		Screw terminal	For FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP		**1067905**	**NECU-M-B12G5-C2-PB**
	Plug M8, 3-pin	Solderable	For NEDY-L2R1-V1-M8G3-N-M8G4		**18696**	**SEA-GS-M8**
		Screw-in	For NEDY-L2R1-V1-M8G3-N-M8G4		**192009**	**SEA-3GS-M8-S**
	Plug M12, 4-pin	Spring-loaded terminal	For cable Ø 4 ... 8 mm		**575719**	**NECU-M-S-A12G4-IS**[1]
		Screw terminal	D-coded	For Ethernet	**543109**	**NECU-M-S-D12G4-C2-ET**
			For cable Ø 2.5 ... 2.9 mm		**570955**	**NECU-S-M12G4-P1-Q6-IS**[1]
					192008	**SEA-4GS-7-2.5**
			For cable Ø 2x3 mm or 2x5 mm		**570956**	**NECU-S-M12G4-D-IS**[1]
			For 2x cable Ø 3 ... 5 mm		**18779**	**SEA-GS-11-DUO**
			For cable Ø 4 ... 6 mm		**570953**	**NECU-S-M12G4-P1-IS**[1]
					18666	**SEA-GS-7**
			For cable Ø 6 ... 8 mm		**570954**	**NECU-S-M12G4-P2-IS**[1]
					18778	**SEA-GS-9**
	Plug M12, 5-pin	Screw terminal	For 2x cable Ø 2.5 ... 5 mm		**192010**	**SEA-5GS-11-DUO**
			For cable Ø 4 ... 6 mm		**175487**	**SEA-M12-5GS-PG7**
			For FBA-2-M12-5POL		**175380**	**FBS-M12-5GS-PG9**
			For FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP		**1066354**	**NECU-M-S-B12G5-C2-PB**
	Connection block, adapter to 5-pin 7/8" plug	Sub-D socket, 9-pin	–	For DeviceNet	**571052**	**CPX-AB-1-7/8-DN**
	Connection block, adapter to M12 plug/socket	Sub-D plug, 9-pin	B-coded	For PROFIBUS DP	**541519**	**CPX-AB-2-M12-RK-DP**
	Open style bus connection for 5-pin terminal strip			For DeviceNet	**525634**	**FBA-1-SL-5POL**
	5-pin terminal strip			For open style connection	**525635**	**FBSD-KL-2x5POL**

1) Component preferred for operation in intrinsically safe circuits.

Accessories

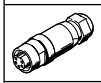
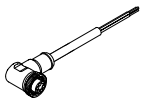
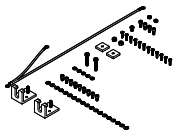
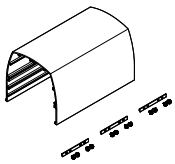
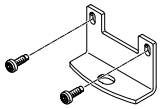
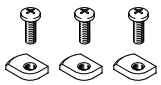
Ordering data

Designation					Part no.	Type
Connectors						
	RJ45 plug				**534494**	**FBS-RJ45-8-GS**
	Socket, 8-pin	Spring-loaded terminal		Black	**565712**	**NECU-L3G8-C1**
				Blue	**565711**	**NECU-L3G8-C1-IS**[1]
		Screw terminal		Black	**565710**	**NECU-L3G8-C2**
				Blue	**565709**	**NECU-L3G8-C2-IS**[1]
	Sub-D plug, 25-pin				**527522**	**SD-SUB-D-ST25**
Connecting cable						
	Modular system for all types of sensor/actuator distributor				**–**	**NEDY-...** → Internet: nedy
	Modular system for a choice of connecting cables				**–**	**NEBU-...** → Internet: nebu
	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, 4-pin		**562248**	**NEDU-M12D4-M12T4-IS**[1]
			2x socket, M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
	1x socket M8, 3-pin	1x plug M8, 3-pin		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**

1) Component preferred for operation in intrinsically safe circuits.

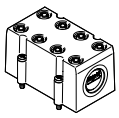
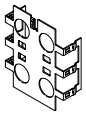
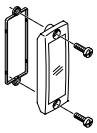
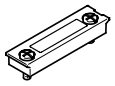
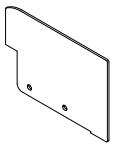
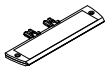
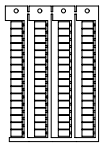
Accessories

Ordering data

Designation				Part no.	Type
Connectors and accessories – Power supply					
	Power supply socket, straight	7/8" connection, 5-pin		**543107**	**NECU-G78G5-C2**
	7/8" power supply socket, 5-pin, angled socket	Open cable end, 5-pin	2 m	**573855**	**NEBU-G78W5-K-2-N-LE5**
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-P 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 an interlinking block	Bus node/plastic connection block		**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block		**550216**	**CPX-M-M3x22-S-4x**
Mounting					
	Attachment for wall mounting (for long valve terminals, 2 mounting brackets and 4 screws)	Version for metal interlinking plates		**550217**	**CPX-M-BG-RW-2x**
	Mounting for H-rail			**526032**	**CPX-CPA-BG-NRH**
Function blocks					
	Terminating resistor, M12, B-coded for PROFIBUS			**1072128**	**CACR-S-B12G5-220-PB**
	Adapter M12, 5-pin to mini USB socket, and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**

Accessories

Ordering data

Designation			Part no.	Type
Covers and attachments				
	Cover for CPX-AB-8-KL-4POL (IP65/67)	8 cable through feeds M9 1 cable through feed for multi-pin plug	**538219**	**AK-8KL**
	Fittings kit for cover AK-8KL		**538220**	**VG-K-M9**
	Screening plate for connection block • CPX-AB-4-M12X2-5POL • CPX-AB-4-M12X2-5POL-R		**526184**	**CPX-AB-S-4-M12**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Transparent cover for DIL switch		**548757**	**CPX-AK-P**
	Cover for RJ45 connection		**534496**	**AK-RJ45**
	Cover cap for closing off unused connections (10 pieces)	For M8 connections	**177672**	**ISK-M8**
		For M12 connections	**165592**	**ISK-M12**
	Coding element (96 pieces of each)	For NECU-L3G8	**565713**	**CPX-P-KDS-AB-2XKL**
	Insulating plate for safe separation of intrinsically safe and non-intrinsically safe areas of the CPX terminal		**565708**	**CPX-P-AB-IP**[1]
Inscription labels				
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	Inscription labels 6x10 mm, 64 pieces, in frame		**18576**	**IBS-6x10**

1) Component preferred for operation in intrinsically safe circuits.