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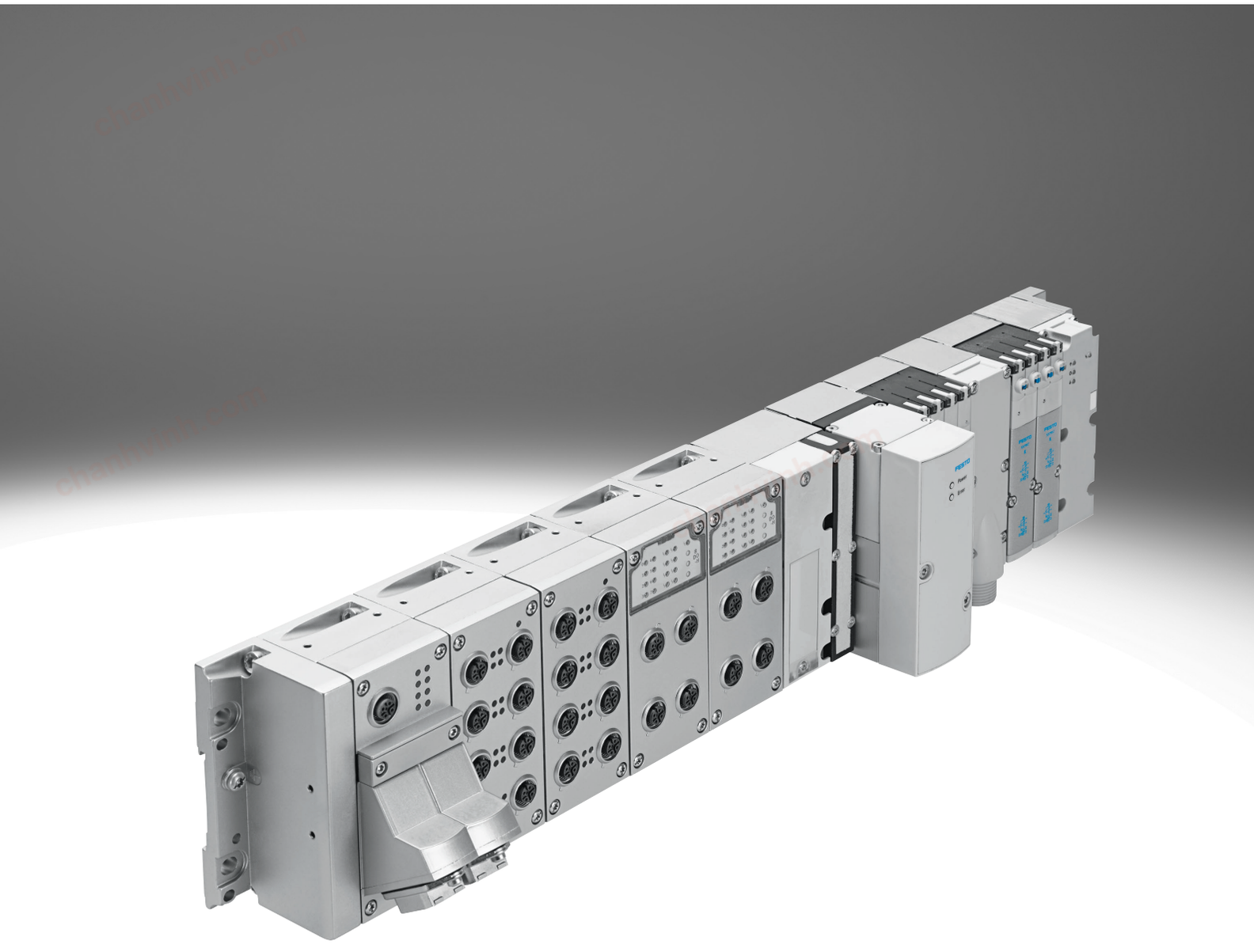
Modular electrical terminal CPX



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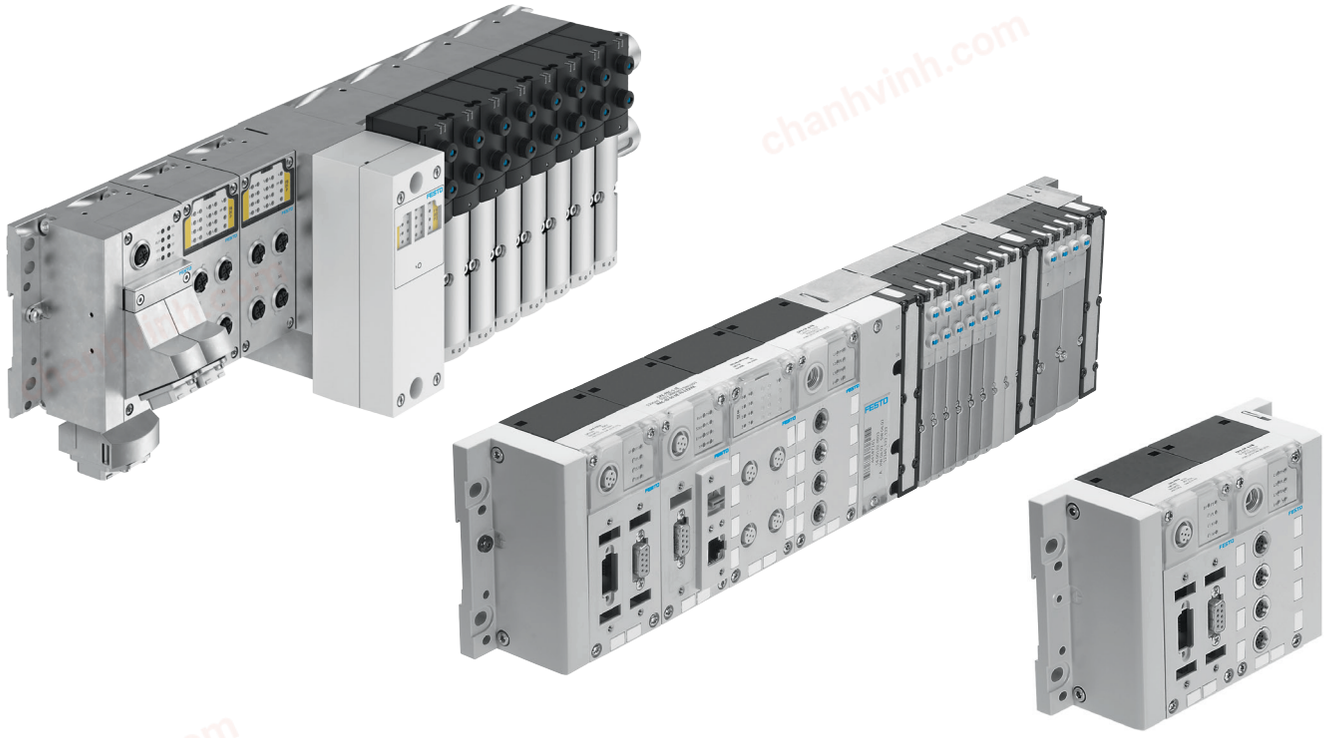
Key features



Key features

Installation concept	Electric	Assembly	Operation
• Choice of several valve terminal types for different applications: – MPA-S – MPA-L – VTSA/VTSA-F/VTSA-F-CB • Economical from the smallest configuration up to the maximum number of modules • Up to 9 electrical input/output modules plus bus node and pneumatic interface/electronics modules for valves • Extensive range of functions and connection options for the electrical modules • Choice of connection technology for technically and economically optimised connections • Can be used as a dedicated remote I/O module	• High operating voltage tolerance (±25%) • Choice of M12x1, M18, 7/8" or AIDA push-pull connection for power supply • Open to all fieldbus protocols and Ethernet • Optional function and technology modules for pre-processing • IT services and TCP/IP such as remote maintenance, remote diagnostics, web server, SMS and email 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 • Pressure inputs • Temperature inputs • Controller for electric axes • IP65 and IP67 or IP20	• Wall or DIN rail mounting, also on mobile units • Conversions/extensions are possible at any time, individual linking with CPX metal design • Modular system offering a range of configuration options • Fully assembled and tested unit • Reduced costs for selection, ordering, mounting and commissioning thanks to the central CPX terminal • Choice of pneumatic components for optimised control chain • Decentralised, subordinate CPI installation system improves cycle times by up to 30% • Safe and convenient earthing thanks to earthing plate	• Fast troubleshooting thanks to an extensive selection of LEDs (some of which are multi-coloured) on the bus node and on all I/O modules • Supports module and channel-related diagnostics • Fieldbus/Ethernet remote diagnostics • Innovative diagnostic support with integrated web server/web monitor or maintenance tool with USB adapter for PC • Optimised commissioning thanks to parameterisable functions • Reliable servicing with connection blocks and modules that are quick to replace without changing the wiring

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Key features

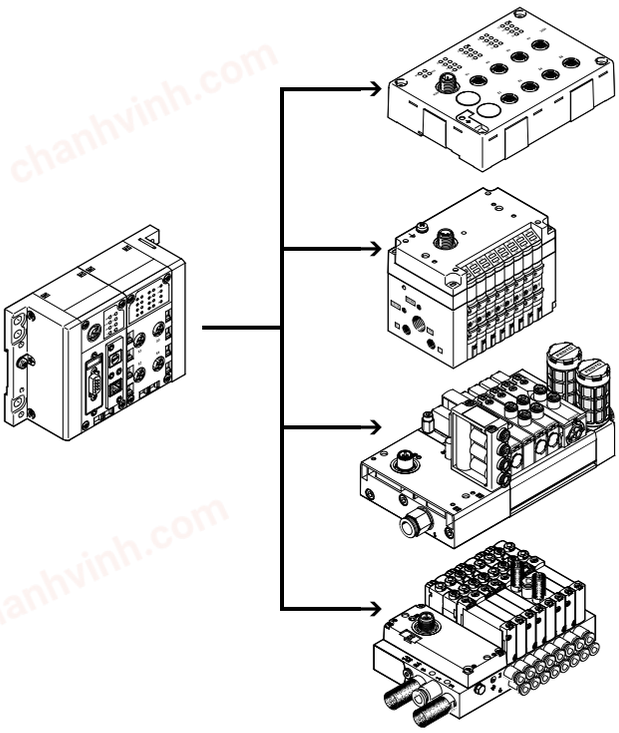
Pneumatic variants of the CPX terminal

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

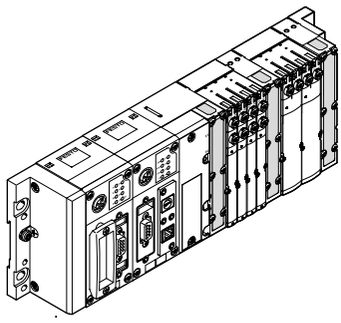
The system is specifically designed so that the valve terminal can be adapted to suit a wide range of different applications.

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

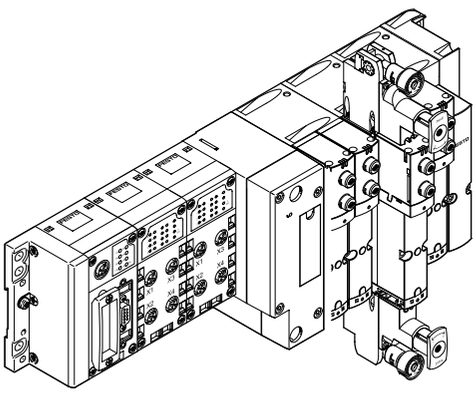
With valve terminal – decentralised



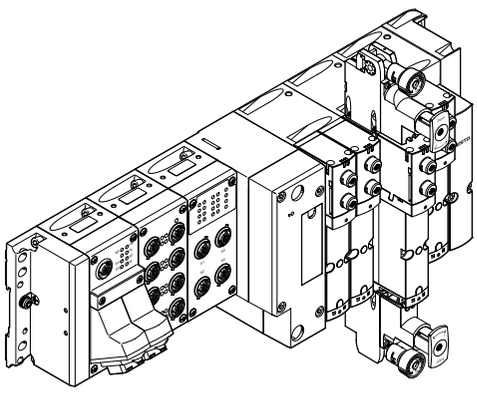
With valve terminal MPA-S – centralised



With valve terminal VTSA – centralised



In metal design with valve terminal VTSA – centralised



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Key features

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

Bus node

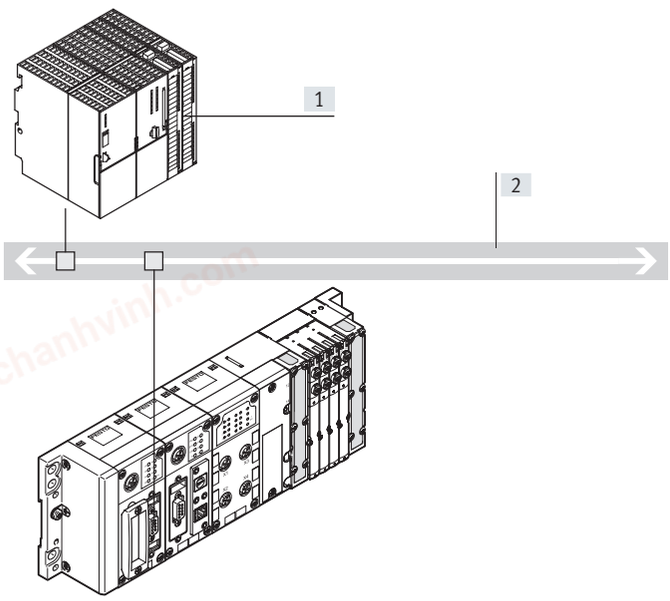
Different bus nodes are used for integration in the control systems of various manufacturers.
The CPX terminal can therefore be operated on over 90% of the most commonly used fieldbus systems:
- PROFIBUS DP
- PROFINET
- DeviceNet®
- CANopen
- CC-Link®

Integration in universal networks based on Ethernet opens up new possibilities. Faster data transmission, real-time capability and above all additional IT services such as file transfer, web server, web monitor as integrated website in the CPX terminal, text message/email alerts, etc. open up a wide range of synergies.

Mail alarms, etc. open up a wide range of synergies.
These include standardised and universal communication technology across all areas, including operating level, management level and field level in the production environment, with protection to IP65, IP67.

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

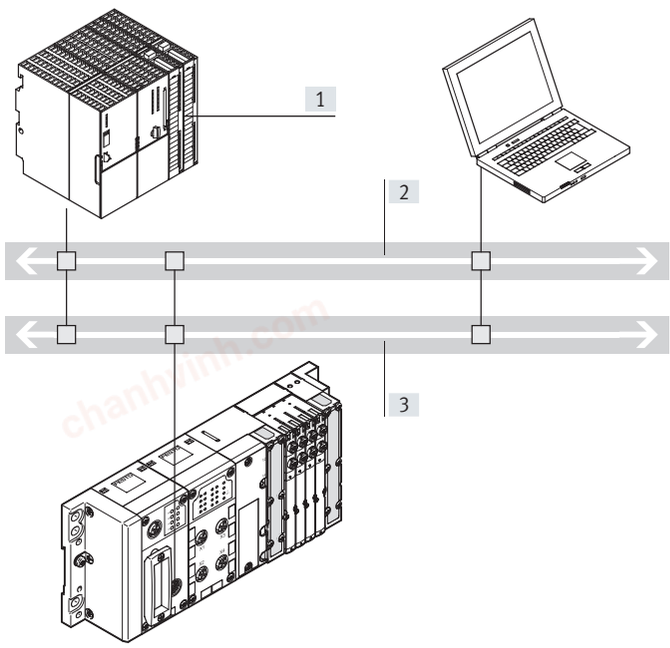
Bus node



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

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

Industrial Ethernet bus node



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

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

Note

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

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

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Key features

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

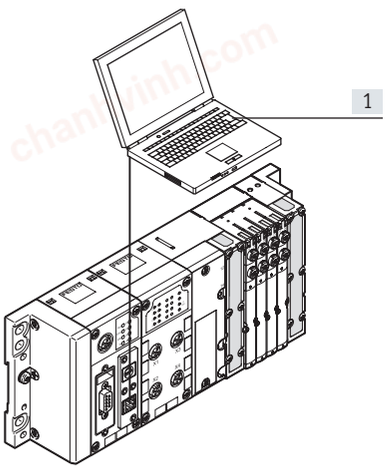
Control block

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

Access via Modbus/TCP and EasyIP is also possible.

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

With control block in stand-alone mode



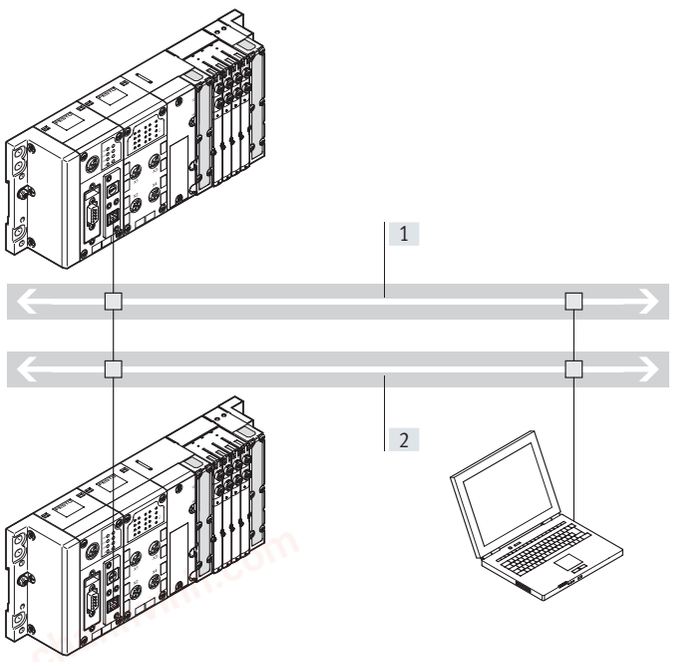
[1] CODESYS/FST

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

Can be successfully used in the follow applications:

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

With control block in Festo EasyIP mode



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

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

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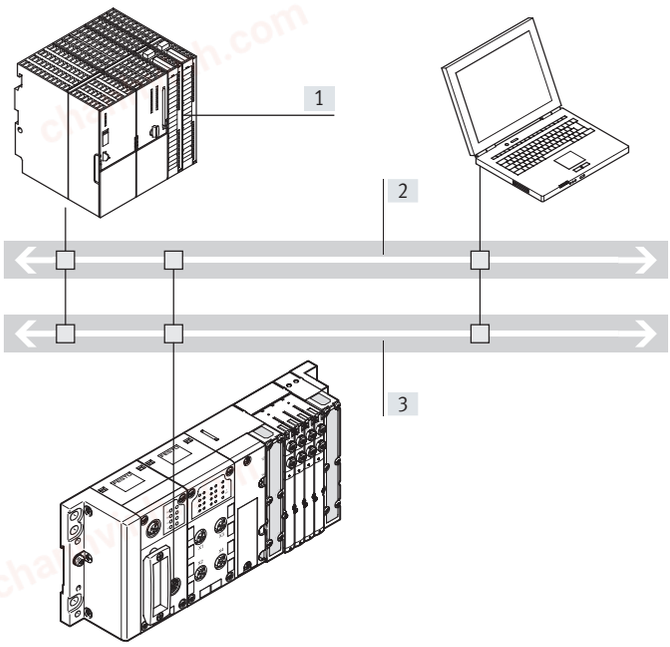
Key features

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

With control block as remote controller on Ethernet

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

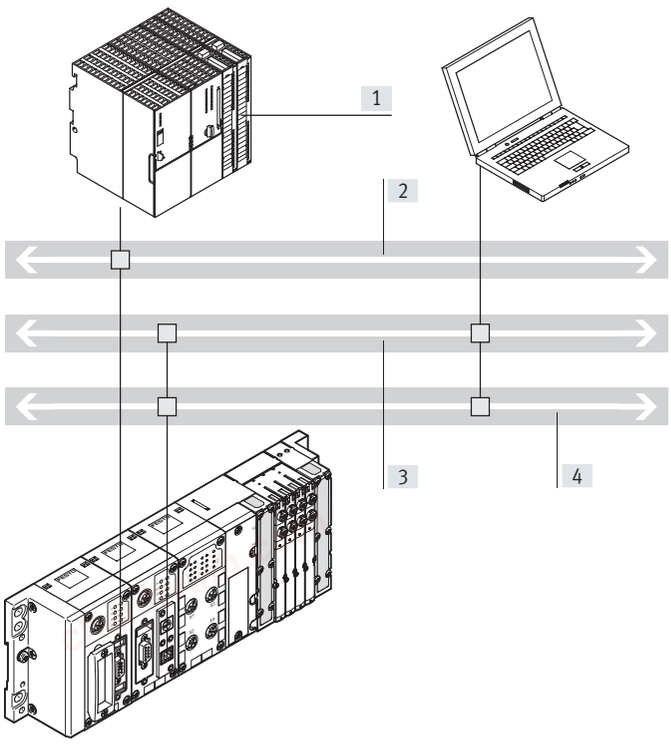


[1] Higher-order controller (PLC)
[2] Industrial Ethernet
[3] IT services:
- Web
- Email
- Data transmission

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

With control block as remote controller on the fieldbus

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



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

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

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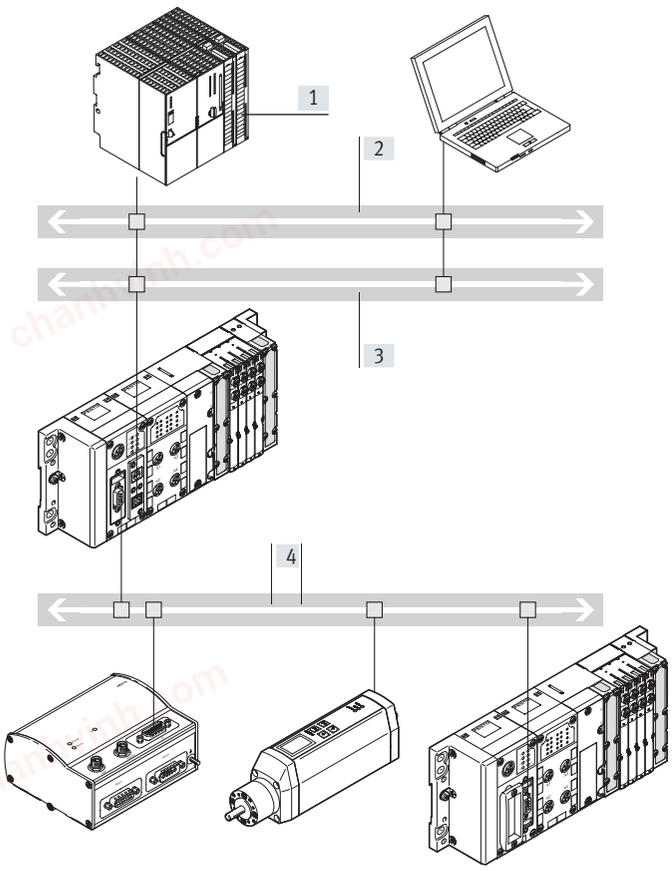
Key features

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

With control block as CANopen fieldbus master



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

Characteristics:

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

Operating modes:

- Remote controller on Ethernet
- Control block in Festo EasyIP mode

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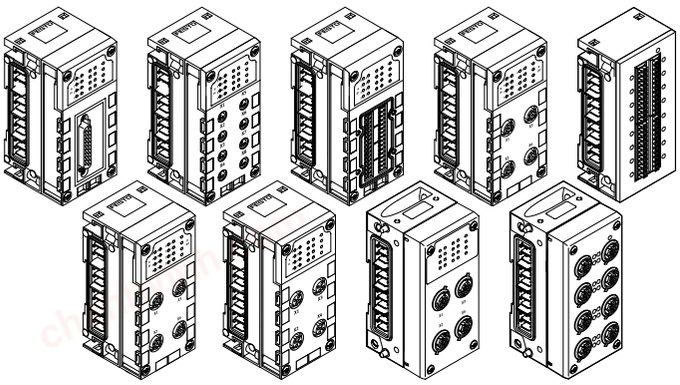
Key features

Connection of inputs and outputs to the CPX terminal

Digital and analogue CPX I/O modules

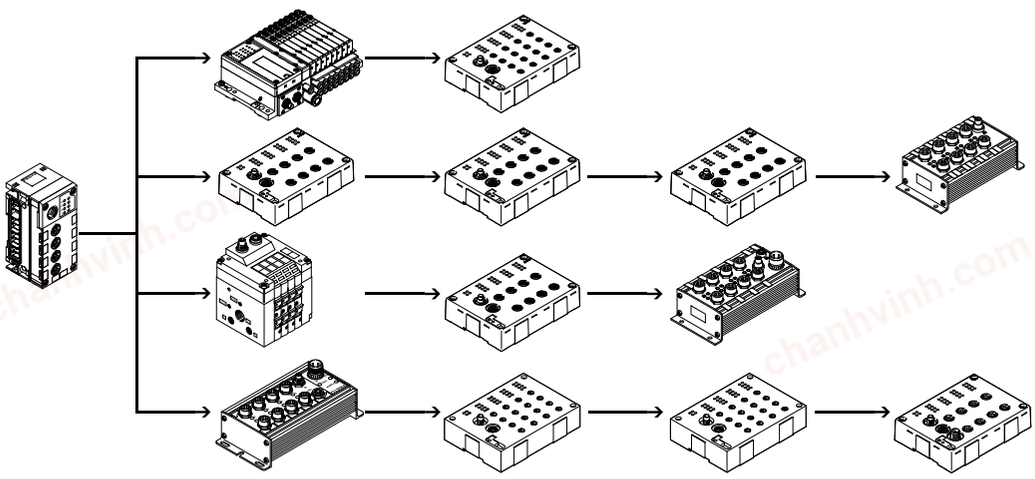


Electrical connection

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

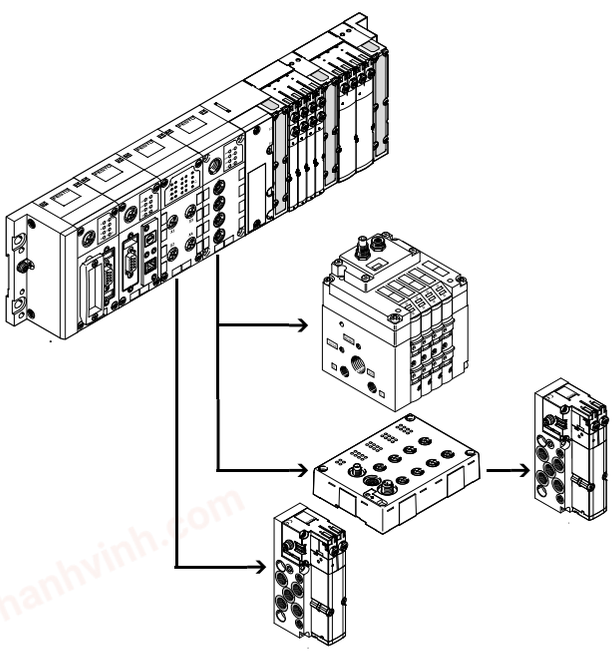
- metal design
  - M12-5POL
- Polymer version:
  - M12-5POL
  - M12-5-PIN with quick lock and metal thread
  - M12-8POL
  - M8-3POL
  - M8-4POL
  - Sub-D
  - CageClamp®
    (with covering hood also to IP65, IP67)
  - Screw/spring-loaded terminal

With CPX-CP interface



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

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



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

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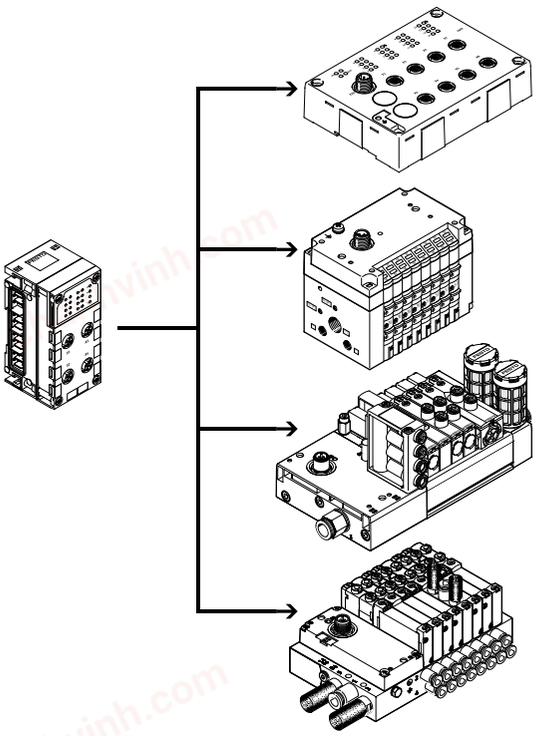
Key features

Connection of inputs and outputs to the CPX terminal

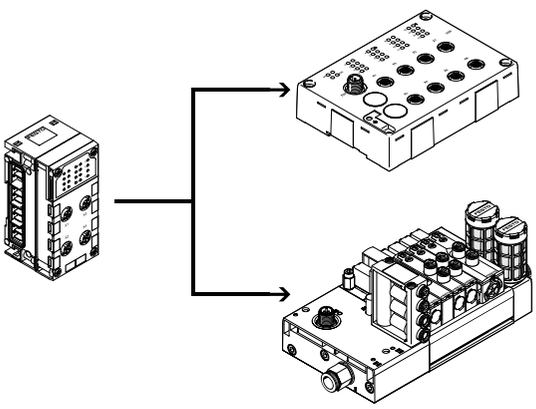
With CPX-CTEL interface



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

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

With CPX-CTEL-2 interface



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

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

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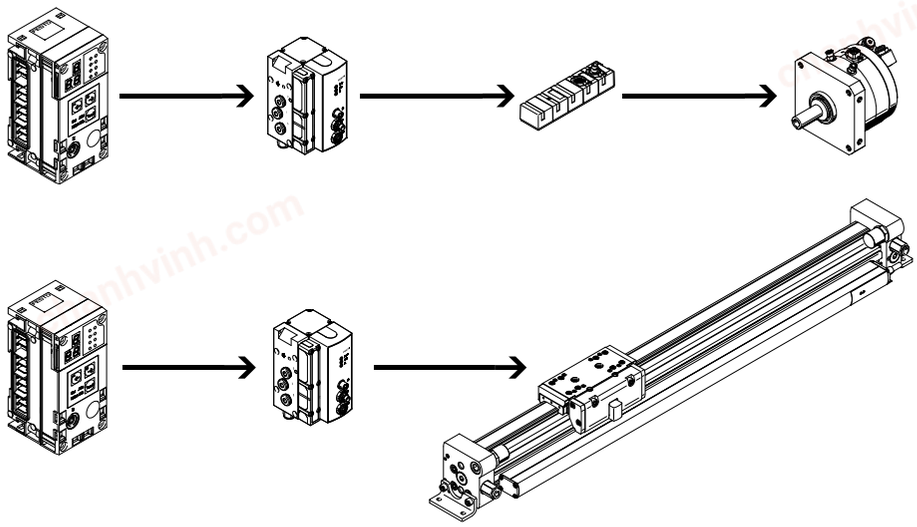
Key features

Connection of inputs and outputs to the CPX terminal

Pneumatic drives with CPX-CMAX/CMPX



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

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Key features

Ordering

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

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

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

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

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

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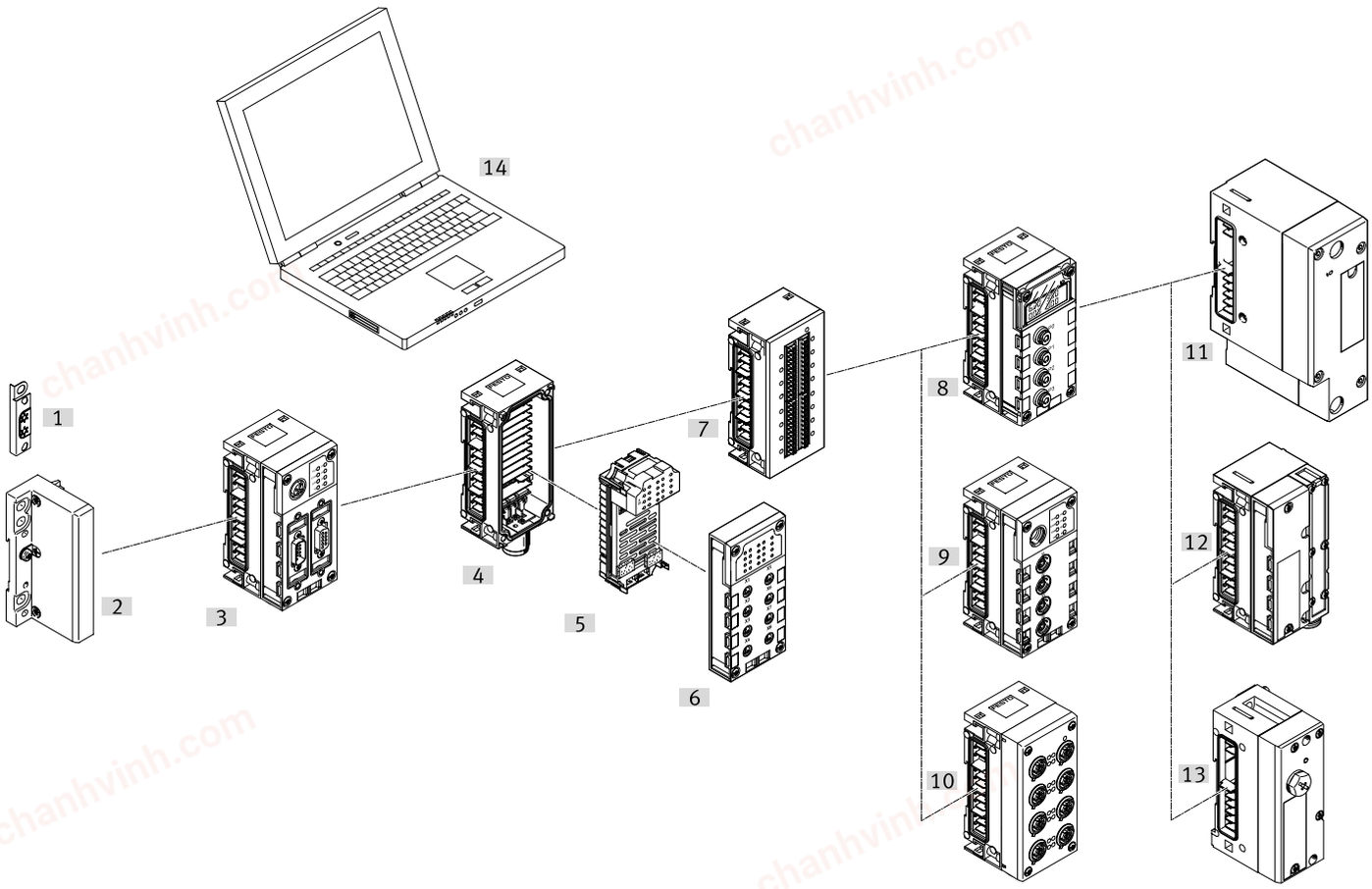
Peripherals overview



Designation		Type	Description	→ Page/Internet
[1]	Earthing component	CPX-EPFE-EV	For right/left end plate	51
[2]	End plate	CPX-EP	• Mounting holes for wall mounting • Functional earth connection • Special earthing plate for safe and easy connection to the machine bed or DIN rail • External power supply for the entire system	51
[3]	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 • PROFINET to AIDA standard in metal housing, fast start-up	64
	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	57
[4]	Polymer interlinking block	CPX-GE	• Internal linking of the power supply and serial communication • External power supply for the entire system or for outputs or valves • Connection accessories for M18, 7/8" • Linking with tie rods	50
	Interlinking block, metal	CPX-M-GE	• Internal linking of the power supply and serial communication • External power supply for the entire system or for outputs • Transmission of the power supply • Connection accessories for M12x1, 7/8" or AIDA push-pull • Individual linking with M6 screws, individually expandable	50

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Peripherals overview

Designation		Type	Description	→ Page/Internet
[5]	Electronics module	CPX-4DE	Input module with 4 digital inputs, positive logic (PNP)	124
		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-F8DE-P	PROFIsafe input module with 8 digital inputs	129
		CPX-16DE	Input module with 16 digital inputs, internal electronic fuse per module	135
		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	141
		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	147
		CPX-2ZE2DA	Counter module with 2 digital inputs and 2 digital outputs	152
		CPX-2AE-U-I	Input module with 2 analogue current or voltage inputs	156
		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	163
		CPX-4AE-TC	Input module for temperature inputs with cold junction compensation	167
		CPX-2AA-U-I	Output module with 2 analogue current or voltage outputs	171
		CPX-FVDA-P2	PROFIsafe shut-off module for shutting off the supply voltage for valves, with two digital outputs	175
[6]	Polymer 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 • Connecting cables M8/M12/Sub-D, etc. • Modular system for M8/M12 connecting cables	–
[7]	Connection block including electronics module and interlinking block	CPX-L	• Spring-loaded terminal • Degree of protection IP20 • Digital input module with 16 inputs • Digital I/O module with 8 inputs and 8 outputs • Polymer connection block	–
[8]	Analogue electronics module for pressure inputs	CPX-4AE-P	• Pneumatic connection QS-4 • Degree of protection IP 65, IP67 • 4 analogue pressure inputs (0 ... 10 bar, –1 ... +1 bar)	161
[9]	CP interface	CPX-CP	• Interfaces for decentralised installation systems, thus optimising the pneumatic control chains (short tubes/short cycle times) • Actuation for I/O modules and valve terminals • Power supply and bus interface via the same cable • Connection technology M9, M12 • Degree of protection IP 65, IP67	105
	CTEL interface	CPX-CTEL		110
[10]	Metal connection block	CPX-M-AB	• Can be combined with the electronics modules • Connection technology M12x1, 5-pin • Degree of protection IP 65, IP67 • Connection accessories for M12 • Connecting cables M12 • Modular system for choice of connecting cables M12	–
[11]	Pneumatic interface VTSA	VABA-S6	• Control of valve terminal VTSA/VTSA-F/VTSA-F-CB • Control of pressure sensors	206
[12]	Pneumatic interface MPA-S	VMPA-FB	• Control of valve terminal MPA-S • Control of pressure sensors • Control of proportional pressure regulators	201
[13]	Pneumatic interface MPA-L	VMPAL-EPL-CPX	Control of valve terminal MPA-L	204
[14]	Web monitor	–	• Website integrated in the CPX terminal • Dynamic status indication • Online diagnostics and SMS/email alert	–

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Peripherals overview

Individual overview of modules

Bus node

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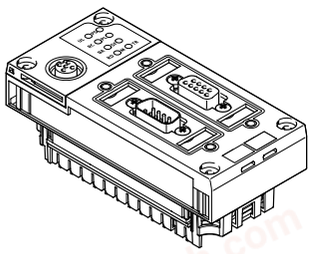

Bus node for
- PROFIBUS DP
- DeviceNet®
- CANopen
- CC-Link®
- EtherNet/IP
- PROFINET
- POWERLINK
- EtherCAT®
- Sercos III

Control block

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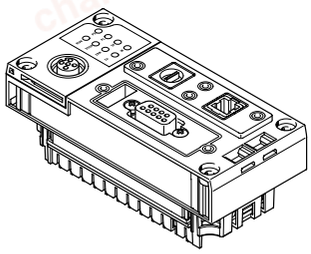

CPX-CEC
- Programming with CODESYS
- Ethernet interface
- Modbus/TCP
- EasyIP
- CANopen master

CP interface

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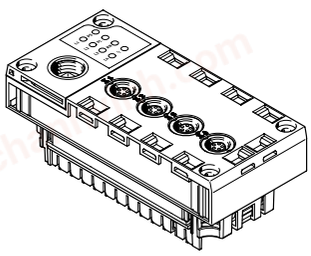

Interface CPX-CP
- 4 CP strings
- Max. 4 modules per string
- 32 inputs/32 outputs per string
- CPI functionality

CTEL interface

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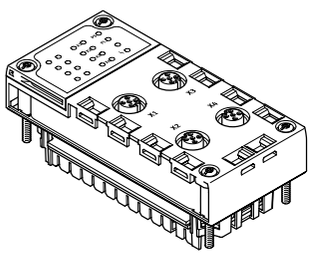

Interface CPX-CTEL
- CTEL master
- Max. 4 devices with individual electronic protection
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m

Electrical interface CPX-CTEL-2

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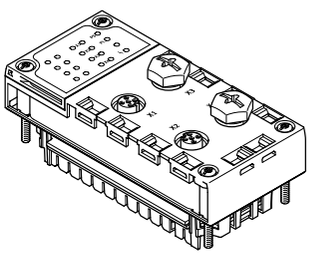

Interface CPX-CTEL-2
- Master for IO-Link®
- Max. 2 devices with individual electronic protection
- The process data length of the inputs and outputs is limited to 16 bytes for inputs and 16 bytes for outputs per port
- The maximum length of a string is 20 m

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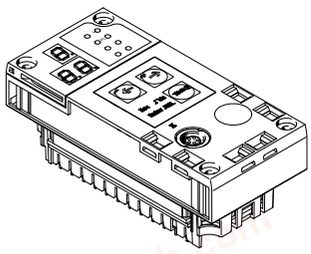
Peripherals overview

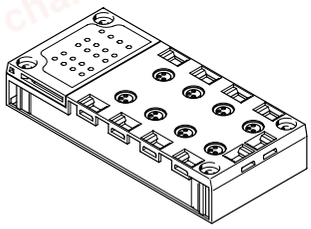
Individual overview of modules

Modules for actuating pneumatic drive units → Page 121



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

Polymer connection block

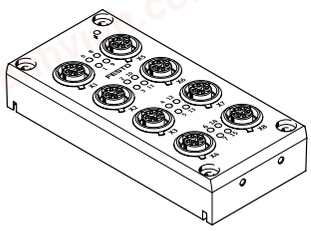


Direct machine mounting
(degree of protection IP65, IP67)
- M8-3POL
- M8-4POL
- M12-5POL
- M12-5POL quick lock, shielded with metal thread
- M12-8POL
- Sub-D
- Spring-loaded terminal with cover

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

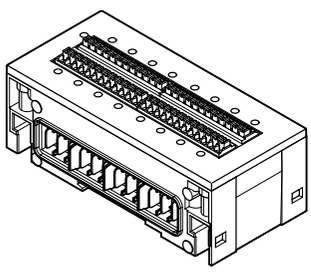
Shielding concept
- Optional screening plate for connection blocks with M12 connection technology

Metal connection block



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

Connection block including electronics module and interlinking block



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

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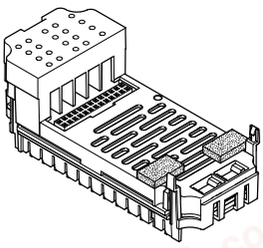
Peripherals overview

Individual overview of modules

Digital electronics module for inputs/outputs → Page 124

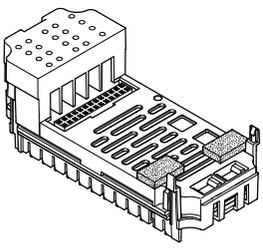


Digital inputs
- 4 digital inputs
- 8 digital inputs NPN
- 8 digital inputs PNP
- 8 digital inputs PNP with individual channel diagnostics
- 16 digital inputs
- 16 digital inputs with individual channel diagnostics

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

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

Analogue electronics module for inputs/outputs → Page 156

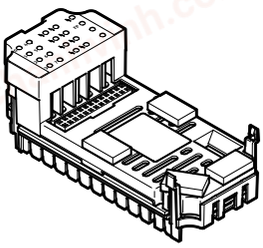


Analogue inputs
- 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue inputs (1 ... 5 V, 0 ... 10 V, –5 ... +5 V, –10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, –20 ... +20 mA)

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)

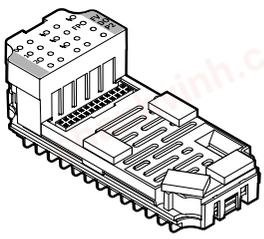
Analogue outputs
- 2 analogue outputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)

PROFIsafe input module → Page 129



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

PROFIsafe shut-off module → Page 175



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

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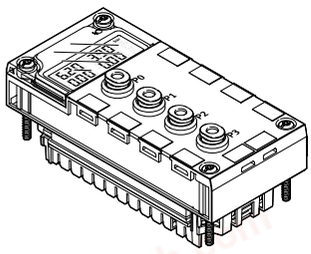
Peripherals overview

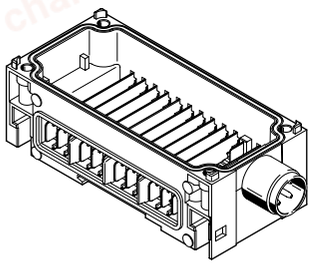
Individual overview of modules

Analogue electronics module for pressure inputs → Page 161



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

Polymer interlinking block – Interlinking using tie rods → Page 184



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

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

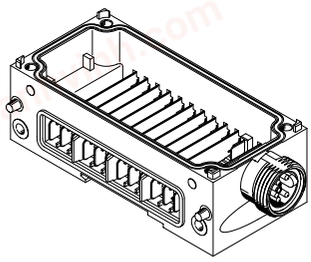
In addition to system linking, power supply for the
- Electronics plus sensors (16 A)
- Valves plus actuators (16 A)

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

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

Extendibility
- Can be extended by an interlinking block with tie rod extension CPX-ZA-1-E

Metal interlinking block – Individual linking → Page 185



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

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

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

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

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

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

to a further CPX terminal or another consuming device.

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

Note

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

Note

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

Note

Appropriate interlinking blocks (CPX-...-VL) must be used in ATEX environments as per the certification (→ page 48). The maximum supply is limited to 8 A for these modules.

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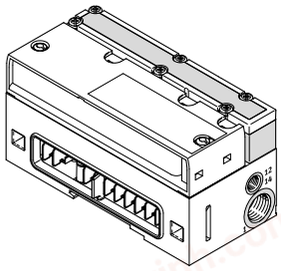
Peripherals overview

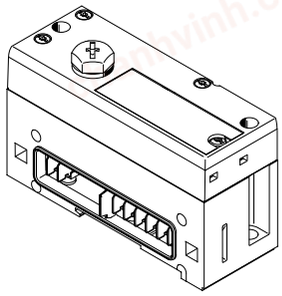
Individual overview of modules

Pneumatic interface MPA-S → Page 201



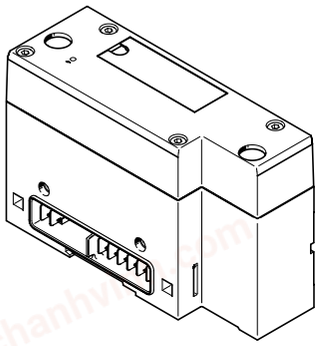
Valve terminal
- MPA1 (360 l/min)
- MPA14 (550 l/min)
- MPA2 (700 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- For CPX polymer design
- For CPX metal design
- Control of pressure sensors
- Proportional pressure regulators
- Pressure sensors
- Proportional pressure regulators

Pneumatic interface MPA-L → Page 204



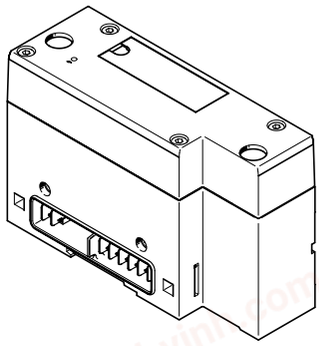
Valve terminal
- MPA1 (360 l/min)
- MPA14 (670 l/min)
- MPA2 (870 l/min)
- Up to 32 solenoid coils
- For CPX polymer design

Pneumatic interface VTSA/VTSA-F → Page 206



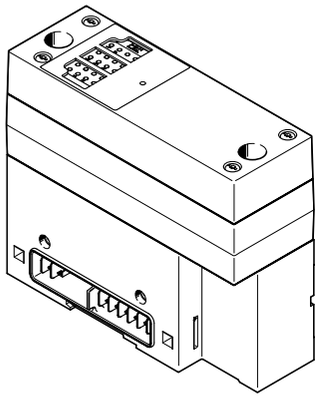
Valve terminal (valve flow rate according to width)
- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- 65 mm (4000 l/min)
- Max. 32 valve positions/max. 32 solenoid coils
- For CPX polymer design
- For CPX metal design

Pneumatic interface VTSA-F-CB → Page 208



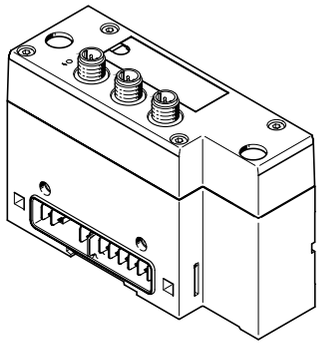
Valve terminal (valve flow rate according to width)
- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- Max. 24 valve positions/max. 24 solenoid coils
- For CPX polymer design
- For CPX metal design

Pneumatic interface VTSA-F-CB → Page 208



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

Pneumatic interface VTSA-F-CB → Page 208



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

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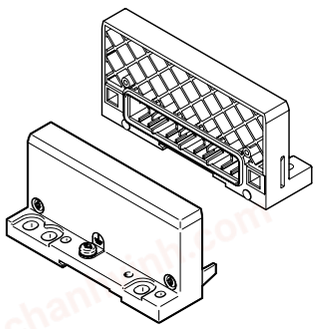
Peripherals overview

Individual overview of modules

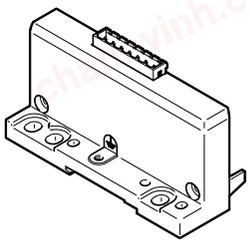
End plate for polymer/metal design



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

End plate with system supply

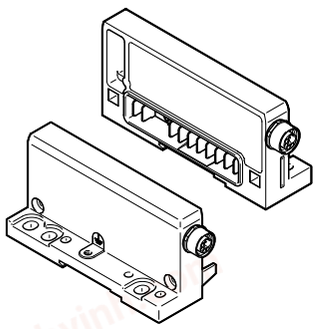
➔ Page 180



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

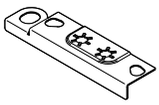
End plate with extension

➔ Page 182



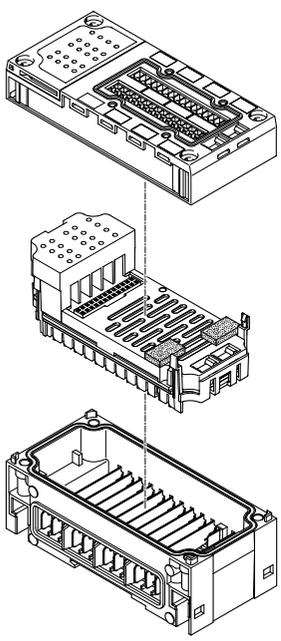
End plate
- Left
- Right
- Enables the CPX terminal to be separated into two interconnected units (series)
- Simplifies control cabinet installation
- For polymer or metal design

Earthing plate (for end plate for polymer design)



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

General basic data and guidelines



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

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Peripherals overview

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

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

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Peripherals overview

Combination of connection blocks with digital output modules and multi I/O modules

	Digital electronics modules						
	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-8DE-8DA	CPX-L-8DE-8DA	CPX-2ZE2DA	CPX-FVDA-P2
Connection blocks, polymer design							
CPX-AB-8-M8-3POL	■	■	–	–	–	–	–
CPX-AB-8-M8X2-4POL	■	■	■	–	–	–	–
CPX-AB-4-M12x2-5POL	■	■	–	–	–	–	–
CPX-AB-4-M12x2-5POL-R	■	■	■	–	–	–	–
CPX-AB-8-M12X2-5POL	–	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	■	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	–	–	■
CPX-AB-1-SUB-BU-25POL	■	■	■	■	–	–	–
CPX-AB-ID-P	–	–	–	–	–	–	–
Connection blocks, metal design							
CPX-M-AB-4-M12X2-5POL	■	■	■	–	–	–	■
CPX-M-AB-4-M12X2-5POL-T	–	–	–	–	–	–	–
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–	–

Combinations of connection blocks and analogue electronics modules for inputs/outputs

	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, polymer design							
CPX-AB-8-M8-3POL	–	–	–	–	–	–	–
CPX-AB-8-M8X2-4POL	–	–	–	–	–	–	–
CPX-AB-4-M12x2-5POL	■	■	■	■	–	■	■
CPX-AB-4-M12x2-5POL-R	■	■	■	■	–	■	■
CPX-AB-8-M12X2-5POL	–	–	–	–	–	–	–
CPX-AB-4-M12-8POL	–	–	–	–	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	–	■	■
CPX-AB-1-SUB-BU-25POL	■	■	■	■	–	–	–
CPX-AB-ID-P	–	–	–	–	–	–	–
Connection blocks, metal design							
CPX-M-AB-4-M12X2-5POL	■	■	■	■	–	■	■
CPX-M-AB-4-M12X2-5POL-T	–	–	–	–	–	–	–
CPX-M-AB-8-M12X2-5POL	–	–	–	–	–	–	–

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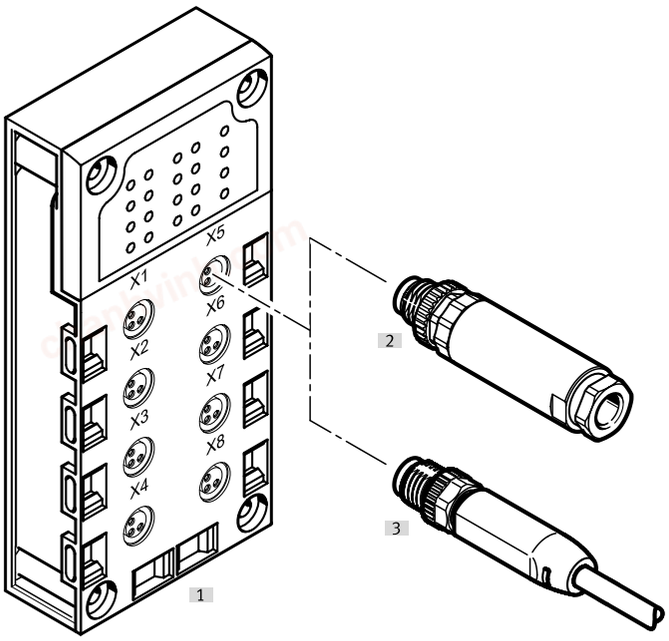
Key features – Electrical components

Electrical connection – Connection block

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



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

Note

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

- Tailored to the application
- Perfect fit
- Easy to install

Combination of connection block and electrical connection technology

Manifold block	Connection technology	Plug connector/connecting cable	Connection technology
[1] CPX-AB-8-M8-3POL	Socket, M8, 3-pin	[2] NECB-S-M8G3-C2	Screw terminals
		[3] NEBA-...-M8G3 (Modular system for choice of connecting cables)	Socket, M8, 3-pin
			Socket, M8, 4-pin
			Socket M12, 5-pin
			Open cable end

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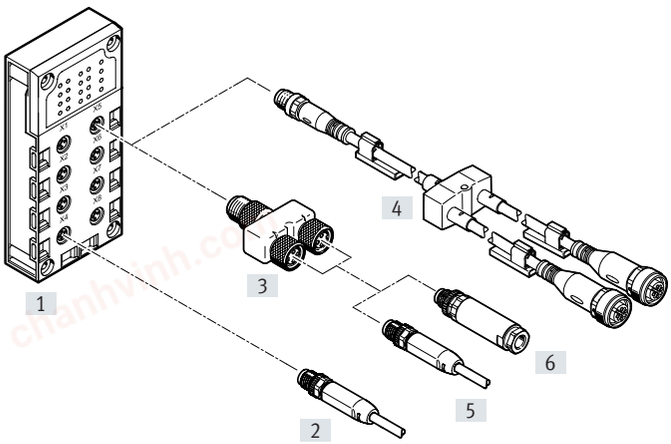
Key features – Electrical components

Electrical connection – Connection block

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



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

Combination of connection block and electrical connection technology

Manifold block	Connection technology	Plug connector/connecting cable	Connection technology	Plug connector/connecting cable	Connection technology
[1] CPX-AB-8-M8X2-4POL	Socket, M8, 4-pin	[2] NEBA-...-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] NECB-S-M8G3-C2	Screw terminals
				[5] NEBA-...-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	–	–

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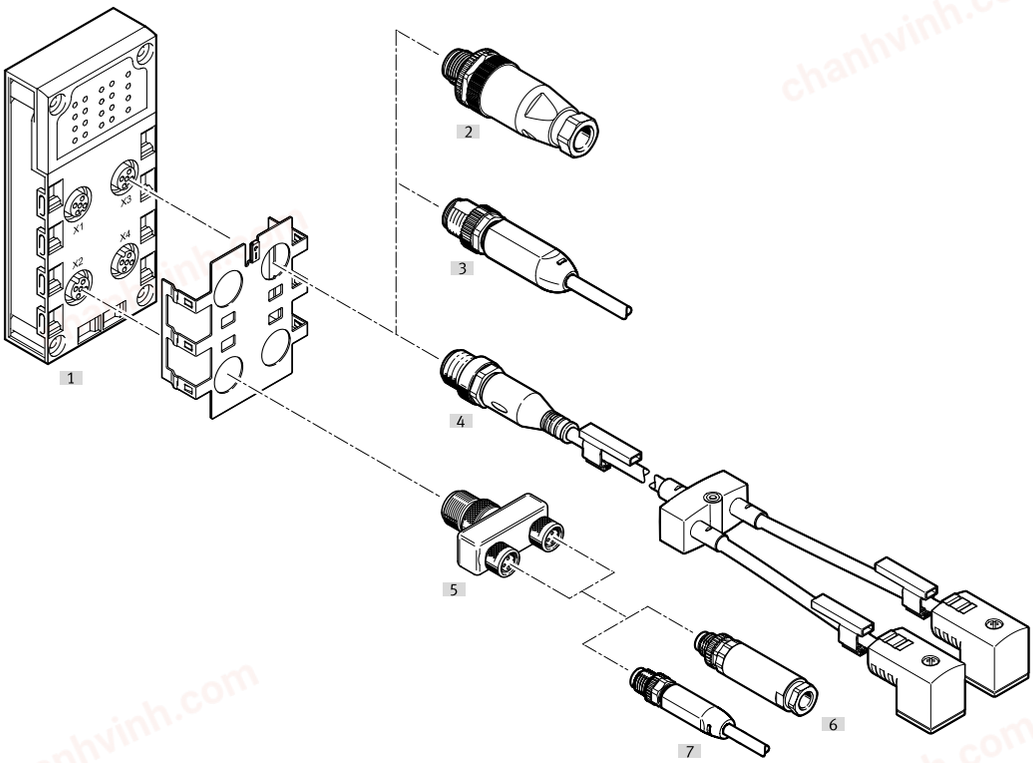
Key features – Electrical components

Electrical connection – Connection block

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



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

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Key features – Electrical components

Combination of connection block and electrical connection technology

Manifold block	Connection technology	Plug connector/connecting cable	Connection technology	Plug connector/connecting cable	Connection technology
[1] CPX-AB-4-M12x2-5POL CPX-AB-4-M12x2-5POL-R	Socket M12, 5-pin	[2] NECB-S-M12G4-C2	Screw terminals	–	–
		[2] NECB-S-M12G5-C2	Screw terminals	–	–
		[2] NECB-S-M12G4-C2-D	Screw terminals, for two cables	–	–
		[2] NECB-S-M12G5-C2-D	Screw terminals, for two cables	–	–
		[3] NEBA-...-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] NECB-S-M8G3-C2	Screw terminals
				[7] NEBA-...-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] NECB-S-M12G4-C2	Screw terminals
				[6] NECB-S-M12G5-C2	Screw terminals
				[6] NECB-S-M12G4-C2-D	Screw terminals, for two cables
				[6] NECB-S-M12G5-C2-D	Screw terminals, for two cables
				[7] NEBA-...-M12G5 (Modular system for choice of connecting cables)	Socket, M8, 4-pin
					Socket M12, 5-pin
					Open cable end

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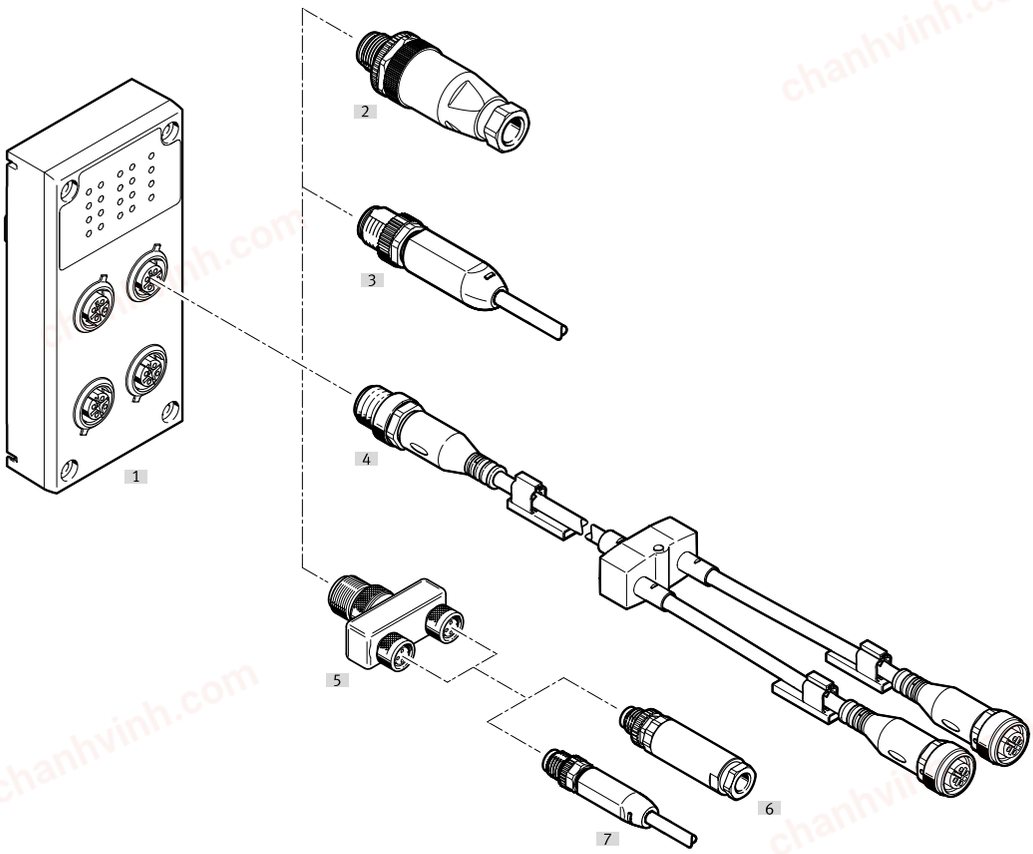
Key features – Electrical components

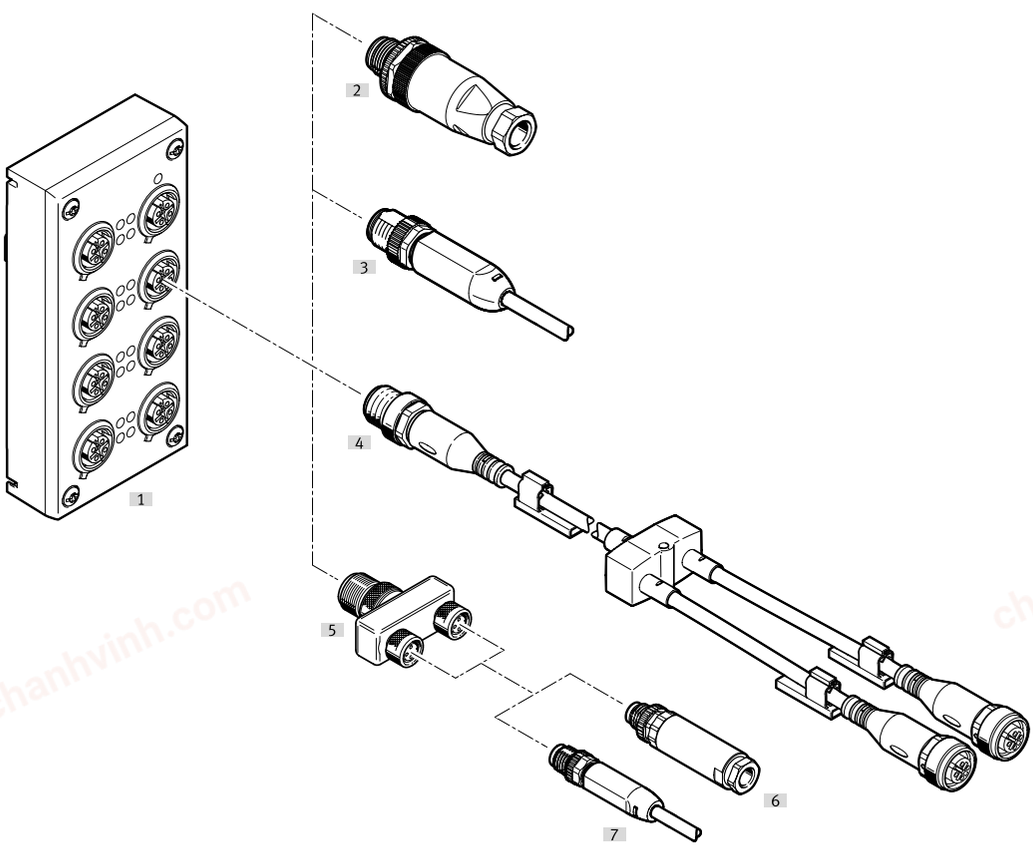
Electrical connection – Connection block (metal design)

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



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

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



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

Note

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

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Key features – Electrical components

Combination of connection block and electrical connection technology

Manifold block	Connection technology	Plug connector/connecting cable	Connection technology	Plug connector/connecting cable	Connection technology
[1] CPX-M-AB-4-M12X2-5POL CPX-M-AB-4-M12X2-5POL-T CPX-M-AB-8-M12X2-5POL CPX-AB-8-M12X2-5POL	Socket M12, 5-pin	[2] NECB-S-M12G4-C2	Screw terminals	–	–
		[2] NECB-S-M12G5-C2	Screw terminals	–	–
		[2] NECB-S-M12G4-C2-D	Screw terminals, for two cables	–	–
		[2] NECB-S-M12G5-C2-D	Screw terminals, for two cables	–	–
		[3] NEBA-...-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] NECB-S-M8G3-C2	Screw terminals
				[7] NEBA-...-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] NECB-S-M12G4-C2	Screw terminals
				[6] NECB-S-M12G5-C2	Screw terminals
				[6] NECB-S-M12G4-C2-D	Screw terminals, for two cables
				[6] NECB-S-M12G5-C2-D	Screw terminals, for two cables
				[7] NEBA-...-M12G5 (Modular system for choice of connecting cables)	Socket, M8, 4-pin
					Socket M12, 5-pin
					Open cable end

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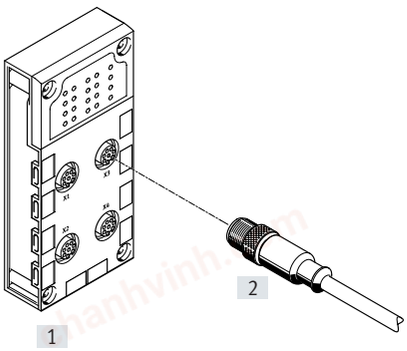
Key features – Electrical components

Electrical connection – Connection block

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

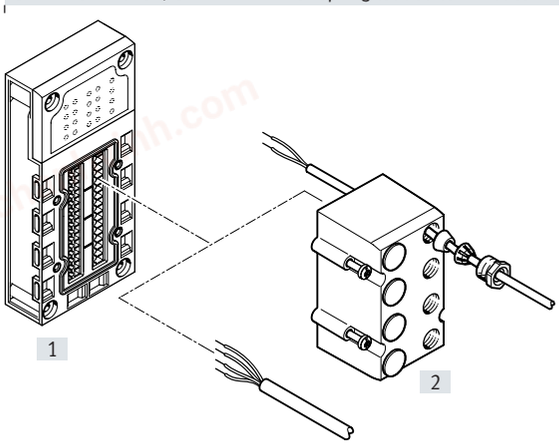


- Connection to cylinder/valve combinations with max. 3 inputs and 2 outputs
- 4 sockets
- 8-pin design per socket

Combination of connection block and electrical connection technology

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

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



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

Combination of connection block and electrical connection technology

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

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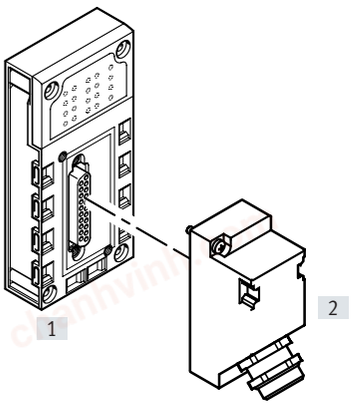
Key features – Electrical components

Electrical connection – Connection block

CPX-AB-1-SUB-BU-25POL with Sub-D connection, 25-pin



- Multi-pin connection for I/O distributors or control console
- One socket
- 25-pin design

Combination of connection block and electrical connection technology

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

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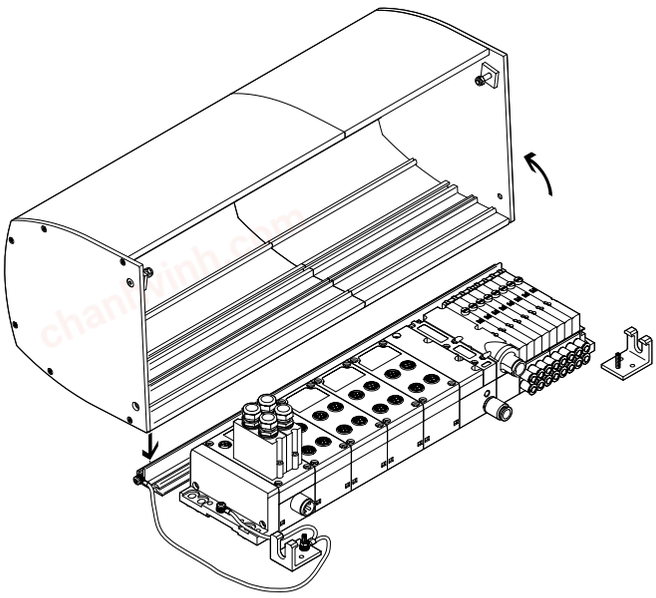
Key features – Mounting

Hood

Description → Page 218



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

The rail and the two mounting brackets are mounted on a base plate. The hood is attached to the retaining rail and secured with two screws. There is also a stand-by position (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 plug connectors (by securing the hood with at least one special fastener to EN 60079-0, 9.2 and 20)
- UV protection for the CPX and MPA modules underneath

Points to note when using the CPX hood

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

Note

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

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

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

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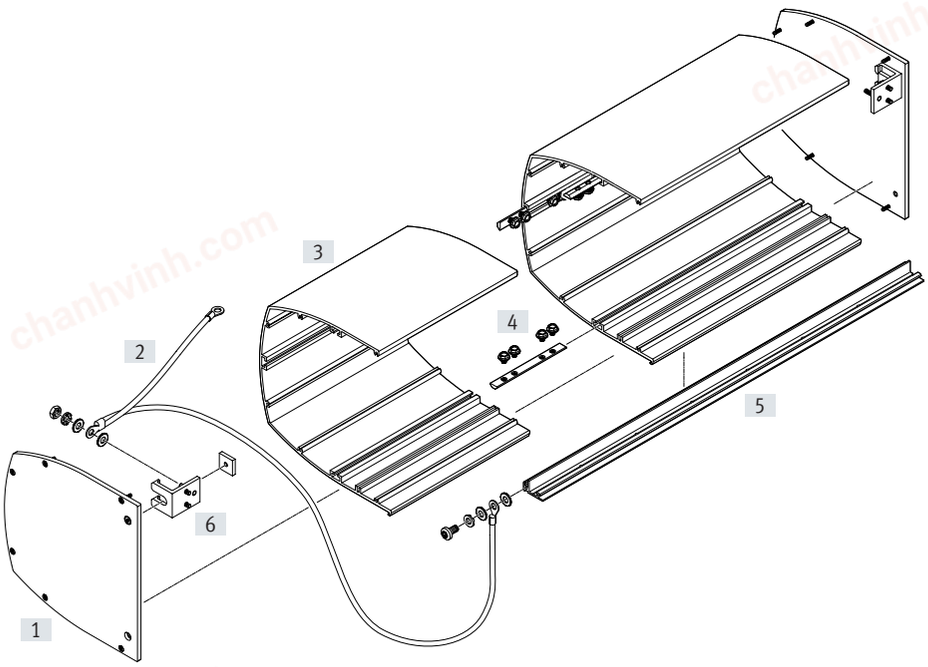
Key features – Mounting

Hood

Assembly



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

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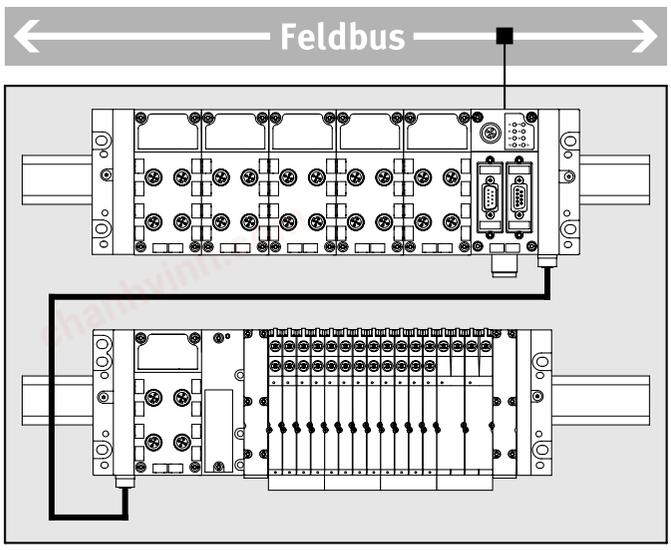
Key features – Mounting

Extension

Operating principle



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

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

Performance limits

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

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

Optimisation

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

Configuration rules

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

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

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

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Key features – Mounting

Extension – Permissible CPX modules

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

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Key features – Mounting

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

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Key features – Mounting

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

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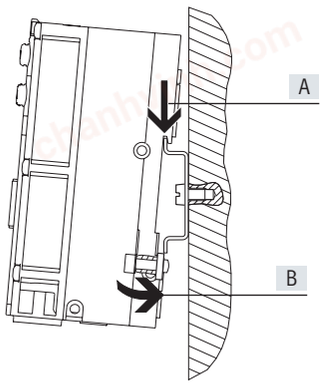
Key features – Mounting

Mounting options

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

DIN rail mounting

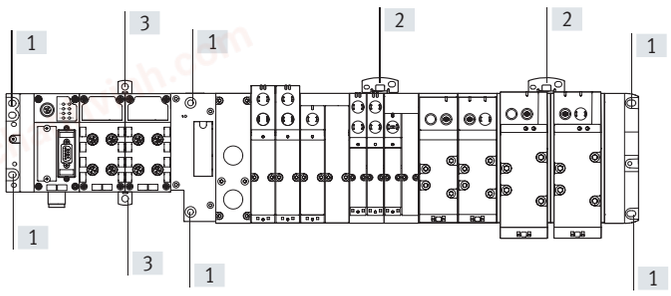


The DIN rail mounting is part of the rear profile of the CPX interlinking blocks. The CPX terminal can be attached to the DIN rail using the DIN rail mounting kit.
The CPX terminal is first hooked onto the DIN rail (see arrow [A]), then swivelled onto the DIN rail and secured in place with the clamping 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 DIN rail mounting:
- CPX-CPA-BG-NRH

This enables the CPX terminal to be mounted on DIN rails in accordance with EN 60715.
An additional mounting kit may be required for combination with valve terminals.

Wall mounting



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

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

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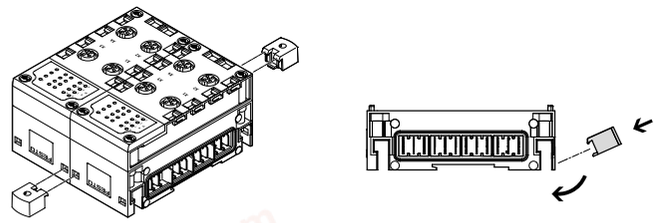
Key features – Mounting

CPX terminal in polymer design

Additional mountings

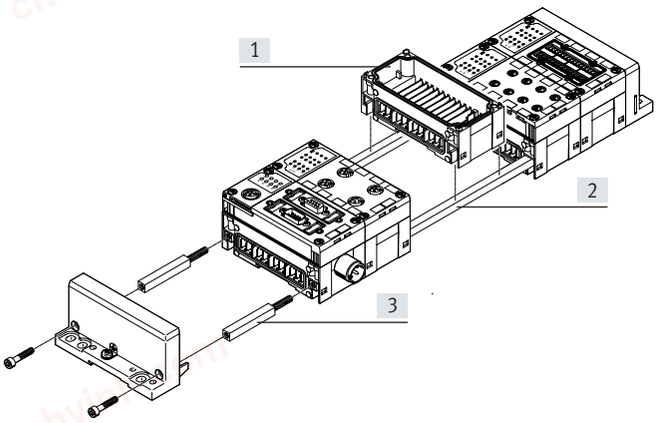


Additional mounting components for the CPX terminal that can be fitted between two modules are available for longer valve terminals.

Note

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

Interlinking with tie rods

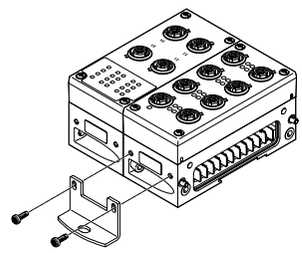


The mechanical connection between the CPX modules is created using special tie rods [2]. The entire unit can be assembled using two screws in the end plates.
The tie rod ensures that the unit has a high mechanical load-bearing capacity and is therefore the mechanical “backbone” of the CPX terminal.

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

CPX terminal in metal design

Additional mountings

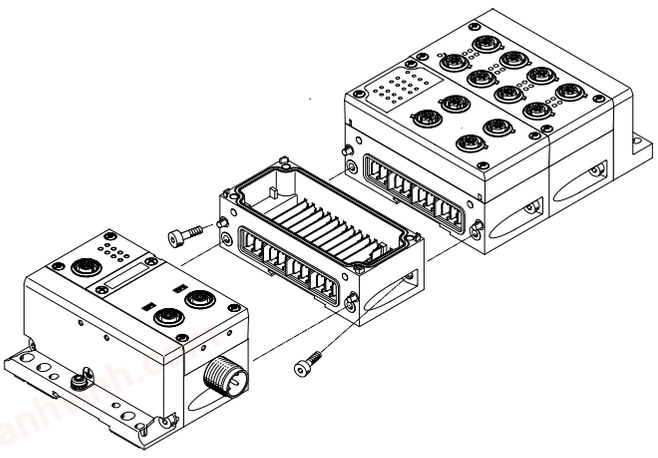


Additional mounting brackets for the CPX terminal that can be screwed onto the interlinking blocks are available for longer valve terminals.
The mounting bracket CPX-M-BG-VT-2X enables a CPX terminal with valve terminal VTSA/VTSA-F/VTSA-F-CB to be mounted on a support system.

Note

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

Linking with screws



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

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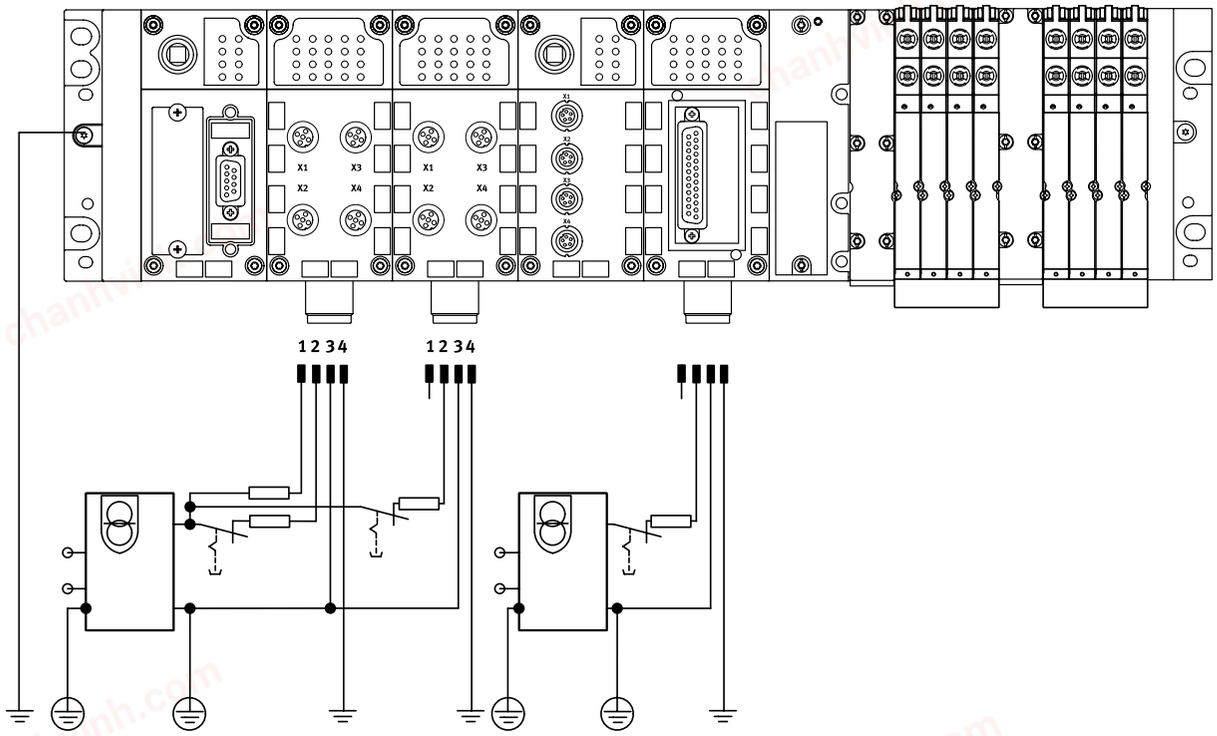
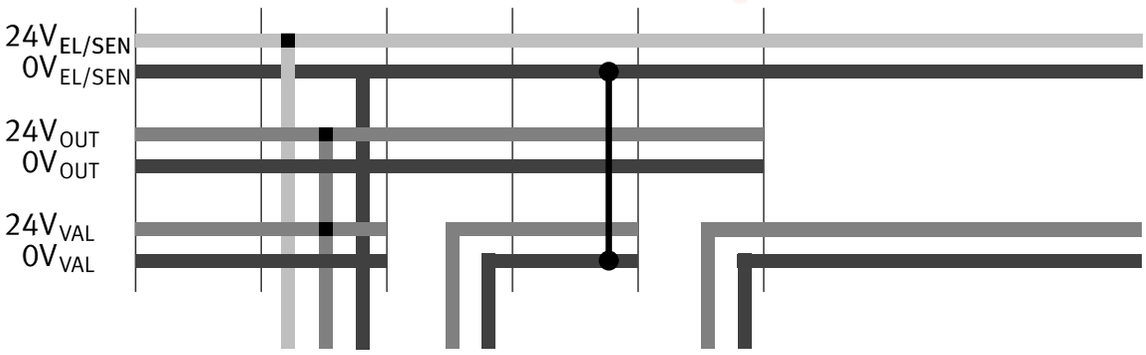
Key features – Power supply

Power supply concept

General





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

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

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

in this case.

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

Interlinking blocks

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

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

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

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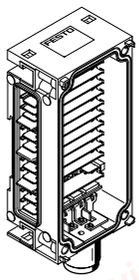
Key features – Power supply

Interlinking blocks

With system supply



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

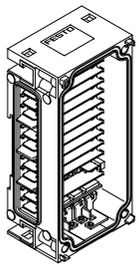
Metal design
- CPX-M-GE-EV-S-7/8-CIP-4P
- CPX-M-GE-EV-S-7/8-5POL
- CPX-M-GE-EV-S-M12-5POL
- CPX-M-GE-EV-S-PP-5POL

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

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

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

Without power supply



Polymer design
- CPX-GE-EV

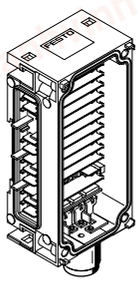
Metal design
- CPX-M-GE-EV
- CPX-M-GE-EV-FVO

–

–

–

With additional supply for outputs



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

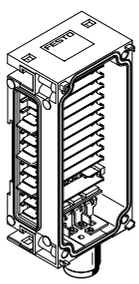
Metal design
- CPX-M-GE-EV-Z-7/8-5POL
- CPX-M-GE-EV-Z-PP-5POL

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

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

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

With additional supply for valves



Polymer design
- CPX-GE-EV-V

Connection technology
- M18, 4 pin

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

Note

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

Note

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

Note

Suitable versions of the interlinking blocks with M18 and 7/8", 5-pin connection are available (CPX-GE-EV-...-VL and CPX-M-GE-EV-...-VL) for use in ATEX environments as per certification (➔ page 48). The maximum current supply for these interlinking blocks is 8 A.

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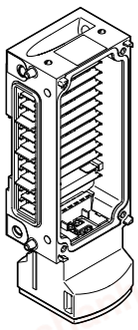
Key features – Power supply

Interlinking blocks

With system forwarding



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

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

Power transmission
- For a further CPX terminal

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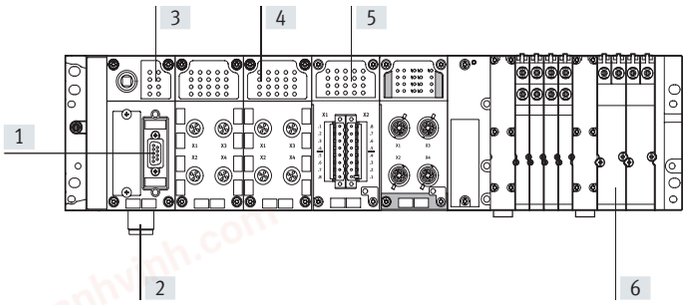
Key features – Diagnostics

Diagnostics

System performance



[1] Diagnostics via bus interface
[2] Undervoltage monitoring
[3] Diagnostic overview LED
– Fieldbus status
– CPX status
[4] Status and diagnostic LED for module and I/O channels
[5] Module and channel-specific diagnostics
[6] Valve-specific diagnostic module and solenoid coils
[7] MPA pressure sensor – integrated solution on the fieldbus
– Pre-assembled for channels 1, 3, 5 and external pressures

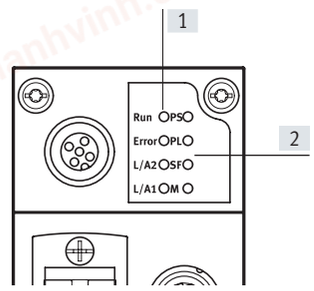
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on-the-spot diagnostics using LEDs or a diagnostic interface and diagnostics using a bus interface.

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

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

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

Overview of LEDs on the bus node



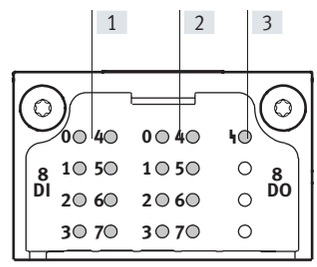
[1] Fieldbus-specific LEDs

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

[2] CPX-specific LEDs

A further 4 CPX-specific LEDs provide non-fieldbus-specific information about the status of the CPX terminal, for example:
– Power system
– Power load
– System error
– 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-related diagnostic LEDs
Depending on the module design, another diagnostic LED is available for each I/O channel

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

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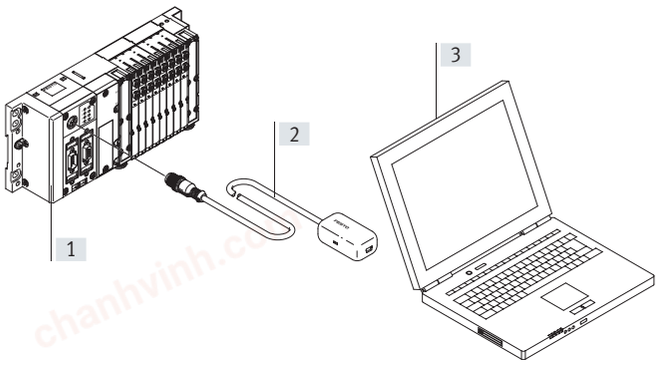
Key features – Diagnostics

Diagnostics

Display on a PC



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

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Key features – Parameterisation

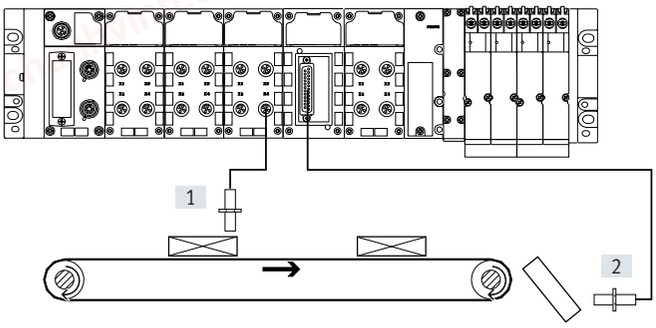
Parameterisation

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

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

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

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



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

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Key features – Addressing

Addressing

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

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

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

Note

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

Overview – Address space for CPX bus node and control block

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

Note

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

Example of CPX-FB43 (PROFINET RT)

	Digital inputs	Digital outputs	Remarks
1x CPX-CTEL-4-M12-5POL	256	256	• The address space is occupied by 7 CPX I/O modules plus pneumatic interface • No additional modules can be configured
2x CPX-2ZE2DA	192	192	
4x CPX-16DE	64	–	
8x VMPA1	–	64	
Assigned address space	512	512	

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

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Key features – Addressing

Overview – Allocated addresses for CPX modules

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

1) Dependent on the DIL switch setting on the module

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Datasheet

Module width
50 mm

Repair service



Note

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

Example

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

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

General technical data			
Module no.			197330
Max. number of modules1)	Control block		1
	Bus node		1
	I/O modules/CP interface/CTEL interface/electrical interface CPX-CTEL-2/axis interface		9
	Pneumatic interface		1
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
Internal cycle time		[ms]	< 1
Configuration support			Fieldbus-specific
LED displays	Bus node/control block/gateway		Up to 4 LEDs, bus-specific 4 LEDs, CPX-specific • PS = Power system • PL = Power load • SF = System error • M = Modify parameter/forcing active
	I/O modules		Min. one group diagnostic LED Channel-oriented status and diagnostic LED, depending on the module
	Pneumatic interface		One group diagnostic LED Valve status LED on valve
Diagnostics			• Channel- and module-orientated diagnostics for inputs/outputs and valves • Detecting the 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)

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General technical data			
Module no.			197330
Parameterisation			Diagnostic behaviour
			Fail-safe response
			Forcing of channels
			Signal setup
Commissioning support			Forcing of inputs and outputs
Degree of protection to EN 60529			IP65, IP67
Nominal operating voltage		[V DC]	24
Operating voltage range		[V DC]	18 ... 30
Power supply	Interlinking block with system supply		
	Electronics plus sensors		
	Actuators plus valves	[A]	16 (8/10 with 7/8" supply, 5-pin/4-pin)
		[A]	16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional supply		
	Actuators	[A]	16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional power supply for valves	[A]	16 (10 with 7/8" supply, 4-pin)
Current consumption			Depending on the system configuration
Power failure buffering (bus electronics only)		[ms]	10
Power supply connection			M18, 4 pin
			7/8" 5-pin
			7/8" 4-pin
			AIDA push-pull, 5-pin
Fuse concept			Per module with electronic fuses
Tests	Vibration test to DIN IEC 68		• With wall mounting: severity level 2 • With DIN rail mounting: severity level 1
	Shock test to DIN IEC 68		• With wall mounting: severity level 2 • With DIN rail mounting: severity level 1
LABS (PWIS) conformity			VDMA24364-B2-L
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
Grid dimension		[mm]	50

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

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Datasheet

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

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

Note

The values indicated represent the maximum performance limits that can be achieved with the fully assembled product. Depending on the individual components used, the actual value 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

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Weight [g]		
Control block	CEC	155
	CEC...V3	135
Bus node	FB11	120
	FB13	115
	FB23-24	115
	FB36	125
	FB37	125
	FB39	125
	FB40	125
	FB43	185
	FB44	280
	FB45	280
I/O module	4 digital outputs	42
	4 digital inputs	39
	8 digital inputs	39
	8 digital inputs, positive logic (PNP), enhanced diagnostic function	45
	8 digital inputs, negative logic (NPN)	40
	16 digital inputs, internal electronic fuse per module	41
	16 digital inputs, internal electronic fuse per channel pair, for CPX in metal	46
	16 digital inputs, for CPX in polymer, including interlinking block and connection block with spring-loaded terminals	167
	8 digital inputs, 8 digital outputs	48
	8 digital inputs, 8 digital outputs, for CPX in polymer, including interlinking block and connection block with spring-loaded terminals	171
	8 digital outputs, power supply 0.5 A per channel	49
	8 digital outputs, power supply 2.1 A per channel pair	48
	2 analogue current or voltage inputs	48
	4 analogue current inputs	47
	2 analogue current or voltage outputs	49
	2 or 4 analogue temperature inputs	47
	4 analogue temperature inputs, with 2-conductor connection for a PT1000 sensor for cold junction compensation	46
	4 analogue pressure inputs	115
PROFIsafe	Shut-off module	50
	Input module	46
Counter module	2ZE2DA	130
CP interface	CP	139
CTEL interface	CTEL	110

Weight [g]		
Electrical interface	CTEL-2	110
Axis controller	CMAX	140
Polymer connection block	8-way, M8 3-pin	62
	8-way, M8 4-pin	65
	4-way, M12 5-pin	60
	4-way, M12 5-pin, quick lock, shielded with metal thread	87
	8-way, M12 5-pin	76
	4-way, M12 8-pin	65
	Spring-loaded terminal, 32-pin	75
	Sub-D 25-pin	72
	8-way, DIL switch	57
Metal connection block	4-way, M12 5-pin	112
	4-way, M12 5-pin, pulsed sensor supply	110
	8-way, M12 5-pin	152
Polymer interlinking block	Without power supply	108
	System supply	125
Interlinking block, metal	Without power supply	169
	System supply, 7/8" 4-pin	228
	System supply, 7/8" 5-pin	187
	System supply, M12x1	279
	System supply, push-pull	279
	System forwarding, M12x1	279
Tie rods	1 block	41
	2 blocks	71
	3 blocks	97
	4 blocks	127
	5 blocks	156
	6 blocks	173
	7 blocks	199
	8 blocks	247
	9 blocks	274
	10 blocks	301
End plate for polymer design	Left	110
	Left, with system supply	145
	Right	110
End plate for metal design	Left	113
End plate with extension	Left	190
	Right	175
Pneumatic interface	MPA-S	238.4
	VTSA/VTSA-F	590
	VTSA-F-CB without voltage zones	560
	VTSA-F-CB with safe voltage zones	734
	VTSA-F-CB with safe voltage zones and power supply for external consuming devices	754
	VTSA-F-CB with external power supply	580

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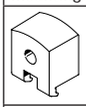
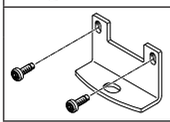
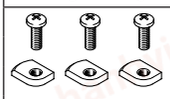
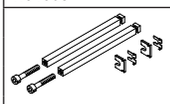
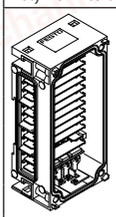
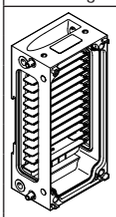
Datasheet

Ordering data – Accessories

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

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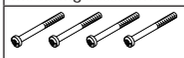
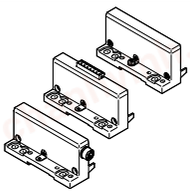
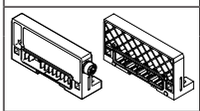
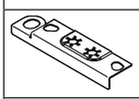
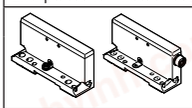
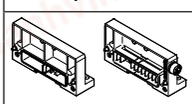
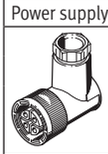
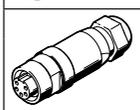
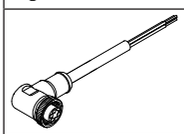
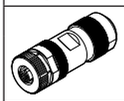
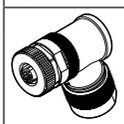
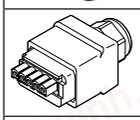
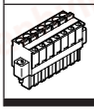
Datasheet

Ordering data – Accessories

Designation			Part no.	Type
Mounting accessories				
	Screws for mounting the bus node/connection block on the polymer interlinking block	Bus node/metal connection block	550218	CPX-DPT-30X32-S-4X
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/polymer connection block	550219	CPX-M-M3x22-4x
		Bus node/metal connection block	550216	CPX-M-M3x22-S-4x
End plates for polymer design				
	Left end plate	–	195716	CPX-EPL-EV
		With system supply	576315	CPX-EPL-EV-S
		With extension	576314	CPX-EPL-EV-X
	Right end plate	–	195714	CPX-EPR-EV
		With extension	576313	CPX-EPR-EV-X
	Earthing component for right/left end plate	Pack of 5	538892	CPX-EPFE-EV
End plates for metal design				
	Left end plate	–	550212	CPX-M-EPL-EV
		With extension	576317	CPX-M-EPL-EV-X
	Right end plate	–	550214	CPX-M-EPR-EV
		With extension	576316	CPX-M-EPR-EV-X
Power supply				
	Plug socket for mains connection M18x1, straight, 4-pin	For 1.5 mm2	18493	NTSD-GD-9
		For 2.5 mm^2	18526	NTSD-GD-13,5
	Plug socket for mains connection M18x1, angled, 4-pin	For 1.5 mm2	18527	NTSD-WD-9
		For 2.5 mm^2	533119	NTSD-WD-11
	Plug socket for mains connection 7/8", straight, 5-pin	0.25 ... 2.0 mm^2	543107	NECU-G78G5-C2
	Plug socket for mains connection 7/8", straight, 4-pin	0.25 ... 2.0 mm^2	543108	NECU-G78G4-C2
	Plug socket for mains connection 7/8", angled, 5-pin – open cable end, 5-core	2 m	573855	NEBU-G78W5-K-2-N-LE5
	Power supply socket M12x1, L-coded, straight	5-pin	8166793	NECL-L12G5-C2-Q10
	Power supply plug M12x1, L-coded, straight	5-pin	8166791	NECL-S-L12G5-C2-Q10
	Power supply socket M12x1, L-coded, angled	5-pin	8166794	NECL-L12W5-C2-Q10
	Power supply plug M12x1, L-coded, angled	5-pin	8166792	NECL-S-L12W5-C2-Q10
	Push-pull power supply socket, plug pattern PP, fulfils requirements to AIDA	5-pin	5195383	NECU-M-PPG5PP-C1-PN
	Straight plug, spring-loaded terminal, for left-hand end plate with system supply	7-pin	576319	NECU-L3G7-C1

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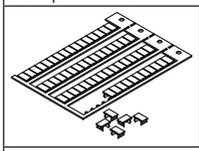
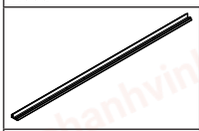
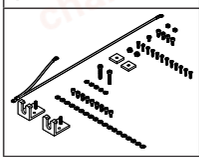
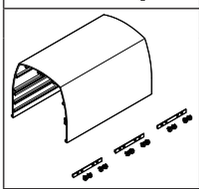
Datasheet

Ordering data – Accessories

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

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Datasheet

User documentation – General information

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

1. Installation
2. Commissioning and parameterisation
3. Diagnostics

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

The documents can be downloaded quickly and easily from the Festo website.

→ www.festo.com



Overview – User documentation

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

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Datasheet

Overview – User documentation

Type	Title	Description
Electronics		
CPX-SYS-...	System description, installation and commissioning	Overview of the design, components and mode of operation of the CPX terminal; installation and commissioning instructions as well as basic principles of parameterisation.
CPX-FVDA-P2-...	PROFIsafe shut-off module	Connection technology and mounting, installation and commissioning instructions for the PROFIsafe shut-off module of the type CPX-FVDA-P2.
CPX-_AA/-_AE-...	CPX I/O modules, digital	Connection technology and mounting, installation and commissioning instructions for digital input and output modules of type CPX-... as well as the VTSA/VTSA-F and MPA-S/L pneumatic interface.
CPX-F8DE-P-...	Input module CPX-F8DE-N	Connection technology and mounting, installation and commissioning instructions for the PROFIsafe input module of type CPX-F8DE-P.
CPX-2ZE2DA-...	I/O module CPX-2ZE2DA	Connection technology and mounting, installation and commissioning instructions for counter modules of type CPX-2ZE2DA.
CPX-_AA/-_AE-...	CPX-EA modules, analogue	Connection technology and mounting, installation and commissioning instructions for analogue input and output modules of type CPX-... as well as pressure sensors and proportional pressure regulators.
CPX-CP-4-FB-...	CPX CP interface	Instructions on mounting, installation, commissioning and diagnostics of the CP interface.
CPX-CTEL-4-M12-5POL-...	CPX CTEL interface	Instructions on mounting, installation, commissioning and diagnostics of the CPX CTEL master.
CPX-CTEL-2-M12-5POLLK-...	Electrical interface CPX-CTEL-2	Instructions on mounting, installation, commissioning and diagnostics for the CPX electrical interface for IO-Link®.
CPX-CMAX-C1-1-...	CPX axis controller	Instructions on mounting, installation, commissioning and diagnostics of the CPX axis controller (CMAX).
CPX-CMAX-C1-1-...	CPX axis controller	Information on control, diagnostics and parameterisation of the axis controller via the fieldbus.
CPX-FB...	CPX bus node	Instructions on mounting, installation, commissioning and diagnostics of the relevant bus node.
CPX-(M)-FB33_35/43_45...	CPX bus node for PROFINET	Instructions on mounting, installation, commissioning and diagnostics of the relevant bus node.
CPX-CEC-...	CPX-CODESYS controller (control block)	Instructions on mounting, installation, commissioning and diagnostics of the relevant control block.

User documentation– GSD, EDS, ...

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

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

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Datasheet – CPX maintenance tool

Function

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

- Adapter
- Software on CD-ROM



Application

Only from Festo

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

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

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

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

General technical data			
Type			NEFC-M12G5-0.3-U1G5
System requirements	PC		IBM-compatible
	Drive		CD-ROM
	Interfaces		USB port (specification USB 1.1 or higher)
	Operating system		MS Windows 2000 or XP
Function range			• Configuration and parameterisation • Reading out of system, module, channel diagnostics and error trace • Saving 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 regulations
Ambient temperature		[°C]	–5 ... +50
Material	Housing		ABS
	Cable sheath		PUR
	Pin contact		Gold-plated brass
Note on materials			RoHs-compliant
LABS (PWIS) conformity			VDMA24364-B2-L

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

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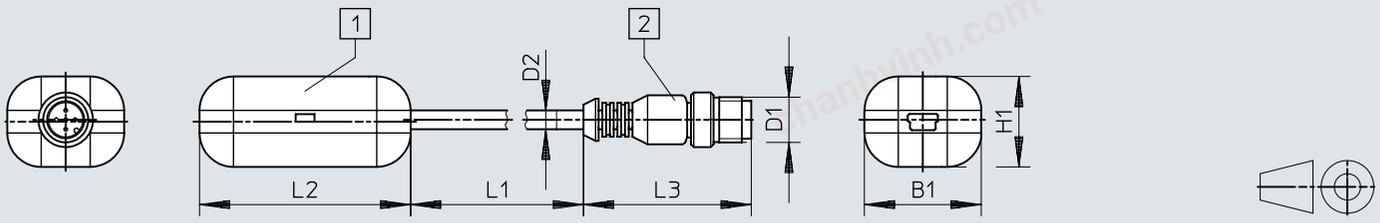
Datasheet – CPX maintenance tool

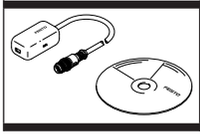
Dimensions Download CAD data ➔ www.festo.com



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

Type	B1	D1	D2	H1	L1	L2	L3
NEFC	31	M12x1	5	24	300	56	44.5

Ordering data

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

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Datasheet – CODESYS controller

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

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



Application

Bus connection

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

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

Communication protocols

- Fieldbus via CPX bus node
- 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 actuation 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 pre-processing
- Control of electric actuators as individual axes via CANopen (CPX-CEC-C1/-M1)
- Early warnings and visualisation options
- Servo-pneumatic applications

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Datasheet – 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			Diagnostics memory
			Channel and module-oriented diagnostics
			Undervoltage/short circuit of modules
LED indicators	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 error
			M: Modify/forcing active
IP address setting			DHCP
			Via CODESYS
			Via MMI
Function elements			CPX diagnostic status, copy CPX diagnostic trace, read CPX module diagnostics, and more
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 55

Materials		
Housing		Reinforced PA
		PC
Note on materials		RoHs-compliant
LABS (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 CRC1)		2

1) More information www.festo.com/x/topic/crc

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

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Datasheet – CODESYS controller

Technical data					
Type			CPX-CEC-C1	CPX-CEC-C1-V3	CPX-CEC-M1-V3
Additional functions			Motion functions for electric drives		SoftMotion functions for electric drives
CPU data	Flash	[MB]	32	32	32
	RAM	[MB]	32	256	256
	Processor	[MHz]	400	800	800
Control interface			CAN bus	CAN bus	CAN bus
Parameterisation			CODESYS V2.3	CODESYS V3	CODESYS V3
Configuration support			CODESYS V2.3	CODESYS V3	CODESYS V3
Program memory, user program		[MB]	4	16	16
Flags			Variable CODESYS concept		
	Remanent data	[kB]	30	28	28
	Global data memory	[MB]	8	–	–
Control elements			DIL switch for CAN termination		
			Rotary switch for RUN/STOP		
Total number of axes			31	127	31
Ethernet	No. of		1		
	Connection technology		RJ45 socket, 8-pin		
	Data transmission speed	[Mbps]	10/100		
	Supported protocols		TCP/IP, EasyIP, Modbus TCP		
Fieldbus interface	No. of		1		
	Connection technology		Sub-D plug, 9-pin		
	Data transmission speed, can be set via software	[kbps]	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000
	Supported protocols		CAN bus		
	Galvanic isolation		Yes		

Technical data				
Type			CPX-CEC	CPX-CEC-S1-V3
CPU data	Flash	[MB]	32	32
	RAM	[MB]	32	256
	Processor	[MHz]	400	800
Parameterisation			CODESYS V2.3	CODESYS V3
Configuration support			CODESYS V2.3	CODESYS V3
Additional functions			Diagnostic functions	
			RS232 communication function	
Program memory, user program		[MB]	4	16
Flags			Variable CODESYS concept	Variable CODESYS concept
	Remanent data	[kB]	30	28
	Global data memory	[MB]	8	–
Control elements			Rotary switch for RUN/STOP	
Ethernet	No. of		1	
	Connection technology		RJ45 socket, 8-pin	
	Data transmission speed	[Mbps]	10/100	
	Supported protocols		TCP/IP, EasyIP, Modbus TCP	
Data interface	No. of		1	
	Connection technology		Sub-D socket, 9-pin	
	Data transmission speed	[kbps]	9.6 ... 230.4	
	Supported protocols		RS232 interface	
	Max. cable length	[m]	–	30
	Galvanic isolation		Yes	

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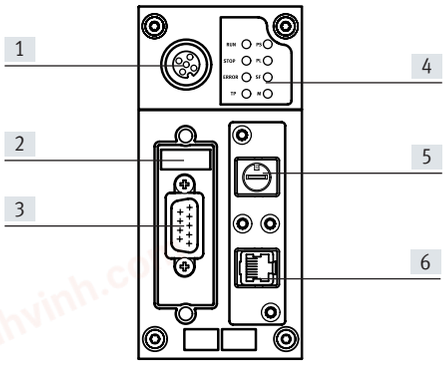
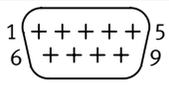
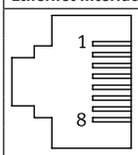
Datasheet – CODESYS controller

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 assignment – 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.

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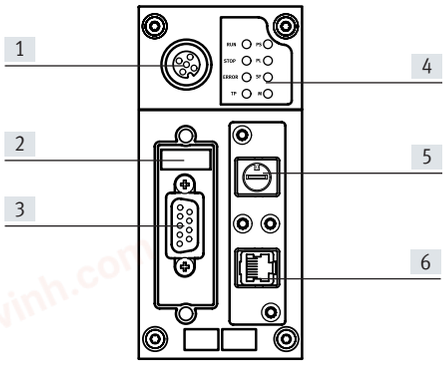
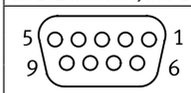
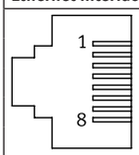
Datasheet – CODESYS controller

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



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

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

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

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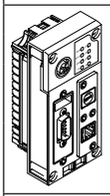
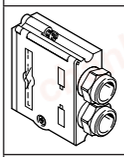
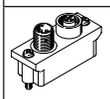
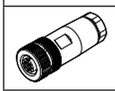
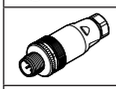
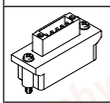
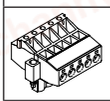
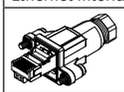
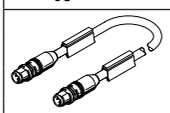
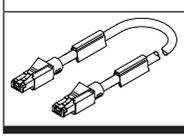
Datasheet – CODESYS controller

Ordering data

Designation					Part no.	Type
Control block						
	Motion functions for electric drives		CODESYS V2.3	155 g	567347	CPX-CEC-C1
			CODESYS V3	135 g	3473128	CPX-CEC-C1-V3
	SoftMotion functions for electric drives		CODESYS V3	135 g	3472765	CPX-CEC-M1-V3
	RS232 communication function		CODESYS V2.3	155 g	567346	CPX-CEC
			CODESYS V3	135 g	3472425	CPX-CEC-S1-V3
Fieldbus interface						
	Sub-D plug, 9-pin, for CANopen				532219	FBS-SUB-9-BU-2x5POL-B
	Micro style bus connection, 2xM12 for DeviceNet/CANopen				525632	FBA-2-M12-5POL
	Socket for micro style connection, M12				8162291	NECB-M12G5-C2
	Plug for micro style connection, M12				8162296	NECB-S-M12G5-C2
	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						
	Plug RJ45		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

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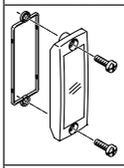
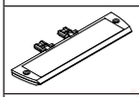
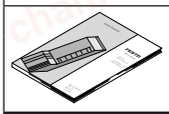
Datasheet – CODESYS controller

Ordering data

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

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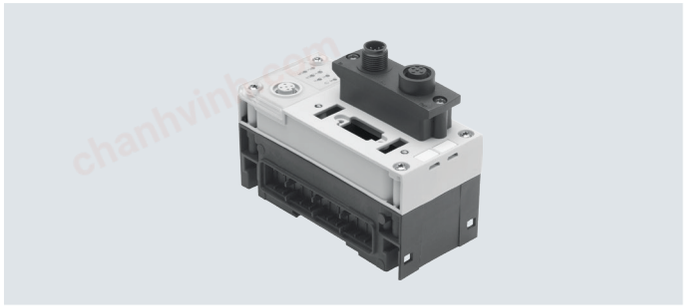
Datasheet – DeviceNet® bus node

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



Application

Bus connection

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

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

DeviceNet® implementation

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

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

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

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

Points to note in connection with CPX-CEC

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

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

- 8 byte outputs
- 8 byte inputs

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

- 56 byte inputs
- 56 byte outputs

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Datasheet – DeviceNet® bus node

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

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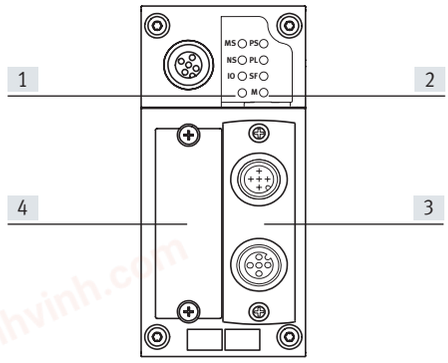
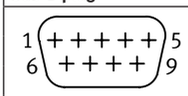
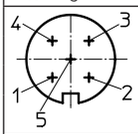
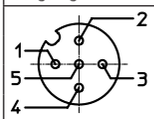
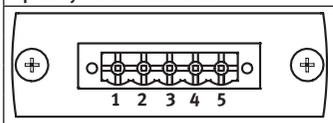
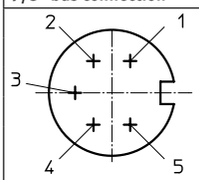
Datasheet – DeviceNet® bus node

Connection and indicator components



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

Pin assignment for the DeviceNet® interface

Terminal assignment	Pin	Signal-related wire colour1)	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	Clear	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	Clear	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	Clear	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	Clear	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	Clear	0 V	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Red	CAN_L	Received/transmitted data low

1) Typical of DeviceNet® connecting cables

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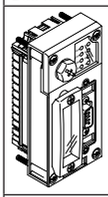
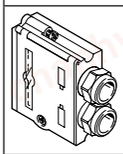
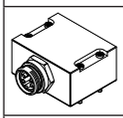
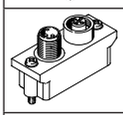
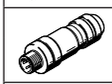
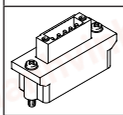
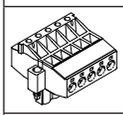
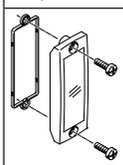
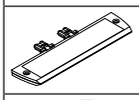
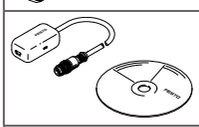
Datasheet – DeviceNet® bus node

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, Sub-D socket 9-pin, plug 7/8" 5-pin	571052	CPX-AB-1-7/8-DN
	Micro style bus connection, 2xM12	525632	FBA-2-M12-5POL
	Socket for micro style connection, M12	8162291	NECB-M12G5-C2
	Plug for micro style connection, M12	8162296	NECB-S-M12G5-C2
	Open style bus connection for 5-pin terminal strip	525634	FBA-1-SL-5POL
	Terminal strip for open style connection, 5-pin	525635	FBSD-KL-2x5POL
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Inscription label holder for connection block	536593	CPX-ST-1
	Adapter M12, 5-pin to mini USB socket, and controller software	547432	NEFC-M12G5-0.3-U1G5
User documentation			
	User documentation for bus node CPX-FB11	German	526421	CPX-FB11-DE
		English	526422	CPX-FB11-EN
		Spanish	526423	P.BE-CPX-FB11-ES
		French	526424	P.BE-CPX-FB11-FR
		Italian	526425	P.BE-CPX-FB11-IT

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Datasheet – PROFIBUS bus node

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



Application

Bus connection

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

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

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

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

PROFIBUS DP implementation

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

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

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

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

Points to note in connection with CPX-CEC

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

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

- 8 byte outputs
- 8 byte inputs

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

- 56 byte inputs
- 56 byte outputs

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Datasheet – PROFIBUS bus node

General technical data			
Type			CPX-FB13
Fieldbus interface			Sub-D socket, 9-pin (EN 50170) Galvanically isolated 5 V
Baud rates		[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) • Acyclical parameterisation via DPV1
Additional functions			• Storage of the last 40 errors with timestamp (access via DPV1) • 8-bit system status in image table for inputs • 2-byte inputs and 2-byte outputs, system diagnostics in process image
Control elements			DIL switches
Operating voltage	Nominal width	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
LABS (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.

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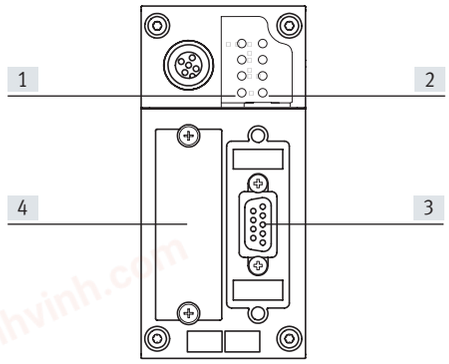
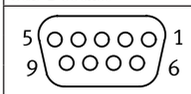
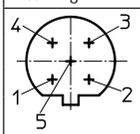
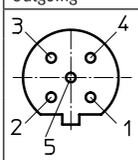
Datasheet – PROFIBUS bus node

Connection and indicator components



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

Pin assignment for PROFIBUS DP interface

Terminal assignment	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.

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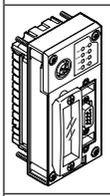
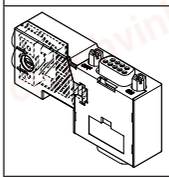
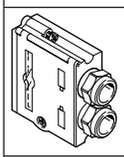
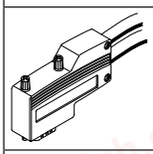
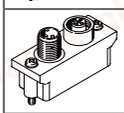
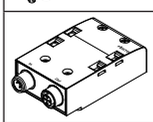
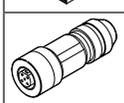
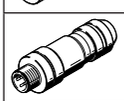
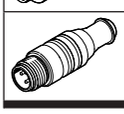
Datasheet – PROFIBUS bus node

Ordering data

Designation		Part no.	Type
Bus node			
	PROFIBUS bus node	**195740**	**CPX-FB13**
Bus connection			
	Sub-D plug, straight, with terminating resistor and programming interface	**574589**	**NECU-S1W9-C2-APB**
	Sub-D plug, straight	**532216**	**FBS-SUB-9-GS-DP-B**
	Sub-D plug, angled	**533780**	**FBS-SUB-9-WS-PB-K**
	Bus connection M12 adapter (B-coded)	**533118**	**FBA-2-M12-5POL-RK**
	Connection block M12 adapter (B-coded)	**541519**	**CPX-AB-2-M12-RK-DP**
	Straight socket, M12x1, 5-pin 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**

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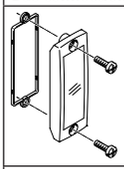
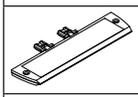
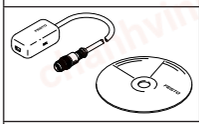
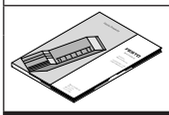
Datasheet – PROFIBUS bus node

Ordering data

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

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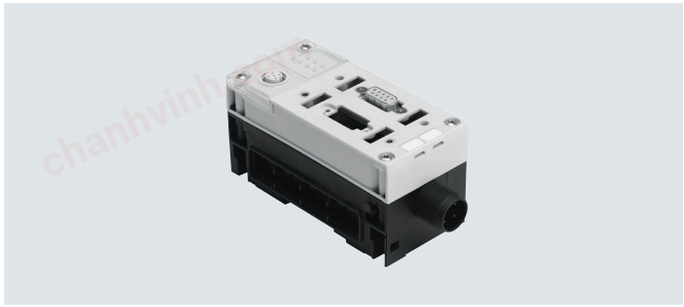
Datasheet – CC-Link® bus node

CC-Link

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



Application

Bus connection

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

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

CC-Link® implementation

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

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

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

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

Points to note in connection with CPX-CEC

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

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

- 8 byte outputs
- 8 byte inputs

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

- 56 byte inputs
- 56 byte outputs

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Datasheet – CC-Link® bus node

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

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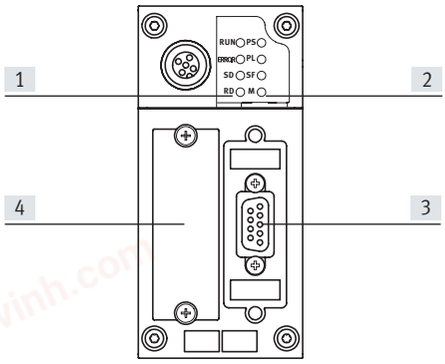
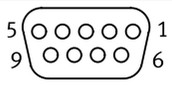
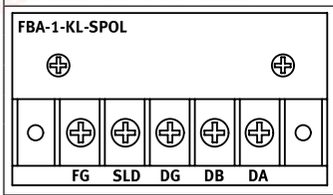
Datasheet – CC-Link® bus node

Connection and indicator components



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

Pin assignment for the CC-Link® interface

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

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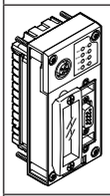
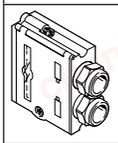
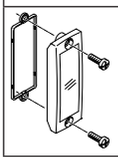
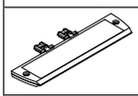
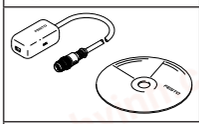
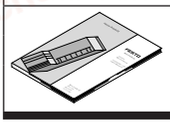
Datasheet – CC-Link® bus node

Ordering data

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

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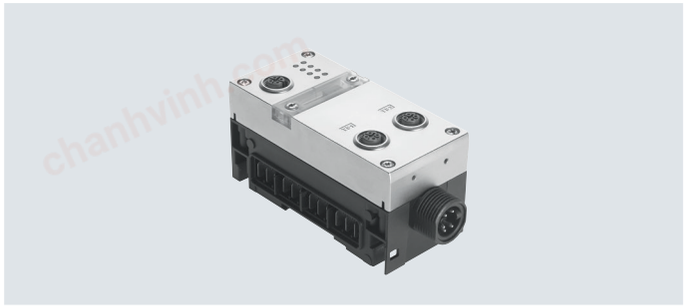
Datasheet – PROFINET bus node, M12, D-coded

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



Application

Bus connection

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

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

- Maximum segment length 100 m
- Transmission rate 100 Mbps

PROFINET implementation

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

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

Points to note in connection with CPX-CEC

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

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

- 8 byte outputs
- 8 byte inputs

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

- 56 byte inputs
- 56 byte outputs

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Datasheet – PROFINET bus node, M12, D-coded

General technical data			
Type			CPX-FB43
Fieldbus interface			2x socket, M12, 4-pin, D-coded
Baud rates		[Mbps]	100
Protocol			PROFINET RT PROFINET IRT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED indicators	(bus-specific)		M/P = Maintenance/PROFIenergy NF = Network error 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 error
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostics 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 switches
Operating voltage	Nominal width	[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
LABS (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 electric modules.

Note

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

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

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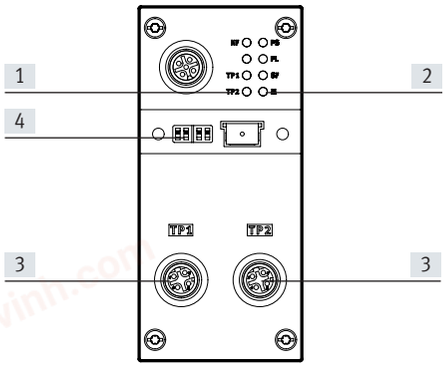
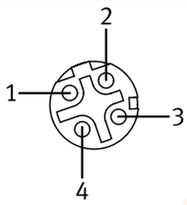
Datasheet – PROFINET bus node, M12, D-coded

Connection and indicator components



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

Pin assignment for the fieldbus interface

Terminal assignment	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

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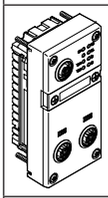
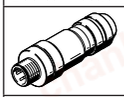
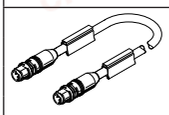
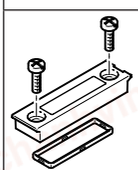
Datasheet – PROFINET bus node, M12, D-coded

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-core	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Transparent cover for the DIL switches			**548757**	**CPX-AK-P**
	Cover cap for sealing unused bus connections (10 pieces)			**165592**	**ISK-M12**
User documentation					
	Description electronics, 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**

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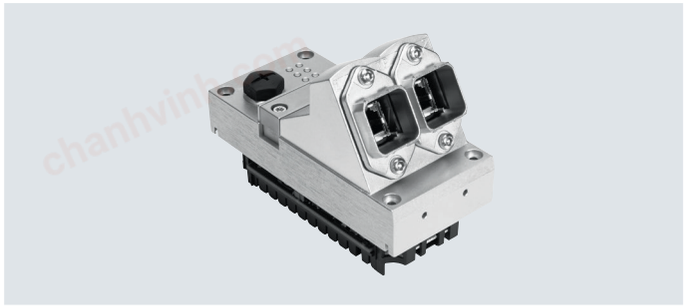
Datasheet – PROFINET bus node, push-pull RJ45

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



Application

Bus connection

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

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

- Maximum segment length 100 m
- Transmission rate 100 Mbps

PROFINET implementation

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

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

Points to note in connection with CPX-CEC

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

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

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

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

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

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Datasheet – 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 indicators	(bus-specific)		M/P = Maintenance/PROFIenergy NF = Network error 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 error
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostics 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 switches
Operating voltage	Nominal width	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typ. 70
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Certification			RCM
Material information: Housing			Die-cast aluminium
Note on materials			RoHs-compliant
LABS (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 electric modules.

Note

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

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

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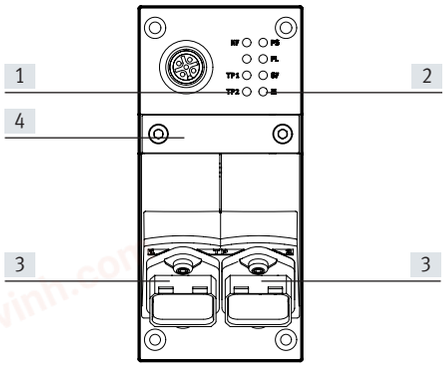
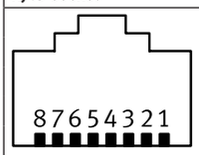
Datasheet – PROFINET bus node, push-pull RJ45

Connection and indicator components



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

Pin assignment for the fieldbus interface

Terminal assignment	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

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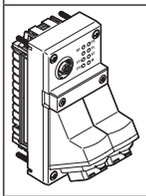
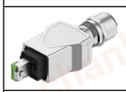
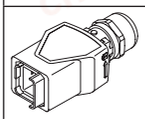
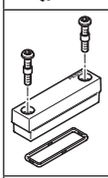
Datasheet – PROFINET bus node, push-pull RJ45

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				
	Plug RJ45, 8-pin	Push-pull with locking mechanism against unintentional pulling	**5195384**	**NECC-M-S-R3G8PP-HX-PN**
	Cover cap for bus connection		**8090740**	**NEAC-M-S-BD-R3SCPP**
	Cover cap for bus connection		**2873540**	**CPX-M-AK-D**
	Cover for DIL switches		**548754**	**CPX-M-AK-M**
User documentation				
	Description electronics, 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**

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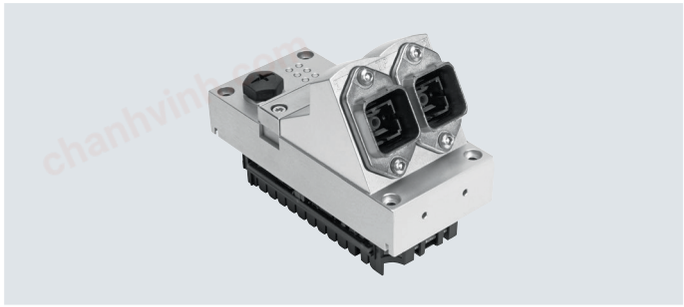
Datasheet – PROFINET bus node, push-pull SCRJ

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



Application

Bus connection

The bus connection is established via SCRJ push-pull sockets to IEC61754-24 (fibre optic cable, AIDA standard) with degree of protection IP65, IP67.

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

Fibre optic cables made of polymer (POF, 980/1000 µm) are also suitable as a transmission medium.

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

PROFINET implementation

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

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

Points to note in connection with CPX-CEC

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

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

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

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

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

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Datasheet – 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 indicators	(bus-specific)		M/P = Maintenance/PROFIenergy NF = Network error 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 error
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostics 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 switches
Operating voltage	Nominal width	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typ. 145
Certification			RCM
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Material information: Housing			Die-cast aluminium
Note on materials			RoHs-compliant
LABS (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 electric modules.

Note

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

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

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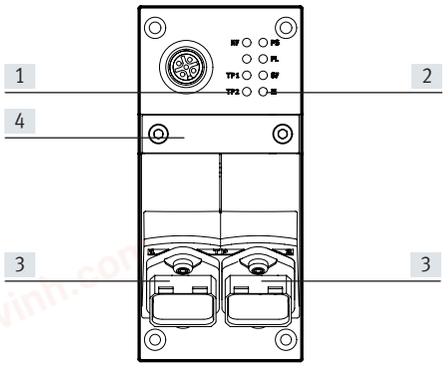
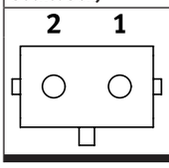
Datasheet – PROFINET bus node, push-pull SCRJ

Connection and indicator components



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

Pin assignment for the fieldbus interface

Terminal assignment	Pin	Signal	Designation
Socket SCRJ			
	1	Tx	Outgoing
	2	Rx	Incoming

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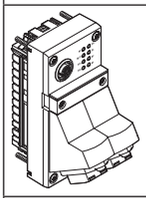
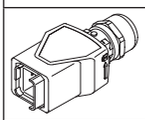
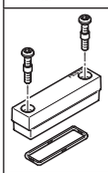
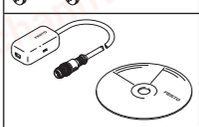
Datasheet – PROFINET bus node, push-pull SCRJ

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				
	SC-RJ connector to IEC 61754-24, 2-pin	Push-pull with locking mechanism against unintentional pulling	**5195381**	**NOCC-M-S-SCRJG2PP-C5-PN**
	Cover cap for bus connection		**8090740**	**NEAC-M-S-BD-R3SCPP**
	Cover cap for bus connection		**2873540**	**CPX-M-AK-D**
	Cover for DIL switches		**548754**	**CPX-M-AK-M**
	Screws for attaching an inscription label to the bus node (pack of 12)		**550222**	**CPX-M-M2.5X8-12X**
	Adapter M12, 5-pin to mini USB socket, and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation				
	Description electronics, 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**

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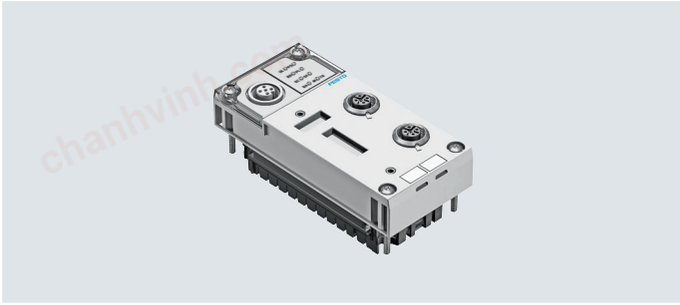
Datasheet – EtherNet/IP bus node

- Industrial Ethernet
- EtherNet/IP
- Web interface

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



Application

Bus connection

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

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

EtherNet/IP implementation

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

Points to note in connection with CPX-CEC

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

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

- 8 byte outputs
- 8 byte inputs

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

- 56 byte inputs
- 56 byte outputs

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Datasheet – EtherNet/IP bus node

General technical data			
Type			CPX-FB36
Fieldbus interface			2x socket M12x1, 4-pin, D-coded
Baud rates		[Mbps]	10/100
Protocol			EtherNet/IP
			Modbus TCP
Max. address capacity, inputs		[byte]	64
Max. address capacity, 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 switches
Operating voltage	Nominal width	[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			Reinforced PA
Note on materials			RoHs-compliant
LABS (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.

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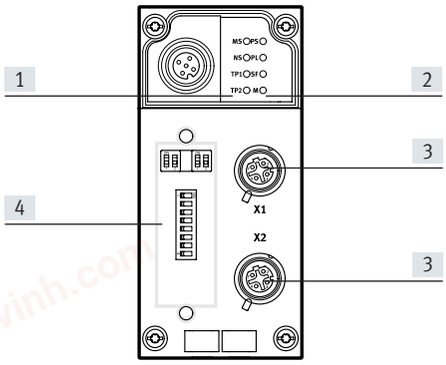
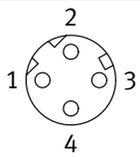
Datasheet – EtherNet/IP bus node

Connection and indicator components



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

Pin assignment for the fieldbus interface

Terminal assignment	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

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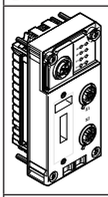
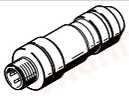
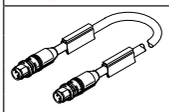
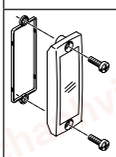
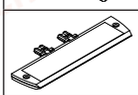
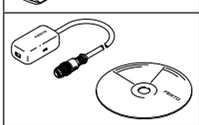
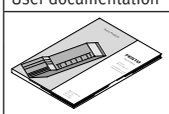
Datasheet – EtherNet/IP bus node

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-core	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**
	Adapter M12, 5-pin to mini USB socket, and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	User documentation for bus node CPX-FB36		German	**8024074**	**CPX-FB36-DE**
			English	**8024075**	**CPX-FB36-EN**

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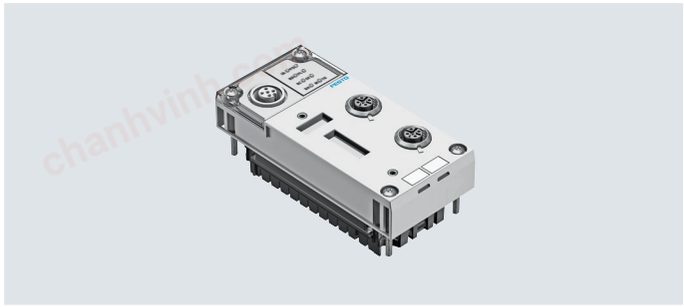
Datasheet – EtherCAT® bus node

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



Application

Bus connection

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

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

- Maximum segment length 100 m
- Transmission rate 100 Mbps

EtherCAT® implementation

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

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

Specific EtherCAT® functions:

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

Points to note in connection with CPX-CEC

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

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

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

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

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

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Datasheet – EtherCAT® bus node

General technical data			
Type			CPX-FB37
Fieldbus interface			2x socket M12x1, 4-pin, D-coded
Baud rates		[Mbps]	100
Protocol			EtherCAT®
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED indicators	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 error
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostics 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 switches
Operating voltage	Nominal width	[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		Reinforced PA
Note on materials			RoHs-compliant
LABS (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 polymer:

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

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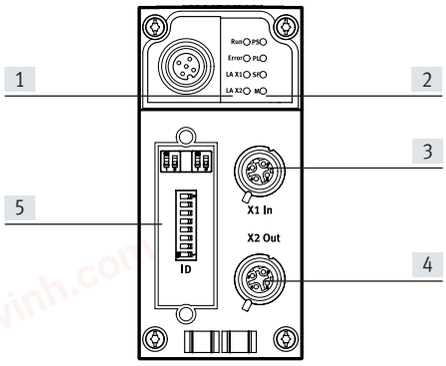
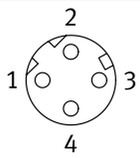
Datasheet – EtherCAT® bus node

Connection and indicator components



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

Pin assignment for the fieldbus interface

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

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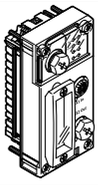
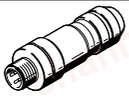
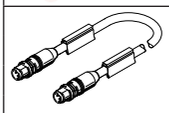
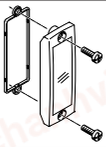
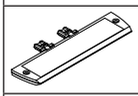
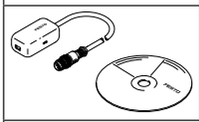
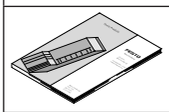
Datasheet – EtherCAT® bus node

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-core	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
	Adapter M12, 5-pin to mini USB socket, and controller software			547432	NEFC-M12G5-0.3-U1G5
User documentation					
	Description electronics, CPX bus node, type CPX-FB37		German	8029674	CPX-FB37-DE
			English	8029675	CPX-FB37-EN

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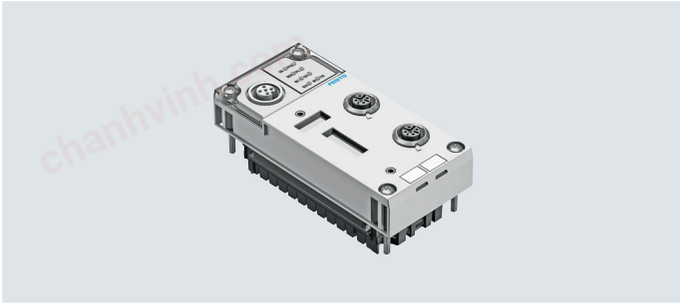
Datasheet – Sercos III bus node

- Sercos
- Web interface

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



Application

Bus connection

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

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

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

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

Webserver

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

Points to note in connection with CPX-CEC

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

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

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

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

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Datasheet – Sercos III bus node

General technical data			
Type			CPX-FB39
Fieldbus interface			2x M12x1 socket, D-coded, 4-pin
Baud rates		[Mbps]	100 full/half duplex
Protocol			Sercos III
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED indicators	Bus-specific		S = Sercos LED SD = Sercos sub-device LED TP1 = Network active, port 1 TP2 = Network active, port 2
	Product-specific		M = Modify, parameterisation PL = Load supply PS = Electronics supply, sensor supply SF = System error
Device-specific diagnostics			• Module and channel-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			SDDML file
Parameterisation			• Diagnostic behaviour • Fallback output data • Forcing of channels • Signal setup • System parameters
Additional functions			• Acyclic and cyclic data access via Sercos • IP addressing via Sercos parameters or operator unit • Channel-oriented diagnostics via fieldbus • Start-up parameterisation in plain text via fieldbus • System status can be displayed using process data • Additional diagnostic interface for operator units
Control elements			DIL switches
Operating voltage	Nominal width	[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			Reinforced PA
Note on materials			RoHs-compliant
LABS (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.

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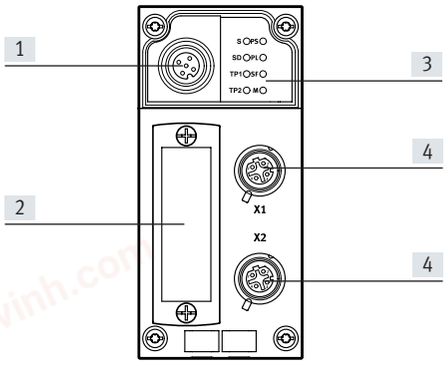
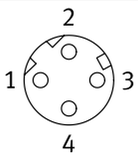
Datasheet – Sercos III bus node

Connection and indicator components



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

Pin assignment for the fieldbus interface

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

Note

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

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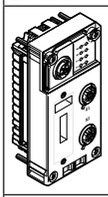
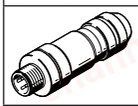
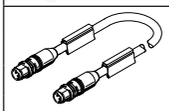
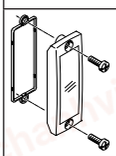
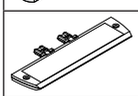
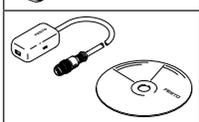
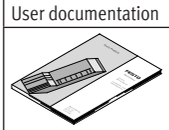
Datasheet – Sercos III bus node

Ordering data

Designation			Part no.	Type
Bus node				
	Ethernet Sercos III bus node		**2093101**	**CPX-FB39**
Bus connection				
	Plug M12x1, 4-pin, D-coded		**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, Straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-core	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**
	Adapter M12, 5-pin to mini USB socket, and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	User documentation for bus node CPX-FB39		German	**8028632**	**CPX-FB39-DE**
			English	**8028633**	**CPX-FB39-EN**

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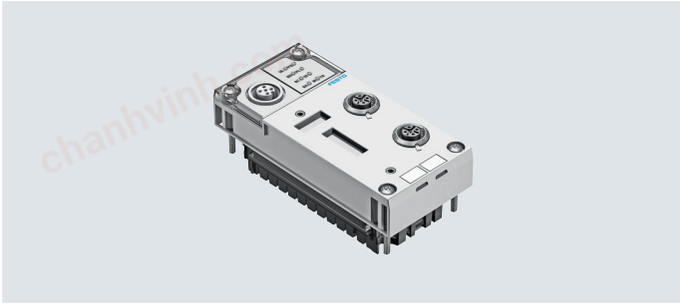
Datasheet – POWERLINK bus node

- Ethernet POWERLINK
- Web interface

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



Application

Bus connection

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

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

Ethernet POWERLINK implementation

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

Points to note in connection with CPX-CEC

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

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

- 8 byte outputs
- 8 byte inputs

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

- 56 byte inputs
- 56 byte outputs

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Datasheet – POWERLINK bus node

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

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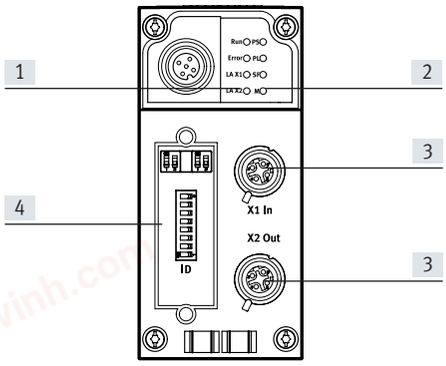
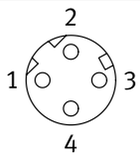
Datasheet – POWERLINK bus node

Connection and indicator components



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

Pin assignment for the fieldbus interface

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

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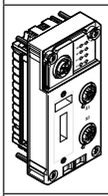
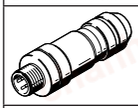
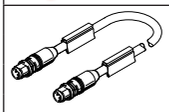
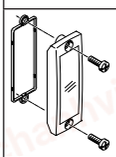
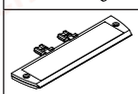
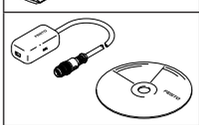
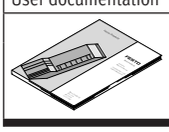
Datasheet – POWERLINK bus node

Ordering data

Designation				Part no.	Type
Bus node					
	Ethernet POWERLINK bus node			**2474896**	**CPX-FB40**
Bus connection					
	Plug M12x1, 4-pin, D-coded			**543109**	**NECU-M-S-D12G4-C2-ET**
	Connecting cable, Straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-core	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**
	Adapter M12, 5-pin to mini USB socket, and controller software			**547432**	**NEFC-M12G5-0.3-U1G5**
User documentation					
	User documentation for bus node CPX-FB40		German	**8028650**	**CPX-FB40-DE**
			English	**8028651**	**CPX-FB40-EN**

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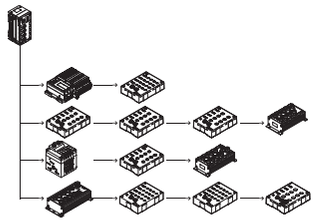
Datasheet – Interface for CPI system



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



Application

CP connection

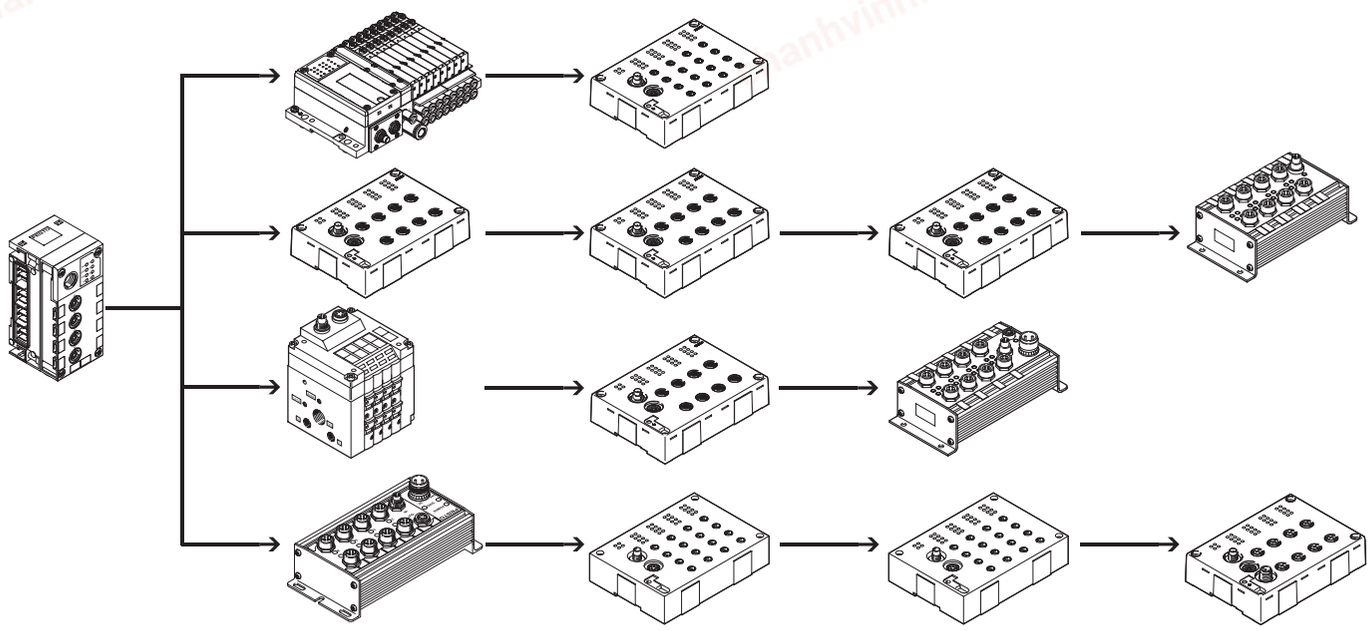
As well as transmitting the communication data, the max. 4 CP strings of a CPX-CP interface also transmit the power supply to the connected sensors and the load supply to the valves (or outputs). Both circuits are supplied separately with 24 V but using a common reference potential.

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

The CP interface allows the following combinations:

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

Configuration example – CP interface with CP modules



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Datasheet – Interface for CPI system

Implementation

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

Note

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

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

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

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

Configuration

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

Note

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

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

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

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

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Datasheet – Interface for CPI system

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

Note

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

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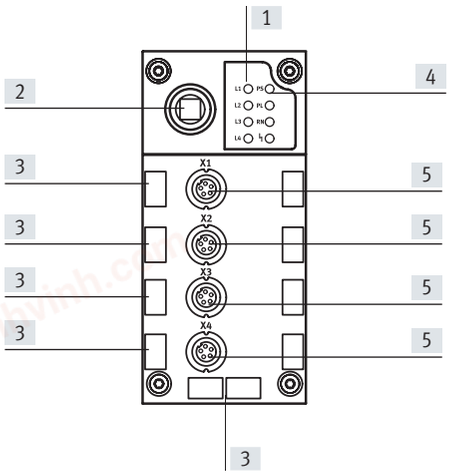
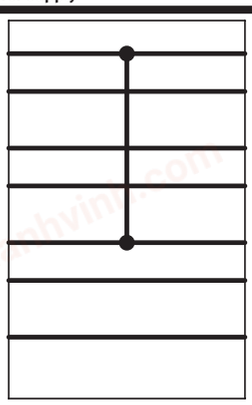
Datasheet – Interface for CPI system

Connection and indicator components



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

Power supply



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

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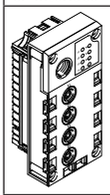
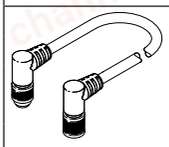
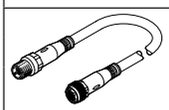
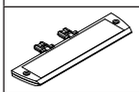
Datasheet – Interface for CPI system

Ordering data

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

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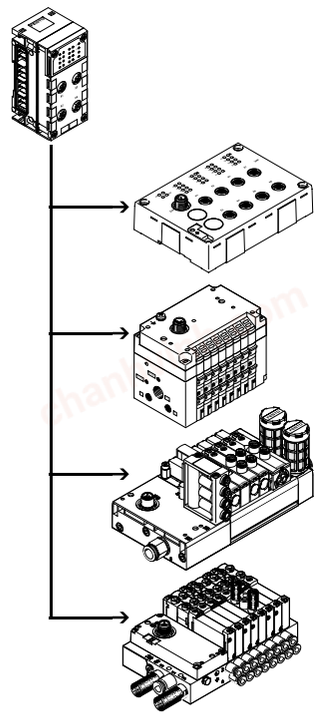
Datasheet – I-Port interface



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

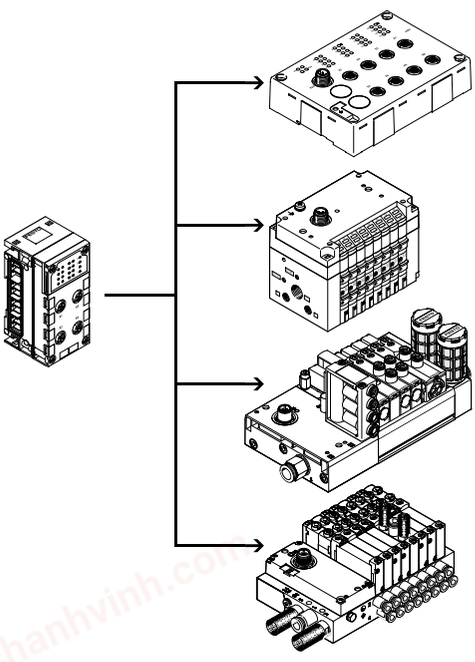


Application

I-Port interface

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

Configuration example – CPX CTEL master with CTEL modules



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

The restrictions compared 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.

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Datasheet – I-Port interface

Implementation

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

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

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

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

Configuration

Settings

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

Manual configuration

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

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

Automatic configuration

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

Power supply for I-Port devices

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

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

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

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Datasheet – I-Port interface

General technical data			
Type			CPX-CTEL-4-M12-5POL
Protocol			I-Port
Maximum address volume	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 air supply
LED indicators			X1 ... 4 = Status of the I-Port interface 1 ... 4 PS = Electronic supply PL = Load supply ↳ = Module error
Diagnostics			• Communication error • Module short circuit • Module-oriented diagnostics • Undervoltage
Parameterisation			• Diagnostic behaviour • Fail-safe per channel • Forcing per channel • Idle mode per channel • Module parameters • Tool change mode
Additional functions			Tool change mode
Control elements			DIL switches
Operating voltage	Nominal width	[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. total current of outputs per channel		[A]	4x 1.6
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
Note on materials			RoHs-compliant
LABS (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 electric modules.

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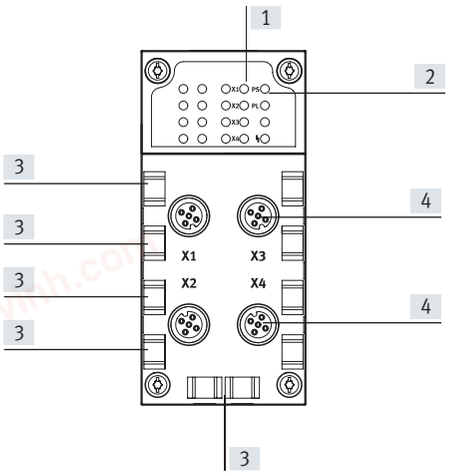
Datasheet – I-Port interface

Connection and indicator components

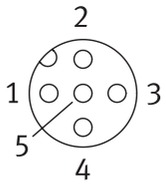


[1] Status LEDs for I-Port interfaces
[2] CPX-specific status LEDs
[3] Holders for inscription labels (IBS 6x10)
[4] I-Port interfaces for up to 4 devices

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

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

Pin assignment – I-Port interface

Terminal assignment	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

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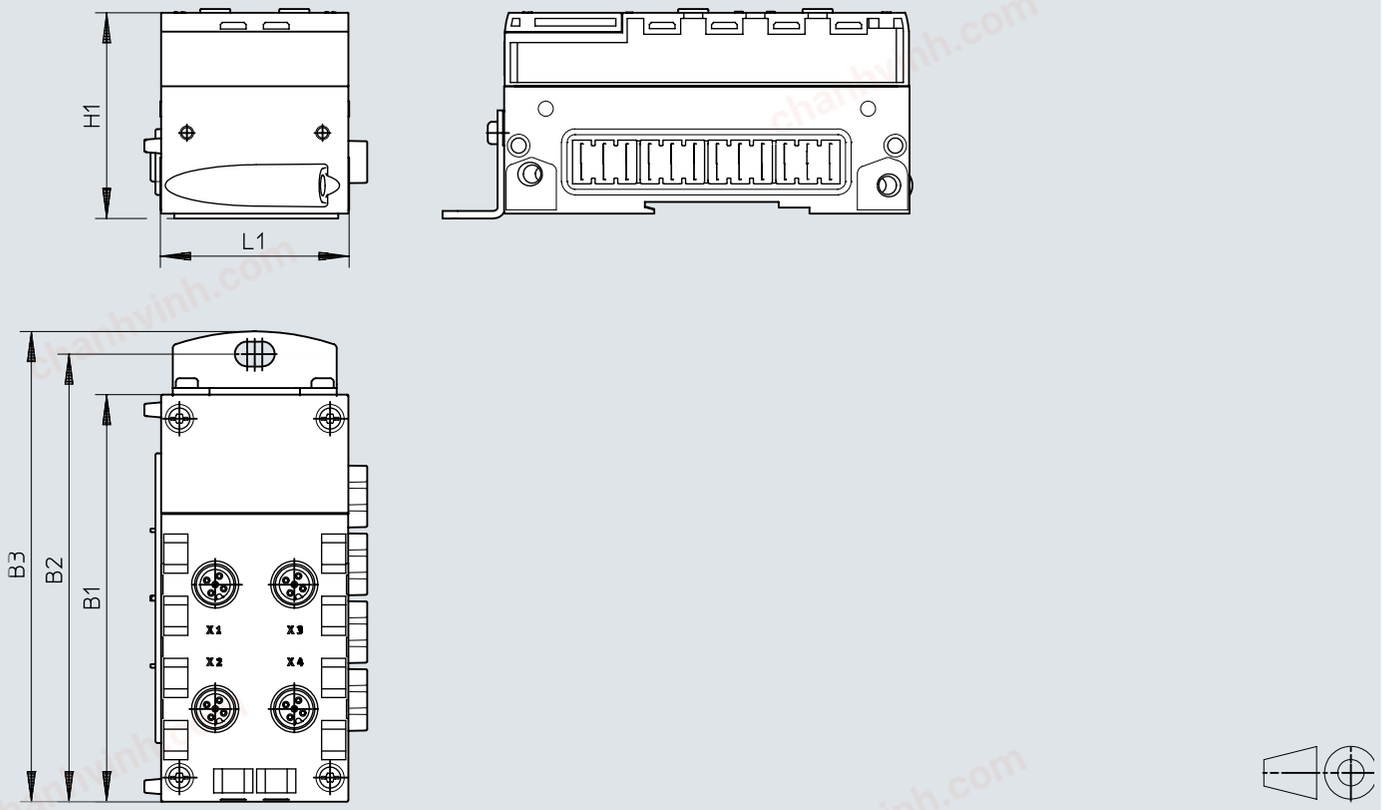
Datasheet – I-Port interface

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

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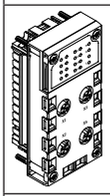
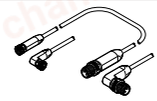
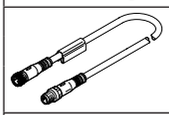
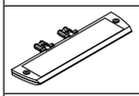
Datasheet – I-Port interface

Ordering data

Designation				Part no.	Type
CPX-CTEL master					
	Interface for a maximum of 4 I/O modules and valve terminals with I-Port interface (devices)			**1577012**	**CPX-CTEL-4-M12-5POL**
Bus connection					
	Cover cap	M12		**165592**	**ISK-M12**
	Modular system for a choice of connecting cables			**–**	**NEBA-...** → Internet: neba
	Connecting cable M12-M12, 5-pin • Straight socket • Straight plug	Cable characteristic: suitable for use with energy chains	5 m	**574321**	**NEBU-M12G5-E-5-Q8N-M12G5**
			7.5 m	**574322**	**NEBU-M12G5-E-7.5-Q8N-M12G5**
			10 m	**574323**	**NEBU-M12G5-E-10-Q8N-M12G5**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
User documentation					
	User documentation CPX CTEL master	German		**574600**	**CPX-CTEL-4-M12-5POL-DE**
		English		**574601**	**CPX-CTEL-4-M12-5POL-EN**

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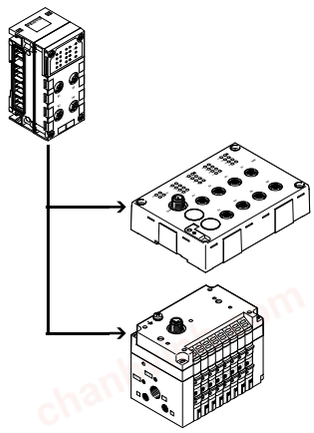
Datasheet – IO-Link® interface



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



Application

IO-Link®

The communication system IO-Link® is used to exchange serial data from decentralised function modules (devices) at the field level.
The electrical interface CPX-CTEL-2-... provides two external IO-Link® interfaces, each of which can be connected to a device.
The connection type corresponds to a star topology, which means that only one device can be connected to each port.
The address space that the module makes available and assigns accordingly in the CPX system can be configured according to various presets.
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.

Constraints

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

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

Power supply for devices

The electrical interface CPX-CTEL-2-... provides two separate power supplies for the connected devices:

- For operating the device and the inputs connected to it
- For the outputs and valves that are connected to the device

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

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Datasheet – IO-Link® interface

General technical data			
Type			CPX-CTEL-2-M12-5POL-LK
Protocol			IO-Link®, master version V 1.0
Maximum address volume	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 air supply
LED indicators			X1 ... 2 = Status of the IO-Link® interface 1 ... 2 PS = Electronic supply PL = Load supply ϟ = Module error
Diagnostics			• Communication error • Module short circuit • Module-oriented diagnostics • Undervoltage
Parameterisation			• Diagnostic behaviour • Fail-safe per channel • Forcing per channel • Idle mode per channel • Module parameters
Additional functions			–
Control elements			DIL switches
Operating voltage	Nominal width	[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. total current of outputs per channel		[A]	2x 1.6
Degree of protection to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
Note on materials			RoHs-compliant
LABS (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 electric modules.

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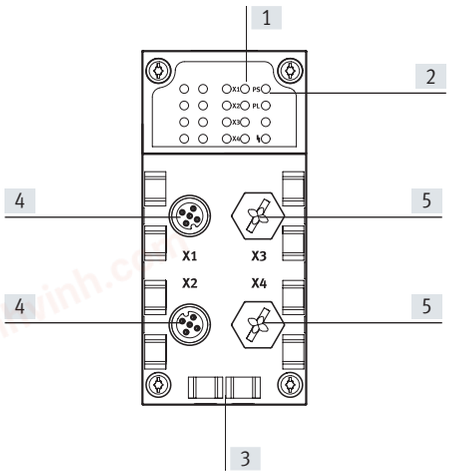
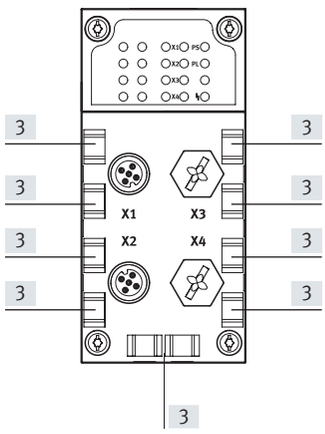
Datasheet – IO-Link® interface

Connection and indicator components



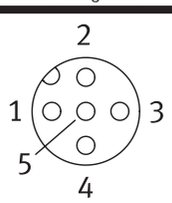
[1] Status LEDs for I-Port interfaces
[2] CPX-specific status LEDs
[3] Holders for inscription labels (IBS 6x10)
[4] IO-Link® interfaces for up to 2 devices
[5] Unused connections



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

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

Pin allocation – IO-Link interface

Terminal assignment	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

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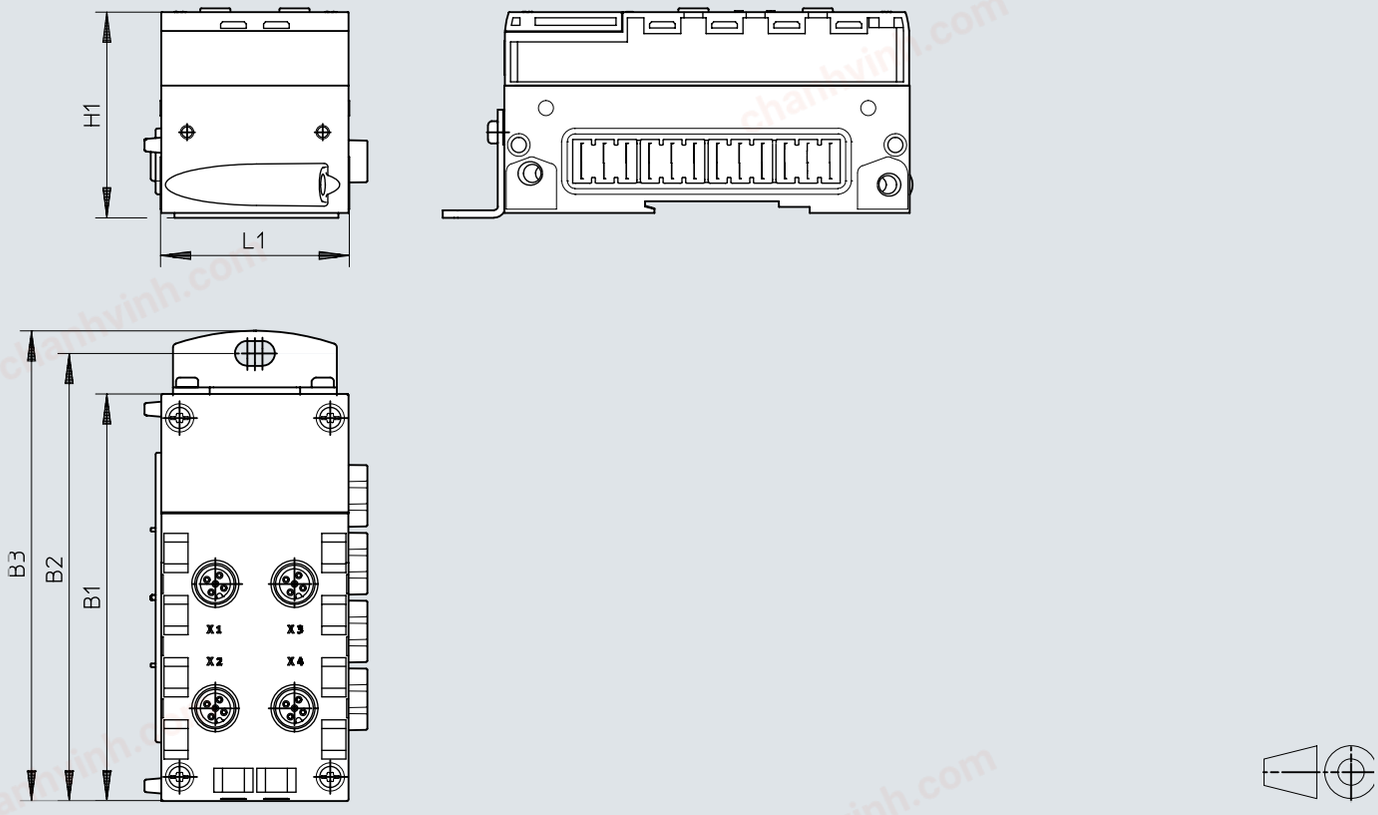
Datasheet – IO-Link® interface

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

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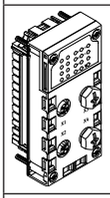
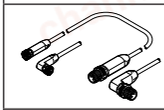
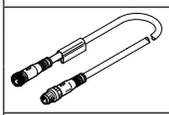
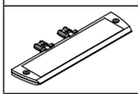
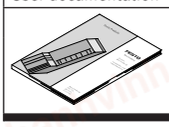
Datasheet – IO-Link® interface

Ordering data

Designation				Part no.	Type
CPX CTEL master, IO-Link®					
	Interface for max. 2 I/O modules and valve terminals with IO-Link® interface (devices)			**2900543**	**CPX-CTEL-2-M12-5POL-LK**
Bus connection					
	Cover cap	M12		**165592**	**ISK-M12**
	Modular system for a choice of connecting cables			–	**NEBA-...** → Internet: neba
	Connecting cable M12-M12, 5-pin • Straight socket • Straight plug	Cable characteristic: suitable for use with energy chains	5 m	**574321**	**NEBU-M12G5-E-5-Q8N-M12G5**
			7.5 m	**574322**	**NEBU-M12G5-E-7.5-Q8N-M12G5**
			10 m	**574323**	**NEBU-M12G5-E-10-Q8N-M12G5**
	Inscription label holder for connection block			**536593**	**CPX-ST-1**
User documentation					
	User documentation CPX CTEL master	German		**8034115**	**CPX-CTEL-2-M12-5POLLK-DE**
		English		**8034116**	**CPX-CTEL-2-M12-5POLLK-EN**

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Datasheet – Axis controller for 1 electric axis

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



General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	200
Fuse protection (short circuit)			Electronic
Power failure buffering		[ms]	10
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Permissible load current		[A]	2.5
Fuse protection (short circuit)			Electronic
No. of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. number of modules			7
Indicator			7-segment display
Assigned addresses	Outputs	[bit]	8x8
	Inputs	[bit]	8x8
Operating modes			Record mode
			Direct mode
Controller types			Position control
			Force control
Diagnostics			Module-orientated
			Via local 7-segment display
Status indicator			Module status
			Power load
			Display/Error Axis X
			MC Axis X
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			Reinforced PA
Note on materials			RoHs-compliant
LABS (PWIS) conformity			VDMA24364-B2-L
Product weight		[g]	240
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

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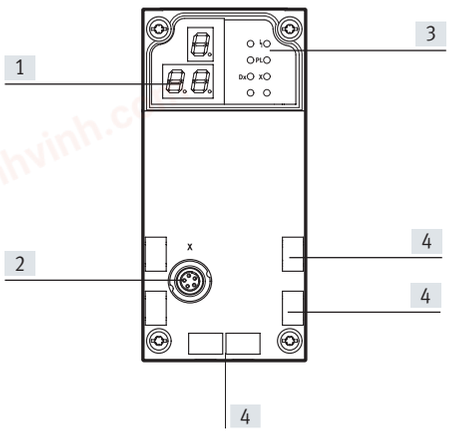
Datasheet – Axis controller for 1 electric axis

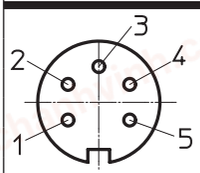
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

Connection and indicator components



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

Pin assignment – Control interface



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

Permitted bus nodes/CEC

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

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

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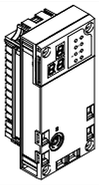
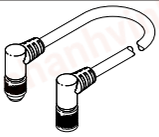
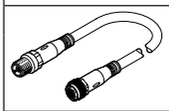
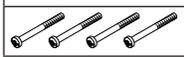
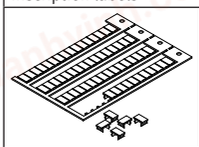
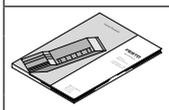
Datasheet – Axis controller for 1 electric axis

Ordering data

	Brief description		Part no.	Type
Axis controller				
	Order code in CPX configurator: T21		**548932**	**CPX-CMAX-C1-1**
Connecting cables				
	Connecting cable with angled plug and angled socket	0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
		0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
		2 m	**540329**	**KVI-CP-3-WS-WD-2**
		5 m	**540330**	**KVI-CP-3-WS-WD-5**
		8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2 m	**540332**	**KVI-CP-3-GS-GD-2**
		5 m	**540333**	**KVI-CP-3-GS-GD-5**
		8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting component for cabinet through feed		**543252**	**KVI-CP-3-SSD**
Screws				
	For mounting on the metal interlinking block		**550219**	**CPX-M-M3X22-4X**
Inscription labels				
	Inscription labels 6x10, in frames	Pack of 64	**18576**	**IBS-6X10**
User documentation				
	Description axis controller CPX-CMAX1)	German	**559750**	**CPX-CMAX-C1-1-DE**
		English	**559751**	**CPX-CMAX-C1-1-EN**
		German	**559756**	**CPX-CMAX-C1-1-DE**
		English	**559757**	**CPX-CMAX-C1-1-EN**

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

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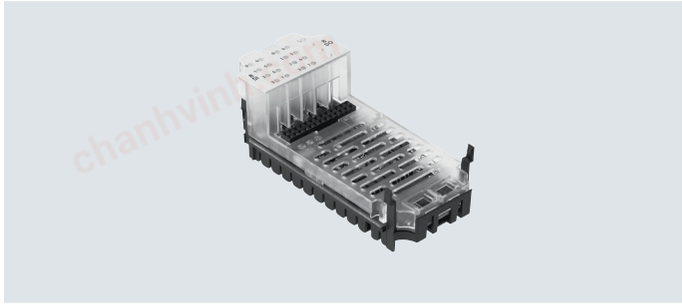
Datasheet – Input module, digital

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).

Application area
- 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 voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse



General technical data

Type			CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
Number of inputs			4	8	8	8
Max. total 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]	Typ. 15			
Operating voltage	Nominal width	[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 indicators	Group diagnostics		1	1	1	1
	Channel diagnostics		–	–	8	–
	Channel status		4	8	8	8
Diagnostics			Short circuit/overload per channel			
Parameterisation			• Module monitoring • Behaviour after short circuit • Input debounce time • Signal extension time			
Degree of protection to EN 60529			Depending on connection block			
Temperature range	Operation	[°C]	–5 ... +50			
	Storage/transport	[°C]	–20 ... +70			
Materials			Reinforced PA, PC			
LABS (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

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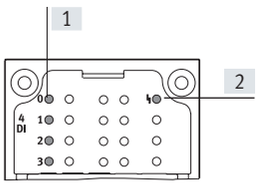
Datasheet – Input module, digital

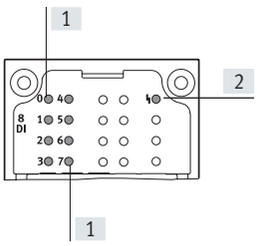
Connection and indicator components

CPX-4DE



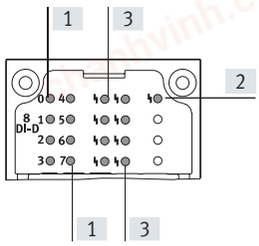
[1] Status LEDs (green)

CPX-8DE



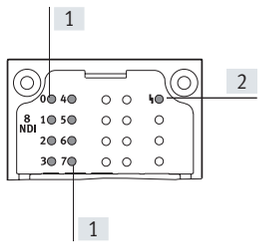
[2] Error LED (red; module error)

CPX-8DE-D



[3] Channel-related error LEDs (red)

CPX-8NDE

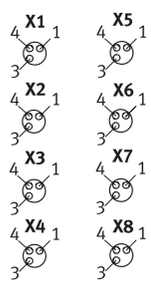
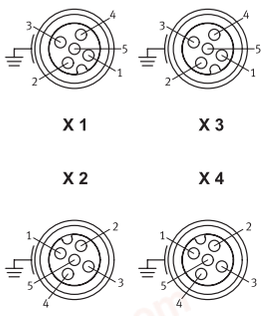


For assigning to inputs
➔ Pin assignment of the module

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 assignment

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

1) Speedcon quick lock, additional shielding on metal thread

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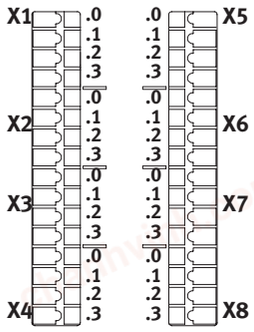
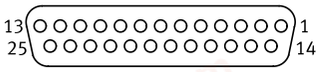
Datasheet – Input module, digital

Pin assignment

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

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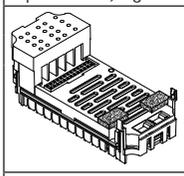
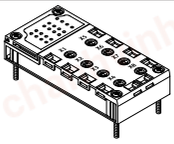
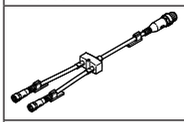
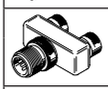
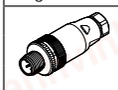
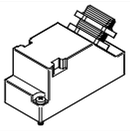
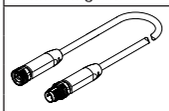
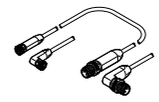
Datasheet – Input module, digital

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					
	Polymer	8x socket M8, 3-pin		195706	CPX-AB-8-M8-3POL
		4x socket M12, 5-pin		195704	CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin		541254	CPX-AB-4-M12X2-5POL-R
		Spring-loaded terminal, 32-pin		195708	CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin		525676	CPX-AB-1-SUB-BU-25POL
	Metal	4x socket M12, 5-pin		549367	CPX-M-AB-4-M12X2-5POL
Distributor					
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy
	1x plug M12, 4-pin	2x socket M8, 3-pin		8005311	NEDY-L2R1-V1-M8G3-N-M12G4
		2x socket M12, 5-pin		8005310	NEDY-L2R1-V1-M12G5-N-M12G4
Plug					
	M8, 3-pin	Screw terminal		8162298	NECB-S-M8G3-C2
	M12, 4-pin	For cable Ø 2.1 ... 7 mm		8162294	NECB-S-M12G4-C2
		For 2x cable Ø 2.1 ... 5.6 mm		8162295	NECB-S-M12G4-C2-D
	M12, 5-pin	For cable Ø 2.1 ... 7 mm		8162296	NECB-S-M12G5-C2
		For 2x cable Ø 2.1 ... 5.6 mm		8162297	NECB-S-M12G5-C2-D
	Sub-D plug, 25-pin			527522	SD-SUB-D-ST25
Connecting cable					
	1x socket M8, 3-pin	1x plug M8, 3-pin	0.5 m	★ 8078282	NEBA-M8G3-U-0.5-N-M8G3
			1.0 m	★ 8078283	NEBA-M8G3-U-1-N-M8G3
			2.5 m	★ 8078286	NEBA-M8G3-U-2.5-N-M8G3
			5.0 m	★ 8078287	NEBA-M8G3-U-5-N-M8G3
	Modular system for a choice of connecting cables			–	NEBA-... → Internet: neba

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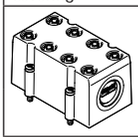
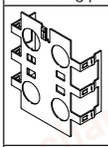
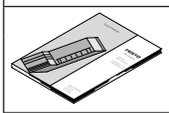
Datasheet – Input module, digital

Ordering data

Designation			Part no.	Type
Covering				
	Covering hood 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	CPX-_DE_DA/CPX-_DE-DE
		English	526440	CPX-_DE_DA/CPX-_DE-EN

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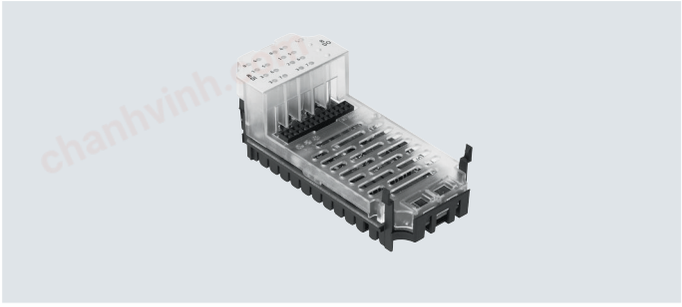
Datasheet – Input module, digital, PROFIsafe

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.

Application area
- 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 voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse



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.

Possible applications

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

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

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

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

Application areas

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

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

Application examples

- Two-hand control device for starting a function
- Emergency stop switch for incidents
- Operating mode selector switch with four positions
- Rotary indexing table
- Light curtain
- Acknowledge button with request
- End-position switch
- Safety door with two N/O switches

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Datasheet – Input module, digital, PROFIsafe

General technical data			
Type			CPX-F8DE-P
Number of inputs			8
Safety function			Reliable detection and evaluation of input statuses
Maximum address volume	Inputs	[byte]	6
	Outputs	[byte]	7
Maximum cable length		[m]	200
Max. power supply	Per module	[A]	3
Current consumption of the module		[mA]	Typ. 35 (power supply for electronics)
Operating voltage	Nominal width	[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
Characteristic curve of inputs			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)			1.0x 10-9
Certificate-issuing authority			01/205/5444.01/21
LED indicators	Group diagnostics		1
	Channel diagnostics		8
	Channel status		8
	Fail-safe protocol active		1
Diagnostics			• Short circuit per channel • Undervoltage • Overvoltage • Excessive temperature • Cross circuit per channel • Wire break per channel • Communication • Process data error • Self-test
Control elements			DIL switches
Degree of protection to EN 60529			Dependent on the 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

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Datasheet – Input module, digital, PROFIsafe

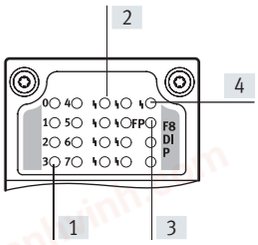
Materials	
Note on materials	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

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)]		According to UK regulations for machines
		To UK EMC regulations
		To UK RoHS regulations
Certification		c UL us – Recognized (OL)

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

Connection and indicator components

CPX-F8DE-P



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

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

Note

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

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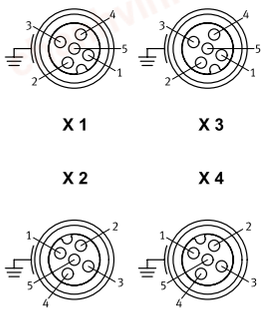
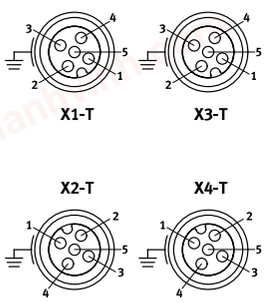
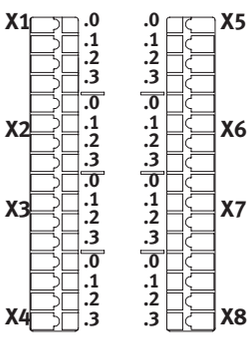
Datasheet – Input module, digital, PROFIsafe

Combinations of connection blocks and PROFIsafe input module

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

Pin assignment

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-M-AB-4-M12X2-5POL-T		
	X1-T.1: 24 $V_{SEN\ x}$ X1-T.2: Input x+1 X1-T.3: 0 V_{SEN} X1-T.4: Input x X1-T.5: 24 $V_{SEN\ x+1}$ X2-T.1: 24 $V_{SEN\ x+2}$ X2-T.2: Input x+3 X2-T.3: 0 V_{SEN} X2-T.4: Input x+2 X2-T.5: 24 $V_{SEN\ x+3}$	X3-T.1: 24 $V_{SEN\ x+4}$ X3-T.2: Input x+5 X3-T.3: 0 V_{SEN} X3-T.4: Input x+4 X3-T.5: 24 $V_{SEN\ x+5}$ X4-T.1: 24 $V_{SEN\ x+6}$ X4-T.2: Input x+7 X4-T.3: 0 V_{SEN} X4-T.4: Input x+6 X4-T.5: 24 $V_{SEN\ x+7}$
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE 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

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Datasheet – Input module, digital, PROFIsafe

General technical data		
Type		CPX-AB-ID-P
Certificate-issuing authority		01/205/5444.00/15
		German Technical Control Board (TÜV) Rh. UK 01/205U/5444.00/22
Degree of protection to EN 60529		IP65
Housing material		PA
		PC
Note on materials		RoHs-compliant
LABS (PWIS) conformity		VDMA24364-B2-L
Corrosion resistance class CRC1)		1
Product weight	[g]	57

1) More information www.festo.com/x/topic/crc

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

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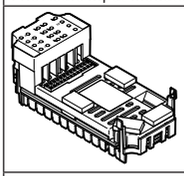
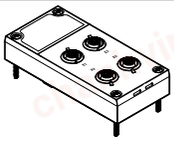
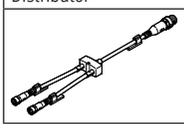
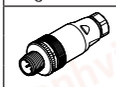
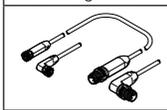
Datasheet – Input module, digital, PROFIsafe

Ordering data

	Description			Part no.	Type
PROFIsafe input module					
	8 digital inputs, positive logic (PNP), for reliable detection and evaluation of input statuses			**2597424**	**CPX-F8DE-P**
Connection block					
	Polymer	Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
		DIL switch, 8-way		**2639571**	**CPX-AB-ID-P**
	Metal	4x socket M12, 5-pin	Unpulsed sensor supply	**549367**	**CPX-M-AB-4-M12X2-5POL**
			Pulsed sensor supply	**2639560**	**CPX-M-AB-4-M12X2-5POL-T**
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
	1x plug M12, 4-pin	2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Plug					
	M12, 4-pin	For cable Ø 2.1 ... 7 mm		**8162294**	**NECB-S-M12G4-C2**
		For 2x cable Ø 2.1 ... 5.6 mm		**8162295**	**NECB-S-M12G4-C2-D**
	M12, 5-pin	For cable Ø 2.1 ... 7 mm		**8162296**	**NECB-S-M12G5-C2**
		For 2x cable Ø 2.1 ... 5.6 mm		**8162297**	**NECB-S-M12G5-C2-D**
Connecting cable					
	Modular system for a choice of connecting cables			–	**NEBA-...** → Internet: neba
User documentation					
	User documentation for PROFIsafe input module		German	**8035496**	**CPX-F8DE-P-DE**
			English	**8035497**	**CPX-F8DE-P-EN**

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Datasheet – 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).

Application area

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



General technical data

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

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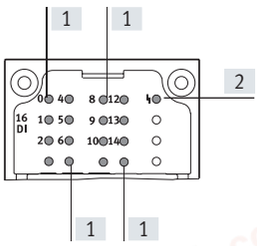
Datasheet – Input module, digital, 16 inputs

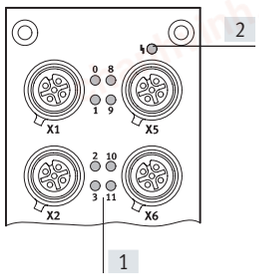
Connection and indicator components

CPX-16DE



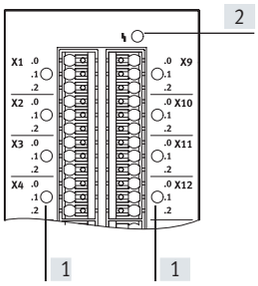
[1] Status LEDs (green) Assignment to inputs ➔ Pin assignment of the module
[2] Error LED (red; module error)

CPX-M-16DE-D



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

CPX-L-16DE



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

Combinations of connection blocks and digital input modules

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

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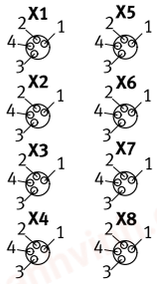
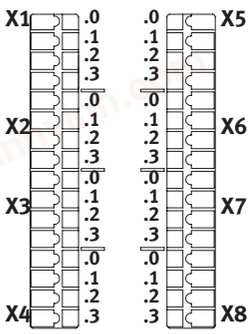
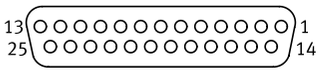
Datasheet – Input module, digital, 16 inputs

Pin assignment

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

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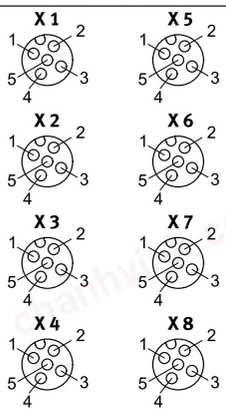
Datasheet – Input module, digital, 16 inputs

Pin assignment

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

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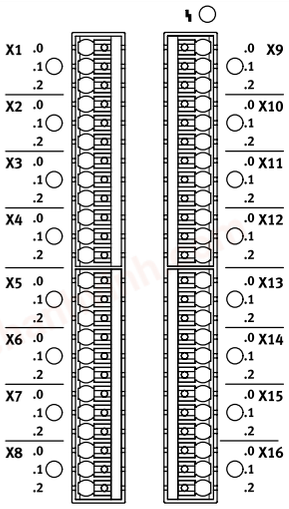
Datasheet – Input module, digital, 16 inputs

Pin assignment

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

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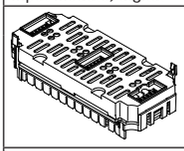
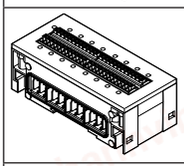
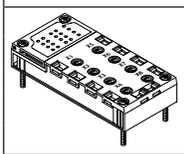
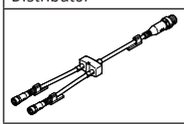
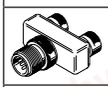
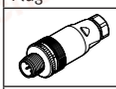
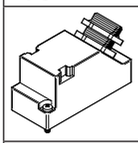
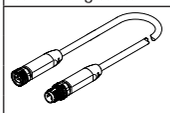
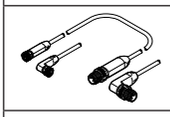
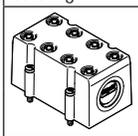
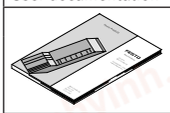
Datasheet – Input module, digital, 16 inputs

Ordering data

Designation				Part no.	Type
Input module, digital					
	16 digital inputs, internal electronic fuse per module			543815	CPX-16DE
	16 digital inputs, internal electronic fuse per channel pair, for CPX in metal			550202	CPX-M-16DE-D
	16 digital inputs, internal electronic fuse per module, for CPX in polymer, including interlinking block and connection block with spring-loaded terminals			572606	CPX-L-16DE-16-KL-3POL
Connection block					
	Polymer	8x socket M8, 4-pin		541256	CPX-AB-8-M8X2-4POL
		8x socket M12, 5-pin		3606900	CPX-AB-8-M12X2-5POL
		Spring-loaded terminal, 32-pin		195708	CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin		525676	CPX-AB-1-SUB-BU-25POL
	Metal	8x socket M12, 5-pin		549335	CPX-M-AB-8-M12X2-5POL
Distributor					
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy
	1x plug M8, 4-pin	2x socket M8, 3-pin		8005312	NEDY-L2R1-V1-M8G3-N-M8G4
Plug					
	M8, 3-pin	Screw terminal		8162298	NECB-S-M8G3-C2
	Sub-D plug, 25-pin			527522	SD-SUB-D-ST25
Connecting cable					
	1x socket M8, 3-pin	1x plug M8, 3-pin	0.5 m	★ 8078282	NEBA-M8G3-U-0.5-N-M8G3
			1.0 m	★ 8078283	NEBA-M8G3-U-1-N-M8G3
			2.5 m	★ 8078286	NEBA-M8G3-U-2.5-N-M8G3
			5.0 m	★ 8078287	NEBA-M8G3-U-5-N-M8G3
	Modular system for a choice of connecting cables			–	NEBA-... → Internet: neba
Covering					
	Covering hood for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through-feeds M9 • 1 cable through-feed for multi-pin plug			538219	AK-8KL
	Fittings kit			538220	VG-K-M9
User documentation					
	User documentation		German	526439	CPX-_DE_DA/CPX-_DE-DE
			English	526440	CPX-_DE_DA/CPX-_DE-EN

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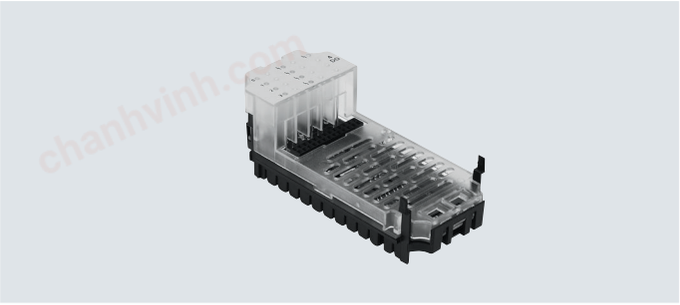
Datasheet – Output module, digital

Function
Digital outputs control actuators such as individual valves, hydraulic valves, heating controllers and many more. Separate circuits are created using additional power supply. By connecting the outputs of a module in parallel, consuming devices can be controlled with up to 4 A.

Application area
- 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 fuse 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		Typ. 34
Operating voltage	Nominal width	[V DC]	24		
	Permissible range	[V DC]	18 ... 30		
Galvanic isolation	Channel – channel		No		
	Channel – internal bus		Yes, with intermediate air supply		
Output characteristic			Based on IEC 1131-2		
Switching logic			Positive logic (PNP)		
LED indicators	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 • Force channel x • Idle mode channel x		
Degree of protection to EN 60529			Dependent on the connection block		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage/transport	[°C]	–20 ... +70		
Materials			Reinforced PA, PC		
LABS (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

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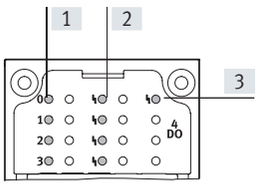
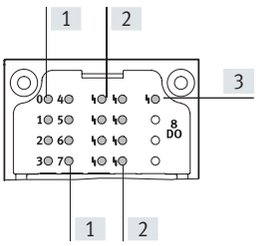
Datasheet – Output module, digital

Connection and indicator components

CPX-4DA



CPX-8DA

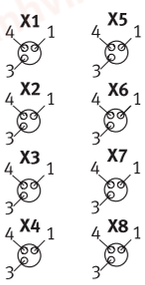


[1] Status LEDs (yellow) Assignment to outputs ➔ Pin assignment of the module
[2] Channel-related error LEDs (red)
[3] Error LED (red, module error)

Combinations of connection blocks 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 assignment

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

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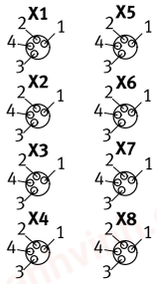
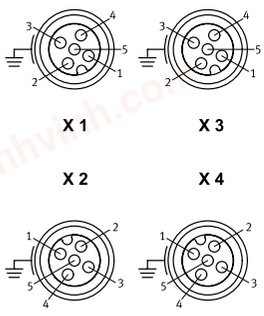
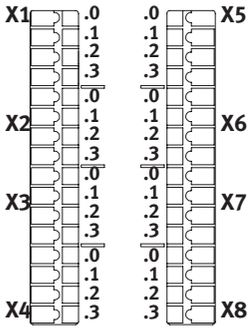
Datasheet – Output module, digital

Pin assignment

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]				
	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

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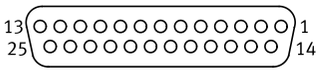
Datasheet – Output module, digital

Pin assignment

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

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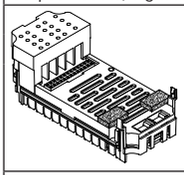
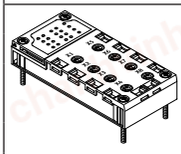
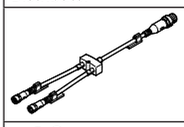
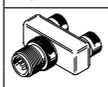
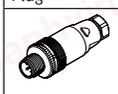
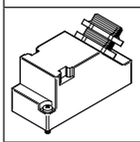
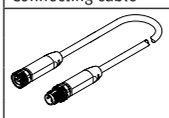
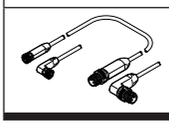
Datasheet – Output module, digital

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					
	Polymer	8x socket M8, 3-pin		195706	CPX-AB-8-M8-3POL
		8x socket M8, 4-pin		541256	CPX-AB-8-M8X2-4POL
		4x socket M12, 5-pin		195704	CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin		541254	CPX-AB-4-M12X2-5POL-R
		Spring-loaded terminal, 32-pin		195708	CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin		525676	CPX-AB-1-SUB-BU-25POL
	Metal	4x socket M12, 5-pin		549367	CPX-M-AB-4-M12X2-5POL
Distributor					
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy
	1x plug M8, 4-pin		2x socket M8, 3-pin	8005312	NEDY-L2R1-V1-M8G3-N-M8G4
	1x plug M12, 4-pin		2x socket M8, 3-pin	8005311	NEDY-L2R1-V1-M8G3-N-M12G4
			2x socket M12, 5-pin	8005310	NEDY-L2R1-V1-M12G5-N-M12G4
Plug					
	M8, 3-pin	Screw terminal		8162298	NECB-S-M8G3-C2
	M12, 4-pin	For cable Ø 2.1 ... 7 mm		8162294	NECB-S-M12G4-C2
		For 2x cable Ø 2.1 ... 5.6 mm		8162295	NECB-S-M12G4-C2-D
	M12, 5-pin	For cable Ø 2.1 ... 7 mm		8162296	NECB-S-M12G5-C2
		For 2x cable Ø 2.1 ... 5.6 mm		8162297	NECB-S-M12G5-C2-D
	Sub-D plug, 25-pin			527522	SD-SUB-D-ST25
Connecting cable					
	1x socket M8, 3-pin	1x plug M8, 3-pin	0.5 m	★ 8078282	NEBA-M8G3-U-0.5-N-M8G3
			1.0 m	★ 8078283	NEBA-M8G3-U-1-N-M8G3
			2.5 m	★ 8078286	NEBA-M8G3-U-2.5-N-M8G3
			5.0 m	★ 8078287	NEBA-M8G3-U-5-N-M8G3
	Modular system for a choice of connecting cables			–	NEBA-... → Internet: neba

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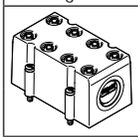
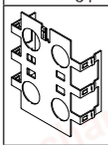
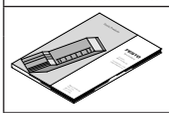
Datasheet – Output module, digital

Ordering data

Designation			Part no.	Type
Covering				
	Covering hood 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	CPX-_DE_DA/CPX-_DE-DE
		English	526440	CPX-_DE_DA/CPX-_DE-EN

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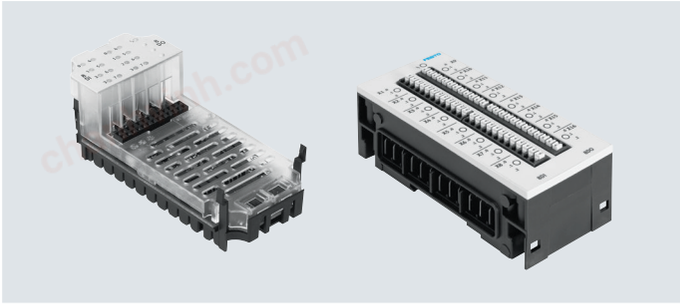
Datasheet – Input/output module, digital

Application area

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



General technical data

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

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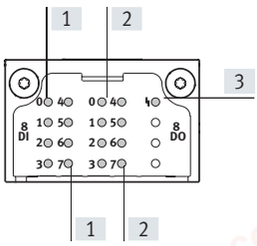
Datasheet – Input/output module, digital

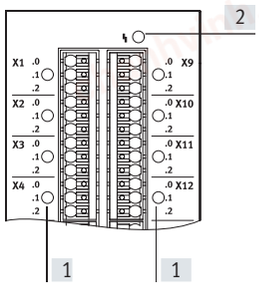
Connection and indicator components

CPX-8DE-8DA



[1] Status LEDs (green) Assignment to inputs ➔ Pin assignment of the module
[2] Status LEDs (yellow) Assignment to outputs ➔ Pin assignment of the module
[3] Error LED (red) (module error)

CPX-L-8DE-8DA

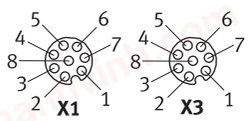
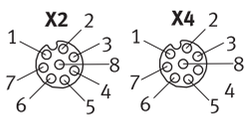


[1] Status LEDs (green) for each input signal
[2] Error LED (red; module error)

Combinations of connection blocks amd digital I/O module

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

Pin assignment

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}

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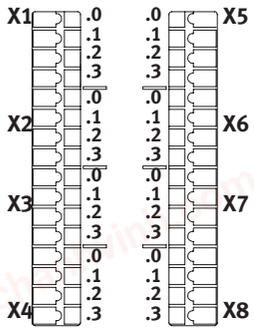
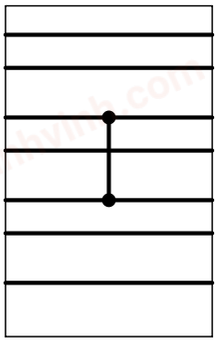
Datasheet – Input/output module, digital

Pin assignment

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

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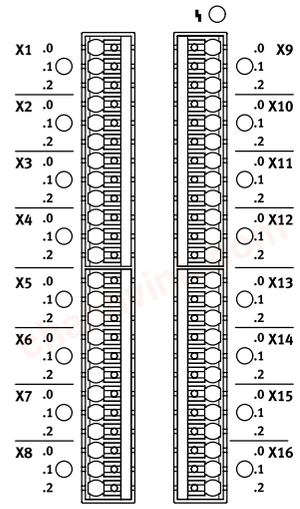
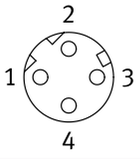
Datasheet – Input/output module, digital

Pin assignment

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

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

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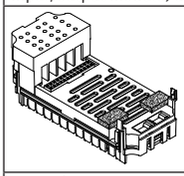
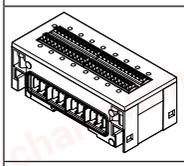
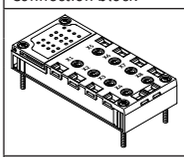
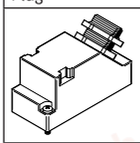
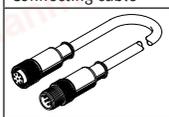
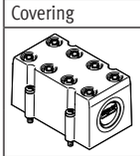
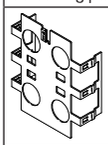
Datasheet – Input/output module, digital

Ordering data

Designation			Part no.	Type
Input/output module, digital				
	8 digital inputs, 8 digital outputs		**526257**	**CPX-8DE-8DA**
	8 digital inputs, 8 digital outputs, for CPX in polymer, including interlinking block and connection block with spring-loaded terminals		**572607**	**CPX-L-8DE-8DA-16-KL-3POL**
Connection block				
	Polymer	4x socket M12, 8-pin	**526178**	**CPX-AB-4-M12-8POL**
		Spring-loaded terminal, 32-pin	**195708**	**CPX-AB-8-KL-4POL**
		1x socket, Sub-D, 25-pin	**525676**	**CPX-AB-1-SUB-BU-25POL**
Plug				
	Sub-D plug, 25-pin		**527522**	**SD-SUB-D-ST25**
Connecting cable				
	Connecting cable M12		**525617**	**KM12-8GD8GS-2-PU**
Covering				
	Covering hood 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**	**CPX-_DE_DA/CPX-_DE-DE**
		English	**526440**	**CPX-_DE_DA/CPX-_DE-EN**

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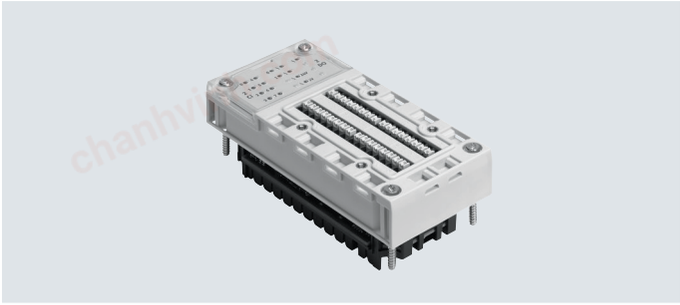
Datasheet – Counter module, digital

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.

Application area

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



Description

Possible 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)

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Datasheet – Counter module, digital

General technical data			
Type			CPX-2ZE2DA
No. of	Inputs		2
	Outputs		2
Max. power supply Per module	Inputs	[A]	2
	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]	typ. 35
Operating voltage	Nominal width	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Electrical isolation, inputs	Channel – channel		No
	Channel – internal bus		No
Electrical isolation, outputs	Channel – channel		No
	Channel – internal bus		Yes, with intermediate air supply
Characteristic curve	Inputs		To IEC 1131-2, type 02
	Outputs		IEC 1131-T2
Switching level	Signal 0	[V DC]	≤ 5
	Signal 1	[V DC]	≥ 11
Input debounce time		[µs]	0.1 (0.2 µs, 0.4 µs, 0.8 µs, 1 µs, 2 µs, 4 µs, 8 µs, 10 µs, 50 µs, 100 µs, 500 µs, 1 ms, 3 ms, 10 ms, 20 ms parameterisable)
Switching logic	Inputs		Positive logic (PNP)
	Outputs		• Negative logic (NPN) • Positive logic (PNP) • Push-pull driver
LED indicators	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 • Pulse output • Pulse train • Rotational speed measurement • Frequency measurement • Measurement duration period • 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 housing materials			Polymer
Note on materials			RoHs-compliant
LABS (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

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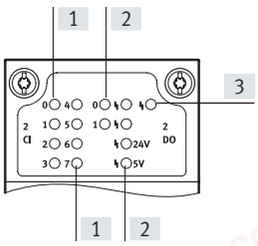
Datasheet – Counter module, digital

Connection and indicator components

CPX-2ZE2DA



[1] Status LEDs (green) Assignment to inputs ➔ Pin assignment of the module

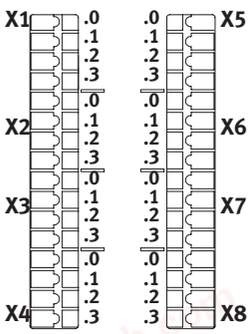
[2] Status LEDs (yellow, red) Assignment to outputs ➔ Pin assignment of the module

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

Pin assignment

Inputs/outputs

CPX-2ZE2DA



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

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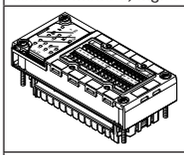
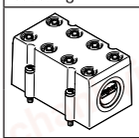
Datasheet – Counter module, digital

Ordering data

Designation			Part no.	Type
Counter module, digital				
	2 digital inputs, 2 digital outputs		**576046**	**CPX-2ZE2DA**
Covering				
	Covering hood for CPX-2ZE2DA (IP65, IP67) • 8 cable through-feeds M9 • 1 cable through-feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
User documentation				
	User documentation for counter module CPX-2ZE2DA	German	**8035733**	**CPX-2ZE2DA-DE**
		English	**8035734**	**CPX-2ZE2DA-EN**

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Datasheet – Input module, analogue

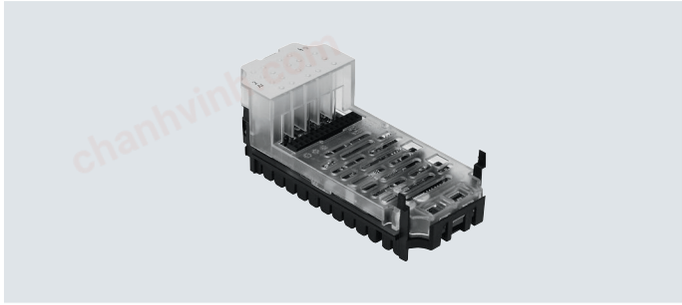
Function

Analogue modules are used to 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.

Application area

- 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
- Module protection and diagnostics of the analogue module via integrated electronic fuse



General technical data

Type		CPX-2AE-U-I156		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)				

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Datasheet – 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 wire break per channel		
			Behaviour after short circuit		
			–	Behaviour after overload at input	–
			–	Sensor supply active	–
Degree of protection to EN 60529			Depending on connection block		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage/transport	[°C]	–20 ... +70		
Materials			Reinforced PA, PC		
Note on materials			–	RoHs-compliant	–
LABS (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

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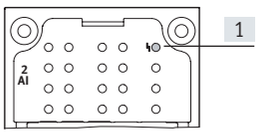
Datasheet – Input module, analogue

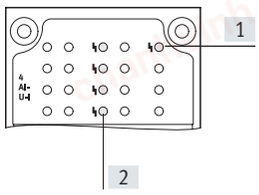
Connection and indicator components

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



[1] Error LED (red; module error)

CPX-4AE-U-I

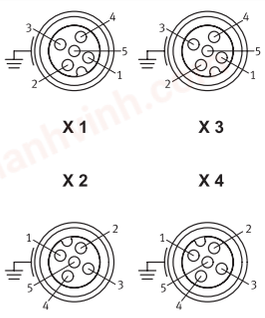
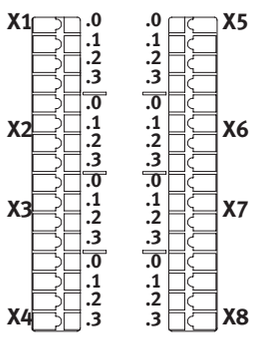


[1] Error LED (red; module error)
[2] Channel-related error LEDs (red)

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 assignment

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

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

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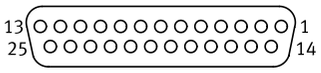
Datasheet – Input module, analogue

Pin assignment

Connection block inputs	CPX-2AE-U-I		CPX-4AE-U-I		CPX-4AE-I	
CPX-AB-1-SUB-BU-25POL						
	1: Input U0– 2: Input U0+ 3: Input I0– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: Shield-ing1)	14: Input U1– 15: Input U1+ 16: Input I1– 17: Input I1+ 18: 24 V_{SEN} 19: n.c. 20: 24 V_{SEN} 21: n.c. 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE Housing: FE	1: Input 0– 2: Input 0+ 3: Input 1– 4: Input 1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: Shielding1)	14: Input 2– 15: Input 2+ 16: Input 3– 17: Input 3+ 18: 24 V_{SEN} 19: n.c. 20: 24 V_{SEN} 21: n.c. 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE Housing: FE	1: Input I0– 2: Input I0+ 3: Input I1– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: Shielding1)	14: Input I2– 15: Input I2+ 16: Input I3– 17: Input I3+ 18: 24 V_{SEN} 19: n.c. 20: 24 V_{SEN} 21: n.c. 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE Housing: FE

1) Connect shield to functional earth FE

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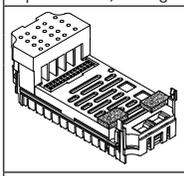
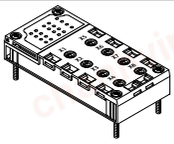
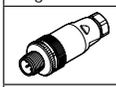
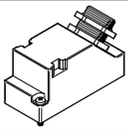
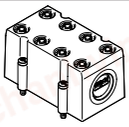
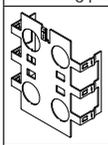
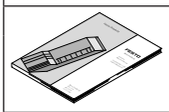
Datasheet – Input module, analogue

Ordering data

				Part no.	Type
Input module, analogue					
	2 analogue current or voltage inputs			526168	CPX-2AE-U-I
	4 analogue current or voltage inputs			573710	CPX-4AE-U-I
	4 analogue current inputs			541484	CPX-4AE-I
Connection block					
	Polymer	4x socket M12, 5-pin		195704	CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin		541254	CPX-AB-4-M12X2-5POL-R
		Spring-loaded terminal, 32-pin		195708	CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin		525676	CPX-AB-1-SUB-BU-25POL
	Metal	4x socket M12, 5-pin		549367	CPX-M-AB-4-M12X2-5POL
Plug					
	M12, 5-pin	For cable Ø 2.1 ... 7 mm		8162296	NECB-S-M12G5-C2
	Sub-D plug, 25-pin			527522	SD-SUB-D-ST25
Covering					
	Covering hood 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	CPX-_AA/-_AE-DE
			English	526416	CPX-_AA/-_AE-EN

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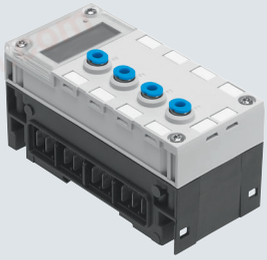
Datasheet – Input module, analogue, with pressure sensors

Function

With the pressure input modules, a maximum of 4 pressures can be processed. 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 also possible to combine 2 channels in each case to form a differential pressure channel.

Application area

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



General technical data

Type			CPX-4AE-P-B2	CPX-4AE-P-D10
Number of analogue inputs			4	
Pneumatic connection			QS-4	
Nominal operating voltage		[V DC]	24	
Operating voltage range		[V DC]	18 ... 30	
Intrinsic current consumption		[mA]	Typically 50	
Measured variable			4x relative or 2x differential pressure measurement	
Displayable units			• kPa • mbar • psi	
Pressure measuring range	Start value	[bar]	–1	0
	End 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			• Diagnostics 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			Reinforced PA, PC	
Note on materials			RoHs-compliant	
LABS (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.

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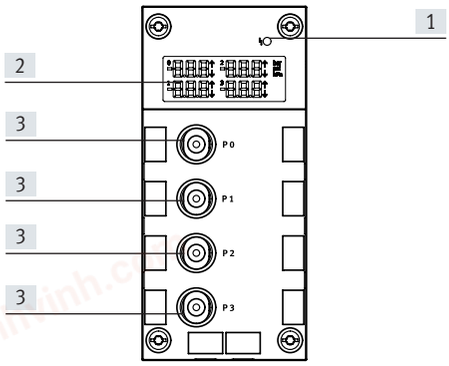
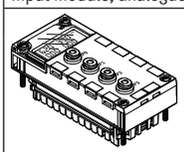
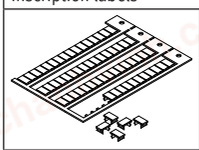
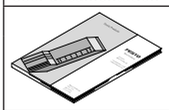
Datasheet – Input module, analogue, with pressure sensors

Connection and indicator 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 a frame	**18576**	**IBS-6x10**
User documentation			
	User documentation	German: **526415**	**CPX-_AA/-_AE-DE**
		English: **526416**	**CPX-_AA/-_AE-EN**

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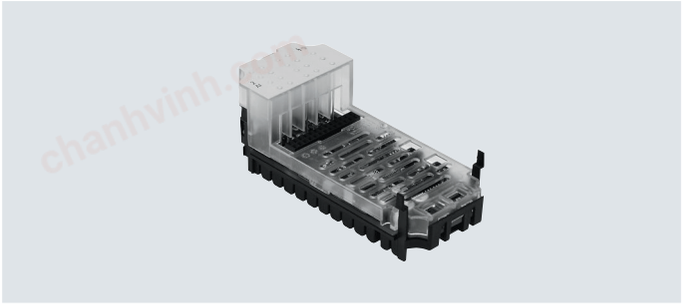
Datasheet – Input module, analogue, for temperature inputs

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.

Application area

- 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-conductor, 3-conductor and 4-conductor 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



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
Supply voltage for sensors		[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 climate	[°C]	–120 ... +130
	Ni	[°C]	–60 ... +180
Sensor connection technology			2-, 3- and 4-conductor technology
Resolution			15 bits + prefix
Operating error limit related to input range		[%]	±0.06
Basic error limit (25 °C)	Standard	[K]	±0.6
	Pt climate	[K]	±0.2
Temperature error relative to input range		[%]	±0.001
Linearity error (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

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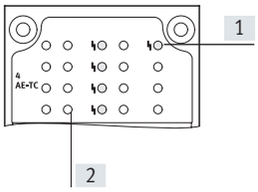
Datasheet – Input module, analogue, for temperature inputs

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/scaling end 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 value monitoring per channel • Sensor connection technology • Sensor type/temperature coefficient, temperature range • Limit value per channel • Measured value smoothing
Degree of protection to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
LABS (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 indicator 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**	■

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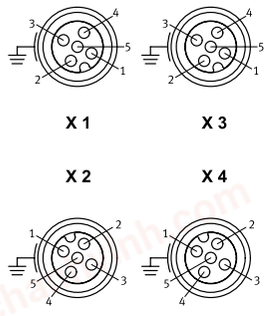
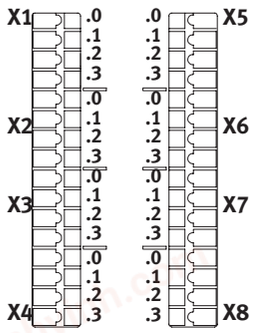
Datasheet – Input module, analogue, for temperature inputs

Pin assignment

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

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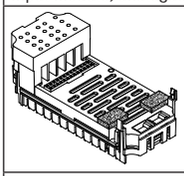
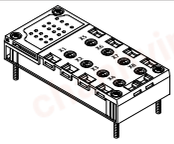
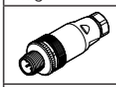
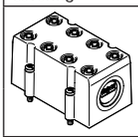
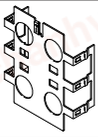
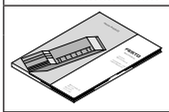
Datasheet – Input module, analogue, for temperature inputs

Ordering data

Designation			Part no.	Type
Input module, analogue				
	2 or 4 analogue temperature inputs		**541486**	**CPX-4AE-T**
Connection block				
	Polymer	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	For cable Ø 2.1 ... 7 mm	**8162296**	**NECB-S-M12G5-C2**
Covering				
	Covering hood 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**	**CPX-_AA/-_AE-DE**
		English	**526416**	**CPX-_AA/-_AE-EN**

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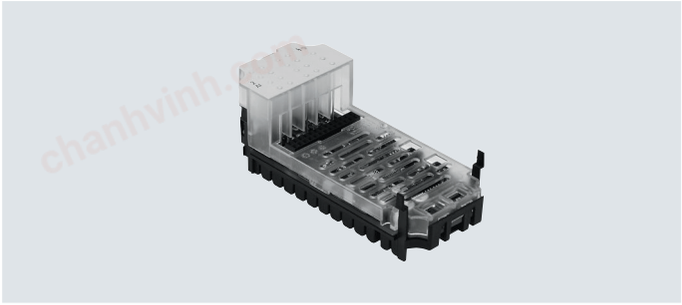
Datasheet – Input module, analogue, for thermocouple

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).

Application area

- Supports connection blocks with M12 and terminal connection
- Temperature module features can be parameterised
- 2-conductor connection
- 2-conductor 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



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-conductor technology
Operating error limit related 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. total current per module	[mA]	30
Max. permissible input voltage	[V]	±30
Internal cycle time (module)	[ms]	250

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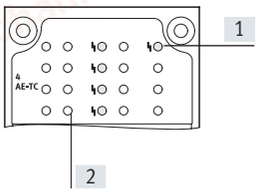
Datasheet – Input module, analogue, for thermocouple

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 wire break per channel • Unit of measurement • Cold-junction compensation • Sensor type per channel • Limit value monitoring per channel • Measured value smoothing
Degree of protection to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced PA, PC
LABS (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 indicator 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**	■

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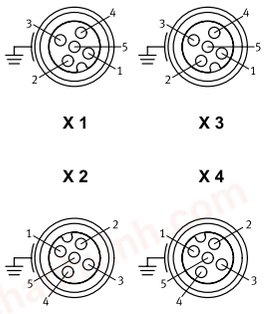
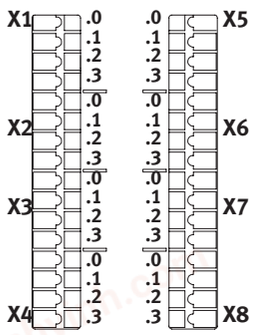
Datasheet – Input module, analogue, for thermocouple

Pin assignment

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

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

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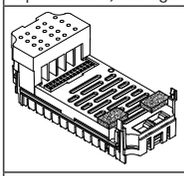
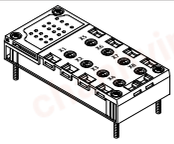
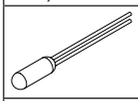
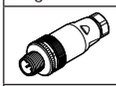
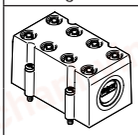
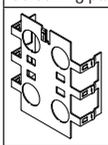
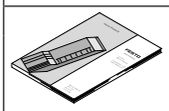
Datasheet – Input module, analogue, for thermocouple

Ordering data

Designation				Part no.	Type
Input module, analogue					
	4 analogue temperature inputs, with 2-conductor connection for a PT1000 sensor for cold junction compensation			**553594**	**CPX-4AE-TC**
Connection block					
	Polymer	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	For cable Ø 2.1 ... 7 mm		**8162296**	**NECB-S-M12G5-C2**
Covering					
	Covering hood 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**	**CPX-_AA/-_AE-DE**
			English	**526416**	**CPX-_AA/-_AE-EN**

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Datasheet – Output module, analogue

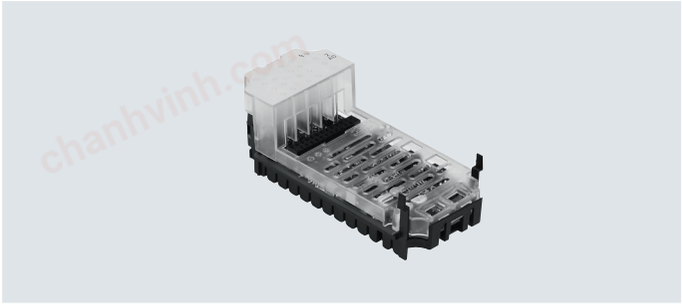
Function

Analogue modules are used to 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.

Application area

- 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
- Module protection and diagnostics of the analogue module via integrated electronic fuse



General technical data

Type			CPX-2AA-U-I	
			Voltage output	Current output
Number of analogue outputs			2	
Max. actuator supply per module		[A]	2.8	
Fuse protection			Internal electronic fuse for actuator supply	
Current consumption from 24 V sensor supply (at full load)		[mA]	Max. 150	
Current consumption from 24 V actuator supply (at full load)		[A]	4 ... 10	
Supply voltage for actuators		[V DC]	24 ±25%	
Signal range (parameterisable for each channel with DIL switch or software)			0 ... 10 V DC	0 ... 20 mA 4 ... 20 mA
Resolution		[bit]	12	
Number of units			4096	
Absolute accuracy		[%]	±0.6	
Linearity error (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 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 conductors	
Cycle time (module)		[ms]	≤ 4	

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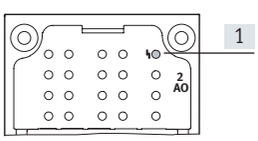
Datasheet – Output module, analogue

General technical data				
Type			CPX-2AA-U-I	
			Voltage output	Current output
Settling 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/scaling end 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 in actuator supply • Data format • Lower limit value/full-scale value • Upper limit value/full-scale value • Monitoring value falling below nominal range/full-scale value • Monitoring value exceeding nominal range/full-scale value • Monitoring wire break • Signal range	
Degree of protection to EN 60529			Depending on connection block	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			Reinforced PA, PC	
LABS (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 indicator 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**	■

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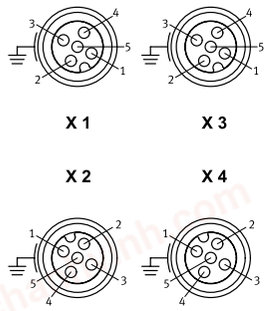
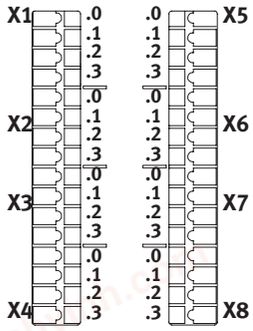
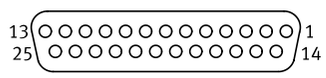
Datasheet – Output module, analogue

Pin assignment

Connection block outputs	CPX-2AA-U-I	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1], CPX-M-AB-4-M12X2-5POL		
	X1.1: 24 V_{OUT} X1.2: Output U0+ X1.3: 0 V_{OUT} X1.4: Output GND X1.5: FE[2]	X3.1: 24 V_{OUT} X3.2: Output U1+ X3.3: 0 V_{OUT} X3.4: Output GND X3.5: FE[2]
	X2.1: 24 V_{OUT} X2.2: Output I0+ X2.3: 0 V_{OUT} X2.4: Output GND X2.5: FE[2]	X4.1: 24 V_{OUT} X4.2: Output I1+ X4.3: 0 V_{OUT} X4.4: Output GND X4.5: FE[2]
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{OUT} X1.1: 0 V_{OUT} X1.2: Output GND X1.3: FE	X5.0: 24 V_{OUT} X5.1: 0 V_{OUT} X5.2: Output GND X5.3: FE
	X2.0: n.c. X2.1: n.c. X2.2: Output U0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: Output U1+ X6.3: FE
	X3.0: 24 V_{OUT} X3.1: 0 V_{OUT} X3.2: Output GDN X3.3: FE	X7.0: 24 V_{OUT} X7.1: 0 V_{OUT} X7.2: Output GND X7.3: FE
	X4.0: n.c. X4.1: n.c. X4.2: Output I0+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Output I1+ X8.3: FE
CPX-AB-1-SUB-BU-25POL		
	1: Output GND 2: Output U0+ 3: Output GND 4: Output I0+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{OUT} 10: 24 V_{OUT} 11: 0 V_{OUT} 12: 0 V_{OUT} 13: Shielding3)	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

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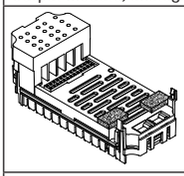
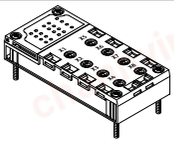
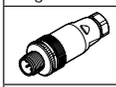
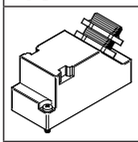
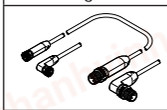
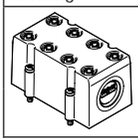
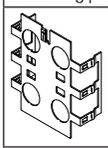
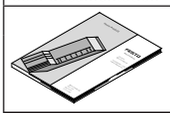
Datasheet – Output module, analogue

Ordering data

Designation				Part no.	Type
Output module, analogue					
	2 analogue current or voltage outputs			526170	CPX-2AA-U-I
Connection block					
	Polymer	4x socket M12, 5-pin		195704	CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin		541254	CPX-AB-4-M12X2-5POL-R
		Spring-loaded terminal, 32-pin		195708	CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin		525676	CPX-AB-1-SUB-BU-25POL
	Metal	4x socket M12, 5-pin		549367	CPX-M-AB-4-M12X2-5POL
Plug					
	M12, 5-pin	For cable Ø 2.1 ... 7 mm		8162296	NECB-S-M12G5-C2
	Sub-D plug, 25-pin			527522	SD-SUB-D-ST25
Connecting cable					
	Modular system for a choice of connecting cables			–	NEBA-... ➔ Internet: neba
Covering					
	Covering hood 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	CPX-_AA/-_AE-DE
			English	526416	CPX-_AA/-_AE-EN

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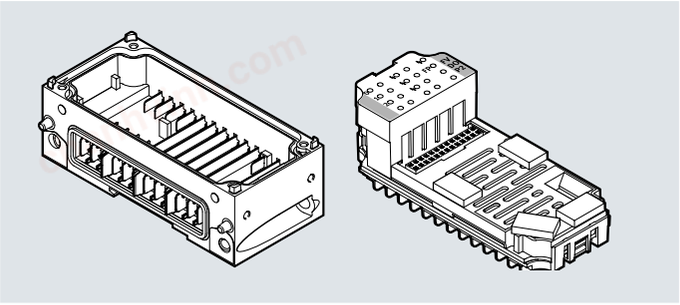
Datasheet – PROFIsafe shut-off module

Function

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

Application area

- 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
Maximum address volume	Inputs	[B]	6
	Outputs	[B]	6
Maximum cable length		[m]	200
Max. power supply	Per module	[A]	5
	Per channel	[A]	1.5
Fuse protection (short circuit)			Internal electronic fuse per channel
Current consumption of the module		[mA]	Typ. 65 (power supply for valves)
		[mA]	Typ. 25 (power supply for electronics)
Operating voltage	Nominal width	[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 switch-off command		[ms]	23
Galvanic isolation	Channel – channel		No
	Channel – internal bus		Yes, with intermediate air 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			German Technical Control Board (TÜV) Rhld 01/205/5294.02/23
			German Technical Control Board (TÜV) Rhld 01/205U/5294.01/23
LED indicators	Group diagnostics		1
	Channel diagnostics		3
	Channel status		3
	Fail-safe protocol active		1
Diagnostics			• Short circuit/overload per channel • Undervoltage of valves • Cross circuit • Wire break per channel
Parameterisation			• Monitoring wire break per channel • Diagnostic behaviour
Degree of protection to EN 60529			Dependent on the 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

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Datasheet – PROFIsafe shut-off module

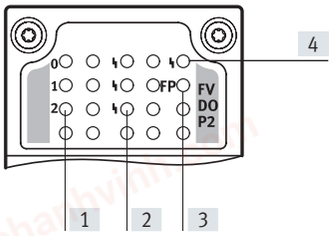
Materials	
Housing	Reinforced PA, PC
Note on materials	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

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]		According to UK regulations for machines
		To UK EMC regulations
		To UK RoHS regulations
Certification		c UL us – Recognized (OL)

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

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

Note

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

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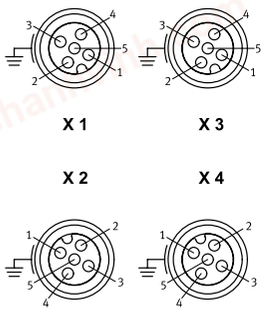
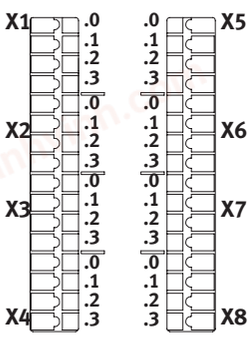
Datasheet – PROFIsafe shut-off module

Combinations of connection blocks for PROFIsafe disconnection 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 assignment

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 VOUT 1 (can be switched off via fieldbus) X1.5: FE	X3.1: n.c. X3.2: n.c. X3.3: n.c. X3.4: n.c. X3.5: 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	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	X5.0: n.c. X5.1: n.c. X5.2: n.c. X5.3: n.c.
	X2.0: n.c. X2.1: n.c. X2.2: 24 V_{OUT} 1 (cannot be switched off) X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: n.c. X6.3: n.c.
	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	X7.0: n.c. X7.1: n.c. X7.2: n.c. X7.3: n.c.
	X4.0: n.c. X4.1: n.c. X4.2: 24 V_{OUT} 2 (cannot be switched off) X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: n.c. X8.3: n.c.

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Datasheet – PROFIsafe shut-off module

Combinations of interlinking blocks and PROFIsafe shut-off module

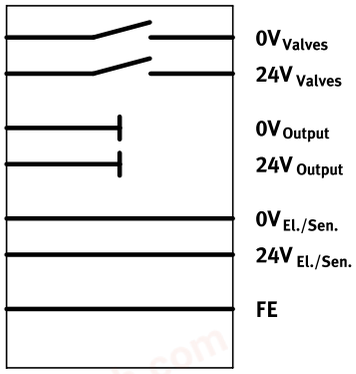
Interlinking blocks	Part no.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-GE-EV-S	**195746**	–
CPX-GE-EV-S-VL	**8022170**	–
CPX-GE-EV-S-7/8-4POL	**541248**	–
CPX-GE-EV-S-7/8-5POL	**541244**	–
CPX-GE-EV-S-7/8-5POL-VL	**8022172**	–
CPX-M-GE-EV-S-7/8-CIP-4P	**568956**	–
CPX-M-GE-EV-S-7/8-5POL	**550208**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

General technical data

Type		CPX-M-GE-EV-FVO
Nominal operating voltage	[V DC]	24
Current carrying capacity (per contact/contact rail)	[A]	16
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Certification		c UL us – Recognized (OL)
Materials		Die-cast aluminium
Note on materials		RoHs-compliant
LABS (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 assignment

Wiring



Pin	Assignment
–	–
–	–
–	–
–	–

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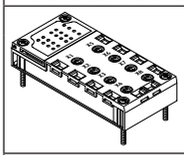
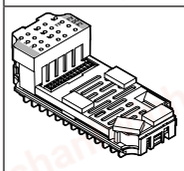
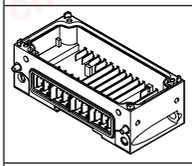
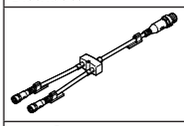
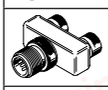
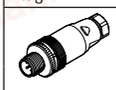
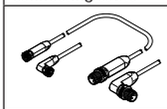
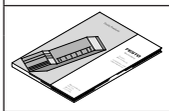
Datasheet – PROFIsafe shut-off module

Ordering data

	Description			Part no.	Type
PROFIsafe shut-off module					
	Metal connection block	4x socket M12, 5-pin		**549367**	**CPX-M-AB-4-M12X2-5POL**
	Polymer connection block	Spring-loaded terminal, 32-pin		**195708**	**CPX-AB-8-KL-4POL**
	Electronics module (can only be used with CPX-M-GE-EV-FVO)	PROFINET, PROFIBUS		**1971599**	**CPX-FVDA-P2**
	Metal interlinking block (for CPX-FVDA-P2 only)			**567806**	**CPX-M-GE-EV-FVO**
Distributor					
	Modular system for all types of sensor/actuator distributor			**–**	**NEDY-...** → Internet: nedy
	1x plug M12, 4-pin	2x socket M12, 5-pin		**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Plug					
	M12, 4-pin	For cable Ø 2.1 ... 7 mm		**8162294**	**NECB-S-M12G4-C2**
		For 2x cable Ø 2.1 ... 5.6 mm		**8162295**	**NECB-S-M12G4-C2-D**
	M12, 5-pin	For cable Ø 2.1 ... 7 mm		**8162296**	**NECB-S-M12G5-C2**
		For 2x cable Ø 2.1 ... 5.6 mm		**8162297**	**NECB-S-M12G5-C2-D**
Connecting cable					
	Modular system for a choice of connecting cables			**–**	**NEBA-...** → Internet: neba
User documentation					
	User documentation for PROFIsafe shut-off module		German	**8022606**	**CPX-FVDA-P2-DE**
			English	**8022607**	**CPX-FVDA-P2-EN**

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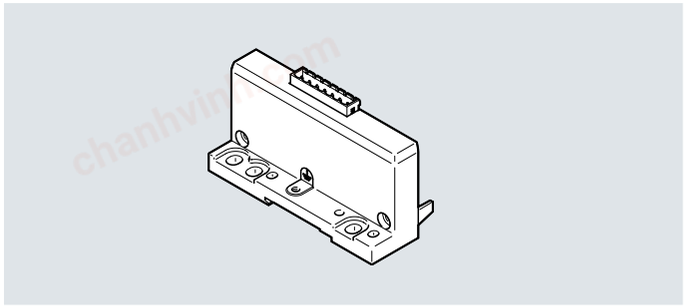
Datasheet – End plate with system supply

Function

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

Application area

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

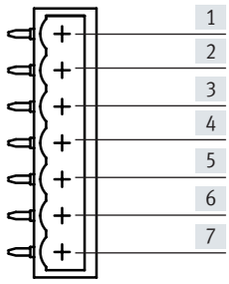


General technical data		
Electrical connection		Plug, 7-pin
Type of mounting		Tie rods
Power supply		System supply
Maximum power supply	[A]	12
Product weight	[g]	145

Materials	
Housing	Die-cast aluminium, painted
Note on materials	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

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

Pin assignment

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

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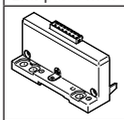
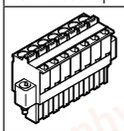
Datasheet – End plate with system supply

Ordering data

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

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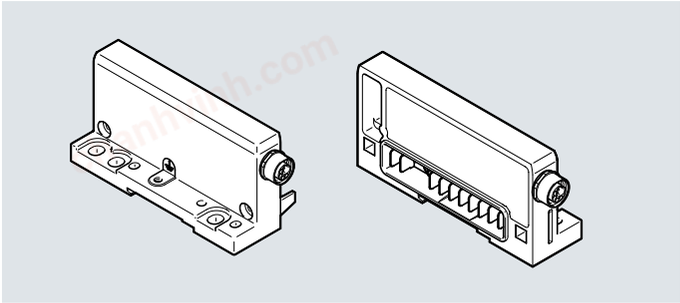
Datasheet – End plate with extension

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

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



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

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

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

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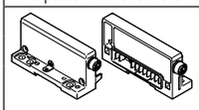
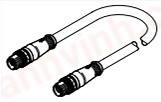
Datasheet – End plate with extension

Pin assignment – End plate with extension

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

Ordering data

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

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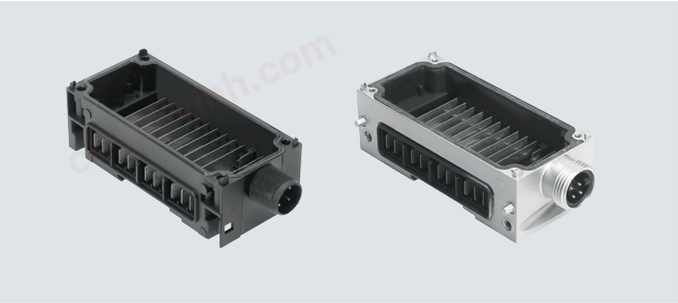
Datasheet – Interlinking block with system supply

Function

Interlinking blocks ensure the electrical supply of all other CPX modules.
They have contact rails, from which the other CPX components on the interlinking modules are supplied with power.
The internal division of the power supply allows specific areas of the sensors and actuators to be switched off individually.

Application area

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



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

Technical data – Polymer interlinking blocks							
Type			CPX-GE-EV-S				
				-VL	-7/8-4POL	-7/8-5POL	-7/8-5POL-VL
Electrical connection			M18	M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Power supply	Sensors and electronics	[A]	Max. 16	Max. 8	Max. 10	Max. 8	Max. 8
	Valves and outputs	[A]	Max. 16	Max. 8	Max. 10	Max. 8	Max. 8
Corrosion resistance class CRC1)			1				
Type of mounting			Tie rods				
Materials			Reinforced PA				
Product weight		[g]	125				

1) More information www.festo.com/x/topic/crc

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Datasheet – Interlinking block with system supply

Technical data – Metal interlinking blocks							
Type			CPX-M-GE-EV-S				
			-7/8-CIP-4P	-7/8-5POL	-M12-5POL	-7/8-5POL-VL	-PP-5POL
Electrical connection			7/8", 4-pin	7/8", 5-pin	Plug M12x1 5-pin L-coded	7/8", 5-pin	AIDA push-pull, 5-pin
Power supply	Sensors and electronics	[A]	Max. 10	Max. 8	Max. 16	Max. 8	Max. 16
	Valves and outputs	[A]	Max. 10	Max. 8	Max. 16	Max. 8	Max. 16
Corrosion resistance class CRC1)			0				
Type of mounting			Angled fitting				
Materials			Die-cast aluminium				
Certification			–	–	c UL - Recog-nized (OL)	–	–
Product weight		[g]	187	187	266	187	279

1) More information www.festo.com/x/topic/crc

Note

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

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

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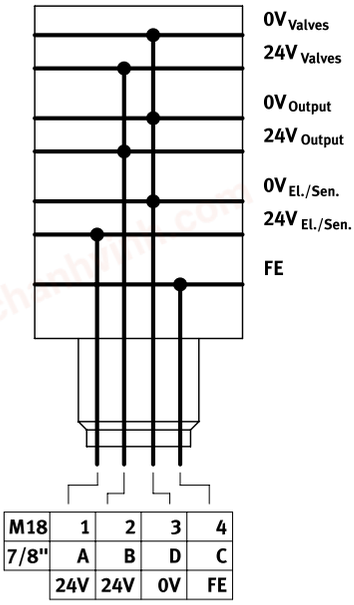
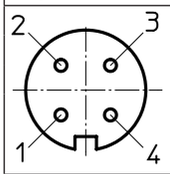
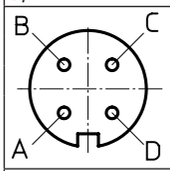
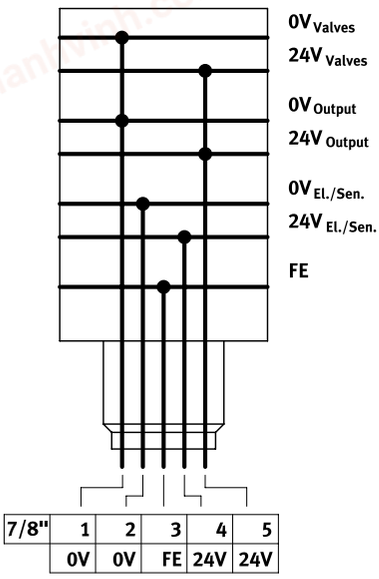
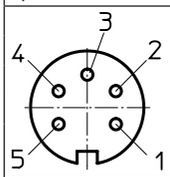
Datasheet – Interlinking block with system supply

Pin assignment – Polymer interlinking blocks

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

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

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

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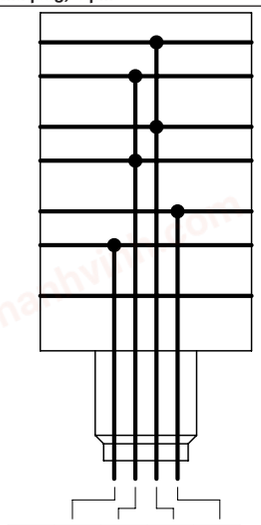
Datasheet – Interlinking block with system supply

Pin assignment – Metal interlinking blocks

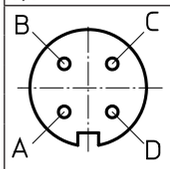
Wiring

Round plug, 4-pin



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

7/8"

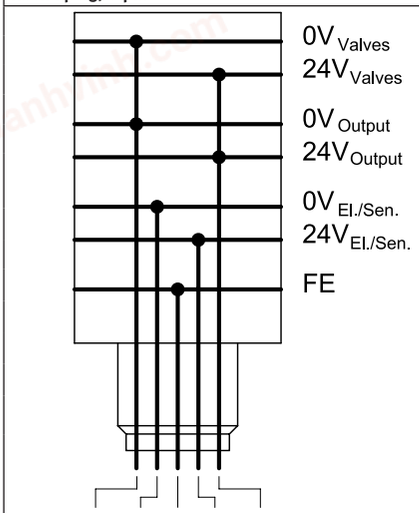


Pin	Assignment
A	24 V DC supply voltage for electronics and sensors
B	24 V DC load voltage supply for valves and outputs
C	0 V DC supply voltage for electronics and sensors
D	0 V DC load voltage supply for valves and outputs

Note

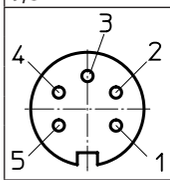
The functional earth (FE) must be connected via the left-hand end plate.

Round plug, 5-pin



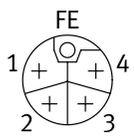
7/8"	1	2	3	4	5
M12	2	3	5	1	4
	0V	0V	FE	24V	24V

7/8"



Pin	Assignment
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

M12



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

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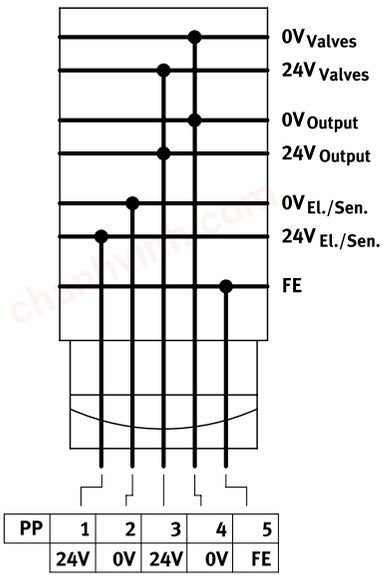
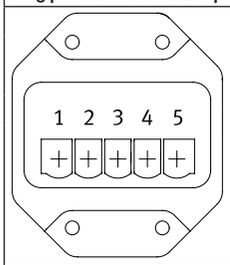
Datasheet – Interlinking block with system supply

Pin assignment – Metal interlinking blocks

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

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

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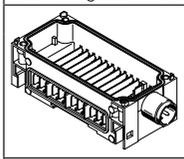
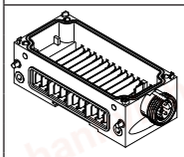
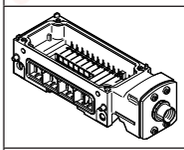
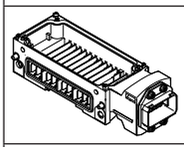
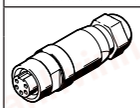
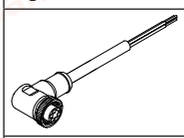
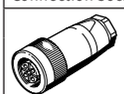
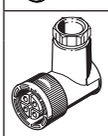
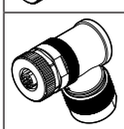
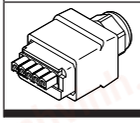
Datasheet – Interlinking block with system supply

Ordering data

Designation				Part no.	Type
Interlinking block with system supply					
	M18 connection, polymer interlinking block	4-pin	–	195746	CPX-GE-EV-S
			For ATEX environment	8022170	CPX-GE-EV-S-VL
	7/8" connection, polymer interlinking block	4-pin	–	541248	CPX-GE-EV-S-7/8-4POL
		5-pin	–	541244	CPX-GE-EV-S-7/8-5POL
			For ATEX environment	8022172	CPX-GE-EV-S-7/8-5POL-VL
	7/8" connection, metal interlinking block	4-pin	–	568956	CPX-M-GE-EV-S-7/8-CIP-4P
		5-pin	–	550208	CPX-M-GE-EV-S-7/8-5POL
			For ATEX environment	8022165	CPX-M-GE-EV-S-7/8-5POL-VL
	M12x1 L-coded connection, metal interlinking block	5-pin	–	8098392	CPX-M-GE-EV-S-M12-5POL
	Push-pull plug connection (AIDA), metal interlinking block	5-pin	–	563057	CPX-M-GE-EV-S-PP-5POL
Connection sockets 7/8"					
	Power supply socket	5-pin		543107	NECU-G78G5-C2
		4-pin		543108	NECU-G78G4-C2
	Angled socket, 5-pin – open cable end, 5-core	2 m		573855	NEBU-G78W5-K-2-N-LE5
Connection sockets M18					
	Straight socket, screw terminal	4-pin	PG9	18493	NTSD-GD-9
			PG13.5	18526	NTSD-GD-13,5
	Angled socket, screw terminal	4-pin	PG9	18527	NTSD-WD-9
	Angled socket, screw terminal	4-pin	PG11	533119	NTSD-WD-11
Power supply sockets M12					
	Straight socket, screw terminal	5-pin		8166793	NECL-L12G5-C2-Q10
	Angled socket, screw terminal	5-pin		8166794	NECL-L12W5-C2-Q10
Push-pull power supply socket					
	Socket, spring-loaded terminal, Plug pattern PP, fulfils requirements to AIDA	5-pin		5195383	NECU-M-PPG5PP-C1-PN

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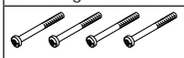
Datasheet – Interlinking block with system supply

Ordering data

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

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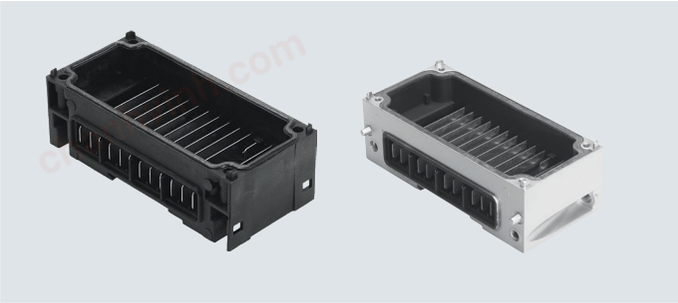
Datasheet – Interlinking block without power supply

Function
Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power.
The internal division of the power supply allows specific areas of the sensors and actuators to be switched off individually.

Application area
- 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.

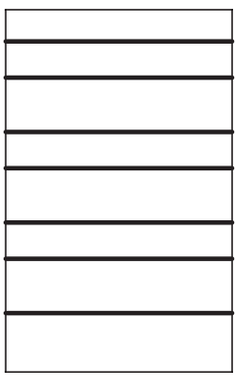


General technical data

Type		CPX-GE-EV	CPX-M-GE-EV
Electrical connection		–	–
Nominal operating voltage	[V DC]	24	24
Current carrying capacity (per contact/contact rail)	[A]	16	16
Degree of protection to EN 60529		Depending on connection block	
Ambient temperature	[°C]	–5 ... +50	
Materials		Reinforced PA	Aluminium
Note on materials		RoHs-compliant	
LABS (PWIS) conformity		VDMA24364-B2-L	
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	
Product weight	[g]	108	169

Pin assignment

Wiring



	Pin	Assignment
	–	–
	–	–
	–	–
	–	–

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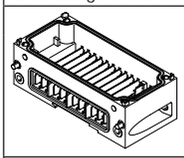
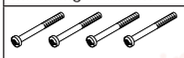
Datasheet – Interlinking block without power supply

Ordering data

Designation			Part no.	Type
Interlinking block without power supply				
	Polymer interlinking block		**195742**	**CPX-GE-EV**
	Metal interlinking block		**550206**	**CPX-M-GE-EV**
Mounting accessories				
	Screws for mounting the bus node/connection block on the polymer interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/polymer connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**

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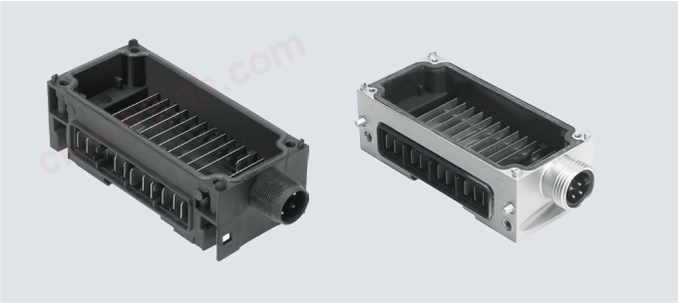
Datasheet – Interlinking block with additional supply for outputs

Function
Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power.
The internal division of the power supply allows specific areas of the sensors and actuators to be switched off individually.

Application area
- 24 V DC supply voltage for outputs



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

Technical data – Polymer interlinking blocks					
Type			CPX-GE-EV-Z		
				-7/8-4POL	-7/8-5POL
Electrical connection			M18	7/8", 4-pin	7/8", 5-pin
Power supply	Outputs	[A]	Max. 16	Max. 10	Max. 8
Materials			Reinforced PA		
Product weight		[g]	125		

Technical data – Metal interlinking blocks				
Type			CPX-M-GE-EV-Z	
			-7/8-5POL	-PP-5POL
Electrical connection			7/8", 5-pin	AIDA push-pull, 5-pin
Power supply	Outputs	[A]	Max. 8	Max. 16
Materials			Die-cast aluminium	
Product weight		[g]	187	279

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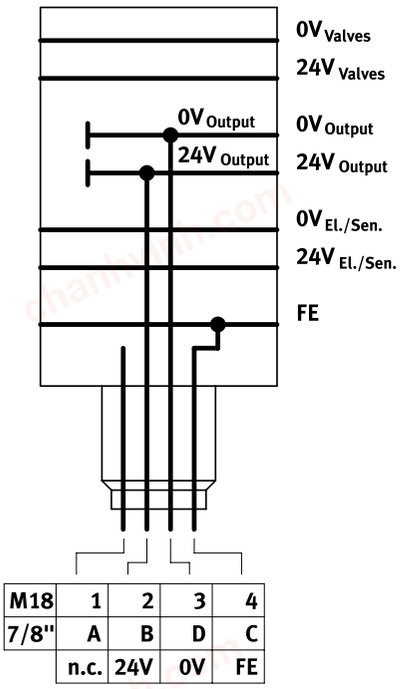
Datasheet – Interlinking block with additional supply for outputs

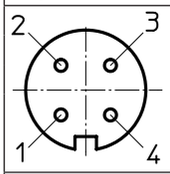
Pin assignment – Polymer interlinking blocks

Round plug, 4-pin



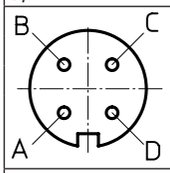
M18	1	2	3	4
7/8"	A	B	D	C
	n.c.	24V	0V	FE

M18



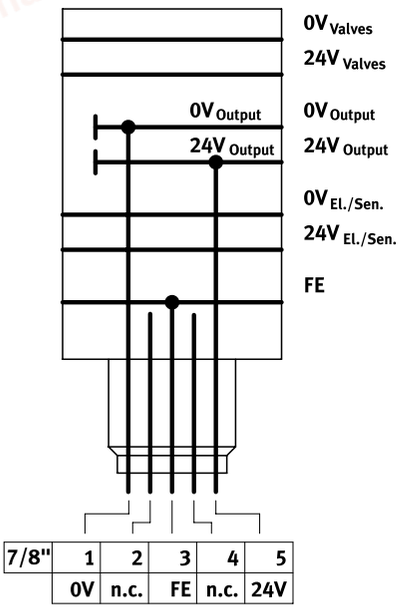
Pin	Assignment
1	n.c.
2	24 V DC load voltage supply for outputs
3	0 V
4	FE

7/8"



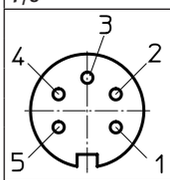
Pin	Assignment
A	n.c.
B	24 V DC load voltage supply for outputs
C	FE
D	0V

Round plug, 5-pin



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

7/8"



Pin	Assignment
1	0 V outputs
2	n.c.
3	FE
4	n.c.
5	24 V DC load voltage supply for outputs

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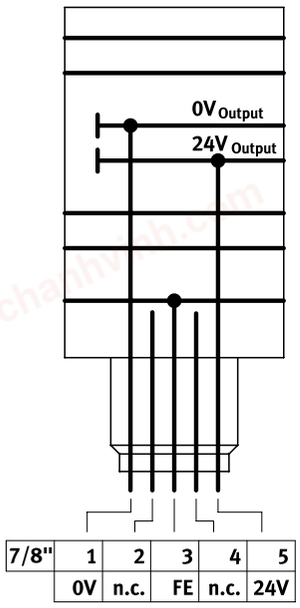
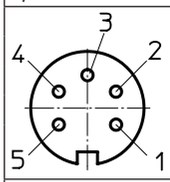
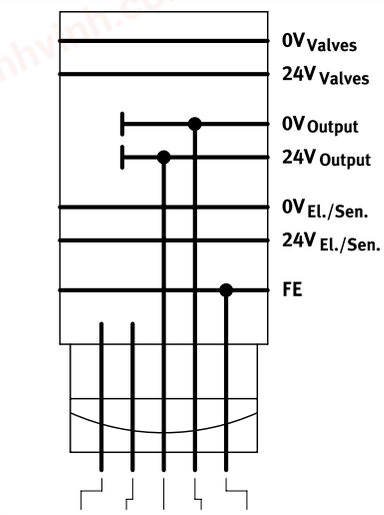
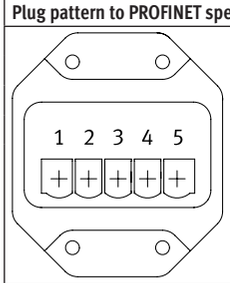
Datasheet – Interlinking block with additional supply for outputs

Pin assignment – Metal interlinking blocks

Wiring		Pin	Assignment
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
Push-pull plug 5-pin			
	**Plug pattern to PROFINET specification** 	1	n.c.
		2	n.c.
		3	24 V DC load voltage supply for outputs
		4	0 V outputs
		5	FE

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

PP	1	2	3	4	5
	n.c.	n.c.	24V	0V	FE

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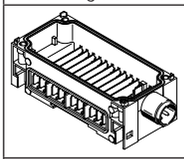
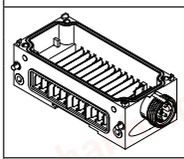
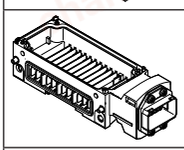
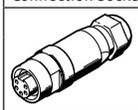
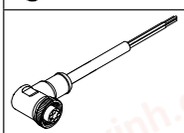
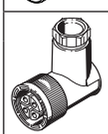
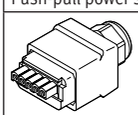
Datasheet – Interlinking block with additional supply for outputs

Ordering data

Designation				Part no.	Type
Interlinking block with additional supply for outputs					
	M18 connection, polymer interlinking block	4-pin	–	**195744**	**CPX-GE-EV-Z**
	7/8" connection, polymer interlinking block	4-pin	–	**541250**	**CPX-GE-EV-Z-7/8-4POL**
		5-pin	–	**541246**	**CPX-GE-EV-Z-7/8-5POL**
	7/8" connection, metal interlinking block	5-pin	–	**550210**	**CPX-M-GE-EV-Z-7/8-5POL**
	Push-pull plug connection (AIDA), metal interlinking block	5-pin	–	**563058**	**CPX-M-GE-EV-Z-PP-5POL**
Connection sockets 7/8"					
	Power supply socket	5-pin		**543107**	**NECU-G78G5-C2**
		4-pin		**543108**	**NECU-G78G4-C2**
	Angled socket, 5-pin – open cable end, 5-core	2 m		**573855**	**NEBU-G78W5-K-2-N-LE5**
Connection sockets M18					
	Straight socket, screw terminal	4-pin	PG9	**18493**	**NTSD-GD-9**
			PG13.5	**18526**	**NTSD-GD-13,5**
	Angled socket, screw terminal	4-pin	PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin	PG11	**533119**	**NTSD-WD-11**
Push-pull power supply socket					
	Socket, spring-loaded terminal, Plug pattern PP, fulfils requirements to AIDA	5-pin		**5195383**	**NECU-M-PPG5PP-C1-PN**
Mounting accessories					
	Screws for mounting the bus node/connection block on the polymer interlinking block	Bus node/metal connection block		**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/polymer connection block		**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block		**550216**	**CPX-M-M3x22-S-4x**

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Datasheet – Interlinking block with additional supply for valves

Function
Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power.
The internal division of the power supply allows specific areas of the sensors and actuators to be switched off individually.

Application area
- 24 V DC supply voltage for valves



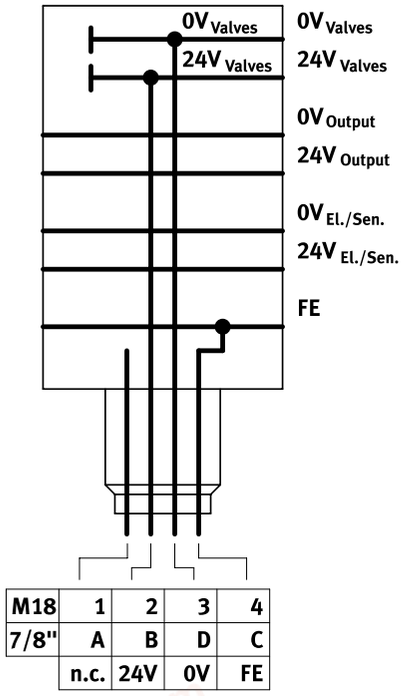
General technical data

Type		CPX-GE-EV-V
Electrical connection		M18
Nominal operating voltage	[V DC]	24
Current carrying capacity (per contact/contact rail)	[A]	16
Degree of protection to EN 60529		Depending on connection block
Ambient temperature	[°C]	–5 ... +50
Materials		Reinforced PA
Note on materials		RoHs-compliant
LABS (PWIS) conformity		VDMA24364-B2-L
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35
Product weight	[g]	125

Pin assignment – Polymer interlinking blocks

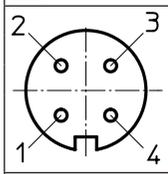
Wiring

Round plug, 4-pin



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

M18



Pin	Assignment
1	n.c.
2	24 V DC load voltage supply for valves
3	0 V
4	FE

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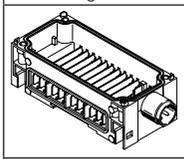
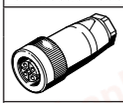
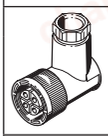
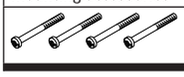
Datasheet – Interlinking block with additional supply for valves

Ordering data

Designation				Part no.	Type
Interlinking block with additional supply for valves					
	M18 connection, polymer interlinking block	4-pin	–	**533577**	**CPX-GE-EV-V**
Connection sockets M18					
	Straight socket, screw terminal	4-pin	PG9	**18493**	**NTSD-GD-9**
		4-pin	PG13.5	**18526**	**NTSD-GD-13,5**
	Angled socket, screw terminal	4-pin	PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin	PG11	**533119**	**NTSD-WD-11**
Mounting accessories					
	Screws for mounting the bus node/connection block on the polymer interlinking block	Bus node/metal connection block		**550218**	**CPX-DPT-30X32-S-4X**

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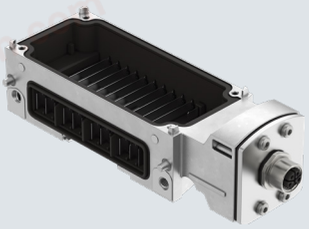
Datasheet – Interlinking block with forwarding supply

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with power.
The internal division of the power supply allows specific areas of the sensors and actuators to be switched off individually.

Application area

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



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

Technical data – Metal interlinking blocks			
Type			CPX-M-GE-EV-W-M12-5POL
Electrical connection			Socket
			M12x1
			5-pin
			L-coded
Power supply	Sensors and electronics	[A]	Max. 16
	Valves and outputs	[A]	Max. 16
Corrosion resistance class CRC1)			0
Type of mounting			Angled fitting
Materials			Die-cast aluminium
Certification			c UL - Recognized (OL)
Product weight		[g]	266

1) More information www.festo.com/x/topic/crc

Note

Points to note about the interlinking block CPX-M-GE-EV-W-M12-5POL:

- Must be mounted as the first module to the right or left of the system supply
- Only one interlinking block permitted per CPX terminal

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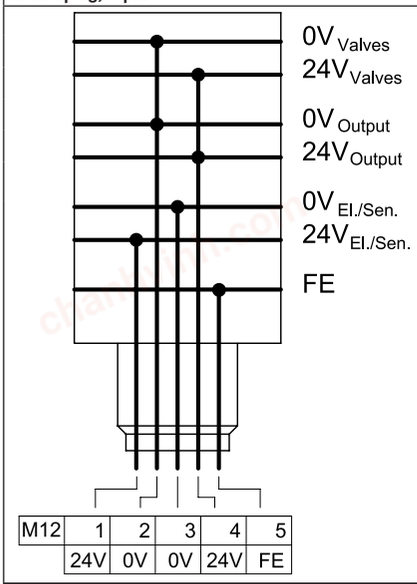
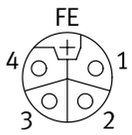
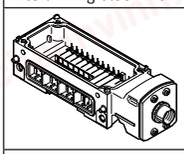
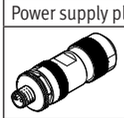
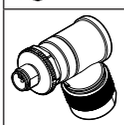
Datasheet – Interlinking block with forwarding supply

Pin assignment – Metal interlinking blocks

Wiring		Pin	Assignment
Round plug, 5-pin			
	**M12** 	1	24 V DC supply voltage for electronics and sensors
		2	0 V valves and outputs
		3	0 V electronics and sensors
		4	24 V DC load voltage supply for valves and outputs
		FE	FE

M12	1	2	3	4	5
	24V	0V	0V	24V	FE

Ordering data

Designation			Part no.	Type
Interlinking block with forwarding supply				
	M12x1 L-coded connection, metal interlinking block	5-pin	**8098391**	**CPX-M-GE-EV-W-M12-5POL**
Power supply plugs M12				
	Straight plug, screw terminal	5-pin	**8166791**	**NECL-S-L12G5-C2-Q10**
	Angled plug, screw terminal	5-pin	**8166792**	**NECL-S-L12W5-C2-Q10**

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Datasheet – Pneumatic interface for valve terminal MPA-S

Function

The pneumatic interface VMPA-FB establishes the electromechanical connection between the CPX terminal and the valve terminal MPA-S.
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA-S via the integrated CPX bus.
The bus signal for activating the solenoid coils is converted in the electronics module for max. 8 coils.
From a technical point of view, the individual MPA pneumatic modules each represent a separate electrical module with digital outputs. Valves, which are galvanically isolated, can be supplied with power via the interlinking block CPX-GE-EV-V.

Application area

- Interface to the valve terminal MPA-S
- Max. 128 solenoid coils
- Characteristics of the electronics module of the valve terminal MPA-S can be parameterised; for example, status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe), individual channel diagnostics can be activated, condition monitoring can be activated individually for each valve
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electronics modules of the valve terminal MPA-S
- Electronics modules of the valve terminal MPA-S:
  - Undervoltage of valves
  - Short circuit of valves
  - Open load of valves
  - Counter preset reached in condition monitoring



General technical data			
Type		VMPA-FB-EPL-G	VMPA-FB-EPL-E
Valve terminal design		Modular, valve sizes can be mixed	
Maximum number of valve positions		64	
Maximum number of pressure zones		17	
Signal status indication		LED	
Pilot air supply		Internal	External
Operating pressure	[MPa]	0.3 ... 0.8	–0.09 ... 1
	[bar]	3 ... 8	–0.9 ... 10
Pilot pressure	[MPa]	0.3 ... 0.8	0.3 ... 0.8
	[bar]	3 ... 8	3 ... 8
Product weight	[g]	320	
Degree of protection		IP67	

Technical data – Electrics		
Nominal operating voltage	[V DC]	24
Permissible voltage fluctuations	[%]	±25

Materials	
Note on materials	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

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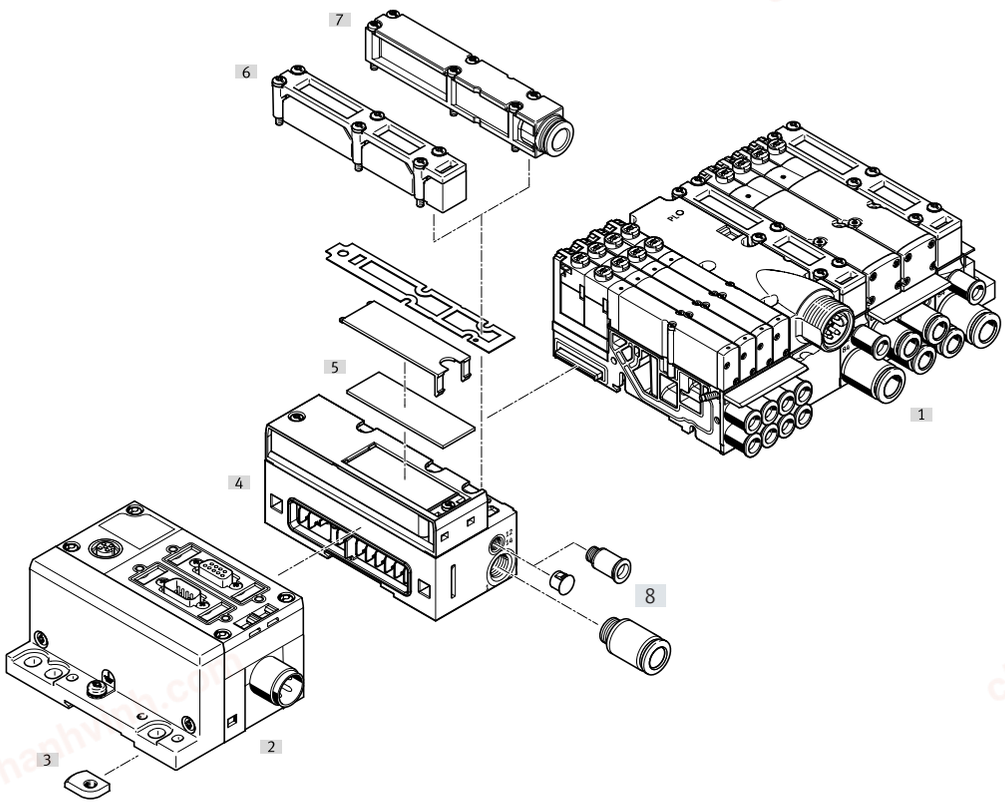
Accessories – Pneumatic interface for valve terminal MPA-S

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	–5 ... +50
Temperature of medium	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +40
Relative humidity		Max. 90% at 40 °C
Corrosion resistance class CRC[1)]		1
CE marking (see declaration of conformity)		To EU EMC Directive[2)]
		To EU RoHS Directive
		To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)		To UK EMC regulations
		To UK RoHS regulations
		To UK explosion regulations
KC marking		KC EMC
Certification		RCM
		c UL us – Recognized (OL)
Certificate-issuing authority		DNV 15.0193 X

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

ATEX		
ATEX category for gas		II 3G
Type of ignition protection for gas		Ex ec IIC T4 Gc X
Explosion-proof ambient temperature	[°C]	–5 ≤ Ta ≤ +50
Explosion protection certification outside the EU		EPL Db (GB)
		EPL Gb (GB)

Overview – Pneumatic interface VMPA-FB



[1] Valve terminal MPA-S
[2] Terminal CPX
[3] Mounting for DIN rail
[4] Pneumatic interface VMPA□FB
[5] Inscription label
[6] Flat plate silencer
[7] Exhaust plate for ducted exhaust air
[8] Fittings

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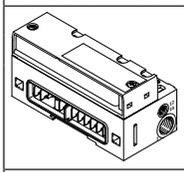
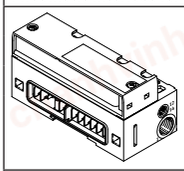
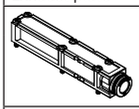
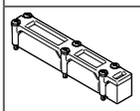
Accessories – Pneumatic interface for valve terminal MPA-S

Ordering data

Designation		Part no.	Type
Pneumatic interface for CPX polymer interlinking module			
	Ducted exhaust air, internal pilot air	533370	VMPA-FB-EPL-G
	Ducted exhaust air, external pilot air	533369	VMPA-FB-EPL-E
	Flat plate silencer, internal pilot air	533372	VMPA-FB-EPL-GU
	Flat plate silencer, external pilot air	533371	VMPA-FB-EPL-EU
Pneumatic interface for CPX metal interlinking module			
	Ducted exhaust air, internal pilot air	552286	VMPA-FB-EPLM-G
	Ducted exhaust air, external pilot air	552285	VMPA-FB-EPLM-E
	Flat plate silencer, internal pilot air	552288	VMPA-FB-EPLM-GU
	Flat plate silencer, external pilot air	552287	VMPA-FB-EPLM-EU
Exhaust plate			
	For ducted exhaust air, with 10 mm push-in connector	533375	VMPA-AP
	For ducted exhaust air, with QS-3/8 connector	541629	VMPA-AP-3/8
	Flat plate silencer	533374	VMPA-APU

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Datasheet – Pneumatic interface for valve terminal MPA-L

Function

The pneumatic interface VMPAL establishes the electromechanical connection between the terminal CPX and the valve terminal MPA-L.
The bus signal for actuating the solenoid coils is converted in the pneumatic interface for the entire valve terminal.
The interlinking within the valve terminal is identical with the interlinking with multi-pin plug connections.

Application area

- Interface to the valve terminal MPA-L
- Max. 32 solenoid coils
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electrical modules of the valve terminal MPA-L



General technical data		
Type		VMPAL-EPL-CPX
Number of valve coils		32
Operating pressure	[bar]	–0.9 ... 10
Pilot pressure	[bar]	3 ... 8
Nominal operating voltage	[V DC]	24
Degree of protection to EN 60529		IP67
Ambient temperature	[°C]	–5 ... +50
Note on materials		RoHs-compliant
LABS (PWIS) conformity		VDMA24364-B1/B2-L

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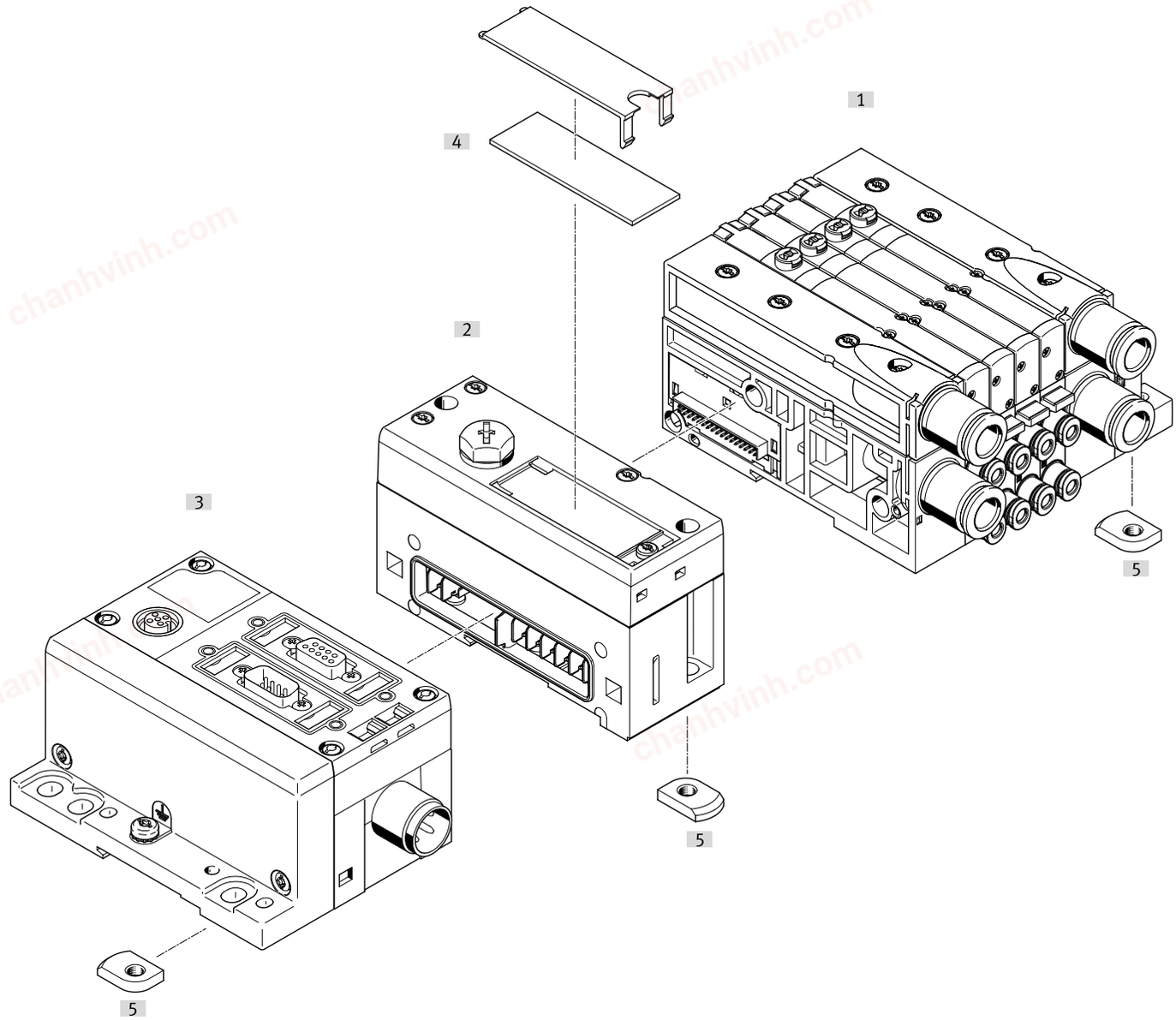
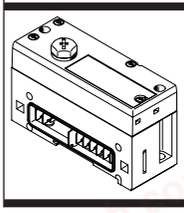
Datasheet – Pneumatic interface for valve terminal MPA-L

Overview – Pneumatic interface VMPAL



[1] Valve terminal MPA-L
[2] Pneumatic interface VMPAL
[3] Terminal CPX
[4] Inscription label
[5] Mounting for DIN rail

Ordering data

Designation		Part no.	Type
	Pneumatic interface for CPX polymer interlinking module	**570783**	**VMPAL-EPL-CPX**

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Datasheet – Pneumatic interface for valve terminal VTSA/VTSA-F

Function

The pneumatic interface VTSA provides the electromechanical connection between the terminal CPX and valve terminal VTSA/VTSA-F.
A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the CPX terminal.
Different circuits for valves and electrical outputs are implemented using an additional supply. The integrated valve diagnostics enable the causes of errors to be identified quickly, thus increasing system availability.

Application area

- Interface to the valve terminal VTSA and VTSA-F
- Max. 32 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Properties of the pneumatic interface can be parameterised, e.g. status of the solenoid coil in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left interlinking block
- Detecting missing solenoid coils and short circuit monitoring for the valves



General technical data			
Max. number of valve positions			16 with double solenoid valves
			32 with single solenoid valves
Valve terminal interface			Type 44, VTSA
Electrical control			Fieldbus
Electrical connection			Via CPX
Diagnostics			Undervoltage of valves
Parameterisation			Fail-safe per channel
			Forcing per channel
			Idle mode per channel
			Module monitoring
LED indicators			1 group diagnostics
			Channel status on valves
Fuse protection (short circuit)			Internal electronic fuse per valve output
Galvanic isolation channel – internal bus			Yes, when using an additional supply for the valves
Nominal operating voltage		[V DC]	24
Operating voltage range		[V DC]	21.6 ... 26.4
Intrinsic current consumption at nominal operating voltage	Electronics	[mA]	Typically 15
	Valves	[mA]	Typically 50
Max. power supply per channel		[A]	0.2
Max. total current per module		[A]	4
Degree of protection			IP65
			NEMA 4
Product weight		[g]	590

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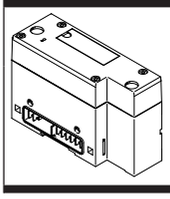
Datasheet – Pneumatic interface for valve terminal VTSA/VTSA-F

Materials	
Housing	Die-cast aluminium
Cover	PA
Note on materials	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Corrosion resistance class CRC1)		0

1) More information www.festo.com/x/topic/crc

Ordering data

Designation			Part no.	Type
	For polymer interlinking block		**543416**	**VABA-S6-1-X1**
	For metal interlinking block	Diagnostics via fieldbus	**550663**	**VABA-S6-1-X2**
		Diagnostics via process data image	**573613**	**VABA-S6-1-X2-D**

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Datasheet – Pneumatic interface for valve terminal VTSA-F-CB

Function

The pneumatic interface provides the electromechanical connection between the terminal CPX and valve terminal VTSA-F-CB.

A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the CPX terminal.

Different circuits for valves and electrical outputs are implemented using an additional supply. The integrated valve diagnostics enable the causes of errors to be identified quickly, thus increasing system availability.

Application area

- Interface to the valve terminal VTSA-F-CB
- Max. 24 solenoid coils
- Properties of the pneumatic interface can be parameterised, e.g. status of the solenoid coil in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- The supply voltage for the valves is provided from the left-hand interlinking block or externally
- Detecting missing solenoid coils and short circuit monitoring for the valves



General technical data

		Pneumatic interface		
		Without voltage zones	With safe voltage zones	With external power supply to the valves
Max. number of valve positions		12 with double solenoid valves		
		24 with single solenoid valves		
Valve terminal interface		Type 44, VTSA		
Electrical control		Fieldbus		
Electrical connection		Via CPX		
Electrical connection output	Function	–	Safe digital output	–
	Connection type	–	Socket	–
	Connection technology	–	M12x1, A-coded to EN 61076-2-101	–
	Number of pins/cores	–	5	–
Electrical connection, power supply to valves	Function	–	–	–
	Connection type	–	–	Plug
	Connection technology	–	–	3x M12x1, A-coded
	Number of pins/cores	–	–	5
Diagnostics		Wire break per valve coil		
		Short circuit of valves		
		Undervoltage of valves		
Parameterisation		Fail-safe per channel		
		Forcing per channel		
		Idle mode per channel		
		Module monitoring		
LED indicators		1 group diagnostics	1 group diagnostics	1 group diagnostics
		Channel status on valves	–	Channel status on valves
		–	–	3 load supply

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Datasheet – Pneumatic interface for valve terminal VTSA-F-CB

Technical data – Electrics

			Pneumatic interface		
			Without voltage zones	With safe voltage zones	With external power supply to the valves
Nominal operating voltage		[V DC]	24		
Operating voltage range		[V DC]	21.6 ... 26.4		
Intrinsic current consumption at nominal operating voltage	Electronics	[mA]	Typically 11	• Typically 45 for electronics without CPX-FVDA-P2 • Typically 110 for electronics with CPX-FVDA-P2	Typically 11
	Valves	[mA]	Typically 45	• Typically 25 for valves without CPX-FVDA-P2 • Typically 90 for valves with CPX-FVDA-P2	Typically 45
Max. power supply per channel		[A]	0.2	0.2	0.2
Max. total current per module		[A]	6	4.5	6
Fuse protection (short circuit)			Internal electronic fuse per valve output	Internal electronic fuse per valve output	Internal electronic fuse per valve output
Galvanic isolation channel – internal bus			Yes, when using an additional supply for the valves	Yes, when using an additional supply for the valves	Yes

Materials

	Pneumatic interface		
	Without voltage zones	With safe voltage zones	With external power supply to the valves
Housing	Die-cast aluminium	–	Die-cast aluminium
Cover	PA	PA	PA
Sub-base	–	Die-cast aluminium	–
Seals	–	NBR	–
Screws	–	Steel	–
Note on materials	RoHs-compliant	RoHs-compliant	RoHs-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L	VDMA24364-B1/B2-L	VDMA24364-B1/B2-L

Operating and environmental conditions

		Pneumatic interface		
		Without voltage zones	With safe voltage zones	With external power supply to the valves
Ambient temperature	[°C]	–5 ... +50	–5 ... +50	–5 ... +50
Storage temperature	[°C]	–	–20 ... +60	–
Corrosion resistance class CRC1)		0	0	0
Shock resistance		–	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27	–
Vibration resistant		–	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6	–
CE marking (see declaration of conformity)[3]		–	To EU EMC Directive[2]	–
		–	To EU RoHS Directive	–
UKCA marking (see declaration of conformity)[3]		–	To UK EMC regulations	–
		–	To UK RoHS regulations	–
Degree of protection		IP65	IP65	IP65
		NEMA 4	–	NEMA 4

1) More information www.festo.com/x/topic/crc
2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... d 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) More information www.festo.com/catalogue/... → Support/Downloads.

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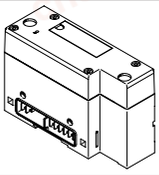
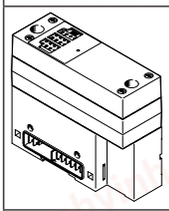
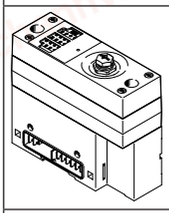
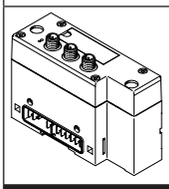
Datasheet – Pneumatic interface for valve terminal VTSA-F-CB

Combinations of bus nodes/control blocks with pneumatic interface

Bus node/control block	Part no.	Pneumatic interface			
		VABA-...-X1-CB	VABA-...-X2-CB	VABA-...-X2-F1-CB	VABA-...-X2-F2-CB
CPX-FB13	**195740**	■	■	■	■
CPX-FB36	**1912451**	■	■	–	–
CPX-FB37	**2735960**	■	■	–	–
CPX-FB43	**8110369**	■	■	■	■
CPX-M-FB44	**8110370**	■	■	■	■

Ordering data

	Description		Product weight [g]	Part no.	Type
Pneumatic interface without voltage zones					
	For polymer interlinking block		560	**8082877**	**VABA-S6-1-X1-CB**
	For metal interlinking block		560	**8082876**	**VABA-S6-1-X2-CB**
Pneumatic interface with voltage zones					
	For metal interlinking block	Division of the connected valves into up to 3 safe voltage zones	734	**8068240**	**VABA-S6-1-X2-F1-CB**
	For metal interlinking block	• Division of the connected valves into up to 2 safe voltage zones • 1 external safe voltage zone	754	**8068241**	**VABA-S6-1-X2-F2-CB**
	For polymer interlinking block	• Division of the connected valves into up to 3 voltage zones • External power supply for each voltage zone	580	**8082879**	**VABA-S6-1-X1-3V-CB**
	For metal interlinking block	• Division of the connected valves into up to 3 voltage zones • External power supply for each voltage zone	580	**8082878**	**VABA-S6-1-X2-3V-CB**

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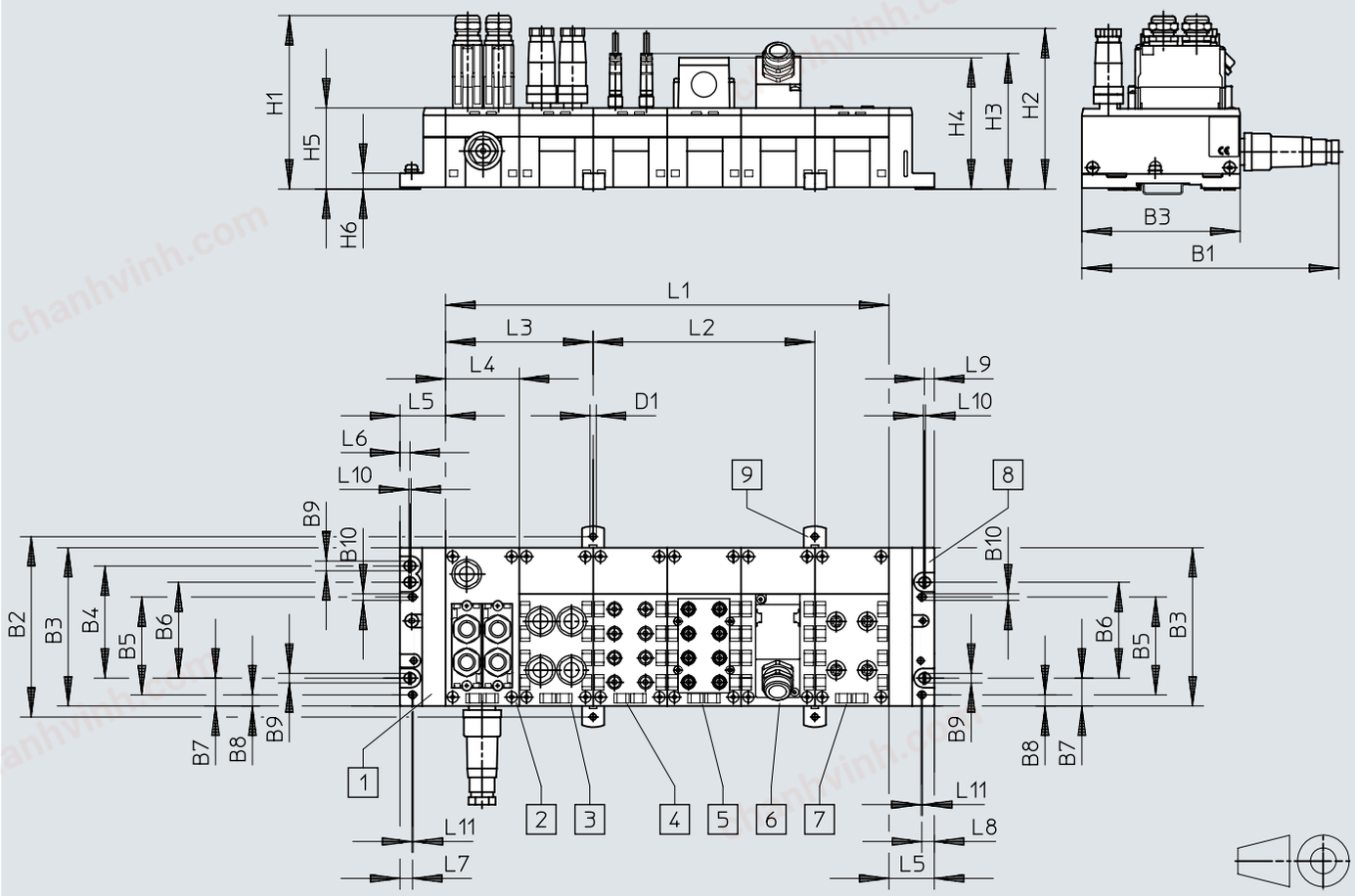
Datasheet

Dimensions – Polymer interlinking module Download CAD data ➔ www.festo.com

With bus nodes and connection blocks



[1] Left end plate (earthing plate optional)
[2] Bus node
[3] Connection block CPX-AB-4-M12-8POL
[4] Connection block CPX-AB-8-M8-3POL
[5] Connection block CPX-AB-8-KL-4POL
[6] Connection block CPX-AB-1-SUB-BU-25POL
[7] Connection block CPX-AB-4-M12-8POL
[8] Right end plate
[9] Mounting clip for wall mounting (required every 2 ... 3 connection blocks)
n Number of CPX modules

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	D1 ø
CPX-M	175	122.3	107.3	78	66.3	65	18.9	7.5	6.6	4.4	4.3

Type	H1	H2	H3	H4	H5	H6
CPX-M	118	110	92	89.1	55.1	10.8

Type	L1[1)]	L2	L3[2)]	L4	L5[3)]	L6	L7	L8	L9	L10	L11
CPX-M	nx50.1	150.3	100.2	50.1	30.8	7.1	8.8	8.5	6.8	1.5	1

1) n = Number of CPX modules

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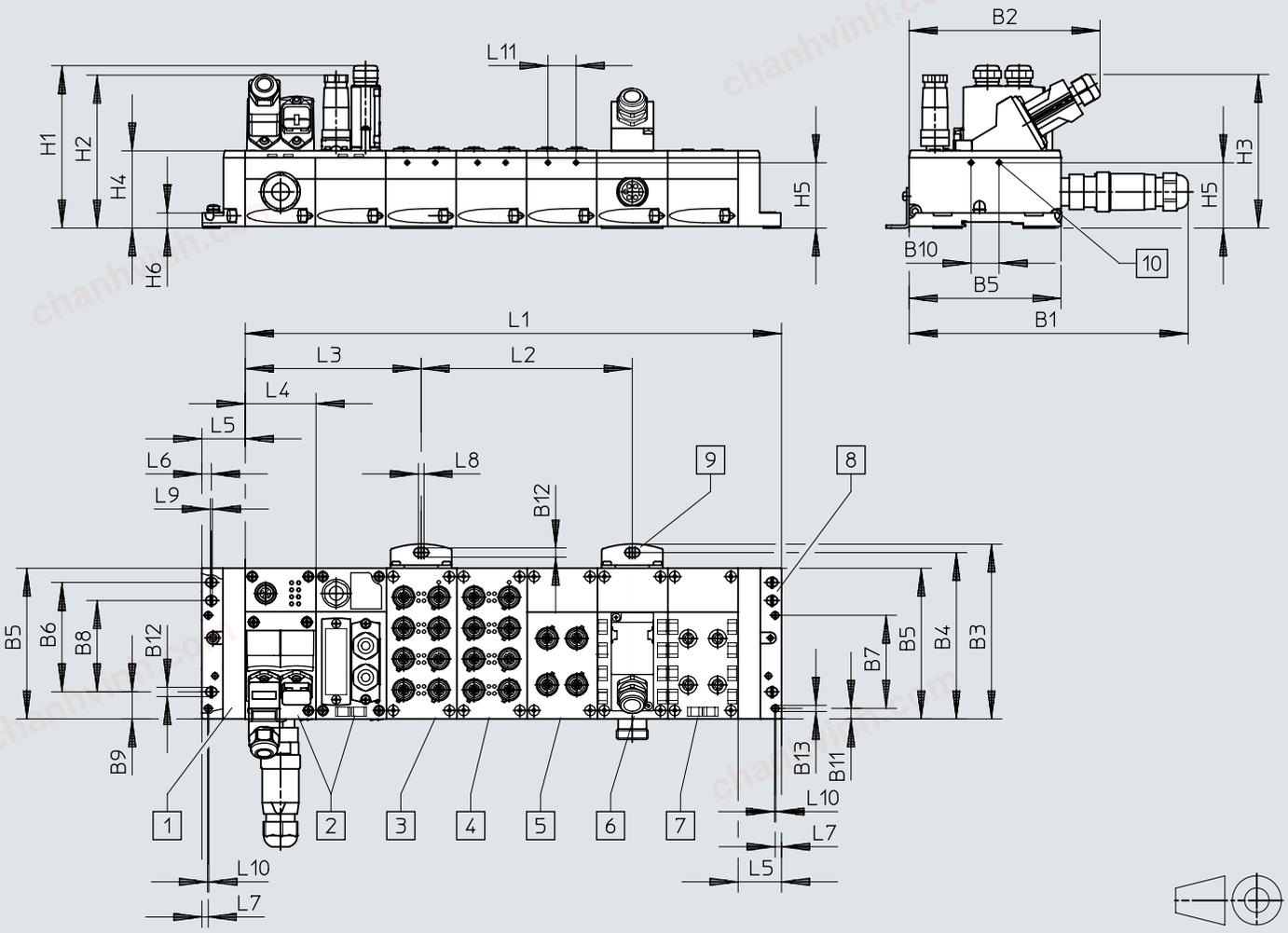
Datasheet

Dimensions – Metal interlinking block Download CAD data ➔ www.festo.com

With bus nodes and connection blocks



[1] Left end plate
[2] Bus node
[3] Connection block CPX-M-AB-8-M12X2-5POL
[4] Connection block CPX-M-AB-8-M12X2-5POL
[5] Connection block CPX-M-AB-4-M12X2-5POL
[6] Connection block CPX-AB-1-SUB-BU-25POL
[7] Connection block CPX-AB-4-M12-8POL
[8] Right end plate
[9] Mounting bracket for wall mounting
[10] Hole for self-tapping screw M2.5

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
CPX-M	199	136	124.9	118.85	108.1	77.95	66.3	65	19.25	20	7.9	6.6	4.4

Type	H1	H2	H3	H4	H5	H6
CPX-M	116	109	109.5	55.1	46.55	10.8

Type	L1[1)]	L2	L3[2)]	L4	L5[3)]	L6	L7	L8	L9	L10	L11
CPX-M	nx50.1+30.4	150.3	125.25	50.1	30.4	6.75	4.5	4	1.5	1	20

1) n = Number of CPX modules

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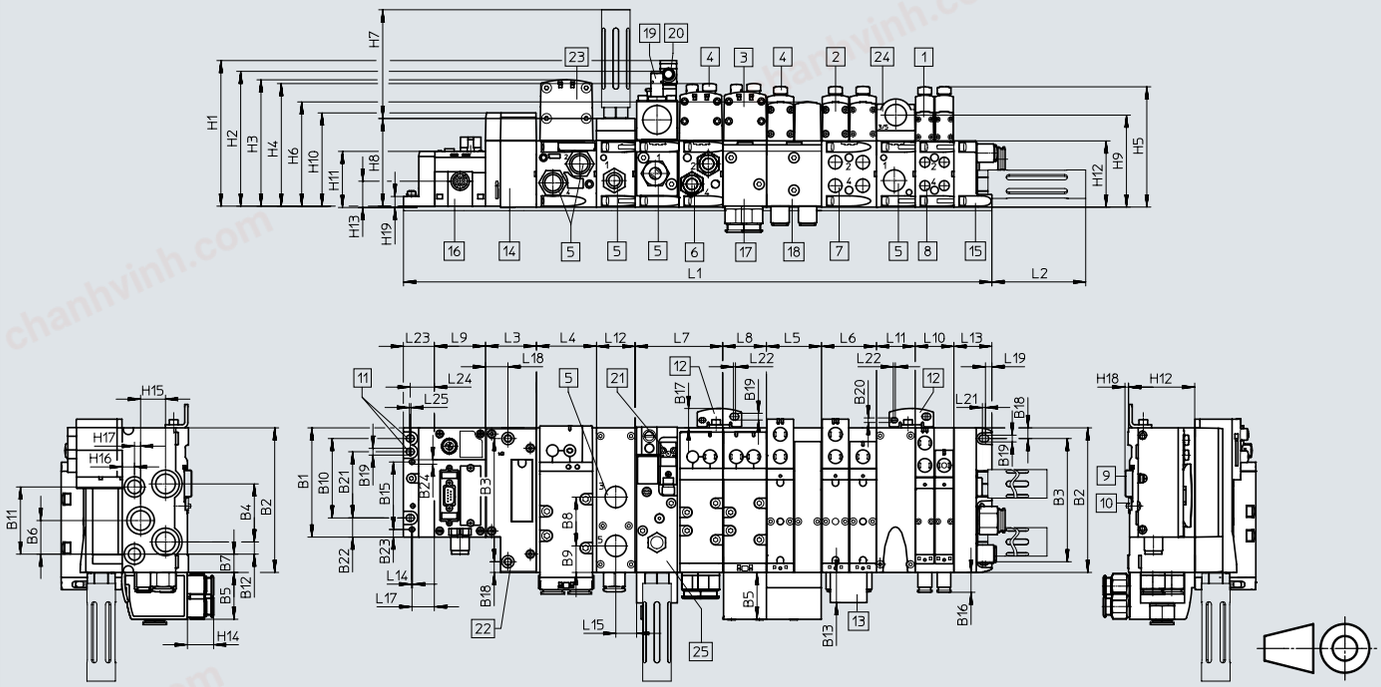
Datasheet

Dimensions Download CAD data ➔ www.festo.com

With bus node and valve terminal VTSA/VTSA-F/VTSA-F-CB



[1] Solenoid valve, width 18 mm
[2] Solenoid valve, width 26 mm
[3] Solenoid valve, width 42 mm
[4] Cover cap/manual override
[5] Threaded connection G1/2
[6] Threaded connection G3/8
[7] Threaded connection G1/4
[8] Threaded connection G1/8
[9] DIN rail
[10] DIN rail mounting
[11] Mounting hole
[12] Additional mounting bracket
[13] Inscription label holder
[14] Pneumatic interface CPX
[15] End plate
[16] CPX module/bus node
[17] Angled connection plate 43 mm, G3/8
[18] Angled connection plate 54 mm, G1/4
[19] Proximity switch M12x1
[20] Plug socket M12x1
[21] Electrical connection to EN 175301-803, type C
[22] Additional mounting bracket
[23] Hole for additional mounting, diameter 6.4 2x
[24] Solenoid valve, width 52 mm
[25] Supply plate
[26] Soft-start valve

Dim.	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B16	B18	B19	B20	B21	B22	B23	B24
[mm]	107.3	142	121	57	46	33	18	48	26	78	66	12	29.6	23	19.5	10.5	6.6	4.5	65	18.9	7.5	4.4

Dim.	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L17	L18	L19	L20	L21	L22
[mm]	92.4	50	n2x59	n01x54	54	n1x43	43	mx50.1	n02x38	nx38	38	37.3	1	20.5	22	22	6.3	5.5	3	2

Dim.	L23	L24	L25	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19
[mm]	30.4	23.7	1.5	143.9	133.3	125	121.3	118.2	103	106.8	87	90.3	92.9	55.1	65	25.8	25.7	24.5	12	6	3.5	10.8

Width	L1[1)]
18 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n x 38 + 37.3
26 mm	30.4 + m x 50.1 + 50 + n01 x 54 + n x 38 + 37.3
42 mm	30.4 + m x 50.1 + 50 + n1 x 43 + n x 38 + 37.3
52 mm	30.4 + m x 50.1 + 50 + n2 x 59 + n x 38 + 37.3
Combination of 18 mm, 26 mm, 42 mm and 52 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n01 x 54 + n1 x 43 + n2x59 + n x 38 + 37.3

1) N02 Number of manifold sub-bases 38 mm
N01 Number of manifold sub-bases 54 mm
N1 Number of manifold sub-bases 43 mm
N2 Number of manifold sub-bases 59 mm
n Number of supply plates (only with end plate with pilot air selector)
m Number of CPX modules

Note: This product conforms to ISO 1179-1 and ISO 228-1.

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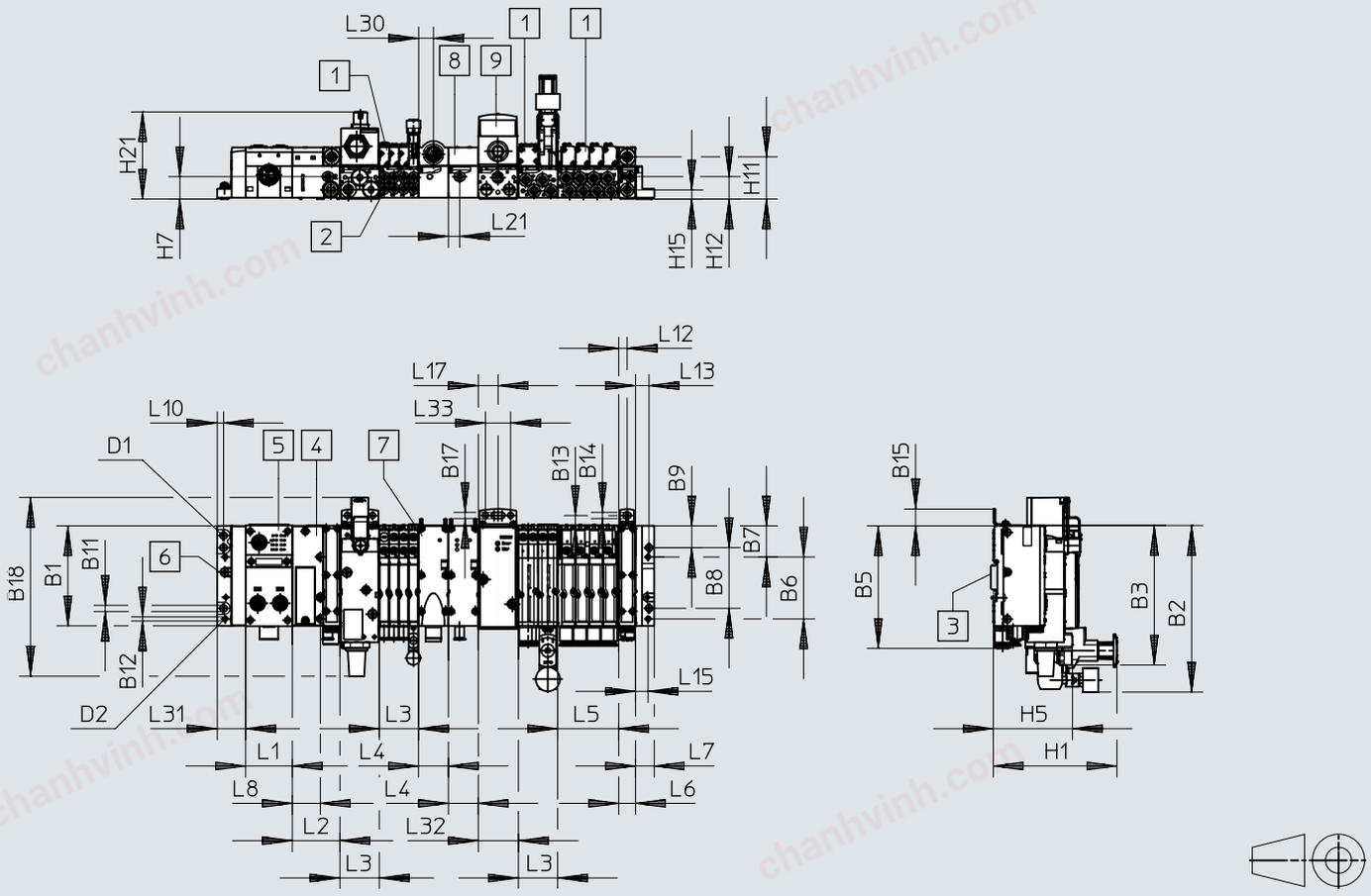
Datasheet

Dimensions – With bus nodes and valve terminals MPA-S Download CAD data ➔ www.festo.com



[1] Solenoid valve
[2] Working ports
[3] DIN rail
[4] Pneumatic interface VMPA□FB
[5] CPX module
[6] Earthing screw
[7] Electrical supply plate
[8] Pressure sensor
[9] Proportional pressure regulator

Type	B1	B2	B3	B5	B6	B7	B8	B9	B11	B12	B13	B14	B15	B17
MPA-S	107.3	178	149.2	129	66.4	33.5	65	23.5	6.6	4.4	11	6.6	18	6.6

Type	D2	H1	H5	H7	H11	H12	H15	H21	L1[1]	L2	L3[2]	L4	L5[3]	L6
MPA-S	M4	132.3	84.9	23.9	45.1	23.9	9.8	93.4	m x 50.1	51.3	n x 42	32	o x 65.5	17.9

Type	L7	L8	L10	L12	L13	L14	L15	L17	L21	L30	L31	L32	L33
MPA-S	20	30	6.8	9	14.5	1.5	13.5	21	11.9	15.8	30.4	42	27

1) m = Number of CPX modules
2) n = Number of sub-bases with 4 valve positions (width 10 mm) or 2 valve positions (width 20 mm)
3) o = number of sub-bases with 4 valve positions (width 14 mm)

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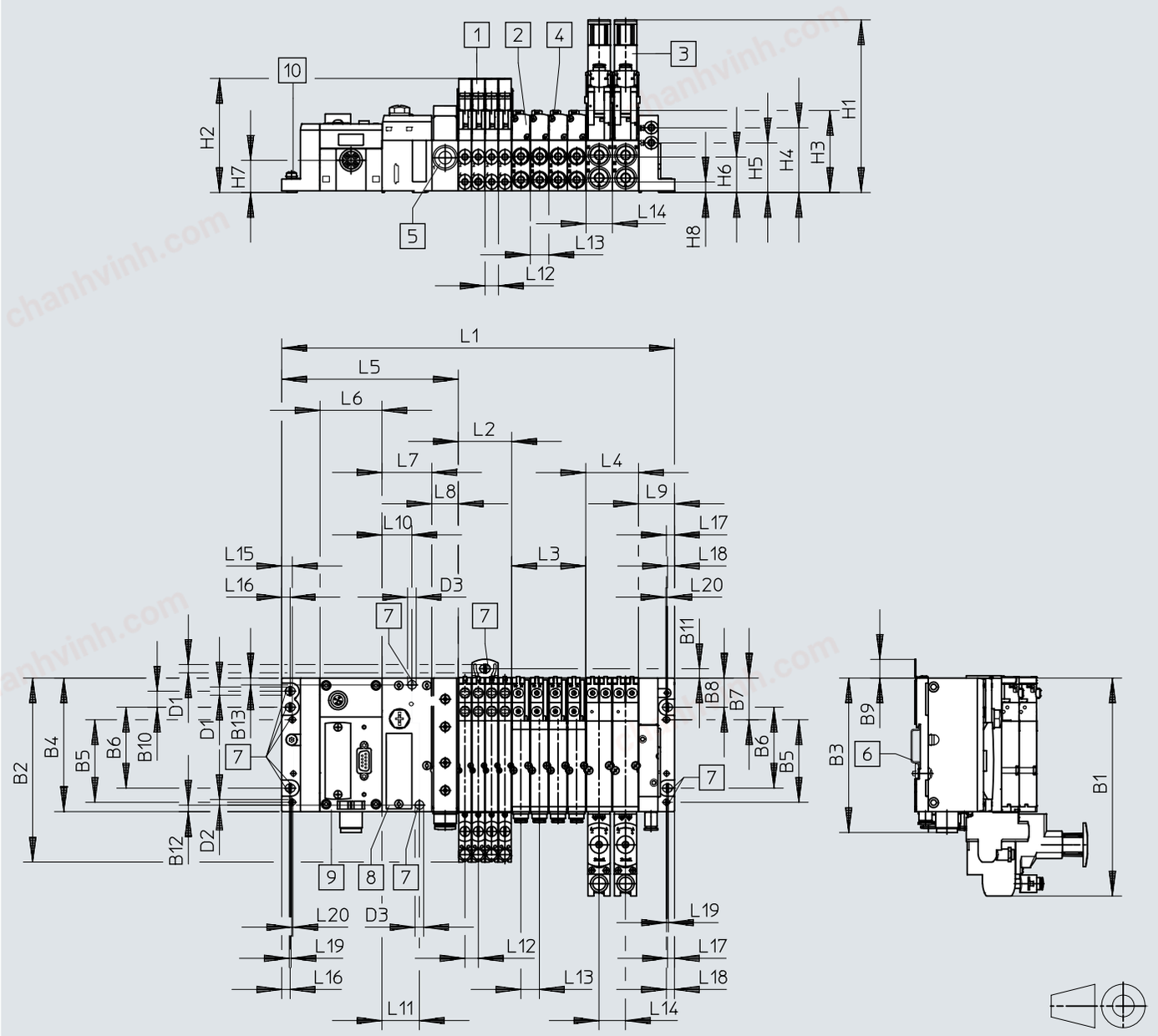
Datasheet

Dimensions – With bus nodes and valve terminals MPA-L Download CAD data ➔ www.festo.com



[1] Solenoid valve VMPA1
[2] Solenoid valve VMPA14
[3] Solenoid valve VMPA2
[4] Manual override
[5] Supply module
[6] DIN rail
[7] Mounting holes
[8] Pneumatic interface, CPX terminal
[9] CPX module
[10] Earthing screw

Type	L1[1]	L2[1]	L3[1]	L4[1]	L5	L6	L7	L8	L9
MPA-L	170.65 + L2 + L3 + L4	m x 10.7	n x 14.9	o x 21.2	142	50	40.1	21.2	28.8

Type	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	L20
MPA-L	24	30	10.7	14.9	21.2	8.5	6.75	5.55	6.5	1.5	1

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
MPA-L	175.1	147.8	124	107.3	66.3	65	33.5	23.45	15	12.95	7.5	5.25	5.5

Type	D1	D2	D3	H1	H2	H3	H4	H5	H6	H7	H8
MPA-L	6.6	4.4	7	138.7	92.6	65.7	52	39.8	28.5	25.8	8.5

1) m, n, o = number of sub-bases/valve positions (m = width 10 mm, n = width 14 mm, o = width 20 mm)

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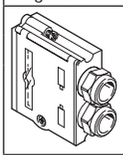
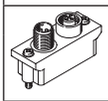
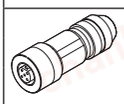
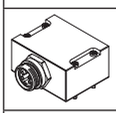
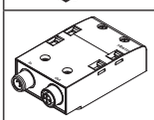
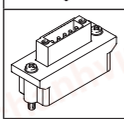
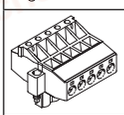
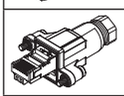
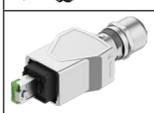
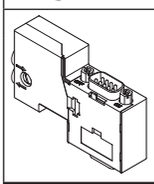
Accessories

Ordering data – Accessories

	Designation				Part no.	Type
Plug connectors and accessories						
	Sub-D plug for DeviceNet®/CANopen				532219	FBS-SUB-9-BU-2x5POL-B
	Sub-D plug for PROFIBUS DP				532216	FBS-SUB-9-GS-DP-B
	Sub-D plug for CC-Link®				532220	FBS-SUB-9-GS-2x4POL-B
	Sub-D plug				534497	FBS-SUB-9-GS-1x9POL-B
	Bus connection M12 adapter (B-coded) for PROFIBUS DP				533118	FBA-2-M12-5POL-RK
	Micro style bus connection, 2xM12 for DeviceNet/CANopen				525632	FBA-2-M12-5POL
	For micro style connection, M12	Socket	For cable Ø 3.8 ... 9 mm		8162291	NECB-M12G5-C2
		Plug	For cable Ø 2.1 ... 7 mm		8162296	NECB-S-M12G5-C2
	Bus connection M12x1, 4-pin (D-coded) for Ethernet				543109	NECU-M-S-D12G4-C2-ET
	For FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP, M12x1, 5-pin, straight			Socket	1067905	NECU-M-B12G5-C2-PB
				Plug	1066354	NECU-M-S-B12G5-C2-PB
	Plug M12x1, 4-pin, straight, A-coded	Screw terminal	For cable Ø 2.1 ... 7 mm		8162294	NECB-S-M12G4-C2
	Connection block, Sub-D socket 9-pin, plug 7/8" 5-pin for DeviceNet®				571052	CPX-AB-1-7/8-DN
	Connection block M12 adapter (B-coded)			For PROFIBUS DP	541519	CPX-AB-2-M12-RK-DP
	Open style bus connection for 5-pin terminal strip for DeviceNet/CANopen				525634	FBA-1-SL-5POL
	Terminal strip for open style connection, 5-pin				525635	FBSD-KL-2x5POL
	RJ45/plug				534494	FBS-RJ45-8-GS
	Push-pull with locking mechanism against unintentional pulling		Plug RJ45, 8-pin		5195384	NECC-M-S-R3G8PP-HX-PN
			SC-RJ connector to IEC 61754-24, 2-pin		5195381	NOCC-M-S-SCRJG2PP-C5-PN
	Sub-D socket with terminating resistor and programming interface			For CANopen	574588	NECU-S1W9-C2-ACO
	Sub-D plug, straight, with terminating resistor and programming interface			For PROFIBUS	574589	NECU-S1W9-C2-APB

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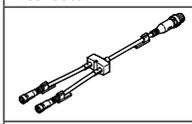
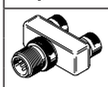
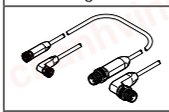
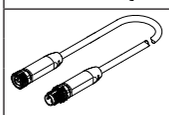
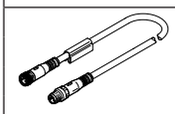
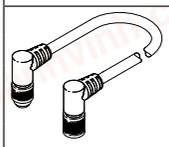
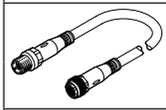
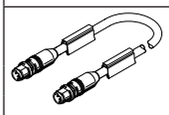
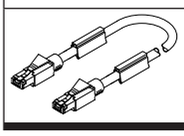
Accessories

Ordering data – Accessories

Designation				Part no.	Type
Distributor					
	Modular system for all types of sensor/actuator distributor			–	**NEDY-...** → Internet: nedy
	Push-in T-connector	1x plug M8, 4-pin	2x socket M8, 3-pin	**8005312**	**NEDY-L2R1-V1-M8G3-N-M8G4**
		1x plug M12, 4-pin	2x socket M8, 3-pin	**8005311**	**NEDY-L2R1-V1-M8G3-N-M12G4**
			2x socket M12, 5-pin	**8005310**	**NEDY-L2R1-V1-M12G5-N-M12G4**
Connecting cables					
	Modular system for a choice of connecting cables			–	**NEBA-...** → Internet: neba
	1x socket M8, 3-pin	1x plug M8, 3-pin	0.5 m	★ **8078282**	**NEBA-M8G3-U-0.5-N-M8G3**
			1.0 m	★ **8078283**	**NEBA-M8G3-U-1-N-M8G3**
			2.5 m	★ **8078286**	**NEBA-M8G3-U-2.5-N-M8G3**
			5.0 m	★ **8078287**	**NEBA-M8G3-U-5-N-M8G3**
	Connecting cable M12-M12	5-pin	1.5 m	**529044**	**KV-M12-M12-1.5**
			3.5 m	**530901**	**KV-M12-M12-3.5**
	Connecting cable for CPX-CTEL, M12-M12, 5-pin, straight plug/straight socket		5 m	**574321**	**NEBU-M12G5-E-5-Q8N-M12G5**
			7.5 m	**574322**	**NEBU-M12G5-E-7.5-Q8N-M12G5**
			10 m	**574323**	**NEBU-M12G5-E-10-Q8N-M12G5**
	Connecting cable M12-M12, 8-pin, Straight plug / straight socket		2.0 m	**525617**	**KM12-8GD8GS-2-PU**
	Connecting cable M9, Angled plug / angled socket		0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
			0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
			2 m	**540329**	**KVI-CP-3-WS-WD-2**
			5 m	**540330**	**KVI-CP-3-WS-WD-5**
			8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable M9, Straight plug / straight socket		2 m	**540332**	**KVI-CP-3-GS-GD-2**
			5 m	**540333**	**KVI-CP-3-GS-GD-5**
			8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting cable, Straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
			1 m	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
			3 m	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
			5 m	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
			10 m	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**
		Straight plug, RJ45, 8-pin	1 m	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
			3 m	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
			5 m	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
			10 m	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
		Open end, 4-core	5 m	**8040456**	**NEBC-LE4-ES-5-D12G4-ET**
	Connecting cable, Straight plug, RJ45, 8-pin	Straight plug, RJ45, 8-pin	1 m	**8040455**	**NEBC-R3G4-ES-1-S-R3G4-ET**

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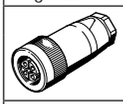
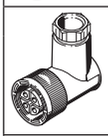
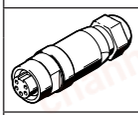
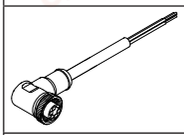
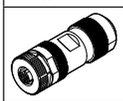
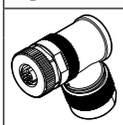
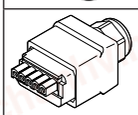
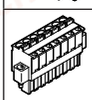
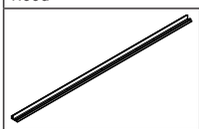
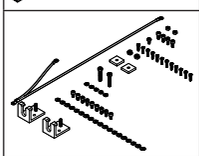
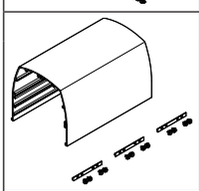
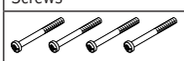
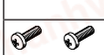
Accessories

Ordering data – Accessories

Designation			Part no.	Type
Plug connectors and accessories – Power supply				
	Plug socket for mains connection M18, straight	For 1.5 mm2	18493	NTSD-GD-9
		For 2.5 mm²	18526	NTSD-GD-13,5
	Plug socket for mains connection M18, angled	For 1.5 mm2	18527	NTSD-WD-9
		For 2.5 mm²	533119	NTSD-WD-11
	Power supply socket, straight	7/8" connection, 5-pin	543107	NECU-G78G5-C2
		7/8" connection, 4-pin	543108	NECU-G78G4-C2
	Power supply socket 7/8", 5-pin, angled socket/open cable end, 5-core	2 m	573855	NEBU-G78W5-K-2-N-LE5
	Power supply socket M12x1, L-coded, straight	5-pin	8166793	NECL-L12G5-C2-Q10
	Power supply plug M12x1, L-coded, straight	5-pin	8166791	NECL-S-L12G5-C2-Q10
	Power supply socket M12x1, L-coded, angled	5-pin	8166794	NECL-L12W5-C2-Q10
	Power supply plug M12x1, L-coded, angled	5-pin	8166792	NECL-S-L12W5-C2-Q10
	Push-pull power supply socket, plug pattern PP, fulfils requirements to AIDA	5-pin	5195383	NECU-M-PPG5PP-C1-PN
	Straight plug, spring-loaded terminal, for left-hand end plate with system supply	7-pin	576319	NECU-L3G7-C1
Hood				
	Mounting rail for attaching the hood	1000 mm	572256	CAFC-X1-S
	Mounting kit for CPX hood		572257	CAFC-X1-BE
	Hood section for CPX terminal including mounting attachments for connecting several hood sections in series	200 mm	572258	CAFC-X1-GAL-200
		300 mm	572259	CAFC-X1-GAL-300
Screws				
	Screws for mounting the bus node/connection block on the polymer interlinking block	Bus node/metal connection block	550218	CPX-DPT-30X32-S-4X
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/polymer connection block	550219	CPX-M-M3x22-4x
		Bus node/metal connection block	550216	CPX-M-M3x22-S-4x
	Screws for mounting an inscription label on the bus node CPX-M-FB45	Pack of 12	550222	CPX-M-M2.5X8-12X

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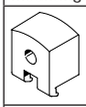
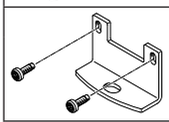
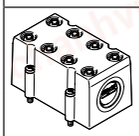
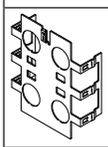
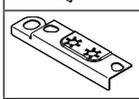
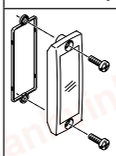
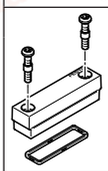
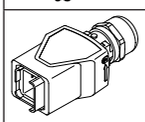
Accessories

Ordering data – Accessories

Designation			Part no.	Type
Mounting				
	Attachment for wall mounting (for long valve terminals, pack of 10)	Version for polymer manifold sub-bases	**529040**	**CPX-BG-RW-10x**
	Attachment for wall mounting, version for metal manifold sub-bases	2 mounting brackets, 4 screws	**550217**	**CPX-M-BG-RW-2X**
		1 mounting bracket, 2 screws	**2721419**	**CPX-M-BG-VT-2X**
Covers and attachments				
	Covering hood for CPX-AB-8-KL-4POL (IP65, IP67) • 8 cable through-feeds M9 • 1 cable through-feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
	Earthing component (pack of 5), for right/left end plate (polymer interlinking blocks)		**538892**	**CPX-EPFE-EV**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Transparent cover for the DIL switches		**548757**	**CPX-AK-P**
	Cover for DIL switches		**548754**	**CPX-M-AK-M**
	Cover for RJ45 connection		**534496**	**AK-RJ45**
	Cover cap for RJ45 push-pull connection		**8090740**	**NEAC-M-S-BD-R3SCPP**
	Cover cap for bus connection		**2873540**	**CPX-M-AK-D**
	Cover cap for sealing unused connections (pack of 10)	For M8 connections	**177672**	**ISK-M8**
		For M12 connections	**165592**	**ISK-M12**

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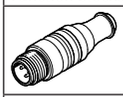
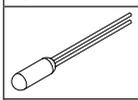
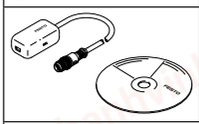
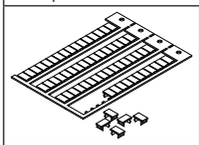
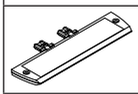
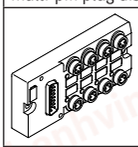
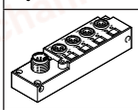
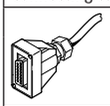
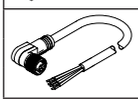
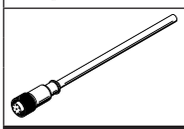
Accessories

Ordering data – Accessories

Designation			Part no.	Type
Function blocks				
	Terminating resistor, M12, B-coded for PROFIBUS		1072128	CACR-S-B12G5-220-PB
	PT1000 temperature sensor for cold junction compensation		553596	CPX-W-PT1000
	Adapter M12, 5-pin to mini USB socket, and controller software		547432	NEFC-M12G5-0.3-U1G5
Inscription labels				
	Inscription labels 6x10 mm, 64 pieces, in a frame		18576	IBS-6x10
	Inscription label holder for connection block		536593	CPX-ST-1
Multi-pin plug distributor				
	Sub-D plug, 15-pin	8x socket M8, 3-pin	177669	MPV-E/A08-M8
		12x socket M8, 3-pin	177670	MPV-E/A12-M8
	Plug M12, 8-pin	4x socket M8, 3-pin	574586	NEDU-L4R1-M8G3L-M12G8
		6x socket M8, 3-pin	574587	NEDU-L6R1-M8G3L-M12G8
Connecting cable for multi-pin plug distributor				
	Sub-D socket, 15-pin Open cable end, 15-core	5 m	177673	KMPV-SUB-D-15-5
		10 m	177674	KMPV-SUB-D-15-10
	Angled socket, M12, 8-pin, Open cable end, 8-core	Length: 2 m	542256	NEBU-M12W8-K-2-N-LE8
		Length: 5 m	542257	NEBU-M12W8-K-5-N-LE8
		Length: 10 m	570007	NEBU-M12W8-K-10-N-LE8
	Straight socket, M12, 8-pin, Open cable end, 8-core	Length: 2 m	525616	SIM-M12-8GD-2-PU
		Length: 5 m	525618	SIM-M12-8GD-5-PU
		Length: 10 m	570008	SIM-M12-8GD-10-PU