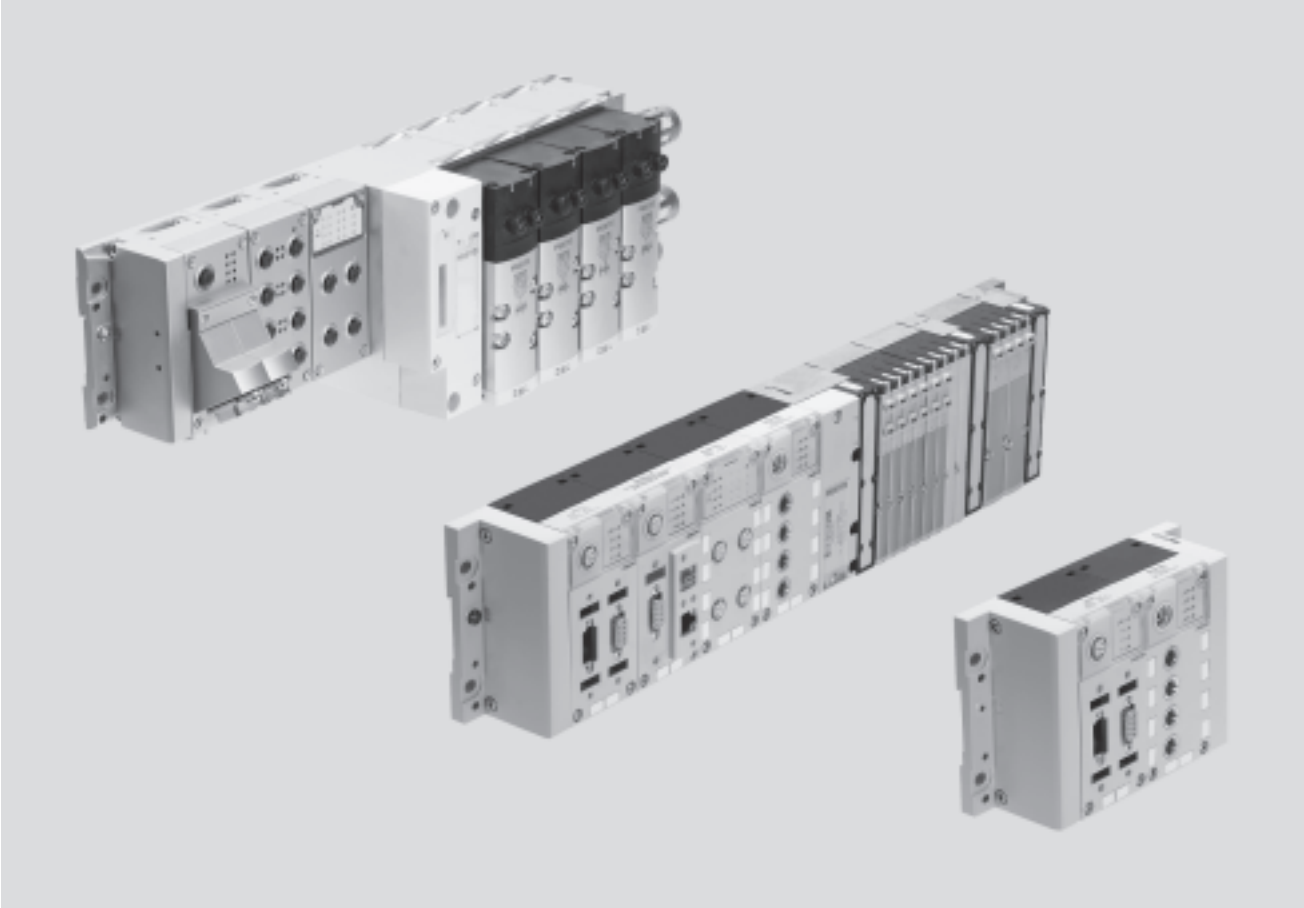
Modular electrical terminal CPX

FESTO

Terminal CPX

Key features



Key features

Installation concept

- Choice of several valve terminal types for different applications:
  - Type 03 MIDI/MAXI
  - Type 12 CPA
  - Type 32 MPA
  - Type 33 MPA-F
  - Type 34 MPA-L
- Economical from the smallest configuration up to the maximum number of modules
- Up to 9 electrical input/output modules plus bus nodes and pneumatic interface/electronic 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

Electrical components

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

Assembly

- Wall or H-rail mounting, also on mobile systems
- 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
- Lower selection, ordering, assembly and commissioning costs thanks to the central CPX terminal
- Choice of pneumatic components for optimised control loop system design
- Decentralised, subordinate CPI installation system improves cycle times by up to 30%
- Safe and convenient earthing thanks to earthing plate

Operation

- Fast troubleshooting thanks to an extensive selection of LEDs (some of which are multi-coloured) on the bus node and on all I/O modules
- Supports module and channel-oriented diagnostics
- On-the-spot diagnostics in plain text via handheld device
- 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
- Reliability of service with connection blocks and modules that are quick to replace without changing the wiring

Terminal CPX

Key features

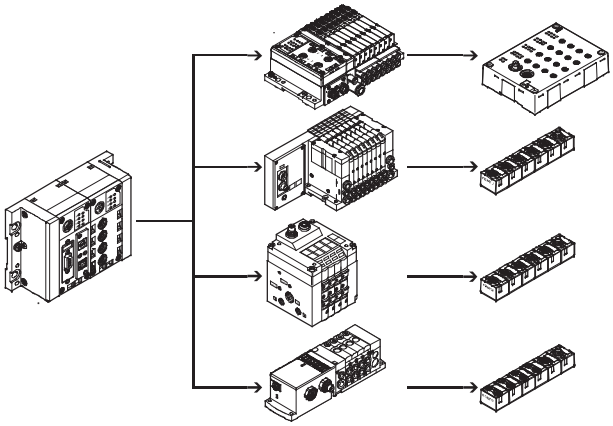
Pneumatic variants of the CPX terminal

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

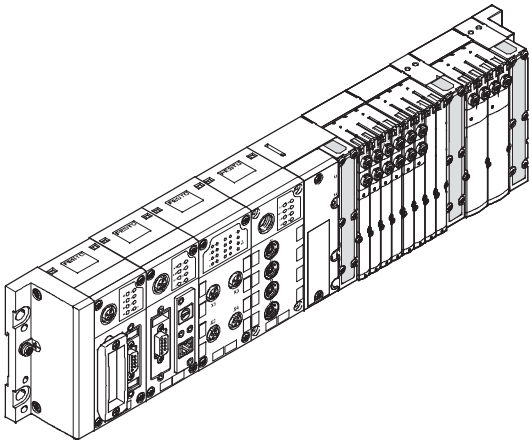
The system is specifically designed so that the valve terminal can be adapted to suit different applications.

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

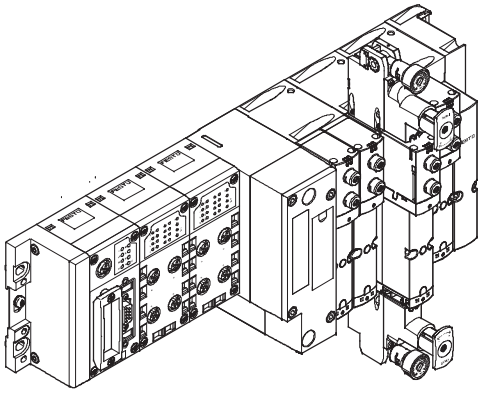
With valve terminal – decentralised



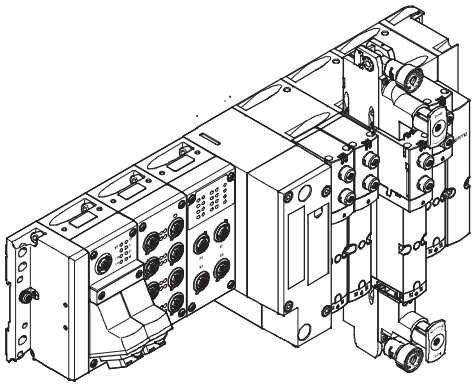
With valve terminal MPA – centralised



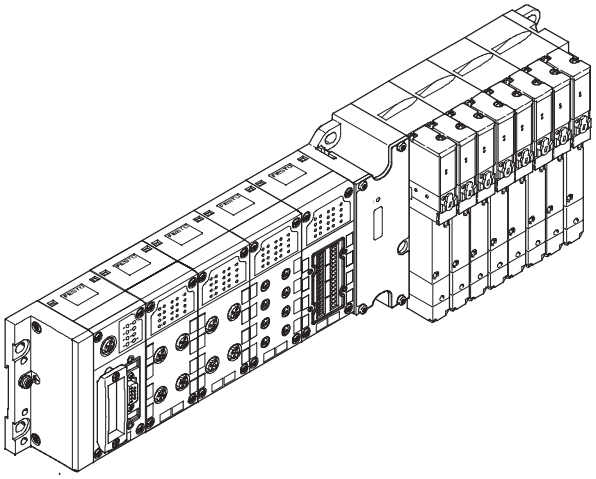
With valve terminal VTSA – centralised



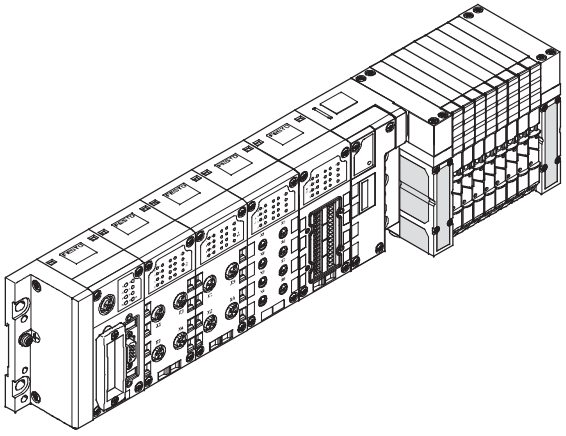
In metal design with valve terminal VTSA – centralised



With valve terminal MIDI/MAXI – centralised



With valve terminal CPA – centralised



Terminal CPX

Key features

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

Fieldbus node

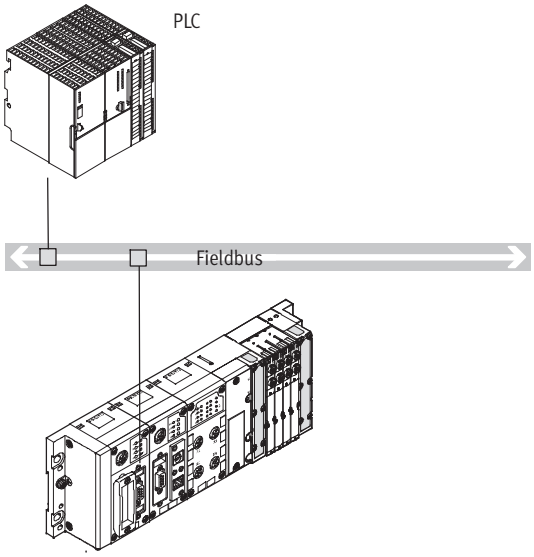
Different bus nodes are used to integrate the terminal in the control systems of various manufacturers. The CPX terminal can therefore be operated on over 90% of the most commonly used fieldbus systems:

- Profibus DP
- PROFINET
- Interbus
- DeviceNet
- CANopen
- CC-Link

Integration in universal networks based on Ethernet opens up new possibilities. Faster data transmission, real-time capability and above all additional IT services such as file transfer, web server, web monitor as integrated website in the CPX terminal, text message/e-mail alerts, etc. open up a wide range of synergies.
These include standardised and universal communication technology across all areas, including operating level, management level and field level in the production environment, with protection to IP65/67.
The following protocols are supported:

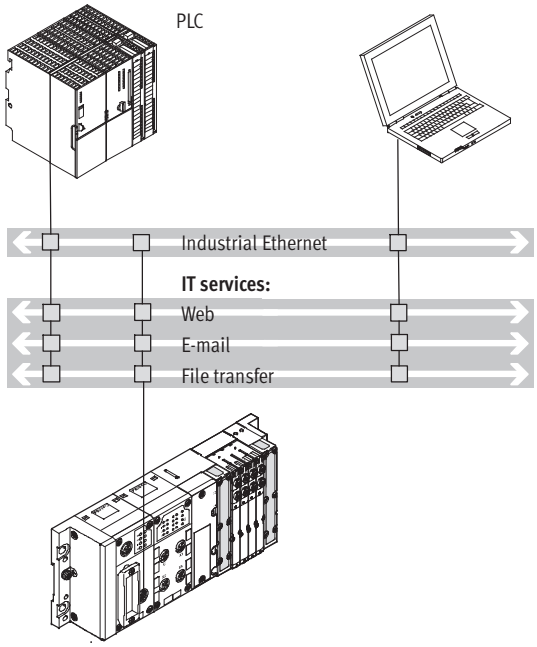
- Ethernet/IP
- Modbus/TCP
- PROFINET
- EtherCAT

Fieldbus node



- Communication with higher-order controller via fieldbus
- No preprocessing
- Fieldbus protocol dependent on CPX fieldbus node used
- Up to 512 I/Os, depending on the fieldbus node used

Industrial Ethernet fieldbus node



- Connection to a higher-order controller directly via Ethernet/IP, Modbus/TCP or ProfiNet
- No preprocessing
- Monitoring via Ethernet and web applications
- Up to 512 I/Os

Note

Every electrical connection 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 connection variant.

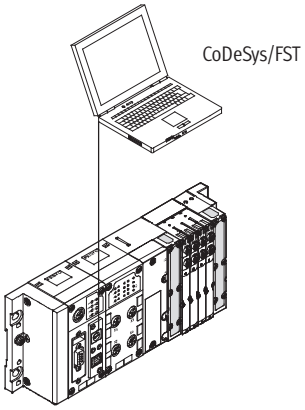
Variants of the CPX terminal controller (with preprocessing in the control block)

Control block

The optional Front End Controllers CPX-FEC and CPX-CEC enable simultaneous access via Ethernet and an integrated web server (in the case of CPX-FEC), in parallel with a fieldbus node, as well as autonomous preprocessing. Access via Modbus/TCP and EasyIP is also possible.

Commissioning, programming and diagnostics using the Festo software tool FST 4.1 with hardware configurator.

With control block in stand-alone mode

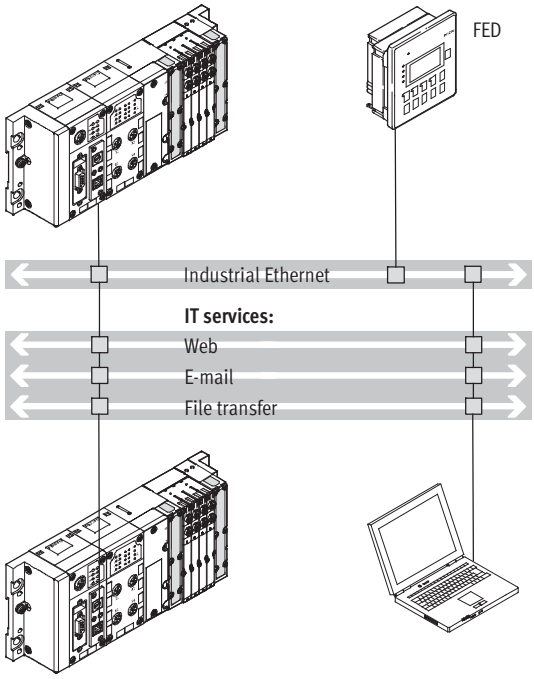


- Decentralised controller with direct machine mounting
- Interaction options via CPX-MMI or Front End Display (FED)
- Downloading of programs via Ethernet (or via the programming interface)
- Supports full expansion of all CPX peripherals
- More than 300 I/Os

Beneficial application areas:

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

With control block in Festo EasyIP mode



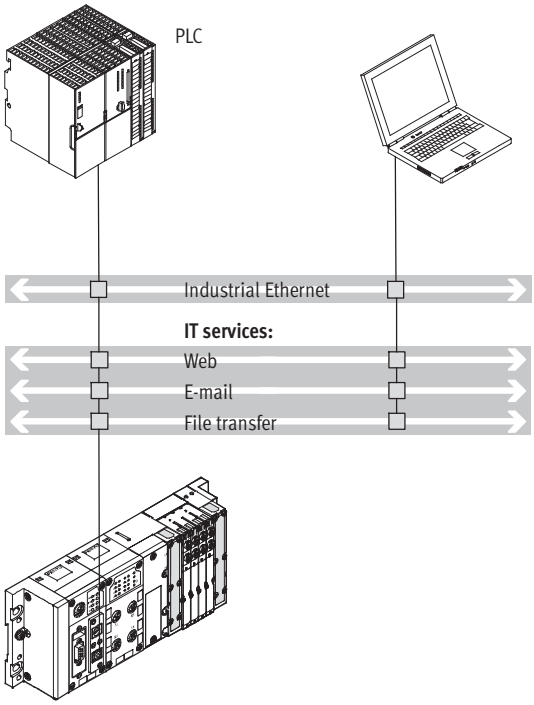
- Fast preprocessing of the CPX peripherals in the control block
- Exchange of any data between the control blocks via EasyIP
- Operation and monitoring of several control blocks via one FED
- Remote diagnostics via an FED and CPX web monitor (only with FST operating system)

- No higher-order controller is required
- More than 300 I/Os per CPX control block

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

With control block as remote controller on Ethernet

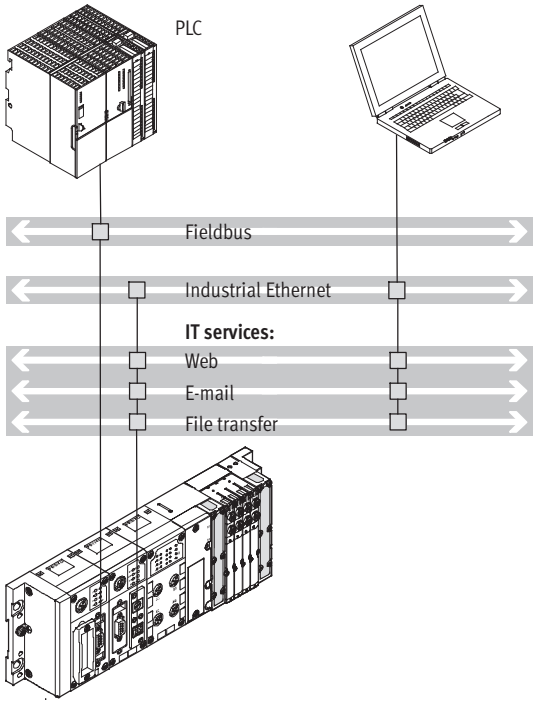
Remote controller on Ethernet as the preprocessing unit for decentralised, stand-alone subsystems using IT technology.



- Connection to a higher-order controller via Ethernet, no further fieldbus 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

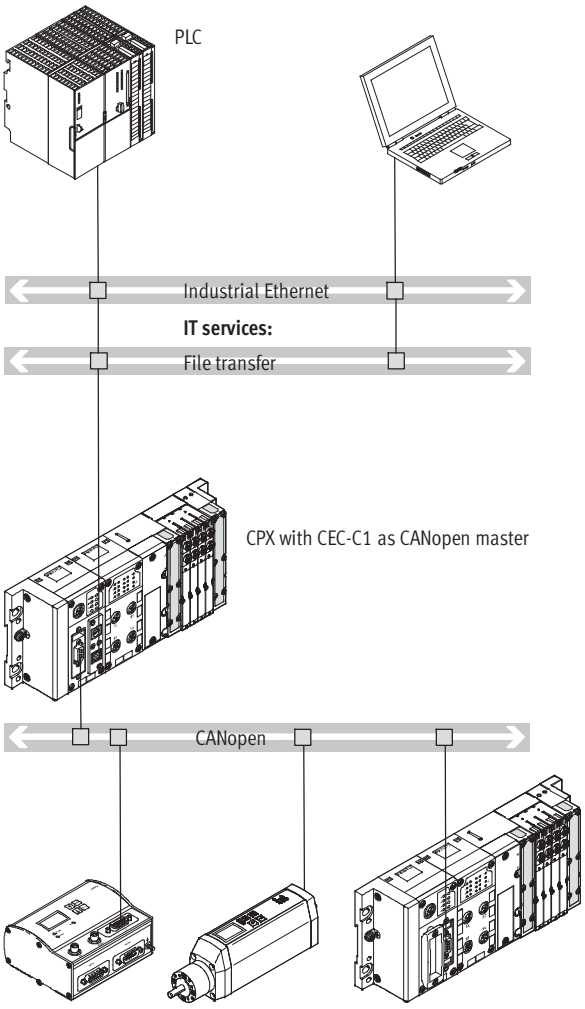
Fieldbus remote controller (combination with fieldbus nodes for Interbus, Profibus DP, PROFINET, CANopen, DeviceNet, CC-Link or EtherCAT) as the preprocessing unit for decentralised, stand-alone subsystems.



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

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

With control block as CANopen fieldbus master



Properties:

- Connection to a higher-order controller via Ethernet, no further fieldbus 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

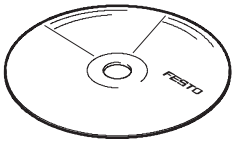
Operating modes:

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

CPX Web Monitor – Online diagnostics for the CPX terminal

➔ 64

What is a CPX Web Monitor?



The CPX Web Monitor is a software tool from Festo for all CPX modules with integrated web server and Ethernet connection:

- Supplied on CD-ROM
- Installation on PC
- Adaptation to application
- Loading via Ethernet to the web server of the CPX module

What can a CPX Web Monitor do?

The Web Monitor dynamically visualises information about the CPX system and its modules via Ethernet in the browser of a PC:

- Status and diagnostics of the CPX system by modules and channels
- Status of the channels/valves
- Text message or e-mail alerts can be set
- Reading of CPX error memory (fault trace)
- Setting of outputs (force mode)

Three password-protected access levels protect access to the CPX terminal.

How does the CPX Web Monitor communicate?

An IP address is allocated to the integrated web server. Depending on the performance of the connected Ethernet network, the CPX web server can be accessed from any PC.

Controllers or intelligent display and operating units can communicate with the CPX terminal.

What advantages does a CPX Web Monitor offer?

- Expensive servicing is avoided
- Remote maintenance and monitoring of important device functions (counters) for the prevention of unjustified rights of recourse
- Preventive maintenance for reduced downtimes
- No engineering/no development of web applications

CPX Web Monitor – Application examples

Channel-oriented diagnostics

- Channel-specific status and error message of an I/O module
- Plain-text error message about the type of error
- Exact error identified and efficient service visits possible

Possible error messages:

- Short circuit
- Overload
- Open load
- Supply voltage below the tolerance limit

Error memory (fault trace)

Quick access to the last 40 diagnostic results with timestamp.

Assistance in finding sporadic errors and statistical accumulations.

Monitoring of analogue values

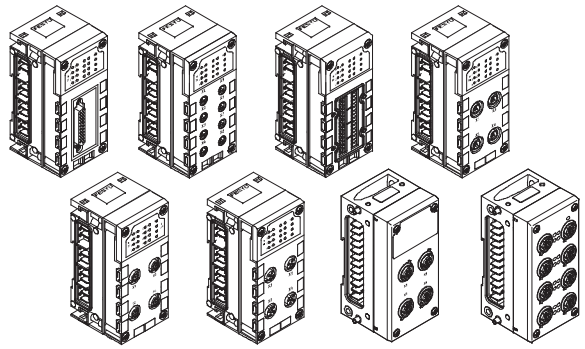
- Channel-specific status and error message of an analogue I/O module
- Display in plain text
- Dynamic display of the current values at the inputs/outputs

Possible error messages:

- Open load
- Upper or lower limit value exceeded

Connection of inputs and outputs to the CPX terminal

Digital and analogue CPX I/O modules

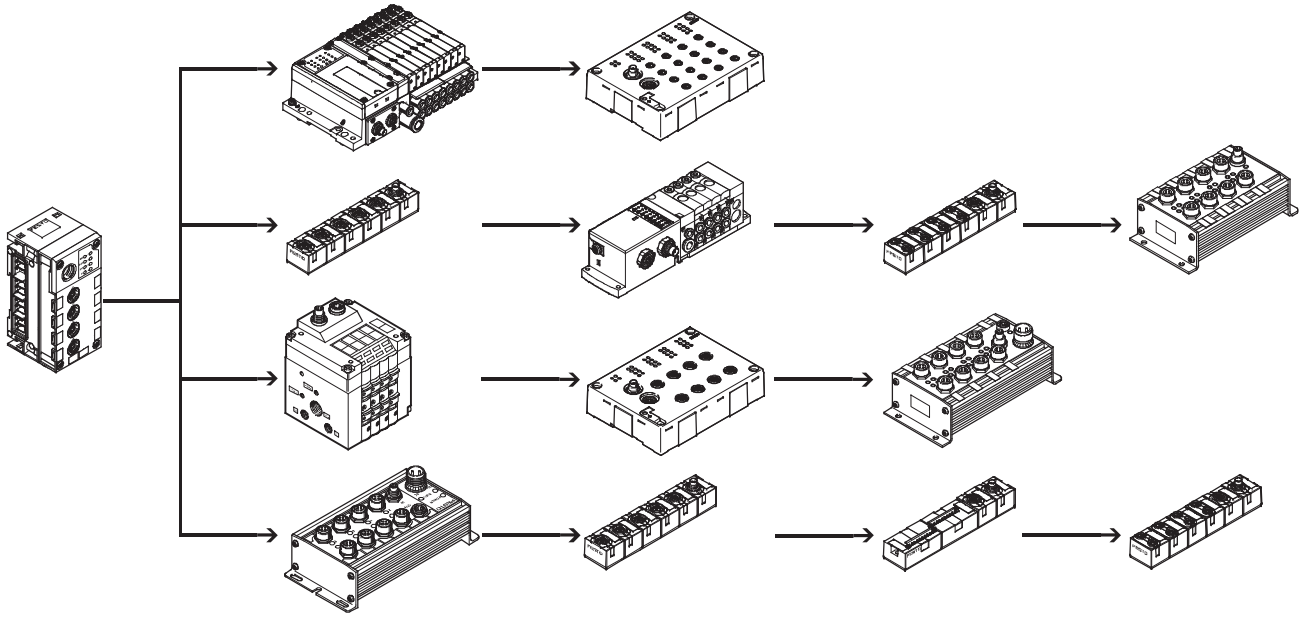


Electrical connection

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. Plastic or metal connection blocks can be combined as required:

- Metal design
  - M12-5POL
- Plastic design:
  - M12-5POL
  - M12-5POL with quick lock and metal thread
  - M12-8POL
  - M8-3POL
  - M8-4POL
  - Sub-D
  - Harax®
  - CageClamp® (with cover also to IP65/67)

With CPX-CP interface

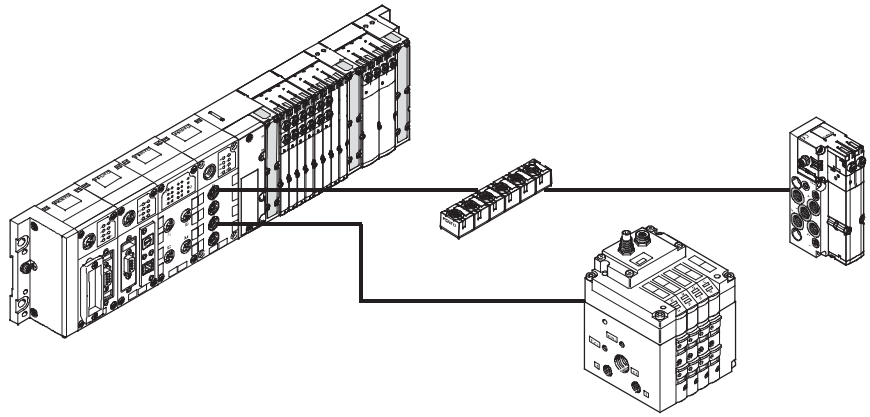


- Up to 4 strings per CP interface possible
- Up to 4 subordinate CP modules can be combined in one string
- Up to 32 I/Os can be connected per string
- Modules with M8, M12 and terminal connection

Several CP interface modules can be combined in one CPX terminal (depending on the controller used).

Combination of centralised CPX I/O modules and decentrally mounted I/O modules of the CPI installation system.

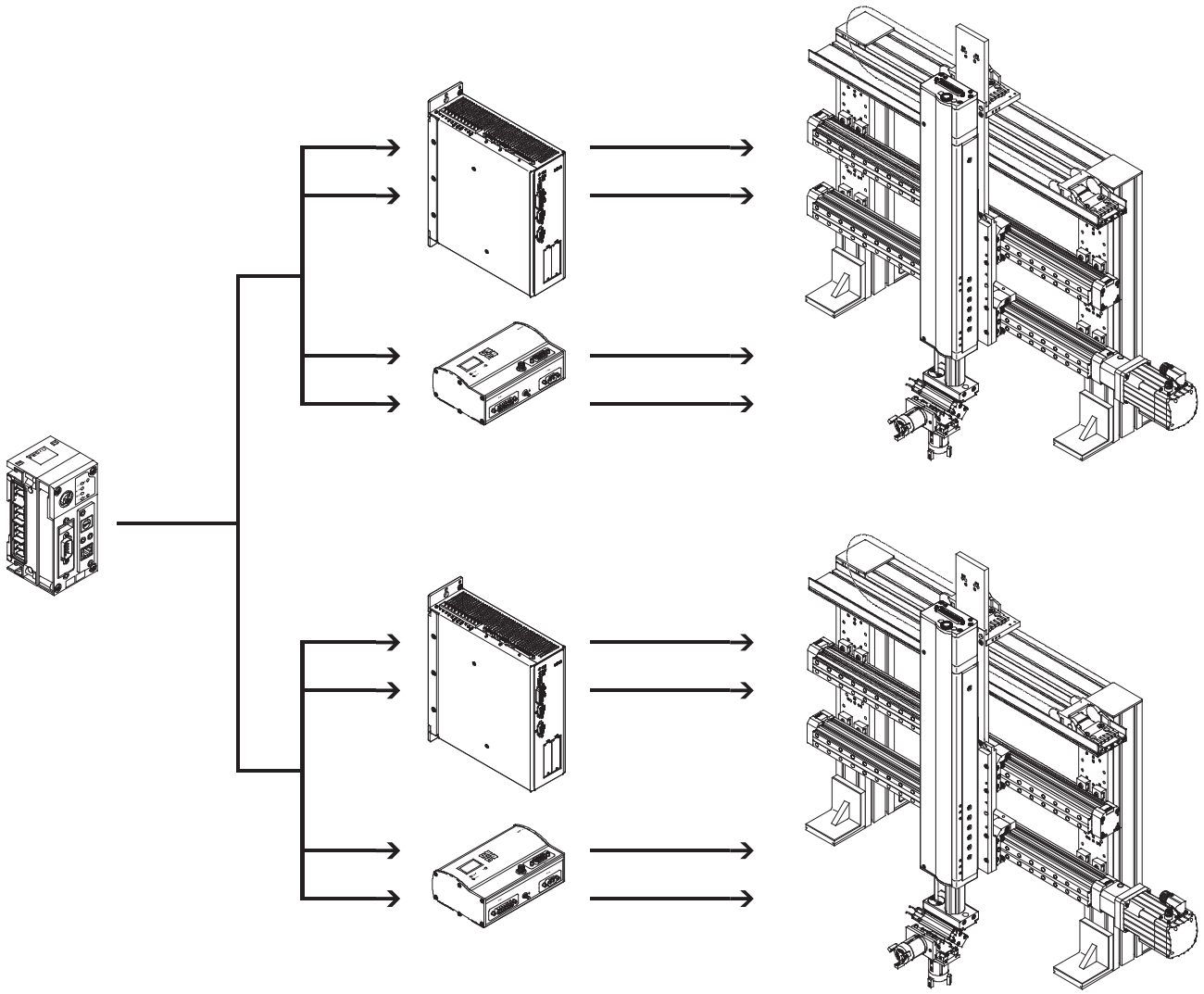
Combined centralised and decentralised electrical connection (valve terminal with CP interface/output module)



- 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

Connection of inputs and outputs to the CPX terminal

Electrical drives with CPX-CMXX multi-axis interface



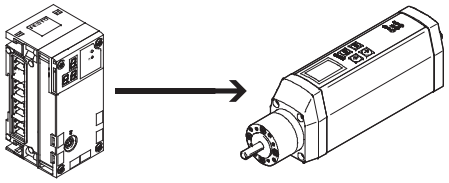
- Two axis groups, each with up to four axes, per CPX-CMXX
- 1,024 positioning records possible per axis group

- 2-axis gantries
- 3-axis gantries

Several CP interface modules can be combined in one CPX terminal (depending on the controller used).

Combination of centralised CPX I/O modules and decentrally mounted I/O modules of the CPI installation system.

Electrical drives with CPX-CM-HPP axis interface



- Max. 4 individual electric axes, per CPX-CM-HPP
- No programming required

- Standardised communication with the drives via the Festo Handling and Positioning Profile (FHPP)

- The control component is independent of the fieldbus node used

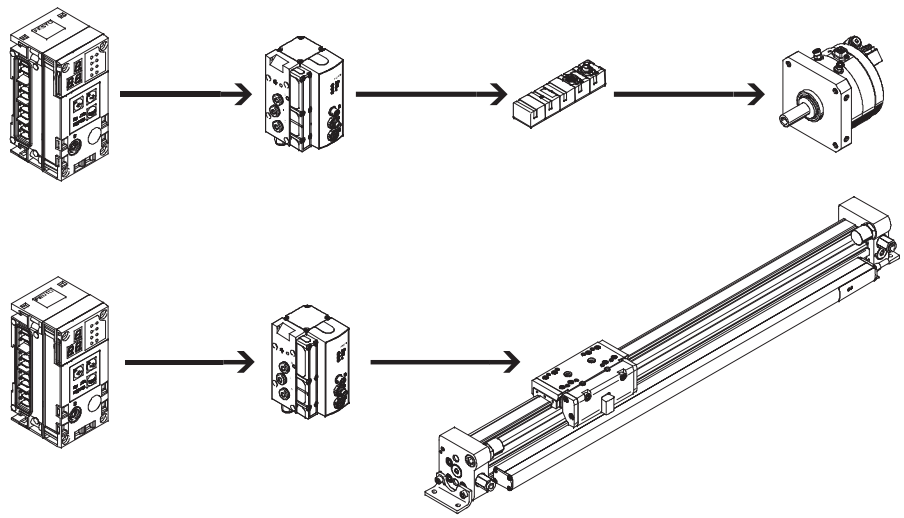
- Quick configuration and diagnostics via the operator unit CPX-MMI

Terminal CPX

Key features

Connection of inputs and outputs to the CPX terminal

Pneumatic drives with CPX-CMAX/CMPX



CPX-CMAX

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

CPX-CMPX

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

Ordering

The CPX terminal with valve terminal is fully assembled according to your order specifications and individually tested. The finished valve terminal consists of the electrical peripherals including the desired actuation and the selected components of the VTSA (ISO), VTSA-F, CPA, MPA or MIDI/MAXI 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. For this order, only the order code for the electrical peripherals is required.

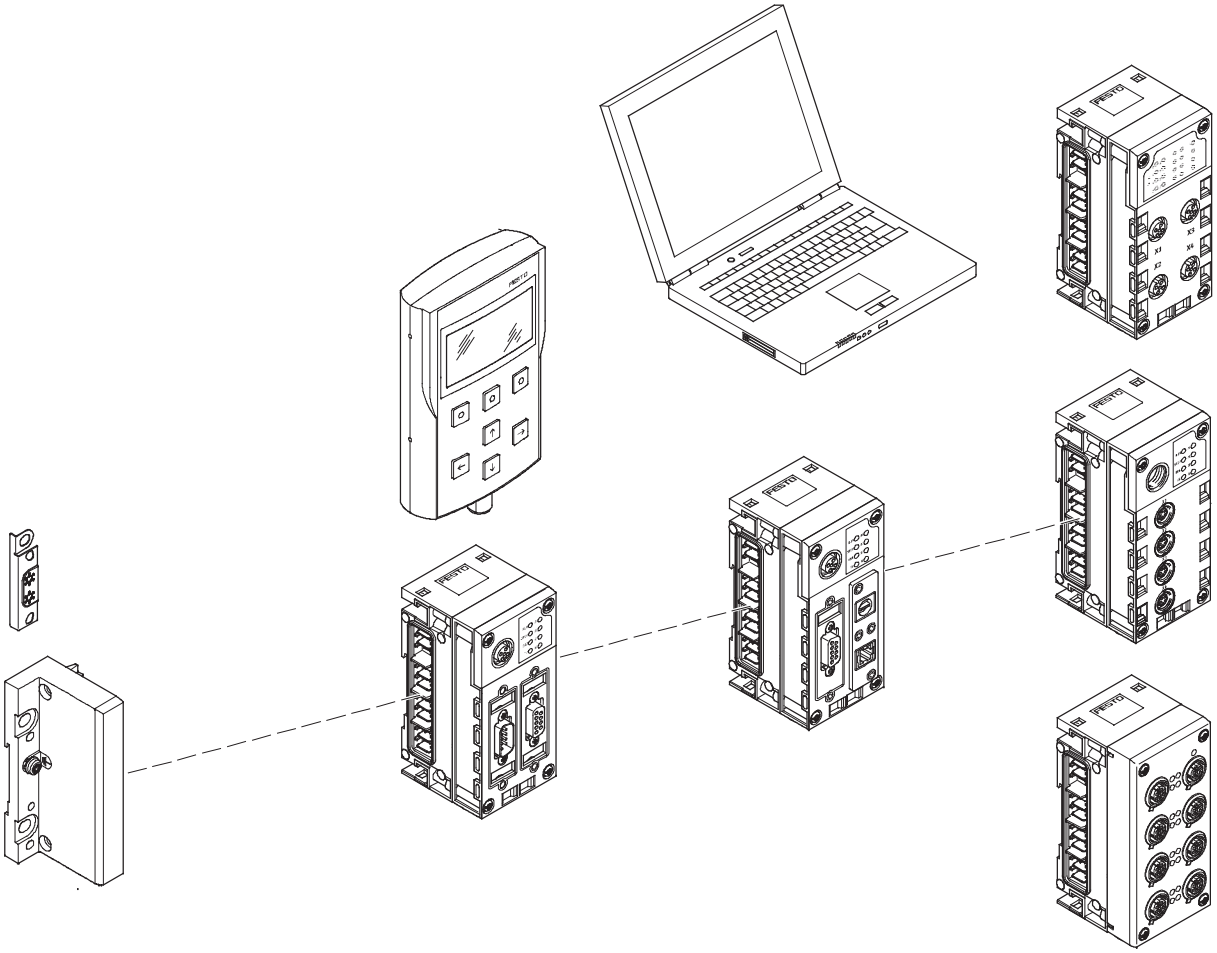
The order lists for the pneumatic components can be found on

- ➔ Internet: type 44 (valve terminal type 44 VTSA)
- ➔ Internet: type 45 (valve terminal type 45 VTSA-F)
- ➔ Internet: type 12 (valve terminal type 12 CPA)
- ➔ Internet: type 32 (valve terminal type 32 MPA)
- ➔ Internet: type 33 (valve terminal type 33 MPA-F)
- ➔ Internet: type 34 (valve terminal type 34 MPA-L)
- ➔ Internet: type 03 midi maxi (valve terminal VIMP-/VIFB-03)

The order lists for the CP/CPI components can be found on

- ➔ Internet: ctec (CPI installation system)

Complete overview of modules



End plate

- Mounting holes for wall mounting
- Functional earth connection
- Special earthing plate for safe and easy connection to the machine bed or H-rail

Bus node

- Fieldbus/Industrial Ethernet connection using various types of connection technology
- Setting of fieldbus parameters via DIL switch
- Display of fieldbus and peripheral equipment status via LED
- PROFINET to AIDA standard in metal housing, fast start-up

Control block

- Preprocessing, stand-alone controller or remote unit CPX-FEC/CPX-CEC
- Connection via Ethernet TCP/IP or Sub-D programming interface
- Setting of operating modes via DIL switch and program selection via rotary switch
- CPX-CMX products for controlling axes

CP interface

- CP interface for decentralised installation systems, thus optimising the pneumatic control loop systems (short tubing lengths/short cycle times)
- Up to 4 strings with up to 4 modules each and up to 32 I/Os in total per string
- Power supply and bus interface via the same cable

Operator unit

- Connection to bus nodes or control block
- Display and modification of parameter settings
- Plain-text display for texts, messages (e.g. individual channel diagnostics, condition monitoring), menus, etc.

Web monitor

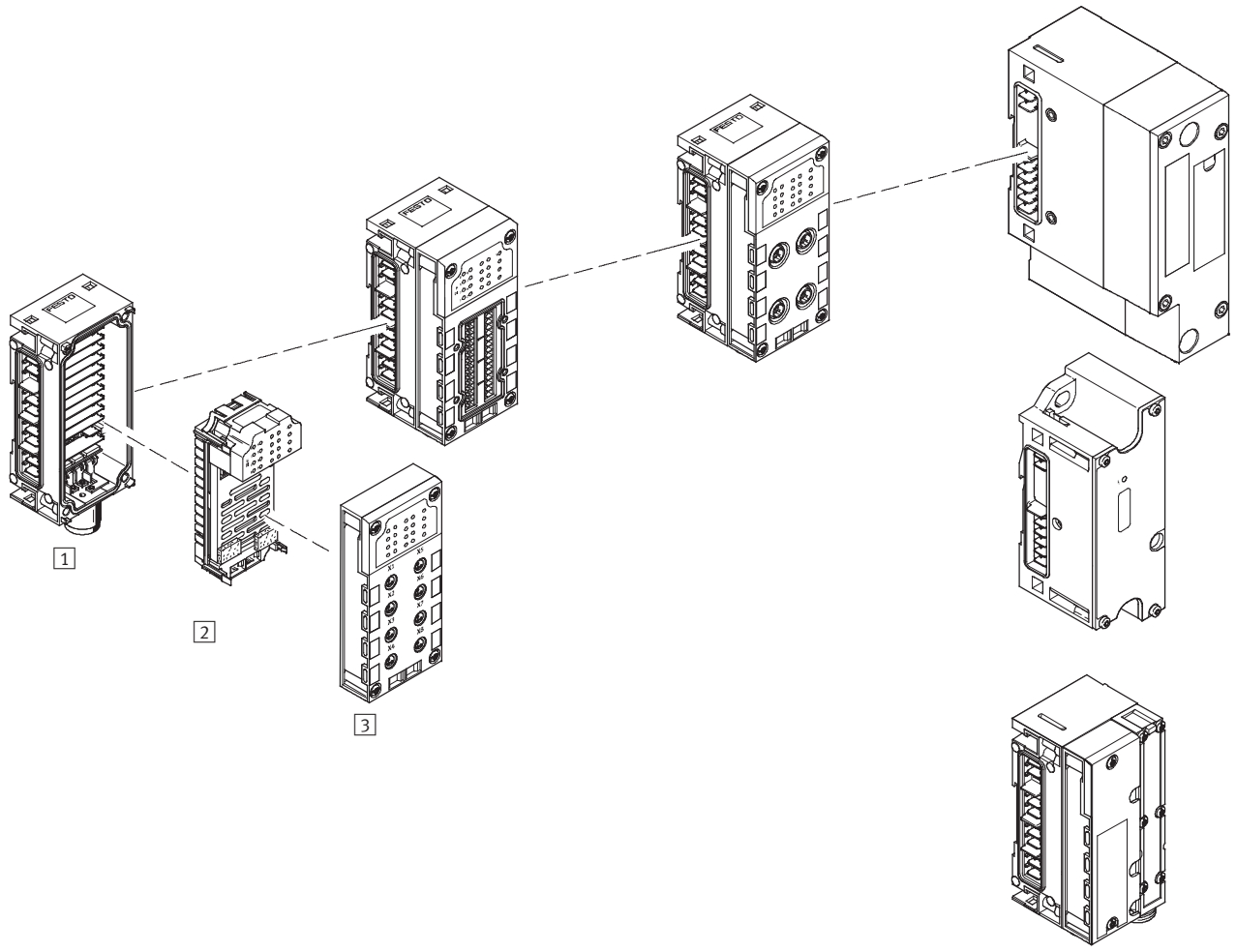
- Website integrated in the CPX terminal
- Dynamic status display
- Online diagnostics
- Text message/e-mail alert

Input/output modules

Combination of

- Interlinking block
- Electronics module
- Connection block

Complete overview of modules



Input/output modules

1 Interlinking block

- Internal linking of the power supply and serial communication
- External power supply for the entire system
- Additional power supply for outputs or valves
- Connection accessories for M18, 7/8" or AIDA push-pull
- Plastic version: linking with tie rods
- Metal version: individual linking with M6 screws, individually expandable

2 Electronics module

- Digital inputs for connecting the sensors
- Digital outputs for activating additional actuators
- Analogue inputs
- Temperature inputs (analogue)
- Analogue outputs

3 Connection block

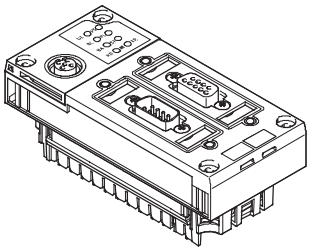
- Choice of 8 connection technology variants
- Protection class IP65/IP67 or IP20
- Freely combinable with the electronics modules
- Connection accessories for M8/M12/Sub-D/quick connector
- M8/M12/Sub-D, etc. connecting cables
- Modular system for M8/M12 connecting cables
- M12 connection technology for the metal design

Pneumatic interface

- MPA
- MPA-F
- MPA-L
- VTSA/VTSA-F
- MIDI/MAXI
- CPA10/14

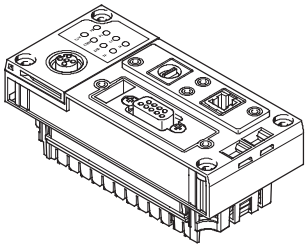
Individual overview of modules

Bus node



Bus node for
- Profibus DP
- Interbus
- DeviceNet
- CANopen
- CC-Link
- Ethernet/IP (integrated web server)
- PROFINET (integrated web server)
- EtherCAT

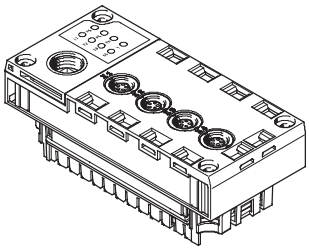
Control block



CPX-FEC
- Programming with FST
- Ethernet interface
- Modbus/TCP
- EasyIP
- Integrated web server
- Sub-D programming interface

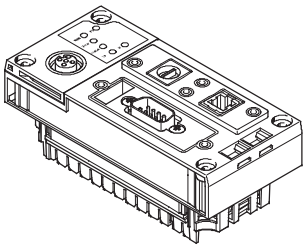
CPX-CEC
- Programming with CoDeSys
- Ethernet interface
- Modbus/TCP
- EasyIP
- CANopen master

CP interface



CP interface
- 4 CP strings
- Max. 4 modules per string
- 32I/32O per string
- CPI functionality

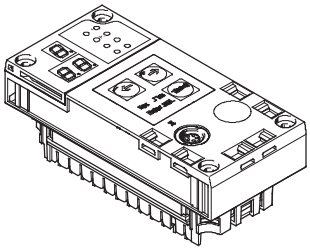
Modules for actuating electric drive units



CPX-CMXX
- Multi-axis interface
- Ethernet interface
- 2 axis groups with max. 4 axes per group
- Max. 1,024 positioning records per axis group

CPX-CM-HPP
- Axis interface
- Max. 4 individual electric axes can be controlled via CAN bus

Modules for actuating pneumatic drive units



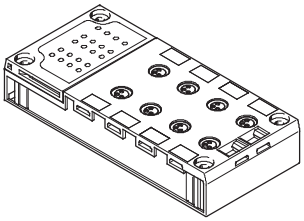
CPX-CMAX
- Axis controller
- Position and force control
- 64 configurable positioning profiles
- Auto identification
- Actuation of a brake or clamping unit via the proportional directional control valve VPWP

CPX-CMPX
- End-position controller
- Fast movement between the mechanical end stops of the cylinder
- Gentle stop in the end position
- Improved downtime control
- Actuation of a brake via the proportional directional control valve VPWP

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

Individual overview of modules

Plastic connection block

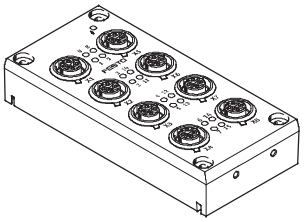


Direct machine mounting
(protection class IP65/IP67)
- M8-3POL
- M8-4POL
- M12-5POL
- M12-5POL quick lock,
  metal thread screened
- M12-8POL
- Sub-D
- Quick connector
- Spring-loaded terminal with cover

Protected fitting space
(protection class IP20)
- Spring-loaded terminal

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

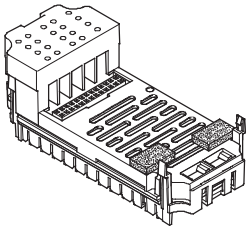
Metal connection block



Direct machine mounting
(protection class IP65/IP67)
- M12-5POL

Individual overview of modules

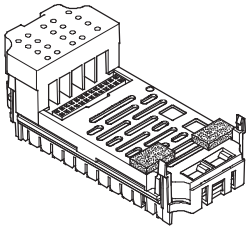
Digital electronics module for inputs/outputs



Digital inputs and outputs
- 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
- 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

Analogue electronics module for inputs/outputs

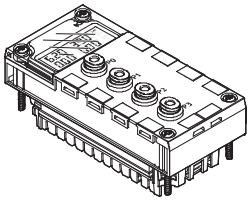


Analogue inputs
- 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue inputs (0 ... 20 mA, 4 ... 20 mA)

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

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

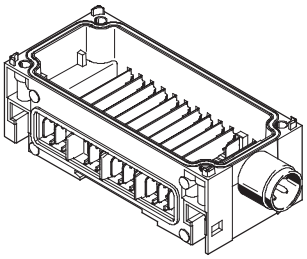
Analogue electronics module for pressure inputs



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

Individual overview of modules

Plastic interlinking block – Linking by means of tie rods



System linking
- Different voltage values for supplying the modules
- Serial communication between the modules

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

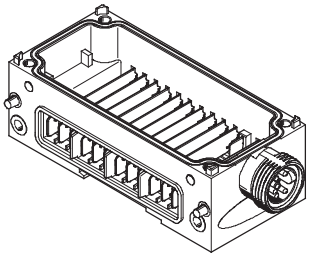
In addition to system linking, power supply for the
- electronics plus sensors (16 A)
- valves plus actuators (16 A)

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

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

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

Metal interlinking block – Individual linking



System linking
- Different voltage values for supplying the modules
- Serial communication between the modules

System supply
- 7/8", 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 power supply
In addition to system linking, power supply for the
- actuators (16 A per supply)

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

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

Note

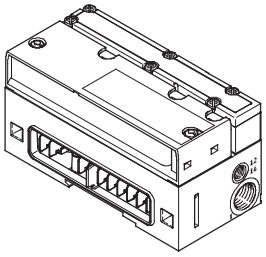
Plastic interlinking blocks (tie rods) and metal interlinking blocks (individual linking) cannot be combined due to their different linking systems.

Note

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

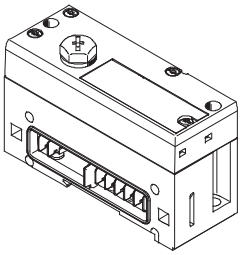
Individual overview of modules

Pneumatic interface MPA
➔ 188



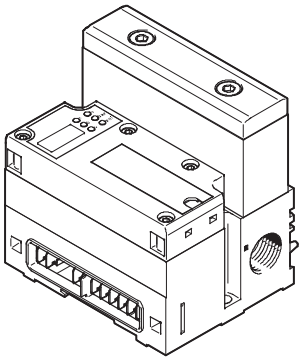
Valve terminal
- MPA1 (360 l/min)
- MPA2 (700 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- For CPX plastic design
- For CPX metal design

Pneumatic interface MPA-L
➔ 190



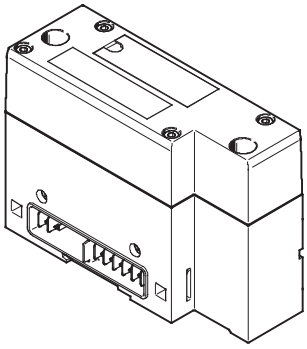
Valve terminal
- MPA1 (360 l/min)
- Up to 32 solenoid coils
- For CPX plastic design

Pneumatic interface MPA-F
➔ 194



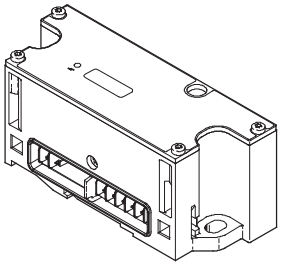
Valve terminal
- MPAF1 (360 l/min)
- MPAF2 (900 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- With integrated pressure sensor for channel 1
- For CPX plastic design
- For CPX metal design

Pneumatic interface VTSA/VTSA-F
➔ 196



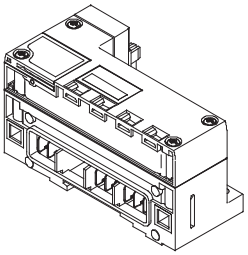
Valve terminal
- 18 mm: valve flow rate up to 700 l/min
- 26 mm: valve flow rate up to 1,400 l/min
- 42 mm: valve flow rate up to 1,500 l/min
- Max. 32 valve positions/ max. 32 solenoid coils
- For CPX plastic design
- For CPX metal design

Pneumatic interface MIDI/MAXI
➔ 197



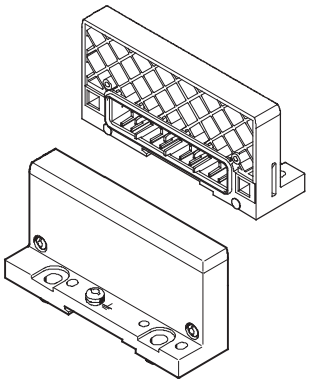
Valve terminal
- MIDI valves (500 l/min) and/or MAXI valves (1,250 l/min)
- Up to 26 solenoid coils
- Setting of the number of valves via DIL switch
- For CPX plastic design
- For CPX metal design

Pneumatic interface CPA
➔ 192



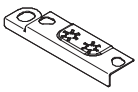
Valve terminal
- CPA10 (300 l/min)
- CPA14 (600 l/min)
- Up to 22 solenoid coils
- Setting of the number of valves via DIL switch
- For CPX plastic design

End plate for plastic/metal design



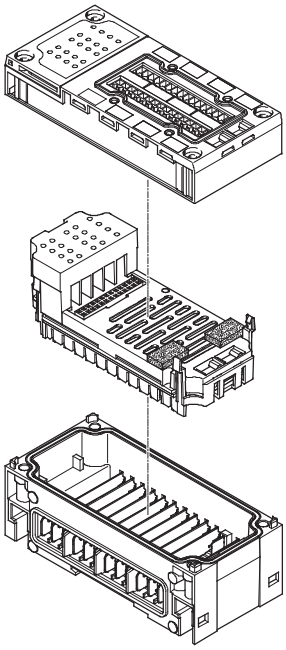
End plate
- Left-hand
- Right-hand (for use without valves)

Earthing plate (for end plate for plastic design)



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

General basic data and guidelines



Max. 11 modules in total:
- One bus node and/or one control block, freely positionable
- Up to 9 additional input/output modules, freely positionable
- In addition a pneumatic interface, always positioned as the last module on the right-hand side
  - For VTSA, VTSA-F, MPA-L, CPA and MIDI/MAXI: fixed operating range, set using DIL switch
  - For MPA: 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, freely positionable
- Multiple interlinking blocks with additional power supply, always positioned to the right of the interlinking block with system supply
- The connection blocks can, with just a few exceptions, be freely combined with the electronics modules for inputs/outputs, either in metal or plastic (➔ table below)
- All electronics modules for inputs/outputs can be combined with any interlinking block
- Plastic interlinking blocks (tie rods) and metal interlinking blocks (individual linking) cannot be combined due to their different linking systems

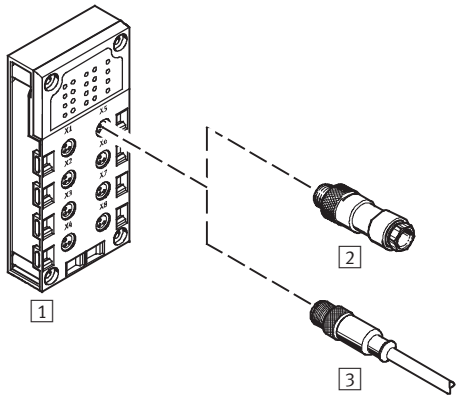
Combinations of connection blocks and digital input modules						
Connection blocks	Digital electronics modules					
	CPX-4DE	CPX-8DE	CPX-16DE	CPX-M-16DE-D	CPX-8DE-D	CPX-8NDE
Plastic design with mounting screws for assembly on plastic interlinking blocks						
CPX-AB-8-M8-3POL	■	■	–	–	■	■
CPX-AB-8-M8X2-4POL	–	–	■	–	–	–
CPX-AB-4-M12x2-5POL	■	■	–	–	■	■
CPX-AB-4-M12x2-5POL-R	■	■	–	–	■	■
CPX-AB-4-M12-8POL	–	–	–	–	–	–
CPX-AB-8-KL-4POL	■	■	■	–	■	■
CPX-AB-1-SUB-BU-25POL	■	■	■	–	■	■
CPX-AB-4-HAR-4POL	■	■	–	–	■	■
Plastic design with mounting screws for assembly on metal interlinking blocks						
CPX-AB-8-M8x2-4P-M3	–	–	■	–	–	–
CPX-AB-4-M12-8P-M3	–	–	–	–	–	–
CPX-AB-4-M12x2-5P-R-M3	■	■	–	–	■	■
Metal design with mounting screws for assembly on metal and plastic interlinking blocks						
CPX-M-4-M12x2-5POL	■	■	–	–	■	■
CPX-M-8-M12x2-5POL	–	–	–	■	–	–

Combinations of connection blocks and digital output modules/multi I/O modules				
Connection blocks	Digital electronics modules			
	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-8DE-8DA
Plastic design with mounting screws for assembly on plastic interlinking blocks				
CPX-AB-8-M8-3POL	■	■	–	–
CPX-AB-8-M8X2-4POL	■	■	■	–
CPX-AB-4-M12x2-5POL	■	■	–	–
CPX-AB-4-M12x2-5POL-R	■	■	■	–
CPX-AB-4-M12-8POL	–	–	–	■
CPX-AB-8-KL-4POL	■	■	■	■
CPX-AB-1-SUB-BU-25POL	■	■	■	■
CPX-AB-4-HAR-4POL	■	■	–	–
Plastic design with mounting screws for assembly on metal interlinking blocks				
CPX-AB-8-M8x2-4P-M3	■	■	■	–
CPX-AB-4-M12-8P-M3	–	–	–	■
CPX-AB-4-M12x2-5P-R-M3	■	■	■	–
Metal design with mounting screws for assembly on metal and plastic interlinking blocks				
CPX-M-4-M12x2-5POL	■	■	■	–
CPX-M-8-M12x2-5POL	–	–	–	–

Combinations of connection blocks and analogue electronics modules for inputs/outputs						
Connection blocks	Analogue electronics modules					
	CPX-2AE-U-I	CPX-4AE-I	CPX-4AE-P	CPX-4AE-T	CPX-4AE-TC	CPX-2AA-U-I
Plastic design with mounting screws for assembly on plastic interlinking blocks						
CPX-AB-4-M12x2-5POL	■	■	–	■	■	■
CPX-AB-4-M12x2-5POL-R	■	■	–	■	■	■
CPX-AB-8-KL-4POL	■	■	–	■	■	■
CPX-AB-1-SUB-BU-25POL	■	■	–	–	–	■
CPX-AB-4-HAR-4POL	–	–	–	■	–	–
Plastic design with mounting screws for assembly on metal interlinking blocks						
CPX-AB-4-M12x2-5P-R-M3	■	■	–	■	■	■
Metal design with mounting screws for assembly on metal and plastic interlinking blocks						
CPX-M-4-M12x2-5POL	■	■	–	■	■	■

Electrical connection – Connection block

CPX-AB-8-M8-3POL with M8-3POL connection



- Compact for pre-assembled individual connection
- 8 sockets
- 3-pin design for connection of 1 channel per socket

Note

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

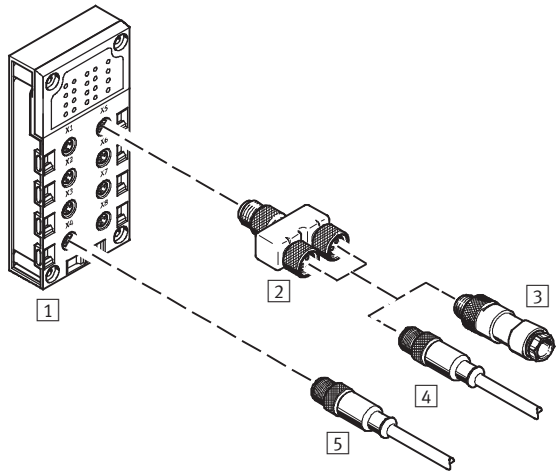
- Tailored to the application
- Perfect fit
- Saves installation

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug connector/connecting cable	Selectable connection technology
1 CPX-AB-8-M8-3POL	Socket, M8, 3-pin	2 SEA-GS-M8	Solder lugs
		2 SEA-3GS-M8-S	Screw terminals
		3 KM8-M8-GSGD-... (pre-assembled connecting cable)	Socket, M8, 3-pin
		3 NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M5, 3-pin
			Socket, M8, 3-pin
			Socket, M8, 4-pin
			Socket, M12, 5-pin
			Open cable end

Electrical connection – Connection block

CPX-AB-8-M8X2-4POL with M8-4POL connection



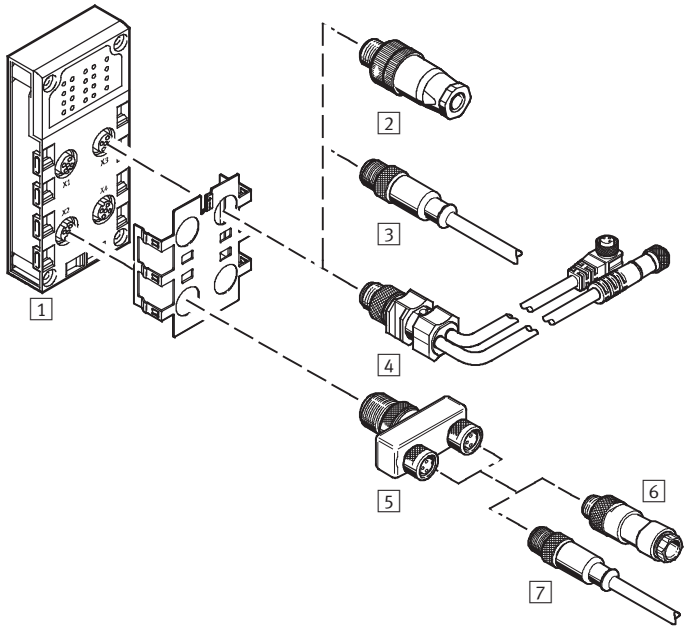
- Compact for pre-assembled individual connection
- 8 sockets
- 4-pin design for connection of 2 channels per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug connector/ connecting cable	Selectable connection technology	Plug connector/ connecting cable	Selectable connection technology
1 CPX-AB-8-M8X2-4POL	Socket, M8, 4-pin	4 NEBU-...-M8G4 (modular system for choice of connecting cables)	Socket, M5, 3-pin	–	–
			Socket, M8, 3-pin	–	–
			Socket, M8, 4-pin	–	–
			Socket, M12, 5-pin	–	–
			Open cable end	–	–
		2 NEDU-M8D3-M8T4 (T-adapter)	1x plug M8, 4-pin to 2x socket M8, 3-pin	3 SEA-GS-M8	Solder lugs
				3 SEA-3GS-M8-S	Screw terminals
				4 KM8-M8-GSGD-... (pre-assembled connecting cable)	Socket, M8, 3-pin
				4 NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M5, 3-pin
					Socket, M8, 3-pin
					Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end

Electrical connection – Connection block

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

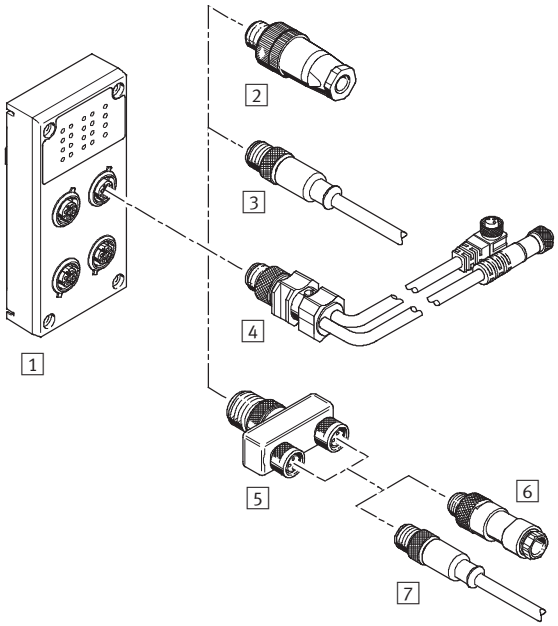


- Pre-assembled and sturdy with 2 channels per socket
- 4 sockets
- 5-pin design per socket
- Version ...-R with quick lock technology and metal thread for screening
- With two channels per socket, the corresponding input signals can be easily connected via a T-adapter and conventional cable with M8 connection

Combination of connection block and electrical connection technology					
Connection 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 SEA-GS-7	Screw terminals	–	–
		2 SEA-4GS-7-2,5	Screw terminals	–	–
		2 SEA-GS-9	Screw terminals	–	–
		2 SEA-M12-5GS-PG7	Screw terminals	–	–
		2 SEA-GS-11-DUO	Screw terminals, for two cables	–	–
		2 SEA-5GS-11-DUO	Screw terminals, for two cables	–	–
		3 KM12-M12-... (pre-assembled connecting cable)	Socket, M12, 4-pin	–	–
		3 NEBU-...-M12G4	Socket, M5, 4-pin	–	–
		3 NEBU-...-M12G5	Socket, M8, 4-pin	–	–
			Socket, M12, 5-pin	–	–
			Open cable end	–	–
		4 KM12-DUO-M8-... (pre-assembled connecting cable)	Plug M12, 4-pin to 2x socket M8, 3-pin	6 SEA-GS-M8	Solder lugs
				6 SEA-3GS-M8-S	Screw terminals
				7 KM8-M8-GSGD-... (pre-assembled connecting cable)	Socket, M8, 3-pin
		5 NEDU-M8D3-M12T4 (T-adapter)		7 NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M5, 3-pin
					Socket, M8, 3-pin
					Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end
		5 NEDU-M12D5-M12T4 (T-adapter)	Plug M12, 4-pin to 2x socket M12, 5-pin	6 SEA-GS-7	Screw terminals
				6 SEA-4GS-7-2,5	Screw terminals
				6 SEA-GS-9	Screw terminals
				6 SEA-M12-5GS-PG7	Screw terminals
				6 SEA-GS-11-DUO	Screw terminals, for two cables
				6 SEA-5GS-11-DUO	Screw terminals, for two cables
				7 KM12-M12-... (pre-assembled connecting cable)	Socket, M12, 4-pin
				7 NEBU-...-M12G4 (modular system for choice of connecting cables)	Socket, M5, 4-pin
				7 NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end

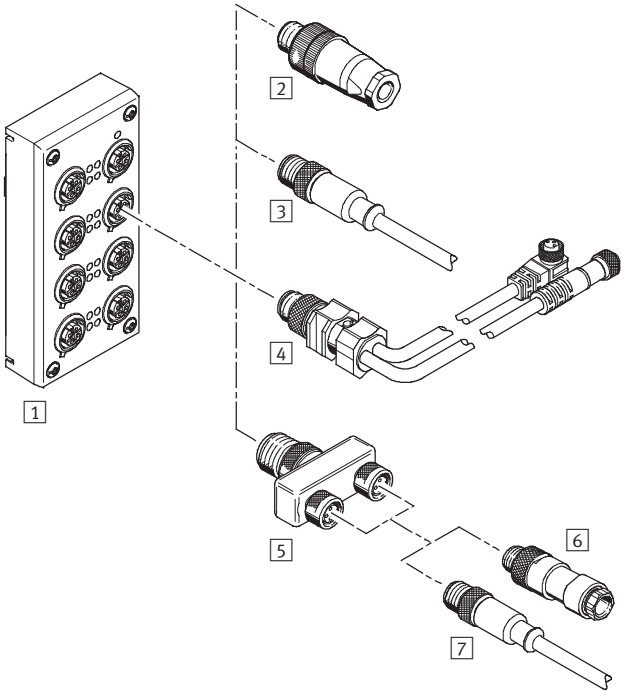
Electrical connection – Connection block (metal design)

CPX-M-4-M12x2-5POL with M12-5POL connection



- Pre-assembled and sturdy with 2 channels per socket
- 4 sockets
- 5-pin design per socket
- With two channels per socket, the corresponding input signals can be easily connected via a T-adapter and conventional cable with M8 connection

CPX-M-8-M12x2-5POL with M12-5POL connection

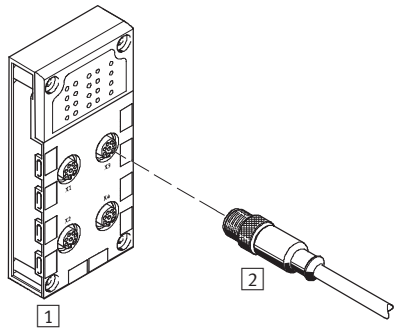


- Pre-assembled and sturdy with 2 channels per socket
- 8 sockets
- 5-pin design per socket
- With two channels per socket, the corresponding input signals can be easily connected via a T-adapter and conventional cable with M8 connection

Combination of connection block and electrical connection technology					
Connection block	Connection technology	Plug connector/ connecting cable	Connection technology	Plug connector/ connecting cable	Connection technology
1 CPX-M-4-M12x2-5POL CPX-M-8-M12x2-5POL	Socket, M12, 5-pin	2 SEA-GS-7	Screw terminals	–	–
		2 SEA-4GS-7-2,5	Screw terminals	–	–
		2 SEA-GS-9	Screw terminals	–	–
		2 SEA-M12-5GS-PG7	Screw terminals	–	–
		2 SEA-GS-11-DUO	Screw terminals, for two cables	–	–
		2 SEA-5GS-11-DUO	Screw terminals, for two cables	–	–
		3 KM12-M12-... (pre-assembled connecting cable)	Socket, M12, 4-pin	–	–
		3 NEBU-...-M12G4	Socket, M5, 4-pin	–	–
		3 NEBU-...-M12G5	Socket, M8, 4-pin	–	–
			Socket, M12, 5-pin	–	–
			Open cable end	–	–
		4 KM12-DUO-M8-... (pre-assembled connecting cable)	Plug M12, 4-pin to 2x socket M8, 3-pin	6 SEA-GS-M8	Solder lugs
				6 SEA-3GS-M8-S	Screw terminals
				7 KM8-M8-GSGD-... (pre-assembled connecting cable)	Socket, M8, 3-pin
		5 NEDU-M8D3-M12T4 (T-adapter)		7 NEBU-...-M8G3 (modular system for choice of connecting cables)	Socket, M5, 3-pin
					Socket, M8, 3-pin
					Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end
		5 NEDU-M12D5-M12T4 (T-adapter)	Plug M12, 4-pin to 2x socket M12, 5-pin	6 SEA-GS-7	Screw terminals
				6 SEA-4GS-7-2,5	Screw terminals
				6 SEA-GS-9	Screw terminals
				6 SEA-M12-5GS-PG7	Screw terminals
				6 SEA-GS-11-DUO	Screw terminals, for two cables
				6 SEA-5GS-11-DUO	Screw terminals, for two cables
				7 KM12-M12-... (pre-assembled connecting cable)	Socket, M12, 4-pin
				7 NEBU-...-M12G4 (modular system for choice of connecting cables)	Socket, M5, 4-pin
				7 NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin
					Socket, M12, 5-pin
					Open cable end

Electrical connection – Connection block

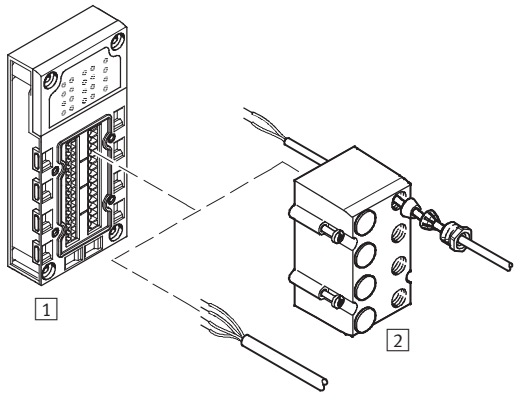
CPX-AB-4-M12-8POL with M12-8POL connection



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

Combination of connection block and electrical connection technology			
Connection block	Connection technology	Plug connector/connecting cable	Selectable connection technology
1 CPX-AB-4-M12-8POL	Socket, M12, 8-pin	2 KM12-8GD8GS-2-PU (pre-assembled connecting cable)	Socket, M12, 8-pin

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

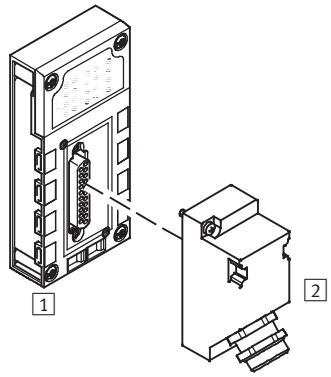


- Fast connection technology for use in control cabinets
- 32 spring-loaded terminals
- 4 spring-loaded terminals per channel
- Wire cross sections 0.05 ... 1.5 mm^2
- Optional cover with fittings for IP65/67 connection
  - 8 through-holes M9
  - 1 through-hole M16
  - Blanking plug
  - For I/O distributors,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

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

Electrical connection – Connection block

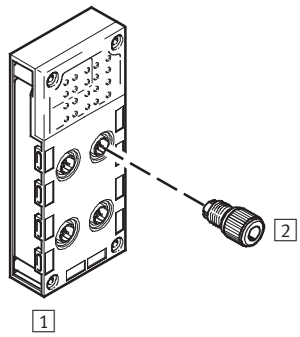
CPX-AB-1-SUB-BU-25POL with Sub-D connection



- Multi-pin plug connection for I/O distributor or console
- One socket
- 25-pin design

Combination of connection block and electrical connection technology			
Connection block	Connection technology	Plug connector/connecting cable	Selectable connection technology
1 CPX-AB-1-SUB-BU-25POL	Socket, Sub-D, 25-pin	2 SD-SUB-D-ST25	Crimp contacts

CPX-AB-4-HAR-4POL with quick connector



- Sturdy quick connection technology for individual connections
- 4 sockets
- 4-pin design per socket

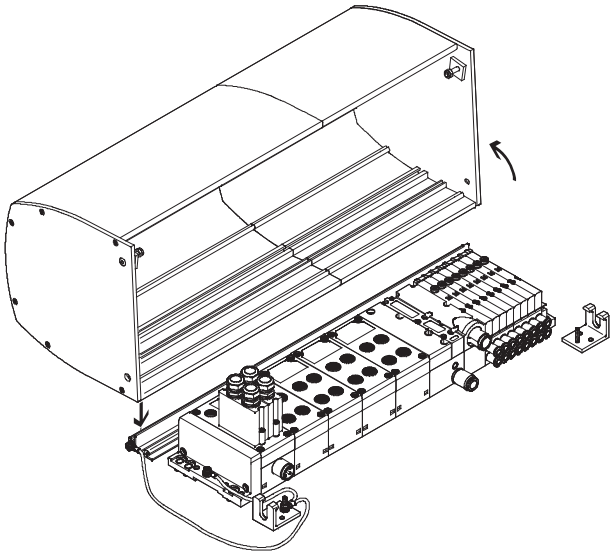
Combination of connection block and electrical connection technology			
Connection block	Connection technology	Plug connector/connecting cable	Selectable connection technology
1 CPX-AB-4-HAR-4POL	Socket, quick connection, 4-pin	2 SEA-GS-HAR-4POL	Insulation displacement connectors

Terminal CPX

Key features – Assembly

Hood

Description



The CPX hood 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 type 32 MPA) is well protected and is quick to install without the need for complex control cabinet installation for cables and tubing. The CPX hood also allows a valve terminal to be installed directly in ATEX zone 2.

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

Advantages of the CPX hood

- Impact protection (min. 7 J) for the underlying modules in combination with a suitable mounting plate provided by the user
- Protection against electrostatic discharge through the use of electrically conductive materials and the option of connecting an earth wire
- Protection against accidental interference with live plug connectors (by securing the hood with at least one special lock to EN 600079-0, 9.2 and 20)
- UV protection for the underlying CPX and MPA modules

Points to note when using the CPX hood

- Only in combination with valve terminal type 32 MPA
- No fieldbus nodes with push-pull connection (CPX-M-FB34, CPX-M-FB35)
- CPX power supply via angled plugs, no T-plugs, no push-pull
- Electrical supply plate/additional power supply only possible with angled plug
- No MPA vertical stacking
- Use of larger QS fittings (for tubing O.D. larger than 12 mm) only possible with the angled design
- Ducted exhaust air only with elbow connector
- The permissible ambient temperature of the valve terminal is reduced by 5 °C

Note

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

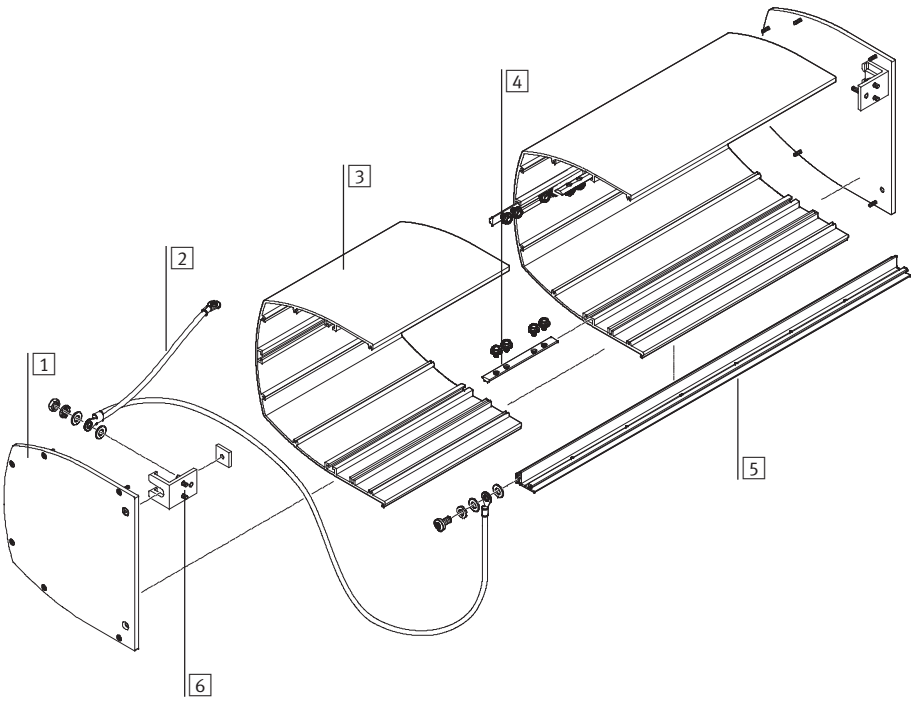
The CPX hood does not protect against the effects of the weather in installations that are not in closed spaces.

Terminal CPX

Key features – Assembly

Hood

Assembly



Procedure:

- Assemble the rail and mounting bracket from the mounting kit
- Attach the earth cable
- Assemble the hood (if applicable, screw together several hood sections before attaching the side pieces)
- Attach and secure the hood

1 Side piece
2 Earth 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

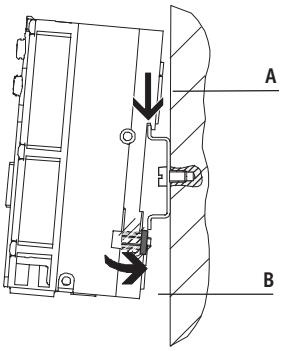
- Ambient temperature −5 ... +50 °C

- RoHS-compliant

Mounting options

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

H-rail mounting

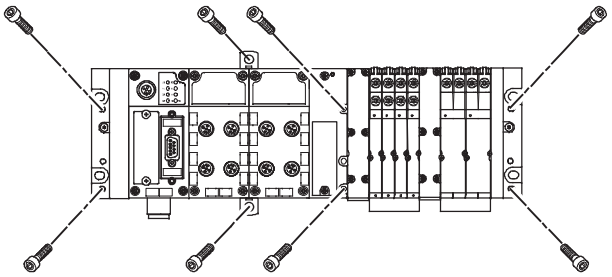


The H-rail mounting is formed in the reverse profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting kit.
The CPX terminal is mounted on the H-rail (see arrow A) and then swivelled onto the H-rail and secured in place with the clamping component (see arrow B).
The optional earthing plate enables a connection to be established to the machine potential/earth in one easy step.

For H-rail mounting you will need the following mounting kit:
- CPA-BG-NRH

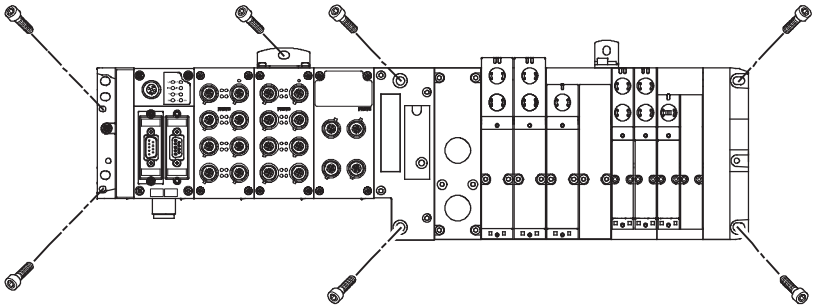
This facilitates mounting of the CPX on H-rails to EN 60715.
An additional mounting kit is required for combination with valve terminals.

Wall mounting, plastic design



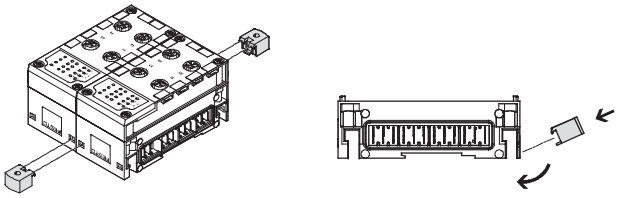
The end plates of the CPX terminal, the valve terminal and the pneumatic interface include mounting holes for wall mounting. Additional mountings for the CPX terminal are available for longer valve terminals. These mountings differ depending on the design of the CPX terminal (plastic or metal).

Wall mounting, metal design



Plastic CPX terminal

Additional mountings

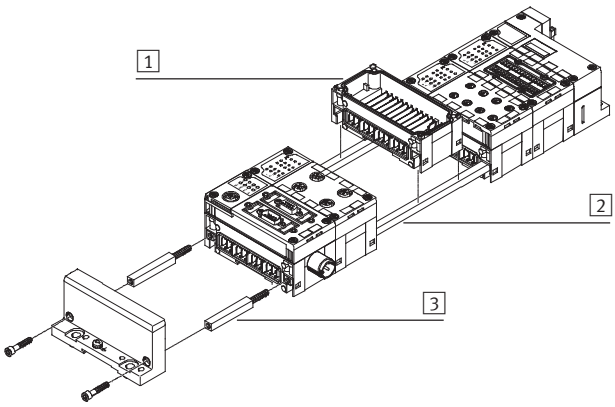


Additional mountings for the CPX terminal that can be fitted between two modules are available for longer valve terminals.

- Note

For CPX terminals with 4 or more interlinking blocks: you will require additional mountings of the type CPX-BG-RW-... every 100 or 150 mm. These are pre-assembled when supplied.

Linking with tie rods

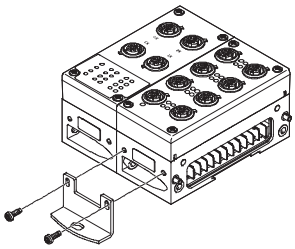


The mechanical connection between the CPX modules is created using special tie rods 2. Two screws in the end plates are all that are needed to assemble the entire unit.
The tie rod ensures that the unit resists high mechanical loads and is therefore the “mechanical backbone” of the CPX terminal.

The open design enables the interlinking blocks 1 to be replaced in the assembled state.
The tie rod expansion kit 3 enables an extra module to be added to the CPX terminal.

Metal CPX terminal

Additional mountings

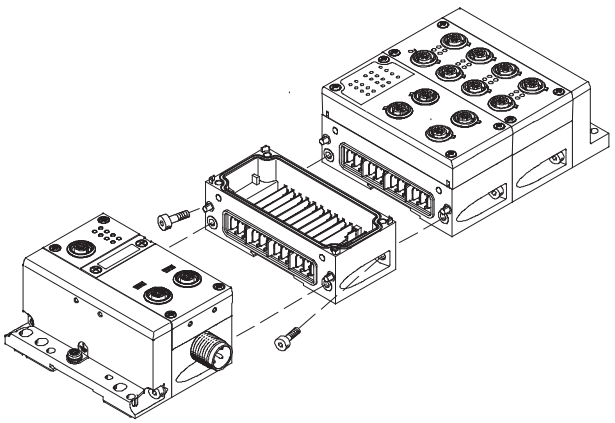


Additional mounting brackets for the CPX terminal that can be screwed onto the interlinking blocks are available for longer valve terminals.

- Note

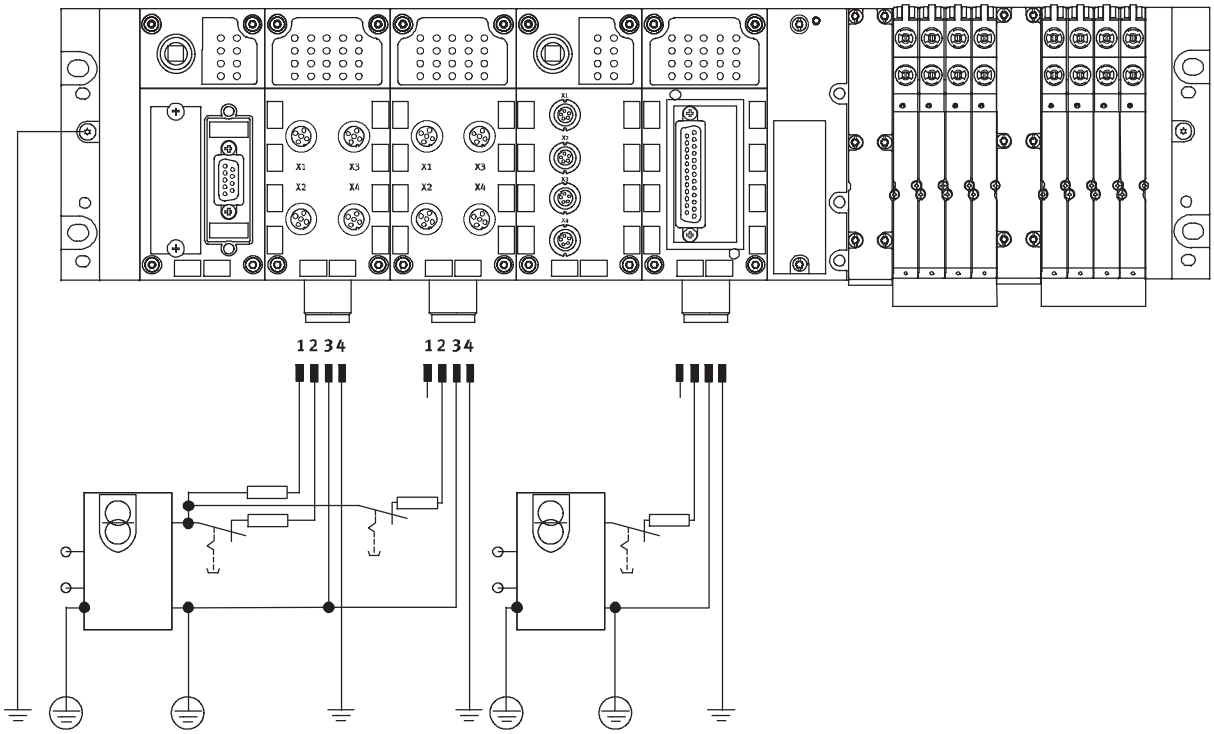
For CPX terminals with 4 or more interlinking blocks: you will require additional mounting brackets of the type CPX-M-BG-RW-... every 100 or 150 mm. These are pre-assembled when supplied.

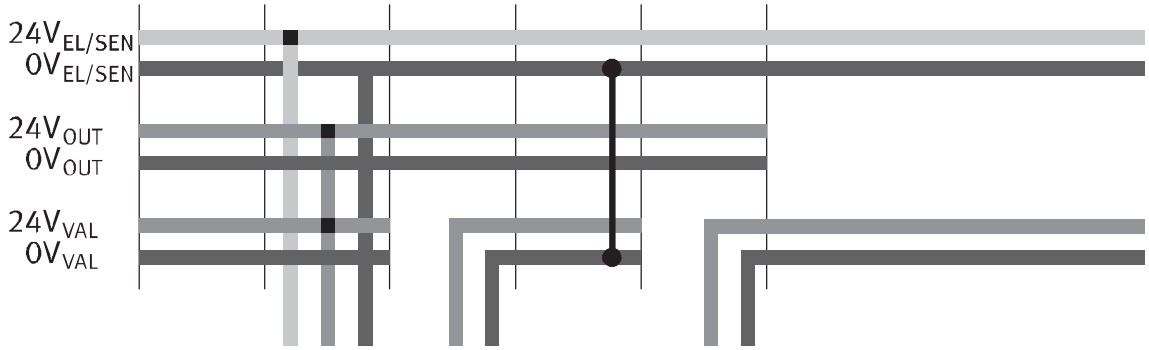
Linking with screws



The mechanical connection between the CPX modules is created using special angle fittings.
The CPX terminal can thus be expanded at any time.

Power supply concept
General information





The use of decentralised devices on the fieldbus – particularly with high protection for direct machine mounting – demands a flexible power supply concept. A valve terminal with CPX can, in principle, supply all voltages via a single socket.

A distinction is made between supplying the
- electronics plus sensors
- valves plus actuators.

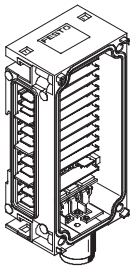
The following connecting threads can be selected:
- M18
- 7/8"
- AIDA push-pull

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 segmented into voltage zones. This applies in particular to the separate disconnection of solenoid coils and outputs.
The interlinking blocks provide either a space-saving central power supply for the entire CPX terminal or galvanically isolated, all-pin disconnectable potential groups/voltage segments.

Interlinking blocks

With system supply



Type for plastic design
- CPX-GE-EV-S
- CPX-GE-EV-S-7/8-5POL
- CPX-GE-EV-S-7/8-4POL

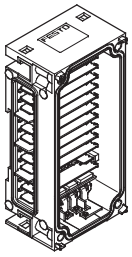
Type for metal design
- CPX-M-GE-EV-S-7/8-5POL
- CPV-M-GE-EV-S-PP-5POL

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

Connection technology
- 7/8", 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 output modules of the CPX terminal

Without power supply



Type for plastic design
- CPX-GE-EV

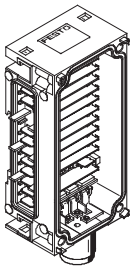
Type for metal design
- CPX-M-GE-EV

–

–

–

With additional power supply for outputs



Type for plastic design
- CPX-GE-EV-Z
- CPX-GE-EV-Z-7/8-5POL
- CPX-GE-EV-Z-7/8-4POL

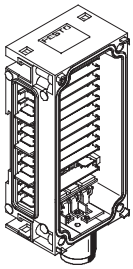
Type for metal design
- CPX-M-GE-EV-Z-7/8-5POL
- CPX-M-GE-EV-Z-PP-5POL

Connection technology
- M18
- 7/8", 5-pin
- 7/8", 4-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 power supply for valves



Type for plastic design
- CPX-GE-EV-V
- CPX-GE-EV-V-7/8-4POL

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

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

- - Note

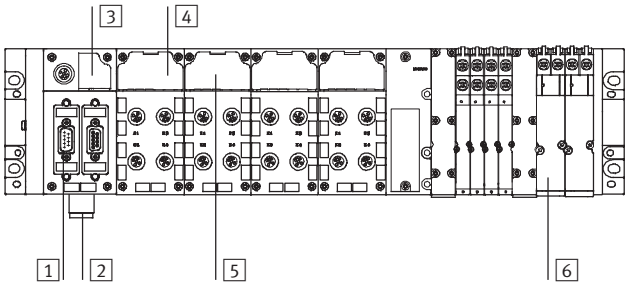
For 7/8":
– Commercially available accessories are often limited to max. 8 A

- - Note

Valve terminal type 32 MPA has either a 5-pin 7/8", 4-pin 7/8", 3-pin M18 or 5-pin AIDA push-pull power supply for one or more valve voltage zones. Galvanically isolated, all pins disconnectable with voltage monitoring in the following MPA module.

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

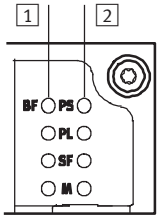
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on-the-spot diagnostics using LEDs or operator unit and diagnostics using a bus interface.

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

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

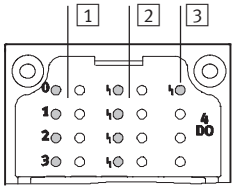
Overview LED on the bus node



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

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

Input/output module status and diagnostic LEDs



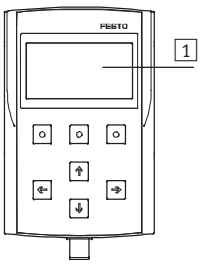
1 Status LEDs for the inputs and outputs
Each input and output channel is assigned a status LED.

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

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

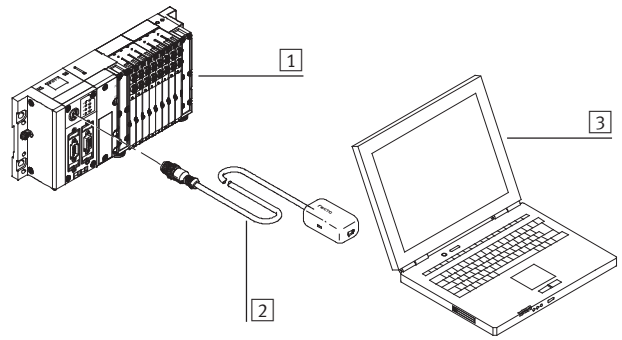
Diagnostics

Display on the operator unit



1 LCD graphical display for on-site plain-text diagnostics
- Fault location and type
- Without programming

Display on a PC



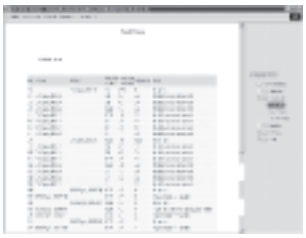
1 CPX terminal with valve terminal
2 Adapter diagnostic interface to USB
3 Laptop/portable device with USB interface and installed FMT software

- Fault location and type
- Without programming
- Storing the configuration
- Preparing screenshots

Display on Web Monitor

CPX Web Monitor overview

Analogue module, channel-oriented diagnostics



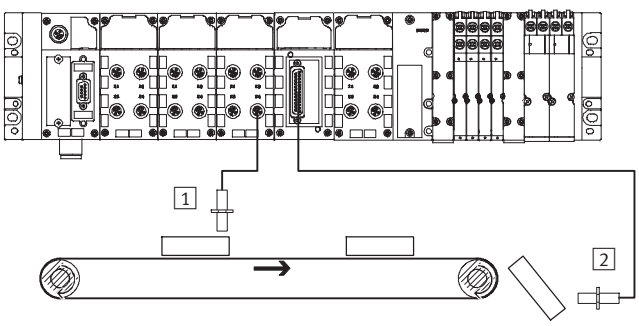
Error memory (fault trace)

The web monitor displays all static and dynamic information on a CPX terminal online via Ethernet – in the web browser of the PC.
This facility is optionally available via Intranet and Internet. Everything is plug & work – without the need for web programming such as HTML or JAVA.

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 by means of 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 interrupt.
Depending on the modules used, parameterisation can be performed via the following interfaces:

- Ethernet
- Fieldbus
- Control block direct interface (programming interface)
- Operator unit CPX-MMI



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

Addressing
General information on 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 with up to 16 MPA manifold sub-bases)

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 – Allocated addresses for CPX modules

	Inputs [bit]	Outputs [bit]
CPX-CMXX	2 x 64	2 x 64
CPX-CM-HPP	256	256
CPX-CMAX	64	64
CPX-CMPX	48	48
CPX-CMIX	48	48
CPX-4DE	4	–
CPX-8DE	8	–
CPX-16DE	16	–
CPX-M-16DE-D	16	–
CPX-8DE-D	8	–
CPX-8NDE	8	–
CPX-4DA	–	4
CPX-8DA	–	8
CPX-8DA-H	–	8
CPX-8DE-8DA	8	8
CPX-2AE	2 x 16	–
CPX-4AE-I	4 x 16	–
CPX-4AE-P	4 x 16	–
CPX-4AE-T	4 x 16	–
CPX-4AE-TC	4 x 16	–
CPX-2AA	–	2 x 16
VABA-S6-1-X1	–	8, 16, 24, 32[1)]
VABA-S6-1-X2	–	8, 16, 24, 32[1)]
CPX-GP-CPA-10	–	8, 16, 24[1)]
CPX-GP-CPA-14	–	8, 16, 24[1)]
CPX-GP-03-4,0	–	8, 16, 24, 32[1)]
CPX-M-GP-03-4,0	–	8, 16, 24, 32[1)]
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)]

1) Depending on the DIL switch setting on the pneumatic interface

Overview – Address space for CPX bus node and control block							
	Protocol	Max. total		Max. digital		Max. analogue	
		Inputs	Outputs	Inputs	Outputs	Inputs	Outputs
CPX-FEC	• TCP/IP • Easy IP • Modbus TCP • HTTP	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-CEC	• CoDeSys Level 2 • TCP/IP • Easy IP • Modbus TCP	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB6	Interbus	96 bits	96 bits	96 DI	96 DO	6 AI	6 AO
CPX-FB11	DeviceNet	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB13	Profibus	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB14	CANopen	192 bits	192 bits	64 DI (+ 64 DI)	64 DO (+ 64 DO)	8 AI (+ 8 AI)	8 AO (+ 8 AO)
CPX-FB23	CC-Link	–	–	64 DI	64 DO	16 AI	16 AO
CPX-FB32	Ethernet/IP	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB33	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB34	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB35	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB38	EtherCAT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO

Note

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

Example – CPX-FB6 (Interbus)			
	Digital inputs	Digital outputs	Remarks
3x CPX-8DE	24	–	• The address space is occupied by 7 CPX I/O modules plus pneumatic interface • No additional modules can be configured
1x CPX-8DE-8DA	8	8	
2x CPX-2AE	64	–	
1x CPX-2AA	–	32	
3x VMPA1	–	24	
Allocated address space	96	96	

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

SEA – GS – HAR – 4POL

Type	
SEA	Plug connector for inputs/outputs, M12x1 connection

Design	
GS	Straight plug connector

Connection	
HAR	Quick connector

Number of pins	
4POL	4-pin

SD – SUB–D – ST25

Type	
SD	Plug connector for inputs/outputs

Design	
SUB-D	SUB-D

Cable connection	
ST25	Connector pin, 25-pin

FBA – 1 – SL – 5POL –

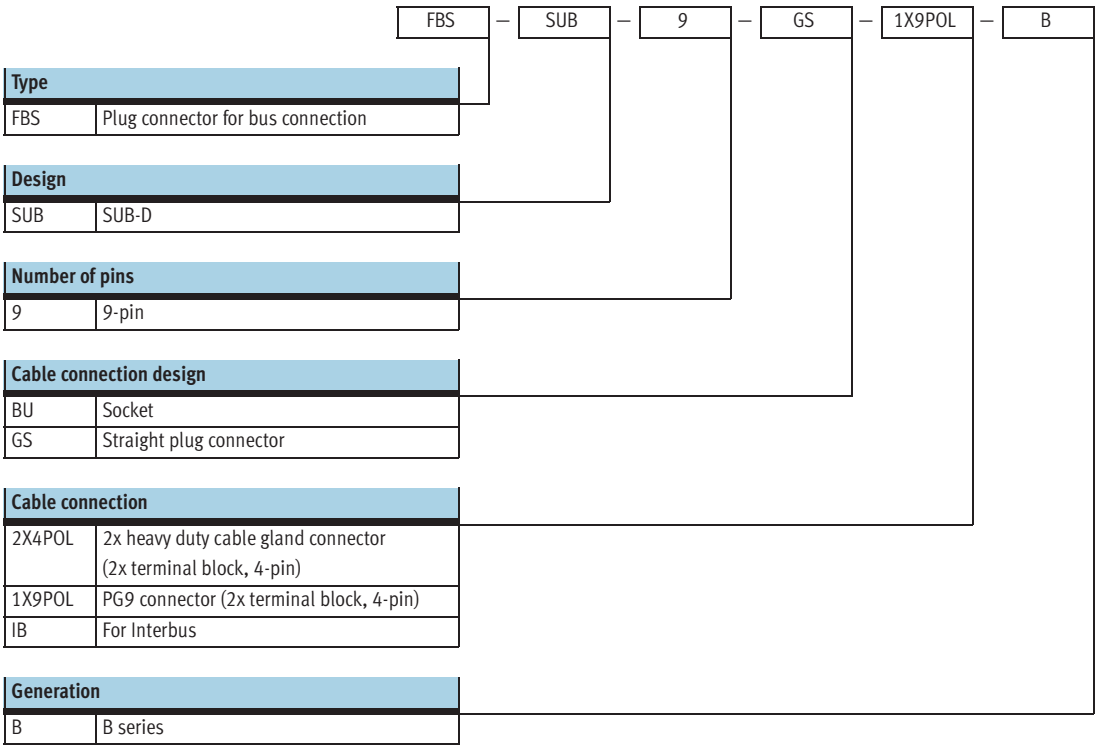
Type	
FBA	Sub-D socket bus connection, 9-pin

Number of cable connections	
1	1 connection
2	2 connections

Cable connection	
M12	2x threaded connections M12x1, 5-pin (1x pin, 1x socket)
SL	5-pin row

Number of pins	
5POL	5-pin

Coding	
RK	Reverse Key coded (B-coded)



Type	
FBS	Plug connector for bus connection

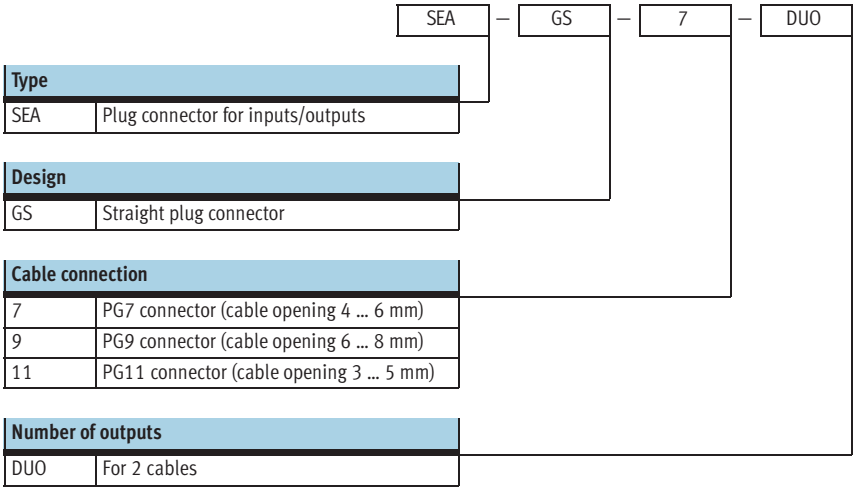
Design	
SUB	SUB-D

Number of pins	
9	9-pin

Cable connection design	
BU	Socket
GS	Straight plug connector

Cable connection	
2X4POL	2x heavy duty cable gland connector (2x terminal block, 4-pin)
1X9POL	PG9 connector (2x terminal block, 4-pin)
IB	For Interbus

Generation	
B	B series

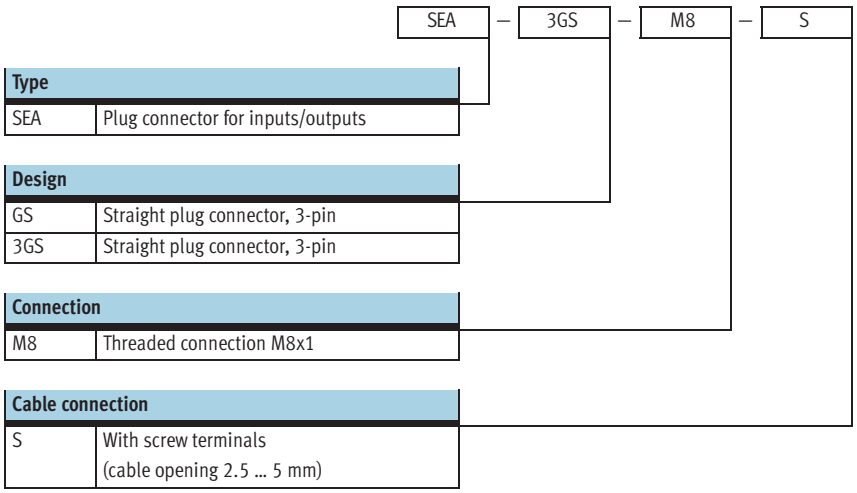


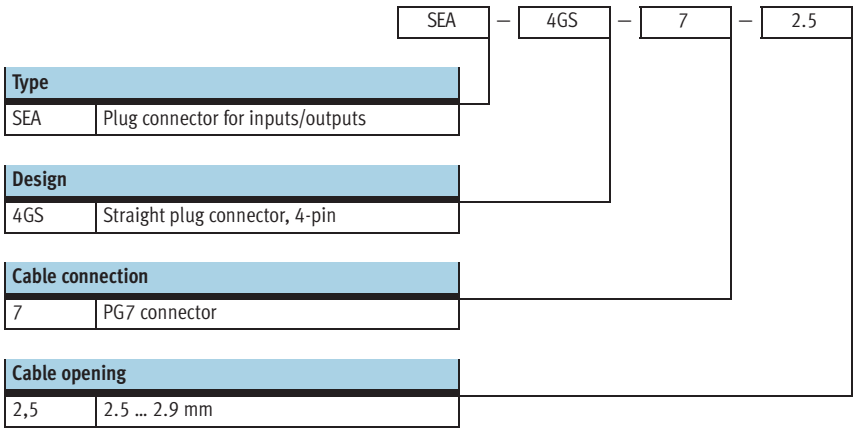
Type	
SEA	Plug connector for inputs/outputs

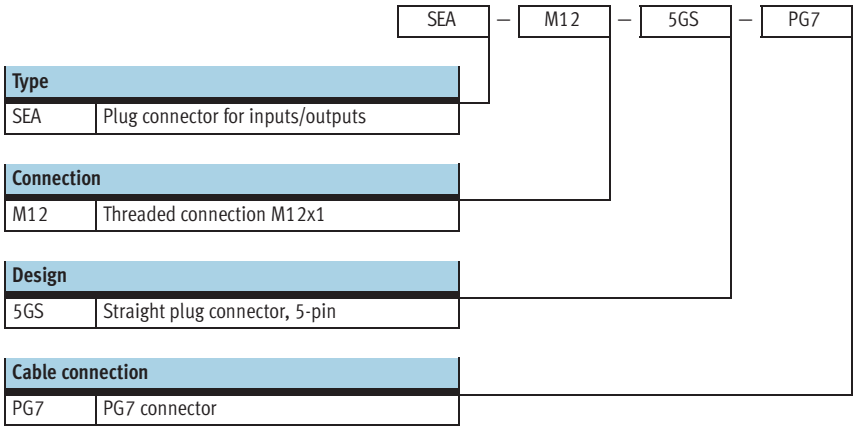
Design	
GS	Straight plug connector

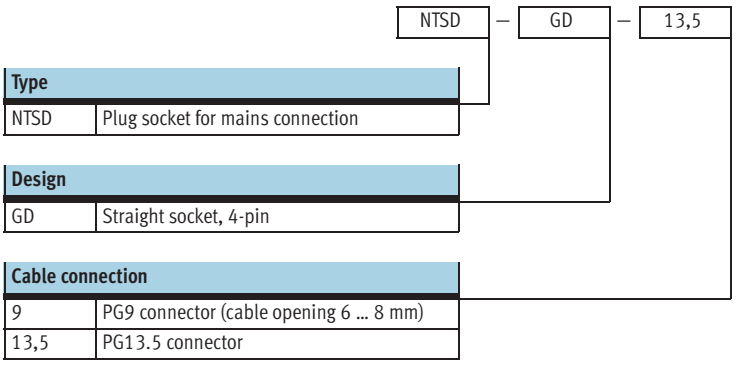
Cable connection	
7	PG7 connector (cable opening 4 ... 6 mm)
9	PG9 connector (cable opening 6 ... 8 mm)
11	PG11 connector (cable opening 3 ... 5 mm)

Number of outputs	
DUO	For 2 cables


SEA – 3GS – M8 – S
Type
SEA Plug connector for inputs/outputs
Design
GS Straight plug connector, 3-pin
3GS Straight plug connector, 3-pin
Connection
M8 Threaded connection M8x1
Cable connection
S With screw terminals (cable opening 2.5 ... 5 mm)


SEA – 4GS – 7 – 2.5
Type
SEA Plug connector for inputs/outputs
Design
4GS Straight plug connector, 4-pin
Cable connection
7 PG7 connector
Cable opening
2,5 2.5 ... 2.9 mm

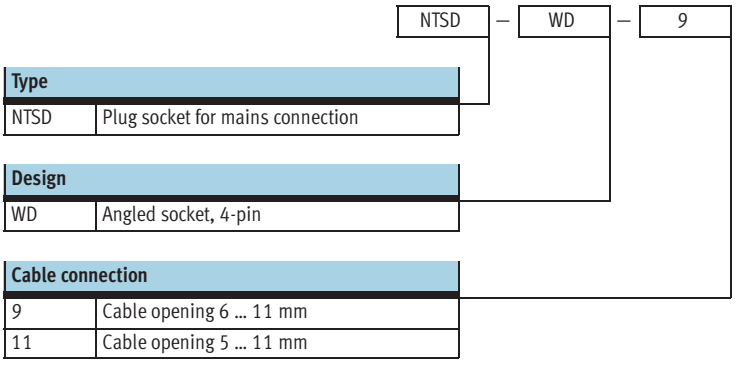

SEA – M12 – 5GS – PG7
Type
SEA Plug connector for inputs/outputs
Connection
M12 Threaded connection M12x1
Design
5GS Straight plug connector, 5-pin
Cable connection
PG7 PG7 connector



Type	
NTSD	Plug socket for mains connection

Design	
GD	Straight socket, 4-pin

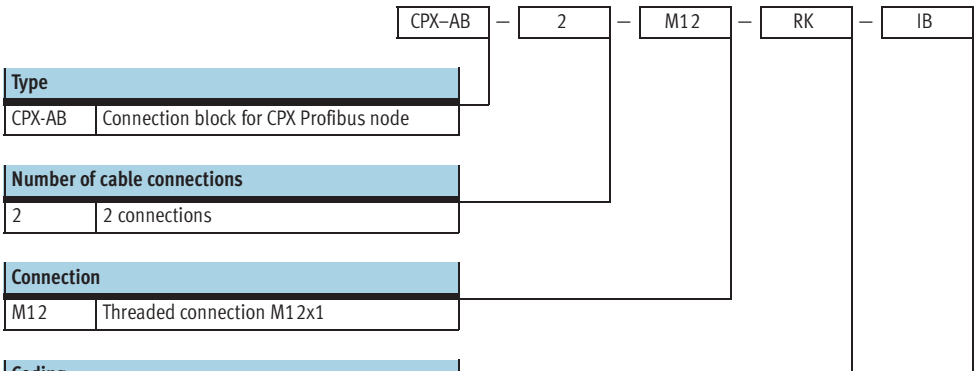
Cable connection	
9	PG9 connector (cable opening 6 ... 8 mm)
13,5	PG13.5 connector



Type	
NTSD	Plug socket for mains connection

Design	
WD	Angled socket, 4-pin

Cable connection	
9	Cable opening 6 ... 11 mm
11	Cable opening 5 ... 11 mm



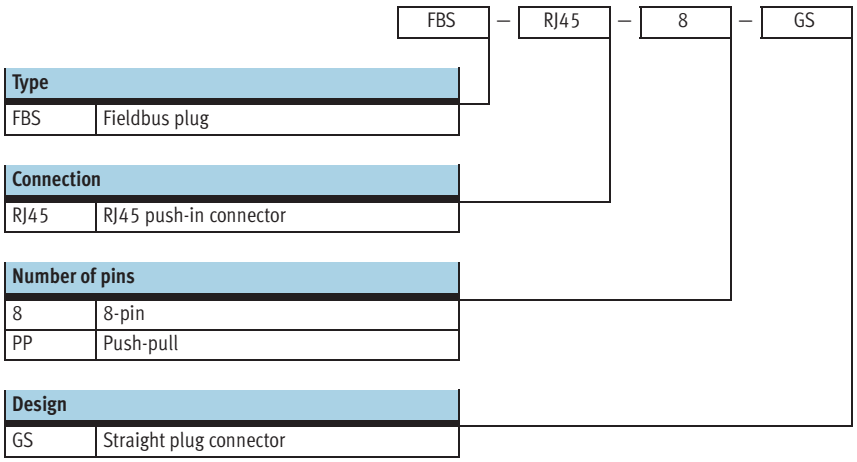
Type	
CPX-AB	Connection block for CPX Profibus node

Number of cable connections	
2	2 connections

Connection	
M12	Threaded connection M12x1

Coding	
RK	Reverse Key coded (B-coded)

Cable connection	
IB	For Interbus
DP	For Profibus

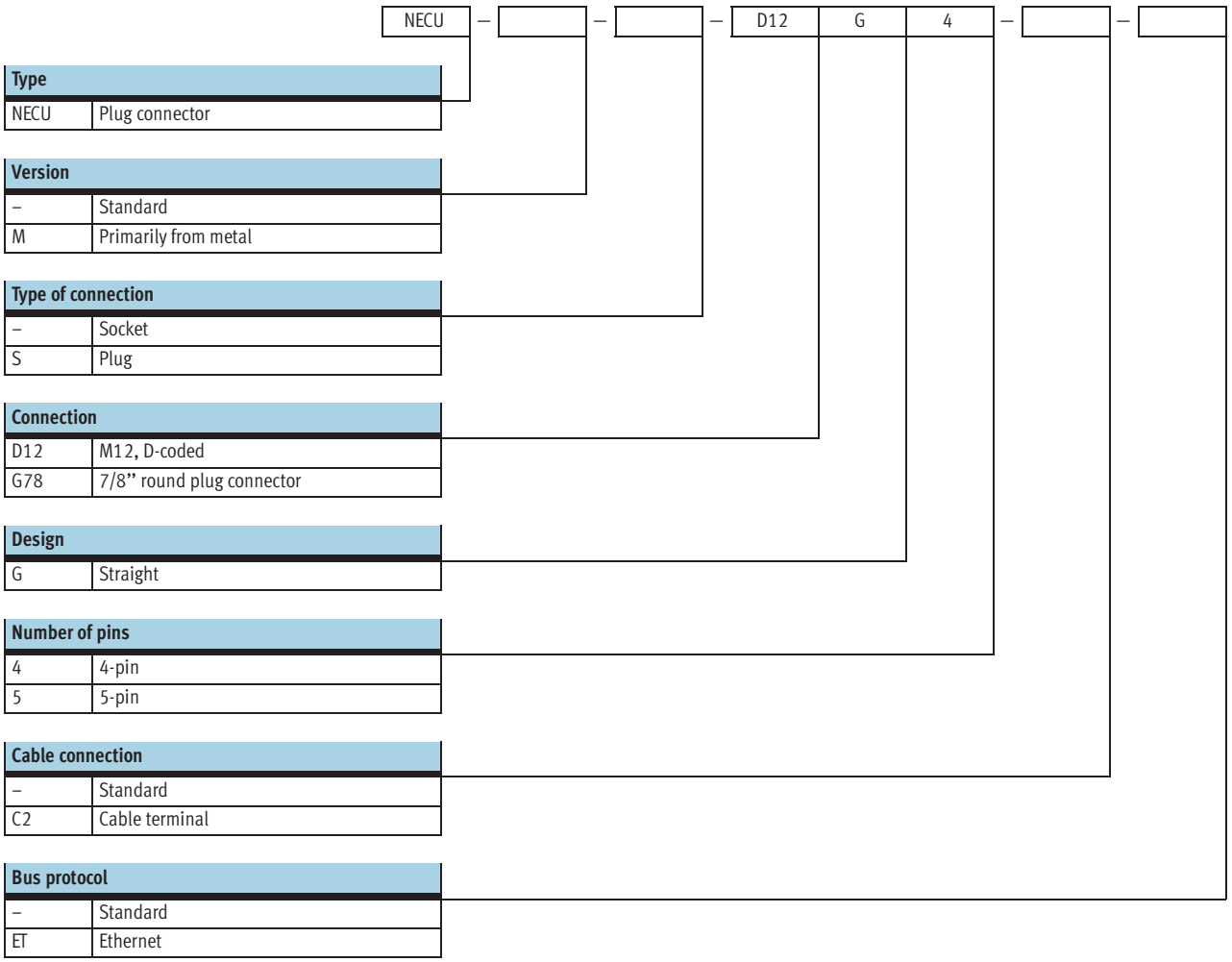


Type	
FBS	Fieldbus plug

Connection	
RJ45	RJ45 push-in connector

Number of pins	
8	8-pin
PP	Push-pull

Design	
GS	Straight plug connector



Type	
NECU	Plug connector

Version	
–	Standard
M	Primarily from metal

Type of connection	
–	Socket
S	Plug

Connection	
D12	M12, D-coded
G78	7/8" round plug connector

Design	
G	Straight

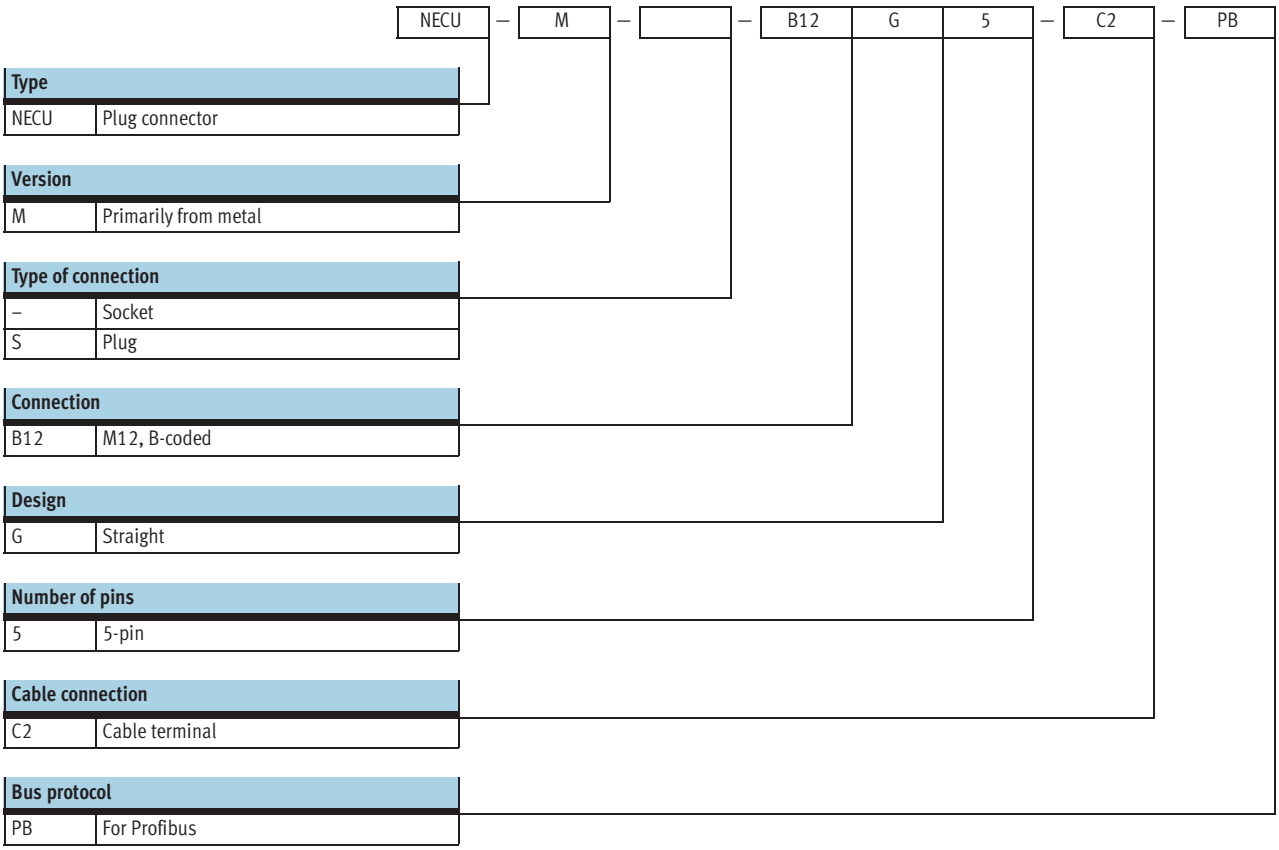
Number of pins	
4	4-pin
5	5-pin

Cable connection	
–	Standard
C2	Cable terminal

Bus protocol	
–	Standard
ET	Ethernet

Terminal CPX

Key features – Type codes for connection technology



NEBU	–	M12	W	5	P	–	K	–	2.5	–			–	LE		3

Function	
NEBU	Connecting cable

Connection technology, left	
M5	Socket with connecting thread
M8	Socket with connecting thread
M12	Socket with connecting thread, A-coded

Socket design	
G	Straight
W	Angled

Number of pins/wires (left)	
3	3-pin (suitable for M8 plug)
4	4-pin (suitable for M8 plug)
5	5-pin (suitable for 3, 4 and 5-pin M12 plug)

Display	
–	Without LED, DC (standard)
P	LED, PNP
N	LED, NPN

Cable properties	
K	Standard
E	Suitable for use with energy chains
R	Suitable for robot applications

Cable length	
0.1 ... 25	0.1 ... 25 m

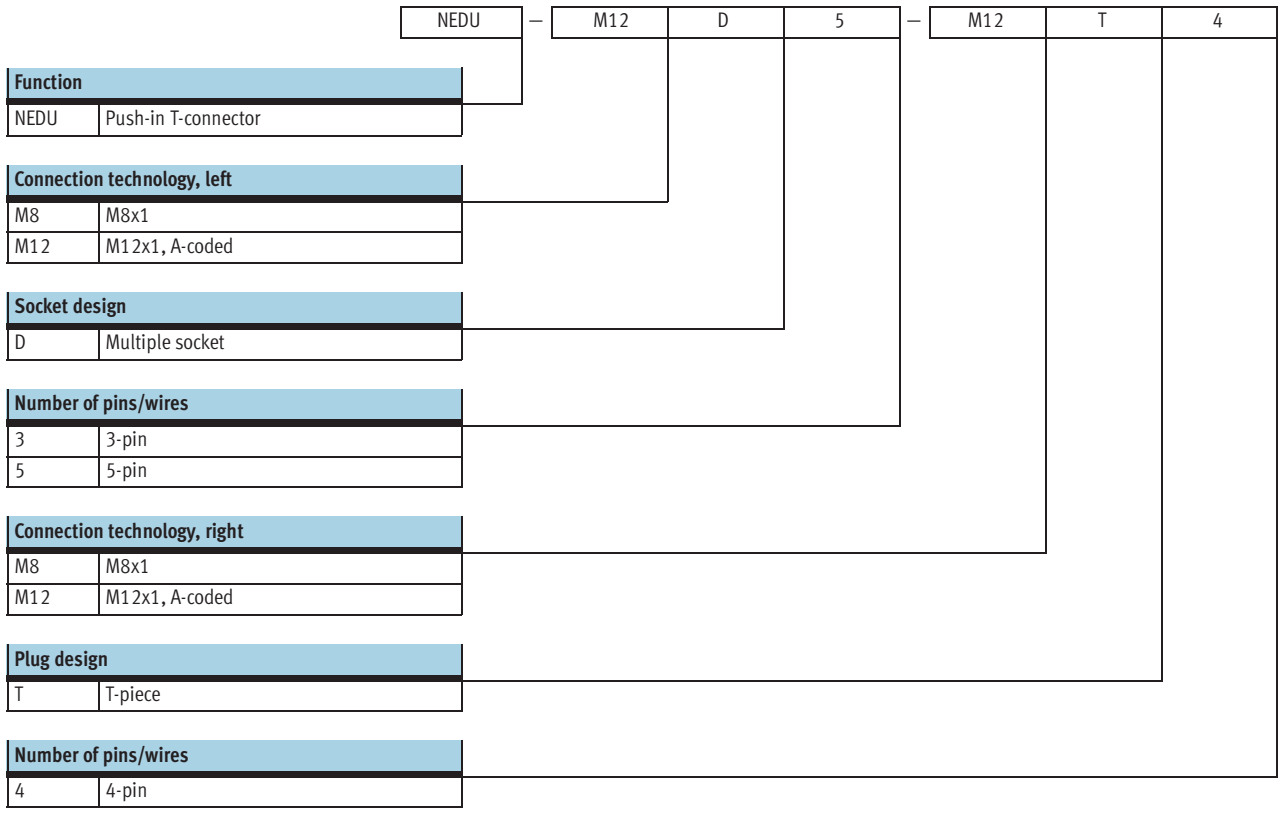
Alternative wire cross section	
–	0.25 mm^2 (standard)
Q3	0.14 mm^2

Cable designation	
–	With inscription label holder (standard)
N	Without inscription label holder

Connection technology, right	
LE	Open end
M8	Socket with connecting thread
M12	Socket with connecting thread, A-coded

Plug design	
G	Straight
W	Angled

Number of pins/wires (right)	
3	3-pin (suitable for M8/M12 socket)
4	4-pin (suitable for M8/M12 socket)
5	5-pin (suitable for M12 socket)



Function	
NEDU	Push-in T-connector

Connection technology, left	
M8	M8x1
M12	M12x1, A-coded

Socket design	
D	Multiple socket

Number of pins/wires	
3	3-pin
5	5-pin

Connection technology, right	
M8	M8x1
M12	M12x1, A-coded

Plug design	
T	T-piece

Number of pins/wires	
4	4-pin

Module width
50 mm

Note

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

Example

Protection class IP65/IP67 applies only to the fully assembled system with fitted plugs or covers (which must also conform to IP65/67). If components with a lower protection class are used, the protection level of the entire system is reduced to the protection class of the component with the lowest protection level, for example CageClamp connection block with IP20 protection or MPA pneumatics with IP65 protection.

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

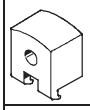
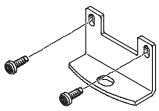
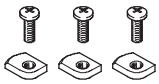
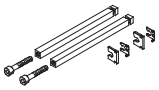
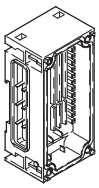
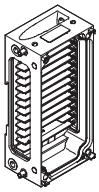
1) A maximum of 11 modules in total can be combined
(e.g. 1 control block + 9 I/O modules + 1 pneumatic interface, or 1 control block + 1 bus node + 8 I/O modules + 1 pneumatic interface)

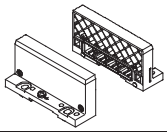
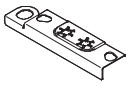
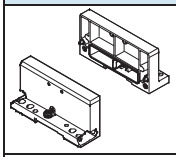
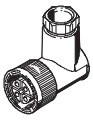
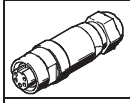
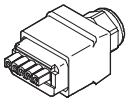
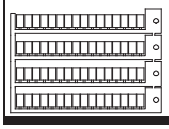
General technical data			
Module No.			**197330**
Parameterisation			Module-specific and entire system, for example: • Diagnostic behaviour • Condition monitoring • Profile of inputs • Fail-safe response of outputs and valves
Commissioning support			Forcing of inputs and outputs
Protection class to EN 60529			IP65/IP67
Nominal operating voltage		[V DC]	24
Operating voltage range		[V DC]	18 ... 30
Current supply	Interlinking block with system supply for electronics plus sensors actuators plus valves	 [A] [A]	 16 (8/10 with 7/8" supply, 5-pin/4-pin) 16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional power supply for 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 system configuration
Power failure bridging (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/EN 60068 Part 2 – 6		• With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
	Shock test to DIN/IEC 68/EN 60068 Part 2 – 27		• With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
PWIS classification			PWIS-free (free of paint-wetting impairment substances)
Interference immunity			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 (Protective Extra-Low Voltage)
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
Relative air humidity (non-condensing)	[%]	5 ... 90
ATEX specification		• II 3D Ex tD A22 IP65 T90°C X • II 3G Ex nA II T4 X
ATEX temperature rating	[°C]	–5 ≤ Ta ≤ +50
CE mark (see declaration of conformity)		In accordance with EU Explosion Protection Directive (ATEX)
Certification		• cULus recognized (OL) • C-Tick

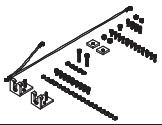
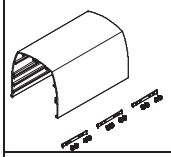
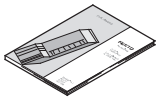
Weight [g]					
Control block	FEC	140.0	Connection block	Plastic	70.0
	CEC	155.0		Metal	175.0
Bus node	FB6	125.0	Interlinking block, plastic	Without power supply	100.0
	FB11	120.0		With system supply	125.0
	FB13	115.0	Interlinking block, metal	Without power supply	162.0
	FB14	115.0		With system supply, 7/8"	187.0
	FB23	115.0		With system supply, push-pull	245.0
	FB32	125.0	Tie rod	1-fold	19.0 ±2.5
	FB33	280.0		2-fold	32.5 ±2.5
	FB34	280.0		3-fold	46.0 ±2.5
	FB35	280.0		4-fold	59.5 ±2.5
	FB38	125.0		5-fold	73.0 ±2.5
I/O module		38.0		6-fold	86.5 ±2.5
CP interface		140.0		7-fold	100.0 ±2.5
Multi-axis interface	CMXX	155.0		8-fold	113.5 ±2.5
Axis interface	CM-HPP	140.0		9-fold	127.0 ±2.5
Axis controller	CMAX	140.0		10-fold	140.5 ±2.5
End-position controller	CMPX	140.0	Plastic end plate	Left-hand	77.0
Measuring module	CMIX	140.0		Right-hand	70.0
Pneumatic interface	MPA	238.4	Metal end plate	Left-hand	113.0
	MPA-F	690.0		Right-hand	113.0
	VTSA/VTSA-F	485.0			
	MIDI/MAXI	390.0			
	CPA	150.0			

Ordering data – Accessories

Designation			Part No.	Type
Mounting				
	Attachment for wall mounting (for long valve terminals, 10 pieces), design for plastic manifold sub-bases		**529040**	**CPX-BG-RW-10x**
	Attachment for wall mounting (for long valve terminals, 2 mounting brackets and 4 screws), design for metal manifold sub-bases		**550217**	**CPX-M-BG-RW-2x**
	Mounting for H-rail	CPX without pneumatic components	**173498**	**CPA-BG-NRH**
		CPX-VTSA	**526032**	**CPX-CPA-BG-NRH**
		CPX-VTSA-F		
		CPX-MPA		
		CPX-CPA		
		CPX-MIDI	**526033**	**CPX-03-4,0**
		CPX-MAXI	**526034**	**CPX-03-7,0**
Tie rod				
	Tie rod CPX	Extension 1-fold	**525418**	**CPX-ZA-1-E**
		1-fold	**195718**	**CPX-ZA-1**
		2-fold	**195720**	**CPX-ZA-2**
		3-fold	**195722**	**CPX-ZA-3**
		4-fold	**195724**	**CPX-ZA-4**
		5-fold	**195726**	**CPX-ZA-5**
		6-fold	**195728**	**CPX-ZA-6**
		7-fold	**195730**	**CPX-ZA-7**
		8-fold	**195732**	**CPX-ZA-8**
		9-fold	**195734**	**CPX-ZA-9**
		10-fold	**195736**	**CPX-ZA-10**
Plastic interlinking block				
	Without power supply	–	**195742**	**CPX-GE-EV**
	With system supply	M18	**195746**	**CPX-GE-EV-S**
		7/8" – 5-pin	**541244**	**CPX-GE-EV-S-7/8-5POL**
		7/8" – 4-pin	**541248**	**CPX-GE-EV-S-7/8-4POL**
	With additional power supply for outputs	M18	**195744**	**CPX-GE-EV-Z**
		7/8" – 5-pin	**541248**	**CPX-GE-EV-Z-7/8-5POL**
		7/8" – 4-pin	**541250**	**CPX-GE-EV-Z-7/8-4POL**
	With additional power supply for valves	M18	**533577**	**CPX-GE-EV-V**
		7/8" – 4-pin	**541252**	**CPX-GE-EV-V-7/8-4POL**
Metal interlinking block				
	Without power supply	–	**550206**	**CPX-M-GE-EV**
	With system supply	7/8" – 5-pin	**550208**	**CPX-M-GE-EV-S-7/8-5POL**
		Push-pull – 5-pin	**563057**	**CPX-M-GE-EV-S-PP-5POL**
	With additional power 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**

Ordering data – Accessories				
Designation			Part No.	Type
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**
Plastic end plates				
	End plate	Right-hand	**195714**	**CPX-EPR-EV**
		Left-hand	**195716**	**CPX-EPL-EV**
	Earthing element for right-hand/left-hand end plate	5 pieces	**538892**	**CPX-EPFE-EV**
Metal end plates				
	End plate	Right-hand	**550214**	**CPX-M-EPR-EV**
		Left-hand	**550212**	**CPX-M-EPL-EV**
Power supply				
	Plug socket for mains connection M18x1, straight, 4-pin	For 1.5 mm^2	**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 mm^2	**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**
	Connection socket AIDA push-pull, spring-loaded terminal	5-pin	**563059**	**NECU-M-PPG5-C1**
Inscription labels				
	Inscription labels 6x10, 64 pieces, in frames		**18576**	**IBS-6x10**

Ordering data – Accessories

Designation			Part No.	Type
Hood				
	Mounting rail for securing the cover	1,000 mm	**572256**	**CAFC-X1-S**
	Mounting kit for CPX cover		**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**
Manual				
	CPX System Manual	German	**526445**	**P.BE-CPX-SYS-DE**
		English	**526446**	**P.BE-CPX-SYS-EN**
		Spanish	**526447**	**P.BE-CPX-SYS-ES**
		French	**526448**	**P.BE-CPX-SYS-FR**
		Italian	**526449**	**P.BE-CPX-SYS-IT**
		Swedish	**526450**	**P.BE-CPX-SYS-SV**
	Operator unit CPX-MMI-1	German	**534824**	**P.BE-CPX-MMI-1-DE**
		English	**534825**	**P.BE-CPX-MMI-1-EN**
		French	**534827**	**P.BE-CPX-MMI-1-FR**
		Italian	**534828**	**P.BE-CPX-MMI-1-IT**
		Swedish	**534829**	**P.BE-CPX-MMI-1-SV**
		Spanish	**534826**	**P.BE-CPX-MMI-1-ES**

User manuals – General information

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

1. Installation
2. Commissioning and parameterisation
3. Diagnostics

Application-oriented explanations are provided for integration of 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 manual for the configuration you have ordered is supplied automatically.

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

Overview – User manuals

Type	Title	Description
Pneumatic components		
P.BE-VTSA-44-...	Valve terminals with VTSA and VTSA-F pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the VTSA and VTSA-F pneumatic components.
P.BE-CPA-...	Valve terminals with CPA pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the CPA pneumatic components.
P.BE-Midi/Maxi-03-...	Valve terminals with MIDI/MAXI pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MIDI/MAXI pneumatic components.
P.BE-MPA-...	Valve terminals with MPA pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MPA pneumatic components.
P.BE-MPAF-...	Valve terminals with MPA pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MPA-F pneumatic components.
P.BE-MPAL-...	Valve terminals with MPA pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MPA-L pneumatic components.

Overview – User manuals		
Type	Title	Description
Electronic components		
P.BE-CPX-SYS-...	System description, installation and commissioning	Overview of the design, components and mode of operation of the CPX terminal; installation and commissioning instructions as well as basic principles of parameterisation
P.BE-CPX-EA-...	CPX-EA modules, digital	Connection technology and assembly, installation and commissioning instructions for digital input and output modules of the type CPX-... as well as CPA, MIDI/MAXI, VTSA/VTSA-F and MPA pneumatic interface
P.BE-CPX-AX-...	CPX-EA modules, analogue	Connection technology and assembly, installation and commissioning instructions for analogue input and output modules of the type CPX-...
P.BE-CPX-CP...	CPX CP interface	Instructions on assembly, installation, commissioning and diagnostics of the CP interface
P.BE-CPX-CMXX...	CPX multi-axis interface	Instructions on assembly, installation, commissioning and diagnostics of the CPX multi-axis interface (CMXX)
P.BE-CPX-CM-HPP...	CPX axis interface	Instructions on assembly, installation, commissioning and diagnostics of the CPX axis interface (CM-HPP)
P.BE-CPX-CMAX-SYS...	CPX axis controller	Instructions on assembly, installation, commissioning and diagnostics of the CPX axis controller (CMAX)
P.BE-CPX-CMAX-CONTROL...	CPX axis controller	Information on controlling, diagnosing and parameterising the axis controller via the fieldbus
P.BE-CPX-CMPX-SYS...	CPX end-position controller	Instructions on assembly, installation, commissioning and diagnostics of the CPX end-position controller (CMPX)
P.BE-CPX-CMIX...	CPX measuring module	Instructions on assembly, installation, commissioning and diagnostics of the CPX measuring module (CMIX)
P.BE-CPX-FB...	CPX fieldbus node	Instructions on assembly, installation, commissioning and diagnostics of the relevant bus nodes
P.BE-CPX-PNIO...	CPX fieldbus node for PROFINET	Instructions on assembly, installation, commissioning and diagnostics of the relevant bus nodes
P.BE-CPX-FEC...	CPX control block	Instructions on assembly, installation, commissioning and diagnostics of the relevant control block
P.BE-CPX-CEC...	CPX CoDeSys controller (control block)	Instructions on assembly, installation, commissioning and diagnostics of the relevant control block
P.BE-CPX-MMI-1-...	Universal handheld type CPX-MMI-1	Instructions on assembly, installation, commissioning and diagnostics of the CPX operator unit

User manuals – GSD, EDS, etc.

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.

CPX macro library for ePLAN	
Type	**GSWC-TE-EP-LA**
Part No.	**537041**

Project planning – total service:
ePLan macros for fast and reliable planning of electrical projects in combination with valve terminals. Available in German and English.

Systematically more reliable:
The CPX macro library contains symbols, graphics and master data. Result: a fast, reliable and standardised system for designing and documenting your circuits.

Simply practical:
High level of planning reliability, standardisation of documentation, no need to create symbols, graphics and master data since everything is stored in the CPX macro library.

Key technical data

- CD with CPX macro library ePLAN 5 and P8 for CPX terminal (supports the planning of bus nodes, interlinking blocks, I/O modules, connection blocks, pneumatic interface and valves)
- Creation and administration of projects
- Creation and editing of circuit diagrams, terminal and cable plans, cross-reference lists, assembly drawings, parts lists and maintenance plans
- Connection to programmable logic controllers
- Generation of the contact and potential cross-references
- Automatic protective contact mirroring
- Generation of documents in paper format and HTML format for viewing in browsers, etc. Library in DXF format for use with AutoCad or other CAD programs

Design example:

From an idea to a functional solution – quickly and reliably
Project planning, design, production, assembly, commissioning, service

↓

Problem definition/ planning of electrical project

↓

Efficient PC-based design

↓

CPX macro

↓

ePLAN CAE software for electrical applications

↓

PC

↓

Documentation

Circuit diagrams
Parts lists in paper format, optional representation in browsers (HTML)

fluidPLAN from ePLAN and FluidDRAW from Festo

ePLAN and Festo also work together in the creation of pneumatic circuit diagrams:
The ePLAN fluid planning tool has a direct interface to the Festo electronic catalogue (DKI). All of the relevant data for the parts lists as well as the pneumatic circuit symbols for Festo products are transferred using this import function.

The FluidDRAW software from Festo makes the creation of circuit diagrams for the pneumatic part on the PC both simple and intuitive.

Terminal CPX

Technical data – Operator unit

FESTO

Width
81 mm

The operator unit is a small, convenient commissioning and service device for the CPX terminal. It provides data polling, configuration and diagnostic functions for CPX terminals. Its extremely flexible application range means that data can be read in or out at any location. IP65 compatibility makes it suitable for use in harsh industrial environments.

Application

Functions

- Advance commissioning through the monitoring/forcing of inputs and outputs without fieldbus master/PLC
- Test function for parameter settings, for example fail-safe of the outputs or switch-on delay of the inputs
- Plain-text diagnostics of module and channel-oriented errors
- Condition monitoring: preselection/loading of counters, activation of the channels to be monitored
- Display of the last 40 error occurrences with timestamp
- Identification of sporadic causes of errors through display of the diagnostic history
- Password protection

Connection

The operator unit is connected to the CPX bus nodes or control block, as appropriate, using a pre-assembled M12 cable.
The voltage for the operator unit is supplied by the CPX component
➔ plug & work.

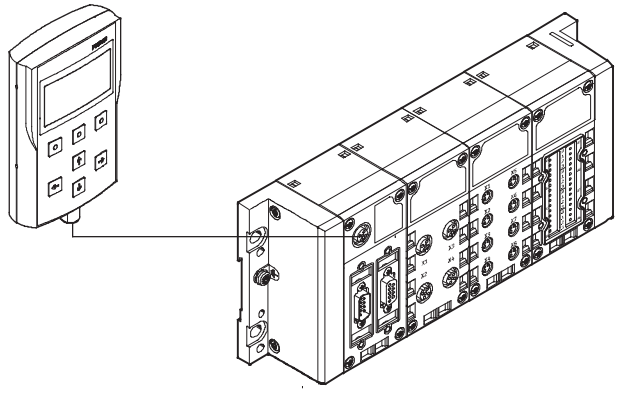
Communication

Once connected to the CPX terminal, the operator unit loads the available configuration for the I/O modules, valves, etc.
This ensures the availability of up-to-date texts, messages, menus and displays.
Status information, diagnostic messages and parameter bits are then exchanged during operation.

Assembly

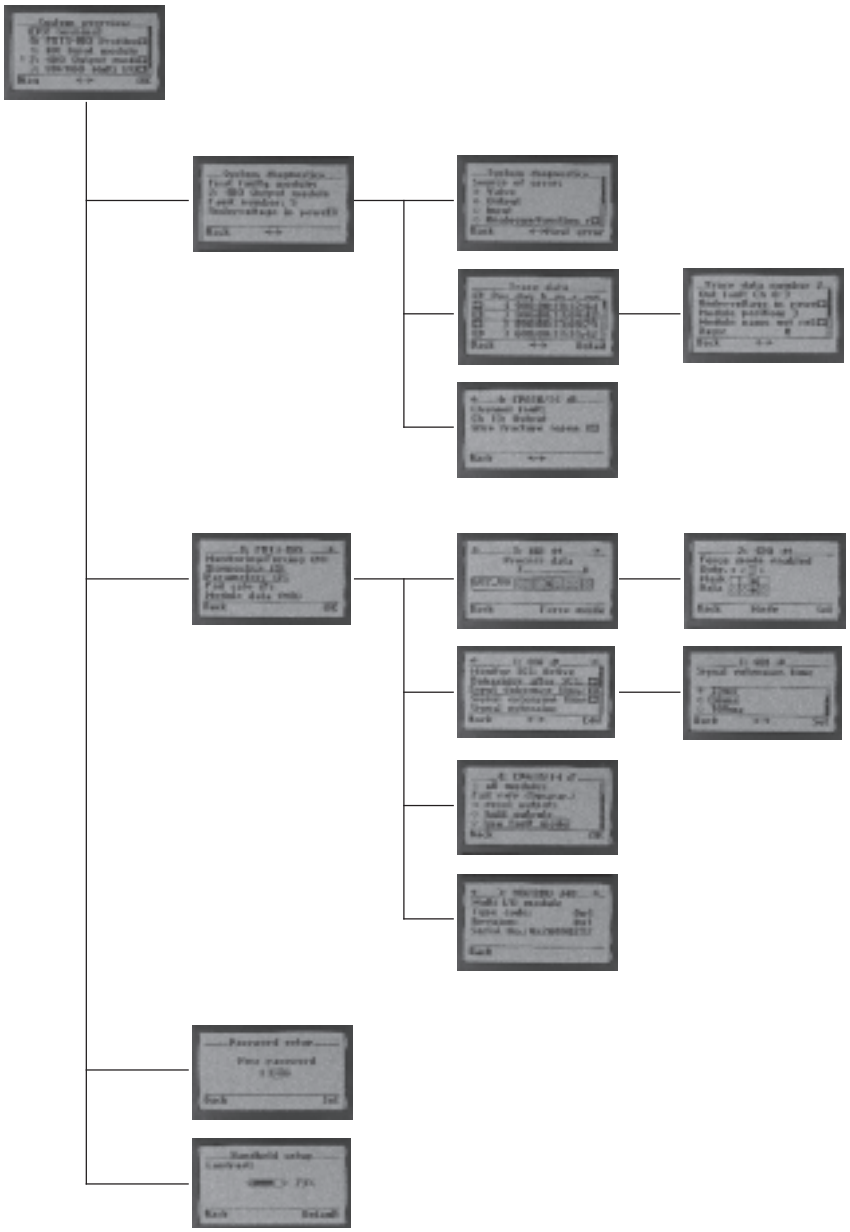
A mounting bracket for the operator unit offers the option of wall or H-rail mounting.
The mounting bracket also has an option for temporary mounting using a hanging device.

Connection



The operator unit is connected to the CPX terminal using pre-assembled cables.

Function examples



System overview

- Overview of configured modules and current diagnostic messages

Diagnostics

- Fast access to the diagnostic history and the modules with diagnostic messaging
- Display of the last 40 diagnostic messages with timestamp
- Display of the current diagnostic message for a module

Commissioning

- Selection of module-specific data and parameters
- Display and modification of the current status of the inputs and outputs of a module
- Display and modification of the current settings for module-specific parameters

Setup

- Setting of access permission (password)
- Contrast setting of the display

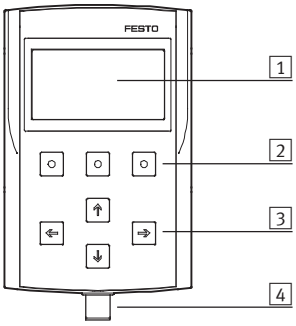
General technical data		
Type		**CPX-MMI-1**
Data interface		RS232 interface, 57.6 kBaud, M12 socket, 4-pin
Display component		LCD graphical display with background illumination (128 x 64 pixels)
Control elements		7 keys: 4 arrow keys and 3 function keys, touch-sensitive keypad
Electromagnetic compatibility		Interference emission tested to DIN EN 61000-6-4, industry
		Interference immunity tested to DIN EN 61000-6-2, industry
Nominal operating voltage	[V DC]	24, supplied by the connected device
Operating voltage range	[V DC]	18 ... 30
Current consumption	[mA]	50 ... 60
Protection class to IEC 60529		IP65
Relative air humidity	[%]	90, non-condensing
Vibration resistance		Tested to DIN/IEC 68/EN 60068, Part 2-6 • With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
Shock resistance		Tested to DIN/IEC 68/EN 60068, Part 2-27 • With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
Materials		Reinforced polyamide
Dimensions (W x H x D)	[mm]	81 x 137 x 28
Weight	[g]	150

Operating and environmental conditions		
Ambient temperature	[°C]	0 ... 50
CE mark (see declaration of conformity)		In accordance with EU Explosion Protection Directive (ATEX)
ATEX category		II 3 G
		II 3 D
ATEX specification		II 3D Ex tD A22 IP65 T60°C X
		II 3G Ex nA II T6 X
ATEX temperature rating	[°C]	0 <= Ta <= +50

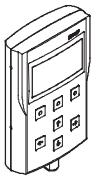
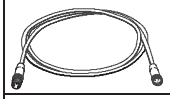
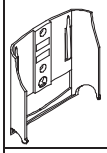
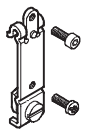
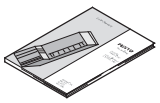
Note

When operating device combinations in hazardous areas, the lowest common zone, temperature class and ambient temperature of the individual devices determine the possible use of the entire module.

Connection and display components



1 Display (LCD display)
2 Function keys
3 Arrow keys
4 M12 interface

Ordering data				
Designation			Part No.	Type
Operator unit				
	Provides data polling, configuration and diagnostic functions for CPX terminals		**529043**	**CPX-MMI-1**
Connecting cable				
	Connecting cable M12-M12, specially for CPX-MMI	1.5 m	**529044**	**KV-M12-M12-1,5**
		3.5 m	**530901**	**KV-M12-M12-3,5**
Mounting				
	Bracket		**534705**	**CPX-MMI-1-H**
	Mounting for H-rail		**536689**	**CPX-MMI-1-NRH**
User manual				
	User manual for operator unit CPX-MMI-1	German	**534824**	**P.BE-CPX-MMI-1-DE**
		English	**534825**	**P.BE-CPX-MMI-1-EN**
		French	**534827**	**P.BE-CPX-MMI-1-FR**
		Italian	**534828**	**P.BE-CPX-MMI-1-IT**
		Swedish	**534829**	**P.BE-CPX-MMI-1-SV**
		Spanish	**534826**	**P.BE-CPX-MMI-1-ES**

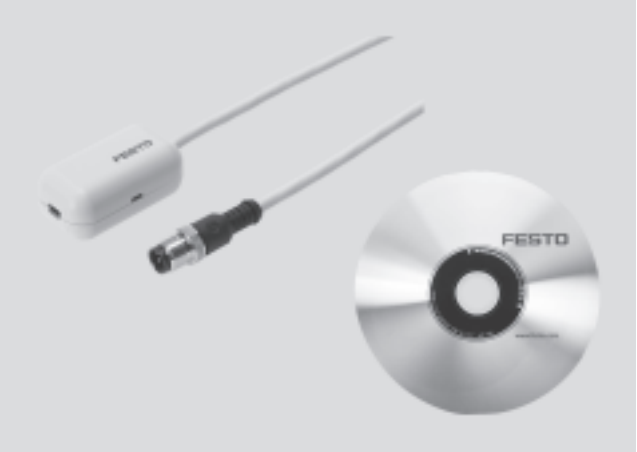
Terminal CPX

Technical data – CPX Maintenance Tool

Function

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

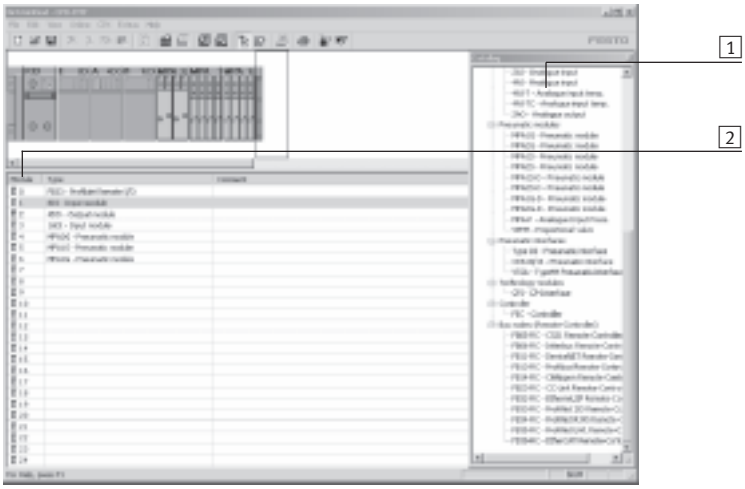
Only from Festo

The CPX-FMT software enables access to CPX valve terminals via Ethernet with the control block CPX-FEC and the fieldbus nodes Ethernet IP (FB 32) and ProfiNET (FB 33, FB 34, FB 35). The fieldbus nodes or control block can be connected directly to the PC via a USB adapter from Festo. Similar to the CPX-MMI, diagnostic data such as the error trace or module diagnostics can be read out and parameters can be modified in plain text. In contrast to the CPX-MMI, the data can be used directly on a PC. There is an option, for example, to send screenshots of a configuration or the current error trace directly via e-mail. In addition, CPX configurations can also be saved and archived directly as a CPX-FMT project. Undocumented changes can subsequently be identified using the online/offline comparison function. On-site tests such as the actuation of valves or the emulation of sensor feedback (in both cases called “forcing”), for example, can be performed without an existing controller infrastructure. It must be noted that with both the CPX-FMT and the CPX-MMI, only local parameters on the CPX valve terminal can be changed and saved. The configuration of the networks or controller software cannot be influenced.

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

Display components

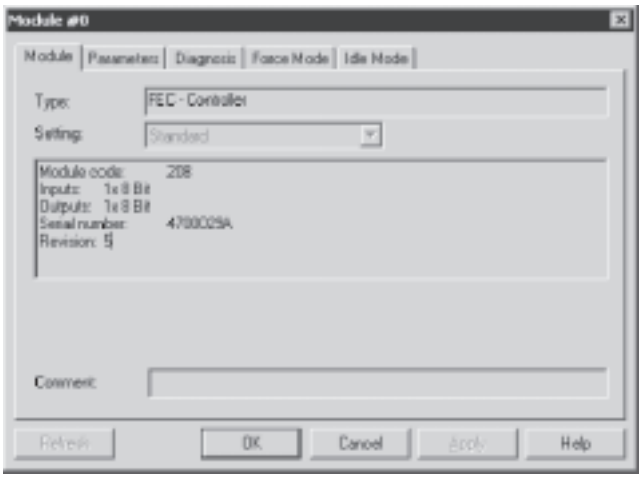
Creating a device configuration using the editor



The device configuration can be conveniently generated, parameterised and saved using the drag & drop feature. You can insert and move modules.

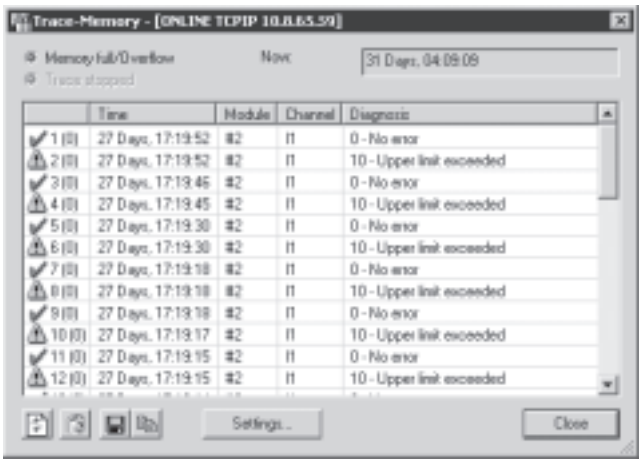
1 Module numbers from the graphic system overview
2 Catalogue for selecting required modules

Module overview for a selected module



Displays important module data as well as the number of allocated inputs and outputs.

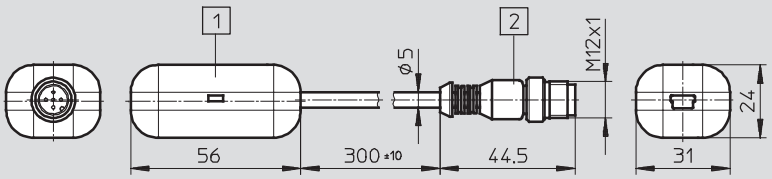
Diagnostic memory



Faults which occur during operation are entered in a diagnostic memory. The first or the last 40 entries are saved, as well as the respective time measured from the moment the power supply was switched on.

Dimensions Download CAD data ➔ **www.festo.com**

Adapter



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

Ordering data

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

Terminal CPX

Technical data – Web Monitor

Function

Web Monitor is a software tool from Festo for CPX modules with integrated web server and Ethernet connection for displaying the CPX service information in real time on a PC connected via a network. This tool provides virtually "free" access to diagnostic and service information, which offers the following benefits:

- Online, up-to-date
- No separate programming
- No separate visualisation

This saves a lot of time and means that there is no need to acquire in-house expertise.

- Supplied on CD-ROM
- Installation on PC
- Adaptation to application
- Loading via Ethernet to the web server of the CPX module
- Display option via touch displays installed on-site (FED 710, 1010, 2010 or 5010)

Application

Only from Festo

CPX is a modular electrical terminal for the connection of pneumatic and electrical control loop systems to automation systems – suitable for all currently used fieldbus systems.

Valve terminals with the comprehensive diagnostic package consisting of pneumatics, electrics and networking systems create unique synergies and simplify the communication between the electrical and pneumatic control levels. Web Monitor makes this diagnostic and additional information visible at every station and without extra programming. Convenient error analysis by Web Monitor provides permanent diagnostic reliability.

General technical data

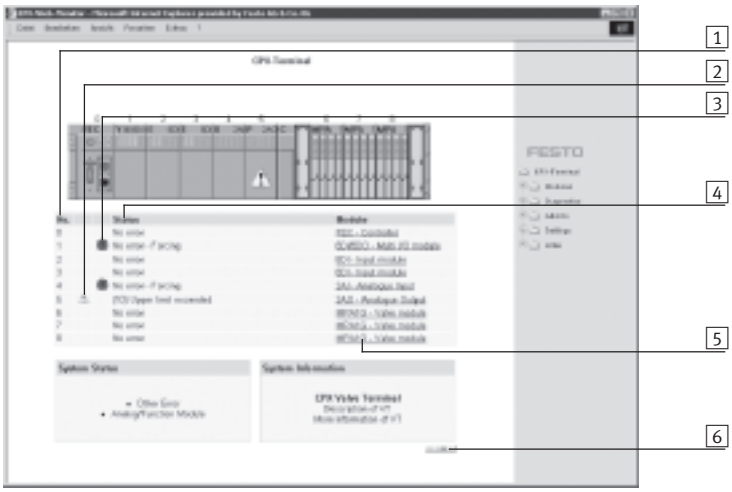
Type		CPX-WEB-MONITOR
System requirements	PC	IBM-compatible, Pentium class or comparable
	Drive	CD-ROM
	Interfaces	Network connection and access
	Operating system	Microsoft Windows 98, ME, 2000 or XP
Browser requirements	Microsoft Internet Explorer	Version 5.5 and later
	Mozilla Firefox	Version 1.0 and later (full version of Web Monitor only)
	Java plug-in	Java Runtime Environment (JRE) 1.3 or higher
Java script		Enabled
Cookies		Enabled
Functional range		• Changing HTML links • Changing symbol names for system, module and channels • Incorporating own web pages • Changing passwords • Incorporating Java applets • Commands for dynamic contents
Scope of delivery	CD-ROM with	• Installation program • Description in German and English • E-mail driver for FST projects (only relevant when using CPX-FEC modules): SMTP-Driver V0.5 • HTML pages for the web server of CPX terminals
Configurable e-mail alerts		8
Non-volatile storage of e-mail alerts		Yes
Sending of e-mails		Initiated by events (positive edge at input bit, output bit, diagnostic bit, flag bit)
E-mail text		Max. 255 characters

Ordering data

Designation		Part No.	Type
	Software for displaying the CPX service information in real time	545413	CPX-WEB-MONITOR

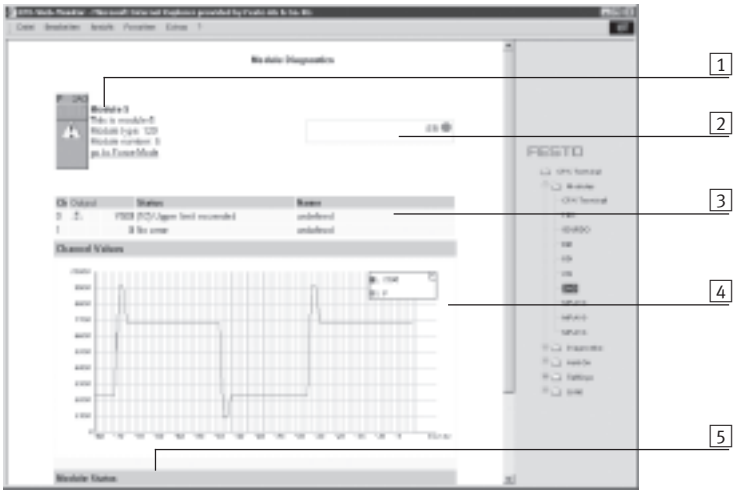
Display components

System overview of CPX terminal



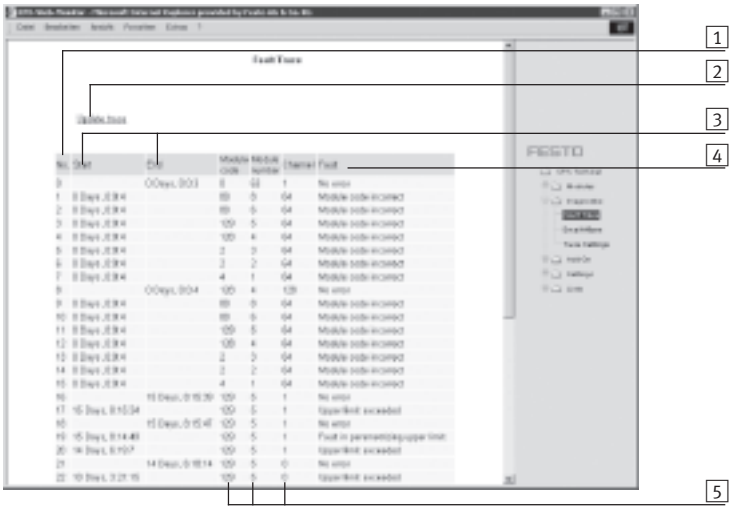
1 Module numbers from the graphic system overview
2 Signalling of fault messages via yellow warning triangle analogous to graphic system overview opposite
3 Signalling of activated Force mode via exclamation mark on blue background
4 Status information in plain text
5 Module designations
6 Monitoring display for data communication

Module overview for a selected module



1 General information about the module
2 Replication of the module display components
3 Table with status information on all channels of the module
4 Graphic representation of the channel values plotted on a time axis
5 Graphic representation of the module status plotted on a time axis

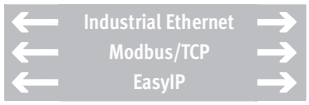
Error log of the CPX Web Monitor



1 Sequence number of the entries
2 Link for updating the log (”Update trace”)
3 Start/end time of the message
4 Text message
5 Module affected (module code/M. number/ channel)

Terminal CPX

Technical data – Control block CPX-FEC



IT services:

Powerful control block for pre-processing actuation of the CPX modules. The power supply to and communication with other modules takes place via the interlinking block.
In addition to the connection for the Ethernet interface in RJ45 and a programming interface in Sub-D, 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-MMI and CPX-FMT.

Application

Bus connection

The CPX-FEC is a remote controller that can be connected to a master PLC via the fieldbus nodes of the CPX terminal or via Ethernet. At the same time, it is possible to operate the CPX-FEC as a compact stand-alone controller directly on the machine.

Modbus/TCP (code T05)

Transmits data in binary format within TCP/IP packets. This ensures good data throughput.

Operating modes

- Stand-alone/EasyIP
- Fieldbus remote controller
- Modbus/TCP remote controller
- Remote I/O Modbus/TCP

Communication protocols

- Profibus, PROFINET, DeviceNet, Interbus, CANopen, EtherCAT and CC-Link via CPX fieldbus node
- Modbus/TCP
- EasyIP
- IP
- TCP
- UDP
- SMTP
- HTTP
- DHCP
- BootP
- TFTP

Setting options

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

- For the CPX-MMI/-FMT
- Serial interface RS232, for example, for a Front End Display (FED)
- Ethernet interface for IT applications
- Remote diagnostics via an FED and CPX Web Monitor

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

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

General technical data			
Type			**CPX-FEC-1-IE**
Ethernet interface			RJ45 (8-pin, socket)
Data interface			RS232 (Sub-D, 9-pin, socket)
MMI/FMT interface			M12, 5-pin, socket
Baud rate	Ethernet interface	[Mbps]	10/100 (to IEEE802.3, 10BaseT)
	Data interface	[kbps]	9.6 ... 115.2
	MMI/FMT interface	[kbps]	56.6
Protocol			• TCP/IP • Easy IP • Modbus TCP • HTTP
Processing time for 1,024 binary instructions		[ms]	Approx. 1
Flags			M0.0 ... M9999, addressable as bits or words
	No. of time flags		T0 ... T255
	Time range	[s]	0.01 to 655.35
	No. of counting flags		Z0 ... Z255
	Counting range		0 to 65535
Register			R0 ... R255, addressable as words
Special FE			FE 0 ... 255, init flag
IP address setting			BOOTP/DHCP via FST or via MMI/FMT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
Program memory	User program	[kB]	250
	Web applications	[kB]	550
Programming language			• IL • LD
Arithmetic functions			+, -, *, :, further functions via functional modules
Functional modules			• CPX diagnostic status • Copy CPX diagnostic trace • Read CPX module diagnostics • Write CPX module parameter • ...
No. of programs/tasks			P0 ... P63
LED displays (FEC-specific)			RUN = Program is being executed/Modbus connection active STOP = Program is stopped/no Modbus connection ERR = Error in the program execution TP = Status of the Ethernet connection
Device-specific diagnostics			Module and channel-oriented diagnostics via peripherals error
Parameterisation			• Start-up parameterisation via FST • Parameterisation during the operating time via functional module
Control elements			• DIL switch for setting the operating mode • Rotary switch for program selection/program start
Additional functions			• Storage of the last 40 errors with timestamp (access via PCP) • 8-bit system status in image table for inputs • 2-byte inputs and 2-byte outputs, system diagnostics in image table

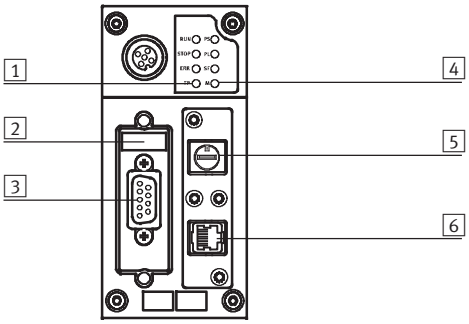
General technical data			
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Residual ripple		[Vss]	4
Current consumption		[mA]	Max. 200
Interference emission			To EN 61000-6-4 (industry)
Interference immunity			To EN 61000-6-2 (industry)
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 55
Weight		[g]	140

Note

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

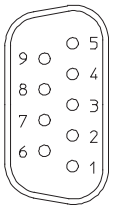
Overview of the operating modes				
	Stand-alone	Remote controller		Remote I/O
		Ethernet	Fieldbus	Modbus/TCP
CPX-FEC function	Control	Control and communication		Ethernet slave
CPX module controlled by	CPX-FEC	CPX-FEC		Higher-order controller
Pre-processing of data in the FEC	Yes	Yes		No
Communication with higher-order controller	No	Via Ethernet • EasyIP • Modbus/TCP	Via fieldbus	Via Ethernet • EasyIP • Modbus/TCP
Web server	Possible	Possible		Possible
Configuration	FST 4.1 or higher	FST 4.1 or higher		Higher-order controller
Parameterisation	Via FST, CPX-MMI/-FMT	Via FST, CPX-MMI/-FMT		Via CPX-MMI/-FMT, Modbus
Order code	T03	T03		T05
Addressing	Changeable	Changeable		Preset
Memory	• 250 kB for user program • 550 kB for web applications	• 250 kB for user program • 550 kB for web applications		• 800 kB for web applications
CPX-MMI/-FMT	Can be connected to CPX-FEC	Can be connected to CPX-FEC		Can be connected to CPX-FEC

Connection and display components

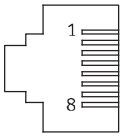


1 Controller and Ethernet LEDs
2 DIL switch for operating mode
3 Programming interface (9-pin Sub-D, socket)
4 CPX-specific status LEDs
5 16-way rotary switch (program selection)
6 Ethernet connection (8-pin RJ45, socket)

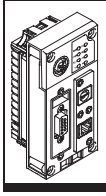
Pin allocation for the programming interface (RS232)

Pin allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	RxD	Received data
	3	TxD-P	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
	Housing	Screened	Connection to functional earth (FE)

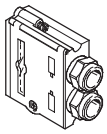
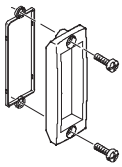
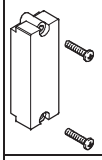
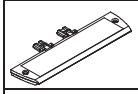
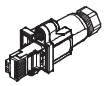
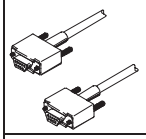
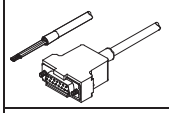
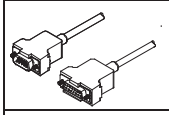
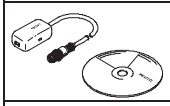
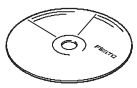
Pin allocation for the Ethernet interface

Pin allocation	Pin	Signal	Designation
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	Screened	Screened

Ordering data

Designation		Part No.	Type
Control block			
	For pre-processing actuation of the CPX modules	**529041**	**CPX-FEC-1-IE**

Ordering data

Designation		Part No.	Type
Bus connection			
	Sub-D plug	**534497**	**FBS-SUB-9-GS-1x9POL-B**
	Inspection cover, transparent	**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)	**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block	**536593**	**CPX-ST-1**
	RJ45/plug	**534494**	**FBS-RJ45-8-GS**
	Cover for RJ45 connection	**534496**	**AK-RJ45**
	Programming cable	**151915**	**KDI-PPA-3-BU9**
	Connecting cable FED	**539642**	**FEC-KBG7**
	Connecting cable FED	**539643**	**FEC-KBG8**
	Adapter from 5-pin M12 to mini USB socket and controller software	**547432**	**NEFC-M12G5-0.3-U1G5**
User manual			
	User manual for control block CPX-FEC, German	**538474**	**P.BE-CPX-FEC-DE**
	English	**538475**	**P.BE-CPX-FEC-EN**
	Spanish	**538476**	**P.BE-CPX-FEC-ES**
	French	**538477**	**P.BE-CPX-FEC-FR**
	Italian	**538478**	**P.BE-CPX-FEC-IT**
	Swedish	**538479**	**P.BE-CPX-FEC-SV**
Software			
	CPX remote diagnostics and process visualisation	**545413**	**CPX-WEB-MONITOR**
	Programming software, German	**537927**	**P.SW-FST4-CD-DE**
	English	**537928**	**P.SW-FST4-CD-EN**

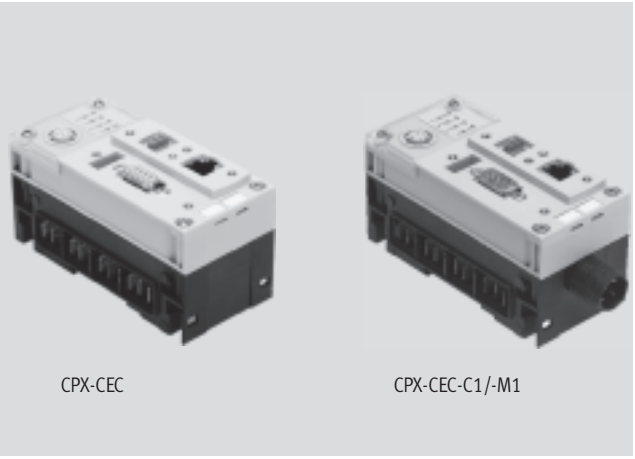
Control block CPX-CEC

Technical data

FESTO

The CoDeSys controller is a modern control system for CPX terminals that enables programming with CoDeSys to IEC 61131-3.

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



CPX-CEC CPX-CEC-C1/-M1

General technical data			
Type	CPX-CEC-C1	CPX-CEC-M1	CPX-CEC
Protocol	CoDeSys level 2		
	EasyIP		
	Modbus TCP		
	TCP/IP		
CPU data	32 MB RAM		
	32 MB flash		
	400 MHz processor		
Control interface	CAN bus		–
Processing time	Approx. 200 µs/1k instruction		
Baud rate	10/100 bps to IEEE 802.3 (10BaseT) or 802.3u (100BaseTx)		
Programming software	CoDeSys provided by Festo		
Programming language	SFC, IL, FCH, LD and ST to IEC 61131-3		
	Additionally CFC		
Programming, operating language	German		
	English		
Programming, support for file handling	Yes		
Program memory	4 MB user program		
Flags	30 kB remanent memory		
	8 MB global data memory		
	CoDeSys variable concept		
Device-specific diagnostics	Diagnostic memory		
	Channel and module-oriented diagnostics		
	Undervoltage/short circuit of modules		
LED displays (bus-specific)	TP: Link/traffic		
LED displays (product-specific)	RUN: PLC status		
	STOP: PLC status		
	ERR: PLC runtime error		
	PS: Electronics supply, sensor supply		
	PL: Load supply		
	SF: System fault		
	M: Modify/forcing active		
Parameterisation	CoDeSys		
Configuration support	CoDeSys		
IP address setting	DHCP		
	Via CoDeSys		
	Via MMI		
Control elements	DIL switch for CAN termination		–
	Rotary switch for RUN/STOP		

Control block CPX-CEC

Technical data

FESTO

General technical data				
Type		CPX-CEC-C1	CPX-CEC-M1	CPX-CEC
Function blocks		CPX diagnostic status, copy CPX diagnostic trace, read CPX module diagnostics		
		And others		
Additional functions		Diagnostic functions		
		Motion functions for electric drives	SoftMotion functions for electric drives	Communication functions RS232
Total number of axes		31	31 (recommended: max. 8)	–
Nominal operating voltage	[V DC]	24		
Nominal operating voltage of the load voltage	[V DC]	24		
		18 ... 30, without pneumatics		
		21.6 ... 26.4, with pneumatics type midi/maxi		
		20.4 ... 26.4, with pneumatics type CPA		
		18 ... 30, with pneumatics type MPA		
Power failure bridging	[ms]	10		
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 85		
Protection class		IP65, IP67		
Dimensions W x L x H (incl. interlinking block)	[mm]	50 x 107 x 55		
Product weight	[g]	155		
Materials				
Housing		Reinforced polyamide, polycarbonate		
Note on materials		RoHS-compliant		

Technical data – Interfaces				
Type		CPX-CEC-C1	CPX-CEC-M1	CPX-CEC
Ethernet				
Number		1		
Ethernet interface		RJ45		
Connector plug		RJ45 socket, 8-pin		
Data transmission speed	[Mbps]	10/100		
Supported protocols		TCP/IP		
		Easy IP		
		Modbus TCP (Server)		
Fieldbus interface				
Type		CAN bus		–
Connection technology		Sub-D plug, 9-pin		
Transmission rate	[kbps]	125; 250; 500; 800; 1,000	125; 250; 500; 1,000	
		Adjustable via software	Adjustable via software	
Electrical isolation		Yes		
RS232 interface				
Data interface		–		Sub-D socket, 9-pin
				9.6 ... 230.4 kbps
				Electrically isolated

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

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

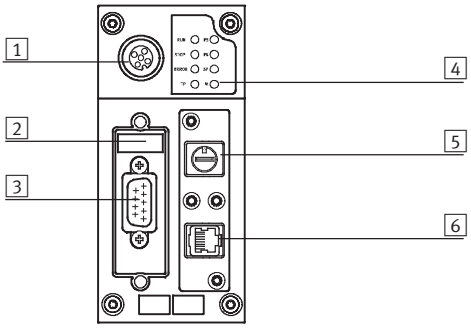
Control block CPX-CEC

Technical data

FESTO

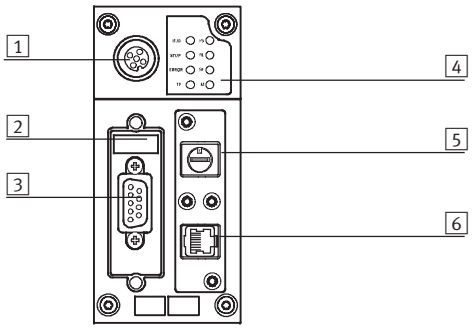
Connection and display components

CPX-CEC-C1/-M1



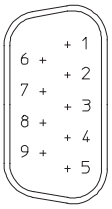
1 CPX-MMI connection
2 DIL switch
3 Fieldbus interface (plug, Sub-D, 9-pin)
4 Status LEDs, bus-specific and product-specific
5 RUN/STOP rotary switch
6 Ethernet interface (RJ45, socket, 8-pin)

CPX-CEC



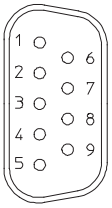
1 CPX-MMI connection
2 DIL switch
3 RS232 interface (socket, Sub-D, 9-pin)
4 Status LEDs, bus-specific and product-specific
5 RUN/STOP rotary switch
6 Ethernet interface (RJ45, socket, 8-pin)

Pin allocation – Fieldbus interface (CPX-CEC-C1/-M1)

	Pin	Signal	Meaning
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	Screened	Plug housing must be connected to FE

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

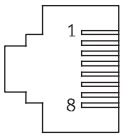
Pin allocation – RS232 interface (CPX-CEC)

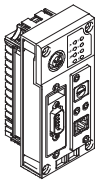
	Pin	Signal	Meaning
Sub-D socket			
	1	n.c.	Not connected
	2	RxD	Received data
	3	TxD	Transmitted data
	4	n.c.	Not connected
	5	GND	Data reference potential
	6	n.c.	Not connected
	7	n.c.	Not connected
	8	n.c.	Not connected
	9	n.c.	Not connected
	Screened	Screened	Connection to functional earth

Control block CPX-CEC

Technical data

FESTO

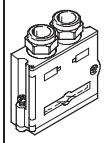
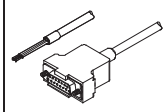
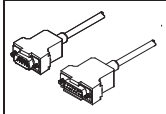
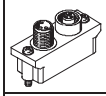
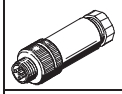
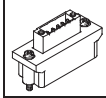
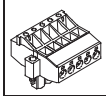
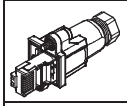
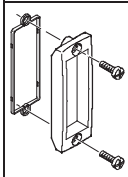
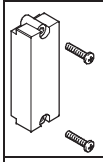
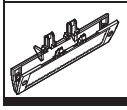
Pin allocation – Ethernet interface			
	Pin	Signal	Meaning
RJ45 plug			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screened	Screened

Ordering data			
Designation		Part No.	Type
	Control block	**567347**	**CPX-CEC-C1**
		567348	**CPX-CEC-M1**
		567346	**CPX-CEC**

Control block CPX-CEC

Accessories

FESTO

Ordering data – Bus connection			
Designation		Part No.	Type
	Sub-D plug, 9-pin (for CPX-CEC-C1/-M1)	532219	FBS-SUB-9-BU-2x5POL-B
	Connecting cable FED (for CPX-CEC)	539642	FEC-KBG7
	Connecting cable FED (for CPX-CEC)	539643	FEC-KBG8
	Bus connection, plug 2xM12, 5-pin	525632	FBA-2-M12-5POL
	Plug socket for fieldbus connection, M12, 5-pin	18324	FBSD-GD-9-5POL
	Plug, M12, 5-pin	175380	FBS-M12-5GS-PG9
	Bus connection, 5-pin	525634	FBA-1-SL-5POL
	Bus connection, screw terminal, 5-pin	525635	FBSD-KL-2x5POL
	RJ45 plug, 8-pin	534494	FBS-RJ45-8-GS
	Cover for RJ45 connection	534496	AK-RJ45
	Inspection cover, transparent for Sub-D plug/socket	533334	AK-SUB-9/15-B
	Cover for Sub-D plug/socket	557010	AK-SUB-9/15
	Inscription label holder for manifold block	536593	CPX-ST-1

Documentation				
Designation		Language	Part No.	Type
	Manual for control block CPX-CEC/CPX-CEC-...	German	569121	P.BE-CPX-CEC-DE
		English	569122	P.BE-CPX-CEC-EN

Terminal CPX

Technical data – Bus node CPX-FB6

Bus node for handling communication between the electrical CPX terminal and a higher-order master via INTERBUS.
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 four CPX-specific LEDs.
The fieldbus communication status is displayed via four INTERBUS-specific LEDs.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket and a 9-pin Sub-D plug with a typical INTERBUS pin allocation.

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

The outgoing bus plug contains the typical INTERBUS RBST bridge for identification of the outgoing bus connection.

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

INTERBUS implementation

The CPX-FB6 supports the INTERBUS protocol to EN 50254.
In addition to synchronous I/O exchange, the optional PCP channel can be used for parameterisation and diagnostic functions.
The PCP channel provides access to advanced system information and assigns operation parameters 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 96 inputs and 96 outputs, the CPX-FB6 supports a large number of I/O module configurations, including pneumatic interface.

Note

If the PCP channel is used, the maximum number of possible process data bits is reduced by 16.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

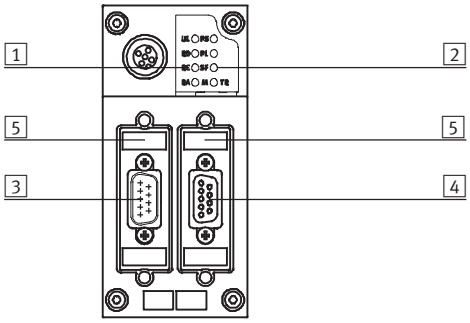
- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB6**
Fieldbus interface			Sub-D, 9-pin, socket and pin
Baud rate		[Mbps]	0.5 and 2
Bus type			Remote bus
Ident. code			1, 2 or 3 (configuration-specific) 243 (PCP-channel activated)
Profile			12 (I/O device)
PCP channel			Yes, 16 bits (optional via DIL switch)
Configuration support			Icons for CMD software
Max. no. of process data bits	Inputs	[bit]	96
	Outputs	[bit]	96
LED displays (bus-specific)			UL = Operating voltage for INTERBUS interface RC = Remotebus check BA = Bus active RD = Remotebus disable TR = Transmit/receive
Device-specific diagnostics			Via peripherals error
Parameterisation			• Start-up parameterisation via user functions (CMD) • Via PCP communication
Additional functions			• Storage of the last 40 errors with timestamp (access via PCP) • 8-bit system status in image table for inputs • 2-byte inputs and 2-byte outputs, system diagnostics in image table
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	125

Note

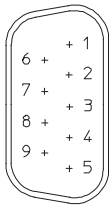
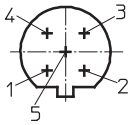
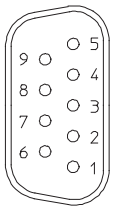
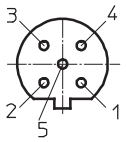
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components



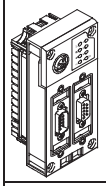
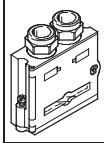
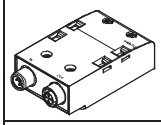
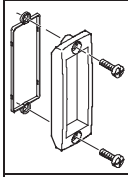
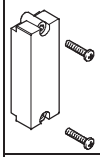
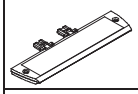
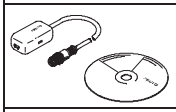
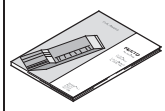
1 INTERBUS-specific LEDs
2 CPX-specific status LEDs
3 Fieldbus connection, incoming (9-pin Sub-D pin)
4 Fieldbus connection, outgoing (9-pin Sub-D socket)
5 DIL switch

Pin allocation for the INTERBUS interface

Pin allocation for Sub-D	Pin	Signal	Designation	Pin	Pin allocation for M12
Incoming					
	1	DO1	Data out	1	
	2	DI1	Data in	3	
	3	GND	Reference conductor/ground	5	
	4	n.c.	Not connected	2	
	5	n.c.	Not connected	4	
	6	/DO1	Data out inverse		
	7	/DI1	Data in inverse		
	8	n.c.	Not connected		
	9	n.c.	Not connected		
	Housing	Screened	Connection to FE (functional earth) via R/C combination	Housing	
Outgoing					
	1	DO2	Data out	1	
	2	DI2	Data in	3	
	3	GND	Reference conductor/ground	5	
	4	n.c.	Not connected	2	
	5	+5 V	Station detection[1)]	4	
	6	/DO2	Data out inverse		
	7	/DI2	Data in inverse		
	8	n.c.	Not connected		
	9	RBST	Station detection[1)]		
	Housing	Screened	Connection to FE (functional earth)	Housing	

The incoming interface is galvanically isolated from the CPX peripherals. The plug housing is connected to the functional earth FE of the CPX terminal via an R/C combination.

1) The CPX terminal contains the protocol chip SUPI 3 OPC. This ensures automatic detection of additional connected INTERBUS stations. There is therefore no need for a bridge between pin 5 and pin 9.

Ordering data				
Designation			Part No.	Type
Bus node				
	INTERBUS fieldbus node		**195748**	**CPX-FB6**
Bus connection				
	Sub-D plug	Incoming	**532218**	**FBS-SUB-9-BU-IB-B**
		Outgoing	**532217**	**FBS-SUB-9-GS-IB-B**
	Connection block M12 adapter (B-coded)		**534505**	**CPX-AB-2-M12-RK-IB**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)		**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	Threaded sleeve, 4 pieces		**533000**	**UNC4-40/M3x6**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	User manual for bus node CPX-FB6	German	**526433**	**P.BE-CPX-FB6-DE**
		English	**526434**	**P.BE-CPX-FB6-EN**
		Spanish	**526435**	**P.BE-CPX-FB6-ES**
		French	**526436**	**P.BE-CPX-FB6-FR**
		Italian	**526437**	**P.BE-CPX-FB6-IT**
		Swedish	**526438**	**P.BE-CPX-FB6-SV**

Bus node for handling communication between the electrical CPX terminal 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 four 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 connectors or OpenStyle 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 synchronous method is used for the transmission of synchronous 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 synchronous data transmission, asynchronous communication is supported through explicit messaging, which enables detailed device diagnostics and parameterisation.

A comprehensive EDS file supports the display of asynchronous 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.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:
- 8 byte outputs
- 8 byte inputs

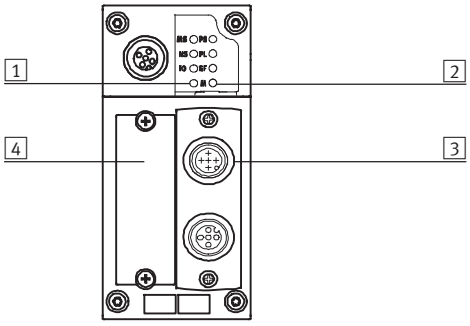
The remaining address capacity of the control block or CPX system for actuating the peripherals is:
- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB11**
Fieldbus interface			Either • Micro Style bus connection: 2xM12 with IP65/IP67 protection • Open Style bus connection: 5-pin terminal strip, IP20
Baud rate		[kbps]	125, 250, 500
Addressing range			0 ... 63 Set using DIL switch
Product	Type		Communication adapter (12 dec.)
	Code		4554 dec.
Communication types			Polled I/O, change of state/synchronous, 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 by means of 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 image table
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	120

Note

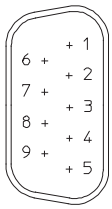
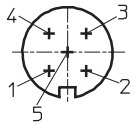
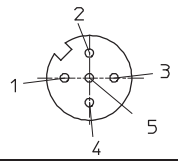
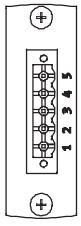
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

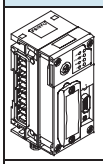
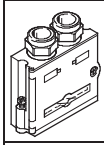
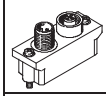
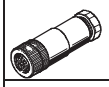
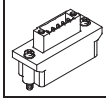
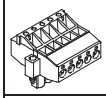
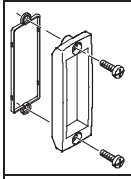
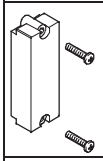
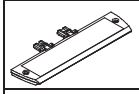
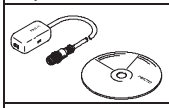
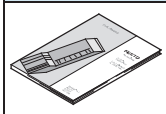


1 Bus-specific LEDs
2 CPX-specific status LEDs
3 Selectable fieldbus connection
Micro Style
Open Style
4 DIL switch cover

Pin allocation for the DeviceNet interface

Pin allocation	Pin	Signal-specific core colour[1)]	Signal	Designation
Sub-D plug				
	1	–	n.c.	Not connected
	2	Blue	CAN_L	Received/transmitted data low
	3	Black	0 V bus	0 V CAN interface
	4	–	n.c.	Not connected
	5	Blank	Screened	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 for CAN interface
Micro Style bus connection (M12), incoming/outgoing				
Incoming	1	Blank	Screened	Connection to housing
	2	Red	24 V DC bus	24 V DC supply for 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	Blank	Screened	Connection to housing
	2	Red	24 V DC bus	24 V DC supply for 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	Blank	Screened	Connection to housing
	4	White	CAN_H	Received/transmitted data high
	5	Red	24 V DC bus	24 V DC supply for CAN interface

1) Typical for DeviceNet cables

Ordering data				
Designation			Part No.	Type
Bus node				
	DeviceNet fieldbus node		**526172**	**CPX-FB11**
Bus connection				
	Sub-D plug		**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Micro Style bus connection, 2xM12		**525632**	**FBA-2-M12-5POL**
	Socket for MicroStyle connection, M12		**18324**	**FBSD-GD-9-5POL**
	Plug for Micro Style connection, M12		**175380**	**FBS-M12-5GS-PG9**
	Open Style bus connection for 5-pin terminal strip		**525634**	**FBA-1-SL-5POL**
	Terminal strip for Open Style connection, 5-pin		**525635**	**FBSD-KL-2x5POL**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)		**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	User manual for bus node CPX-FB11	German	**526421**	**P.BE-CPX-FB11-DE**
		English	**526422**	**P.BE-CPX-FB11-EN**
		Spanish	**526423**	**P.BE-CPX-FB11-ES**
		French	**526424**	**P.BE-CPX-FB11-FR**
		Italian	**526425**	**P.BE-CPX-FB11-IT**
		Swedish	**526426**	**P.BE-CPX-FB11-SV**

Bus node for handling communication between the electrical CPX terminal 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 four 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 IP65/IP67 protection from Festo or IP20 protection 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 synchronous I/O exchange, parameterisation and diagnostic functions (DPV0).

In addition to DPV0, asynchronous communication to the advanced specification DPV1 is supported. DPV1 provides asynchronous access to advanced system information and assigns operation parameters 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.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

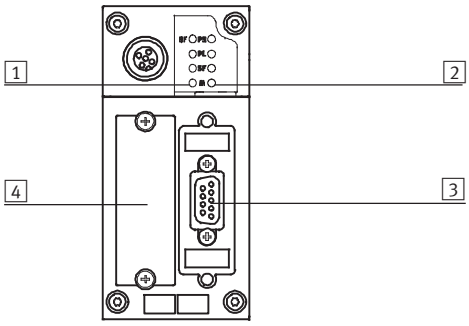
- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB13**
Fieldbus interface			Sub-D socket, 9-pin (EN 50 170) Galvanically isolated 5 V
Baud rate		[Mbps]	0.0096 ... 12
Addressing range			1 ... 125 Set using DIL switch
Product range			4: Valves
Ident. number			0x059E
Communication types			DPV0: Synchronous communication DPV1: Asynchronous 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) • Asynchronous 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 image table
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	115

Note

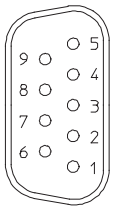
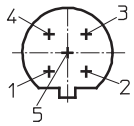
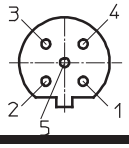
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

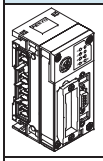
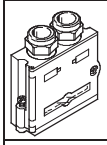
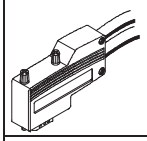
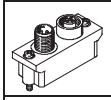
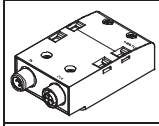
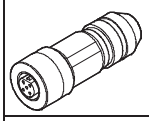
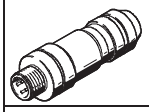
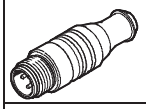
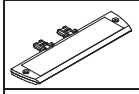
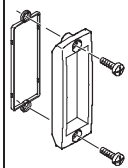
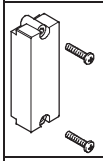
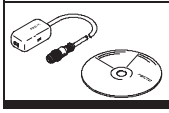


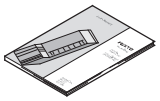
1 Bus status LEDs/bus fault
2 CPX-specific status LEDs
3 Fieldbus connection (9-pin Sub-D socket)
4 DIL switch cover

Pin allocation for Profibus DP interface

Pin allocation	Pin	Signal	Designation
Sub-D plug			
	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	Screened	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	Screened	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	Screened	Connection to FE (functional earth)

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

Ordering data			
Designation		Part No.	Type
Bus node			
	Profibus fieldbus node	**195740**	**CPX-FB13**
Bus connection			
	Sub-D plug, straight	**532216**	**FBS-SUB-9-GS-DP-B**
	Sub-D plug, angled	**533780**	**FBS-SUB-9-WS-PB-K**
	Bus connection M12 adapter (B-coded)	**533118**	**FBA-2-M12-5POL-RK**
	Connection block M12 adapter (B-coded)	**541519**	**CPX-AB-2-M12-RK-DP**
	Socket M12x1, 5-pin, straight, for self-assembly of a connecting cable for 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 for FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP	**1066354**	**NECU-M-S-B12G5-C2-PB**
	Terminating resistor, M12, B-codetd for Profibus	**1072128**	**CACR-S-B12G5-220-PB**
	Inscription label holder for connection block M12	**536593**	**CPX-ST-1**
	Inspection cover, transparent	**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)	**557010**	**AK-SUB-9/15**
	Adapter from 5-pin M12 to mini USB socket and controller software	**547432**	**NEFC-M12G5-0.3-U1G5**

Ordering data				
Designation			Part No.	Type
User manual				
	User manual for bus node CPX-FB13	German	**526427**	**P.BE-CPX-FB13-DE**
		English	**526428**	**P.BE-CPX-FB13-EN**
		Spanish	**526429**	**P.BE-CPX-FB13-ES**
		French	**526430**	**P.BE-CPX-FB13-FR**
		Italian	**526431**	**P.BE-CPX-FB13-IT**
		Swedish	**526432**	**P.BE-CPX-FB13-SV**

FESTO

CANopen

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

Application

Bus connection

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

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

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

CANopen implementation

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

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

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

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

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

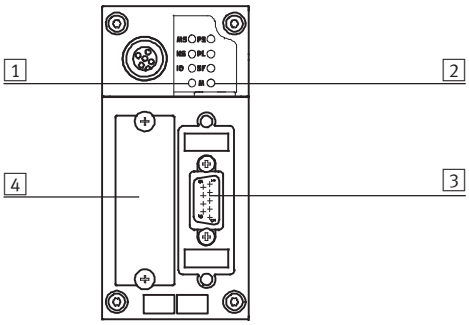
- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB14**
Fieldbus interface			Sub-D pin, 9-pin (to DS 102) Bus interface galvanically isolated via optocoupler 24 V supply for CAN interface via bus
Baud rate		[kbps]	125; 250; 500 and 1,000 can be set via DIL switch
Addressing range			Node ID 1 ... 127 Set using DIL switch
Product range			Digital inputs and outputs
Communication profile			DS 301, V4.01
Device profile			DS 401, V2.0
Number	PDO		4 Tx/4 Rx
	SDO		1 server SDO
Configuration support			EDS file and bitmaps
Max. address capacity	Inputs	[byte]	16 digital, 16 analogue channels
	Outputs	[byte]	16 digital, 16 analogue channels
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status
Device-specific diagnostics			Via emergency message Object 1001, 1002 and 1003
Parameterisation			Via SDO
Additional functions			• Storage of the last 40 errors with timestamp (access via SDO) • 8-bit system status via transmit PDO 4 (default) • 2-byte inputs and 2-byte outputs, system diagnostics via PDO 4 • Minimum boot-up • Variable PDO mapping • Emergency message • Node guarding • Heart beat
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	115

Note

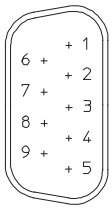
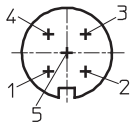
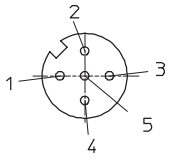
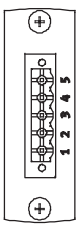
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

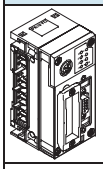
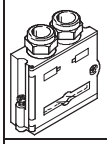
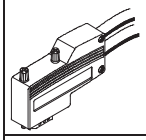
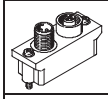
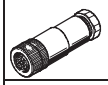
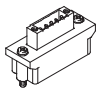
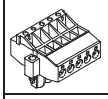
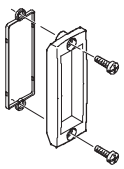
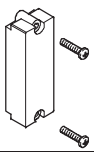
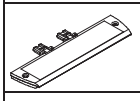
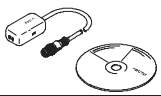
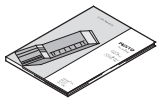


1 Bus-specific LEDs
2 CPX-specific status LEDs
3 Fieldbus connection (9-pin Sub-D, pin)
4 DIL switch cover

Pin allocation for the CANopen interface

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

1) Connected internally via Pin 3

Ordering data				
Designation			Part No.	Type
Bus node				
	CANopen fieldbus node		**526174**	**CPX-FB14**
Bus connection				
	Sub-D plug		**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Sub-D plug, angled		**533783**	**FBS-SUB-9-WS-CO-K**
	Micro Style bus connection, 2xM12, 5-pin		**525632**	**FBA-2-M12-5POL**
	Fieldbus socket for Micro Style connection, M12, 5-pin		**18324**	**FBSD-GD-9-5POL**
	Plug for Micro Style connection, M12, 5-pin		**175380**	**FBS-M12-5GS-PG9**
	Open Style bus connection		**525634**	**FBA-1-SL-5POL**
	Terminal strip for Open Style connection, 5-pin		**525635**	**FBSD-KL-2x5POL**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)		**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	User manual for bus node CPX-FB14	German	**526409**	**P.BE-CPX-FB14-DE**
		English	**526410**	**P.BE-CPX-FB14-EN**
		Spanish	**526411**	**P.BE-CPX-FB14-ES**
		French	**526412**	**P.BE-CPX-FB14-FR**
		Italian	**526413**	**P.BE-CPX-FB14-IT**
		Swedish	**526414**	**P.BE-CPX-FB14-SV**

Terminal CPX

Technical data – Bus node CPX-FB23

FESTO

Bus node for handling communication between the electrical CPX terminal 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 four CPX-specific LEDs.
The fieldbus communication status is displayed via four CC-Link-specific LEDs.

Application

Bus connection

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

The integrated interface with RS 485 transmission technology is designed for the typical CC-Link 3-wire connection technology (in accordance with CLPA CC-Link Spec. V1.1).

CC-Link implementation

The CPX-FB23 supports max. four stations per slave. The number of stations used can be set by means of a DIL switch. Synchronous data transmission for digital and analogue I/Os is conducted using the bit and word ranges (Rx/Ry/RWr/RWw).
The CPX-FB23 supports an address space of max. 64 digital inputs and 64 digital outputs (Rx/Ry) or up to 16 analogue inputs and 16 analogue outputs (RWr/RWw). Mixed operation of digital and analogue inputs/outputs is possible.

Example:
Station 1 + 2 = 32 digital inputs and 32 digital outputs
Station 3 = 4 analogue inputs and 4 analogue outputs

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

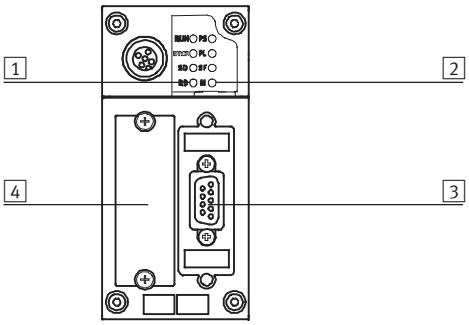
- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB23**
Fieldbus interface			Either • Sub-D socket, 9-pin • Screw terminal bus connection, IP20
Baud rate		[kbps]	156 ... 10 000
Addressing range			1 ... 64 Set using DIL switch
No. of stations per slave			1, 2, 3 or 4 stations Set using DIL switch
Vendor code			0x0177
Machine type			0x3C
Communication types			Synchronous communication
Configuration support			–
Max. address capacity, inputs	Digital		Station 1, 2, 3, 4 = 64 Rx
	Analogue		Station 1, 2, 3, 4 = 16 RWr
Max. address capacity, outputs	Digital		Station 1, 2, 3, 4 = 64 Ry
	Analogue		Station 1, 2, 3, 4 = 16 RWw
LED displays (bus-specific)			RUN = Data communication OK ERROR = CRC error or data communication error SD = Send data RD = Receive data
Device-specific diagnostics			• 8-bit system status in image table for inputs • 2 byte inputs and 2 byte outputs, system diagnostics in image table
Parameterisation			Hold/clear by means of DIL switch
Additional functions			Storage of the last 40 errors with timestamp (access via system diagnostics)
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	115

Note

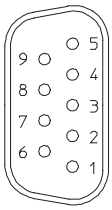
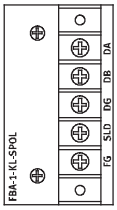
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

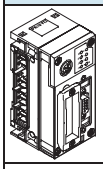
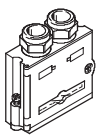
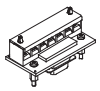
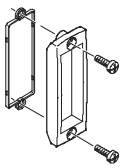
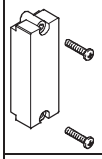
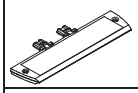
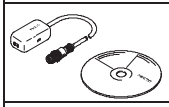


1 Bus-specific status LEDs
2 CPX-specific status LEDs
3 Fieldbus connection (9-pin Sub-D socket)
4 DIL switch cover

Pin allocation for the CC-Link interface

Pin allocation	Pin	Signal	Designation
Sub-D plug			
	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
	Housing	SLD	Screened
Screw terminal bus connection			
	1	FG	Functional earth/housing
	2	SLD	Screened
	3	DG	Data reference potential
	4	DB	Data B
	5	DA	Data A

1) Via RC element on housing

Ordering data				
Designation			Part No.	Type
Bus node				
	CC-Link fieldbus node		**526176**	**CPX-FB23**
Bus connection				
	Sub-D plug		**532220**	**FBS-SUB-9-GS-2x4POL-B**
	Screw terminal bus connection		**197962**	**FBA-1-KL-5POL**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)		**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	User manual for bus node CPX-FB23	German	**526403**	**P.BE-CPX-FB23-DE**
		English	**526404**	**P.BE-CPX-FB23-EN**

Terminal CPX

Technical data – Bus node CPX-FB32

FESTO

Industrial Ethernet
Ethernet/IP

IT services:

Web

Bus node for handling communication between the electrical CPX terminal 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 four CPX-specific LEDs.

Application

Bus connection

The bus connection is established via an M12 plug, D-coded to IEC947-5-2 with IP65/67 protection.

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

Ethernet/IP implementation

The CPX-FB32 supports the two remote I/O and remote controller operating modes.
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 actuation 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 data of the device from the automation network.
The Ethernet/IP node for CPX supports the transmission technology that conforms to DIN EN 50173/CAT 5.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

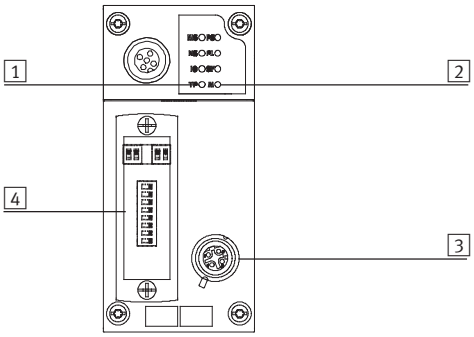
- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB32**
Fieldbus interface			Plug connector M12, D-coded, 4-pin
Baud rate		[Mbps]	10/100, full/half duplex
IP addressing			Via DHCP, DIL switch or network software
Max. address capacity, inputs		[byte]	64
Max. address capacity, outputs		[byte]	64
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status TP = Link/traffic
Device-specific diagnostics			System, module and channel-oriented diagnostics
Parameterisation			• Start-up parameterisation • Asynchronous parameterisation via Explicit Messaging
Additional functions			• Storage of the last 40 errors with timestamp (access via system diagnostics) • 8-bit system status in image table for inputs • 2-byte I/O, system diagnostics via image table
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 65
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	125

Note

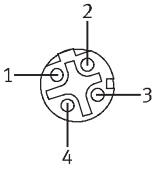
Please observe the general limits and guidelines for the system when configuring the electrical modules.

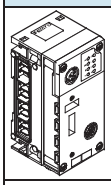
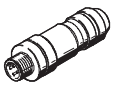
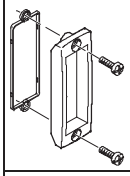
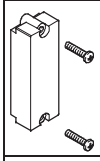
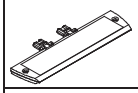
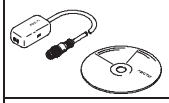
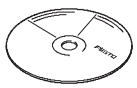
Connection and display components



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

Pin allocation for the fieldbus interface

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

Ordering data				
Designation			Part No.	Type
Bus node				
	Ethernet/IP bus node		**541302**	**CPX-FB32**
Bus connection				
	Plug M12x1, 4-pin, D-coded		**543109**	**NECU-M-S-D12G4-C2-ET**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)		**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	User manual for bus node CPX-FB32	German	**693134**	**P.BE-CPX-FB32-DE**
		English	**693135**	**P.BE-CPX-FB32-EN**
		Spanish	**693136**	**P.BE-CPX-FB32-ES**
		French	**693137**	**P.BE-CPX-FB32-FR**
		Italian	**693138**	**P.BE-CPX-FB32-IT**
		Swedish	**693139**	**P.BE-CPX-FB32-SV**
Software				
	CPX remote diagnostics and process visualisation		**545413**	**CPX-WEB-MONITOR**

Terminal CPX

Technical data – Bus node CPX-FB33

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 four 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 IEC61076-2-101 with IP65/67 protection.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality (cross-over 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 CPX-FB33 supports the PROFINET protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.
This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred. The Ethernet bandwidth is sufficient to transfer both data types (real-time and non-real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements, memory stick and a diagnostic interface.
The purpose of the memory stick is to guarantee fast replacement of the fieldbus node in the event of an error.

PROFINET provides the user with access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The fieldbus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, depending on the function, changed via an MMI.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB33**
Fieldbus interface			2x socket M12, D-coded, 4-pin
Baud rate		[Mbps]	100
Protocol			ProfiNet RT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	(bus-specific)		NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			GSDML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• Start-up parameterisation in plain text via fieldbus • Fast startup (FSU) • Channel-oriented diagnostics via fieldbus • Asynchronous data access via fieldbus • System status can be represented using process data • Additional diagnostic interface for operator units • Asynchronous data access via Ethernet
Control elements			• DIL switch • Optional memory card
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Current consumption		[mA]	Typically 120
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials	Housing		Die-cast aluminium
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	280

Note

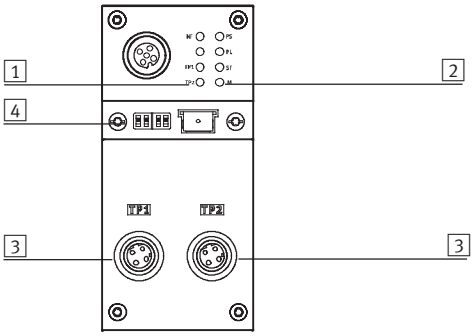
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Note

Always use screws appropriate to the interlinking block (metal or plastic):

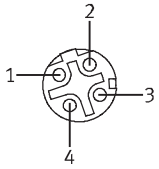
- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

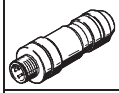
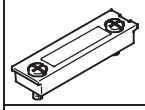
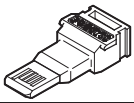
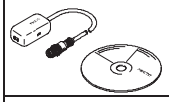
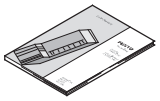
Connection and display components



1 Bus-specific status LEDs
2 CPX-specific status LEDs
3 Fieldbus connection
(4-pin socket M12, D-coded)
4 Transparent cover for DIL switch
and memory card

Pin allocation for the fieldbus interface

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

Ordering data				
Designation			Part No.	Type
Bus node				
	PROFINET fieldbus node		**548755**	**CPX-FB33**
Bus connection				
	Plug M12x1, 4-pin, D-coded		**543109**	**NECU-M-S-D12G4-C2-ET**
	Transparent cover for DIL switch and memory card		**548757**	**CPX-AK-P**
	Memory card for PROFINET fieldbus node, 2 MB		**568647**	**CPX-SK-2**
	Cover cap for sealing unused bus connections (10 pieces)		**352059**	**ISK-M12**
	Screws for attaching an inscription label holder to the fieldbus node (12 pieces)		**550222**	**CPX-M-M2,5X8-12X**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	Electronics manual, CPX bus node, type CPX-FB33	German	**548759**	**P.BE-CPX-PNIO-DE**
		English	**548760**	**P.BE-CPX-PNIO-EN**
		Spanish	**548761**	**P.BE-CPX-PNIO-ES**
		French	**548762**	**P.BE-CPX-PNIO-FR**
		Italian	**548763**	**P.BE-CPX-PNIO-IT**
		Swedish	**548764**	**P.BE-CPX-PNIO-SV**

Terminal CPX

Technical data – Bus node CPX-M-FB34

Bus node for operating the CPX valve terminal on PROFINET IO.
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 four CPX-specific LEDs.
The fieldbus communication status is displayed via three bus-specific LEDs.

Application

Bus connection

The bus connection is established via two RJ45 push-pull sockets to IEC61076-3-106 and IEC60603 with IP65/67 protection.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality (cross-over 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 CPX-M-FB34 supports the PROFINET IO protocol based on the Ethernet standard and the 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 transmit 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, memory stick and a diagnostic interface.
The purpose of the memory stick is to guarantee fast replacement of the fieldbus node in the event of an error.
PROFINET provides the user with access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The fieldbus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, depending on the function, changed via an MMI.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

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

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

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

General technical data			
Type			**CPX-M-FB34**
Fieldbus interface			2x RJ45 push-pull socket, AIDA
Baud rate		[Mbps]	100
Protocol			ProfiNet RT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	(bus-specific)		NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			GSDML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• Start-up parameterisation in plain text via fieldbus • Fast startup (FSU) • Channel-oriented diagnostics via fieldbus • Asynchronous data access via fieldbus and via Ethernet • System status can be represented using process data • Additional diagnostic interface for operator units
Control elements			DIL switch, optional memory card
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 120
Protection class to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Material of housing			Die-cast aluminium
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 80
Weight		[g]	280

Note

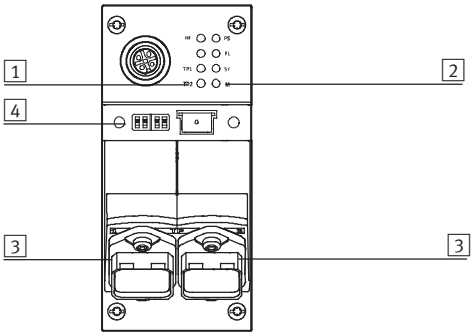
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Note

Always use screws appropriate to the interlinking block (metal or plastic):

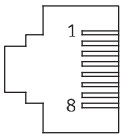
- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

Connection and display components

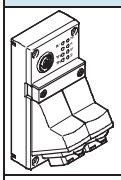
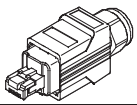
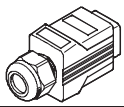
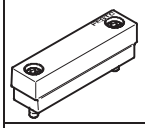
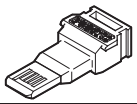
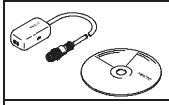


1 Bus-specific status LEDs
2 CPX-specific status LEDs
3 Fieldbus connection (8-pin RJ45 socket)
4 DIL switch and memory card

Pin allocation for the fieldbus interface

Pin allocation	Pin	Signal	Designation
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	Screened	Screened

Ordering data

Designation		Part No.	Type
Bus node			
	PROFINET IO fieldbus node	**548751**	**CPX-M-FB34**
Bus connection			
	RJ45 plug, 8-pin, push-pull	**552000**	**FBS-RJ45-PP-GS**
	Cover cap for bus connection	**548753**	**CPX-M-AK-C**
	Cover for DIL switch and memory card	**548754**	**CPX-M-AK-M**
	Memory card for PROFINET fieldbus node, 2 MB	**568647**	**CPX-SK-2**
	Screws for attaching an inscription label holder to the fieldbus node (12 pieces)	**550222**	**CPX-M-M2,5X8-12X**
	Adapter from 5-pin M12 to mini USB socket and controller software	**547432**	**NEFC-M12G5-0.3-U1G5**
User manual			
	Electronics manual, CPX bus node, type CPX-M-FB34 – German	**548759**	**P.BE-CPX-PNIO-DE**
	English	**548760**	**P.BE-CPX-PNIO-EN**
	Spanish	**548761**	**P.BE-CPX-PNIO-ES**
	French	**548762**	**P.BE-CPX-PNIO-FR**
	Italian	**548763**	**P.BE-CPX-PNIO-IT**
	Swedish	**548764**	**P.BE-CPX-PNIO-SV**

Terminal CPX

Technical data – Bus node CPX-M-FB35

FESTO

Bus node for operating the CPX valve terminal on PROFINET IO.
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 four CPX-specific LEDs.
The fieldbus communication status is displayed via three bus-specific LEDs.

Application

Bus connection

The bus connection is established via two SCRJ push-pull sockets to IEC61754-24 (fibre-optic cable, AIDA standard) to IP65/67.

Both connections are equivalent 100BaseFX Ethernet ports that are brought together via an internal switch.

Fibre-optic cables made from plastic (POF) are suitable for use as the transmission medium.

- Maximum segment length 50 m
- Baud rate 100 Mbps

PROFINET implementation

The CPX-M-FB35 supports the PROFINET IO protocol based on the Ethernet standard and the TCP/IP technology to IEEE802.3.
This guarantees data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. Furthermore, non real-time critical information such as diagnostic information, configuration information, etc. can be transferred.
The Ethernet bandwidth is sufficient to transmit 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, memory stick and a diagnostic interface. The purpose of the memory stick is to guarantee fast replacement of the fieldbus node in the event of an error.
PROFINET provides the user with access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The fieldbus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, depending on the function, changed via an MMI.

Points to note in connection with CPX-FEC/CPX-CEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node takes place via interlinking of 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 actuation of the peripherals:

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

New

Terminal CPX

Technical data – Bus node CPX-M-FB35

General technical data			
Type			**CPX-M-FB35**
Fieldbus interface			2x SCRJ push-pull socket, AIDA
Baud rate		[Mbps]	100
Protocol			PROFINET RT
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
LED displays	(bus-specific)		NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			GSDML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• Start-up parameterisation in plain text via fieldbus • Fast start-up (FSU) • Channel-oriented diagnostics via fieldbus • Acyclic data access via fieldbus and via Ethernet • System status can be represented using process data • Additional diagnostic interface for operator unit
Operating elements			DIL switch, optional memory card
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 150
Protection class to EN 60529			IP65, IP67
Temperature range	Operation	[°C]	– 5 ... +50
	Storage/transport	[°C]	–20 ... +70
Housing material			Die-cast aluminium
Note on materials			RoHS-compliant
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 80
Product weight		[g]	280

Note

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

Note

Always use screws appropriate to the interlinking block (metal or plastic):

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

Terminal CPX

Technical data – Bus node CPX-M-FB35

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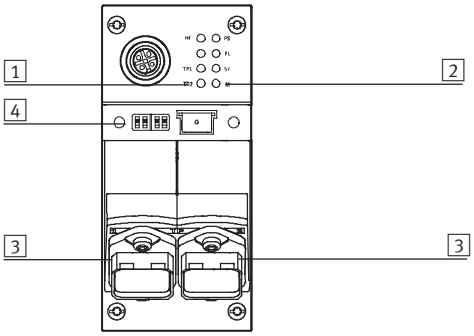
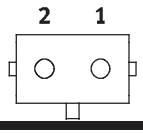
Connection and display components



1 Bus-specific status LEDs
2 CPX-specific status LEDs
3 Fieldbus connection (2-pin SCRJ socket)
4 DIL switch and memory card

Pin allocation for the fieldbus interface

Pin allocation	Pin	Signal	Designation
Plug SCRJ			
	1	Tx	Outgoing
	2	Rx	Incoming

Terminal CPX

Accessories – Bus node CPX-M-FB35

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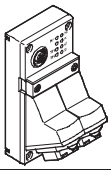
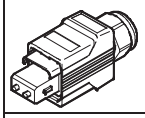
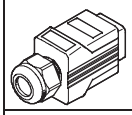
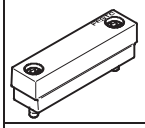
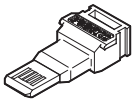
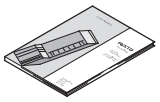
Ordering data				
Designation			Part No.	Type
Bus node				
	PROFINET IO fieldbus node		**548749**	**CPX-M-FB35**
Bus connection				
	Plug SCRJ, 2-pin, push-pull		**571017**	**FBS-SCRJ-PP-GS**
	Cover cap for bus connection		**548753**	**CPX-M-AK-C**
	Cover for DIL switch and memory card		**548754**	**CPX-M-AK-M**
	Memory card for PROFINET fieldbus node, 2 MB		**568647**	**CPX-SK-2**
	Screws for attaching an inscription label holder to the fieldbus node (12 pieces)		**550222**	**CPX-M-M2,5X8-12X**
	Adapter from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
Manual				
	Electronics manual, CPX bus node, type CPX-M-FB35	German	**548759**	**P.BE-CPX-PNIO-DE**
		English	**548760**	**P.BE-CPX-PNIO-EN**
		Spanish	**548761**	**P.BE-CPX-PNIO-ES**
		French	**548762**	**P.BE-CPX-PNIO-FR**
		Italian	**548763**	**P.BE-CPX-PNIO-IT**
		Swedish	**548764**	**P.BE-CPX-PNIO-SV**

Terminal CPX

Technical data – Bus node CPX-FB38

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 four CPX-specific LEDs.
The fieldbus communication status is displayed via four bus-specific LEDs.

Application

Bus connection

The bus connection is established via two M12 sockets, D-coded to IEC61076-2-101 with IP65/67 protection.

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

- Maximum segment length 100 m
- Transmission rate 100 Mbps

EtherCAT implementation

The CPX-FB38 supports the EtherCAT protocol based on the Ethernet standard and the 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 transmit 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 fieldbus 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 an MMI/FMT.

Special points in combination with CPX-FEC/CPX-CEC

When a fieldbus node is combined with a control block (CPX-FEX, 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 fieldbus node only provides the communication interface to the PLC.
Communication between the control block and CPX fieldbus node is established via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56 byte inputs
- 56 byte outputs

General technical data			
Type			**CPX-FB38**
Fieldbus interface			Two plug connectors M12, D-coded, 4-pin
Baud rate		[Mbps]	100
Max. address capacity, inputs		[byte]	64
Max. address capacity, outputs		[byte]	64
LED displays	(bus-specific)		Error = Communication error L/A1 = Network active port 1 L/A2 = Network active port 2 Run = Communication status
	(product-specific)		M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics			• Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory
Configuration support			XML file
Parameterisation			• System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels
Additional functions			• System status can be represented using process data • Additional diagnostic interface for operator units
Control elements			DIL switch
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	10
Current consumption		[mA]	Typically 100
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials	Housing		Reinforced polyamide
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	125

Note

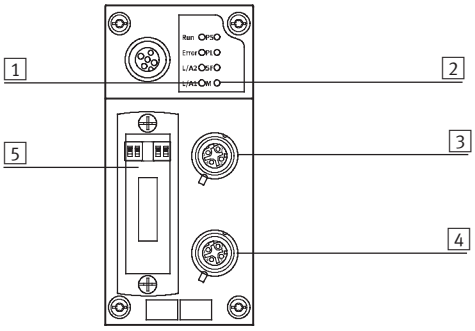
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Note

Always use screws appropriate to the interlinking block (metal or plastic):

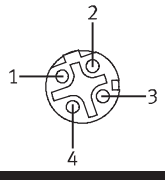
- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

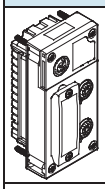
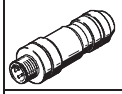
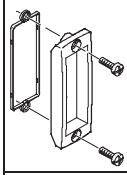
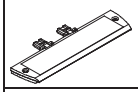
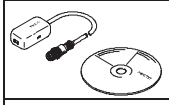
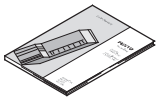
Connection and display components

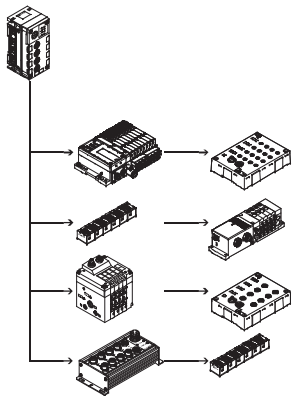


1 Bus-specific status LEDs
2 CPX-specific status LEDs
3 Fieldbus connection, output (4-pin socket M12, D-coded)
4 Fieldbus connection, input (4-pin socket M12, D-coded)
5 Transparent DIL switch cover

Pin allocation for the fieldbus interface

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

Ordering data				
Designation			Part No.	Type
Bus node				
	EtherCAT fieldbus node		**552046**	**CPX-FB38**
Bus connection				
	M12x1 plug, 4-pin, D-coded		**543109**	**NECU-M-S-D12G4-C2-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 from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
User manual				
	Electronics manual, CPX bus node, type CPX-FB38	German	**562524**	**P.BE-CPX-FB38-DE**
		English	**562525**	**P.BE-CPX-FB38-EN**
		Spanish	**562526**	**P.BE-CPX-FB38-ES**
		French	**562527**	**P.BE-CPX-FB38-FR**
		Italian	**562528**	**P.BE-CPX-FB38-IT**
		Swedish	**562529**	**P.BE-CPX-FB38-SV**



The CPX-CP electrical interface establishes the connection to CP modules of the CPI installation system via prefabricated 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.
The CP electrical interface is supported by all CPX fieldbus nodes and the CPX-FEC.

Application

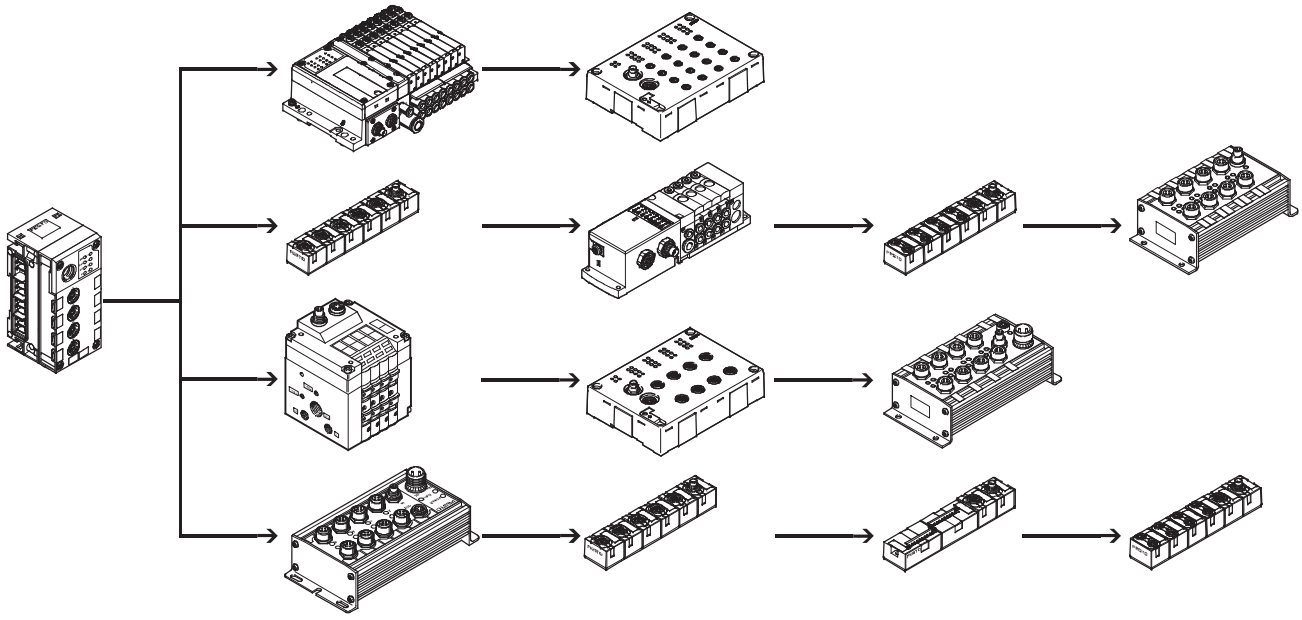
CP connection

As well as transmitting the communication data, the max. four CP strings of a CPX-CP interface also transmit the supply voltage to the connected sensors and the load supply to the valves (or outputs). Both circuits are supplied separately with 24 V, but with 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 following combinations are made possible by the CP interface:

- 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



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

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

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

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

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.

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

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 (plug and work).
Saved data are retained even when the CP interface is isolated from the voltage 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.

Note

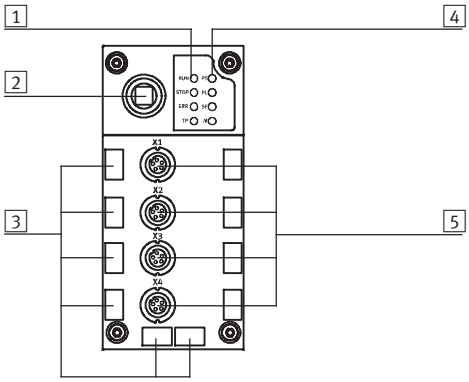
The remanent saving of configuration data means that changes in the configuration or faulty modules are still displayed even after a voltage failure.

General technical data			
Type			**CPX-CP-4-FB**
Brief description			CP interface
Max. number of	CP strings		4
	CP modules per string		4
	Outputs per string		32
	Inputs per string		32
CP connection			M9 socket, 5-pin
Baud rate		[kbps]	1,000
Cycle time	CP modules without CPI functionality	[ms]	4
	CP modules with CPI functionality	[ms]	2
LED displays			L1 ... 4 = Status of the CP string 1 ... 4 PS = Electronic supply, sensor supply PL = Load supply RN = Status of the CP system SF = System fault
Device-specific diagnostics			Via bus node
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure buffering	[ms]	20
Supply voltage of sensors		[V DC]	24 ±25% coming from bus node
Load voltage of actuators		[V DC]	24 ±10% coming from bus node
Current consumption	Without CP modules	[A]	Max. 0.2
	Per CP string	[A]	Max. 1.6
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polyamide
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 45
Weight		[g]	140

- Note

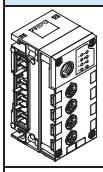
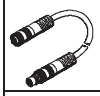
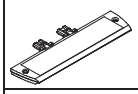
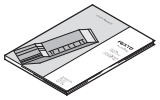
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components



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

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 M9	**356684**	**FLANSCHDOSE SER.712**
	Cover cap M12	**165592**	**ISK-M12**
	Connecting cable WS-WD, 0.25 m	**540327**	**KVI-CP-3-WS-WD-0,25**
	Connecting cable WS-WD, 0.5 m	**540328**	**KVI-CP-3-WS-WD-0,5**
	Connecting cable WS-WD, 2 m	**540329**	**KVI-CP-3-WS-WD-2**
	Connecting cable WS-WD, 5 m	**540330**	**KVI-CP-3-WS-WD-5**
	Connecting cable WS-WD, 8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable GS-GD, 2 m	**540332**	**KVI-CP-3-GS-GD-2**
	Connecting cable GS-GD, 5 m	**540333**	**KVI-CP-3-GS-GD-5**
	Connecting cable GS-GD, 8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Inscription label holder for connection block	**536593**	**CPX-ST-1**
User manual			
	User manual for CPX-CP interface, German	**539293**	**P.BE-CPX-CP-DE**
	English	**539294**	**P.BE-CPX-CP-EN**
	Spanish	**539295**	**P.BE-CPX-CP-ES**
	French	**539296**	**P.BE-CPX-CP-FR**
	Italian	**539297**	**P.BE-CPX-CP-IT**
	Swedish	**539298**	**P.BE-CPX-CP-SV**

Control block CPX-CMXX

Technical data

FESTO

The control block CPX-CMXX is an intelligent module in the CPX terminal for controlling electric drive units. Individual axis and simple multi-axis applications can easily be implemented. Programming is not necessary. Configuration, parameterisation and commissioning of the application is easily achieved with the Festo Configuration Tool (FCT).

- Configuration of two axes groups with up to four axes each is possible
- There are 1024 position sets available per axes group
- Input or Teach-In of positions in specified set structure
- Parameterisation via Ethernet
- Communication protocol: FHPP-MAX, Festo handling and positioning profile for multi-axis movements.
- Control of drive units via CANopen

General technical data		
Protocol		FHPP-Max
Maximum address volume for inputs	[byte]	16
Maximum address volume for outputs	[byte]	16
LED displays (bus-specific)		RUN: Program is executed
		STOP: Program is stopped
		ERR: Error in the program execution
		TP: Status of Ethernet connection
LED displays (product-specific)		M: Modify, parameterisation
		PS: Electronic supply, sensor supply
Device-specific diagnostics		Diagnostic memory
		Channel and module-oriented diagnostics
		Undervoltage/short circuit of modules
Parameterisation		System parameters
Operating elements		Rotary switch for RUN/STOP
Configuration support		Festo Configuration Tool (FCT)
Additional functions		System status can be displayed using process data
		Additional diagnostic interface for FCT
Supported kinematic system		2-axis gantries (X-Z / Y-Z / X-Y)
		3-axis gantries (X-Y-Z)
Total number of axes		8
Distribution of axes		2 groups with max. 4 axes
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Power failure bridging	[ms]	10
Intrinsic current consumption at nominal operating voltage	[mA]	Typ. 85
Protection class to EN 60529		IP65/IP67
Dimensions W x L x H (including interlinking block)	[mm]	50 x 107 x 55
Product weight	[g]	155
Materials		
Housing		Reinforced polyamide, polycarbonate
Note on materials		RoHS-compliant

Control block CPX-CMXX

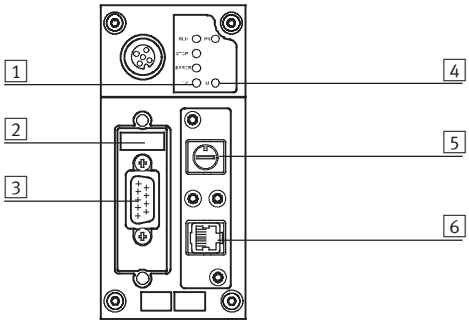
Technical data

FESTO

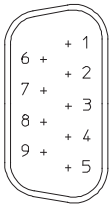
Technical data – Interfaces		
Ethernet		
Ethernet interface		Socket RJ45, 8-pin, for configuration only
Baud rate	[Mbit/s]	10/100
Interface		
Control interface		CAN bus
Baud rate	[Mbit/s]	1

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

Connection and display components



1 LED display, bus-specific
2 DIL switch
3 Control interface (plug, Sub-D, 9-pin)
4 LED display, product-specific
5 16-position rotary switch (RUN/STOP)
6 Ethernet interface (RJ45, socket, 8-pin)

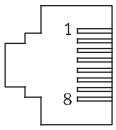
Pin allocation – Control interface			
	Pin	Signal	Meaning
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	CAN_GND	CAN ground
	4	n.c.	Not connected
	5	CAN_SHLD	Connection to functional earth (FE)
	6	CAN_GND	CAN ground (optional)[1)]
	7	CAN_H	CAN high
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	Screened	Plug housing must be connected to FE

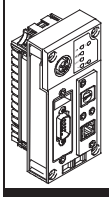
1) If a drive controller is connected to an external power supply, CAN ground (optional), pin 6, cannot be used on the CPX-CMXX.

Control block CPX-CMXX

Technical data

FESTO

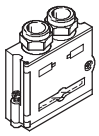
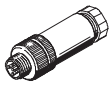
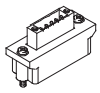
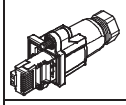
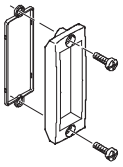
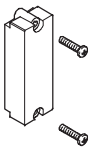
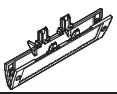
Pin allocation – Ethernet interface			
	Pin	Signal	Meaning
Plug RJ45			
	1	TD+	Transmitted data+
	2	TD–	Transmitted data–
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD–	Received data–
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screened	Screened

Ordering data			
Designation		Part No.	Type
	Control block	**555667**	**CPX-CMXX**

Control block CPX-CMXX

Accessories

FESTO

Ordering data – Bus connection			
Designation		Part No.	Type
	Sub-D plug, 9-pin	**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Bus connection, plug 2xM12, 5-pin	**525632**	**FBA-2-M12-5POL**
	Plug socket for fieldbus connection, M12, 5-pin	**18324**	**FBSD-GD-9-5POL**
	Plug M12, 5-pin	**175380**	**FBS-M12-5GS-PG9**
	Bus connection, 5-pin	**525634**	**FBA-1-SL-5POL**
	Bus connection, screw terminal, 5-pin	**525635**	**FBSD-KL-2x5POL**
	Plug RJ45, 8-pin	**534494**	**FBS-RJ45-8-GS**
	Cover for RJ45 connection	**534496**	**AK-RJ45**
	Inspection cover, transparent for plug/socket Sub-D	**533334**	**AK-SUB-9/15-B**
	Cover for plug/socket Sub-D	**557010**	**AK-SUB-9/15**
	Inscription label holder for connection block	**536593**	**CPX-ST-1**

Documentation				
Designation		Language	Part No.	Type
	Description of control block CPX-CMXX	German	**564221**	**P.BE-CPX-CMXX-DE**
		English	**564222**	**P.BE-CPX-CMXX-EN**
	Description of Festo handling and positioning profile for multi-axis movements FHPP-MAX	German	**564223**	**P.BE-CMXX-FHPP-SW-DE**
		English	**564224**	**P.BE-CMXX-FHPP-SW-EN**

Control block CPX-CM-HPP

Technical data

FESTO

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

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

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

New

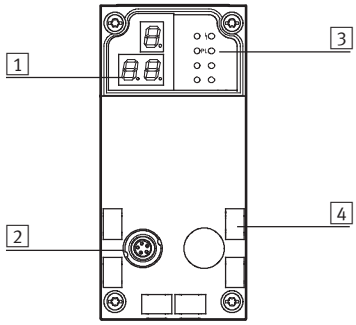
Control block CPX-CM-HPP

Technical data

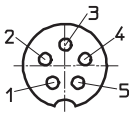
Technical data – Interfaces		
Interface		
Control interface		CAN bus
Baud rate	[Mbps]	1

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

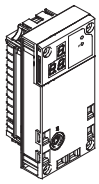
Connection and display components



1 3-digit display
2 Control interface
3 LED display, product-specific
4 Inscription labels

Pin allocation – Control interface			
	Pin	Signal	Meaning
Plug M9, 5-pin			
	1	n.c.	Not connected
	2	n.c.	Not connected
	3	CAN_GND	CAN ground
	4	CAN_H	CAN high
	5	CAN_L	CAN low
	Housing	Screened	Cable screen must be connected to functional earth (FE)

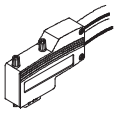
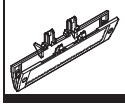
Permissible CPX modules		
CPX module	Protocol	Remarks
CPX-FEC	–	Revision 16 (R16) and above
CPX-CEC-...	–	In preparation
CPX-FB6	Interbus	Not available
CPX-FB11	DeviceNet	Revision 22 (R22) and above
CPX-FB13	Profibus DP	Revision 23 (R23) and above
CPX-FB14	CANopen	Revision 24 (R24) and above
CPX-FB23	CC-Link	In preparation
CPX-FB32	Ethernet/IP	In preparation
CPX-FB33, FB34, FB35	ProfiNet	In preparation
CPX-FB38	EtherCAT	In preparation

Ordering data			
Designation		Part No.	Type
	Control block	**562214**	**CPX-CM-HPP**

Control block CPX-CM-HPP

Accessories

FESTO

Ordering data – Bus connection				
Designation		Cable length [m]	Part No.	Type
	Connecting cable	2	**563711**	**NEBC-M9W5-K-2-N-LE3**
		5	**563712**	**NEBC-M9W5-K-5-N-LE3**
	Plug for CAN bus interface, Sub-D, 9-pin, without terminating resistor		**533783**	**FBS-SUB-9-WS-CO-K**
	Inscription label holder for manifold block		**536593**	**CPX-ST-1**

Documentation				
Designation		Language	Part No.	Type
	Manual – Control block CPX-CM-HPP	German	**568683**	**P.BE-CPX-CM-HPP-DE**
		English	**568684**	**P.BE-CPX-CM-HPP-EN**

New

Axis controllers CPX-CMAX

Technical data

The axis controller CPX-CMAX is intended exclusively for 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 bridging		[ms]	10
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Perm. load current		[A]	2.5
Fuse protection (short circuit)			Electronic
Number of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. no. of modules			7
Display			7-segment display
Assigned addresses	Outputs	[bit]	8x8
	Inputs	[bit]	8x8
Operating modes			Record Select mode
			Direct mode
Controller types			Position control
			Force control
Diagnostics			Module-orientated
			Via local 7-segment display
Status display			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 polyamide
Product weight		[g]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

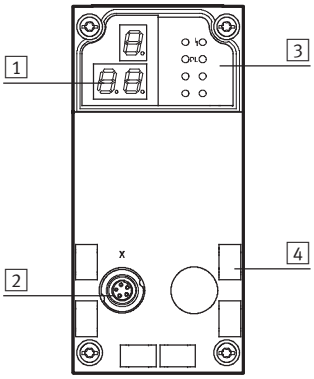
Axis controllers CPX-CMAX

Technical data

FESTO

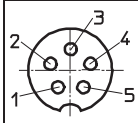
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65
CE mark (see declaration of conformity)		To EU EMC Directive

Connection and display components



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

Pin allocation – plug 2



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	Screened	Cable screening

Permitted bus nodes/FEC

Bus node/FEC	Protocol	Max. no. of CMAX modules	Remarks
CPX-FEC	–	7	On request
CPX-FB6	Interbus	1	On request
CPX-FB11	DeviceNet	7	Revision 20 (R20) and above
CPX-FB13	Profibus DP	7	Revision 23 (R23) and above
CPX-FB14	CANopen	2	On request
CPX-FB23	CC-Link	7	On request
CPX-FB32	Ethernet/IP	7	On request
CPX-FB33	Profinet, M12	7	On request
CPX-FB34	Profinet, RJ45	7	On request
CPX-FB38	EtherCat	7	On request

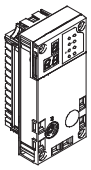
PROFIBUS®, DeviceNet®, CANopen®, INTERBUS®, CC-LINK®, EtherCAT®, PROFINET®, EtherNet/IP® is a registered trademark of its respective trademark holder in certain countries.

Axis controllers CPX-CMAX

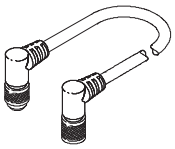
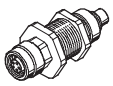
Accessories

FESTO

Ordering data – Axis controllers

	Brief description	Part No.	Type
	Order code in the CPX configurator: T21	**548932**	**CPX-CMAX-C1-1**

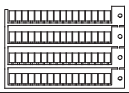
Ordering data – Connecting cables

	Brief description	Cable length [m]	Part No.	Type
	Connecting cable with angled plug and angled socket	0.25	**540327**	**KVI-CP-3-WS-WD-0,25**
		0.5	**540328**	**KVI-CP-3-WS-WD-0,5**
		2	**540329**	**KVI-CP-3-WS-WD-2**
		5	**540330**	**KVI-CP-3-WS-WD-5**
		8	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2	**540332**	**KVI-CP-3-GS-GD-2**
		5	**540333**	**KVI-CP-3-GS-GD-5**
		8	**540334**	**KVI-CP-3-GS-GD-8**
	Connector for control cabinet through-feed	–	**543252**	**KVI-CP-3-SSD**

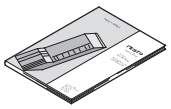
Ordering data – Screws

	Brief description	Part No.	Type
	For mounting on the metal interlinking block	**550219**	**CPX-M-M3X22-4X**

Ordering data – Inscription labels

	Brief description	Number	Part No.	Type
	Inscription labels 6x10, in frames	64	**18576**	**IBS-6X10**

Documentation[1)]

	Language	Part No.	Type
	DE	**559750**	**P.BE-CPX-CMAX-SYS-DE**
	EN	**559751**	**P.BE-CPX-CMAX-SYS-EN**
	ES	**559752**	**P.BE-CPX-CMAX-SYS-ES**
	FR	**559753**	**P.BE-CPX-CMAX-SYS-FR**
	IT	**559754**	**P.BE-CPX-CMAX-SYS-IT**
	SV	**559755**	**P.BE-CPX-CMAX-SYS-SV**

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

End-position controllers CPX-CMPX

Technical data

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

General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	80
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Perm. load current		[A]	2.5
Number of axes per module			1
Length of connecting cable to axis		[m]	≤ 30
Max. no. of modules			9
Display			7-segment display
Control elements			3 keys
Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8
Diagnostics			Module-orientated
			Via local 7-segment display
			Via operator unit CPX-MMI-1
Status display			Module status
			Power Load
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			Reinforced polyamide
Product weight		[g]	240
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

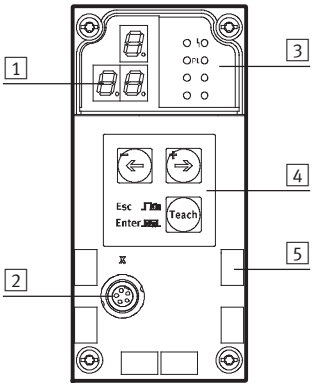
End-position controllers CPX-CMPX

Technical data

FESTO

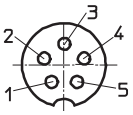
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65
CE mark (see declaration of conformity)		To EU EMC Directive

Connection and display components



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

Pin allocation – plug 2



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	Screened	Cable screening

Permitted bus nodes/FEC

Bus node/FEC	Protocol	Max. no. of CMPX modules	Remarks
CPX-FEC	–	9	Revision 14 (R14) and above
CPX-FB6	Interbus	1	On request
CPX-FB11	DeviceNet	9	Revision 20 (R20) and above
CPX-FB13	Profibus DP	9	Revision 22 (R22) and above
CPX-FB14	CANopen	3	On request
CPX-FB23	CC-Link	9	On request
CPX-FB32	Ethernet/IP	9	On request
CPX-FB33	Profinet, M12	9	On request
CPX-FB34	Profinet, RJ45	9	On request
CPX-FB38	EtherCat	9	On request

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End-position controllers CPX-CMPX

Accessories

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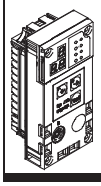
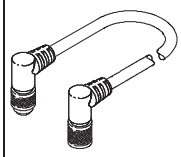
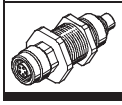
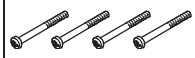
Ordering data – End-position controllers

	Brief description	Part No.	Type
	Order code in the CPX configurator: T20	**548931**	**CPX-CMPX-C-1-H1**

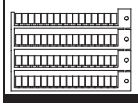
Ordering data – Connecting cables

	Brief description	Cable length [m]	Part No.	Type
	Connecting cable with angled plug and angled socket	0.25	**540327**	**KVI-CP-3-WS-WD-0,25**
		0.5	**540328**	**KVI-CP-3-WS-WD-0,5**
		2	**540329**	**KVI-CP-3-WS-WD-2**
		5	**540330**	**KVI-CP-3-WS-WD-5**
		8	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2	**540332**	**KVI-CP-3-GS-GD-2**
		5	**540333**	**KVI-CP-3-GS-GD-5**
		8	**540334**	**KVI-CP-3-GS-GD-8**
	Connector for control cabinet through-feed	–	**543252**	**KVI-CP-3-SSD**

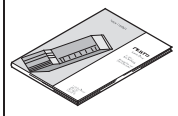
Ordering data – Screws

	Brief description	Part No.	Type
	For mounting on the metal interlinking block	**550219**	**CPX-M-M3X22-4X**

Ordering data – Inscription labels

	Brief description	Number	Part No.	Type
	Inscription labels 6x10, in frames	64	**18576**	**IBS-6X10**

Documentation[1)]

	Language	Part No.	Type
	DE	**555479**	**P.BE-CPX-CMPX-SYS-DE**
	EN	**555480**	**P.BE-CPX-CMPX-SYS-EN**
	ES	**555481**	**P.BE-CPX-CMPX-SYS-ES**
	FR	**555482**	**P.BE-CPX-CMPX-SYS-FR**
	IT	**555483**	**P.BE-CPX-CMPX-SYS-IT**
	SV	**555484**	**P.BE-CPX-CMPX-SYS-SV**

1) Manual in paper form is not included in the scope of delivery

New

Measuring modules CPX-CMIX

Technical data

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

General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	80
Protection against short circuit			Yes
Power failure bridging		[ms]	10
No. of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. no. of modules			9
Display			7-segment display
Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8
Diagnostics			Channel and module-oriented
			Via local 7-segment display
			Undervoltage of modules
			Undervoltage of measuring system
Status display			Power Load
			Error
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			Reinforced polyamide
Product weight		[g]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Measuring modules CPX-CMIX

Technical data

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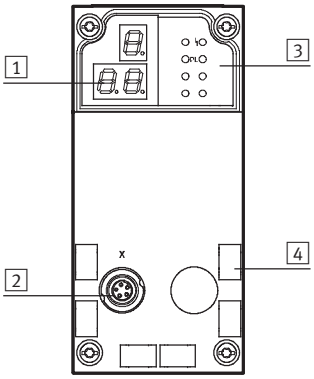
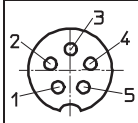
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65
CE mark (see declaration of conformity)		To EU EMC Directive

Connection and display components



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

Pin allocation – Plug 2



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	Screened	Cable screening

Permitted bus nodes/FEC

Bus node/FEC	Protocol	Max. no. of CMIX modules	Remarks
CPX-FEC	–	9	On request
CPX-FB6	Interbus	2	On request
CPX-FB11	DeviceNet	9	Revision 20 (R20) and above
CPX-FB13	Profibus DP	9	Revision 23 (R23) and above
CPX-FB14	CANopen	3	On request
CPX-FB23	CC-Link	9	On request
CPX-FB32	Ethernet/IP	9	On request
CPX-FB33	Profinet, M12	9	On request
CPX-M-FB34	Profinet, RJ45	9	On request
CPX-FB38	EtherCat	9	On request

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Measuring modules CPX-CMIX

Accessories

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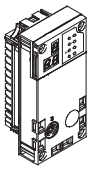
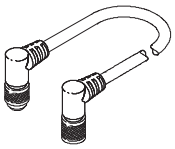
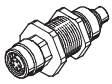
Ordering data – Measuring module

	Brief description	Part No.	Type
	Order code in the CPX configurator: T23	**567417**	**CPX-CMIX-M1-1**

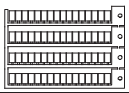
Ordering data – Connecting cables

	Brief description	Cable length [m]	Part No.	Type
	Connecting cable with angled plug and angled socket	0.25	**540327**	**KVI-CP-3-WS-WD-0,25**
		0.5	**540328**	**KVI-CP-3-WS-WD-0,5**
		2	**540329**	**KVI-CP-3-WS-WD-2**
		5	**540330**	**KVI-CP-3-WS-WD-5**
		8	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2	**540332**	**KVI-CP-3-GS-GD-2**
		5	**540333**	**KVI-CP-3-GS-GD-5**
		8	**540334**	**KVI-CP-3-GS-GD-8**
	Connector for control cabinet through-feed	–	**543252**	**KVI-CP-3-SSD**

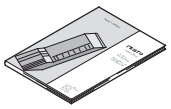
Ordering data – Screws

	Brief description	Part No.	Type
	For mounting on the metal interlinking block	**550219**	**CPX-M-M3X22-4X**

Ordering data – Inscription labels

	Brief description	Number	Part No.	Type
	Inscription labels 6x10, in frames	64	**18576**	**IBS-6X10**

Documentation[1)]

	Language	Part No.	Type
	DE	**567053**	**P.BE-CPX-CMIX-DE**
	EN	**567054**	**P.BE-CPX-CMIX-EN**
	ES	**567055**	**P.BE-CPX-CMIX-ES**
	FR	**567056**	**P.BE-CPX-CMIX-FR**
	IT	**567057**	**P.BE-CPX-CMIX-IT**
	SV	**567058**	**P.BE-CPX-CMIX-SV**

1) Manual in paper form is not included in the scope of delivery

Terminal CPX

Technical data – Input module, digital

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Function

Digital input modules enable the connection of two-wire and three-wire sensors (proximity sensors, 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).

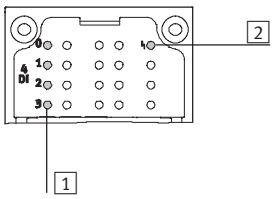
Applications

- Input modules for 24 V DC sensor supply voltage
- PNP or NPN logic
- Supports connection blocks with M12, M8, Sub-D, Harax 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 protection

General technical data						
Type			CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
No. of inputs			4	8	8	8
Max. residual current of inputs per module		[A]	0.7	1	0.7	0.7
Fuse protection			Internal electronic fuse for each module	Internal electronic fuse for each module	Internal electronic fuse for each channel	Internal electronic fuse for each module
Intrinsic current consumption at operating voltage		[mA]	Typically 15			
Operating voltage	Nominal value	[V DC]	24			
	Permissible range	[V DC]	18 ... 30			
Electrical 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 curve			IEC 1131 Part 2			
Switching logic			Positive logic (PNP)			Negative logic (NPN)
LED displays	Group diagnostics		1	1	1	1
	Channel diagnostics		–	–	8	–
	Channel status		4	8	8	8
Diagnostics			Short circuit/overload per channel			
Parameterisation			• Module monitoring • Behaviour after short circuit • Input debounce time • Signal stretching time			
Protection class to EN 60529			Depending on connection block			
Temperature range	Operation	[°C]	–5 ... +50			
	Storage/transport	[°C]	–20 ... +70			
Materials			Reinforced polyamide, polycarbonate			
Grid dimension		[mm]	50			
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50			
Weight		[g]	38			

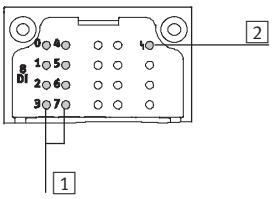
Connection and display components

CPX-4DE



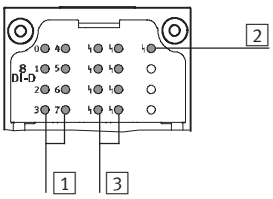
1 Status LEDs (green)

CPX-8DE



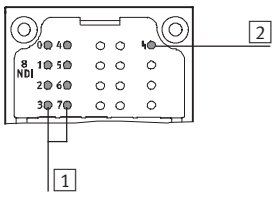
2 Error LED (red, module error)

CPX-8DE-D



3 Channel-specific error LEDs (red)

CPX-8NDE



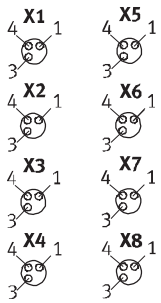
Allocation to inputs
➔ Pin allocation for module

Connection block/digital input module combinations

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-AB-4-HAR-4POL	**525636**	■	■	■	■
CPX-M-4-M12x2-5POL	**549367**	■	■	■	■
CPX-AB-4-M12x2-5P-R-M3	**546997**	■	■	■	■

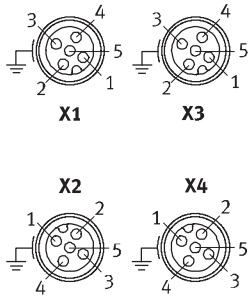
Pin allocation

CPX-AB-8-M8-3POL



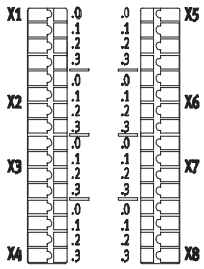
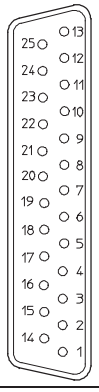
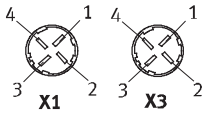
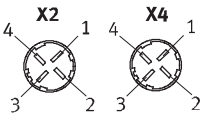
CPX-4DE		CPX-8DE, CPX-8DE-D and CPX-8NDE	
X1.1: 24 V_{SEN}	X5.1: 24 V_{SEN}	X1.1: 24 $V_{SEN\ x}$	X5.1: 24 $V_{SEN\ x+4}$
X1.3: 0 V_{SEN}	X5.3: 0 V_{SEN}	X1.3: 0 $V_{SEN\ x}$	X5.3: 0 $V_{SEN\ x+4}$
X1.4: Input x	X5.4: Input x+2	X1.4: Input x	X5.4: Input x+4
X2.1: 24 V_{SEN}	X6.1: 24 V_{SEN}	X2.1: 24 $V_{SEN\ x+1}$	X6.1: 24 $V_{SEN\ x+5}$
X2.3: 0 V_{SEN}	X6.3: 0 V_{SEN}	X2.3: 0 $V_{SEN\ x+1}$	X6.3: 0 $V_{SEN\ x+5}$
X2.4: Input x+1	X6.4: Input x+3	X2.4: Input x+1	X6.4: Input x+5
X3.1: 24 V_{SEN}	X7.1: 24 V_{SEN}	X3.1: 24 $V_{SEN\ x+2}$	X7.1: 24 $V_{SEN\ x+6}$
X3.3: 0 V_{SEN}	X7.3: 0 V_{SEN}	X3.3: 0 $V_{SEN\ x+2}$	X7.3: 0 $V_{SEN\ x+6}$
X3.4: Input x+1	X7.4: Input x+3	X3.4: Input x+2	X7.4: Input x+6
X4.1: 24 V_{SEN}	X8.1: 24 V_{SEN}	X4.1: 24 $V_{SEN\ x+3}$	X8.1: 24 $V_{SEN\ x+7}$
X4.3: 0 V_{SEN}	X8.3: 0 V_{SEN}	X4.3: 0 $V_{SEN\ x+3}$	X8.3: 0 $V_{SEN\ x+7}$
X4.4: n.c.	X8.4: n.c.	X4.4: Input x+3	X8.4: Input x+7

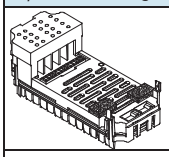
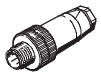
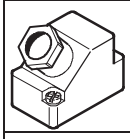
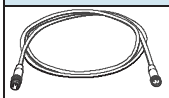
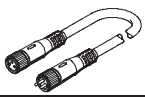
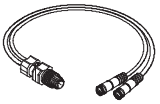
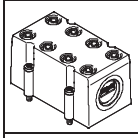
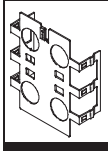
CPX-AB-4-M12X2-5POL and CPX-AB-4-M12X2-5POL-R[1)]

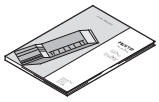


X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}	X1.1: 24 $V_{SEN\ x}$	X3.1: 24 $V_{SEN\ x+4}$
X1.2: Input x+1	X3.2: Input x+3	X1.2: Input x+1	X3.2: Input x+5
X1.3: 0 V_{SEN}	X3.3: 0 V_{SEN}	X1.3: 0 $V_{SEN\ x}$	X3.3: 0 $V_{SEN\ x+4}$
X1.4: Input x	X3.4: Input x+2	X1.4: Input x	X3.4: Input x+4
X1.5: FE	X3.5: FE	X1.5: FE	X3.5: FE
X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}	X2.1: 24 $V_{SEN\ x+2}$	X4.1: 24 $V_{SEN\ x+6}$
X2.2: n.c.	X4.2: n.c.	X2.2: Input x+3	X4.2: Input x+7
X2.3: 0 V_{SEN}	X4.3: 0 V_{SEN}	X2.3: 0 V_{SENx+2}	X4.3: 0 $V_{SEN\ x+6}$
X2.4: Input x+1	X4.4: Input x+3	X2.4: Input x+2	X4.4: Input x+6
X2.5: FE	X4.5: FE	X2.5: FE	X4.5: FE

1) Speedcon quick lock, screening additionally on metal thread

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

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)		**541480**	**CPX-8DE-D**
	8 digital inputs, negative logic (NPN)		**543813**	**CPX-8NDE**
Plug				
	Push-in T-connector	2x socket M12, 5-pin 1x plug M12, 4-pin	**541596**	**NEDU-M12D5-M12T4**
		2x socket M8, 3-pin 1x plug M12, 4-pin	**541597**	**NEDU-M8D3-M12T4**
	Plug	M8, 3-pin, solderable	**18696**	**SEA-GS-M8**
		M8, 3-pin, screw-in	**192009**	**SEA-3GS-M8-S**
		M12, 4-pin, PG7	**18666**	**SEA-GS-7**
		M12, PG7, 4-pin for cable ∅ 2.5 mm	**192008**	**SEA-4GS-7-2,5**
		M12, 4-pin, PG9	**18778**	**SEA-GS-9**
		M12, 4 pin for 2 cables	**18779**	**SEA-GS-11-DUO**
		M12 for 2 cables, 5-pin	**192010**	**SEA-5GS-11-DUO**
		M12, 5-pin	**175487**	**SEA-M12-5GS-PG7**
	HARAX plug, 4-pin		**525928**	**SEA-GS-HAR-4POL**
	Sub-D plug, 25-pin		**527522**	**SD-SUB-D-ST25**
Connecting cable				
	Connecting cable M8-M8	0.5 m	**175488**	**KM8-M8-GSGD-0,5**
		1.0 m	**175489**	**KM8-M8-GSGD-1**
		2.5 m	**165610**	**KM8-M8-GSGD-2,5**
		5.0 m	**165611**	**KM8-M8-GSGD-5**
	Connecting cable M12-M12	2.5 m	**18684**	**KM12-M12-GSGD-2,5**
		5.0 m	**18686**	**KM12-M12-GSGD-5**
		1.0 m	**185499**	**KM12-M12-GSWD-1-4**
	Modular system for connecting cables		–	**NEBU-...** ➔ Internet: nebu
	DUO cable M12	2x straight socket	**18685**	**KM12-DUO-M8-GDGD**
		2x straight/angled socket	**18688**	**KM12-DUO-M8-GDWD**
		2x angled socket	**18687**	**KM12-DUO-M8-WDWD**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**

Ordering data				
Designation			Part No.	Type
User manual				
	User manual	German	**526439**	**P.BE-CPX-EA-DE**
		English	**526440**	**P.BE-CPX-EA-EN**
		Spanish	**526441**	**P.BE-CPX-EA-ES**
		French	**526442**	**P.BE-CPX-EA-FR**
		Italian	**526443**	**P.BE-CPX-EA-IT**
		Swedish	**526444**	**P.BE-CPX-EA-SV**

Terminal CPX

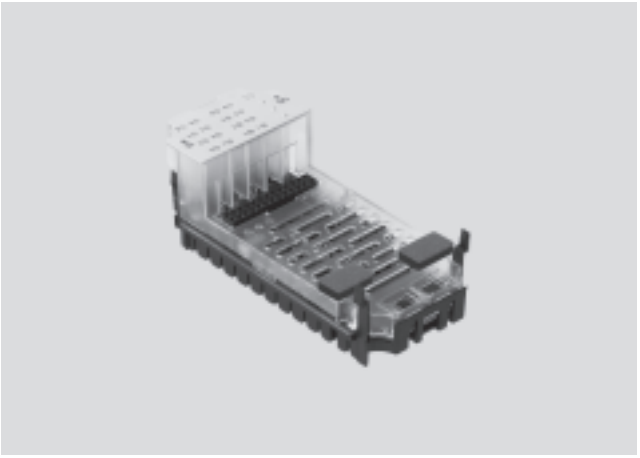
Technical data – Input module, digital, 16 inputs

Function

Digital input modules enable the connection of two-wire and three-wire sensors (proximity sensors, 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).

Applications

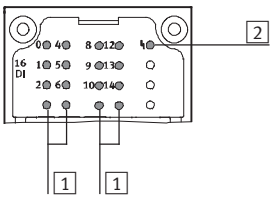
- Input modules for 24 V DC sensor supply voltage
- PNP logic
- Module features can be parameterised
- The input module receives the voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection



General technical data				
Type			CPX-16DE	CPX-M-16DE-D
No. of inputs			16	16
Max. power supply	Per module	[A]	1.8	1.8
	Per channel	[A]	0.5	0.5 (per channel pair)
Fuse protection			Internal electronic fuse for each module	Internal electronic fuse for each channel pair
Intrinsic current consumption at operating voltage		[mA]	Typically 15	Typically 34
Supply voltage of sensors		[V DC]	24 ±25%	24 ±25%
Electrical isolation	Channel – channel		No	No
	Channel – internal bus		No	No
Switching level	Signal 0	[V DC]	≤ 5	≤ 5
	Signal 1	[V DC]	≥ 11	≥ 11
Input debounce time		[ms]	3 (0.1 ms, 10, 20 parameterisable)	3 (0.1 ms, 10, 20 parameterisable)
Input characteristic curve			IEC 1131-2	IEC 1131-2
Switching logic			Positive logic (PNP)	Positive logic (PNP)
LED displays	Group diagnostics		1	1
	Channel diagnostics		–	16
	Channel status		16	16
Diagnostics			Short circuit/overload, sensor supply	Short circuit/overload per channel
Parameterisation			• Module monitoring • Behaviour after short circuit • Input debounce time • Signal stretching time	• Module monitoring • Behaviour after short circuit • Input debounce time • Signal stretching time
Protection class to EN 60529			Depending on connection block	Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50	–5 ... +50
	Storage/transport	[°C]	–20 ... +70	–20 ... +70
Materials			Polymer	Polymer
Grid dimension		[mm]	50	50
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	50 x 107 x 50
Weight		[g]	38	38

Connection and display components

CPX-16DE

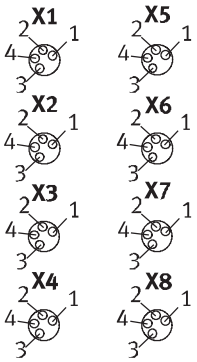


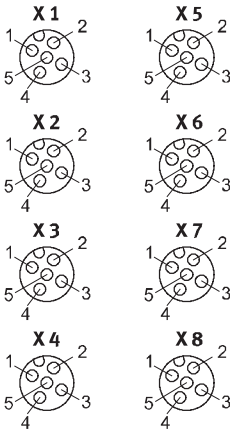
1 Status LEDs (green)
Allocation to inputs
➔ Pin allocation for module
2 Error LED (red, module error)

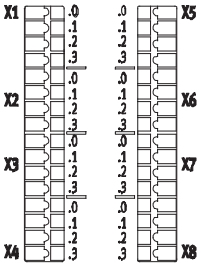
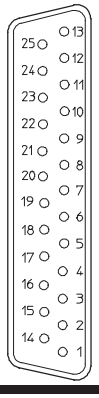
Connection block/digital input module combinations

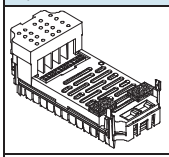
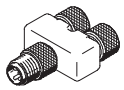
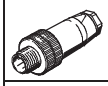
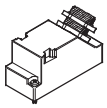
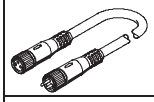
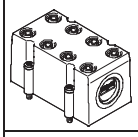
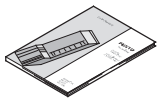
Connection blocks	Part No.	Digital input modules	
		CPX-16DE	CPX-M-16DE-D
CPX-AB-8-M8X2-4POL	**541256**	■	–
CPX-AB-8-KL-4POL	**195708**	■	–
CPX-AB-1-SUB-BU-25POL	**525676**	■	–
CPX-M-8-M12x2-5POL	**549335**	–	■
CPX-AB-8-M8x2-4P-M3	**556166**	■	–

Pin allocation

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

Pin allocation		
Connection block inputs	CPX-M-16DE-D	
CPX-M-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 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 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 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	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 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 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 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

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

Ordering data				
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 metal		**550202**	**CPX-M-16DE-D**
Plug				
	Push-in T-connector	2x socket M8, 3-pin 1x plug M8, 4-pin	**544391**	**NEDU-M8D3-M8T4**
	M8 plug, 3-pin	Solderable	**18696**	**SEA-GS-M8**
		Screw-in	**192009**	**SEA-3GS-M8-S**
	Sub-D plug, 25-pin		**527522**	**SD-SUB-D-ST25**
Connecting cable				
	Connecting cable M8-M8	0.5 m	**175488**	**KM8-M8-GSGD-0,5**
		1.0 m	**175489**	**KM8-M8-GSGD-1**
		2.5 m	**165610**	**KM8-M8-GSGD-2,5**
		5.0 m	**165611**	**KM8-M8-GSGD-5**
	Modular system for connecting cables		–	**NEBU-...** ➔ Internet: nebu
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
User manual				
	User manual	German	**526439**	**P.BE-CPX-EA-DE**
		English	**526440**	**P.BE-CPX-EA-EN**
		Spanish	**526441**	**P.BE-CPX-EA-ES**
		French	**526442**	**P.BE-CPX-EA-FR**
		Italian	**526443**	**P.BE-CPX-EA-IT**
		Swedish	**526444**	**P.BE-CPX-EA-SV**

Terminal CPX

Technical data – Output module, digital

FESTO

Function

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

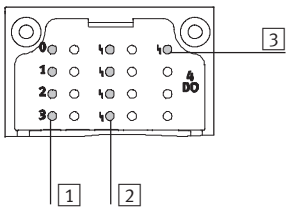
Applications

- 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 protection in each channel

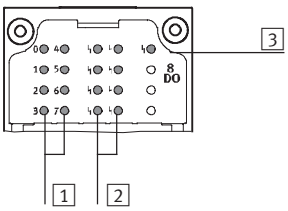
General technical data					
Type			CPX-4DA	CPX-8DA	CPX-8DA-H
No. of outputs			4	8	8
Max. power supply	Per module	[A]	4		8.4
	Per channel	[A]	1 (24 W lamp load, 4 channels can be connected in parallel)	0.5 (12 W lamp load, 8 channels can be connected in parallel)	2.1 (50 W lamp load), per channel pair
Fuse protection (short circuit)			Internal electronic fuse for each channel		
Module current consumption (voltage supply for electronics)		[mA]	Typically 16		Typically 34
Operating voltage	Nominal value	[V DC]	24		
	Permissible range	[V DC]	18 ... 30		
Electrical isolation	Channel – channel		No		
	Channel – internal bus		Yes, using an intermediate supply		
Output characteristic curve			To IEC 1131-2		
Switching logic			Positive logic (PNP)		
LED displays	Group diagnostics		1	1	1
	Channel diagnostics		4	8	8
	Channel status		4	8	8
Diagnostics			• Short circuit/overload, channel x • Undervoltage of outputs		
Parameterisation			• Module monitoring • Behaviour after short circuit • Fail-safe channel x • Forcing channel x • Idle mode channel x		
Protection class to EN 60529			Depending on connection block		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage/transport	[°C]	–20 ... +70		
Materials			Reinforced polyamide, polycarbonate		
Grid dimension		[mm]	50		
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50		
Weight		[g]	38		

Connection and display components

CPX-4DA



CPX-8DA

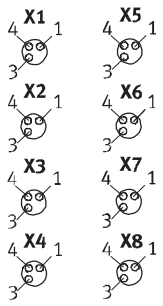


1 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module
2 Channel-specific error LEDs (red)
3 Error LED (red, module error)

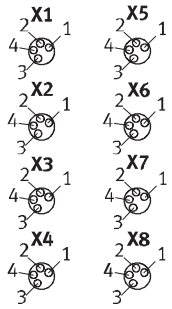
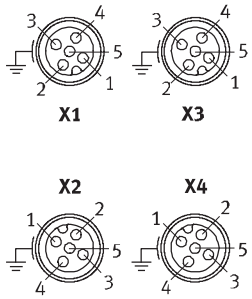
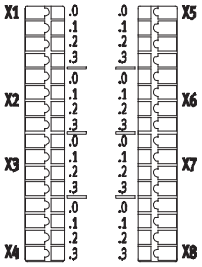
Connection block/digital output module combinations

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-AB-4-HAR-4POL	**525636**	■	■	–
CPX-AB-8-M8x2-4P-M3	**556166**	■	■	■
CPX-AB-4-M12x2-5P-R-M3	**546997**	■	■	■
CPX-M-4-M12x2-5POL	**549367**	■	■	■

Pin allocation

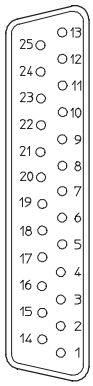
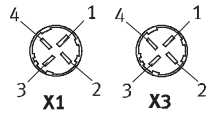
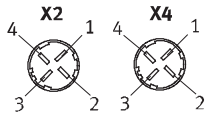
Connection block outputs	CPX-4DA		CPX-8DA	
CPX-AB-8-M8-3POL				
	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+1 X4.1: n.c. X4.3: 0 V_{OUT} X4.4: n.c.	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+2 X6.1: n.c. X6.3: 0 V_{OUT}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

Pin allocation

Connection block outputs	CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-8-M8X2-4POL and CPX-AB-8-M8x2-4P-M3				
	X1.1: 0 V_{OUT}	X5.1: 0 V_{OUT}	X1.1: 0 V_{OUT}	X5.1: 0 V_{OUT}
	X1.2: Output x+1	X5.2: n.c.	X1.2: Output x+1	X5.2: n.c.
	X1.3: 0 V_{OUT}	X5.3: 0 V_{OUT}	X1.3: 0 V_{OUT}	X5.3: 0 V_{OUT}
	X1.4: Output x	X5.4: n.c.	X1.4: Output x	X5.4: n.c.
	X2.1: 0 V_{OUT}	X6.1: 0 V_{OUT}	X2.1: 0 V_{OUT}	X6.1: 0 V_{OUT}
	X2.2: n.c.	X6.2: n.c.	X2.2: Output x+3	X6.2: n.c.
	X2.3: 0 V_{OUT}	X6.3: 0 V_{OUT}	X2.3: 0 V_{OUT}	X6.3: 0 V_{OUT}
	X2.4: Output x+1	X6.4: n.c.	X2.4: Output x+2	X6.4: n.c.
	X3.1: 0 V_{OUT}	X7.1: 0 V_{OUT}	X3.1: 0 V_{OUT}	X7.1: 0 V_{OUT}
	X3.2: Output x+3	X7.2: n.c.	X3.2: Output x+5	X7.2: n.c.
	X3.3: 0 V_{OUT}	X7.3: 0 V_{OUT}	X3.3: 0 V_{OUT}	X7.3: 0 V_{OUT}
	X3.4: Output x+2	X7.4: n.c.	X3.4: Output x+4	X7.4: n.c.
	X4.1: 0 V_{OUT}	X8.1: 0 $V_{OUT\,x+1}$	X4.1: 0 V_{OUT}	X8.1: 0 V_{OUT}
	X4.2: n.c.	X8.2: n.c.	X4.2: Output x+7	X8.2: n.c.
	X4.3: 0 V_{OUT}	X8.3: 0 $V_{OUT\,x+3}$	X4.3: 0 V_{OUT}	X8.3: 0 V_{OUT}
	X4.4: Output x+3	X8.4: n.c.	X4.4: Output x+6	X8.4: n.c.
CPX-AB-4-M12X2-5POL[1], CPX-AB-4-M12X2-5POL-R[2] and CPX-AB-4-M12x2-5P-R-M3[2]				
	X1.1: n.c.	X3.1: n.c.	X1.1: n.c.	X3.1: n.c.
	X1.2: Output x+1	X3.2: Output x+3	X1.2: Output x+1	X3.2: Output x+5
	X1.3: 0 V_{OUT}	X3.3: 0 V_{OUT}	X1.3: 0 V_{OUT}	X3.3: 0 V_{OUT}
	X1.4: Output x	X3.4: Output x+2	X1.4: Output x	X3.4: Output x+4
	X1.5: FE	X3.5: FE	X1.5: FE	X3.5: FE
	X2.1: n.c.	X4.1: n.c.	X2.1: n.c.	X4.1: n.c.
	X2.2: n.c.	X4.2: n.c.	X2.2: Output x+3	X4.2: Output x+7
	X2.3: 0 V_{OUT}	X4.3: 0 V_{OUT}	X2.3: 0 V_{OUT}	X4.3: 0 V_{OUT}
	X2.4: Output x+1	X4.4: Output x+3	X2.4: Output x+2	X4.4: Output x+6
	X2.5: FE	X4.5: FE	X2.5: FE	X4.5: FE
CPX-AB-8-KL-4POL				
	X1.0: n.c.	X5.0: n.c.	X1.0: n.c.	X5.0: n.c.
	X1.1: 0 V_{OUT}	X5.1: 0 V_{OUT}	X1.1: 0 V_{OUT}	X5.1: 0 V_{OUT}
	X1.2: Output x	X5.2: Output x+2	X1.2: Output x	X5.2: Output x+4
	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.
	X2.1: 0 V_{OUT}	X6.1: 0 V_{OUT}	X2.1: 0 V_{OUT}	X6.1: 0 V_{OUT}
	X2.2: Output x+1	X6.2: Output x+3	X2.2: Output x+1	X6.2: Output x+5
	X2.3: FE	X6.3: FE	X2.3: FE	X6.3: FE
	X3.0: n.c.	X7.0: n.c.	X3.0: n.c.	X7.0: n.c.
	X3.1: 0 V_{OUT}	X7.1: 0 V_{OUT}	X3.1: 0 V_{OUT}	X7.1: 0 V_{OUT}
	X3.2: Output x+1	X7.2: Output x+3	X3.2: Output x+2	X7.2: Output x+6
	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.
	X4.1: 0 V_{OUT}	X8.1: 0 V_{OUT}	X4.1: 0 V_{OUT}	X8.1: 0 V_{OUT}
	X4.2: n.c.	X8.2: n.c.	X4.2: Output x+3	X8.2: Output x+7
	X4.3: FE	X8.3: FE	X4.3: FE	X8.3: FE

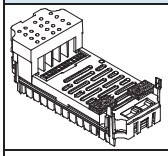
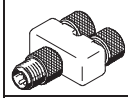
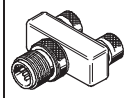
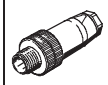
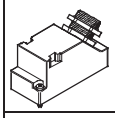
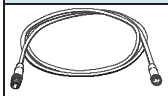
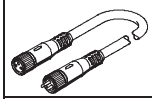
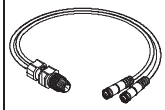
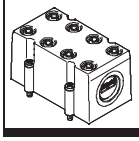
1) Not suitable for CPX-8DA-H.

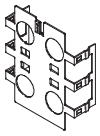
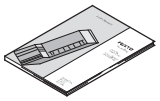
2) Speedcon quick lock, screening additionally on metal thread

Pin allocation				
Connection block outputs	CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-1-SUB-BU-25POL				
	1: Output x 2: Output x+1 3: Output x+1 4: n.c. 5: n.c. 6: 0 V_{OUT} 7: n.c. 8: 0 V_{OUT} 9: n.c. 10: n.c. 11: 0 V_{OUT} 12: 0 V_{OUT} 13: FE	14: Output x+2 15: Output x+3 16: Output x+3 17: n.c. 18: n.c. 19: n.c. 20: n.c. 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE Socket: FE	1: Output x 2: Output x+1 3: Output x+2 4: Output x+3 5: n.c. 6: 0 V_{OUT} 7: n.c. 8: 0 V_{OUT} 9: n.c. 10: n.c. 11: 0 V_{OUT} 12: 0 V_{OUT} 13: FE	14: Output x+4 15: Output x+5 16: Output x+6 17: Output x+7 18: n.c. 19: n.c. 20: n.c. 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE Socket: FE
CPX-AB-4-HAR-4POL[1]				
	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4
	X2.1: n.c. X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1	X4.1: n.c. X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3	X2.1: n.c. X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2	X4.1: n.c. X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6

1) Not suitable for CPX-8DA-H.

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**
Plug			
	Push-in T-connector, 2x socket M8, 3-pin, 1x plug M8, 4-pin	**544391**	**NEDU-M8D3-M8T4**
	Push-in T-connector, 2x socket M12, 5-pin, 1x plug M12, 4-pin	**541596**	**NEDU-M12D5-M12T4**
	2x socket M8, 3-pin, 1x plug M12, 4-pin	**541597**	**NEDU-M8D3-M12T4**
	Plug, M8, 3-pin, solderable	**18696**	**SEA-GS-M8**
	M8, 3-pin, screw-in	**192009**	**SEA-3GS-M8-S**
	M12, PG7	**18666**	**SEA-GS-7**
	M12, PG7, 4-pin for cable ∅ 2.5 mm	**192008**	**SEA-4GS-7-2,5**
	M12, PG9	**18778**	**SEA-GS-9**
	M12 for 2 cables	**18779**	**SEA-GS-11-DUO**
	M12 for 2 cables, 5-pin	**192010**	**SEA-5GS-11-DUO**
	M12, 5-pin	**175487**	**SEA-M12-5GS-PG7**
	HARAX plug, 4-pin	**525928**	**SEA-GS-HAR-4POL**
	Sub-D plug, 25-pin	**527522**	**SD-SUB-D-ST25**
Connecting cable			
	Connecting cable M8-M8, 0.5 m	**175488**	**KM8-M8-GSGD-0,5**
	1.0 m	**175489**	**KM8-M8-GSGD-1**
	2.5 m	**165610**	**KM8-M8-GSGD-2,5**
	5.0 m	**165611**	**KM8-M8-GSGD-5**
	Connecting cable M12-M12, 2.5 m	**18684**	**KM12-M12-GSGD-2,5**
	5.0 m	**18686**	**KM12-M12-GSGD-5**
	1.0 m	**185499**	**KM12-M12-GSWD-1-4**
	Modular system for connecting cables	**–**	**NEBU-...** ➔ Internet: nebu
	DUO cable M12, 2x straight socket	**18685**	**KM12-DUO-M8-GDGD**
	2x straight/angled socket	**18688**	**KM12-DUO-M8-GDWD**
	2x angled socket	**18687**	**KM12-DUO-M8-WDWD**
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	**538219**	**AK-8KL**
	Fittings kit	**538220**	**VG-K-M9**

Ordering data				
Designation			Part No.	Type
Screening plate				
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
User manual				
	User manual	German	**526439**	**P.BE-CPX-EA-DE**
		English	**526440**	**P.BE-CPX-EA-EN**
		Spanish	**526441**	**P.BE-CPX-EA-ES**
		French	**526442**	**P.BE-CPX-EA-FR**
		Italian	**526443**	**P.BE-CPX-EA-IT**
		Swedish	**526444**	**P.BE-CPX-EA-SV**

Terminal CPX

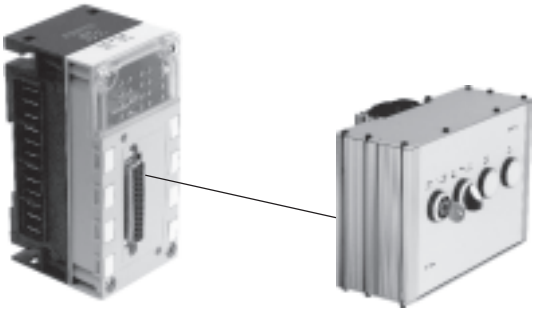
Technical data – Input/output module, digital

FESTO

Applications

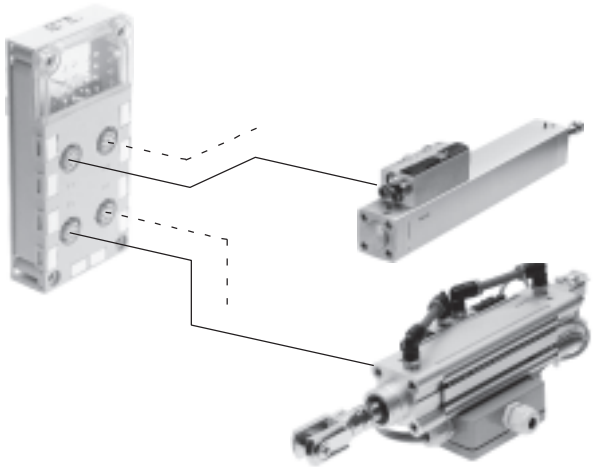
- Digital multi I/O module for 24 V DC supply voltage
- Supports connection blocks with Sub-D, terminal connection and M12 connection (8-pin)
- Module features can be parameterised
- The inputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive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

Function



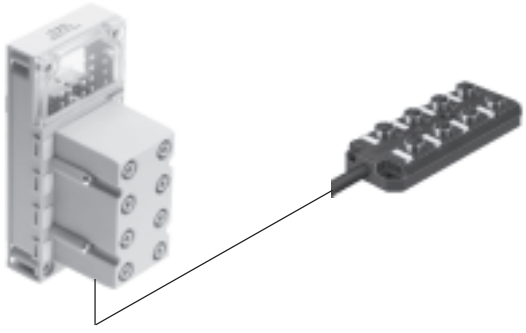
The multi I/O module controls devices with a high number of inputs and outputs per connection point. Because the module supports Sub-D connection blocks, consoles with pushbuttons and lamps can be connected to the CPX terminal using a minimal amount of installation space.

Up to eight inputs and outputs can be connected to a connection point with IP65 protection.



Support for the M12 connection block (8-pin) means that up to four cylinder-valve combinations with integrated sensors can be connected. Each cylinder-valve combination is supported by two inputs and two outputs per socket. It is therefore possible to control max. two solenoid coils and operate two sensors with a pre-assembled cable.

Two inputs on two sockets are bridged to provide support for the diagnostic module of the cylinder-valve combination. This effectively means that there are three inputs and two outputs available on two sockets.



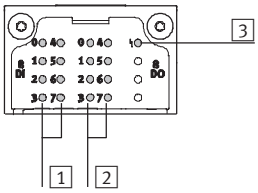
As an alternative to the Sub-D and M12 connection block (8-pin) for installation with higher protection to IP65, the terminal connection block produces an identical result for installation with IP20 protection – or with IP65/67 protection with additional cover.

Subordinate I/O modules with multi-pin plug connection (Sub-D plug or multi-pin cable for self-assembly) support the cost-effective and space-saving integration of critical installation areas such as energy chains or upstream functions.

General technical data			
Type			**CPX-8DE-8DA**
No. of	Inputs		8
	Outputs		8
Max. power supply per module	Sensor supply	[A]	0.7
	Outputs	[A]	4
Max. power supply per channel	Sensor supply	[A]	0.5
	Outputs	[A]	0.5
Max. power supply per channel		[A]	0.5 (12 W lamp load, channels A0 ... A03 can be connected in parallel with A4 ... A7)
Fuse protection	Sensor supply		Internal electronic fuse for sensor supply
	Outputs		Internal electronic fuse for each channel
Internal current consumption of electronic components	Inputs	[mA]	Typically 22
	Outputs	[mA]	Typically 34
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Galvanic isolation, inputs	Channel – channel		No
	Channel – internal bus		No
Galvanic isolation, outputs	Channel – channel		No
	Channel – internal bus		Yes, using an intermediate supply
Characteristic curve	Inputs		IEC 1131-2
	Outputs		IEC 1131-2
Switching level, inputs	Signal 0	[V DC]	≤ 5
	Signal 1	[V DC]	≥ 11
Input debounce time		[ms]	3 (0.1, 10, 20 parameterisable)
Switching logic			Positive logic (PNP)
LED displays	Group diagnostics		1
	Channel diagnostics		–
	Channel status		16
Diagnostics	Inputs		• Short circuit/overload, sensor supply
	Outputs		• Short circuit/overload, output channel x • Undervoltage of outputs
Parameterisation	Inputs		• Module monitoring • Behaviour after short circuit, sensor supply • Input debounce time • Signal stretching time, inputs
	Outputs		• Behaviour after short circuit • Fail-safe channel x • Forcing channel x • Idle mode channel x
Protection class to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced polyamide, polycarbonate
Grid dimension		[mm]	50
Dimensions (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

Connection and display components

CPX-8DE-8DA



1 Status LEDs (green)
Allocation to inputs
➔ Pin allocation for module

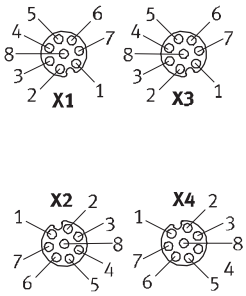
2 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module

3 Error LED (red)
(module error)

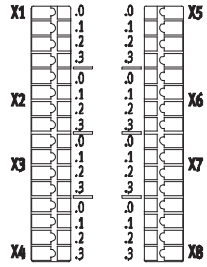
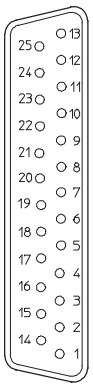
Connection block/digital I/O module combinations

Connection blocks	Part No.	Digital I/O module
		CPX-8DE-8DA
CPX-AB-4-M12-8POL	**526178**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-AB-1-SUB-BU-25POL	**525676**	■
CPX-AB-4-M12-8P-M3	**556168**	■

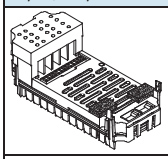
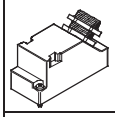
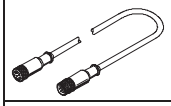
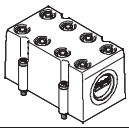
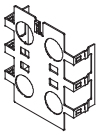
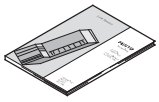
Pin allocation

Connection block inputs/outputs	CPX-8DE-8DA	
CPX-AB-4-M12-8POL and CPX-AB-4-M12-8P-M3		
	X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}
	X1.2: Input x	X3.2: Input x+4
	X1.3: Input x+1	X3.3: Input x+5
	X1.4: 0 V_{SEN}	X3.4: 0 V_{SEN}
	X1.5: Output x	X3.5: Output x+4
	X1.6: Output x+1	X3.6: Output x+5
	X1.7: Input x+4	X3.7: n.c.
	X1.8: 0 V_{OUT}	X3.8: 0 V_{OUT}
	X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}
	X2.2: Input x+2	X4.2: Input x+6
	X2.3: Input x+3	X4.3: Input x+7
	X2.4: 0 V_{SEN}	X4.4: 0 V_{SEN}
	X2.5: Output x+2	X4.5: Output x+6
	X2.6: Output x+3	X4.6: Output x+7
	X2.7: Input x+6	X4.7: n.c.
	X2.8: 0 V_{OUT}	X4.8: 0 V_{OUT}

Pin allocation

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

Ordering data

Designation		Part No.	Type
Input/output module, digital			
	8 digital inputs, 8 digital outputs	**526257**	**CPX-8DE-8DA**
Plug			
	Sub-D plug, 25-pin	**527522**	**SD-SUB-D-ST25**
Connecting cable			
	Connecting cable M12	**525617**	**KM12-8GD8GS-2-PU**
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 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 manual			
	User manual, German	**526439**	**P.BE-CPX-EA-DE**
	English	**526440**	**P.BE-CPX-EA-EN**
	Spanish	**526441**	**P.BE-CPX-EA-ES**
	French	**526442**	**P.BE-CPX-EA-FR**
	Italian	**526443**	**P.BE-CPX-EA-IT**
	Swedish	**526444**	**P.BE-CPX-EA-SV**

Terminal CPX

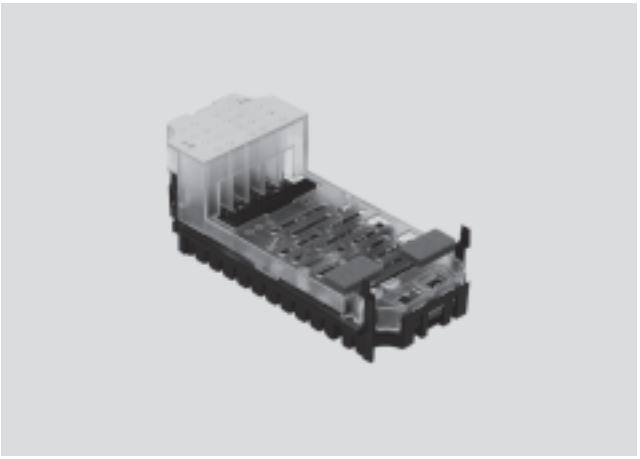
Technical data – Analogue module for inputs

Function

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

Applications

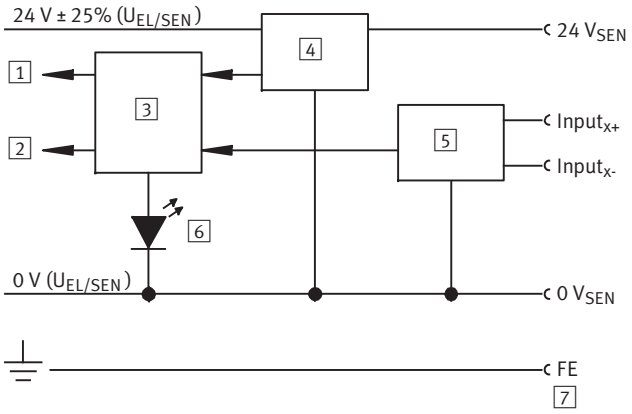
- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without galvanic isolation possible
- The analogue module receives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



General technical data				
Type		CPX-2AE-U-I		CPX-4AE-I
		Voltage input	Current input	Current input
No. of analogue inputs		2		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		
Current consumption from 24 V sensor supply (at full load)	[A]	Max. 0.7		
Supply voltage of sensors	[V DC]	24 ±25%		
Signal range (parameterisable for each channel by means of DIL switch or software)		0 ... 10 V DC	0 ... 20 mA 4 ... 20 mA	0 ... 20 mA 4 ... 20 mA
Resolution		12 bits		
No. of units		4,096		
Absolute accuracy	[%]	±0.5	±0.6	±0.6
Linearity errors (no software scaling)	[%]	±0.05	±0.05	±0.05
Repetition accuracy (at 25 °C)	[%]	0.15	0.15	0.15
Input resistance		100 kΩ	≤ 100 Ω	≤ 100 Ω
Max. permissible input voltage	[V DC]	30	–	–
Max. permissible input current	[mA]	–	40	40
Conversion time per channel	[µs]	Typically 150		
Cycle time (module)	[ms]	≤ 4		≤ 10

General technical data			
Data format			Prefix + 15 bits, linear scaling Prefix + 12 bits right-justified, type 03 compatible Prefix + 15 bits left-aligned, S7 compatible Prefix + 12 bits left-aligned + diagnostics, S5 compatible
Cable length		[m]	Max. 30 (screened)
Electrical isolation	Channel – channel		No
	Channel – internal bus		Yes, with external sensor supply
	Channel – sensor supply		Yes, with external sensor supply
LED displays	Group diagnostics		1
	Channel diagnostics		Yes, by means of flashing frequency of group diagnostics
Diagnostics			• Short circuit/overload, sensor supply • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break (with measuring range 4 … 20 mA)
Parameterisation			• Short circuit monitoring, sensor supply • Behaviour after short circuit, sensor supply • Data format • Lower limit value/full-scale value • Upper limit value/full-scale value • Monitoring of value falling below nominal range/full-scale value • Monitoring of value exceeding nominal range/full-scale value • Monitoring of wire break (with measuring range 4 … 20 mA) • Signal range • Measured value smoothing
Protection class to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 … +50
	Storage/transport	[°C]	–20 … +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

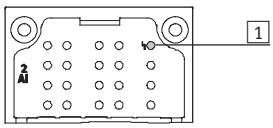
Internal structure, basic representation



1 Diagnostics
2 $Input_x$ (PLC/IPC via fieldbus)
3 Logic
4 Monitoring/disconnection of sensor supply
5 D/A conversion
6 Error LED (red, module error)
7 Connections on the connection block

Connection and display components

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

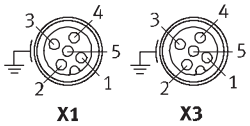
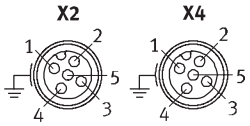
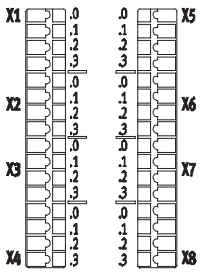


1 Error LED (red, module error)

Connection block/analogue module combinations

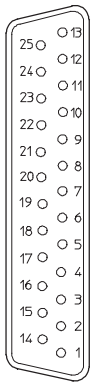
Connection blocks	Part No.	Analogue module	
		CPX-2AE-U-I	CPX-4AE-I
CPX-AB-4-M12X2-5POL	**195704**	■	■
CPX-AB-4-M12X2-5POL-R	**541254**	■	■
CPX-AB-8-KL-4POL	**195708**	■	■
CPX-AB-1-SUB-BU-25POL	**525676**	■	■
CPX-AB-4-M12x2-5P-R-M3	**546997**	■	■
CPX-M-4-M12x2-5POL	**549367**	■	■

Pin allocation

Connection block inputs	CPX-2AE-U-I		CPX-4AE-I	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1], CPX-M-4-M12x2-5POL and CPX-AB-4-M12x2-5P-R-M3[1]				
	X1.1: 24 V_{SEN} X1.2: Input U0+ X1.3: 0 V_{SEN} X1.4: Input U0– X1.5: FE[2]	X3.1: 24 V_{SEN} X3.2: Input U1+ X3.3: 0 V_{SEN} X3.4: Input U1– X3.5: FE[2]	X1.1: 24 V_{SEN} X1.2: Input I0+ X1.3: 0 V_{SEN} X1.4: Input I0– X1.5: FE[2]	X3.1: 24 V_{SEN} X3.2: Input I2+ X3.3: 0 V_{SEN} X3.4: Input I2– X3.5: FE[2]
	X2.1: 24 V_{SEN} X2.2: Input I0+ X2.3: 0 V_{SEN} X2.4: Input I0– X2.5: FE[2]	X4.1: 24 V_{SEN} X4.2: Input I1+ X4.3: 0 V_{SEN} X4.4: Input I1– X4.5: FE[2]	X2.1: 24 V_{SEN} X2.2: Input I1+ X2.3: 0 V_{SEN} X2.4: Input I1– X2.5: FE[2]	X4.1: 24 V_{SEN} X4.2: Input I3+ X4.3: 0 V_{SEN} X4.4: Input I3– X4.5: FE[2]
CPX-AB-8-KL-4POL				
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input U0– X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input I0– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input I0+ X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input U1– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Input U1+ X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input I1– X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Input I1+ X8.3: FE	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input I0– X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Input I0+ X2.3: FE X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input I1– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input I1+ X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input I2– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Input I2+ X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input I3– X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Input I3+ X8.3: FE

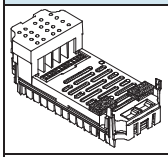
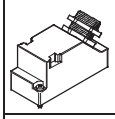
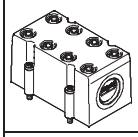
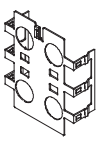
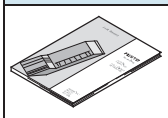
1) Speedcon quick lock, screening additionally on metal thread
2) FE/screening additionally on metal thread

Pin allocation

Connection block inputs	CPX-2AE-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: Screening[1]	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 Socket: 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: Screening[1]	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 Socket: FE

1) Connect screening to functional earth FE

Ordering data

Designation			Part No.	Type
Input module, analogue				
	2 analogue current or voltage inputs		**526168**	**CPX-2AE-U-I**
	2 or 4 analogue current inputs		**541484**	**CPX-4AE-I**
Plug				
	M12 plug, 5-pin		**175487**	**SEA-M12-5GS-PG7**
	Sub-D plug, 25-pin		**527522**	**SD-SUB-D-ST25**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 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 manual				
	User manual	German	**526415**	**P.BE-CPX-AX-DE**
		English	**526416**	**P.BE-CPX-AX-EN**
		Spanish	**526417**	**P.BE-CPX-AX-ES**
		French	**526418**	**P.BE-CPX-AX-FR**
		Italian	**526419**	**P.BE-CPX-AX-IT**
		Swedish	**526420**	**P.BE-CPX-AX-SV**

Terminal CPX

Technical data – Analogue input module with pressure sensors

FESTO

Function

The pressure input modules enable a maximum of four pressures to 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 fieldbus node as an image table. It is also possible to combine two channels into one differential pressure channel.

Applications

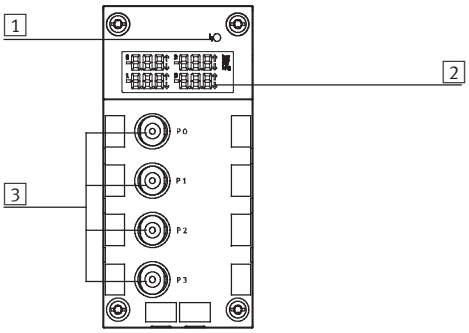
- Measuring range 0 ... 10 bar or –1 ... +1 bar
- Choice of units of measurement
- Processing of max. four pressures per module
- Pressure indication via LCD display
- Direct connection via QS4 push-in connectors
- Error message via CPX
- Channel-oriented diagnostics

General technical data				
Type			CPX-4AE-P-B2	CPX-4AE-P-D10
No. 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	Starting value	[bar]	–1	0
	Final value	[bar]	1	10
Internal cycle time		[ms]	5	
Data format			• 15 bits + prefix • Binary representation in mbar, kPa, psi	
LED displays			Group diagnostics	
Diagnostics			• Limit value violation per channel • Parameterisation error • Sensor limit per channel	
Parameterisation			• Diagnostic delay per channel • Hysteresis per module • Unit of measurement • Measured value smoothing per channel • Limit value monitoring per channel • Sensor limit per channel • Measurement of relative/differential pressure	
Protection class to EN 60529			IP65/IP67	
Operating medium			Filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm	
Ambient temperature		[°C]	–5... 50	
Storage temperature		[°C]	–20 ... 70	
Temperature of medium		[°C]	0... 50	
Note on materials			RoHS-compliant	
Materials			Reinforced polyamide, polycarbonate	
Grid dimension		[mm]	50	
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 55	
Weight		[g]	112	

- Note

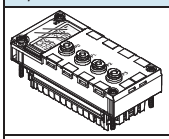
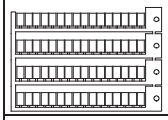
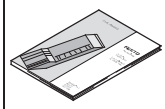
Extreme pneumatic conditions, for example high cycle frequency with large pressure amplitudes, can damage the sensors.

Connection and display components



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

Ordering data

Designation			Part No.	Type
Input module, analogue				
	4 analogue pressure inputs, pressure range –1 … +1 bar		**560361**	**CPX-4AE-P-B2**
	4 analogue pressure inputs, pressure range 0 … 10 bar		**560362**	**CPX-4AE-P-D10**
Inscription labels				
	Inscription labels 6x10, 64 pieces, in frames		**18576**	**IBS-6x10**
User manual				
	User manual	German	**526415**	**P.BE-CPX-AX-DE**
		English	**526416**	**P.BE-CPX-AX-EN**
		Spanish	**526417**	**P.BE-CPX-AX-ES**
		French	**526418**	**P.BE-CPX-AX-FR**
		Italian	**526419**	**P.BE-CPX-AX-IT**
		Swedish	**526420**	**P.BE-CPX-AX-SV**

Terminal CPX

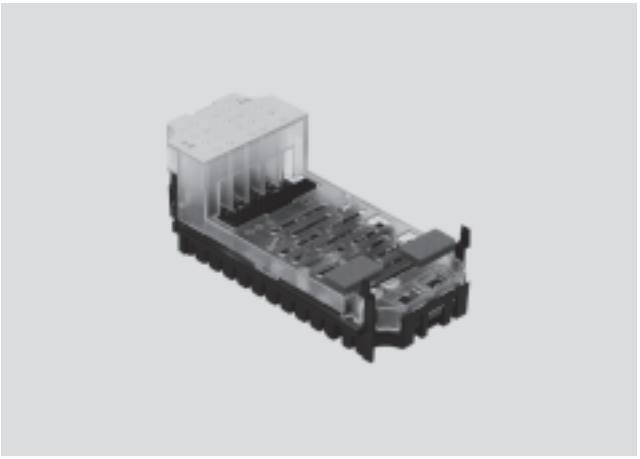
Technical data – Analogue module for temperature inputs

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.

Applications

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

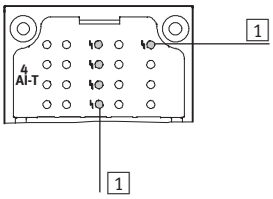


General technical data			
Type			**CPX-4AE-T**
			Temperature input
No. of analogue inputs			Choice of 2 or 4
Max. power supply per module		[A]	0.7
Fuse protection			Internal electronic fuse for sensor supply
Current consumption from 24 V sensor supply (quiescent current)		[mA]	Typically 50
Supply voltage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

General technical data			
Data format			15 bits + prefix, complement of two, binary notation in tenths of a degree
Cable length		[m]	Max. 200 (screened)
Electrical isolation	Channel – channel		No
	Channel – internal bus		Yes
LED displays	Group diagnostics		1
	Channel diagnostics		4
Diagnostics			• Short circuit/overload, channel • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break
Parameterisation			• Unit of measurement and interference frequency suppression • Diagnostic message in the event of a wire break or short circuit • Limit monitoring per channel • Sensor connection technology • Sensor type/temperature coefficient, temperature range • Limit value per channel • Measured value smoothing
Protection class to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

Connection and display components

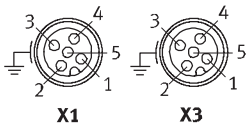
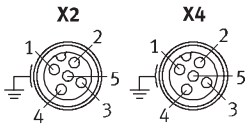
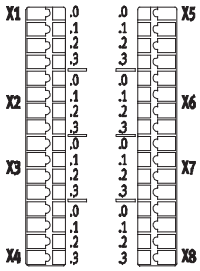
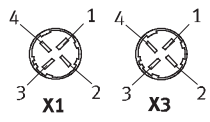
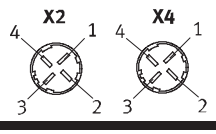
CPX-4AE-T



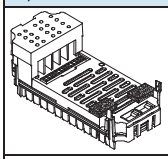
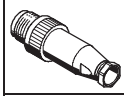
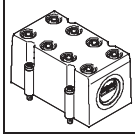
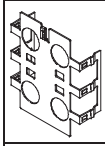
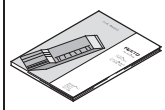
1 Error LED (red, module error)
2 Channel-specific error LEDs (red)

Connection block/analogue module combinations		
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-AB-4-HAR-4POL	**525636**	■
CPX-AB-4-M12x2-5P-R-M3	**546997**	■
CPX-M-4-M12x2-5POL	**549367**	■

Pin allocation

Connection block inputs	CPX-4AE-T	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1], CPX-AB-4-M12x2-5P-R-M3[1] and CPX-M-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
CPX-AB-4-HAR-4POL		
	X1.1: Input I0+ X1.2: Input U0+ X1.3: Input I0– X1.4: Input U0–	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2–
	X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1–	X4.1: Input I3+ X4.2: Input U3+ X4.3: Input I3– X4.4: Input U3–

1) Speedcon quick lock, screening additionally on metal thread
2) FE/screening additionally on metal thread

Ordering data				
Designation			Part No.	Type
Input module, analogue				
	2 or 4 analogue temperature inputs		541486	CPX-4AE-T
Plug				
	M12 plug, 5-pin		175487	SEA-M12-5GS-PG7
	HARAX plug, 4-pin		525928	SEA-GS-HAR-4POL
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		538219	AK-8KL
	Fittings kit		538220	VG-K-M9
Screening plate				
	Screening plate for M12 connections		526184	CPX-AB-S-4-M12
User manual				
	User manual	German	526415	P.BE-CPX-AX-DE
		English	526416	P.BE-CPX-AX-EN
		Spanish	526417	P.BE-CPX-AX-ES
		French	526418	P.BE-CPX-AX-FR
		Italian	526419	P.BE-CPX-AX-IT
		Swedish	526420	P.BE-CPX-AX-SV

Terminal CPX

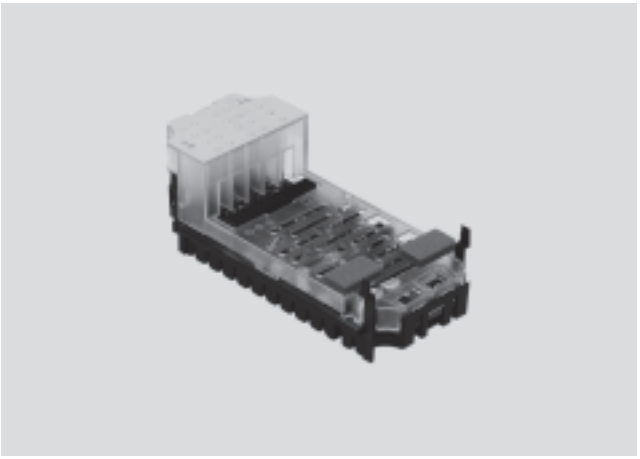
Technical data – Analogue module for thermocoupler

Function

The CPX-4AE-TC analogue input module with four channels for temperature measurement enables up to four thermocoupler 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).

Applications

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

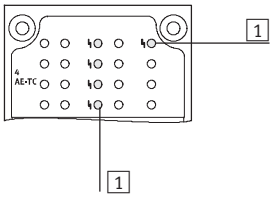


General technical data		
Type		CPX-4AE-TC
		Temperature input
No. of analogue inputs		4
Fuse protection (short circuit)		Internal electronic fuse for each channel
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Sensor type (parameterisable for each channel by means of software)		• Type B +400 ... +1,820 °C, 8 µV/°C • Type E –270 ... +900 °C, 60 µV/°C • Type J –200 ... +1,200 °C, 51 µV/°C • Type K –200 ... +1,370 °C, 40 µV/°C • Type N –200 ... +1,300 °C, 38 µV/°C • Type R 0 ... +1,760 °C, 12 µV/°C • Type S 0 ... +1,760 °C, 11 µV/°C • Type T –200 ... +400 °C, 40 µV/°C
Sensor connection technology		2-wire technology
Operating error limit relative to ambient temperature	[%]	Max. ±0.6
Basic error limit (at 25 °C)	[%]	Max. ±0.4
Repetition accuracy (at 25 °C)	[%]	±0.05
Max. line resistance per wire	[Ω]	10
Max. residual current per module	[mA]	30
Max. permissible input voltage	[V]	±30
Internal cycle time (module)	[ms]	250

General technical data			
Data format			• 15 bits + prefix, complement of two • Binary notation in tenths of a degree
Cable length		[m]	Max. 50 (screened)
Electrical 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			• Wire break monitoring per channel • Unit of measurement • Cold junction compensation • Sensor type per channel • Limit value monitoring per channel • Measured value smoothing
Protection class to EN 60529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced polyamide, polycarbonate
Grid dimension		[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

Connection and display components

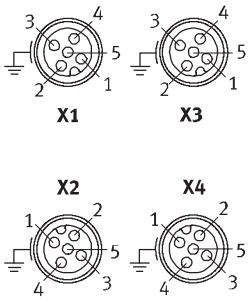
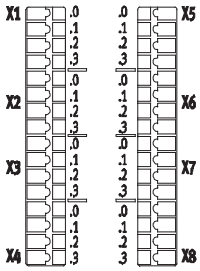
CPX-4AE-TC



1 Error LED (red, module error)
2 Channel-specific error LEDs (red)

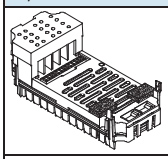
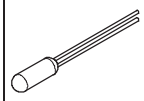
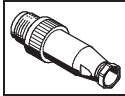
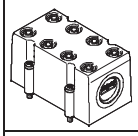
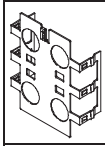
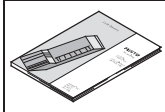
Connection block/analogue module combinations		
Connection blocks	Part No.	Temperature module
		CPX-4AE-TC
CPX-AB-4-M12X2-5POL	**195704**	■
CPX-AB-4-M12X2-5POL-R	**541254**	■
CPX-AB-8-KL-4POL	**195708**	■
CPX-AB-4-M12x2-5P-R-M3	**546997**	■
CPX-M-4-M12x2-5POL	**549367**	■

Pin allocation

Connection block inputs	CPX-4AE-TC	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1], CPX-AB-4-M12x2-5P-R-M3[1] and CPX-M-4-M12x2-5POL		
	X1.1: Input I0+ X1.2: Input U0+ X1.3: Input I0– X1.4: Input U0– X1.5: FE[2] X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1– X2.5: FE[2]	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2– X3.5: FE[2] X4.1: Input I3+ X4.2: Input U3+ X4.3: Input I3– X4.4: Input U3– X4.5: FE[2]
CPX-AB-8-KL-4POL		
	X1.0: Input I0+ X1.1: Input I0– X1.2: Input U0– X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE X3.0: Input I1+ X3.1: Input I1– X3.2: Input U1– X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Input U1+ X4.3: FE	X5.0: Input I2+ X5.1: Input I2– X5.2: Input U2– X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: InputUI2+ X6.3: FE X7.0: Input I3+ X7.1: Input I3– X7.2: Input U3– X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Input U3+ X8.3: FE

1) Speedcon quick lock, screening additionally on metal thread
2) FE/screening additionally on metal thread

Ordering data

Designation		Part No.	Type
Input module, analogue			
	4 analogue temperature inputs, with 2-wire connection for a PT1000 sensor for cold junction compensation	**553594**	**CPX-4AE-TC**
Cold junction compensation			
	PT1000 temperature sensor for cold junction compensation	**553596**	**CPX-W-PT1000**
Plug			
	M12 plug, 5-pin	**175487**	**SEA-M12-5GS-PG7**
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	**538219**	**AK-8KL**
	Fittings kit	**538220**	**VG-K-M9**
Screening plate			
	Screening plate for M12 connections	**526184**	**CPX-AB-S-4-M12**
User manual			
	User manual, German	**526415**	**P.BE-CPX-AX-DE**
	User manual, English	**526416**	**P.BE-CPX-AX-EN**
	User manual, Spanish	**526417**	**P.BE-CPX-AX-ES**
	User manual, French	**526418**	**P.BE-CPX-AX-FR**
	User manual, Italian	**526419**	**P.BE-CPX-AX-IT**
	User manual, Swedish	**526420**	**P.BE-CPX-AX-SV**

Terminal CPX

Technical data – Analogue module for outputs

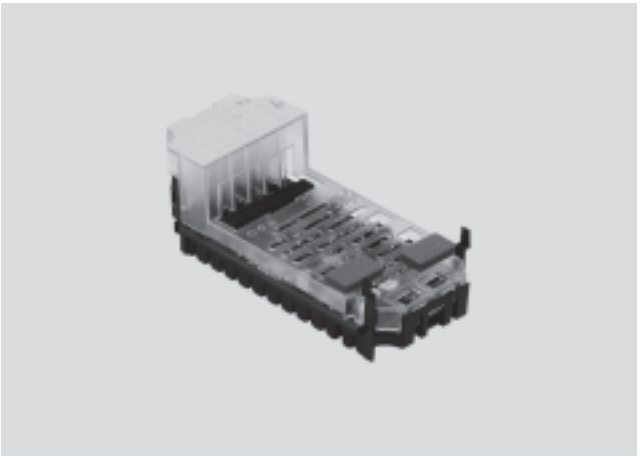
FESTO

Function

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

Applications

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

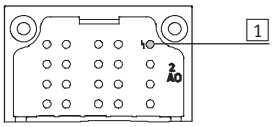


General technical data				
Type			CPX-2AA-U-I	
			Voltage output	Current output
No. of analogue outputs			2	
Max. actuator supply per module		[A]	2.8	
Fuse protection			Internal electronic fuse for actuator supply	
Current consumption from 24 V sensor supply (at full load)		[mA]	Max. 150	
Current consumption from 24 V actuator supply (at full load)		[A]	4 ... 10	
Supply voltage of actuators		[V DC]	24 ±25%	
Signal range (parameterisable for each channel by means of DIL switch or software)			0 ... 10 V DC	0 ... 20 mA 4 ... 2 mA
Resolution		[bit]	12	
No. of units			4,096	
Absolute accuracy		[%]	±0.6	
Linearity errors (no software scaling)		[%]	±0.1	
Repetition accuracy (at 25 °C)		[%]	0.05	
Encoder selection	Load resistance for ohmic load	[kΩ]	Min. 1	Max. 0.5
	Load resistance for capacitive load	[µF]	Max. 1	–
	Load resistance for inductive load	[mH]	–	Max. 1
	Short circuit protection analogue output		Yes	–
	Short circuit current analogue output	[mA]	Approx. 20	–
	Open circuit voltage	[V DC]	–	18
	Destruction limit against externally applied voltage	[V DC]	15	
	Actuator connection		2 wires	
Cycle time (module)		[ms]	≤ 4	

General technical data				
Type			CPX-2AA-U-I	
			Voltage output	Current output
Response time	For ohmic load	[ms]	0.1	0.1
	For capacitive load	[ms]	0.7	–
	For inductive load	[ms]	–	0.5
Data format			15 bits + prefix, linear scaling 12 bits right-justified, type 03 compatible 12 bits left-justified, S7 compatible 12 bits left-justified, S5 compatible	
Cable length		[m]	Max. 30 (screened)	
LED displays	Group diagnostics		1	
	Channel diagnostics		Yes, by means of flashing frequency of group diagnostics	
Diagnostics			• Short circuit/overload, actuator supply • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break	
Parameterisation			• Short circuit monitoring, actuator supply • Short circuit monitoring, analogue output • Behaviour after short circuit, actuator supply • Data format • Lower limit value/full-scale value • Upper limit value/full-scale value • Monitoring of value falling below nominal range/full-scale value • Monitoring of value exceeding nominal range/full-scale value • Wire break monitoring • Signal range	
Protection class to EN 60529			Depending on connection block	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			Polymer	
Grid dimension		[mm]	50	
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Weight		[g]	38	

Connection and display components

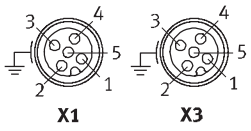
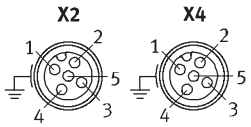
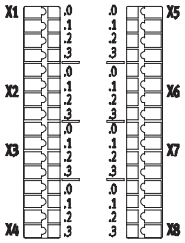
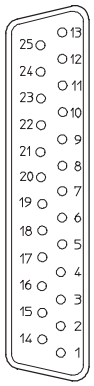
CPX-2AA-U-I



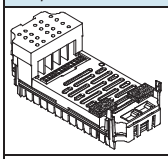
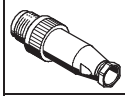
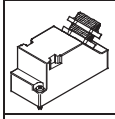
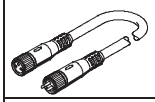
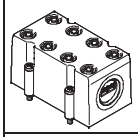
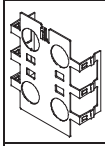
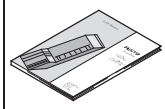
1 Error LED (red, module error)

Connection block/analogue module combinations		
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-AB-4-M12x2-5P-R-M3	**546997**	■
CPX-M-4-M12x2-5POL	**549367**	■

Pin allocation

Connection block outputs	CPX-2AA-U-I	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R[1], CPX-AB-4-M12x2-5P-R-M3[1], CPX-M-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 X2.0: n.c. X2.1: n.c. X2.2: Output U0+ X2.3: FE X3.0: 24 V_{OUT} X3.1: 0 V_{OUT} X3.2: Output GDN X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Output I0+ X4.3: FE	X5.0: 24 V_{OUT} X5.1: 0 V_{OUT} X5.2: Output GND X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Output U1+ X6.3: FE X7.0: 24 V_{OUT} X7.1: 0 V_{OUT} X7.2: Output GND X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Output I1+ X8.3: FE
CPX-AB-1-SUB-BU-25POL		
	1: Output GND 2: Output U0+ 3: Output GND 4: Output I0+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{OUT} 10: 24 V_{OUT} 11: 0 V_{OUT} 12: 0 V_{OUT} 13: Screening[3]	14: Output GND 15: Output U1+ 16: Output GND 17: Output I1+ 18: 24 V_{OUT} 19: n.c. 20: 24 V_{OUT} 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE Socket: FE

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

Ordering data				
Designation			Part No.	Type
Output module, analogue				
	2 analogue current or voltage outputs		526170	CPX-2AA-U-I
Plug				
	M12 plug, 5-pin		175487	SEA-M12-5GS-PG7
	Sub-D plug, 25-pin		527522	SD-SUB-D-ST25
Connecting cable				
	Modular system for connecting cables		–	NEBU-... ➔ Internet: nebu
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		538219	AK-8KL
	Fittings kit		538220	VG-K-M9
Screening plate				
	Screening plate for M12 connections		526184	CPX-AB-S-4-M12
User manual				
	User manual	German	526415	P.BE-CPX-AX-DE
		English	526416	P.BE-CPX-AX-EN
		Spanish	526417	P.BE-CPX-AX-ES
		French	526418	P.BE-CPX-AX-FR
		Italian	526419	P.BE-CPX-AX-IT
		Swedish	526420	P.BE-CPX-AX-SV

Terminal CPX

Technical data – 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 current.
Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

- 24 V DC supply voltage for 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

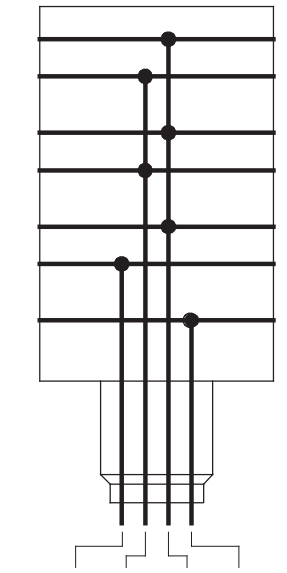
General technical data – Plastic interlinking blocks					
Type			CPX-GE-EV-S	CPX-GE-EV-S-7/8-4POL	CPX-GE-EV-S-7/8-5POL
Electrical connection			M18	7/8", 4-pin	7/8", 5-pin
Nominal operating voltage		[V DC]	24		
Current supply	Sensors and electronics	[A]	Max. 16	Max. 10	Max. 8
	Valves and outputs	[A]	Max. 16	Max. 10	Max. 8
Protection class to EN 60529			Depending on connection block		
Ambient temperature		[°C]	–5 ... +50		
Corrosion resistance class CRC[1)]			2		
Material declaration			RoHS-compliant		
Materials			Reinforced polyamide		
Grid dimension		[mm]	50		
Dimensions W x L x H		[mm]	50 x 107 x 35		
Weight		[g]	125		

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

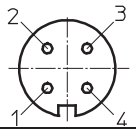
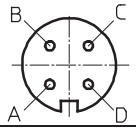
General technical data – Metal interlinking blocks				
Type			CPX-M-GE-EV-S-7/8-5POL	CPX-M-GE-EV-S-PP-5POL
Electrical connection			7/8", 5-pin	AIDA push-pull, 5-pin
Nominal operating voltage		[V DC]	24	
Current supply	Sensors and electronics	[A]	Max. 8	Max. 16
	Valves and outputs	[A]	Max. 8	Max. 16
Protection class to EN 60529			Depending on connection block	
Ambient temperature		[°C]	–5 ... +50	
Material declaration			–	RoHS-compliant
Materials			Die-cast aluminium	
Grid dimension		[mm]	50	
Dimensions W x L x H		[mm]	50 x 107 x 35	
Weight		[g]	187	245

Pin allocation

Circuitry

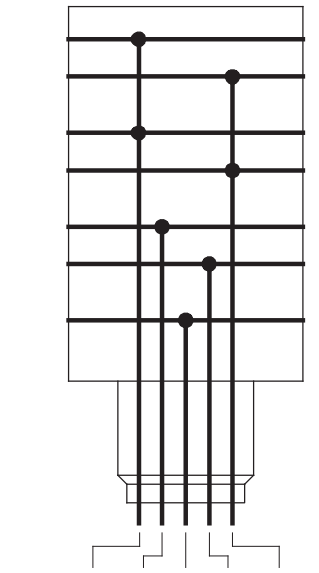


M18	1	2	3	4
7/8"	A	B	D	C
	24V	24V	0V	FE

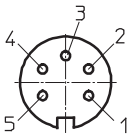
	Pin	Allocation
M18 – 4-pin		
	1	24 V DC supply voltage for electronics and sensors
	2	24 V DC load voltage supply for valves and outputs
	3	0 V
	4	FE
7/8" – 4-pin		
	A	24 V DC supply voltage for electronics and sensors
	B	24 V DC load voltage supply for valves and outputs
	C	FE
	D	0V

Pin allocation

Circuitry

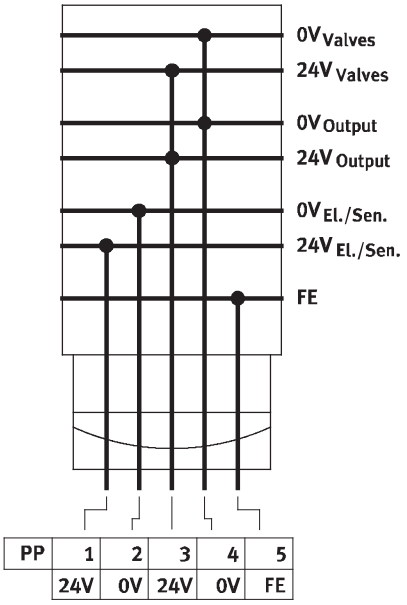


7/8"	1	2	3	4	5
	0V	0V	FE	24V	24V

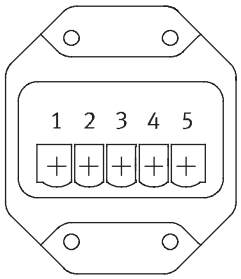
	Pin	Allocation
7/8" – 5-pin		
	1	0 V valves and outputs
	2	0 V electronics and sensors
	3	FE
	4	24 V DC supply voltage for electronics and sensors
	5	24 V DC load voltage supply for valves and outputs

Pin allocation

Circuitry

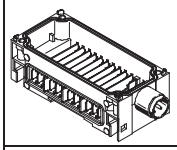
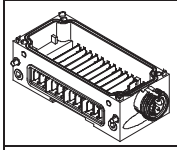
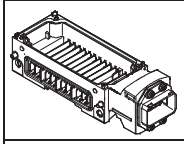
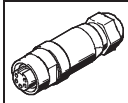
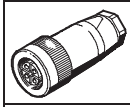
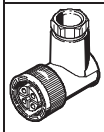
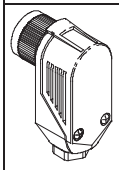
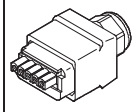
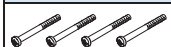


Push-pull plug – 5-pin (AIDA)



Pin	Allocation
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

Ordering data

Designation			Part No.	Type
Interlinking block with system supply				
	Connection M18, 4-pin, plastic interlinking block		**195746**	**CPX-GE-EV-S**
	Connection 7/8", 4-pin, plastic interlinking block		**541248**	**CPX-GE-EV-S-7/8-4POL**
	Connection 7/8", 5-pin, plastic interlinking block		**541244**	**CPX-GE-EV-S-7/8-5POL**
	Connection 7/8", 5-pin, metal interlinking block		**550208**	**CPX-M-GE-EV-S-7/8-5POL**
	Connection push-pull plug (AIDA), 5-pin, metal interlinking block		**563057**	**CPX-M-GE-EV-S-PP-5POL**
7/8" connection sockets				
	Power supply socket	5-pin	**543107**	**NECU-G78G5-C2**
		4-pin	**543108**	**NECU-G78G4-C2**
M18 connection sockets				
	Straight socket, screw terminal	4-pin, PG9	**18493**	**NTSD-GD-9**
		4-pin, PG13.5	**18526**	**NTSD-GD-13,5**
	Angled socket, screw terminal	4-pin, PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin, PG11	**533119**	**NTSD-WD-11**
Connection socket AIDA push-pull				
	Socket, spring-loaded terminal	5-pin	**563059**	**NECU-M-PPG5-C1**
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**

Terminal CPX

Technical data – Interlinking block

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 current.
Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

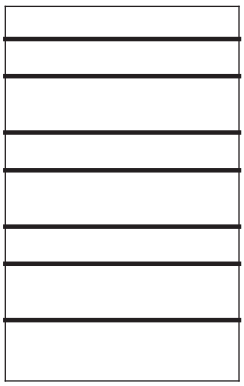
Applications

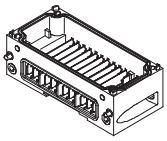
- All voltages are fed through to the next module by means of an interlinking system.
- The connected electronics module for inputs/outputs or bus node taps off the required voltage.

General technical data			
Type		CPX-GE-EV	CPX-M-GE-EV
Electrical connection		–	–
Nominal operating voltage	[V DC]	24	24
Acceptable current load (per contact/contact rail)	[A]	16	8
Protection class to EN 60529		Depending on connection block	
Ambient temperature	[°C]	–5 ... +50	
Corrosion resistance class CRC[1)]		2	–
Material declaration		RoHS-compliant	
Materials		Polymer	Aluminium
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	
Weight	[g]	100	162

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Pin allocation

Circuitry	Pin	Allocation
	–	–
	–	–
	–	–
	–	–

Ordering data – Mounting accessories				
Designation			Part No.	Type
Interlinking block without supply				
	Plastic interlinking block		**195742**	**CPX-GE-EV**
	Metal interlinking block		**550206**	**CPX-M-GE-EV**
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**

Terminal CPX

Technical data – Interlinking block with additional power 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 current.
Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

- 24 V DC supply voltage for outputs

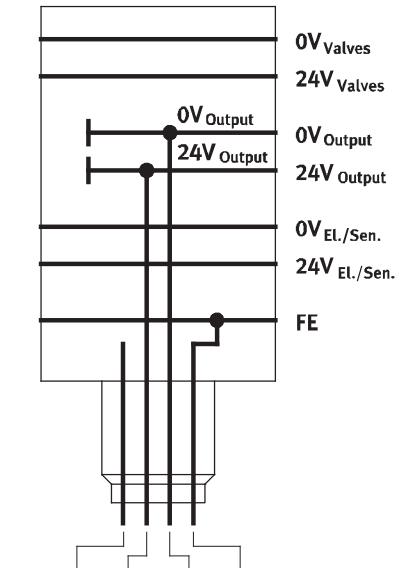
General technical data – Plastic interlinking blocks					
Type			CPX-GE-EV-Z	CPX-GE-EV-Z-7/8-4POL	CPX-GE-EV-Z-7/8-5POL
Electrical connection			M18	7/8", 4-pin	7/8", 5-pin
Nominal operating voltage		[V DC]	24		
Current supply	Outputs	[A]	Max. 16	Max. 10	Max. 8
Protection class to EN 60529			Depending on connection block		
Ambient temperature		[°C]	–5 ... +50		
Corrosion resistance class CRC[1)]			2		
Material declaration			RoHS-compliant		
Materials			Polymer		
Grid dimension		[mm]	50		
Dimensions W x L x H		[mm]	50 x 107 x 35		
Weight		[g]	125		

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

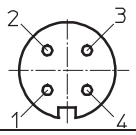
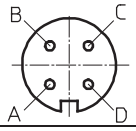
General technical data – Metal interlinking blocks				
Type			CPX-M-GE-EV-Z-7/8-5POL	CPX-M-GE-EV-Z-PP-5POL
Electrical connection			7/8", 5-pin	AIDA push-pull, 5-pin
Nominal operating voltage		[V DC]	24	
Current supply	Outputs	[A]	Max. 8	Max. 16
Protection class to EN 60529			Depending on connection block	
Ambient temperature		[°C]	–5 ... +50	
Material declaration			–	RoHS-compliant
Materials			Die-cast aluminium	
Grid dimension		[mm]	50	
Dimensions W x L x H		[mm]	50 x 107 x 35	
Weight		[g]	187	245

Pin allocation

Circuitry

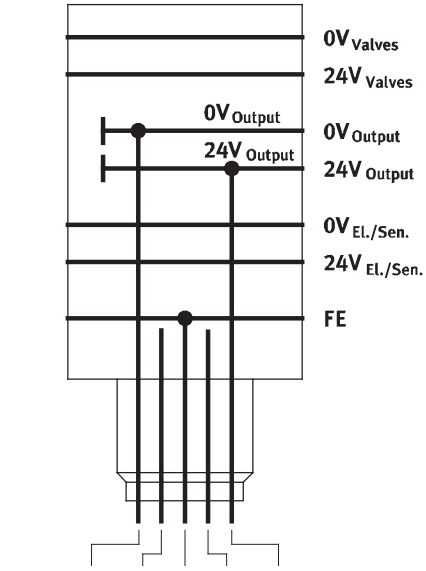


M18	1	2	3	4
7/8"	A	B	D	C
	n.c.	24V	0V	FE

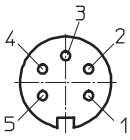
	Pin	Allocation
M18 – 4-pin		
	1	n.c.
	2	24 V DC load voltage supply for outputs
	3	0 V
	4	FE
7/8" – 4-pin		
	A	n.c.
	B	24 V DC load voltage supply for outputs
	C	FE
	D	0V

Pin allocation

Circuitry

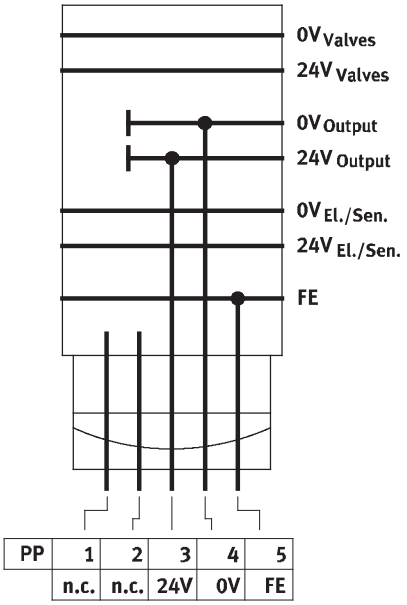


7/8"	1	2	3	4	5
	0V	n.c.	FE	n.c.	24V

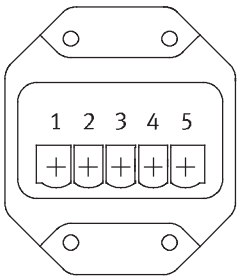
	Pin	Allocation
7/8" – 5-pin		
	1	0 V outputs
	2	n.c.
	3	FE
	4	n.c.
	5	24 V DC load voltage supply for outputs

Pin allocation

Circuitry

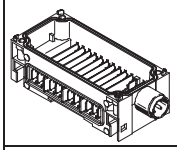
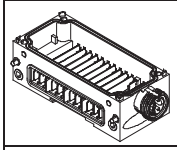
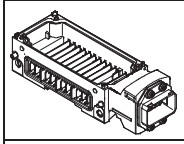
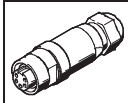
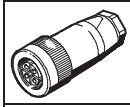
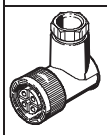
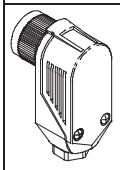
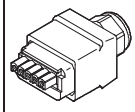
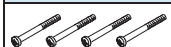


Push-pull plug – 5-pin (AIDA)



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

Ordering data

Designation			Part No.	Type
Interlinking block with additional power supply for outputs				
	Connection M18, 4-pin, plastic interlinking block		**195744**	**CPX-GE-EV-Z**
	Connection 7/8", 4-pin, plastic interlinking block		**541250**	**CPX-GE-EV-Z-7/8-4POL**
	Connection 7/8", 5-pin, plastic interlinking block		**541246**	**CPX-GE-EV-Z-7/8-5POL**
	Connection 7/8", 5-pin, metal interlinking block		**550210**	**CPX-M-GE-EV-Z-7/8-5POL**
	Connection push-pull plug (AIDA), 5-pin, metal interlinking block		**563058**	**CPX-M-GE-EV-Z-PP-5POL**
7/8" connection sockets				
	Power supply socket	5-pin	**543107**	**NECU-G78G5-C2**
		4-pin	**543108**	**NECU-G78G4-C2**
M18 connection sockets				
	Straight socket, screw terminal	4-pin, PG9	**18493**	**NTSD-GD-9**
		4-pin, PG13.5	**18526**	**NTSD-GD-13,5**
	Angled socket, screw terminal	4-pin, PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin, PG11	**533119**	**NTSD-WD-11**
Connection socket AIDA push-pull				
	Socket, spring-loaded terminal	5-pin	**563059**	**NECU-M-PPG5-C1**
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**

Terminal CPX

Technical data – Interlinking block with additional power 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 current.
Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

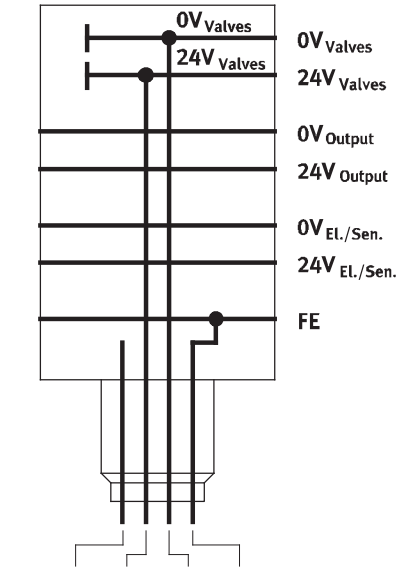
- 24 V DC supply voltage for valves

General technical data			
Type		CPX-GE-EV-V	CPX-GE-EV-V-7/8-4POL
Electrical connection		M18	7/8", 4-pin
Nominal operating voltage	[V DC]	24	
Acceptable current load (per contact/contact rail)	[A]	16	10
Protection class to EN 60529		Depending on connection block	
Ambient temperature	[°C]	–5 ... +50	
Corrosion resistance class CRC[1)]		2	
Material declaration		RoHS-compliant	
Materials		Polymer	
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	
Weight	[g]	125	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

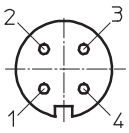
Pin allocation

Circuitry



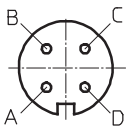
M18	1	2	3	4
7/8"	A	B	D	C
	n.c.	24V	0V	FE

M18 – 4-pin



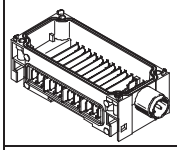
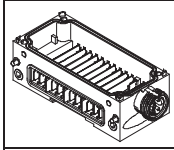
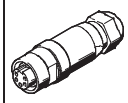
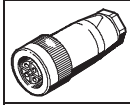
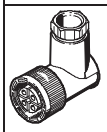
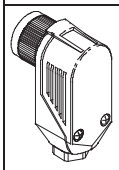
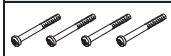
Pin	Allocation
1	n.c.
2	24 V DC load voltage supply for valves
3	0 V
4	FE

7/8" – 4-pin



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

Ordering data

Designation			Part No.	Type
Interlinking block with additional power supply for valves				
	Connection M18, 4-pin, plastic interlinking block		**533577**	**CPX-GE-EV-V**
	Connection 7/8", 4-pin, plastic interlinking block		**541252**	**CPX-GE-EV-V-7/8-4POL**
7/8" connection sockets				
	Power supply socket	5-pin	**543107**	**NECU-G78G5-C2**
		4-pin	**543108**	**NECU-G78G4-C2**
M18 connection sockets				
	Straight socket, screw terminal	4-pin, PG9	**18493**	**NTSD-GD-9**
		4-pin, PG13.5	**18526**	**NTSD-GD-13,5**
	Angled socket, screw terminal	4-pin, PG9	**18527**	**NTSD-WD-9**
	Angled socket, screw terminal	4-pin, PG11	**533119**	**NTSD-WD-11**
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**

Terminal CPX

Technical data – Pneumatic interface MPA

FESTO

Function

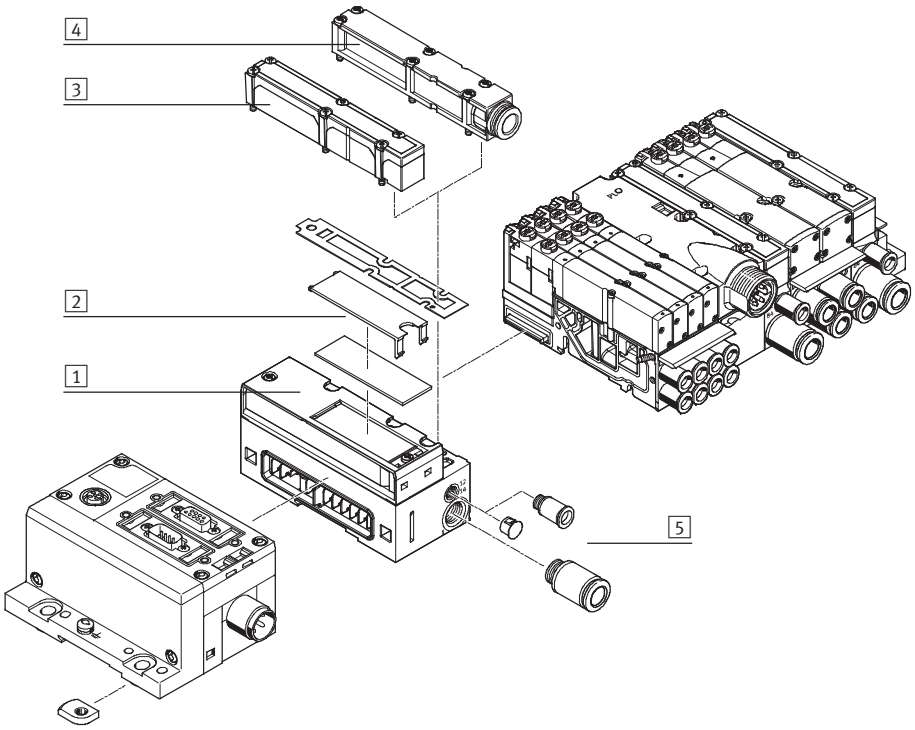
The pneumatic interface MPA establishes the electromechanical connection between the CPX terminal and the valve terminal MPA.
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA via the integrated CPX bus. The bus signal for activation of 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.

Applications

- Interface to the valve terminal MPA
- Max. 128 solenoid coils
- Features of the electronics module of the valve terminal MPA 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
- Electronics modules of the valve terminal MPA:
  - Undervoltage of valves
  - Short circuit of valves
  - Open load of valves
  - Counter preset reached in condition monitoring

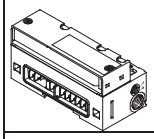
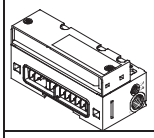
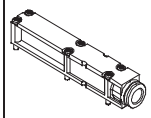
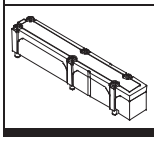
General technical data				
Type			VMPA-FB-EPL-G	VMPA-FB-EPL-E
No. of solenoid coils			128	
Pilot air supply			Internal	External
Pilot air connection 12/14			–	M7
Pneumatic connection 1			G¼	G¼
Operating pressure		[bar]	3 ... 8	–0.9 ... 10
Pilot pressure		[bar]	3 ... 8	3 ... 8
Nominal operating voltage		[V DC]	24	
Protection class to EN 60529			IP65	
Ambient temperature		[°C]	–5 ... +50	
Materials	Cover		Polyamide	
	Housing		Die-cast aluminium	
Weight		[g]	Approx. 320	

Overview – Pneumatic interface MPA



1 Pneumatic interface MPA
2 Inscription label
3 Flat plate silencer
4 Exhaust plate for ducted exhaust air
5 Fittings

Ordering data

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

Terminal CPX

Technical data – Pneumatic interface MPA-L

Function

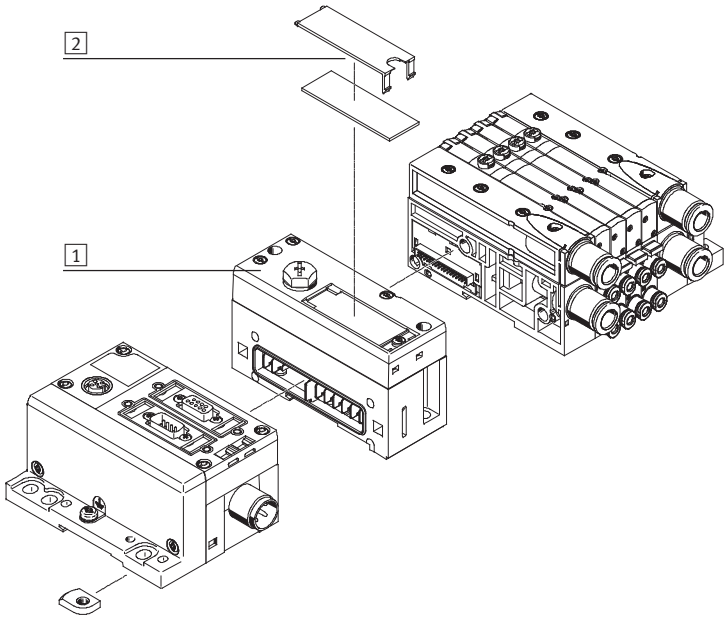
The pneumatic interface MPA-L establishes the electromechanical connection between the terminal CPX and the valve terminal MPA-L.
The bus signal for actuating the solenoid coils is converted in the pneumatic interface for the entire valve terminal.
The interlinking within the valve terminal is identical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

Application

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

General technical data		
Type		VMPAL-EPL-CPX
Number of solenoid coils		32
Operating pressure	[bar]	–0.9 ... 10
Pilot pressure	[bar]	3 ... 8
Nominal operating voltage	[V DC]	24
Protection class to EN 60529		IP67
Ambient temperature	[°C]	–5 ... +50
Note on materials		RoHS-compliant

Overview – Pneumatic interface MPA-L

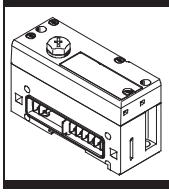


1 Pneumatic interface MPA-L
2 Inscription label

Terminal CPX

Technical data – Pneumatic interface MPA-L

FESTO

Ordering data			
Designation		Part No.	Type
	Pneumatic interface for CPX plastic interlinking module	**570783**	**VMPAL-EPL-CPX**

Terminal CPX

Technical data – Pneumatic interface CPA

FESTO

Function

The pneumatic interface CPA connects the valve terminal CPA to the supported fieldbus protocols of the CPX terminal. 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 power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

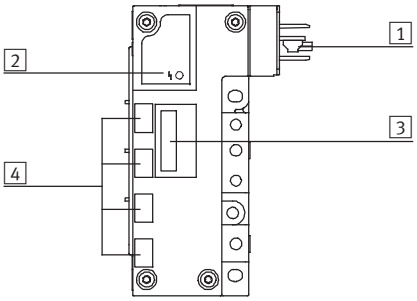
Applications

- Interface to valve terminals CPA10 and CPA14
- Max. 22 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, for example status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- Detection of missing solenoid coils and short circuit monitoring for the valves

General technical data			
No. of solenoid coils			22
Max. power supply	Per module	[A]	4
	Per channel	[A]	0.2
Fuse protection			Internal electronic fuse for each valve output
Current consumption of module from electronics/sensor supply		[mA]	Typically 15
Supply voltage for valves		[V DC]	24 +10% –15%
Electrical isolation	Channel – channel		No
	Channel – internal bus		Yes, using an additional power supply for valves (in preparation)
LED displays	Group diagnostics		1
	Channel diagnostics		–
	Channel status		– (on valves)
Diagnostics			• Load voltage of valves • Short circuit, solenoid coils (channel-oriented) • Wire break, solenoid coils (channel-oriented quiescent current detection for solenoid coils)
Parameterisation			• Module monitoring • Wire break monitoring, channel x • Fail-safe behaviour, channel x
Protection class to EN 60529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions W x L x H		[mm]	50 x 110 x 58
Weight		[g]	150

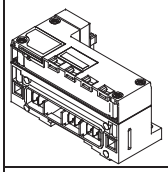
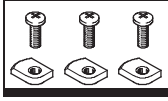
Connection and display components

CPX-GP-CPA-...



1 Connecting plug to valves
2 Error LED (red)
3 DIL switch under transparent cover
4 Inscription fields for addresses

Ordering data

Designation		Part No.	Type
Pneumatic interface CPA			
	For CPA in 10 mm width	**195710**	**CPX-GP-CPA-10**
	For CPA in 14 mm width	**195712**	**CPX-GP-CPA-14**
H-rail mounting			
	For mounting CPX terminal and valve terminal CPA on H-rail	**526032**	**CPX-CPA-BG-NRH**

Terminal CPX

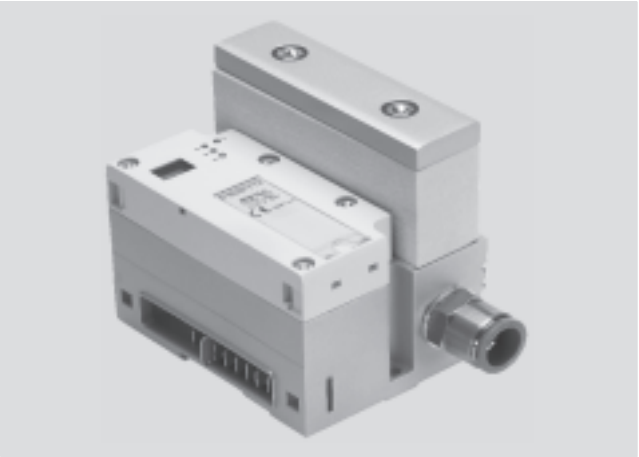
Technical data – Pneumatic interface MPA-F

Function

The pneumatic interface MPA-F establishes the electromechanical connection between the CPX terminal and the valve terminal MPA-F.
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA-F via the integrated CPX bus. The bus signal for activation of the solenoid coils is converted in the electronics module for max. 8 coils.
From a technical point of view, the individual MPA-F 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.

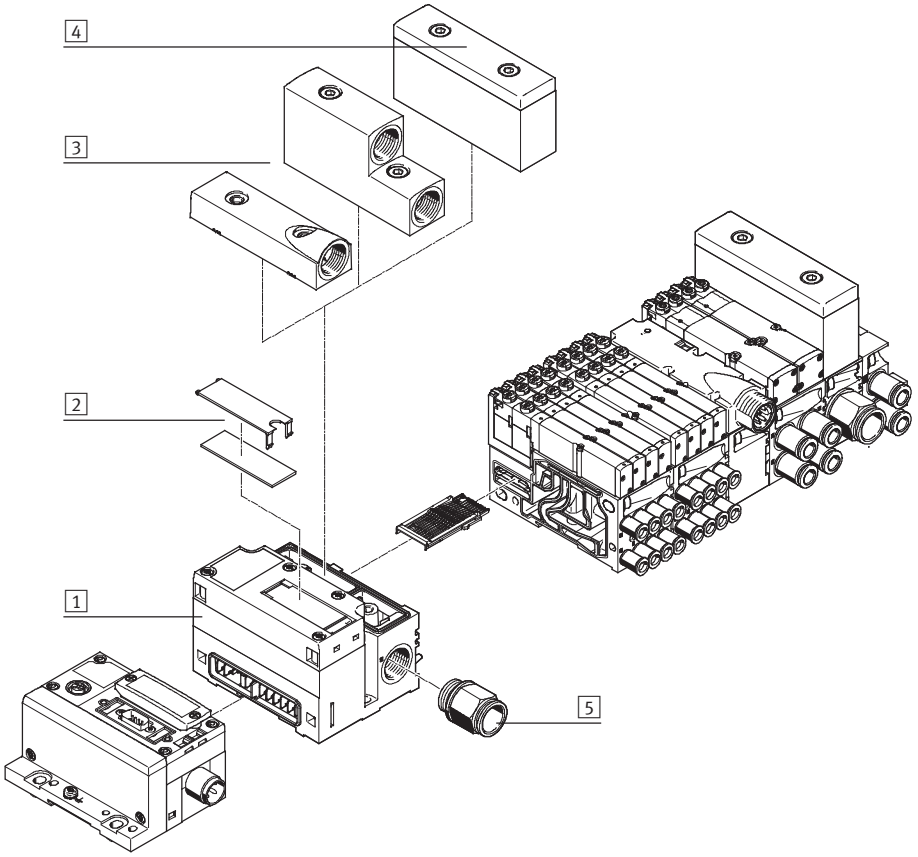
Applications

- Interface to the valve terminal MPA-F
- Max. 128 solenoid coils
- Electronics module can be parameterised, for example status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe), individual channel diagnostics, condition monitoring can be activated individually for each valve
- In the version with pressure sensor, display of the numerical pressure value, unit and adherence to setpoint value. Parameterisation via PLC or handheld unit (CPX-MMI)
- Voltage for electronics and valves supplied from the left-hand interlinking block
- Electronics modules of the valve terminal MPA-F:
  - Undervoltage of valves
  - Short circuit of valves
  - Open load of valves
  - Counter preset reached in condition monitoring



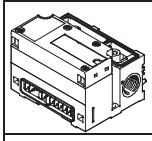
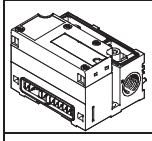
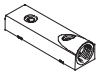
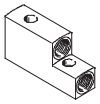
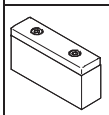
General technical data			
Type		VMPAF-FB-EPL	VMPAF-FB-EPL-PS
Version		–	With integrated pressure sensor for channel 1
No. of solenoid coils		128	
Pneumatic connection 1		G½	
Operating pressure	[bar]	–0.9 ... 10	0 ... 10
Accuracy FS	[%]	–	2.5
Nominal operating voltage	[V DC]	24	
Protection class to EN 60529		IP65	
Ambient temperature	[°C]	–5 ... +50	
CE mark (see declaration of conformity)		To EU EMC Directive	
Note on materials		RoHS-compliant	
Weight	[g]	690	

Overview – Pneumatic interface MPA-F



1 Pneumatic interface MPA-F
2 Inscription label
3 Exhaust plate for ducted exhaust air
4 Flat plate silencer
5 Fittings

Ordering data

Designation		Part No.	Type
Pneumatic interface for CPX plastic interlinking module			
	Without exhaust plate, without flat plate silencer	**544399**	**VMPAF-FB-EPL**
	Without exhaust plate, without flat plate silencer, with integrated pressure sensor for channel 1	**547491**	**VMPAF-FB-EPL-PS**
Pneumatic interface for CPX metal interlinking module			
	Without exhaust plate, without flat plate silencer	**552279**	**VMPAF-FB-EPLM**
	Without exhaust plate, without flat plate silencer, with integrated pressure sensor for channel 1	**552280**	**VMPAF-FB-EPLM-PS**
Exhaust plate			
	For ducted exhaust air, ducts 3/5 common	**544411**	**VMPAF-AP-1**
	For ducted exhaust air, duct 3 and duct 5 separated	**544412**	**VMPAF-AP-2**
	Flat plate silencer	**544410**	**VMPAF-APU**

Terminal CPX

Technical data – Pneumatic interface VTSA/VTSA-F

Function

The pneumatic interface VTSA establishes the electromechanical connection between the CPX terminal and the valve terminal type 44 VTSA/ type 45 VTSA-F.

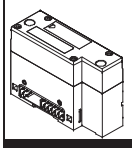
A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the CPX terminal.

Different circuits for valves and electrical outputs are implemented using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Applications

- 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
- Pneumatic interface features can be parameterised, for example status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- Detection of missing solenoid coils and short circuit monitoring for the valves

General technical data				
Type			VABA-S6-1-X1	VABA-S6-1-X2
Connection for CPX interlinking blocks made of			Plastic	Metal
No. of solenoid coils			32	
Electrical actuation			Fieldbus	
Electrical connection			Via CPX	
Nominal operating voltage		[V DC]	24	
Permissible voltage fluctuations		[%]	10	
Protection class to EN 60529			IP65	
Ambient temperature		[°C]	–5 ... +50	
Mounting position			Any	
Materials	Housing		Die-cast aluminium	
	Cover		Polyamide	
Weight		[g]	485	

Ordering data			
Designation		Part No.	Type
	For plastic interlinking block	**543416**	**VABA-S6-1-X1**
	For metal interlinking block	**550663**	**VABA-S6-1-X2**

Terminal CPX

Technical data – Pneumatic interface MIDI/MAXI

Function

The pneumatic interface MIDI/MAXI connects the valve terminal MIDI/MAXI to the supported fieldbus protocols of the CPX terminal.
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 power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

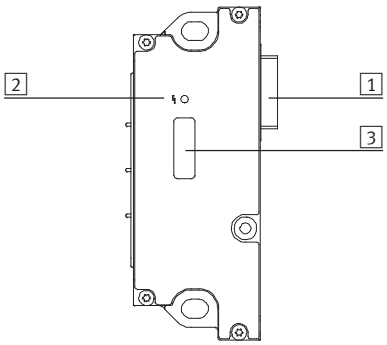
Applications

- Interface to valve terminals MIDI/MAXI
- Max. 26 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, for example status of the solenoid coils 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

General technical data				
Type			CPX-GP-03-4,0	CPX-M-GP-03-4,0
Connection for CPX interlinking blocks made of			Plastic	Metal
No. of solenoid coils			26	
Max. power supply	Per module	[A]	4	
	Per channel	[A]	0.2	
Fuse protection			Internal electronic fuse for each valve output	
Current consumption of modules for electronics		[mA]	Typically 15	
Current consumption of modules for valves		[mA]	Typically 30	
Nominal operating voltage		[V DC]	24	
Operating voltage range		[V DC]	21.6 ... 26.4	
Electrical isolation	Channel – channel		No	
	Channel – internal bus		Yes, using an additional power supply for valves	
LED displays	Group diagnostics		1	
	Channel diagnostics		–	
	Channel status		– (on valves)	
Diagnostics			• Undervoltage of valves	
Parameterisation			• Module monitoring • Fail-safe behaviour, channel x	
Protection class to EN 60529			IP65	
Ambient temperature		[°C]	–5 ... +50	
Materials	Cover		Steel	
			Die-cast aluminium	
Grid dimension		[mm]	50	
Dimensions W x L x H		[mm]	50 x 132 x 55	
Weight		[g]	390	

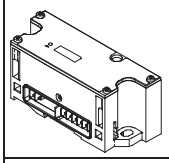
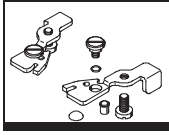
Connection and display components

CPX-GP-03-4,0



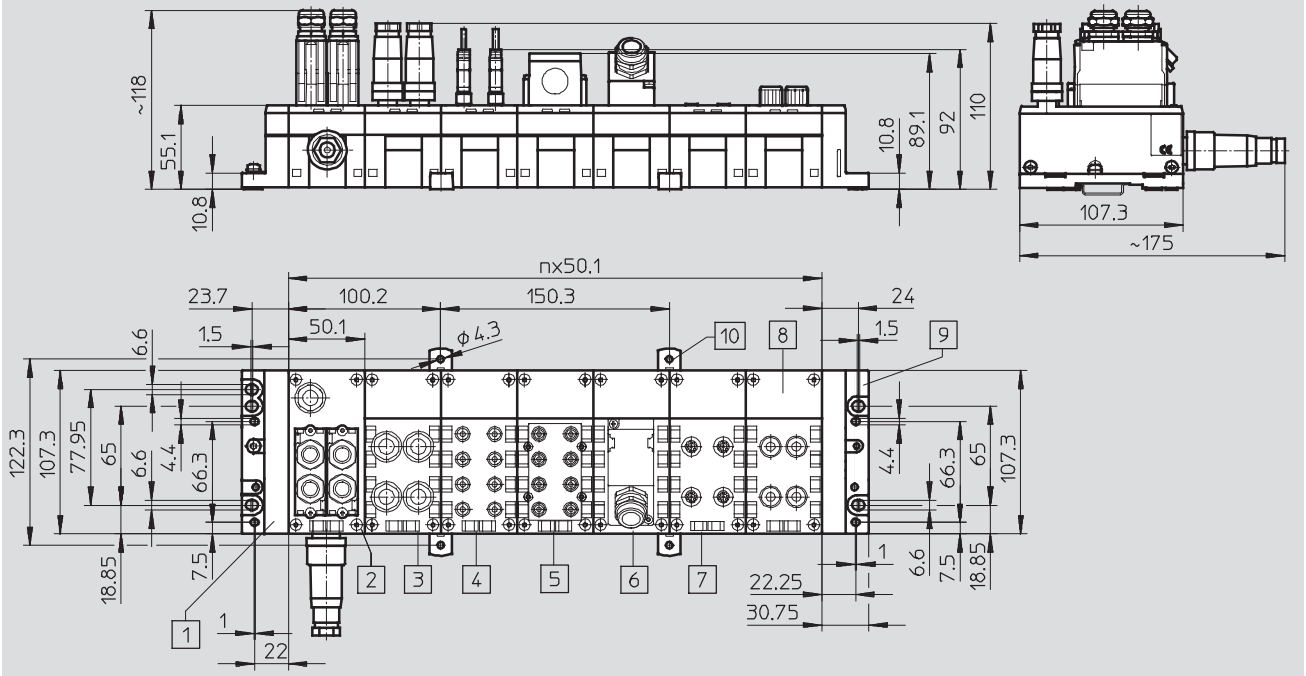
1 Connecting plug to valves
2 Error LED (red)
3 DIL switch under transparent cover

Ordering data

Designation		Part No.	Type
Pneumatic interface MIDI/MAXI			
	For plastic interlinking block	**195738**	**CPX-GP-03-4,0**
	For metal interlinking block	**556775**	**CPX-M-GP-03-4,0**
H-rail mounting			
	For mounting CPX terminal and valve terminal MIDI on H-rail	**526033**	**CPX-03-4,0**
	For mounting CPX terminal and valve terminal MAXI on H-rail	**526034**	**CPX-03-7,0**

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

With bus nodes and connection blocks

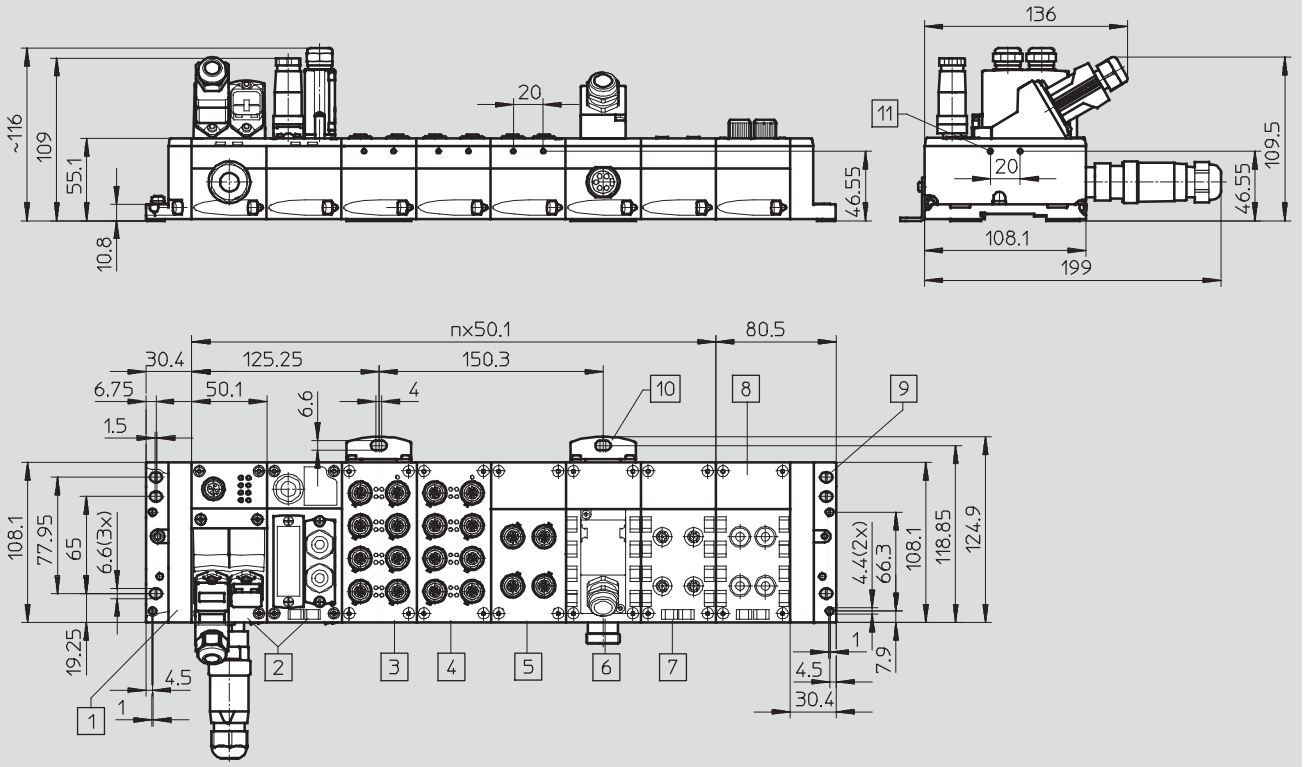


1 Left-hand end plate (earthing plate optional)
2 Bus nodes
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Right-hand end plate
10 Mounting clip for wall mounting (required every 2 … 3 connection blocks)

n Number of bus nodes and connection blocks for CPX

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

With bus nodes and connection blocks

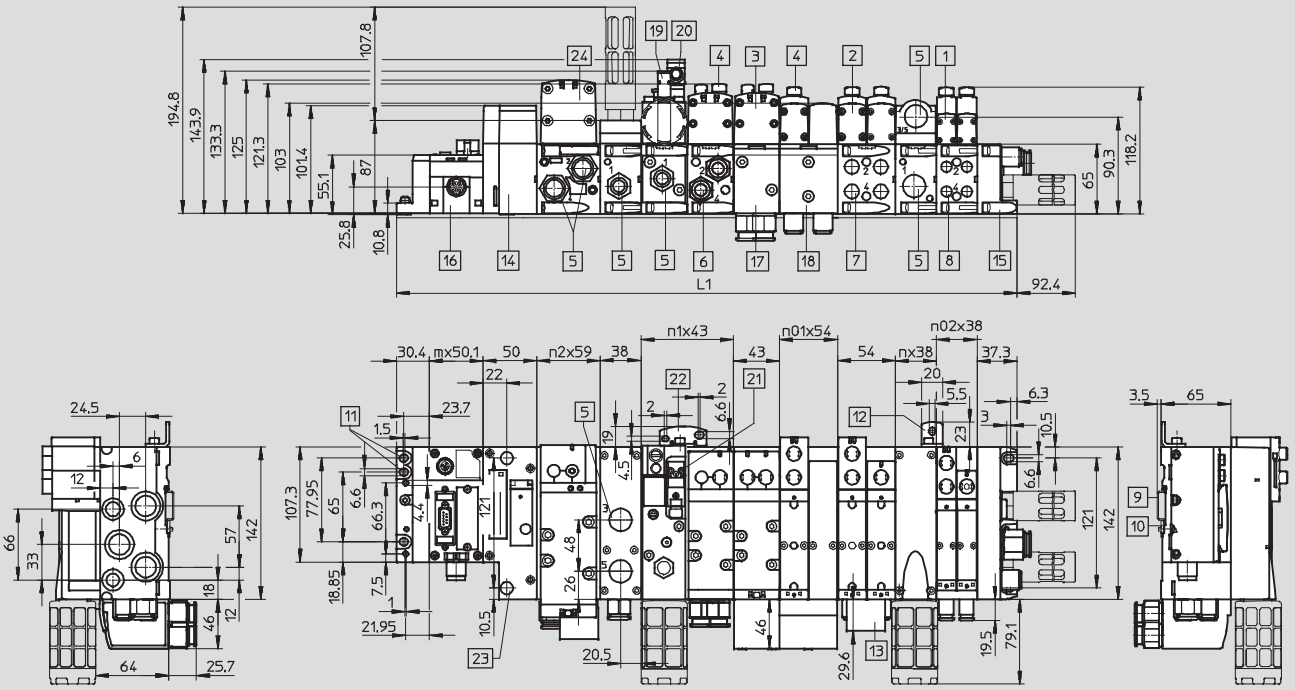


1 Left-hand end plate
2 Bus nodes
3 Connection block CPX-M-8-M12x2-5POL
4 Connection block CPX-M-8-M12x2-5POL
5 Connection block CPX-M-4-M12x2-5POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-M12-8POL
8 Connection block CPX-AB-4-HAR-4POL
9 Right-hand end plate
10 Mounting bracket for wall mounting
11 Hole for self-tapping screw M2.5

n Number of bus nodes and connection blocks for CPX

Dimensions Download CAD data ➔ **www.festo.com**

With bus nodes and valve terminal type 44 VTSA



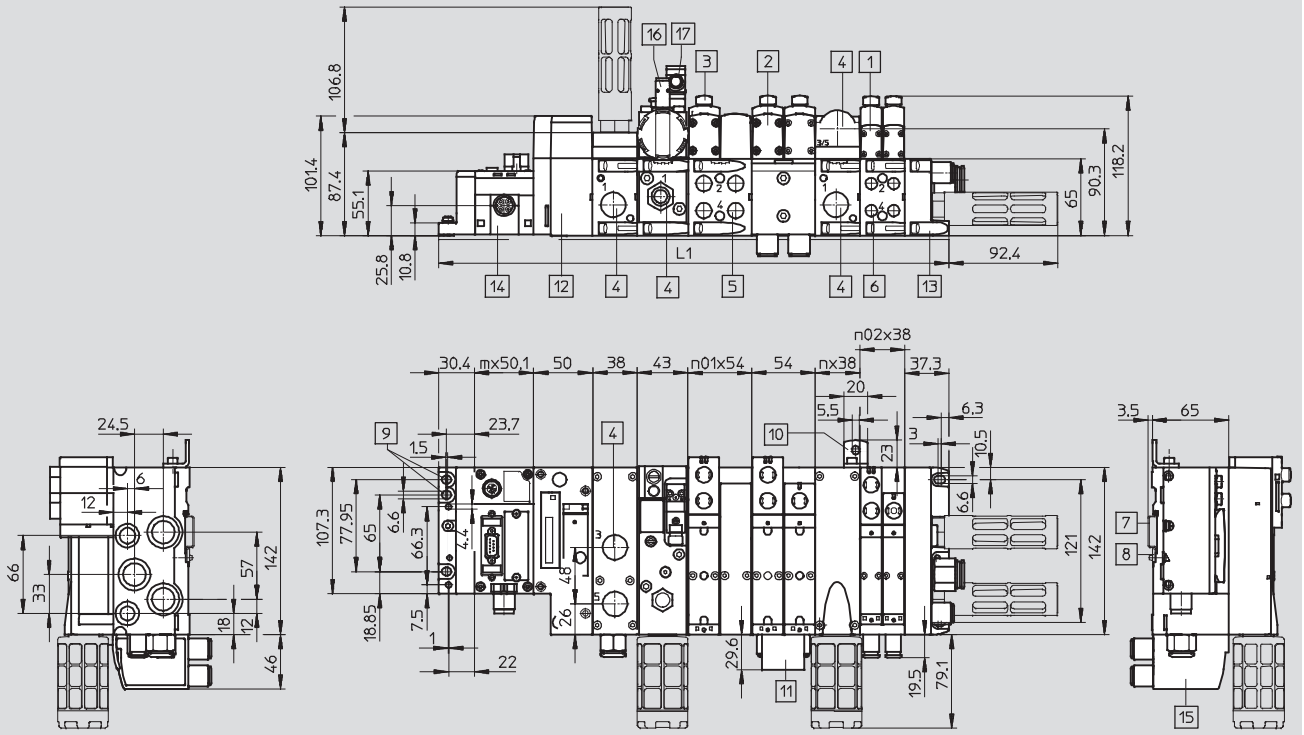
1	Solenoid valve 18 mm	11	Mounting hole	19	Proximity sensor M12x1	n02	Number of manifold sub-bases 38 mm
2	Solenoid valve 26 mm	12	Additional mounting bracket	20	Plug socket M12x1	n01	Number of manifold sub-bases 54 mm
3	Solenoid valve 42 mm	13	Inscription label holder	21	Electrical connection to DIN EN 175301-803 type C	n1	Number of manifold sub-bases 43 mm
4	Cover cap/manual override	14	Pneumatic interface VTSA	22	Additional mounting bracket	n2	Number of manifold sub-bases 59 mm
5	Threaded connection G½	15	End plate	23	Drilled hole for additional mounting, diameter 6,4, 2x	n	Number of supply plates (only with end plate with pilot air selector)
6	Threaded connection G⅜	16	CPX module/fieldbus node	24	Solenoid valve 52 mm	m	Number of CPX modules
7	Threaded connection G¼	17	90° connection plate, width 43 mm, G⅜				
8	Threaded connection G⅛	18	90° connection plate, width 54 mm, G¼				
9	H-rail						
10	H-rail mounting						

Width	L1
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
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n01 x 54 + n1 x 43 + n2x59 +n x 38 + 37.3

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

Dimensions Download CAD data ➔ **www.festo.com**

With bus nodes and valve terminal type 45 VTSA-F

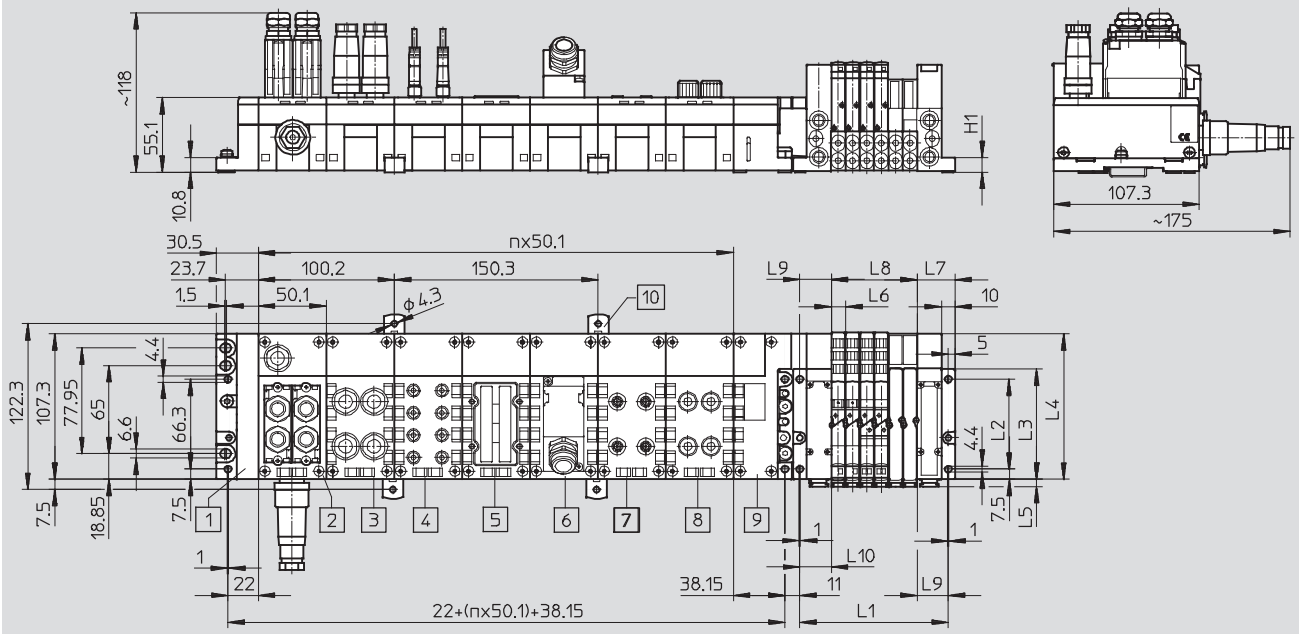


1	Solenoid valve 18 mm	7	H-rail	13	End plate	n02	Number of manifold sub-bases 18 mm
2	Solenoid valve 26 mm	8	H-rail mounting	14	CPX module/fieldbus node		
3	Cover cap/manual override	9	Mounting hole	15	90° connection plate, width 18 mm, G⅛ width 26 mm, G¼	n01	Number of manifold sub-bases 26 mm
4	Threaded connection G½	10	Additional mounting bracket				
5	Threaded connection G¼	11	Inscription label holder			n	Number of supply plates
6	Threaded connection G⅛	12	Pneumatic interface VTSA-F	16	Proximity sensor M12x1	m	Number of CPX modules
				17	Plug socket M12x1		

Width	L1
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
Mixture of 18 mm and 26 mm	30.4 m x 50.1 + 50 + n02 x 38 + n01 x 54 + n x 38 + 37.3

Dimensions Download CAD data ➔ **www.festo.com**

With bus nodes, connection blocks and valve terminal CPA



1 Left-hand end plate
2 Bus nodes
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-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Pneumatic interface CPA
10 Mounting clip for wall mounting (required every 2 ... 3 connection blocks)

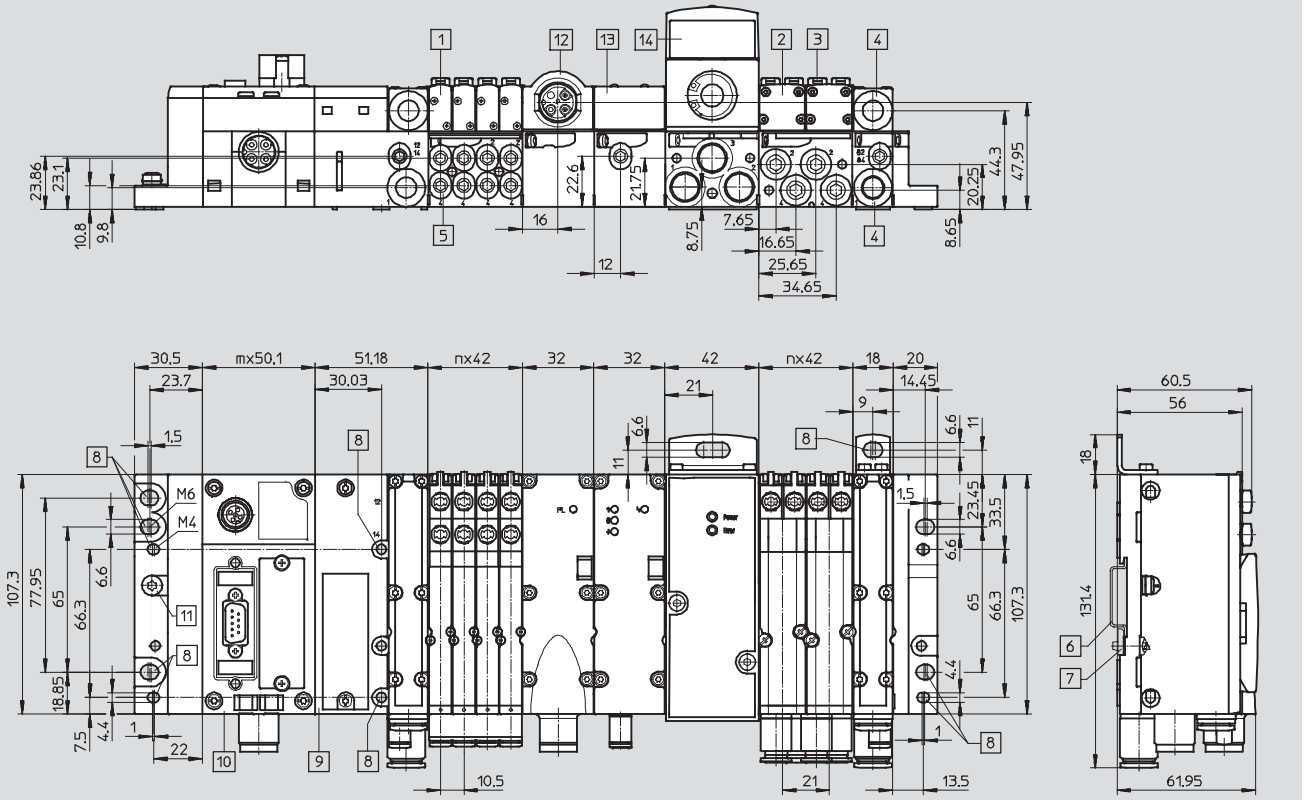
n Number of bus nodes and connection blocks for CPX

Type	L1[1]	L2 ±0.1	L3	L4	L5	L6	L7	L8[1]	L9 ±0.1	H1
CPA10	46 + (m x 10.6)	66.3	81.3	108.3	5.5	10.6	28	m x 10.6	23	10.8
CPA14	51 + (m x 14.6)	76.1	91.1	118.1	6.5	14.6	31	m x 14.6	26	13

1) m = Number of valves

Dimensions Download CAD data ➔ **www.festo.com**

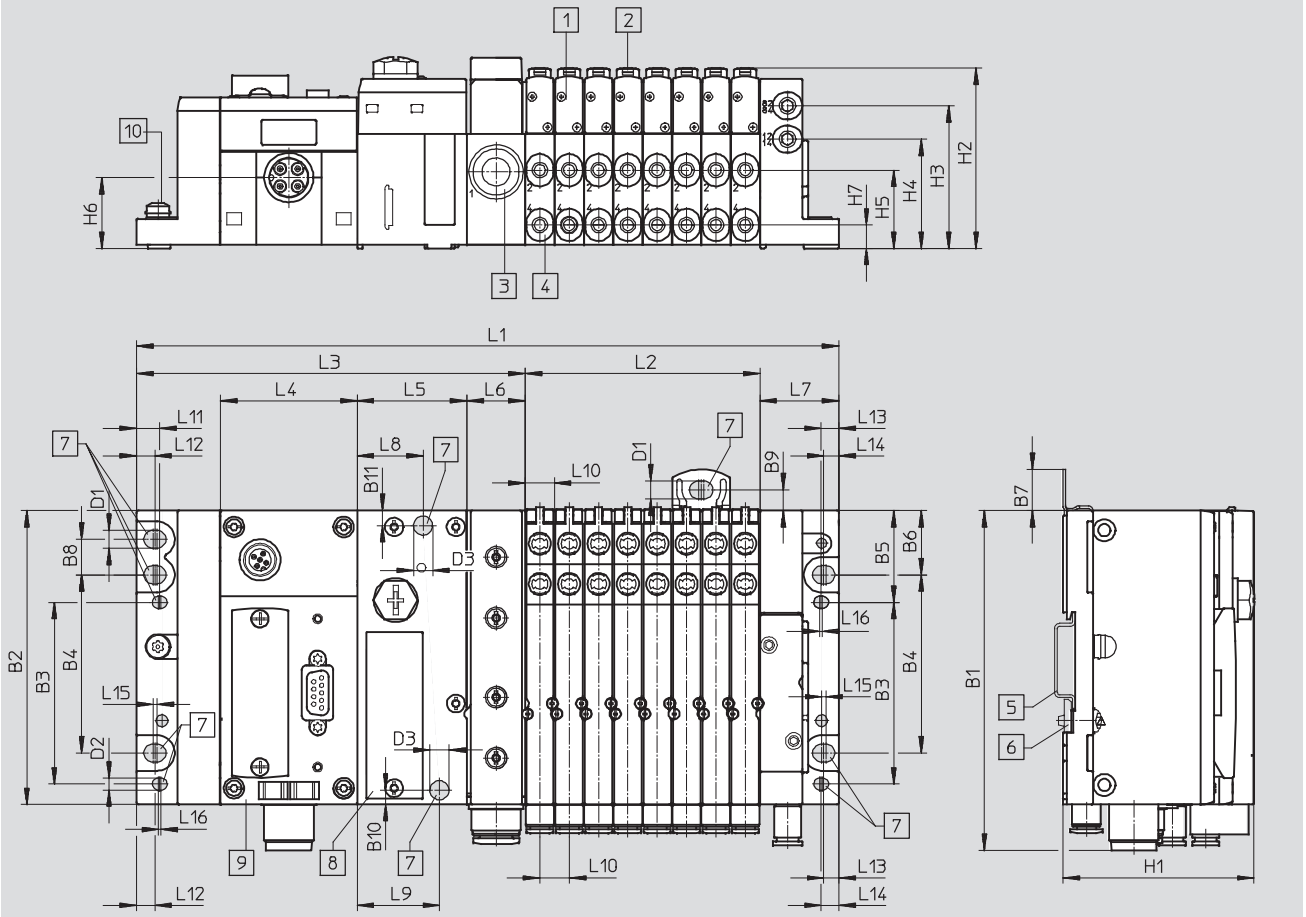
With bus nodes and valve terminal MPA



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

Dimensions Download CAD data ➔ **www.festo.com**

With bus node and valve terminal MPA-L



1 Solenoid valve
2 Manual override
3 Power supply module
4 Working lines
5 H-rail
6 H-rail mounting
7 Mounting holes
8 Pneumatic interface MPA-L
9 CPX module
10 Earthing screw

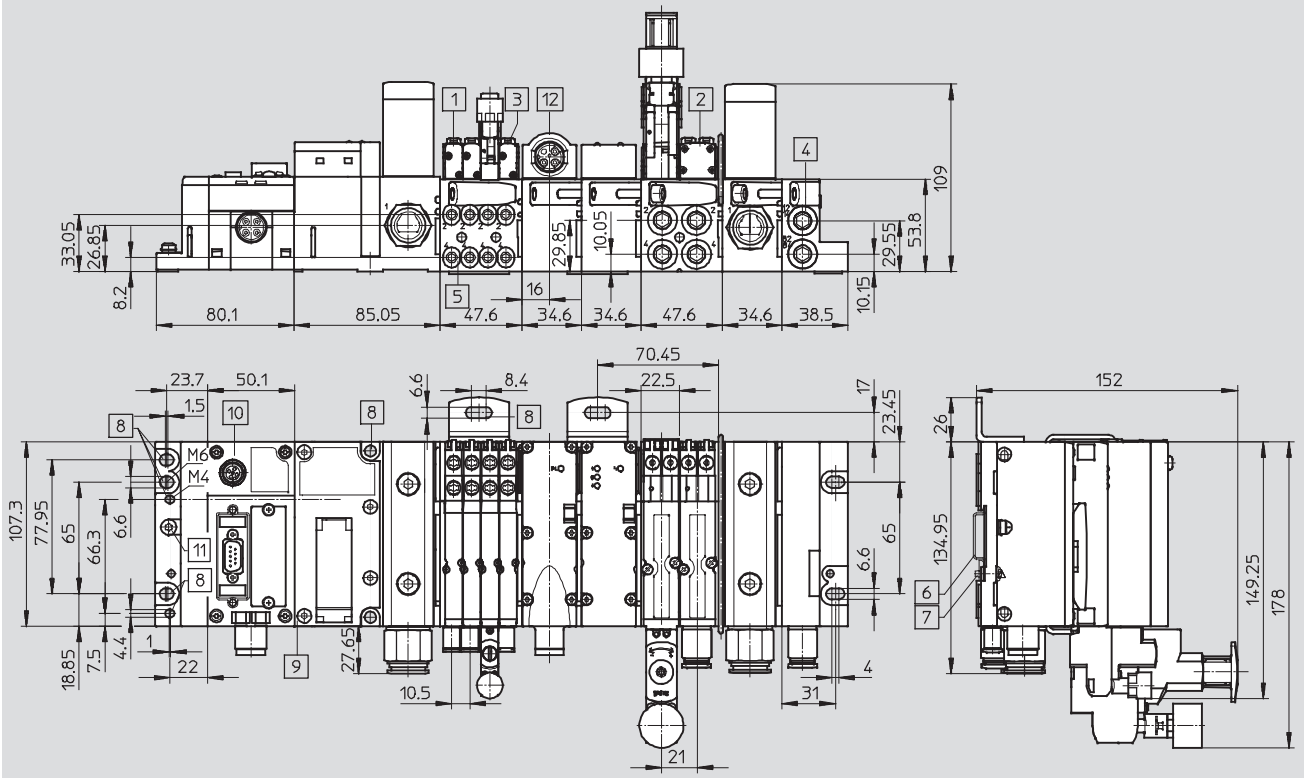
Type	L1[1)]	L2[1)]	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	D1	D2	D3
MPA-L	170.9 + n x 10.70	n x 10.70	142.1	50	40.1	21.2	28.8	24	30	10.7	8.5	6.8	5.6	6.5	6.6	4.4	7

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	H1	H2	H3	H4	H5	H6	H7
MPA-L	124	107.3	66.3	65	33.5	23.5	15	13	7.5	5.3	5.5	69.6	65.7	52	39.8	28.5	25.8	8.5

1) n = Number of sub-bases/valve positions

Dimensions Download CAD data ➔ **www.festo.com**

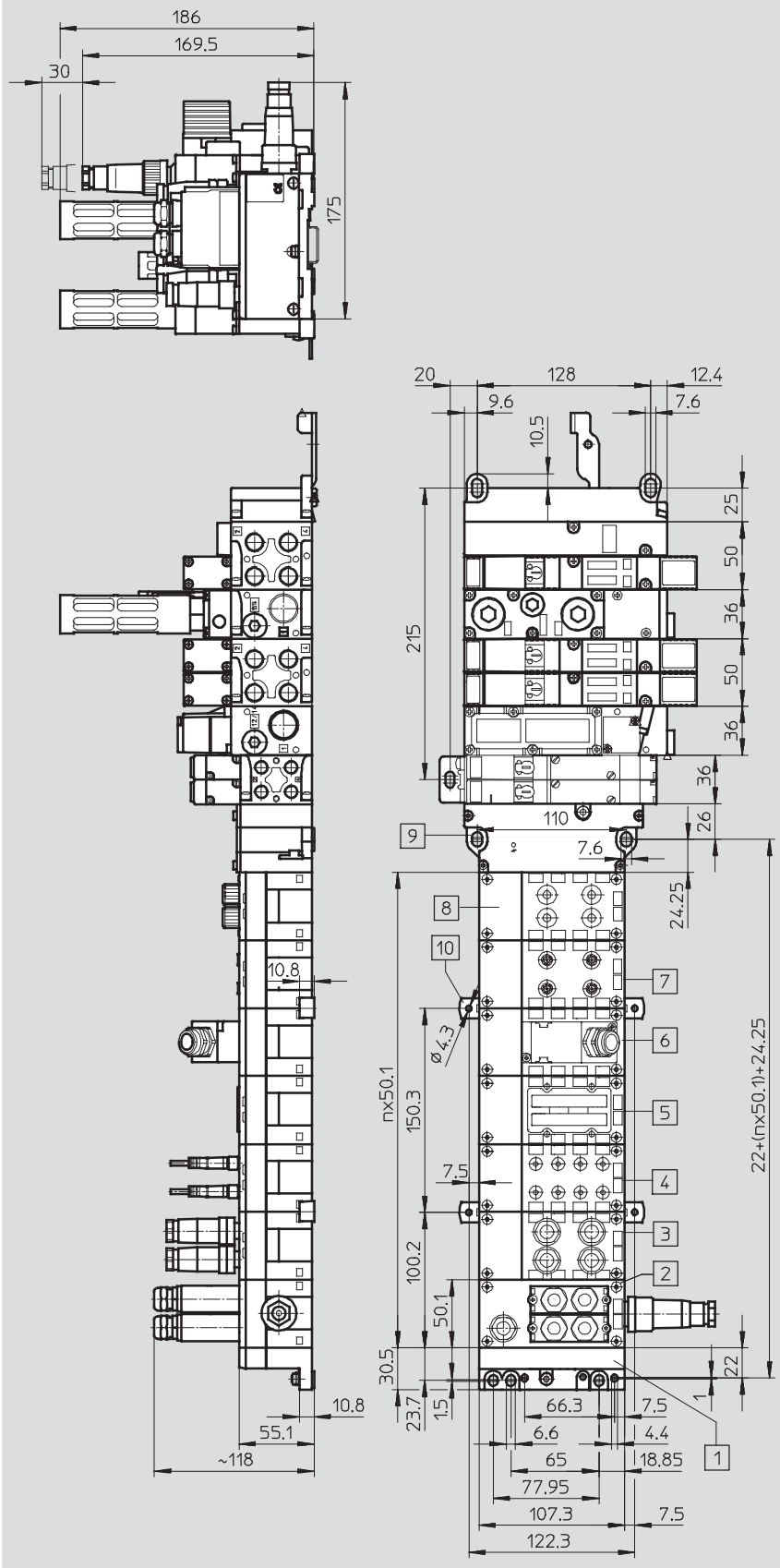
With bus nodes and valve terminal MPA-F



1 Solenoid valve MPA1
2 Solenoid valve MPA2
3 Manual override
4 Pilot air supply, pilot exhaust air
5 Working lines
6 H-rail
7 H-rail mounting
8 Mounting holes
9 Pneumatic interface MPAF
10 CPX module
11 Earthing screw
12 Electrical supply plate

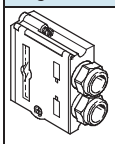
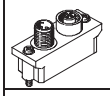
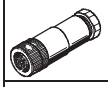
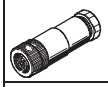
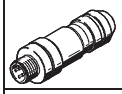
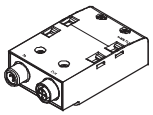
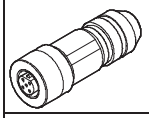
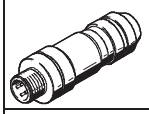
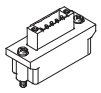
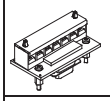
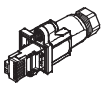
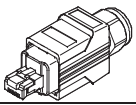
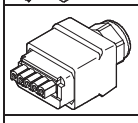
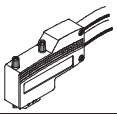
Dimensions Download CAD data ➔ **www.festo.com**

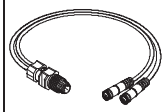
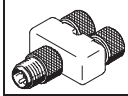
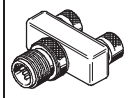
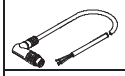
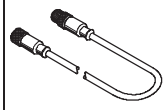
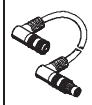
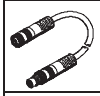
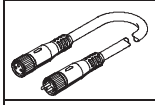
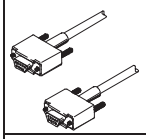
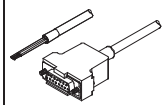
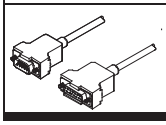
With bus nodes, connection blocks and valve terminal MIDI/MAXI

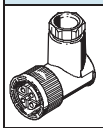
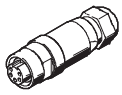
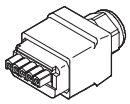
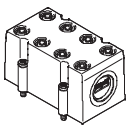
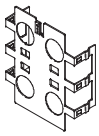
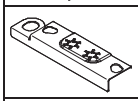
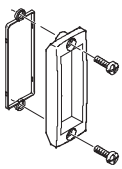
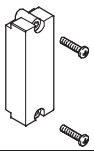
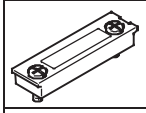
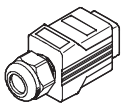
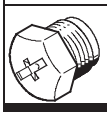


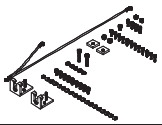
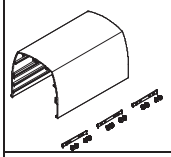
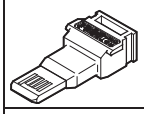
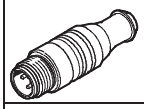
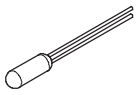
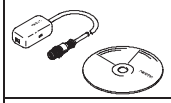
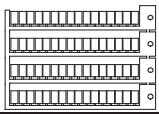
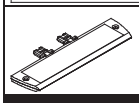
n Number of bus nodes and connection blocks for CPX

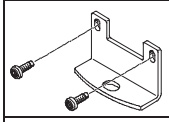
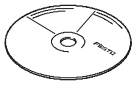
[1] Left-hand end plate
[2] Bus nodes
[3] Connection block CPX-AB-4-M12-8POL
[4] Connection block CPX-AB-8-M8-3POL
[5] Connection block CPX-AB-8-KL-4POL
[6] Connection block CPX-AB-1-SUB-BU-25POL
[7] Connection block CPX-AB-4-HAR-4POL
[8] Connection block CPX-AB-4-M12x2-5POL
[9] Pneumatic interface MIDI/MAXI
[10] Mounting clip for wall mounting (required every 2 ... 3 connection blocks)

Ordering data – Accessories				
Designation			Part No.	Type
Plug connectors and accessories				
	Sub-D plug for INTERBUS	Incoming	532218	FBS-SUB-9-BU-IB-B
		Outgoing	532217	FBS-SUB-9-GS-IB-B
	Sub-D plug for DeviceNet/CANopen		532219	FBS-SUB-9-BU-2x5POL-B
	Sub-D plug for Profibus DP		532216	FBS-SUB-9-GS-DP-B
	Sub-D plug for CC-Link		532220	FBS-SUB-9-GS-2x4POL-B
	Sub-D plug		534497	FBS-SUB-9-GS-1x9POL-B
	Bus connection M12 adapter (B-coded) for Profibus DP		533118	FBA-2-M12-5POL-RK
	Micro Style bus connection, 2xM12 for DeviceNet/CANopen		525632	FBA-2-M12-5POL
	Socket for Micro Style connection, M12		18324	FBSD-GD-9-5POL
	Plug for Micro Style connection, M12		175380	FBS-M12-5GS-PG9
	M12x1 bus connection, 4-pin (D-coded) for Ethernet		543109	NECU-M-S-D12G4-C2-ET
	Connection block M12 adapter (B-coded) for Profibus DP		541519	CPX-AB-2-M12-RK-DP
	Connection block M12 adapter (B-coded) for INTERBUS		534505	CPX-AB-2-M12-RK-IB
	Socket M12x1, 5-pin, straight, for self-assembly of a connecting cable for 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 for FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP		1066354	NECU-M-S-B12G5-C2-PB
	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
	Screw terminal bus connection for CC-Link		197962	FBA-1-KL-5POL
	RJ45/plug		534494	FBS-RJ45-8-GS
	RJ45 plug, 8-pin, push-pull		552000	FBS-RJ45-PP-GS
	SCRJ plug, 2-pin, push-pull, for CPX-M-FB35		571017	FBS-SCRJ-PP-GS
	Socket/spring-loaded terminal, 5-pin, AIDA push-pull		563059	NECU-M-PPG5-C1
	Plug for CAN bus interface, Sub-D, 9-pin, without terminating resistor		533783	FBS-SUB-9-WS-CO-K

Ordering data – Accessories				
Designation			Part No.	Type
Connecting cables				
	DUO cable M12-2xM8, 4-pin/2x3-pin	2x straight socket	**18685**	**KM12-DUO-M8-GDGD**
		2x straight/angled socket	**18688**	**KM12-DUO-M8-GDWD**
		2x angled socket	**18687**	**KM12-DUO-M8-WDWD**
	Push-in T-connector	2x socket M8, 3-pin 1x plug M8, 4-pin	**544391**	**NEDU-M8D3-M8T4**
	Push-in T-connector	2x socket M12, 5-pin 1x plug M12, 4-pin	**541596**	**NEDU-M12D5-M12T4**
		2x socket M8, 3-pin 1x plug M12, 4-pin	**541597**	**NEDU-M8D3-M12T4**
	Connecting cable M9, 5-pin, angled plug-open cable end 3-pin	2 m	**563711**	**NEBC-M9W5-K-2-N-LE3**
		5 m	**563712**	**NEBC-M9W5-K-5-N-LE3**
	Connecting cable M8-M8, straight plug-straight socket	0.5 m	**175488**	**KM8-M8-GSGD-0,5**
		1.0 m	**175489**	**KM8-M8-GSGD-1**
		2.5 m	**165610**	**KM8-M8-GSGD-2,5**
		5.0 m	**165611**	**KM8-M8-GSGD-5**
	Connecting cable M12-M12, 5-pin, straight plug-straight socket	1.5 m	**529044**	**KV-M12-M12-1,5**
		3.5 m	**530901**	**KV-M12-M12-3,5**
	Connecting cable M12-M12, 4-pin, straight plug-straight socket	2.5 m	**18684**	**KM12-M12-GSGD-2,5**
		5.0 m	**18686**	**KM12-M12-GSGD-5**
	Connecting cable M12-M12, 8-pin, straight plug-straight socket	2.0 m	**525617**	**KM12-8GD8GS-2-PU**
	Connecting cable M12-M12, 4-pin, straight plug-angled socket	1.0 m	**185499**	**KM12-M12-GSWD-1-4**
	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**
	Modular system for connecting cables		–	**NEBU-...** ➔ Internet: nebu
	Programming cable		**151915**	**KDI-PPA-3-BU9**
	Connecting cable FED (for CPX-CEC)		**539642**	**FEC-KBG7**
	Connecting cable FED (for CPX-CEC)		**539643**	**FEC-KBG8**

Ordering data – Accessories				
Designation			Part No.	Type
Plug connectors and accessories – Power supply				
	Plug socket for mains connection M18, straight	For 1.5 mm^2	**18493**	**NTSD-GD-9**
		For 2.5 mm^2	**18526**	**NTSD-GD-13.5**
	Plug socket for mains connection M18, angled	For 1.5 mm^2	**18527**	**NTSD-WD-9**
		For 2.5 mm^2	**533119**	**NTSD-WD-11**
	Power supply socket	7/8" connection, 5-pin	**543107**	**NECU-G78G5-C2**
		7/8" connection, 4-pin	**543108**	**NECU-G78G4-C2**
	Connection socket AIDA push-pull, spring-loaded terminal	5-pin	**563059**	**NECU-M-PPG5-C1**
Covers and attachments				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**538219**	**AK-8KL**
	Fittings kit		**538220**	**VG-K-M9**
	Screening plate for M12 connections		**526184**	**CPX-AB-S-4-M12**
	Earthing component (5 pieces), for right-hand/left-hand plastic end plate		**538892**	**CPX-EPFE-EV**
	Inspection cover, transparent		**533334**	**AK-SUB-9/15-B**
	Inspection cover, for use in Atex environments as per certification (➔ 49)		**557010**	**AK-SUB-9/15**
	Transparent cover for DIL switch and memory card		**548757**	**CPX-AK-P**
	Cover for DIL switch and memory card		**548754**	**CPX-M-AK-M**
	Cover for RJ45 connection		**534496**	**AK-Rj45**
	Cover for RJ45 push-pull connection		**548753**	**CPX-M-AK-C**
	Cover cap for sealing unused sockets (10 pieces)	For M8 connections	**177672**	**ISK-M8**
		M9	**356684**	**FLANSCHDOSE SER.712**
		For M12 connections	**165592**	**ISK-M12**

Ordering data – Accessories				
Designation			Part No.	Type
Hood				
	Mounting rail for securing the cover	1,000 mm	**572256**	**CAFC-X1-S**
	Mounting kit for CPX cover		**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 a plastic interlinking block	Bus node/metal connection block	**550218**	**CPX-DPT-30X32-S-4X**
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	**550219**	**CPX-M-M3x22-4x**
		Bus node/metal connection block	**550216**	**CPX-M-M3x22-S-4x**
	Screws for attaching an inscription label holder to the fieldbus node (CPX-FB33, CPX-M-FB34, CPX-M-FB35)	12 pieces	**550222**	**CPX-M-M2,5X8-12X**
Functional modules				
	Memory card for PROFINET fieldbus node (CPX-FB33, CPX-M-FB34, CPX-M-FB35), 2 MB		**568647**	**CPX-SK-2**
	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 from 5-pin M12 to mini USB socket and controller software		**547432**	**NEFC-M12G5-0.3-U1G5**
Inscription labels				
	Inscription labels 6x10, 64 pieces, in frames		**18576**	**IBS-6x10**
	Inscription label holder for connection block		**536593**	**CPX-ST-1**

Ordering data – Accessories				
Designation			Part No.	Type
Mounting				
	Attachment for wall mounting (for long valve terminals, 10 pieces), design for plastic manifold sub-bases		**529040**	**CPX-BG-RW-10x**
	Attachment for wall mounting (for long valve terminals, 2 mounting brackets and 4 screws), design for metal manifold sub-bases		**550217**	**CPX-M-BG-RW-2x**
Software				
	CPX remote diagnostics and process visualisation		**545413**	**CPX-WEB-MONITOR**
	Programming software	German	**537927**	**P.SW-FST4-CD-DE**
		English	**537928**	**P.SW-FST4-CD-EN**
	ePlan macro library		**537041**	**GSWC-TE-EP-LA**