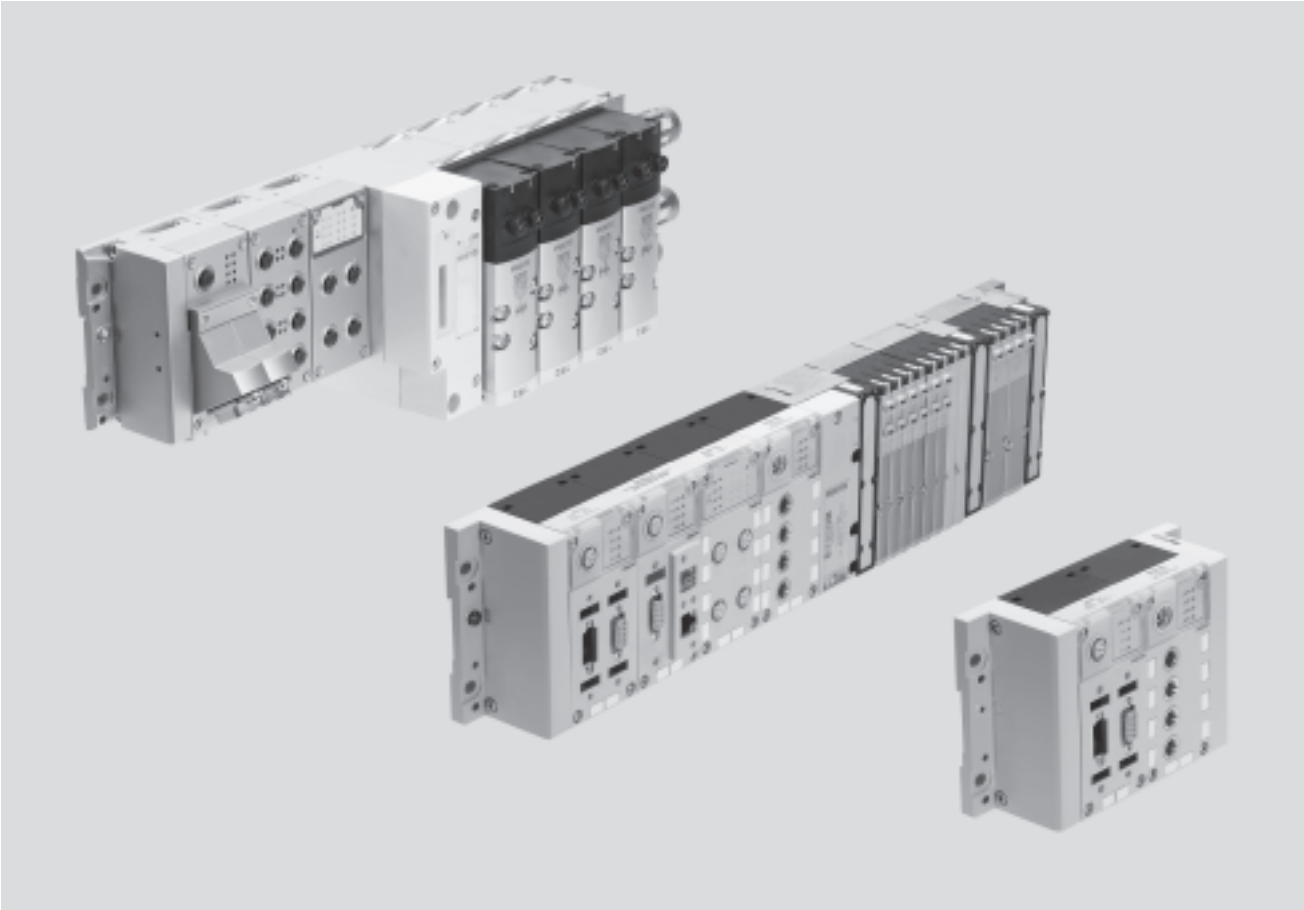
- Modular, flexible and sturdy terminal with up to 512 I/Os
- Selectable connection technology
- Open to all fieldbus protocols and Ethernet
- Integrated diagnostic and service function
- Integrated IT services
- Suitable for MPA, CPA, MIDI/MAXI, VTSA/ISO, VTSA-F
- CPX as a dedicated remote I/O module

Terminal CPX

Key features



Key features

Installation concept	Electrical	Mounting	Operation
• Choice of multiple valve terminal types for different applications: – Type 03 MIDI/MAXI – Type 12 CPA – Type 32 MPA – Type 44/45 VTSA/VTSA-F • 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/electronics modules for valves • Extensive range of functions and connection options for the electrical modules • Selectable connection technology for technically and economically optimised connections • Can be used as a dedicated remote I/O module	• High operating voltage tolerance (±25%) • Choice of M18 or 7/8" connection for power supply • Open to all common fieldbus protocols and Ethernet • Optional function and technology modules for pre-processing • IT services and TCP/IP such as remote maintenance, remote diagnostics, web server, SMS and e-mail alert • Digital inputs and outputs, 4-fold/8-fold/16-fold, optionally available with individual channel diagnostics • Analogue inputs and outputs, 2-fold/4-fold • Temperature inputs –200 ... +850 °C • IP65 and IP67 or IP20	• 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 costs for selection, ordering, assembly and commissioning thanks to the central CPX terminal • Design of optimised control loop systems thanks to selectable pneumatic components • Decentralised, subordinate installation system CPI improves cycle times by up to 30% • Safe and convenient earthing thanks to earthing plate	• Fast troubleshooting thanks to an extensive selection of LEDs (some of which are multi-coloured) on the bus node and on all I/O modules • Supports module and channel-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

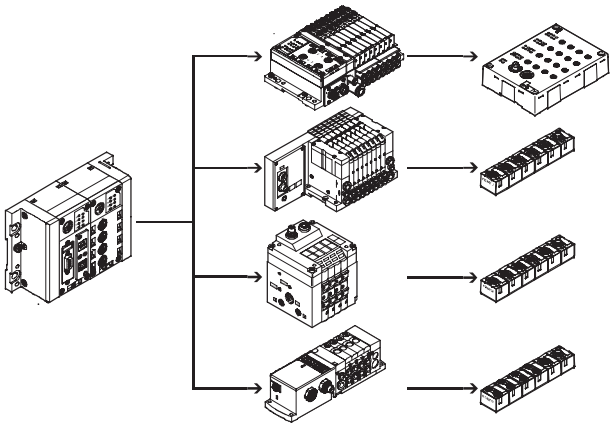
Key features

Pneumatic variants of the CPX terminal

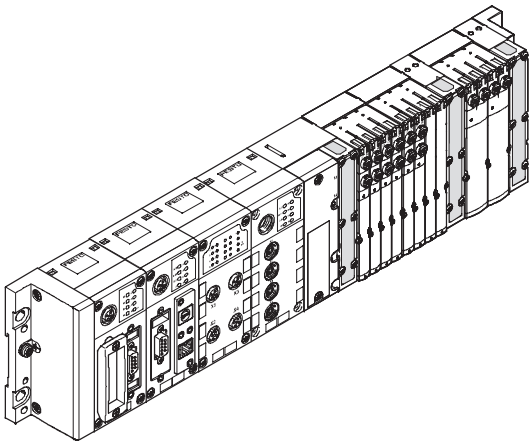
The electrical CPX terminal is a modular peripheral system for valve terminals.
The system is specifically designed so that the valve terminal can be adapted to suit different applications.

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

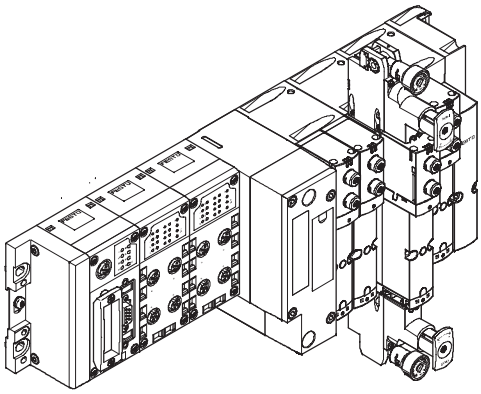
With valve terminal – decentralised



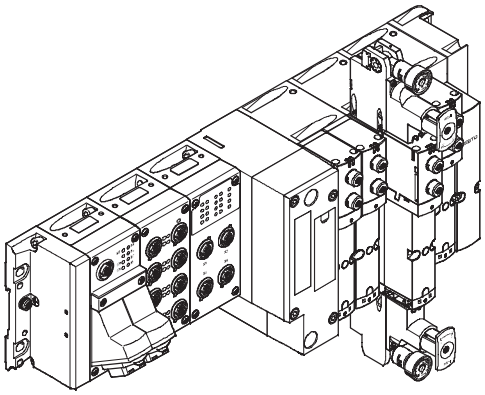
With valve terminal MPA – centralised



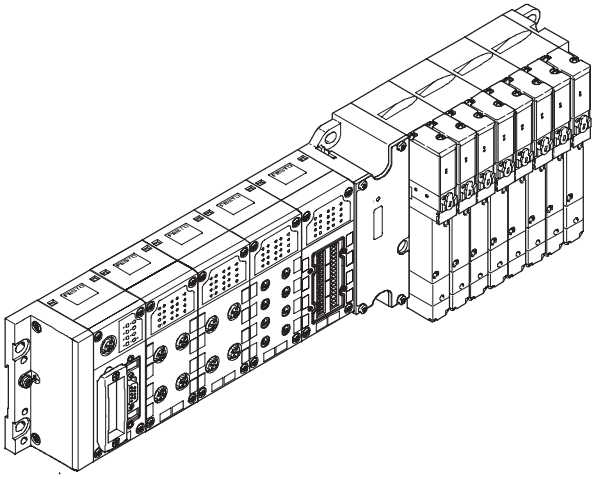
With valve terminal VTSA – centralised



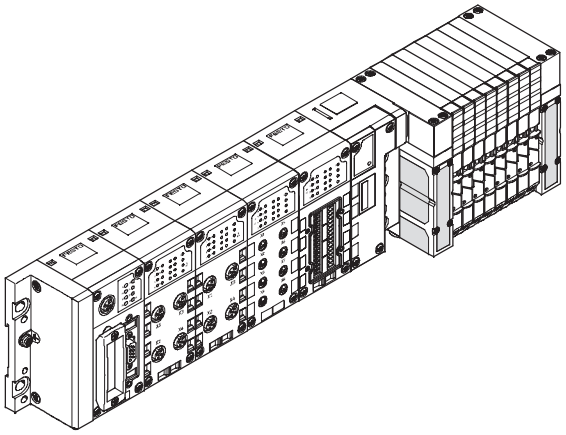
In metal version with valve terminal VTSA – centralised



With valve terminal MIDI/MAXI – centralised



With valve terminal CPA – centralised



Variants of the CPX terminal controller (with fieldbus node, without pre-processing)

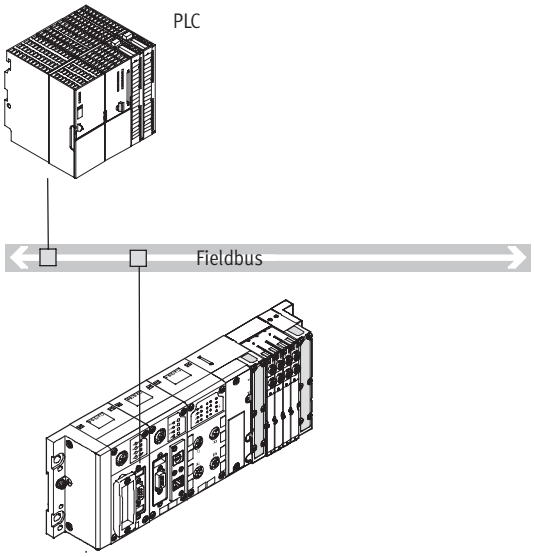
Fieldbus node

Different bus nodes are used for integration in the control systems of various manufacturers.
The CPX terminal can therefore be operated on over 90% of the most commonly used fieldbus systems:
- Profibus-DP
- 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 servers, web monitors as integrated home pages, SMS/e-mail alerts, etc. are opening up a wide range of synergies.
This incorporates standardised and universal communications technology across all areas, including operating level, control level and field level with protection to IP 65/67.

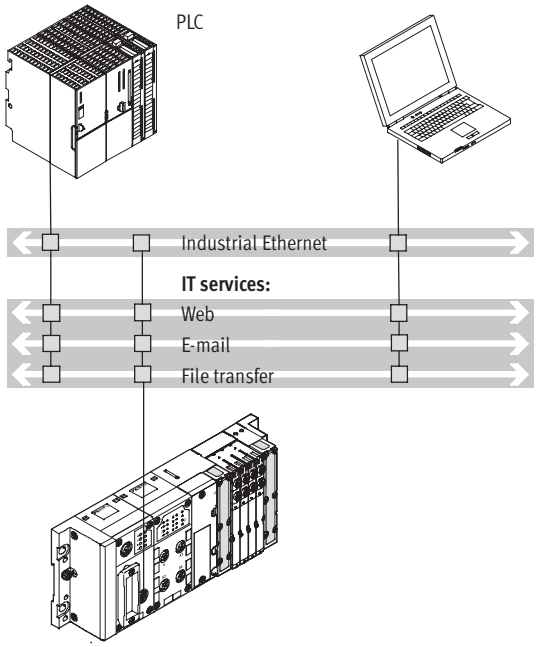
The following protocols are supported:
- Ethernet/IP
- Modbus/TCP
- Profinet

Fieldbus node



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

Fieldbus node Industrial Ethernet



- Connection to a higher-order controller directly via Ethernet/IP, Modbus/TCP or ProfiNet
- No pre-processing
- 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.

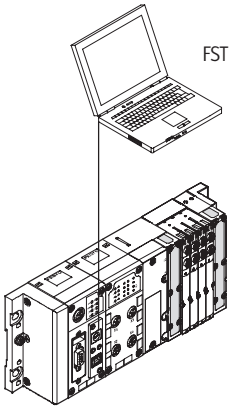
Variants of the CPX terminal controller (with pre-processing in the FEC)

Control block

The optional Front End Controller CPX-FEC, in parallel with a fieldbus node, permits simultaneous access via Ethernet and an integrated web server, as well as autonomous pre-processing. 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 FEC in standalone mode

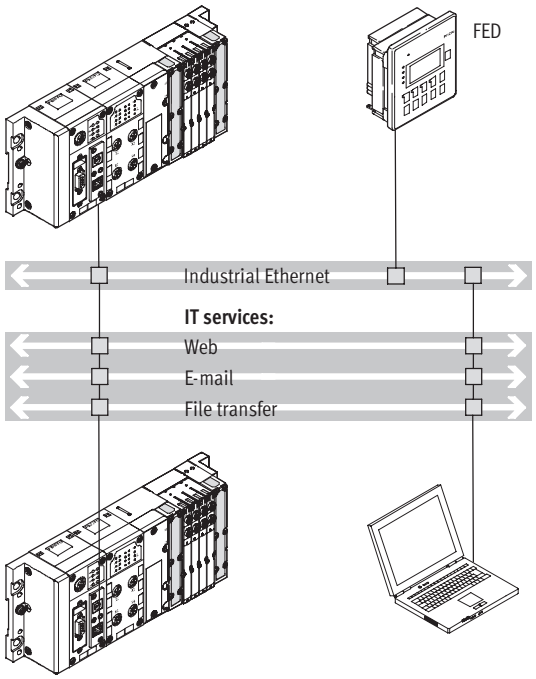


- Decentralised controller with direct machine mounting
- Interaction options via CPX-MMI or Front End Display (FED)
- Possibility of downloading programs via Ethernet (or via the programming interface)
- Supports full expansion of all CPX peripherals
- More than 300 I/Os

Beneficial application areas:

- Autonomous single workstations
- Interlinked, standalone subsystems
- Automation using IT technology

With FEC in Festo EasyIP mode



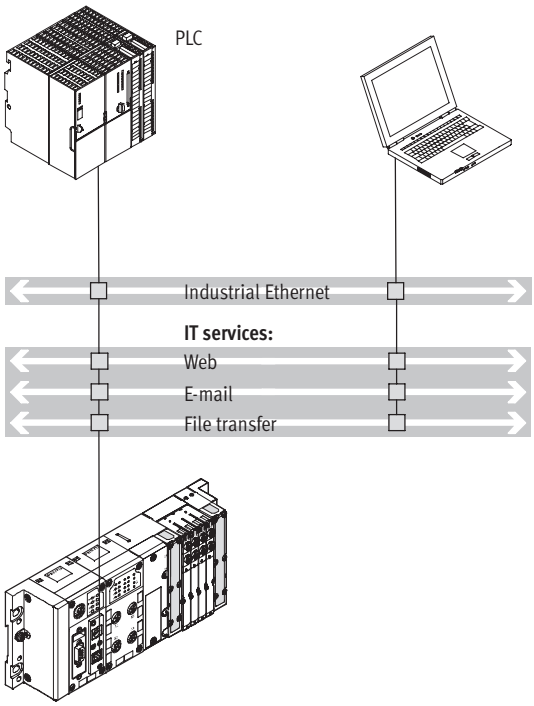
- Fast pre-processing of the CPX peripherals in the FEC
- Any data can be exchanged between the FEC via EasyIP
- Several FECs can be operated and monitored via one FED
- Remote diagnostics via an FED and CPX Web Monitor

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

Variants of the CPX terminal controller (with pre-processing in the FEC)

With FEC as remote controller on Ethernet

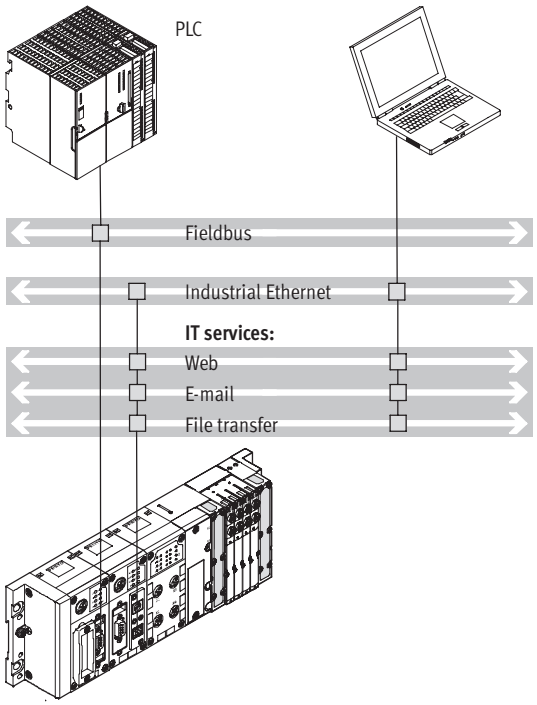
Remote controller on Ethernet as the pre-processing unit for decentralised, standalone subsystems using IT technology.



- Connection to a higher-order controller directly via Ethernet, no further fieldbus nodes are required
- Monitoring via Ethernet and web applications
- Pre-processing of the CPX peripherals through CPX-FEC
- More than 300 I/Os

With FEC as remote controller on fieldbus

Fieldbus remote controller (combination with fieldbus nodes for Interbus, Profibus-DP, Profinet, CANopen, DeviceNet or CC-Link) as the pre-processing unit for distributed, standalone subsystems.



- Fast pre-processing of the CPX peripherals in the FEC
- 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 nodes are only used for communication with the higher-order PLC
- Two fieldbus nodes for redundant communication configuration

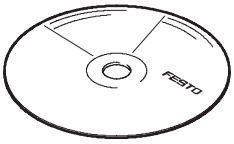
Terminal CPX

Key features

CPX Web Monitor – Online diagnostics for the CPX terminal

➔ 4 / 4.8-55

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
- Adaptable 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 via modules and channels
- Status of the channels/valves
- SMS 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 assigned 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 have?

- 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
- Error message in "plain text" describing the type of error
- Exact error identified and appropriate service tasks available

Possible error messages:

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

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

Error memory (fault trace)

Quick access to the last 40 diagnostic results with timestamp.

Assistance in finding sporadic errors and statistical accumulations.

Plug and work with FEDs

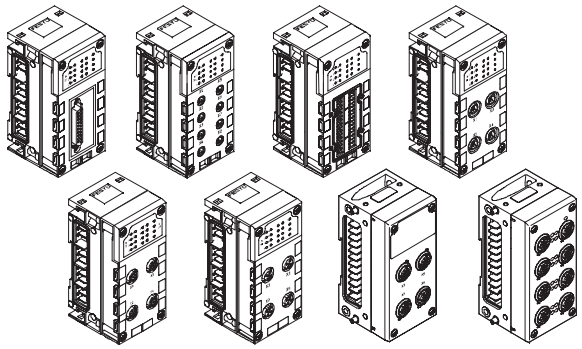
The CPX Web Monitor can be implemented directly on all Festo touchpanels with the Windows CE operating system

- FED 710 with 7.5" TFT display
- FED 1010 with 10.4" TFT display
- FED 2010 with 12.1" TFT display
- FED 5010 with 15" TFT display

Convenient remote maintenance via Ethernet (TCP or Easy IP) is thus possible.

Connection of inputs and outputs to the CPX terminal

Digital and analogue CPX I/O modules

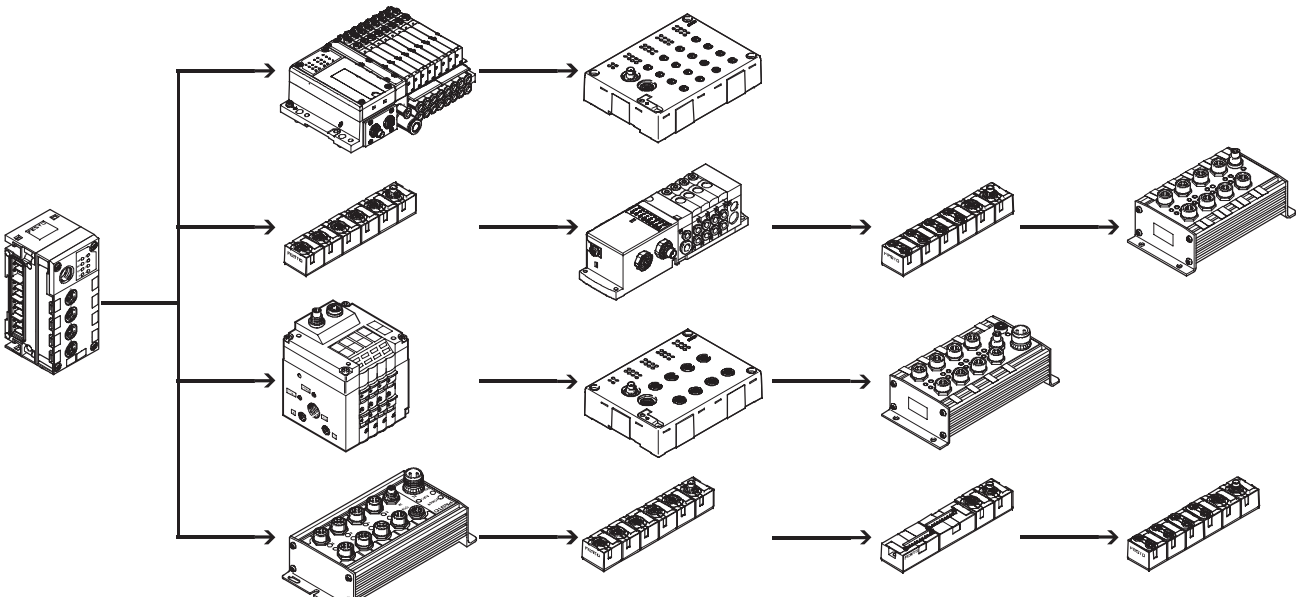


Electrical connection

The connection technology for the sensors and additional actuators offers a wide range of digital and analogue input and output modules and is freely selectable – depending on your standards or application. Connection blocks in plastic or metal can be freely combined:

- Metal version
  - M12-5-PIN
- Plastic version
  - M12-5-PIN
  - M12-5-PIN with quick lock and metal thread
  - M12-8-PIN
  - M8-3-PIN
  - M8-4-PIN
  - Sub-D
  - Harax®
  - CageClamp® (with cover also for IP65/67)

With CPX-CP interface

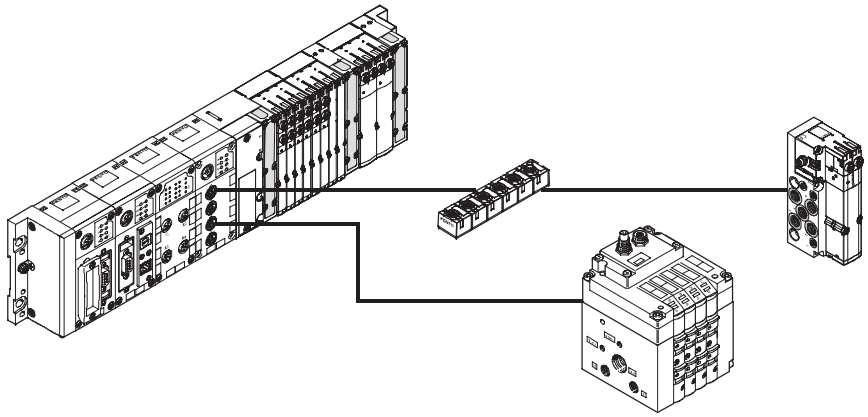


- Up to 4 strings per CP interface possible
- Up to 4 subordinate CP modules can be combined in a string
- Up to 32 I/Os can be connected per string
- Modules with M8, M12 and terminal connection

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

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

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



- Can be scaled to different requirements within a system
- One control interface in the system, reduces installation complexity with concentrated and widely dispersed actuators
- Enables the implementation of an optimum electrical and pneumatic control loop system

Ordering

The CPX terminal with valve terminal is fully assembled according to 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 field-bus. For this order, only the order code for the electrical peripherals is required.

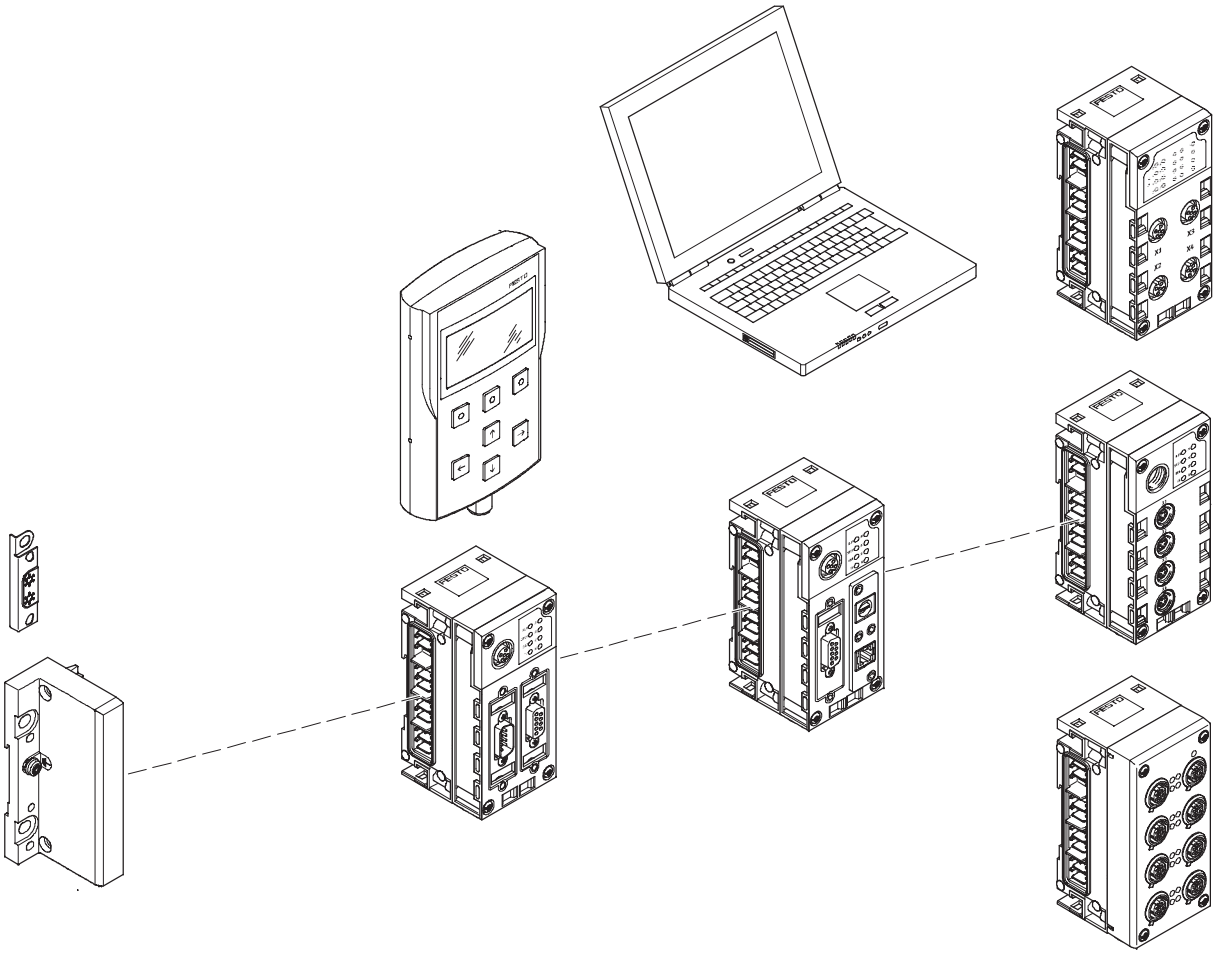
The order lists for the pneumatic components can be found in

- Valve terminal type 44 VTSA, ISO 15407-2
- Valve terminal type 45 VTSA-F
- Valve terminal type 12 CPA, Compact Performance
  4 / 2.1-89
- Valve terminal type 32 MPA, Modular Performance
  4 / 2.2-1
- Valve terminal type 03 VIMP-/VIFB-03, multi-functional MIDI/MAXI
  4 / 2.2-56

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

- Installation system CPI
  4 / 4.6-1

Complete overview of modules



End plate

- Mounting holes for wall mounting
- Functional earthing 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 peripherals status via LED
- Profinet to AIDA standard in metal housing

Control block

- Pre-processing, autonomous controller or remote unit CPX-FEC
- Connection via Ethernet TCP/IP or Sub-D programming interface
- Setting of operating modes via DIL switch and program selection via rotary switch

Input/output modules

Combination of

- Interlinking block
- Electronics module
- Connection block

Handheld control 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

- Integrated home page of the valve terminal
- Dynamic status display
- Online diagnostics
- SMS/e-mail alert

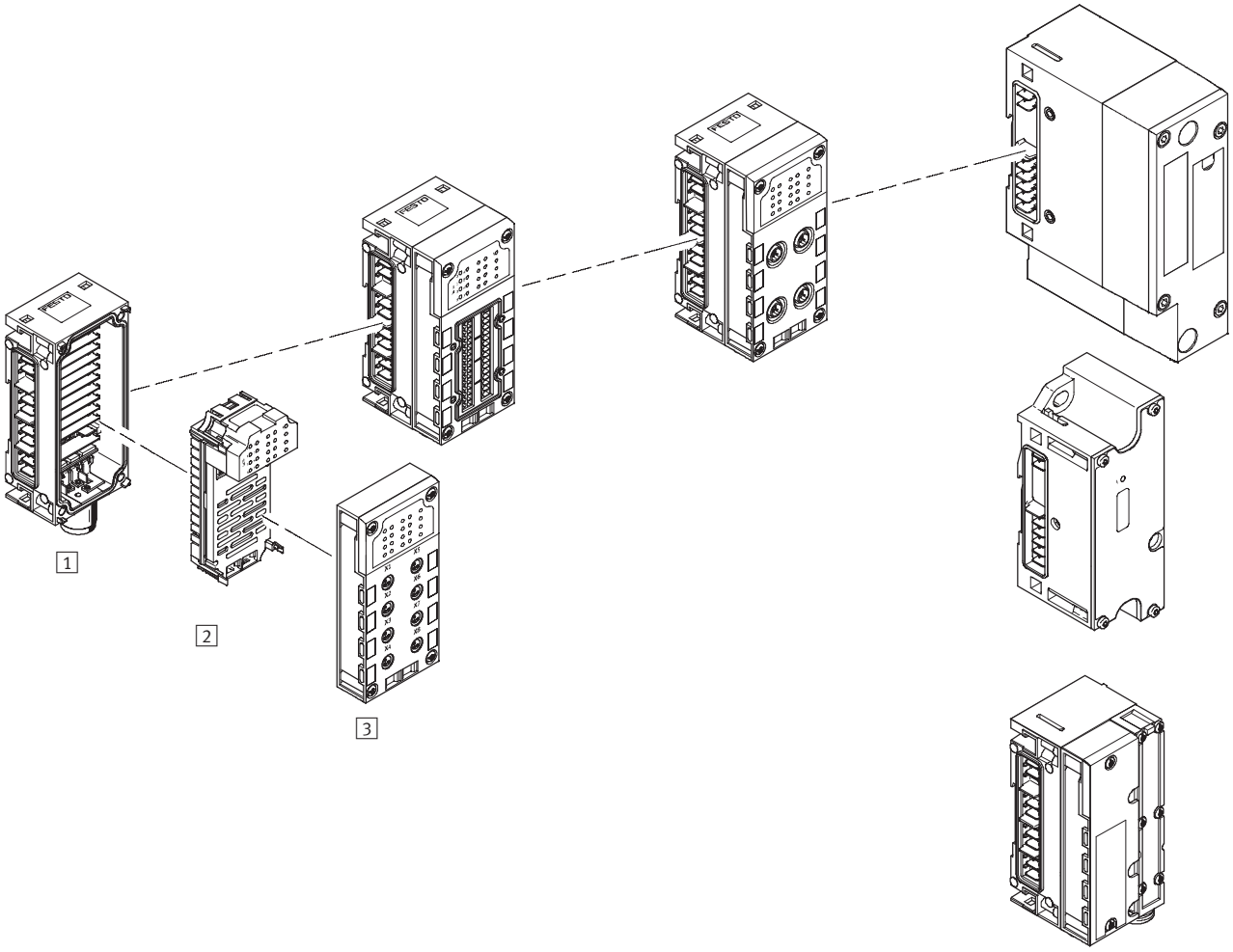
CP interface

- CP interface for decentralised installation systems, thus optimising the pneumatic control loop system (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

Terminal CPX

Peripherals overview

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
- M18 or 7/8" connection accessories
- 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 activation of additional actuators
- Analogue inputs
- Temperature inputs (analogue)
- Analogue outputs

3 Connection block

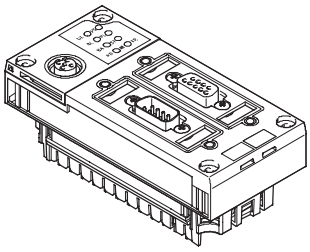
- Selectable connection technology with 8 variants
- Protection class IP65/IP67 or IP20
- Freely combinable with the electronics modules
- M8/M12/Sub-D/Harax connection accessories
- M8/M12/Sub-D, etc. connecting cables
- Modular system for M8/M12 connecting cables
- M12 connection technology for the metal version

Pneumatic interface

- MPA1/2
- VTSA/VTSA-F
- MIDI/MAXI
- CPA10/14

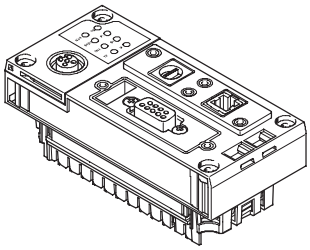
Individual overview of modules

Bus node



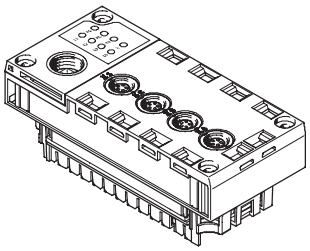
Bus node for
- Profibus-DP
- Interbus
- DeviceNet
- CANopen
- CC-Link
- Ethernet/IP
  (integrated web server)
- Profinet
  (integrated web server)

Control block



Control block
- Ethernet interface
- Modbus/TCP
- EasyIP
- Integrated web server
- Sub-D programming interface

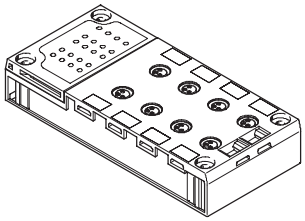
CP interface



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

Individual overview of modules

Plastic connection block

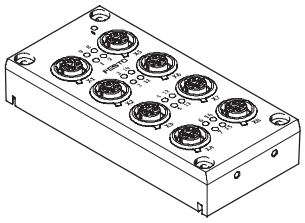


Direct machine mounting
(protection class IP65/IP67)
- M8-3-PIN
- M8-4-PIN
- M12-5-PIN
- M12-5-PIN Speedcon quick lock, metal thread screened
- M12-8-PIN
- Sub-D
- Harax®
- Clamped terminal connection (CageClamp®) with cover

Protected fitting space
(protection class IP20)
- Clamped terminal connection (CageClamp®)

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

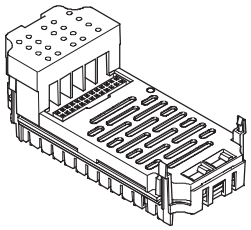
Metal connection block



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

Individual overview of modules

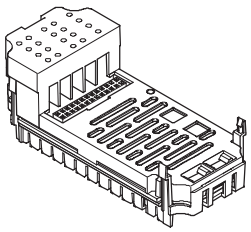
Digital electronics module for inputs/outputs



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)

Multi I/O modules
- 8 digital inputs and 8 digital outputs

Analogue electronics module for inputs/outputs



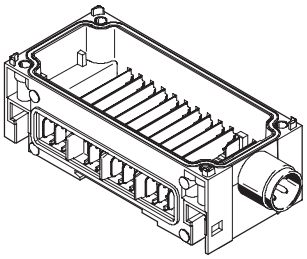
Analogue inputs
- 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue inputs (0 ... 20 mA, 4 ... 20 mA)

Analogue temperature inputs
- 4 analogue inputs for measuring temperature (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni500, Ni1000)

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

Individual overview of modules

Plastic interlinking block – Linking using 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)

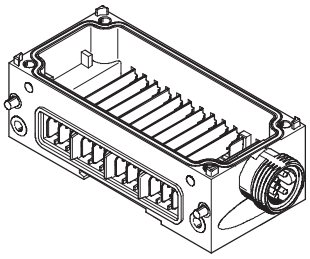
Power supply for the
- valves (16 A per supply)

Expandability
- Can be expanded to include an interlinking block with tie rod expansion CPX-ZA-1-E

Note

The max. current is limited to 12 A with the 7/8" system supply.
When using a conventional pre-assembled cable, the max. current is limited to 8 A.

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

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 up to 10 interlinking blocks

Note

The max. current is limited to 12 A with the 7/8" system supply.
When using a conventional pre-assembled cable, the max. current is limited to 8 A.

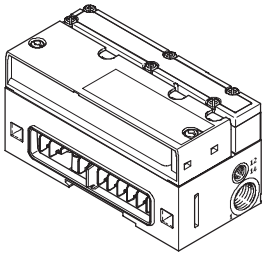
Note

Interlinking blocks made from plastic (tie rods) and from metal (individual linking) cannot be combined due to the fact that they have different types of linking.

Individual overview of modules

Pneumatic interface MPA

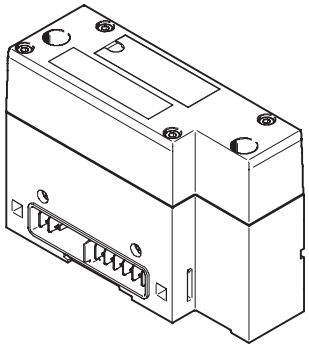
➔ 4 / 4.8-137



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 version

Pneumatic interface VTSA/VTSA-F

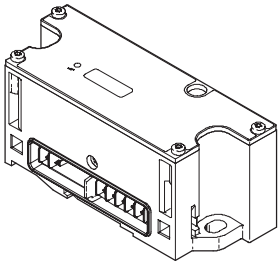
➔ 4 / 4.8-138



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 version
- For CPX metal version

Pneumatic interface MIDI/MAXI

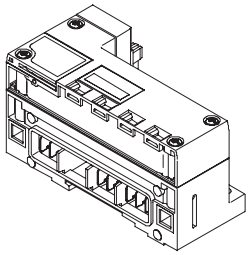
➔ 4 / 4.8-139



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 version
- For CPX metal version

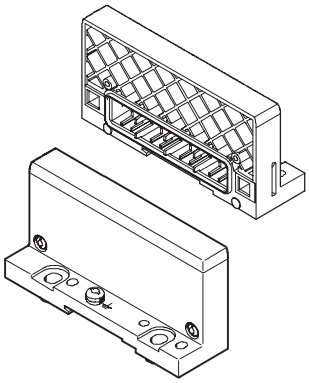
Pneumatic interface CPA

➔ 4 / 4.8-141



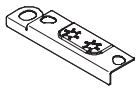
Valve terminal
- CPA10 (300 l/min)
- CPA14 (600 l/min)
- Up to 22 solenoid coils
- Setting of the number of valves via DIL switch
- For CPX plastic version

Plastic end plate



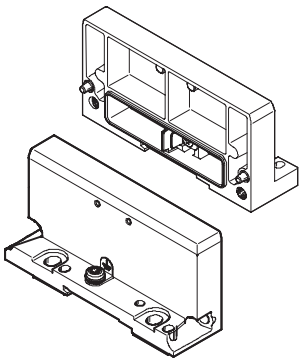
End plate
- Left-hand
- Right-hand (for use without valves)

Plastic earthing plate for end plate



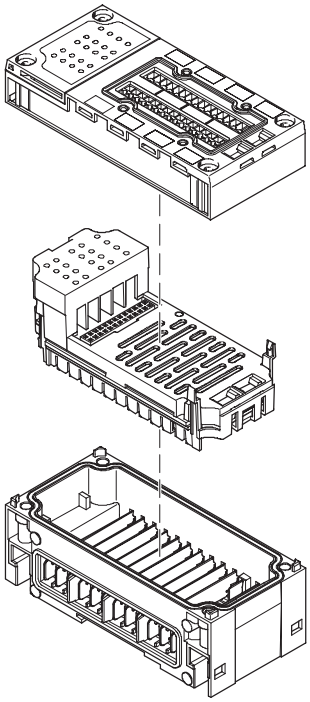
Earthing plate
- For safe and easy connection to the machine bed or H-rail, suitable for right-hand and left-hand end plate
- Assembly and earthing in a single processing step, which means:
  - 50% time saving
  - No additional material required

Metal end plate



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

General basic data and guidelines



Max. 11 modules in total:
- One bus node and/or one control block, freely positionable
- Up to 9 further input/output modules, freely positionable
- An additional pneumatic interface, always positioned as the last module on the right-hand side
  - For VTSA, VTSA-F, CPA and MIDI/MAXI: fixed operating range, set using DIL switch
  - For MPA: 16 MPA modules can be configured
- Address capacity max. 512 inputs and 512 outputs, depending on bus node or control block
- One interlinking block with system supply, 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 small number of exceptions, be freely combined with the electronics modules for inputs/outputs, also metal with plastic version (➔ table below)
- All electronics modules for inputs/outputs can be combined with any interlinking block
- Interlinking blocks made from plastic (tie rods) and from metal (individual linking) cannot be combined due to the fact that they have different types of linking

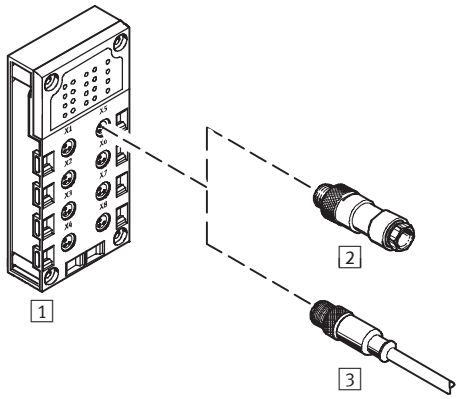
Combinations of connection blocks with digital input modules						
Connection blocks	Digital electronics modules					
	CPX-4DE	CPX-8DE	CPX-16DE	CPX-M-16DE-D	CPX-8DE-D	CPX-8NDE
Plastic version with mounting screws for mounting on plastic interlinking blocks						
CPX-AB-8-M8-3POL	■	■	–	–	■	■
CPX-AB-8-M8X2-4POL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

Combinations of connection blocks with digital output modules and multi I/O modules				
Connection blocks	Digital electronics modules			
	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-8DE-8DA
Plastic version with mounting screws for mounting 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 version with mounting screws for mounting on metal interlinking blocks				
CPX-AB-8-M8x2-4P-M3	■	■	■	–
CPX-AB-4-M12-8P-M3	–	–	–	■
CPX-AB-4-M12x2-5P-R-M3	■	■	■	–
Metal version with mounting screws for mounting on metal and plastic interlinking blocks				
CPX-M-4-M12x2-5POL	■	■	■	–
CPX-M-8-M12x2-5POL	–	–	–	–

Combinations of connection blocks with analogue electronics modules for inputs and outputs				
Connection blocks	Analogue electronics modules			
	CPX-2AE-U-I	CPX-4AE-I	CPX-4AE-T	CPX-2AA-U-I
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 version with mounting screws for mounting on metal interlinking blocks				
CPX-AB-4-M12x2-5P-R-M3	■	■	■	■
Metal version with mounting screws for mounting 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 customer request:

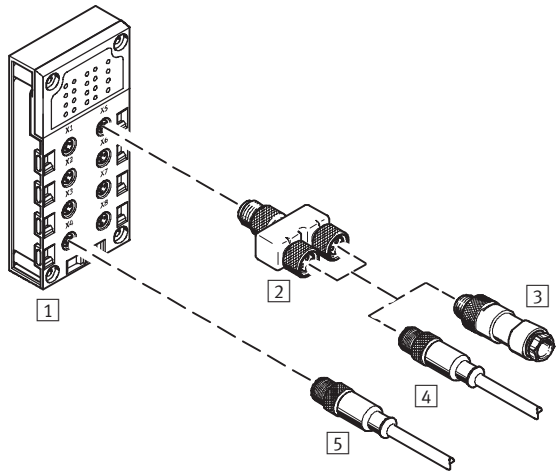
- Individual
- Fits perfectly
- Installation-saving

Combination of connection block with 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	Solderable lugs
		2 SEA-3GS-M8-S	Screw terminals
		3 KM8-M8-GSGD-... (pre-assembled connecting cable)	Socket, M8, 3-pin
		3 KM8-M12-GSGD-... (pre-assembled connecting cable)	Socket, M12, 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



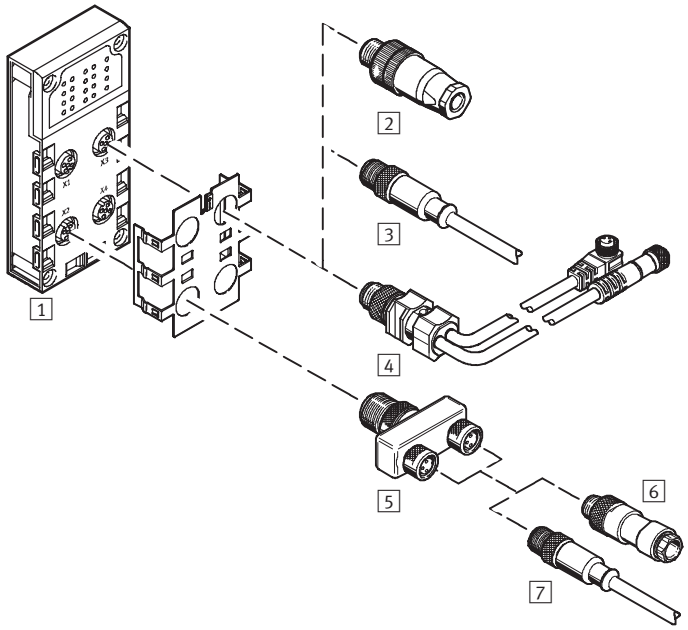
- Compact for pre-assembled individual connection
- 8 sockets
- 4-pin design for connection of 2 channels per socket

Combination of connection block with 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	Solderable lugs
				3 SEA-3GS-M8-S	Screw terminals
				4 KM8-M8-GSGD-... (pre-assembled connecting cable)	Socket, M8, 3-pin
				4 KM8-M12-GSGD-... (pre-assembled connecting cable)	Socket, M12, 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-M12x2-5POL-R with M12-5POL connection

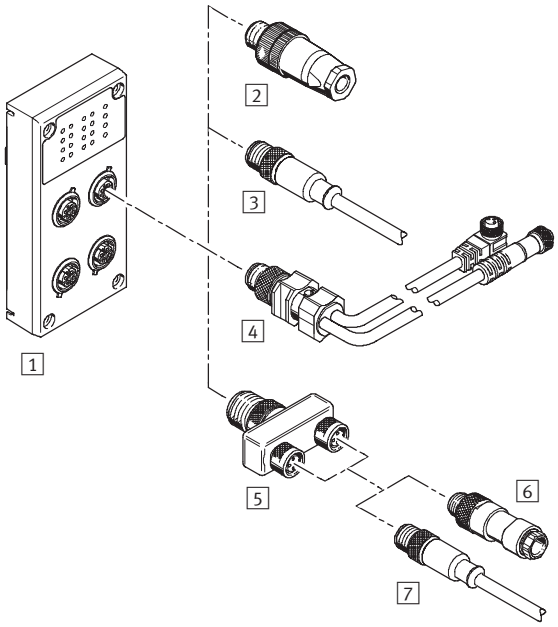


- Sturdy and pre-assembled with 2 channels per socket
- 4 sockets
- 5-pin design per socket
- Version ...-R with Speedcon quick-lock technology and metal thread for screening
- With two channels per socket, the corresponding input signals can be easily connected via a T-adapter and conventional cable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

Combination of connection block with 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	Solderable 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 KM8-M12-GSGD-... (pre-assembled connecting cable)	Socket, M12, 3-pin
				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

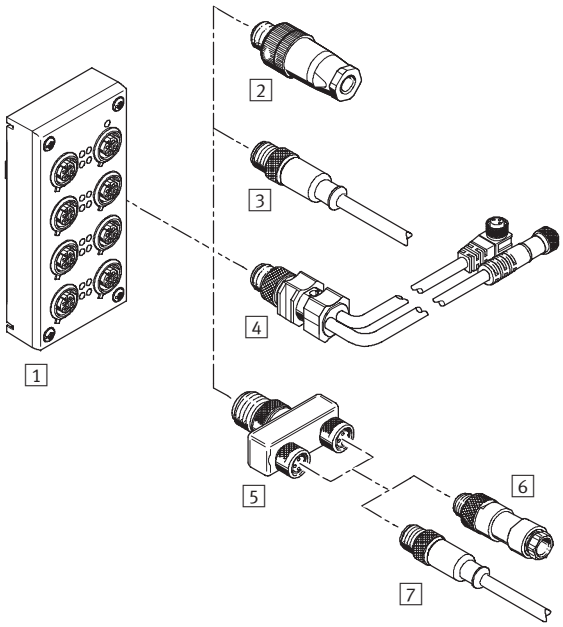
Electrical connection – Connection block (metal version)

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



- Sturdy and for pre-assembly 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

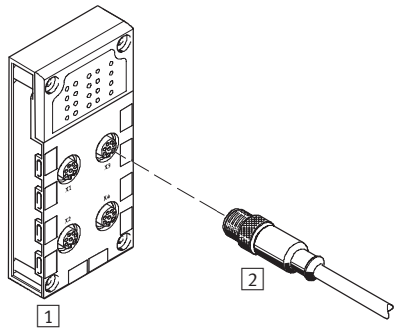


- Sturdy and for pre-assembly with 2 channels per socket
- 8 sockets
- 5-pin design per socket
- With two channels per socket, the corresponding input signals can be easily connected via a T-adapter and conventional cable with M8 connection

Combination of connection block with 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	Solderable 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 KM8-M12-GSGD-... (pre-assembled connecting cable)	Socket, M12, 3-pin
				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

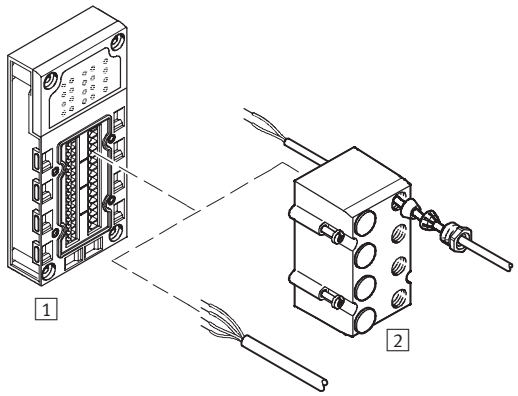
CPX-AB-4-M12-8POL with M12-8POL connection



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

Combination of connection block with 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 terminal (CageClamp®) connection

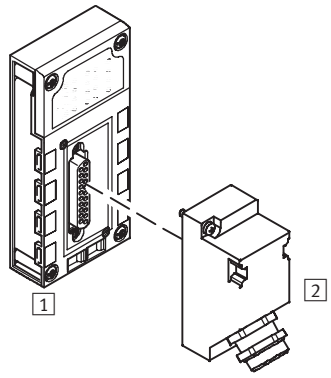


- Fast connection technology for use in control cabinets
- 32 CageClamp® spring-loaded terminals
- 4 terminals per channel
- Wire cross sections 0.05 … 1.5 mm²
- Optional cover with fittings for IP65/67 connection
  - 8 through-holes M9
  - 1 through-hole M16
  - Blanking plug
  - For I/O distributors, consoles or individual sensors/actuators

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

Electrical connection – Connection block

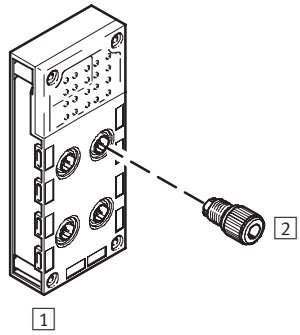
CPX-AB-1-SUB-BU-25POL with Sub-D connection



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

Combination of connection block with 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-HARx2-4POL with HARAX connection



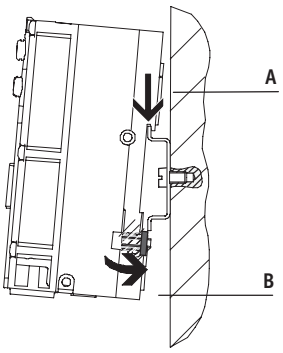
- Sturdy, fast connection technology for individual connections
- 4 sockets
- 4-pin design per socket

Combination of connection block with electrical connection technology				
Connection block	Connection technology		Plug connector/connecting cable	Selectable connection technology
1 CPX-AB-4-HARx2-4POL	Socket, HARAX, 4-pin		2 SEA-GS-HAR-4POL	Insulation displacement connectors

Mounting options

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

H-rail mounting



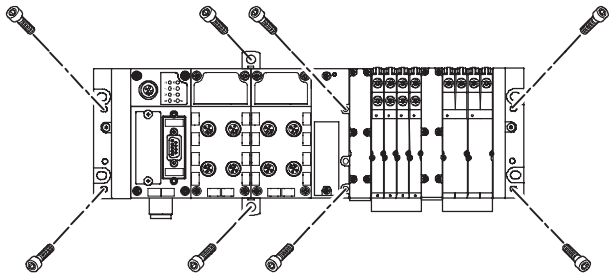
The H-rail mounting is formed in the reverse profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting kit.
The CPX terminal is attached to the H-rail as follows (see arrow A).

It is first swivelled on the H-rail and then secured in place with the clamping component (see arrow B).
The optional earthing plate allows a convenient working connection to be established to the machine potential/ earth.

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

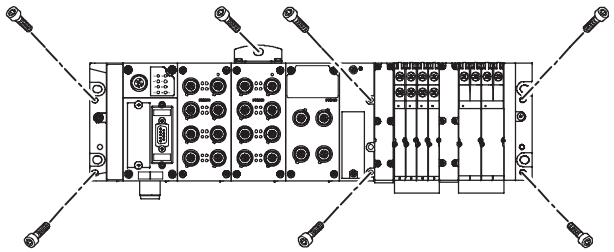
This enables mounting of the CPX on H-rails to EN 60715.
An additional mounting kit is required for combination with valve terminals.

Wall mounting for plastic version



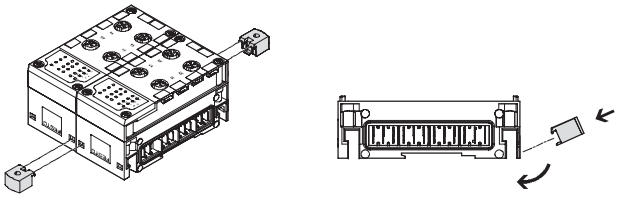
The end plates of the CPX terminal, the valve terminal and the pneumatic interface include mounting holes for wall mounting. For longer valve terminals, there are additional mountings for the CPX terminal. These mountings vary depending on the CPX terminal version (plastic or metal).

Wall mounting for metal version



CPX terminal in plastic version

Additional mountings

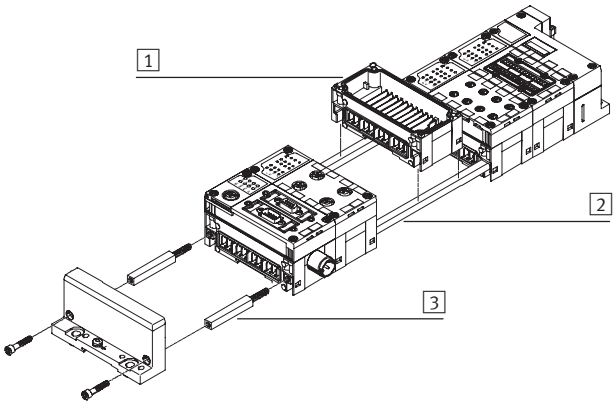


For longer valve terminals, there are additional mountings for the CPX terminal that can be fitted between two modules.

- Note

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

Linking with tie rods

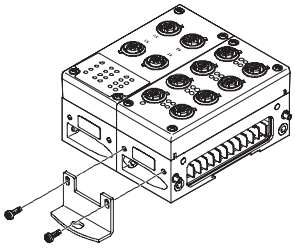


The mechanical connection between the CPX modules is created using special tie rods 2. Two screws in the end plates are all that are needed to assemble the entire unit.
The tie rod ensures that the unit withstands high mechanical loads and is therefore the “mechanical backbone” of the CPX terminal.

The open design allows 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.

CPX terminal in metal version

Additional mounting parts

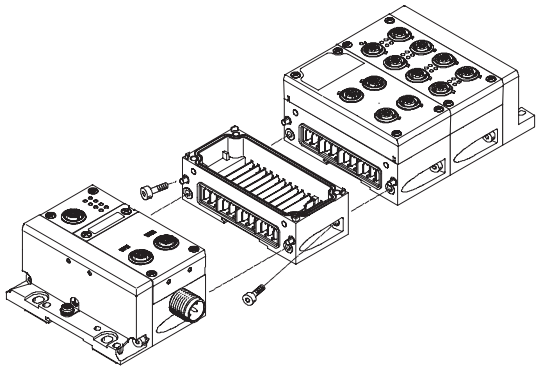


For longer valve terminals, there are additional mounting brackets for the CPX terminal that can be fitted to the interlinking blocks.

- Note

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

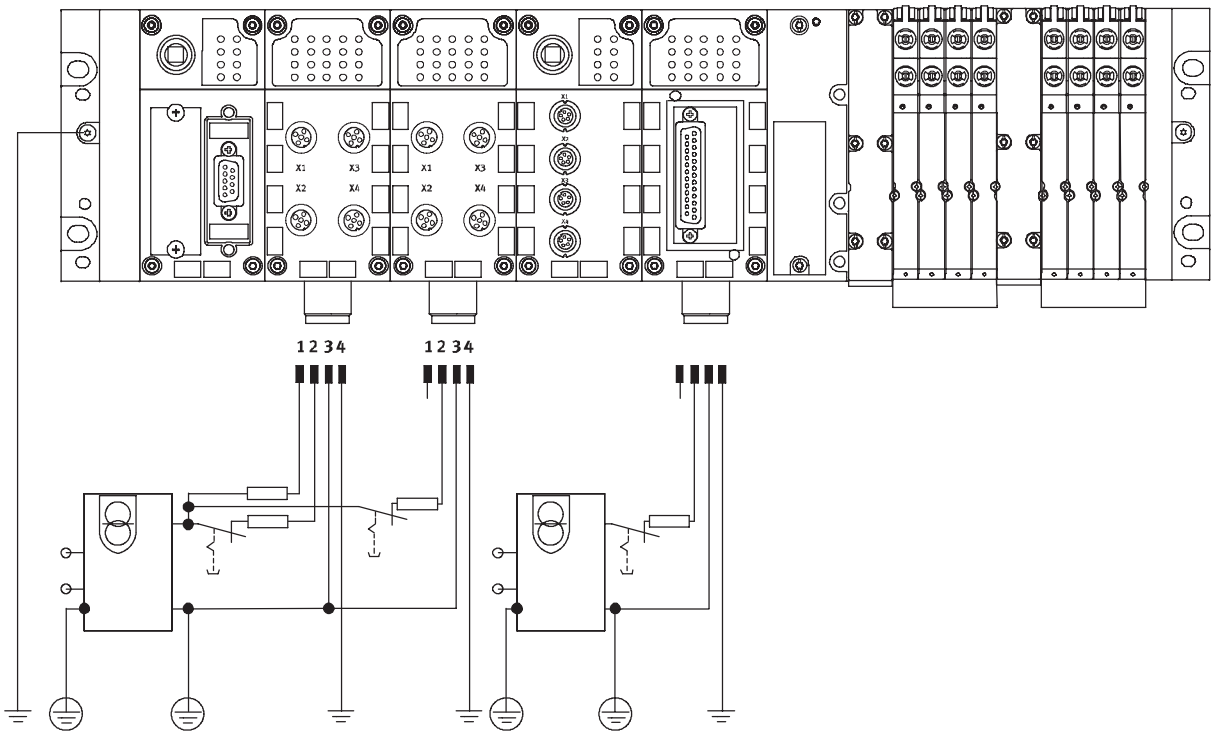
Linking with screws

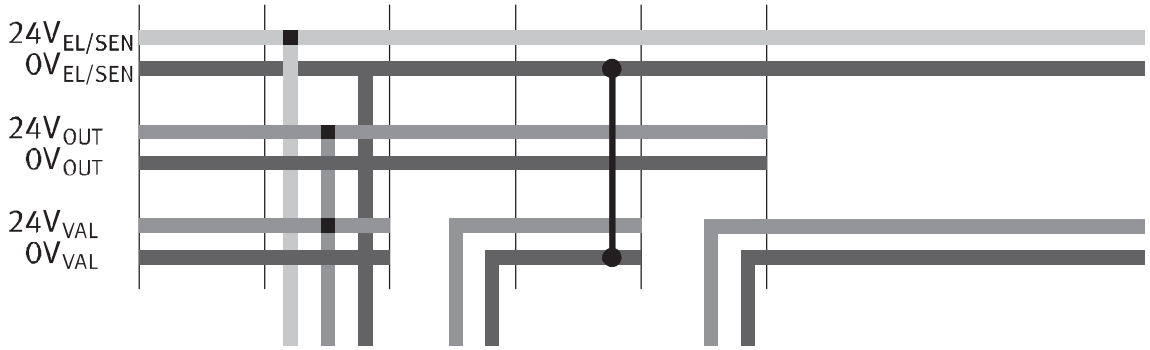


The mechanical connection between the CPX modules is created using a splayed screw connection.
The CPX terminal is thus flexibly expandable at any time.

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 be supplied with all voltages using a single socket.

A distinction is made between supply for

- electronics plus sensors
- valves plus actuators

in this case. The following connecting thread can be selected:

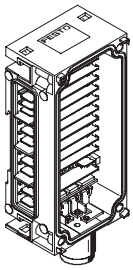
- M18
- 7/8"

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 the bus connection.
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 – plastic version
- CPX-GE-EV-S
- CPX-GE-EV-S-7/8-5POL
- CPX-GE-EV-S-7/8-4POL

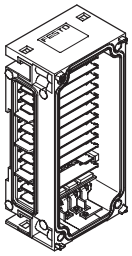
Type – metal version
- CPX-M-GE-EV-S-7/8-5POL

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

Connection technology
- 7/8" 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 CPX terminal output modules

Without power supply



Type – plastic version
- CPX-GE-EV

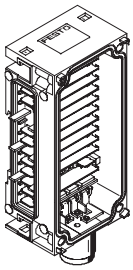
Type – metal version
- CPX-M-GE-EV

–

–

- No power supply

With additional power supply for outputs



Type – plastic version
- CPX-GE-EV-Z
- CPX-GE-EV-Z-7/8-5POL
- CPX-GE-EV-Z-7/8-4POL

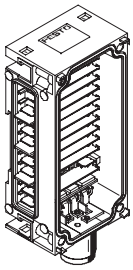
Type – metal version
- CPX-M-GE-EV-Z-7/8-5POL

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

Connection technology
- 7/8" 5-pin

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

With additional power supply for valves



Type – plastic version
- 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

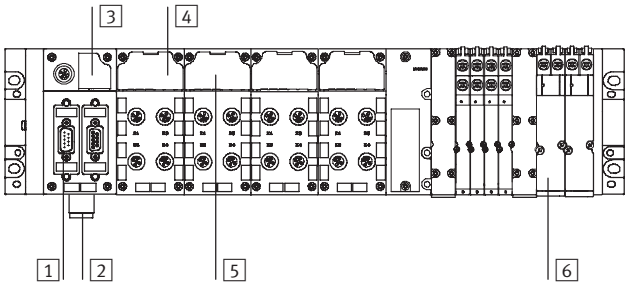
Note

Valve terminal type 32 MPA has either a 7/8", 5-pin, 7/8", 4-pin or M18, 3-pin power supply for one or more voltage zones of the valves.

Galvanically isolated, all-pin disconnectable with voltage monitoring in the following MPA module.

Diagnostics

System performance



1 Diagnostics via bus interface
2 Undervoltage monitor
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 diagnostics for module and solenoid coils

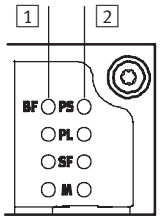
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on-the-spot diagnostics using LEDs or handheld control unit and diagnostics using a bus interface.

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 identification for the outputs and valves
- Short circuit detection for sensors, outputs and valves
- Open-circuit 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 via bus interface in the master controller and visualised for the centralised recording and evaluation of error causes. This is done using the individual fieldbus-specific channels. The CPX-FEC also offers the option of access via the integrated Ethernet interface (remote maintenance via PC/web applications).

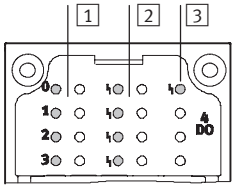
Overview of LEDs on the bus node



1 Fieldbus-specific LEDs
On each bus node, a maximum of 4 fieldbus-specific LEDs display the fieldbus communication status of the CPX terminal with the master 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 errors
– Modification parameters

Status of input/output module and diagnostic LEDs



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

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

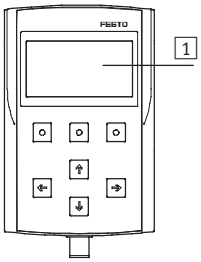
3 Central diagnostic LED
An LED displays an overall diagnostic for each module.

Terminal CPX

Key features – Parameterisation

Diagnostics

Display on handheld control unit

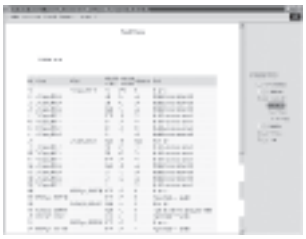


1 LCD graphical display for plain text diagnostics on the spot
- Location and type of fault
- No programming

Display on Web Monitor

CPX Web Monitor overview

Analogue module, channel-oriented diagnostics



Error memory (fault trace)

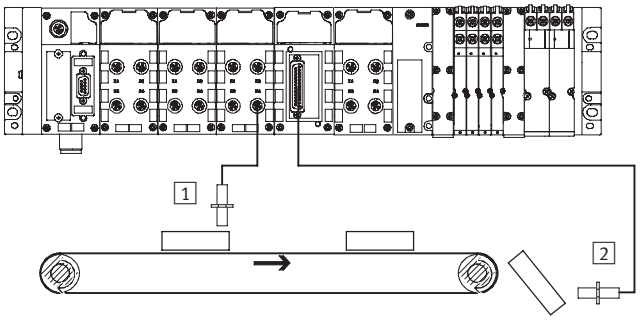
The Web Monitor displays all static and dynamic information on a CPX terminal via Ethernet online – in the web browser of the PC.
This facility is optionally available via intranet and Internet. Everything is plug & work – without the need for web programming such as HTML or JAVA.

Parameterisation

Changes to the application are often required during commissioning. Thanks to the parameterisable characteristics of CPX modules, 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 failure.

Depending on the modules used, parameterisation can be performed via the following interfaces:
- Ethernet
- Fieldbus
- FEC direct interface (programming interface)
- Handheld control 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 system.

Maximum system extension:
- 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 extension 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-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-T	4 x 16	–
CPX-2AA	–	2 x 16
VABA-S6-1-X1	–	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)]
VMPA1-FB-EMS-8	–	8
VMPA-FB-EMG-8	–	8
VMPA2-FB-EMS-4	–	4
VMPA2-FB-EMG-4	–	4

1) Depends 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 • EasyIP • Modbus TCP • HTTP	512 bit	512 bit	512 DE	512 DO	32 AI	18 AO
CPX-FB6	Interbus	96 bit	96 bit	96 DE	96 DO	6 AI	6 AO
CPX-FB11	DeviceNet	512 bit	512 bit	512 DE	512 DO	32 AI	18 AO
CPX-FB13	Profibus	512 bit	512 bit	512 DE	512 DO	32 AI	18 AO
CPX-FB14	CANopen	192 bit	192 bit	64 DI (+ 64 DI)	64 DO (+ 64 DO)	8 AI (+ 8 AI)	8 AO (+ 8 AO)
CPX-FB23	CC-Link	–	–	64 DE	64 DO	16 AI	16 AO
CPX-FB32	Ethernet/IP	512 bit	512 bit	512 DE	512 DO	32 AI	18 AO
CPX-FB33	PROFINET IO	512 bit	512 bit	512 bit	512 bit	32 AI	18 AO

Note

With module selection and the maximum number of modules, the bandwidth of the fieldbus nodes can be restricted.

Example – CPX-FB6 (Interbus)			
	Digital inputs	Digital outputs	Remarks
3x CPX-8DE	24	–	• The address space is occupied with 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 bit) AI = Analogue inputs (16 bit)

SEA – GS – HAR – 4POL

Type	
SEA	Plug connector for inputs/outputs, M12x1 connection

Design	
GS	Straight plug connector

Connection	
HAR	Harax fast connection technology

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	Bus connection, Sub-D socket, 9-pin

Number of cable connections	
1	1 connection
2	2 connections

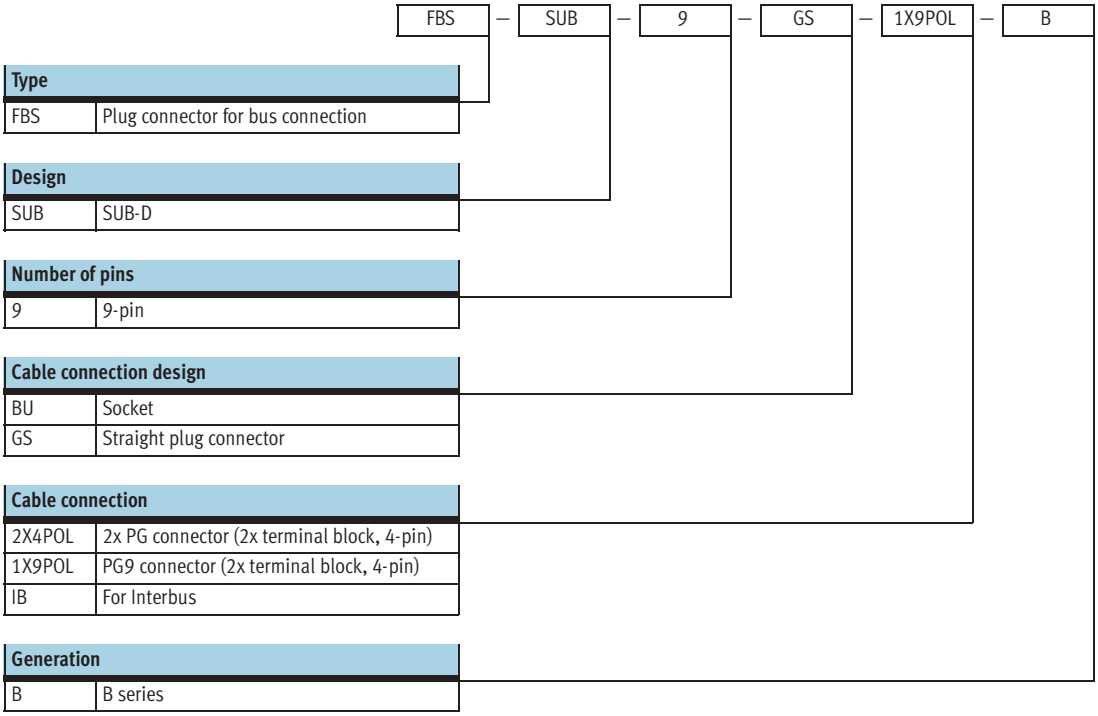
Cable connection	
M12	2x threaded connections M12x1, 5-pin (1x pin, 1x socket)
SL	5-pin row

Number of pins	
5POL	5-pin

Coding	
RK	Reverse Key coded (B-coded)

Terminal CPX

Key features – Type codes for connection technology



Type	
FBS	Plug connector for bus connection

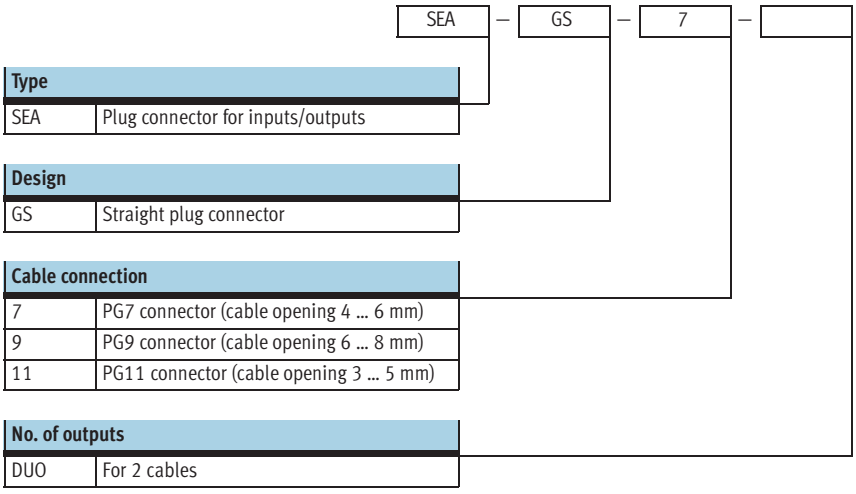
Design	
SUB	SUB-D

Number of pins	
9	9-pin

Cable connection design	
BU	Socket
GS	Straight plug connector

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

Generation	
B	B series

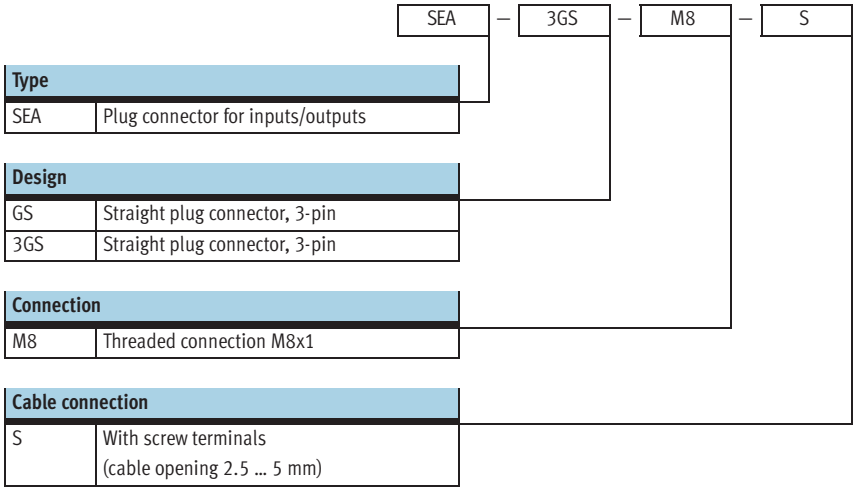


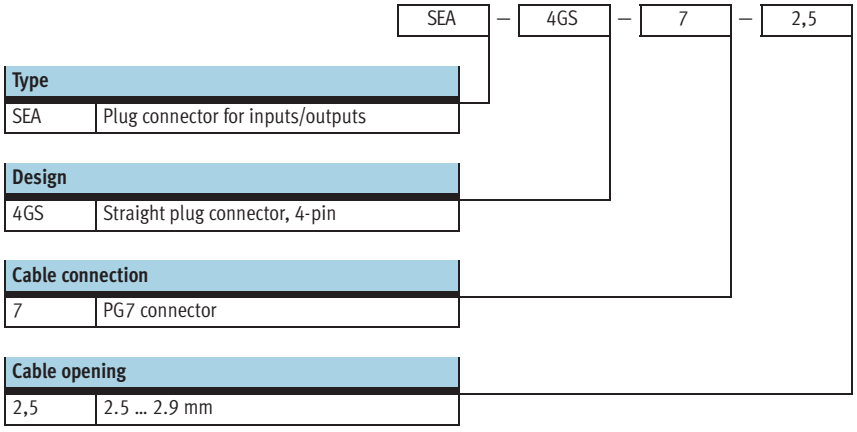
Type	
SEA	Plug connector for inputs/outputs

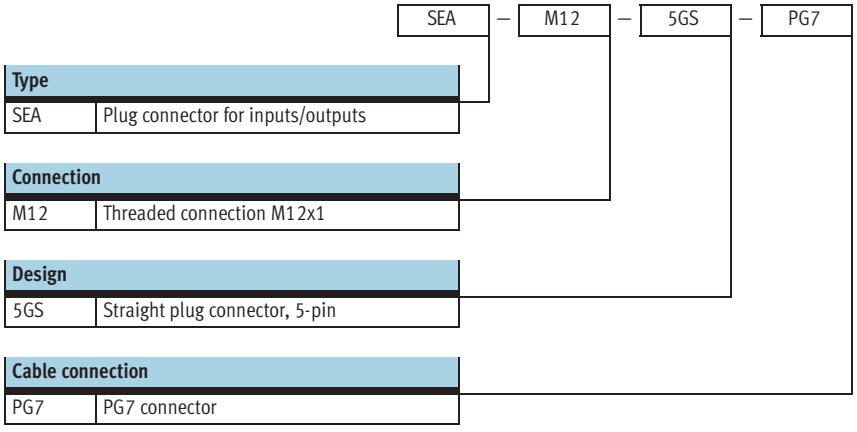
Design	
GS	Straight plug connector

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)

No. of outputs	
DUO	For 2 cables

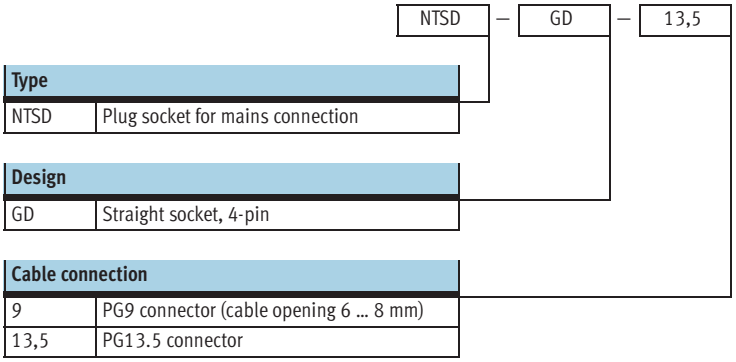

SEA – 3GS – M8 – S
Type
SEA Plug connector for inputs/outputs
Design
GS Straight plug connector, 3-pin
3GS Straight plug connector, 3-pin
Connection
M8 Threaded connection M8x1
Cable connection
S With screw terminals (cable opening 2.5 ... 5 mm)


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

Terminal CPX

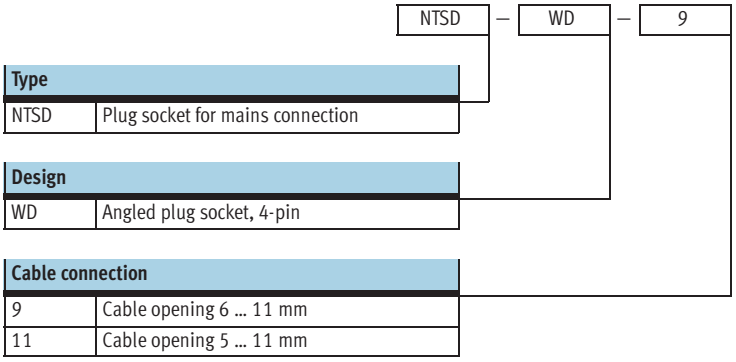
Key features – Type codes for connection technology



Type	
NTSD	Plug socket for mains connection

Design	
GD	Straight socket, 4-pin

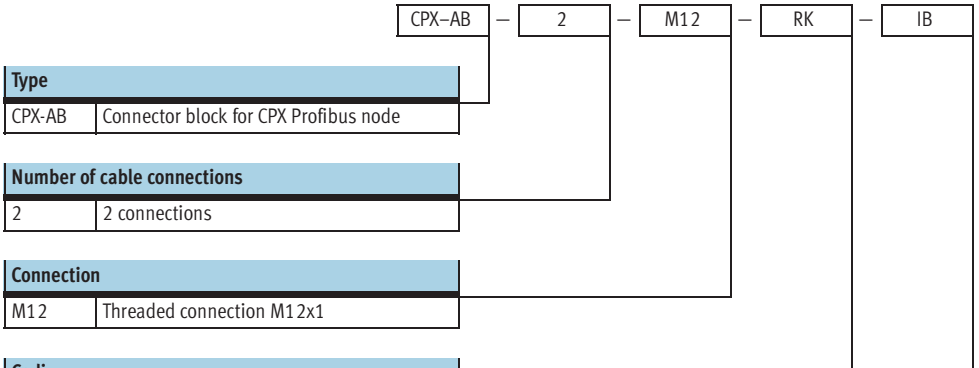
Cable connection	
9	PG9 connector (cable opening 6 ... 8 mm)
13,5	PG13.5 connector



Type	
NTSD	Plug socket for mains connection

Design	
WD	Angled plug socket, 4-pin

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



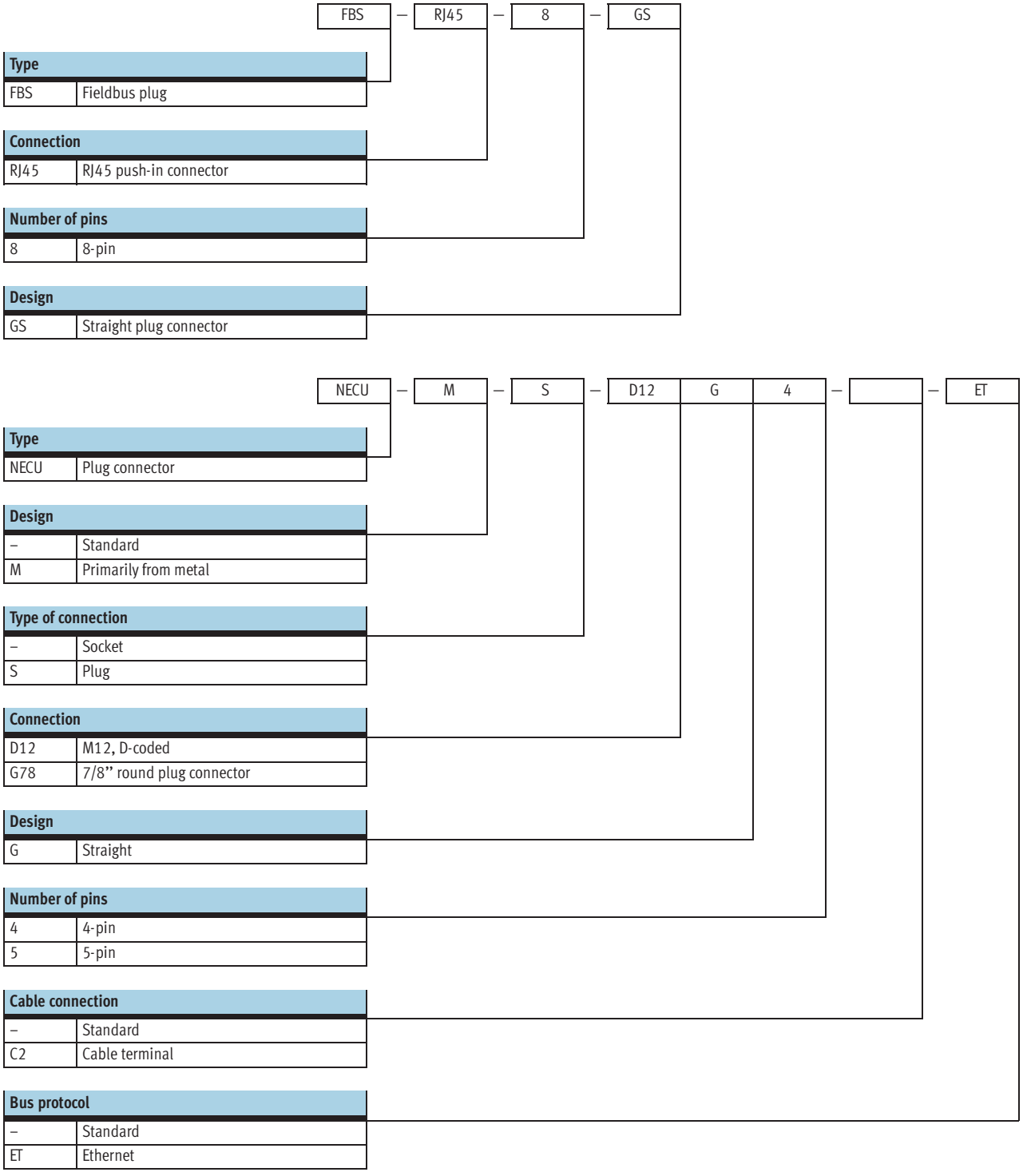
Type	
CPX-AB	Connector block for CPX Profibus node

Number of cable connections	
2	2 connections

Connection	
M12	Threaded connection M12x1

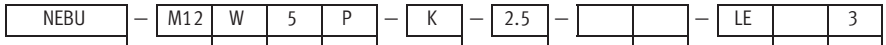
Coding	
RK	Reverse Key coded (B-coded)

Cable connection	
IB	For Interbus
DP	For Profibus


FBS – RJ45 – 8 – GS
Type
FBS Fieldbus plug
Connection
RJ45 RJ45 push-in connector
Number of pins
8 8-pin
Design
GS Straight plug connector
NECU – M – S – D12 G 4 – – ET
Type
NECU Plug connector
Design
– 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



Function	
NEBU	Connecting cable

Connection, 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 attribute	
K	Standard
E	Suitable for chain link trunking
R	Suitable for robot applications

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

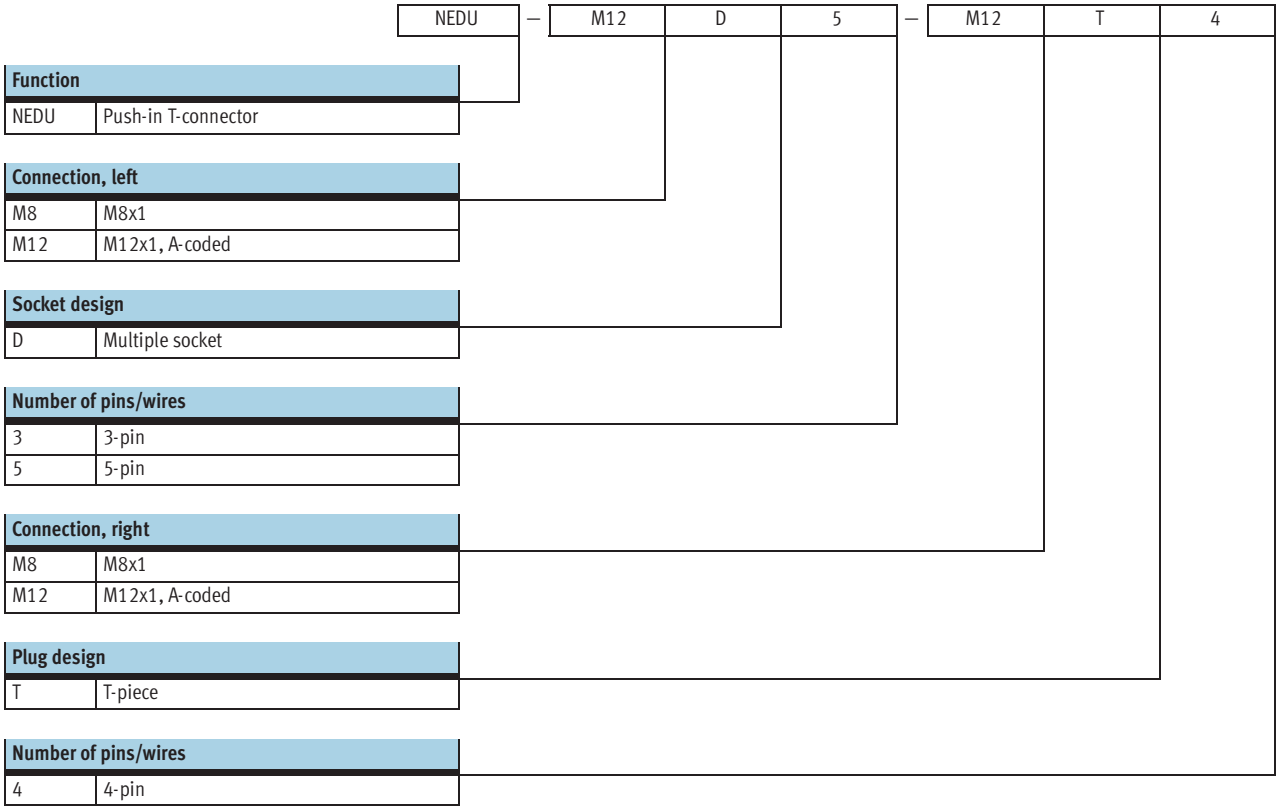
Alternative wire cross section	
–	0.25 mm^2 (standard)
Q3	0.14 mm^2

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

Connection, 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)


NEDU – M12 D 5 – M12 T 4
Function
NEDU Push-in T-connector
Connection, left
M8 M8x1
M12 M12x1, A-coded
Socket design
D Multiple socket
Number of pins/wires
3 3-pin
5 5-pin
Connection, right
M8 M8x1
M12 M12x1, A-coded
Plug design
T T-piece
Number of pins/wires
4 4-pin

Terminal CPX

Technical data

FESTO

Module width
50 mm

Note

The data given here applies 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, e.g. Cage-Clamp connection block with IP20 protection or MPA pneumatics with IP65 protection.

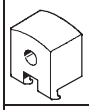
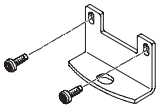
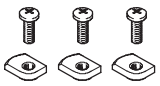
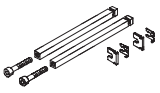
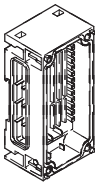
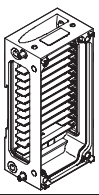
General technical data			
Module No.			**197 330**
Max. no. of modules[1)]	Control block		1
	Bus node		1
	I/O module/CP interface		9
	Pneumatic interface		1
Max. address capacity	Inputs	[Byte]	64
	Outputs	[Byte]	64
Internal cycle time		[ms]	< 1
Configuration support			Fieldbus-specific
LED displays	Bus node/control block		Up to 4 LEDs, bus-specific 4 LEDs, CPX-specific • PS = Power system • PL = Power load • SF = System error • M = Modify parameter/forcing active
	I/O modules		Min. one centralised diagnostic LED Channel-oriented status and diagnostic LED, depending on module
	Pneumatic interface		One centralised diagnostic LED Valve status LED on valve
Diagnostics			• Channel and module-oriented diagnostics for inputs/outputs and valves • Detection of module undervoltage for the different voltage potential values • Storage of the last 40 errors with timestamp (aynchronous access)

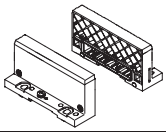
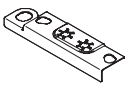
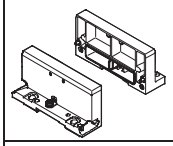
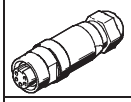
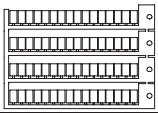
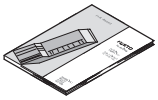
1) A maximum of 11 modules in total can be combined
(e.g. 1 control block + 9 I/O modules + 1 pneumatic interface, or 1 control block + 1 bus node + 8 I/O modules + 1 pneumatic interface)

General technical data			
Module No.			**197 330**
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
Voltage		[V DC]	24
Power supply	Interlinking block with system supply		
	Electronics plus sensors	[A]	Max. 16 A (M18 supply), max. 12 A (7/8" supply)
	Actuators plus valves	[A]	Max. 16 A (M18 supply), max. 12 A (7/8" supply)
	Additional power supply Actuators	[A]	Max. 16 A per M18 supply, max. 12 A per 7/8" supply
	Additional power supply for valves	[A]	Max. 16 A per M18 supply
Current consumption			Depending on system configuration
Power failure bridging (bus electronics only)		[ms]	10
Voltage supply connection			M18, 4-pin
			7/8" 5-pin
			7/8" 4-pin
Fuse concept			Per module with electronic fuses
Temperature range, electronics	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Temperature range, electronics plus pneumatic components	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +40
Relative air humidity (non-condensing)		[%]	5 ... 90
Tests	Vibration test To DIN/IEC 68/EN 60068 Part 2 – 6		• For wall mounting: severity level 2 • For H-rail mounting: severity level 1
	Shock test To DIN/IEC 68/EN 60068 Part 2 – 27		• For wall mounting: severity level 2 • For H-rail mounting: severity level 1
PWIS classification			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]	500 DC
Galvanic isolation of electrical voltages		[V]	80 DC
Protection against direct and indirect contact			PELV (Protected Extra-Low Voltage)
Materials			End plates: die-cast aluminium
Grid dimension		[mm]	50

Weight [g]					
Control block	FEC	140.0	Interlinking block, metal	Without power supply	162
Bus node	FB6	125.0		With system supply	187
	FB11	120.0	Tie rod	1-fold	19.0 ±2.5
	FB13	115.0		2-fold	32.5 ±2.5
	FB14	115.0		3-fold	46.0 ±2.5
	FB23	115.0		4-fold	59.5 ±2.5
	FB32	125.0		5-fold	73.0 ±2.5
	FB33	185.0		6-fold	86.5 ±2.5
I/O module		38.0		7-fold	100.0 ±2.5
CP interface		140		8-fold	113.5 ±2.5
Pneumatic interface	MPA	238.4		9-fold	127.0 ±2.5
	VTSA/VTSA-F	485.0		10-fold	140.5 ±2.5
	MIDI/MAXI	390.0	End plate, plastic	Left-hand	77.0
	CPA	150.0		Right-hand	70.0
Connection block	Plastic	70.0	End plate, metal	Left-hand	113
	Metal	175.0		Right-hand	113
Interlinking block, plastic	Without power supply	80.0			
	With system supply	100.0			

Ordering data – Accessories

Designation			Type	Part No.
Mounting set				
	Attachment for wall mounting (for long valve terminals, 10 pieces), version for plastic interlinking plates		**CPX-BG-RW-10x**	**529 040**
	Attachment for wall mounting (for long valve terminals, 2 mounting brackets and 4 screws), version for metal interlinking plates		**CPX-M-BG-RW-2x**	**550 217**
	Mounting for H-rail	CPX without pneumatic components	**CPA-BG-NRH**	**173 498**
		CPX-VTSA	**CPX-CPA-BG-NRH**	**526 032**
		CPX-VTSA-F		
		CPX-MPA		
		CPX-CPA		
		CPX-MIDI	**CPX-03-4,0**	**526 033**
		CPX-MAXI	**CPX-03-7,0**	**526 034**
Tie rod				
	Tie rod CPX	Extension 1-fold	**CPX-ZA-1-E**	**525 418**
		1-fold	**CPX-ZA-1**	**195 718**
		2-fold	**CPX-ZA-2**	**195 720**
		3-fold	**CPX-ZA-3**	**195 722**
		4-fold	**CPX-ZA-4**	**195 724**
		5-fold	**CPX-ZA-5**	**195 726**
		6-fold	**CPX-ZA-6**	**195 728**
		7-fold	**CPX-ZA-7**	**195 730**
		8-fold	**CPX-ZA-8**	**195 732**
		9-fold	**CPX-ZA-9**	**195 734**
		10-fold	**CPX-ZA-10**	**195 736**
Interlinking block, plastic				
	Without power supply	–	**CPX-GE-EV**	**195 742**
	With system supply	M18	**CPX-GE-EV-S**	**195 746**
		7/8" – 5-pin	**CPX-GE-EV-S-7/8-5POL**	**541 244**
		7/8" – 4-pin	**CPX-GE-EV-S-7/8-4POL**	**541 248**
	With additional power supply for outputs	M18	**CPX-GE-EV-Z**	**195 744**
		7/8" – 5-pin	**CPX-GE-EV-Z-7/8-5POL**	**541 248**
		7/8" – 4-pin	**CPX-GE-EV-Z-7/8-4POL**	**541 250**
	With additional power supply for valves	M18	**CPX-GE-EV-V**	**533 577**
		7/8" – 4-pin	**CPX-GE-EV-V-7/8-4POL**	**541 252**
Interlinking block, metal				
	Without power supply	–	**CPX-M-GE-EV**	**550 206**
	With system supply	7/8" – 5-pin	**CPX-M-GE-EV-S-7/8-5POL**	**550 208**
	With additional power supply for outputs	7/8" – 5-pin	**CPX-M-GE-EV-Z-7/8-5POL**	**550 210**

Ordering data – Accessories				
Designation			Type	Part No.
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Metal bus node/connection block	**CPX-DPT-30X32-S-4X**	**550 218**
	Screws for mounting the bus node/connection block on the metal interlinking block	Plastic bus node/connection block	**CPX-M-M3x22-4x**	**550 219**
		Metal bus node/connection block	**CPX-M-M3x22-S-4x**	**550 216**
End plates, plastic				
	End plate	Right-hand	**CPX-EPR-EV**	**195 714**
		Left-hand	**CPX-EPL-EV**	**195 716**
	Earthing element for right-hand/left-hand end plates	5 pieces	**CPX-EPFE-EV**	**538 892**
End plates, metal				
	End plate	Right-hand	**CPX-M-EPR-EV**	**550 214**
		Left-hand	**CPX-M-EPL-EV**	**550 212**
Power supply				
	Plug socket for mains connection M18, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Plug socket for mains connection M18, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
	Plug socket for mains connection 7/8", straight, 5-pin	0.25 … 2.0 mm^2	**NECU-G78G5-C2**	**543 107**
	Plug socket for mains connection 7/8", straight, 4-pin	0.25 … 2.0 mm^2	**NECU-G78G4-C2**	**543 108**
Inscription labels				
	Inscription labels, 6x10, 64 pieces, in frames		**IBS-6x10**	**18 576**
User documentation				
	CPX System Manual	German	**P.BE-CPX-SYS-DE**	**526 445**
		English	**P.BE-CPX-SYS-EN**	**526 446**
		Spanish	**P.BE-CPX-SYS-ES**	**526 447**
		French	**P.BE-CPX-SYS-FR**	**526 448**
		Italian	**P.BE-CPX-SYS-IT**	**526 449**
		Swedish	**P.BE-CPX-SYS-SV**	**526 450**
	Operator unit CPX-MMI-1	German	**P.BE-CPX-MMI-1-DE**	**534 824**
		English	**P.BE-CPX-MMI-1-EN**	**534 825**
		French	**P.BE-CPX-MMI-1-FR**	**534 827**
		Italian	**P.BE-CPX-MMI-1-IT**	**534 828**
		Swedish	**P.BE-CPX-MMI-1-SV**	**534 829**
		Spanish	**P.BE-CPX-MMI-1-ES**	**534 826**

User documentation – General information

Comprehensive user documentation is vital for the fast and consistent implementation of fieldbus components.
The documentation provided by Festo contains 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.

It can be downloaded quickly and conveniently from the download area of the Festo Internet home page.
➔ www.festo.com

User documentation overview

Type	Title	Description
Electronics		
P.BE-CPX-SYS-...	System description, installing 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 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 digital input and output modules of type CPX-...
P.BE-CPX-CP...	CPX CP interface	Instructions on assembly, installation, commissioning and diagnostics of the CP interface.
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-MMI-1-...	Universal handheld type CPX-MMI-1	Instructions on assembly, installation, commissioning and diagnostics of the CPX operator unit.

User documentation overview		
Type	Title	Description
Pneumatics		
P.BE-VTSA-44-...	Valve terminals with VTSA and VTSA-F pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the VTSA and VTSA-F pneumatic components.
P.BE-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.

User documentation – GSD, EDS, ...

Device description files and icons are used to explain the integration of the CPX terminal in the configuration software of the various controller manufacturers.
These can be downloaded quickly and conveniently from the download area of the Festo Internet home page.

➔ www.festo.com/fieldbus

CPX macro library for ePLAN	
Type	GSWC-TE-EP-LA
Part No.	537 041

Project planning – pure 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 system

↓

CPX macro

↓

ePLAN CAE software for electrical applications

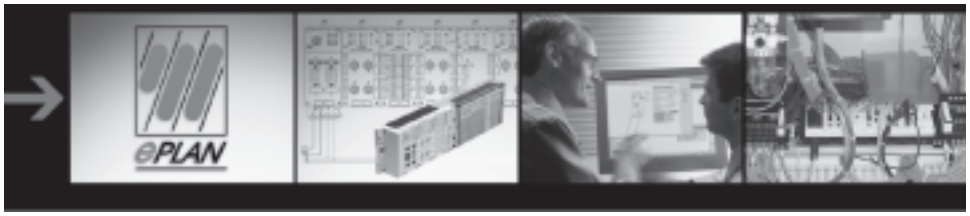
↓

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 Engineering Tool ePLAN fluid 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 requisition, configuration and diagnostics 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, e.g. 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 through the CPX bus node.
➔ Plug &Work.

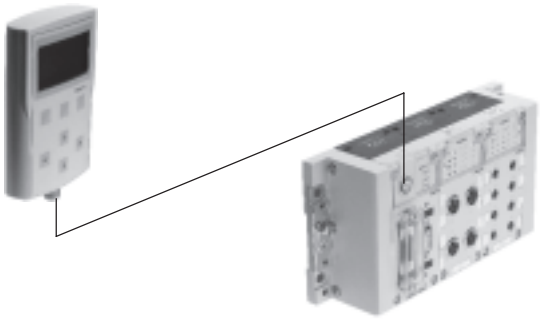
Communication

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 exchanged during operation.

Mounting

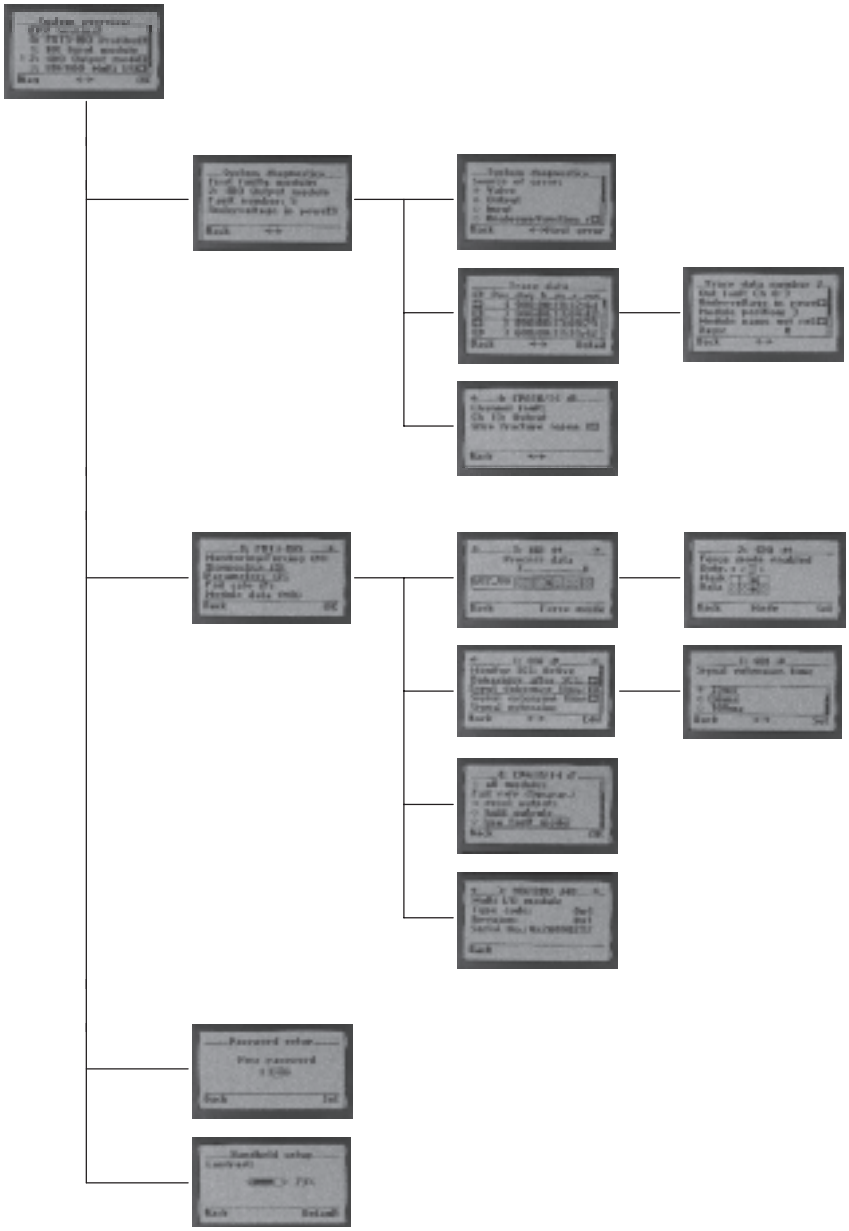
A mounting bracket for the operator unit offers the option of wall or H-rail mounting.
The mounting bracket also has an option for temporary mounting using a hanging device.

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

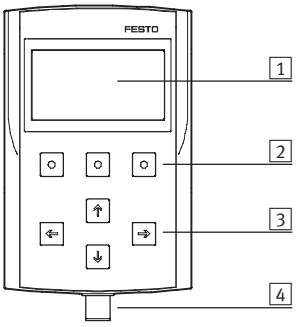
Terminal CPX

Technical data – Operator unit

FESTO

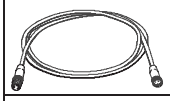
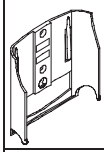
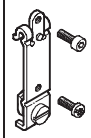
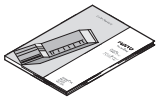
General technical data			
Type			**CPX-MMI-1**
Part No.			**529 043**
Display component			LCD graphical display with background illumination (128 x 64 pixels)
Control elements			7 keys: 4 arrow keys and 3 function keys
Interface			M12-5-pin
Electromagnetic compatibility			Interference emission tested to DIN EN 61000-6-4, industry
			Interference immunity tested to DIN EN 61000-6-2, industry
Operating voltage		[V DC]	24, supplied from the connected device
Current consumption		[mA]	Max. 55
Protection class to EN 60529			IP65, IP67
Relative air humidity		[%]	90, non-condensing
Vibration resistance			Tested to DIN/IEC 68/EN 60068, Part 2-6 • For wall mounting: severity level 2 • For H-rail mounting: severity level 1
Shock resistance			Tested to DIN/IEC 68/EN 60068, Part 2-27 • For wall mounting: severity level 2 • For H-rail mounting: severity level 1
Temperature range	Operation	[°C]	0 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Reinforced polyamide
Dimensions (W x H x D)		[mm]	81 x 137 x 28
Weight		[g]	150

Connection and display components



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

Ordering data

Designation			Type	Part No.
Connecting cable				
	Connecting cable M12-M12, specially designed for CPX-MMI	1.5 m	**KV-M12-M12-1,5**	**529 044**
		3.5 m	**KV-M12-M12-3,5**	**530 901**
Mounting				
	Bracket		**CPX-MMI-1-H**	**534 705**
	Mounting for H-rail		**CPX-MMI-1-NRH**	**536 689**
User documentation				
	User manual for operator unit CPX-MMI-1	German	**P.BE-CPX-MMI-1-DE**	**534 824**
		English	**P.BE-CPX-MMI-1-EN**	**534 825**
		French	**P.BE-CPX-MMI-1-FR**	**534 827**
		Italian	**P.BE-CPX-MMI-1-IT**	**534 828**
		Swedish	**P.BE-CPX-MMI-1-SV**	**534 829**
		Spanish	**P.BE-CPX-MMI-1-ES**	**534 826**

Terminal CPX

Technical data – Web Monitor

FESTO

Function

Web Monitor is a software tool from Festo for all 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

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. The 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
Part No.		545 413
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
Scope of functions		• Changing HTML links • Changing symbol names for systems, modules 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

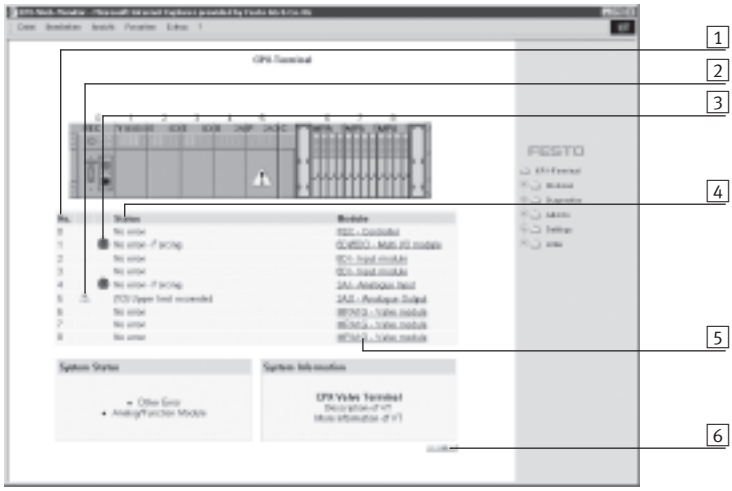
Terminal CPX

Technical data – Web Monitor

FESTO

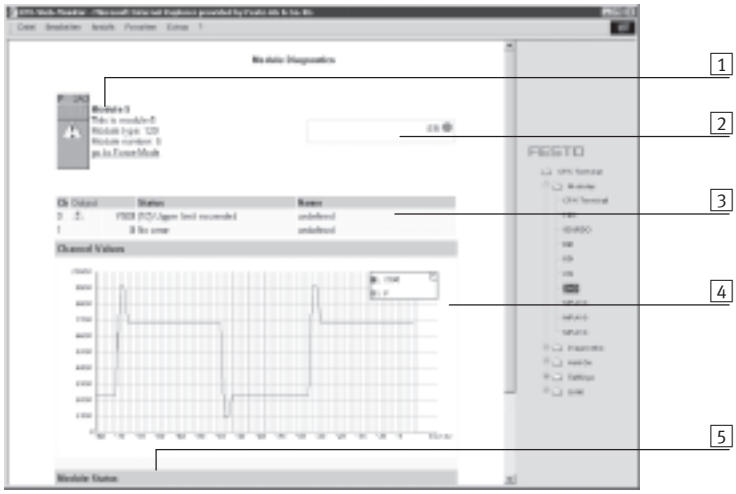
Display elements

System overview of CPX terminal



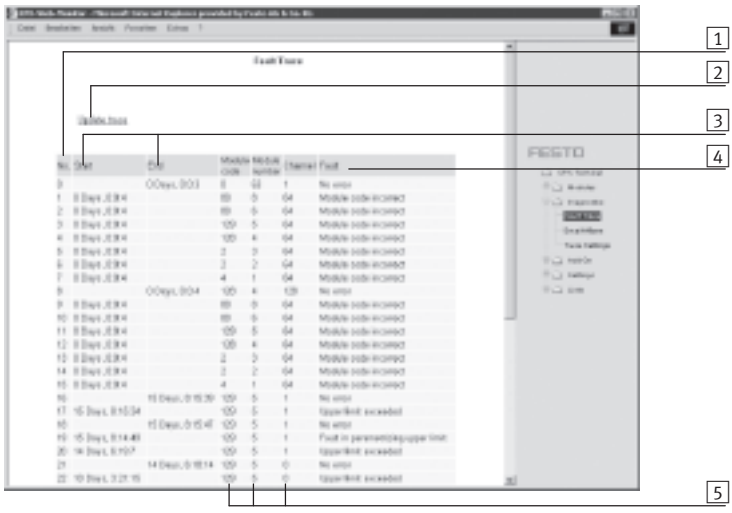
1 Module numbers from the graphic system overview
2 Signalling of fault messages via yellow warning triangle analogous to graphic system overview opposite
3 Signalling of activated Force mode via exclamation mark on blue background
4 Status information in plain text
5 Module designations
6 Monitoring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

Module overview of a selected module



1 General information about the module
2 Copy of the module display elements
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

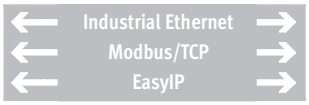
Error log of the CPX Web Monitor



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 voltage 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.

Application

Bus connection

The CPX-FEC is a separate controller, which can be connected to a higher-order 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 standalone 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

- Standalone/EasyIP
- Fieldbus remote controller
- Modbus/TCP remote controller
- Remote I/O Modbus/TCP

Communication protocols

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

Setting options

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

- For the CPX-MMI
- 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
Part No.			529 041
Ethernet interface			RJ45 (8-pin, socket)
Data interface			RS232 (Sub-D, 9-pin, socket)
MMI interface			M12, 5-pin, socket
Baud rates	Ethernet interface	[Mbps]	10/100 (acc. to IEEE802.3, 10BaseT)
	Data interface	[kbps]	9.6 ... 115.2
	MMI interface	[kbps]	56.6
Protocol			• TCP/IP • EasyIP • 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
Max. address capacity	Inputs	[Byte]	64
	Outputs	[Byte]	64
Program memory	User program	[kB]	250
	WEB applications	[kB]	550
Programming language			• STL • LDR
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-specific diagnostics via peripherals error
Parameterisation			• Start-up parameterisation via FST • Parameterisation of the operating time via the 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

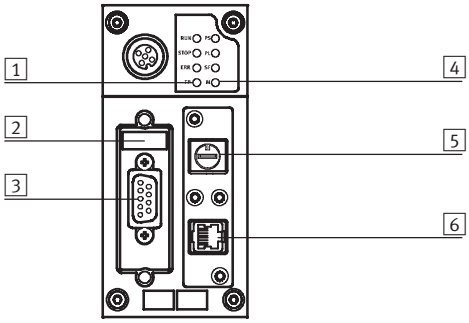
General technical data			
Type			**CPX-FEC-1-IE**
Part No.			**529 041**
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Residual ripple		[Vss]	4
Current consumption		[mA]	Max. 200
Interference emission			To EN 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 (including interlinking block) W x L x H		[mm]	50 x 107 x 55
Weight	Without interlinking block	[g]	140
	Including interlinking block without power supply	[g]	220
	Including interlinking block with system supply	[g]	240

Note

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

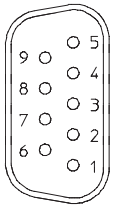
Overview of the operating modes				
	Standalone	Remote controller		Remote I/O
		Ethernet	Fieldbus	Modbus/TCP
CPX-FEC function	Controller	Controller and communication		Ethernet slave
CPX module controlled by	CPX-FEC	CPX-FEC		Higher-order controller
Pre-processing of data in the FEC	Yes	Yes		No
Communication 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	Via FST/CPX-MMI		Via CPX-MMI/Modbus
Order code	T03	T03		T05
Addressing	Changeable	Changeable		Prescribed
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	Can be connected to CPX-FEC	Can be connected to CPX-FEC		Can be connected to CPX-FEC

Connection and display components

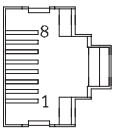


1 Controller and Ethernet LEDs
2 DIL switch for operating mode
3 Programming interface (9-pin Sub-D, socket)
4 CPX-specific status LEDs
5 16-fold rotary switch (program selection)
6 Ethernet connection (8-pin RJ45, socket)

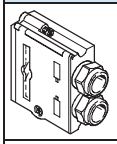
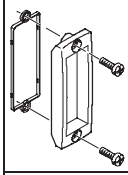
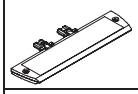
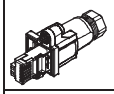
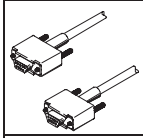
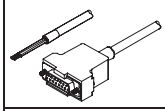
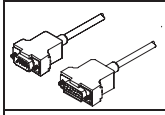
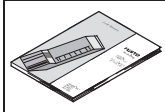
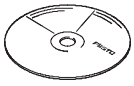
Pin allocation for the programming interface (RS232)

Pin allocation	Pin	Signal	Description
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 (FE) functional earth

Pin allocation for the Ethernet interface

Pin allocation	Pin	Signal	Description
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	Screening

Ordering data

Designation		Type	Part No.
Bus connection			
	Sub-D plug	**FBS-SUB-9-GS-1x9POL-B**	**534 497**
	Inspection cover, transparent	**AK-SUB-9/15-B**	**533 334**
	Inscription label holder for connection block	**CPX-ST-1**	**536 593**
	RJ45/plug	**FBS-RJ45-8-GS**	**534 494**
	Cover for RJ45 connection	**AK-Rj45**	**534 496**
	Programming cable	**KDI-PPA-3-BU9**	**151 915**
	Connecting cable FED	**FEC-KBG7**	**539 642**
	Connecting cable FED	**FEC-KBG8**	**539 643**
User documentation			
	User documentation for control block CPX-FEC	German	**P.BE-CPX-FEC-DE**	**538 474**
		English	**P.BE-CPX-FEC-EN**	**538 475**
		Spanish	**P.BE-CPX-FEC-ES**	**538 476**
		French	**P.BE-CPX-FEC-FR**	**538 477**
		Italian	**P.BE-CPX-FEC-IT**	**538 478**
		Swedish	**P.BE-CPX-FEC-SV**	**538 479**
Software			
	CPX remote diagnostics and process visualisation		**CPX-WEB-MONITOR**	**545 413**
	Programming software	German	**FST4.1DE**	**537 927**
		English	**FST4.1GB**	**537 928**

Terminal CPX

Technical data – Bus node CPX-FB6

FESTO

Bus node for handling communication between the electrical CPX terminal and a higher-order master via INTERBUS.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 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 protection class IP65/IP67 from Festo or IP20 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 the control of 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 features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

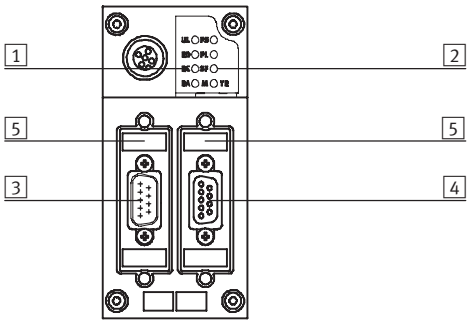
The full address capacity of the CPX-FEC is available for actuation of the peripherals:
- 64 byte inputs
- 64 byte outputs

General technical data			
Type			**CPX-FB6**
Part No.			**195 748**
Fieldbus interface			Sub-D, 9-pin, socket and pin
Baud rates		[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 bit (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 errors
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
Operating voltage	Nominal value	[V DC]	24 (reverse polarity protected)
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Current consumption		[mA]	Max. 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 (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	125
	Including interlinking block without power supply	[g]	205
	Including interlinking block with system supply	[g]	225

Note

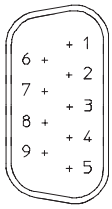
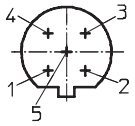
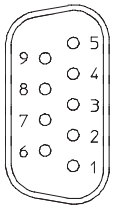
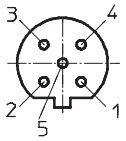
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components



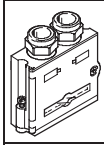
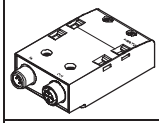
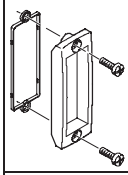
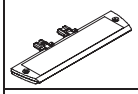
1 INTERBUS-specific LEDs
2 CPX-specific status LEDs
3 Fieldbus connection, incoming (9-pin Sub-D, pin)
4 Fieldbus connection, outgoing (9-pin Sub-D, socket)
5 DIL switch

Pin allocation for the INTERBUS interface

Pin allocation for Sub-D	Pin	Signal	Description	Pin	Pin allocation for M12
Incoming					
	1	DO1	Data out	1	
	2	DI1	Data in	3	
	3	GND	Reference conductor/earth	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/earth	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			Type	Part No.
Bus connection				
	Sub-D plug	Incoming	**FBS-SUB-9-BU-IB-B**	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB-B**	**532 217**
	Connection block M12 adapter plug (B-coded)		**CPX-AB-2-M12-RK-IB**	**534 505**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB6	German	**P.BE-CPX-FB6-DE**	**526 433**
		English	**P.BE-CPX-FB6-EN**	**526 434**
		Spanish	**P.BE-CPX-FB6-ES**	**526 435**
		French	**P.BE-CPX-FB6-FR**	**526 436**
		Italian	**P.BE-CPX-FB6-IT**	**526 437**
		Swedish	**P.BE-CPX-FB6-SV**	**526 438**

Terminal CPX

Technical data – Bus node CPX-FB11

DeviceNet

Bus node for handling communication between the electrical CPX terminal and a DeviceNet network.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the 3 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 features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

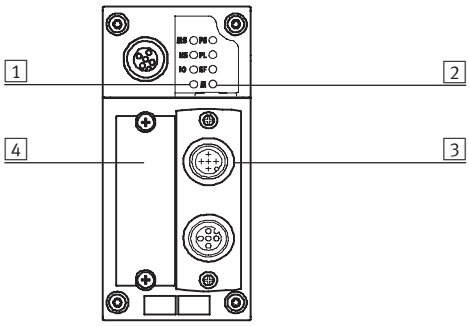
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for control of the peripherals:
- 64 byte inputs
- 64 byte outputs

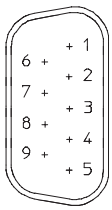
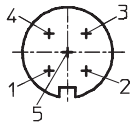
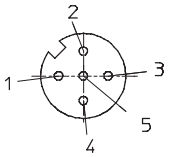
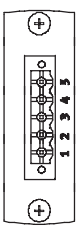
General technical data			
Type			**CPX-FB11**
Part No.			**526 172**
Fieldbus interface			Either • MicroStyle bus connection: 2xM12 protection class IP65/IP67 • OpenStyle bus connection: 5-pin terminal strip IP20
Baud rates		[kbps]	125, 250, 500
Addressing range			0 ... 63 Set using DIL switch
Product	Type		Communication adapter (12 dec.)
	Code		4554 dec.
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 through manufacturer-specific diagnostics 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
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Current consumption		[mA]	Max. 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 (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	120
	Including interlinking block without power supply	[g]	200
	Including interlinking block with system supply	[g]	220

Connection and display components

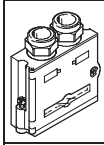
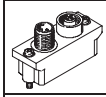
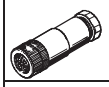
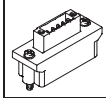
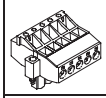
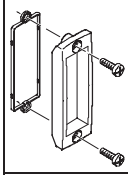
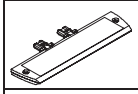
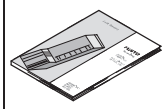


1 Bus-specific LEDs
2 CPX-specific status LEDs
3 Selectable fieldbus connection
Micro Style
Open Style
4 DIL switch cover

Pin allocation for the DeviceNet interface

Pin allocation	Pin	Signal-specific core colour[1)]	Signal	Description
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 CAN interface
Bus connection Micro Style (M12) incoming/outgoing				
Incoming	1	Blank	Screened	Connection to housing
	2	Red	24 V DC bus	24 V DC supply CAN interface
	3	Black	0 V bus	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Blue	CAN_L	Received/transmitted data low
Outgoing	1	Blank	Screened	Connection to housing
	2	Red	24 V DC bus	24 V DC supply CAN interface
	3	Black	0 V bus	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Blue	CAN_L	Received/transmitted data low
Bus connection Open Style				
	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 CAN interface

1) Typical for DeviceNet cables

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Bus connection Micro Style, 2xM12		**FBA-2-M12-5POL**	**525 632**
	Socket for Micro Style connection, M12		**FBSD-GD-9-5POL**	**18 324**
	Plug for Micro Style connection, M12		**FBS-M12-5GS-PG9**	**175 380**
	Bus connection Open Style for 5-pin terminal strip		**FBA-1-SL-5POL**	**525 634**
	Bus connection, 5-pin terminal strip		**FBSD-KL-2x5POL**	**525 635**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
User documentation				
	User documentation for bus node CPX-FB11	German	**P.BE-CPX-FB11-DE**	**526 421**
		English	**P.BE-CPX-FB11-EN**	**526 422**
		Spanish	**P.BE-CPX-FB11-ES**	**526 423**
		French	**P.BE-CPX-FB11-FR**	**526 424**
		Italian	**P.BE-CPX-FB11-IT**	**526 425**
		Swedish	**P.BE-CPX-FB11-SV**	**526 426**

Terminal CPX

Technical data – Bus node CPX-FB13

Bus node for handling communication between the electrical CPX terminal and a higher-order master via Profibus-DP.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the Profibus-specific fault 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 protection class IP65/IP67 from Festo or IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

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

The Sub-D interface is designed for the control of 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 features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

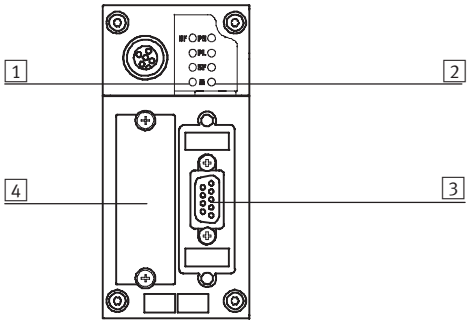
The full address capacity of the CPX-FEC is available for actuation of the peripherals:
- 64 byte inputs
- 64 byte outputs

General technical data			
Type			**CPX-FB13**
Part No.			**195 740**
Fieldbus interface			Sub-D socket, 9-pin (EN 50 170) Galvanically isolated 5 V
Baud rates		[Mbps]	0.0096 ... 12
Addressing range			1 ... 125 Set using DIL switch
Product family			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-specific 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
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Current consumption		[mA]	Max. 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 (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	115
	Including interlinking block without power supply	[g]	195
	Including interlinking block with system supply	[g]	215

Note

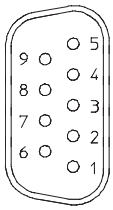
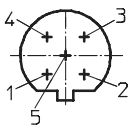
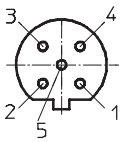
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

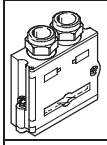
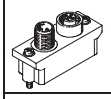
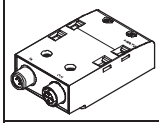
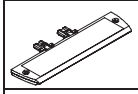
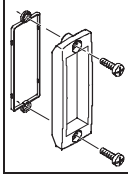
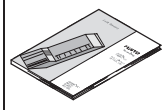


1 Bus status LEDs / Bus Fault
2 CPX-specific status LEDs
3 Fieldbus connection (9-pin Sub-D, socket)
4 DIL switch cover

Pin allocation for Profibus-DP interface

Pin allocation	Pin	Signal	Description
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 plug (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			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-GS-DP-B**	**532 216**
	Bus connection M12 adapter plug (B-coded)		**FBA-2-M12-5POL-RK**	**533 118**
	Connection block M12 adapter plug (B-coded)		**CPX-AB-2-M12-RK-DP**	**541 519**
	Inscription label holder for connection block M12		**CPX-ST-1**	**536 593**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB13	German	**P.BE-CPX-FB13-DE**	**526 427**
		English	**P.BE-CPX-FB13-EN**	**526 428**
		Spanish	**P.BE-CPX-FB13-ES**	**526 429**
		French	**P.BE-CPX-FB13-FR**	**526 430**
		Italian	**P.BE-CPX-FB13-IT**	**526 431**
		Swedish	**P.BE-CPX-FB13-SV**	**526 432**

FESTO

CANopen

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

Application

Bus connection

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

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

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

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 4 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 features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

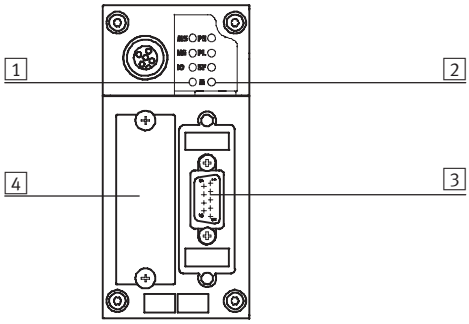
The full address capacity of the CPX-FEC is available for actuation of the peripherals:
- 64 byte inputs
- 64 byte outputs

General technical data			
Type			**CPX-FB14**
Part No.			**526 174**
Fieldbus interface			Sub-D pin, 9-pin (to DS 102) Bus interface galvanically isolated via optocoupler 24 V supply CAN interface via bus
Baud rates		[kbps]	125, 250, 500 and 1000 can be set via DIL switch
Addressing range			Node ID 1 ... 127 Set using DIL switch
Product family			Digital inputs and outputs
Communication profile			DS 301, V4.01
Device profile			DS 401, V2.0
Number	PDO		4 Tx/4 Rx
	SDO		1 server SDO
Configuration support			EDS file and bitmaps
Max. address capacity	Inputs	[Byte]	16 digital, 16 analogue channels
	Outputs	[Byte]	16 digital, 16 analogue channels
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status
Device-specific diagnostics			Via emergency message Object 1001, 1002 and 1003
Parameterisation			Via SDO
Additional functions			• Storage of the last 40 errors with timestamp (access via SDO) • 8 bit system status via transmit PDO 4 (default) • 2 byte inputs and 2 byte outputs, system diagnostics via PDO 4 • Minimum boot-up • Variable PDO mapping • Emergency message • Node guarding • Heart beat
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Current consumption		[mA]	Max. 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 (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	115
	Including interlinking block without power supply	[g]	195
	Including interlinking block with system supply	[g]	215

- Note

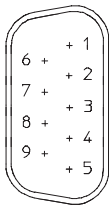
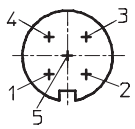
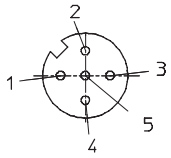
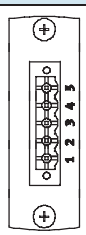
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

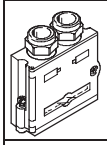
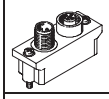
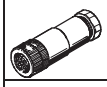
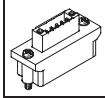
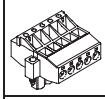
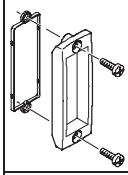
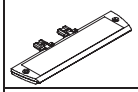
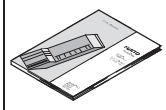


1 Bus-specific LEDs
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D, pin)
4 DIL switch cover

Pin allocation for the CANopen interface

Pin allocation	Pin	Signal	Description
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 CAN interface
	Housing	Screened	Connection to FE (functional earth)
Bus connection Micro Style (M12)			
Incoming 	1	Screened	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Outgoing 	1	Screened	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Bus connection Open Style			
	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 CAN interface

1) Connected internally via Pin 3

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Bus connection Micro Style (M12)		**FBA-2-M12-5POL**	**525 632**
	Fieldbus socket for Micro Style connection, M12		**FBSD-GD-9-5POL**	**18 324**
	Plug for Micro Style connection, M12		**FBS-M12-5GS-PG9**	**175 380**
	Bus connection Open Style		**FBA-1-SL-5POL**	**525 634**
	Bus connection, 5-pin terminal strip		**FBSD-KL-2x5POL**	**525 635**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB14	German	**P.BE-CPX-FB14-DE**	**526 409**
		English	**P.BE-CPX-FB14-EN**	**526 410**
		Spanish	**P.BE-CPX-FB14-ES**	**526 411**
		French	**P.BE-CPX-FB14-FR**	**526 412**
		Italian	**P.BE-CPX-FB14-IT**	**526 413**
		Swedish	**P.BE-CPX-FB14-SV**	**526 414**

FESTO

CC-Link

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 receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 CC-Link-specific LEDs.

Application

Bus connection

The bus connection can be selected when ordering and is established 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. 4 stations per slave. The number of stations used can be set by means of 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 features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for actuation of the peripherals:
- 64 byte inputs
- 64 byte outputs

Terminal CPX

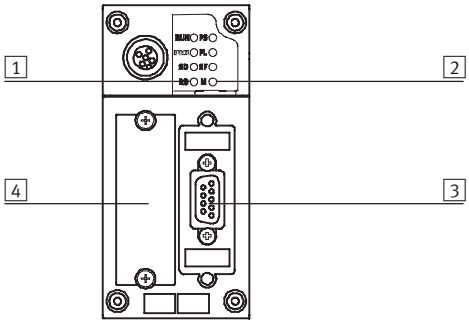
Technical data – Bus node CPX-FB23

General technical data			
Type			**CPX-FB23**
Part No.			**526 176**
Fieldbus interface			Either • Sub-D socket, 9-pin • Bus connection screw terminal, IP20
Baud rates		[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)
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Current consumption		[mA]	Max. 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 (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	115
	Including interlinking block without power supply	[g]	195
	Including interlinking block with system supply	[g]	215

Note

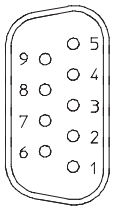
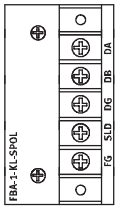
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

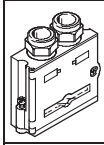
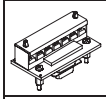
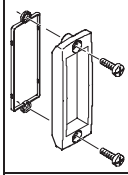
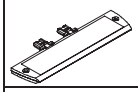
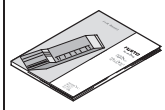


1 Bus-specific status LEDs
2 CPX-specific status LEDs
3 Fieldbus connection (9-pin Sub-D, socket)
4 DIL switch cover

Pin allocation for the CC-Link interface

Pin allocation	Pin	Signal	Description
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	Screening
Bus connection screw terminal			
	1	FG	Functional earth/housing
	2	SLD	Screening
	3	DG	Data reference potential
	4	DB	Data B
	5	DA	Data A

1) Via RC element on housing

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-GS-2x4POL-B**	**532 220**
	Bus connection screw terminal		**FBA-1-KL-5POL**	**197 962**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB23	German	**P.BE-CPX-FB23-DE**	**526 403**
		English	**P.BE-CPX-FB23-EN**	**526 404**

Terminal CPX

Technical data – Bus node CPX-FB32

FESTO

Industrial Ethernet
Ethernet/IP
EasyIP

IT services:

Web
E-mail
File transfer

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

Application

Bus connection

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

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 having control 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 features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.

Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

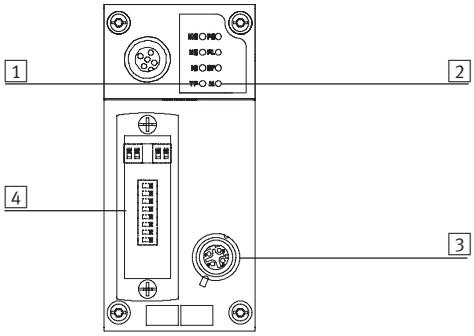
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte inputs/outputs or
- 16 byte inputs/outputs

General technical data			
Type			**CPX-FB32**
Part No.			**541 302**
Fieldbus interface			Plug connector, M12, D-coded, 4-pin
Baud rates		[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
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[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 (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	125
	Including interlinking block without power supply	[g]	215
	Including interlinking block with system supply	[g]	225

Note

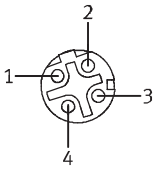
Please observe the general limits and guidelines for the system when configuring the electrical modules.

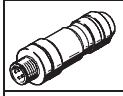
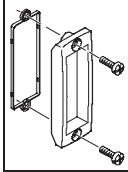
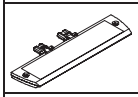
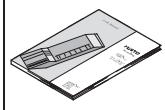
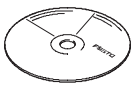
Connection and display components



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	Description
M12 socket, D-coded			
	1	TX+	Transmitted data+
	2	RX+	Received data+
	3	TX-	Transmitted data-
	4	RX-	Received data-
	Housing		Screening

Ordering data				
Designation			Type	Part No.
Bus connection				
	Plug, M12x1, 4-pin, D-coded		**NECU-M-S-D12G4-C2-ET**	**543 109**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
User documentation				
	User documentation for bus node CPX-FB32	German	**P.BE-CPX-FB32-DE**	**693 134**
		English	**P.BE-CPX-FB32-EN**	**693 135**
		Spanish	**P.BE-CPX-FB32-ES**	**693 136**
		French	**P.BE-CPX-FB32-FR**	**693 137**
		Italian	**P.BE-CPX-FB32-IT**	**693 138**
		Swedish	**P.BE-CPX-FB32-SV**	**693 139**
Software				
	CPX remote diagnostics and process visualisation		**CPX-WEB-MONITOR**	**545 413**

Terminal CPX

Technical data – Bus node CPX-FB33

FESTO

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

Application

Bus connection

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

Both connections are equivalent 100BaseTX Ethernet ports with integrated Auto-MDI functionality (crossover and patch cables can be used), which are merged via an internal switch.

- Maximum segment length 100 m
- Baud rate 100 Mbps

PROFINET implementation

The CPX-FB33 supports the PROFINET IO protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.
This ensures data transfer with a high baud rate, e.g. IO data of 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 the bus status and CPX peripherals information, as well as switching elements, memory stick and a diagnostic interface. The memory stick helps to ensure that the fieldbus node can be replaced quickly in the event of an error. With PROFINET the user has 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 changed depending on the function via an MMI.

Special features in combination with CPX-FEC

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

In this case, the fieldbus node only provides the communication interface to the PLC.

Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.

The CPX-FEC occupies an address capacity of the CPX fieldbus node of:
- 8 byte inputs/outputs or
- 16 byte inputs/outputs

Terminal CPX

Technical data – Bus node CPX-FB33

FESTO

General technical data			
Type			**CPX-FB33**
Part No.			**548 755**
Fieldbus interface			Two plug connectors, M12, D-coded, 4-pin
Baud rates		[Mbps]	100
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)			NF = Network fault TP1 = Link/Traffic TP1 TP2 = Link/Traffic TP2
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
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
	Power failure bridging	[ms]	10
Current consumption		[mA]	Maximum 150
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	– 5... +50
	Storage/transport	[°C]	–20 ... +70
Materials	Top cover		Geomet-coated aluminium
	Seals		Nitrile rubber
	Cover caps		Polyamide
	Screws		Galvanised steel
Grid dimension		[mm]	50
Dimensions (including interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	Without interlinking block	[g]	185

Note

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

Note

Use the right kind of screws for the type of interlinking block (metal or plastic):

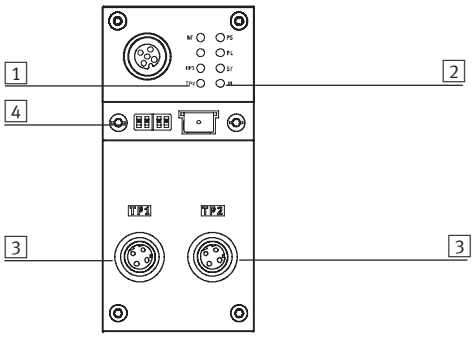
- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

Terminal CPX

Technical data – Bus node CPX-FB33

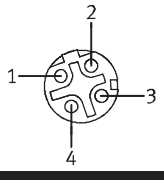
FESTO

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

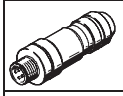
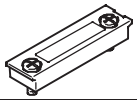
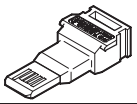
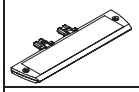
Pin allocation for the fieldbus interface

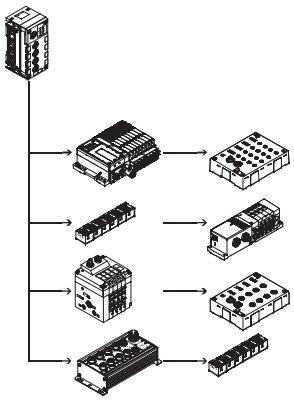
Pin allocation	Pin	Signal	Description
M12 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing		Screening

Terminal CPX

Accessories – Bus node CPX-FB33

FESTO

Ordering data				
Designation			Type	Part No.
Bus connection				
	Plug, M12x1, 4-pin, D-coded		**NECU-M-S-D12G4-C2-ET**	**543 109**
	Transparent cover for DIL switch and memory card		**CPX-AK-P**	**548 757**
	Memory card		**CPX-SK**	**549 526**
	Cover cap for sealing unused bus connections (10 pieces)		**ISK-M12**	**352 059**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
User documentation				
	User documentation for bus node CPX-FB33	German	**P.BE-CPX-PNIO-DE**	**548 759**
		English	**P.BE-CPX-PNIO-EN**	**548 760**
		Spanish	**P.BE-CPX-PNIO-ES**	**548 761**
		French	**P.BE-CPX-PNIO-FR**	**548 762**
		Italian	**P.BE-CPX-PNIO-IT**	**548 763**
		Swedish	**P.BE-CPX-PNIO-SV**	**548 764**



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 is transferred to the connected CPX bus node and thus via fieldbus to the higher-order controller. This enables the establishment of modular centralised and compact decentralised concepts with one system. The CP electrical interface is supported by all CPX fieldbus nodes and the CPX-FEC.

Application

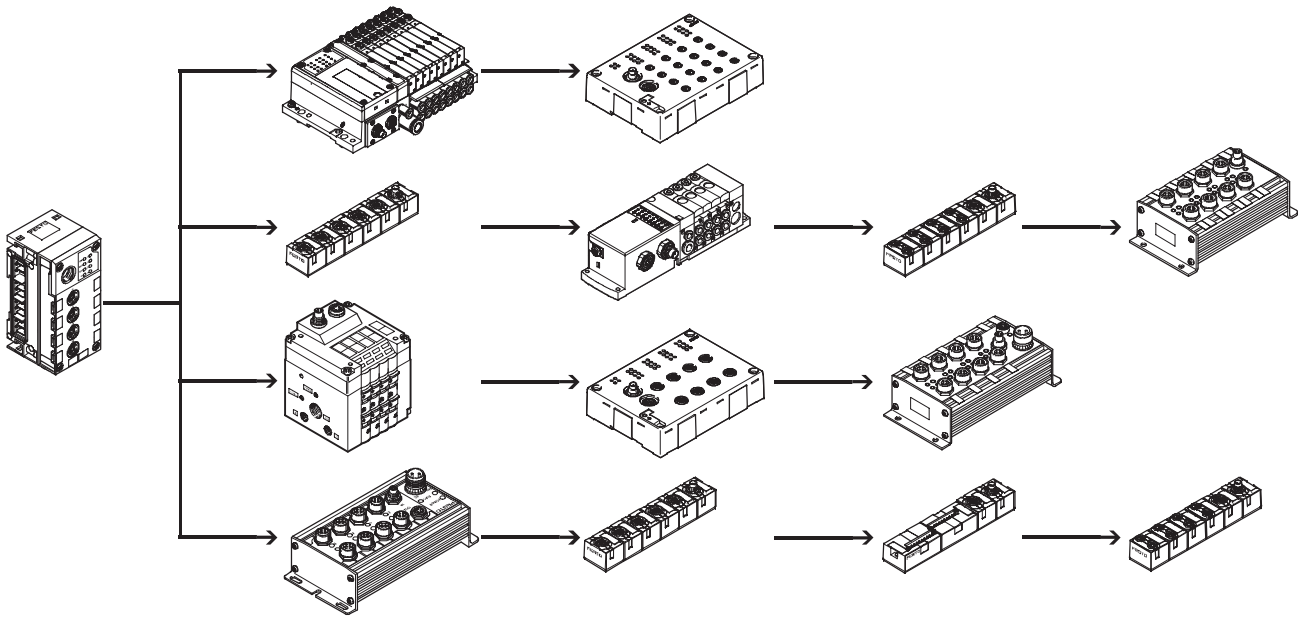
CP connection

As well as transmitting the communication data, the max. 4 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 with 24 V separately from one another, 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 of all functions by the CPX-MMI 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 is 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

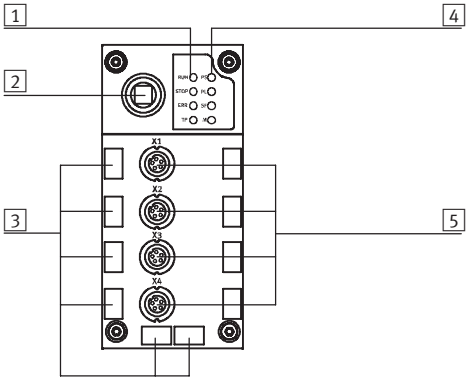
The remanent saving of configuration data means that changes in the configuration or faulty modules are still displayed even after a voltage failure.

General technical data			
Type			**CPX-CP-4-FB**
Part No.			**526 705**
Brief description			CP interface
Max. number of	CP strings		4
	CP modules per string		4
	outputs per string		32
	inputs per string		32
CP connection			Socket M9, 5-pin
Baud rate		[kbps]	1000
Cycle time	CP modules without CPI functionality	[ms]	4
	CP modules with CPI functionality	[ms]	2
LED displays			L1 ... 4 = Status of the CP string 1 ... 4 PS = Electronic supply, sensor supply PL = Load supply RN = Status of the CP system SF = System error
Device-specific diagnostics			Via bus node
Operating voltage	Nominal value	[V]	24 DC (reverse polarity protected)
	Permissible range	[V]	18 ... 30 DC
	Power failure bridging	[ms]	20
Supply voltage of sensors		[V]	24 DC ±25% coming from bus node
Load voltage of actuators		[V]	24 DC ±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 (including interlinking block) W x L x H		[mm]	50 x 107 x 45
Weight	Without interlinking block	[g]	140
	Including interlinking block without power supply	[g]	220
	Including interlinking block with system supply	[g]	240

Note

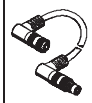
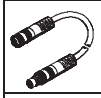
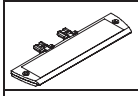
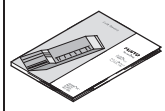
Please observe the general limits and guidelines for the system when configuring the electrical modules.

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			Type	Part No.
Bus connection				
	Cover cap	M9	**FLANSCHDOSE SER.712**	**356 684**
		M12	**ISK-M12**	**165 592**
	Connecting cable WS-WD	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
User documentation				
	User documentation for CPX-CP interface	German	**P.BE-CPX-CP-DE**	**539 293**
		English	**P.BE-CPX-CP-EN**	**539 294**
		Spanish	**P.BE-CPX-CP-ES**	**539 295**
		French	**P.BE-CPX-CP-FR**	**539 296**
		Italian	**P.BE-CPX-CP-IT**	**539 297**
		Swedish	**P.BE-CPX-CP-SV**	**539 298**

Terminal CPX

Technical data – Input module, digital

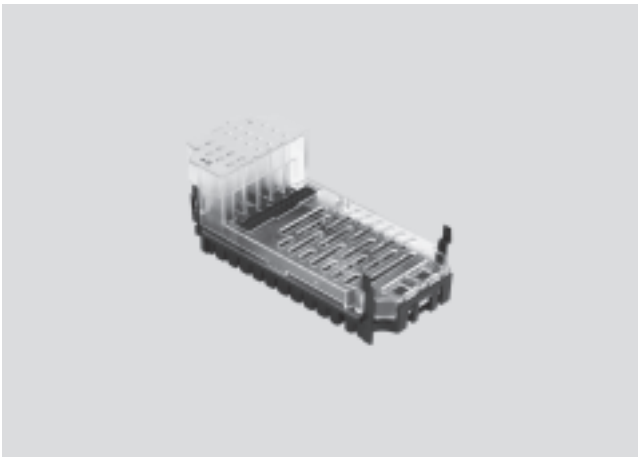
FESTO

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).

Application

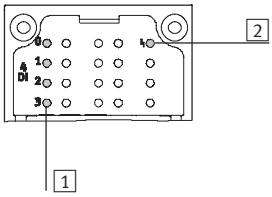
- Input modules for 24 V DC sensor voltage supply
- PNP or NPN logic
- Supports connection blocks with M12, M8, Sub-D, Harax and terminal connection
- Module features can be parameterised
- The input module receives the voltage supply for the electronics and the sensors from the interlinking block
-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



General technical data						
Type Part No.			**CPX-4DE 195 752**	**CPX-8DE 195 750**	**CPX-8DE-D 541 480**	**CPX-8NDE 543 813**
No. of inputs			4	8	8	8
Max. power supply	per module	[A]	0.5			
	per channel	[A]	0.5			
Fuse protection			Internal electronic fuse protection for each module	Internal electronic fuse protection for each module	Internal electronic fuse protection for each channel	Internal electronic fuse protection for each module
Module current consumption (input logic level OFF)		[mA]	Typ. 15	Typ. 15	Typ. 12	Typ. 4
Supply voltage of sensors		[V]	24 DC ±25%			
Galvanic isolation	Channel – Channel		No			
	Channel – Internal bus		No			
Switching level	Signal 0	[V]	≤ 5 DC			≥ 11 DC
	Signal 1	[V]	≥ 11 DC			≤ 5 DC
Switch-on debounce time		[ms]	3 (0.1 ms, 10, 20 parameterisable)			
Input characteristic curve			IEC 1131-2			
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, sensor supply			
Parameterisation			• Module monitoring • Behaviour after short circuit • Switch-on 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			Polymer			
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			

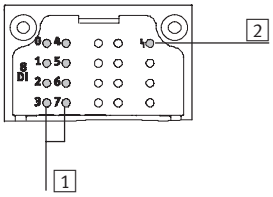
Connection and display components

CPX-4DE



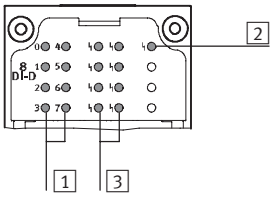
1 Status LEDs (green)

CPX-8DE



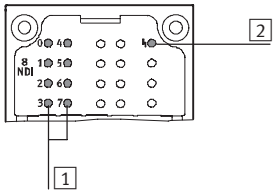
2 Error LED (red, module error)

CPX-8DE-D



3 Channel-oriented error LEDs (red)

CPX-8NDE



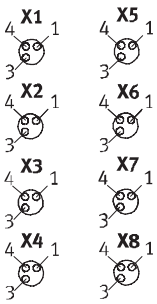
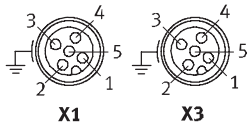
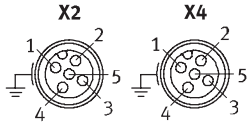
Allocation to inputs

➔ Pin allocation for module

Connection block/digital input module combinations

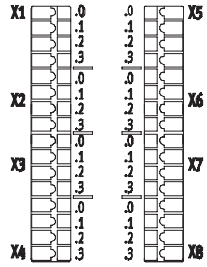
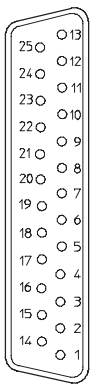
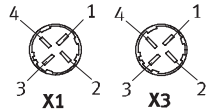
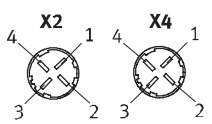
Connection blocks	Part No.	Digital input modules			
		CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
CPX-AB-8-M8-3POL	**195 706**	■	■	■	■
CPX-AB-4-M12X2-5POL	**195 704**	■	■	■	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■	■	■	■
CPX-AB-8-KL-4POL	**195 708**	■	■	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■	■	■
CPX-AB-4-HAR-4POL	**525 636**	■	■	■	■
CPX-M-4-M12x2-5POL	**549 367**	■	■	■	■
CPX-AB-4-M12x2-5P-R-M3	**546 997**	■	■	■	■

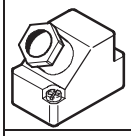
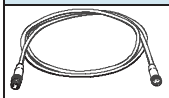
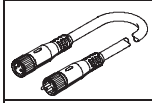
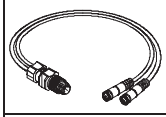
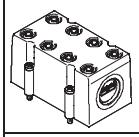
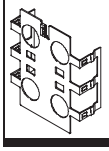
Pin allocation

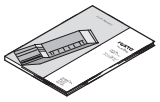
Connection block inputs	CPX-4DE		CPX-8DE, CPX-8DE-D and CPX-8NDE	
CPX-AB-8-M8-3POL				
	X1.1: 24 V_{SEN} X1.3: 0 V_{SEN} X1.4: Input x X2.1: 24 V_{SEN} X2.3: 0 V_{SEN} X2.4: Input x+1 X3.1: 24 V_{SEN} X3.3: 0 V_{SEN} X3.4: Input x+1 X4.1: 24 V_{SEN} X4.3: 0 V_{SEN} X4.4: n.c.	X5.1: 24 V_{SEN} X5.3: 0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

1) Speedcon quick lock, metal thread with additional screening

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 X2.1: 24 V_{SEN} X2.2: n.c. X2.3: 0 V_{SEN} X2.4: Input x+1	X3.1: 24 V_{SEN} X3.2: Input x+3 X3.3: 0 V_{SEN} X3.4: Input x+2 X4.1: 24 V_{SEN} X4.2: n.c. X4.3: 0 V_{SEN} X4.4: Input x+3	X1.1: 24 $V_{SEN\ x}$ X1.2: Input x+1 X1.3: 0 $V_{SEN\ x}$ X1.4: Input x X2.1: 24 $V_{SEN\ x+2}$ X2.2: Input x+3 X2.3: 0 $V_{SEN\ x+2}$ X2.4: Input x+2	X3.1: 24 $V_{SEN\ x+4}$ X3.2: Input x+5 X3.3: 0 $V_{SEN\ x+4}$ X3.4: Input x+4 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			Type	Part No.
Plug				
	Push-in T-connector	2x socket M12, 5-pin 1x plug M12, 4-pin	**NEDU-M12D5-M12T4**	**541 596**
		2x socket M8, 3-pin 1x plug M12, 4-pin	**NEDU-M8D3-M12T4**	**541 597**
	Plug	M8, solderable	**SEA-GS-M8**	**18 696**
		M8, screw-in	**SEA-3GS-M8-S**	**192 009**
		M12, PG7	**SEA-GS-7**	**18 666**
		M12, PG7, 4-pin for cable ∅ 2.5 mm	**SEA-4GS-7-2,5**	**192 008**
		M12, PG9	**SEA-GS-9**	**18 778**
		M12 for 2 cables	**SEA-GS-11-DUO**	**18 779**
		M12 for 2 cables, 5-pin	**SEA-5GS-11-DUO**	**192 010**
		M12, 5-pin	**SEA-M12-5GS-PG7**	**175 487**
	HARAX plug, 4-pin		**SEA-GS-HAR-4POL**	**525 928**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Connecting cable				
	Connecting cable M8-M8	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Connecting cable M12-M12	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
		1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	Modular system for connecting cables		**NEBU-...** ➔ www.festo.com/catalogue/nebu	–
	DUO cable M12	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**

Ordering data				
Designation			Type	Part No.
User documentation				
	User documentation	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

Terminal CPX

Technical data – Input module, digital, 16 inputs

FESTO

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).

Application

- Input modules for 24 V DC sensor voltage supply
- 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
Part No.			543 815	550 202
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 protection for each module	Internal electronic fuse protection for each channel pair
Module current consumption (input logic level OFF)		[mA]	Typ. 4	Typ. 34
Supply voltage of sensors		[V]	24 DC ±25%	24 DC ±25%
Galvanic isolation	Channel – Channel		No	No
	Channel – Internal bus		No	No
Switching level	Signal 0	[V]	≤ 5 DC	≤ 5 DC
	Signal 1	[V]	≥ 11 DC	≥ 11 DC
Switch-on 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 • Switch-on debounce time • Signal stretching time	• Module monitoring • Behaviour after short circuit • Switch-on 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 (including 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

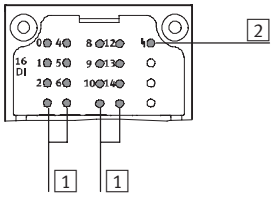
Terminal CPX

Technical data – Input module, digital, 16 inputs

FESTO

Connection and display components

CPX-16DE

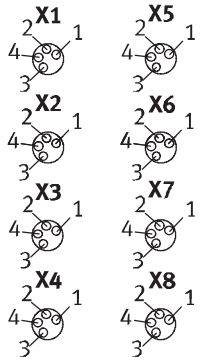


1 Status LEDs (green)
Allocation to inputs
➔ Pin allocation for module
2 Error LED (red, module error)

Connection block/digital input module combinations

Connection blocks	Part No.	Digital input modules	
		CPX-16DE	CPX-M-16DE-D
CPX-AB-8-M8X2-4POL	**541 256**	■	–
CPX-AB-8-KL-4POL	**195 708**	■	–
CPX-AB-1-SUB-BU-25POL	**525 676**	■	–
CPX-M-8-M12x2-5POL	**550 202**	–	■
CPX-AB-8-M8x2-4P-M3	**556 165**	■	–

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

Terminal CPX

Technical data – Input module, digital, 16 inputs

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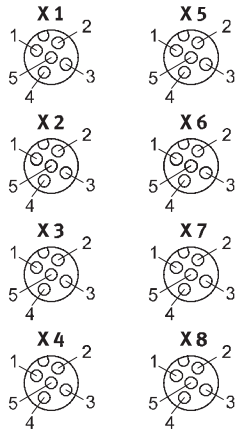
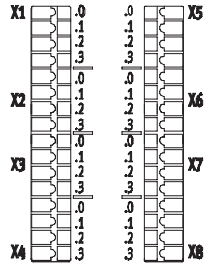
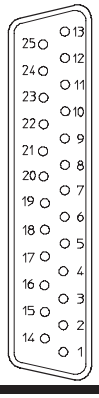
Pin allocation		
Connection block inputs	CPX-M-16DE-D	
CPX-M-8-M12x2-5POL		
	X1.1: 24 V_{Sx} X1.2: Input x+1 X1.3: 0 V_{Sx} X1.4: Input x X1.5: FE X2.1: 24 V_{Sx+2} X2.2: Input x+3 X2.3: 0 V_{Sx+2} X2.4: Input x+2 X2.5: FE X3.1: 24 V_{Sx+4} X3.2: Input x+5 X3.3: 0 V_{Sx+4} X3.4: Input x+4 X3.5: FE X4.1: 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

Terminal CPX

Technical data – Input module, digital, 16 inputs

FESTO

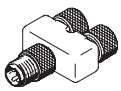
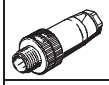
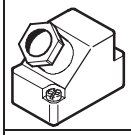
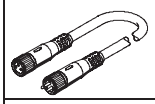
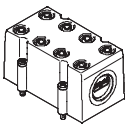
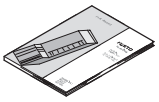
Pin allocation

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 (earth) X2.0: Input x+9 X2.1: 24 V_{SEN} X2.2: Input x+1 X2.3: FE (earth) X3.0: Input x+10 X3.1: 24 V_{SEN} X3.2: Input x+2 X3.3: FE (earth) X4.0: Input x+11 X4.1: 24 V_{SEN} X4.2: Input x+3 X4.3: FE (earth)	X5.0: Input x+12 X5.1: 0 V_{SEN} X5.2: Input x+4 X5.3: FE (earth) X6.0: Input x+13 X6.1: 0 V_{SEN} X6.2: Input x+5 X6.3: FE (earth) X7.0: Input x+14 X7.1: 0 V_{SEN} X7.2: Input x+6 X7.3: FE (earth) X8.0: Input x+15 X8.1: 0 V_{SEN} X8.2: Input x+7 X8.3: FE (earth)
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 (earth)	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 (earth) Housing: FE

Terminal CPX

Accessories – Input module, digital, 16 inputs

FESTO

Ordering data				
Designation			Type	Part No.
Plug				
	Push-in T-connector	2x socket M8, 3-pin 1x plug M8, 4-pin	**NEDU-M8D3-M8T4**	**544 391**
	M8 plug, 3-pin	Solderable	**SEA-GS-M8**	**18 696**
		Screw-in	**SEA-3GS-M8-S**	**192 009**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Connecting cable				
	Connecting cable M8-M8	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Modular system for connecting cables		**NEBU-...** ➔ www.festo.com/catalogue/nebu	–
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
User documentation				
	User documentation	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

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.

Application

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

General technical data					
Type			CPX-4DA	CPX-8DA	CPX-8DA-H
Part No.			195 754	541 482	550 202
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
Protection (short circuit)			Internal electronic fuse protection for each channel		
Module current consumption (voltage supply for electronics)		[mA]	Typ. 16		Typ. 34
Supply voltage		[V]	24 DC ±25%		
Galvanic 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 • Load voltage 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			Polymer		
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		

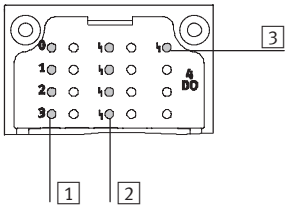
Terminal CPX

Technical data – Output module, digital

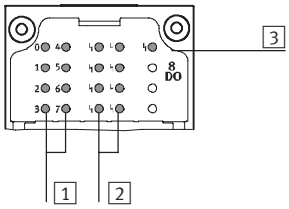
FESTO

Connection and display components

CPX-4DA



CPX-8DA

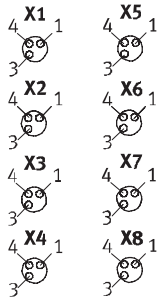


1 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module
2 Channel-oriented error LEDs (red)
3 Error LED (red, module error)

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	**195 706**	■	■	–
CPX-AB-8-M8X2-4POL	**541 256**	■	■	■
CPX-AB-4-M12X2-5POL	**195 704**	■	■	–
CPX-AB-4-M12X2-5POL-R	**541 254**	■	■	■
CPX-AB-8-KL-4POL	**195 708**	■	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■	■
CPX-AB-4-HAR-4POL	**525 636**	■	■	–
CPX-AB-8-M8x2-4P-M3	**556 166**	■	■	■
CPX-AB-4-M12x2-5P-R-M3	**546 997**	■	■	■
CPX-M-4-M12x2-5POL	**549 367**	■	■	–

Pin allocation

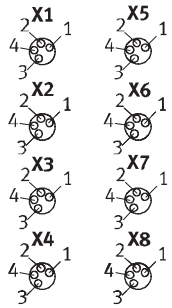
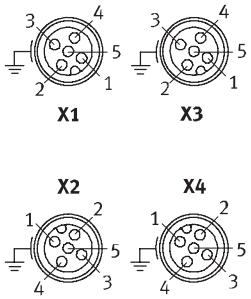
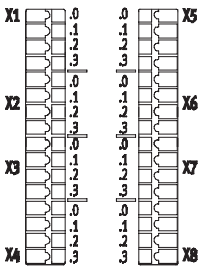
Connection block outputs	CPX-4DA		CPX-8DA	
CPX-AB-8-M8-3POL				
	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+1 X4.1: n.c. X4.3: 0 V_{OUT} X4.4: n.c.	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+2 X6.1: n.c. X6.3: 0 V_{OUT}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

Terminal CPX

Technical data – Output module, digital

FESTO

Pin allocation

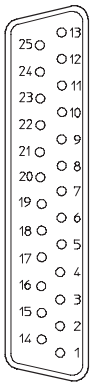
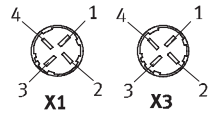
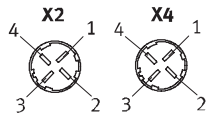
Connection block outputs	CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-8-M8X2-4POL and CPX-AB-8-M8x2-4P-M3				
	X1.1: 0 V_{OUT} X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X2.1: 0 V_{OUT} X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: 0 V_{OUT} X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2 X4.1: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

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

Terminal CPX

Technical data – Output module, digital

FESTO

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

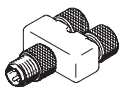
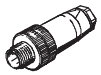
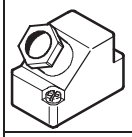
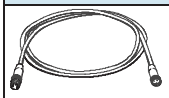
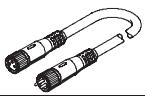
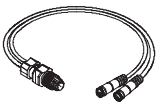
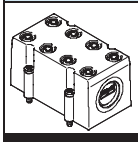
1) Not suitable for CPX-8DA-H.

Terminal CPX

Accessories – Output module, digital

FESTO

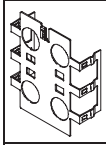
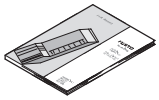
Ordering data

Designation			Type	Part No.
Plug				
	Push-in T-connector	2x socket M8, 3-pin 1x plug M8, 4-pin	**NEDU-M8D3-M8T4**	**544 391**
	Push-in T-connector	2x socket M12, 5-pin 1x plug M12, 4-pin	**NEDU-M12D5-M12T4**	**541 596**
		2x socket M8, 3-pin 1x plug M12, 4-pin	**NEDU-M8D3-M12T4**	**541 597**
	Plug	M8, 3-pin, solderable	**SEA-GS-M8**	**18 696**
		M8, 3-pin, screw-in	**SEA-3GS-M8-S**	**192 009**
		M12, PG7	**SEA-GS-7**	**18 666**
		M12, PG7, 4-pin for cable ∅ 2.5 mm	**SEA-4GS-7-2,5**	**192 008**
		M12, PG9	**SEA-GS-9**	**18 778**
		M12 for 2 cables	**SEA-GS-11-DUO**	**18 779**
		M12 for 2 cables, 5-pin	**SEA-5GS-11-DUO**	**192 010**
		M12, 5-pin	**SEA-M12-5GS-PG7**	**175 487**
	HARAX plug, 4-pin		**SEA-GS-HAR-4POL**	**525 928**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Connecting cable				
	Connecting cable M8-M8	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Connecting cable M12-M12	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
		1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	Modular system for connecting cables		**NEBU-...** ➔ www.festo.com/catalogue/nebu	–
	DUO cable M12	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**

Terminal CPX

Accessories – Output module, digital

FESTO

Ordering data				
Designation			Type	Part No.
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User documentation				
	User documentation	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

Terminal CPX

Technical data – Input/output module, digital

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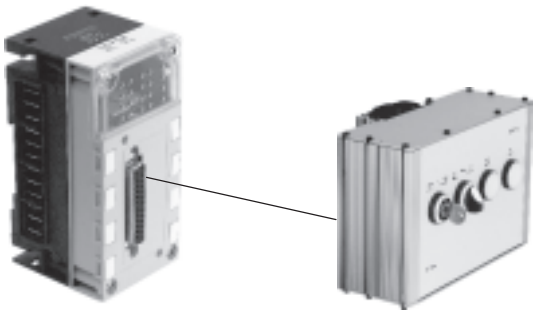
Application

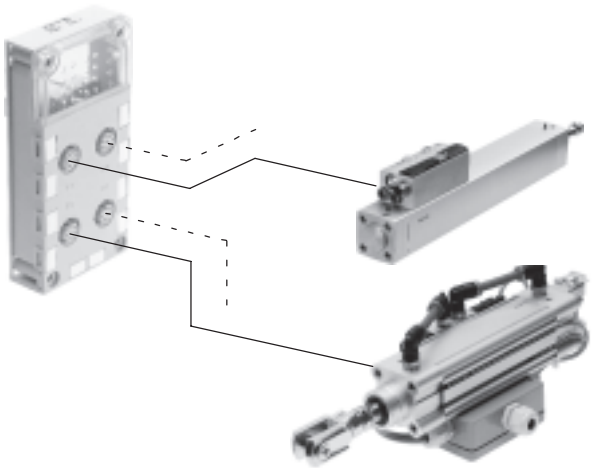
- Digital multi I/O module for 24 V DC supply voltage
- Supports connection blocks with Sub-D, terminal connection and M12 connection (8-pin)
- Module features can be parameterised
- The inputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive the voltage supply for the electronics and 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



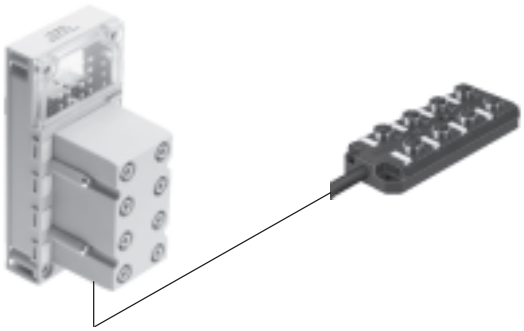
The multi I/O module controls devices with a high number of inputs and outputs per connection point. Because the module supports Sub-D connection blocks, consoles with pushbuttons and lamps can be connected to the CPX terminal using a minimal amount of installation space.

Up to 8 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 4 cylinder-valve combinations with integrated sensors can be connected. Each cylinder-valve combination is supported by 2 inputs and 2 outputs per socket. It is therefore possible to control max. 2 solenoid coils and operate 2 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 3 inputs and 2 outputs available on 2 sockets.



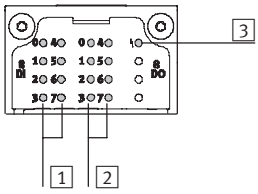
As an alternative to the Sub-D and M12 connection block (8-pin) for installation with higher protection class IP65, the terminal connection block produces an identical result for installation with IP20 protection – or with IP65/67 protection with additional cover.

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 chain link trunking or upstream functions.

General technical data			
Type			CPX-8DE-8DA
Part No.			526 257
No. of	Inputs		8
	Outputs		8
Max. power supply	Sensor supply	[A]	0.5
per module	Outputs	[A]	4
Max. power supply	Sensor supply	[A]	0.5
per channel	Outputs	[A]	0.5
Max. power supply per channel		[A]	0.5 (24 W lamp load, 4 channels can be connected in parallel)
Fuse protection	Sensor supply		Internal electronic fuse protection for sensor supply
	Outputs		Internal electronic fuse protection for each channel
Internal electronics	Inputs	[mA]	Typ. 22
current consumption	Outputs	[mA]	Typ. 34
Supply voltage	Sensors	[V]	24 DC ±25%
	Outputs	[V]	24 DC ±25%
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		To IEC 1131-2
Switching level, inputs	Signal 0	[V]	≤ 5 DC
	Signal 1	[V]	≥ 11 DC
Switch-on 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 • Load voltage of outputs
Parameterisation	Inputs		• Module monitoring • Behaviour after short circuit, sensor supply • Switch-on 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			Polymer
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

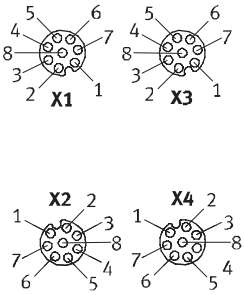
2 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module

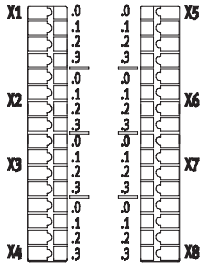
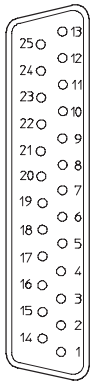
3 Error LED (red)
(module error)

Connection block/digital input/output module combinations

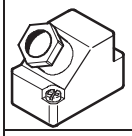
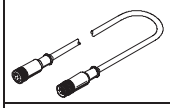
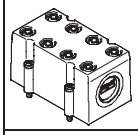
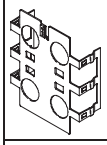
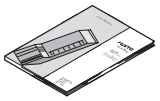
Connection blocks	Part No.	Digital I/O module
		CPX-8DE-8DA
CPX-AB-4-M12-8POL	**526 178**	■
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-M12-8P-M3	**556 167**	■

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		Type	Part No.
Plug			
	Sub-D plug, 25-pin	**SD-SUB-D-ST25**	**527 522**
Connecting cable			
	Connecting cable M12	**KM12-8GD8GS-2-PU**	**525 617**
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	**AK-8KL**	**538 219**
	Fittings kit	**VG-K-M9**	**538 220**
Screening plate			
	Screening plate for M12 connections	**CPX-AB-S-4-M12**	**526 184**
User documentation			
	User documentation	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

Terminal CPX

Technical data – Analogue module for inputs

FESTO

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.

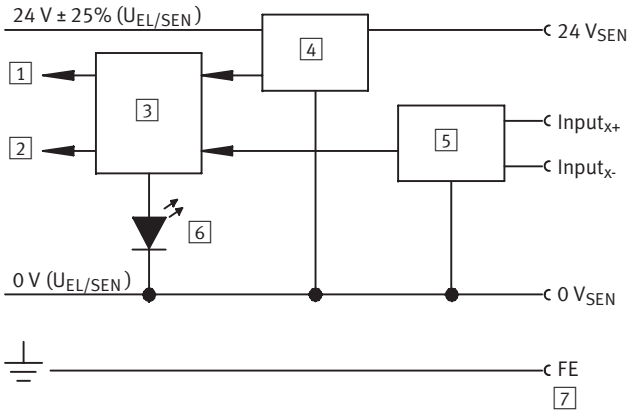
Application

- 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
Part No.		526 168		541 484
		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 protection 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]	24 DC ±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 bit		
No. of units		4096		
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]	30 DC	–	–
Max. permissible input current	[mA]	–	40	40
Conversion time per channel	[µs]	Typically 150		
Cycle time (module)	[ms]	≤ 4		≤ 10

General technical data				
Type			CPX-2AE-U-I	CPX-4AE-I
Part No.			526 168	541 484
Data format			Prefix + 15 bit, linear scaling Prefix + 12 bit right-justified, type 03 compatible Prefix + 15 bit left-aligned, S7 compatible Prefix + 12 bit left-aligned + diagnostics, S5 compatible	
Cable length			Max. 30 m (screened)	
Galvanic 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 errors • 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 (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Weight		[g]	38	

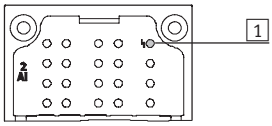
Internal structure, basic representation



1 Diagnostics
2 $Input_x$ = 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 connection block

Connection and display components

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

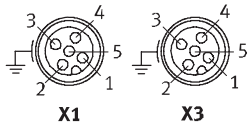
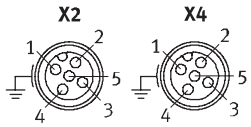
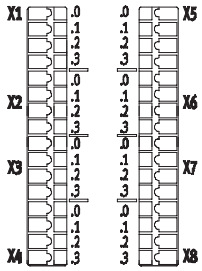


1 Error LED (red, module error)

Connection block/analogue module combinations

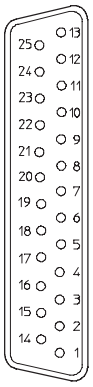
Connection blocks	Part No.	Analogue module	
		CPX-2AE-U-I	CPX-4AE-I
CPX-AB-4-M12X2-5POL	**195 704**	■	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■	■
CPX-AB-8-KL-4POL	**195 708**	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■
CPX-AB-4-M12x2-5P-R-M3	**546 997**	■	■
CPX-M-4-M12x2-5POL	**549 367**	■	■

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

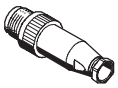
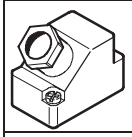
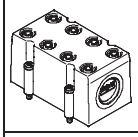
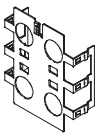
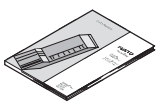
1) Speedcon quick lock, metal thread with additional screening
2) FE/metal thread with additional screening

Pin allocation

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

1) Connect screening to functional earth FE

Ordering data

Designation		Type	Part No.
Plug			
	M12 plug, 5-pin	**SEA-M12-5GS-PG7**	**175 487**
	Sub-D plug, 25-pin	**SD-SUB-D-ST25**	**527 522**
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	**AK-8KL**	**538 219**
	Fittings kit	**VG-K-M9**	**538 220**
Screening plate			
	Screening plate for M12 connections	**CPX-AB-S-4-M12**	**526 184**
User documentation			
	User documentation	German	**P.BE-CPX-AX-DE**	**526 415**
		English	**P.BE-CPX-AX-EN**	**526 416**
		Spanish	**P.BE-CPX-AX-ES**	**526 417**
		French	**P.BE-CPX-AX-FR**	**526 418**
		Italian	**P.BE-CPX-AX-IT**	**526 419**
		Swedish	**P.BE-CPX-AX-SV**	**526 420**

Terminal CPX

Technical data – Analogue module for temperature inputs

FESTO

Function

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

Application

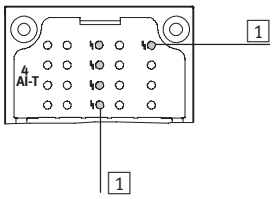
- Temperature module for temperature sensors PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni500, Ni1000
- Supports connection blocks with M12, Harax and terminal connection
- Temperature module features can be parameterised
- 2-wire, 3-wire and 4-wire connection
- The temperature module receives the voltage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

General technical data			
Type			**CPX-4AE-T**
Part No.			**541 486**
			Temperature input
No. of analogue inputs			Choice of 2 or 4
Max. power supply per module		[A]	0.7
Fuse protection			Internal electronic fuse protection for sensor supply
Current consumption from 24 V sensor supply (quiescent current)		[mA]	Typically 50
Supply voltage of sensors		[V]	24 DC ±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 bit + 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. cable resistance per conductor		[Ω]	10
Max. permissible input voltage		[V]	±30
Cycle time (module)		[ms]	≤ 250

General technical data			
Type			**CPX-4AE-T**
Part No.			**541 486**
Data format			15 bit + prefix, complement of two, binary notation in tenths of a degree
Cable length		[m]	Max. 200 (screened)
Galvanic isolation	Channel – Channel		No
	Channel – Internal bus		Yes
LED displays	Group diagnostics		1
	Channel diagnostics		4
Diagnostics			• Short circuit/overload channel • Parameterisation errors • 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 (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

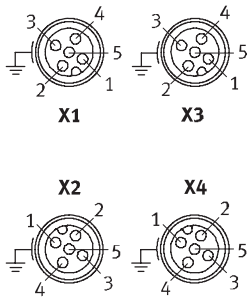
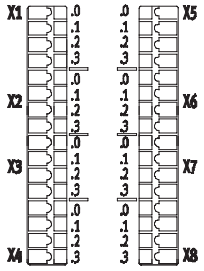
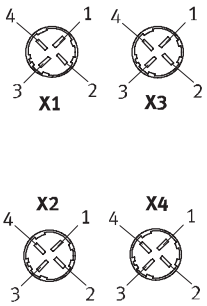
Connection and display components

CPX-4AE-T



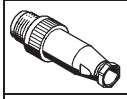
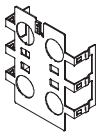
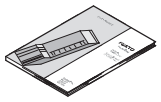
1 Error LED (red)
2 Channel-oriented error LEDs (red)

Connection block/analogue module combinations		
Connection blocks	Part No.	Temperature module
		CPX-4AE-T
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-4-HAR-4POL	**525 636**	■
CPX-AB-4-M12x2-5P-R-M3	**546 997**	■
CPX-M-4-M12x2-5POL	**549 367**	■

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] 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
CPX-AB-4-HAR-4POL		
	X1.1: Input I0+ X1.2: Input U0+ X1.3: Input I0– X1.4: Input U0– X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1–	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2– X4.1: Input I3+ X4.2: Input U3+ X4.3: Input I3– X4.4: Input U3–

1) Speedcon quick lock, metal thread with additional screening
2) FE/metal thread with additional screening

Ordering data

Designation		Type	Part No.
Plug			
	M12 plug, 5-pin	**SEA-M12-5GS-PG7**	**175 487**
	HARAX plug, 4-pin	**SEA-GS-HAR-4POL**	**525 928**
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	**AK-8KL**	**538 219**
	Fittings kit	**VG-K-M9**	**538 220**
Screening plate			
	Screening plate for M12 connections	**CPX-AB-S-4-M12**	**526 184**
User documentation			
	User documentation	German	**P.BE-CPX-AX-DE**	**526 415**
		English	**P.BE-CPX-AX-EN**	**526 416**
		Spanish	**P.BE-CPX-AX-ES**	**526 417**
		French	**P.BE-CPX-AX-FR**	**526 418**
		Italian	**P.BE-CPX-AX-IT**	**526 419**
		Swedish	**P.BE-CPX-AX-SV**	**526 420**

Terminal CPX

Technical data – Analogue module for outputs

FESTO

Function

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

Application

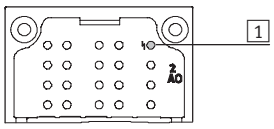
- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without galvanic isolation possible
- The analogue module receives 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**	
Part No.			**526 170**	
			Voltage output	Current output
No. of analogue outputs			2	
Max. actuator supply per module		[A]	2.8	
Fuse protection			Internal electronic fuse protection for actuator supply	
Current consumption from 24 V sensor supply (at full load)		[mA]	Max. 150	
Current consumption from 24 V actuator supply (at full load)		[A]	4 ... 10	
Supply voltage for actuators		[V DC]	24 ±25%	
Signal range (parameterisable for each channel by means of DIL switch or software)			0 ... 10 V DC	0 ... 20 mA 4 ... 2 mA
Resolution		[Bit]	12	
No. of units			4096	
Absolute accuracy		[%]	±0.6	
Linearity errors (no software scaling)		[%]	±0.1	
Repetition accuracy (at 25 °C)		[%]	0.05	
Encoder selection	Load resistance for ohmic load	[kΩ]	Min. 1	Max. 0.5
	Load resistance for capacitive load	[µF]	Max. 1	–
	Load resistance for inductive load	[mH]	–	Max. 1
	Short circuit protection 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	
Part No.			526 170	
			Voltage output	Current output
Response time	for ohmic load	[ms]	0.1	
	for capacitive load	[ms]	0.7	–
	for inductive load	[ms]	–	0.5
Data format			15 bit + prefix, linear scaling 12 bit right-justified, type 03 compatible 12 bit left-aligned, S7 compatible 12 bit left-aligned, 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 errors • 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 • Monitoring of wire break • 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 (including interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Weight		[g]	38	

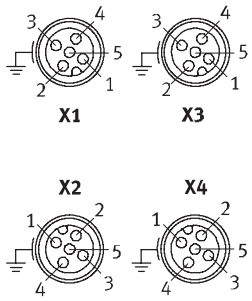
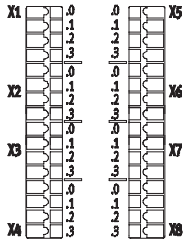
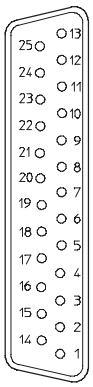
Connection and display components

CPX-2AA-U-I

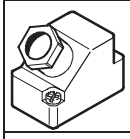
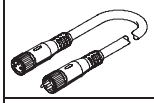
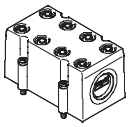
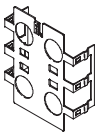
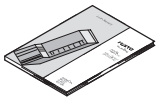


1 Error LED (red; module error)

Connection block/analogue module combinations		
Connection blocks	Part No.	Analogue module
		CPX-2AA-U-I
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-M12x2-5P-R-M3	**546 997**	■
CPX-M-4-M12x2-5POL	**549 367**	■

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] X2.1: 24 V_{OUT} X2.2: Output I0+ X2.3: 0 V_{OUT} X2.4: Output GND X2.5: FE[2]	X3.1: 24 V_{OUT} X3.2: Output U1+ X3.3: 0 V_{OUT} X3.4: Output GND X3.5: FE[2] X4.1: 24 V_{OUT} X4.2: Output I1+ X4.3: 0 V_{OUT} X4.4: Output GND X4.5: FE[2]
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{OUT} X1.1: 0 V_{OUT} X1.2: Output GND X1.3: FE X2.0: n.c. X2.1: n.c. X2.2: Output U0+ X2.3: FE X3.0: 24 V_{OUT} X3.1: 0 V_{OUT} X3.2: Output GDN X3.3: FE X4.0: n.c. X4.1: n.c. X4.2: Output I0+ X4.3: FE	X5.0: 24 V_{OUT} X5.1: 0 V_{OUT} X5.2: Output GND X5.3: FE X6.0: n.c. X6.1: n.c. X6.2: Output U1+ X6.3: FE X7.0: 24 V_{OUT} X7.1: 0 V_{OUT} X7.2: Output GND X7.3: FE X8.0: n.c. X8.1: n.c. X8.2: Output I1+ X8.3: FE
CPX-AB-1-SUB-BU-25POL		
	1: Output GND 2: Output U0+ 3: Output GND 4: Output I0+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{OUT} 10: 24 V_{OUT} 11: 0 V_{OUT} 12: 0 V_{OUT} 13: 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, metal thread with additional screening
2) FE/metal thread with additional screening
3) Connect screening to functional earth FE

Ordering data				
Designation			Type	Part No.
Plug				
	M12 plug, 5-pin		**SEA-M12-5GS-PG7**	**175 487**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Connecting cable				
	Modular system for connecting cables		**NEBU-...** ➔ www.festo.com/catalogue/nebu	–
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User documentation				
	User documentation	German	**P.BE-CPX-AX-DE**	**526 415**
		English	**P.BE-CPX-AX-EN**	**526 416**
		Spanish	**P.BE-CPX-AX-ES**	**526 417**
		French	**P.BE-CPX-AX-FR**	**526 418**
		Italian	**P.BE-CPX-AX-IT**	**526 419**
		Swedish	**P.BE-CPX-AX-SV**	**526 420**

Terminal CPX

Technical data – Interlinking block with system supply

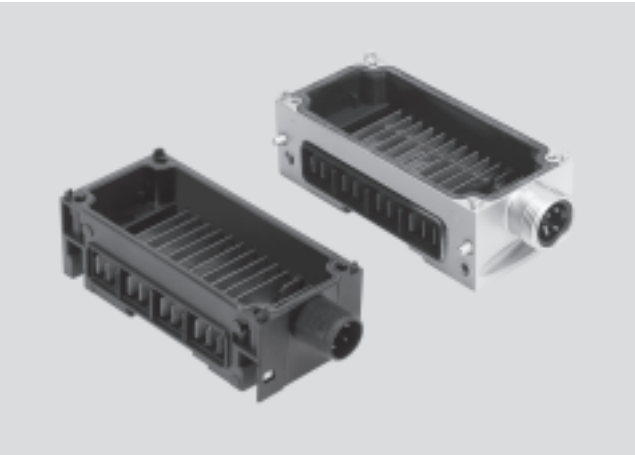
FESTO

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components using 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.

Application

- 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						
Type			CPX-GE-EV-S	CPX-GE-EV-S-7/8-4POL	CPX-GE-EV-S-7/8-5POL	CPX-M-GE-EV-S-7/8-5POL
Part No.			195 746	541 248	541 244	550 208
Electrical connection			M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Nominal operating voltage		[V DC]	24			
Current supply	Sensors and electronics	[A]	Max. 16		Max. 12	Max. 8
	Valves and outputs	[A]	Max. 16		Max. 12	Max. 8
Protection class to EN 60529			Depending on connection block			
Ambient temperature		[°C]	–5 ... +50			
Corrosion resistance class CRC[1)]			2			–
Material declaration			Conforms to RoHS			–
Materials			Polymer			Aluminium
Grid dimension		[mm]	50			
Dimensions W x L x H		[mm]	50 x 107 x 35			

1) Corrosion resistance class 2 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.

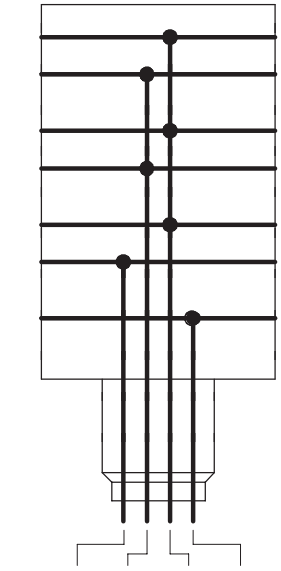
Terminal CPX

Technical data – Interlinking block with system supply

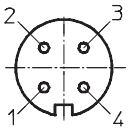
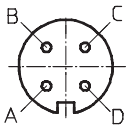
FESTO

Pin allocation

Wiring allocation

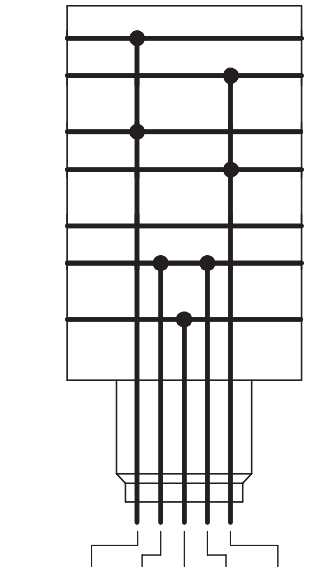


M18	1	2	3	4
7/8"	A	B	D	C
	24V	24V	0V	FE

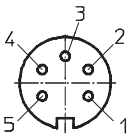
	Pin	Allocation
M18 – 4-pin		
	1	24 V DC supply voltage for electronics and sensors
	2	24 V DC load voltage supply for valves and outputs
	3	0 V
	4	FE
7/8" – 4-pin		
	A	24 V DC supply voltage for electronics and sensors
	B	24 V DC load voltage supply for valves and outputs
	C	FE
	D	0V

Pin allocation

Wiring allocation



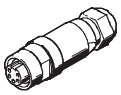
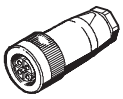
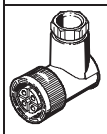
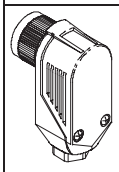
7/8"	1	2	3	4	5
	0V	0V	FE	24V	24V

	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

Terminal CPX

Accessories – Interlinking block with system supply

FESTO

Ordering data				
Designation			Type	Part No.
Connection sockets 7/8"				
	Power supply socket	5-pin	**NECU-G78G5-C2**	**543 107**
		4-pin	**NECU-G78G4-C2**	**543 108**
Connection sockets M18				
	Straight socket, screw terminal	PG9	**NTSD-GD-9**	**18 493**
		PG13.5	**NTSD-GD-13,5**	**18 526**
	Angled socket, screw terminal	PG9	**NTSD-WD-9**	**18 527**
	Angled socket, screw terminal	PG11	**NTSD-WD-11**	**533 119**
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Metal bus node/connection block	**CPX-DPT-30X32-S-4X**	**550 218**
	Screws for mounting the bus node/connection block on the metal interlinking block	Plastic bus node/connection block	**CPX-M-M3x22-4x**	**550 219**
		Metal bus node/connection block	**CPX-M-M3x22-S-4x**	**550 216**

Terminal CPX

Technical data – Interlinking block

FESTO

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components using 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.

Application

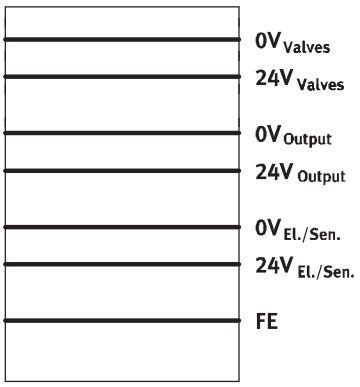
- All voltages are fed through to the next module by means of system linking.
- The connected electronics module for inputs/outputs or bus nodes taps off the required voltage.

General technical data			
Type		CPX-GE-EV	CPX-M-GE-EV
Part No.		195 742	550 206
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		Conforms to RoHS	
Materials		Polymer	Aluminium
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	

1) Corrosion resistance class 2 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

Wiring allocation



Pin	Allocation
–	–
–	–
–	–
–	–

Terminal CPX

Technical data – Interlinking block

FESTO

Ordering data – Mounting accessories				
Designation			Type	Part No.
	Screws for mounting the bus node/connection block on the plastic interlinking block	Metal bus node/connection block	**CPX-DPT-30X32-S-4X**	**550 218**
	Screws for mounting the bus node/connection block on the metal interlinking block	Plastic bus node/connection block	**CPX-M-M3x22-4x**	**550 219**
		Metal bus node/connection block	**CPX-M-M3x22-S-4x**	**550 216**

Terminal CPX

Technical data – Interlinking block with additional power supply for outputs

FESTO

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components using 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.

Application

- 24 V DC supply voltage for outputs

General technical data					
Type		CPX-GE-EV-Z	CPX-GE-EV-Z-7/8-4POL	CPX-GE-EV-Z-7/8-5POL	CPX-M-GE-EV-Z-7/8-5POL
Part No.		195 744	541 250	541 246	550210
Electrical connection		M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Nominal operating voltage	[V DC]	24			
Current supply Outputs	[A]	Max. 16		Max. 12	Max. 8
Protection class to EN 60529		Depending on connection block			
Ambient temperature	[°C]	–5 ... +50			
Corrosion resistance class CRC[1)]		2			–
Material declaration		Conforms to RoHS			–
Materials		Polymer			Aluminium
Grid dimension	[mm]	50			
Dimensions W x L x H	[mm]	50 x 107 x 35			

1) Corrosion resistance class 2 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.

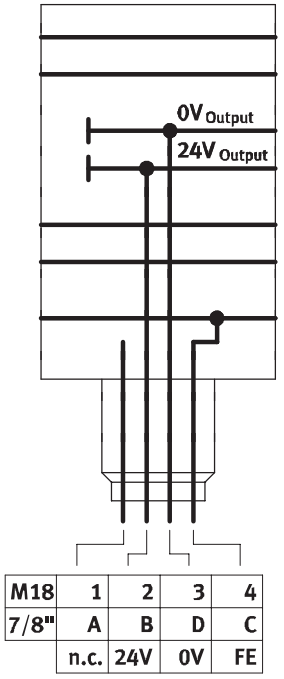
Terminal CPX

Technical data – Interlinking block with additional power supply for outputs

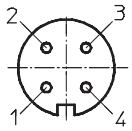
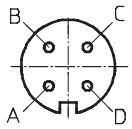
FESTO

Pin allocation

Wiring allocation

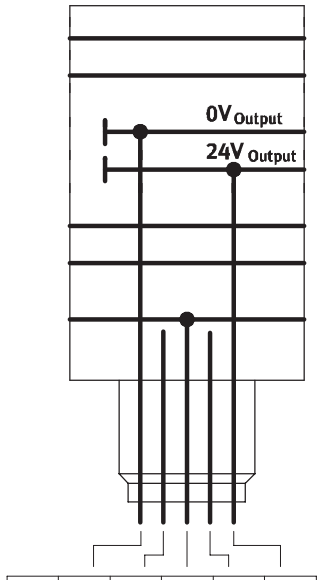


M18	1	2	3	4
7/8"	A	B	D	C
	n.c.	24V	0V	FE

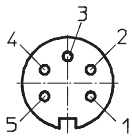
	Pin	Allocation
M18 – 4-pin		
	1	n.c.
	2	24 V DC load voltage supply for outputs
	3	0 V
	4	FE
7/8" – 4-pin		
	A	n.c.
	B	24 V DC load voltage supply for outputs
	C	FE
	D	0V

Pin allocation

Wiring allocation



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

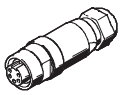
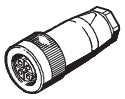
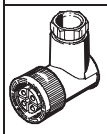
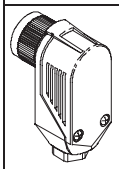
	Pin	Allocation
7/8" – 5-pin		
	1	0 V outputs
	2	n.c.
	3	FE
	4	n.c.
	5	24 V DC load voltage supply for outputs

Terminal CPX

Accessories – Interlinking block with additional power supply for outputs

FESTO

Ordering data

Designation			Type	Part No.
Connection sockets 7/8"				
	Power supply socket	5-pin	**NECU-G78G5-C2**	**543 107**
		4-pin	**NECU-G78G4-C2**	**543 108**
Connection sockets M18				
	Straight socket, screw terminal	PG9	**NTSD-GD-9**	**18 493**
		PG13.5	**NTSD-GD-13,5**	**18 526**
	Angled socket, screw terminal	PG9	**NTSD-WD-9**	**18 527**
	Angled socket, screw terminal	PG11	**NTSD-WD-11**	**533 119**
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Metal bus node/connection block	**CPX-DPT-30X32-S-4X**	**550 218**
	Screws for mounting the bus node/connection block on the metal interlinking block	Plastic bus node/connection block	**CPX-M-M3x22-4x**	**550 219**
		Metal bus node/connection block	**CPX-M-M3x22-S-4x**	**550 216**

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 using 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.

Application

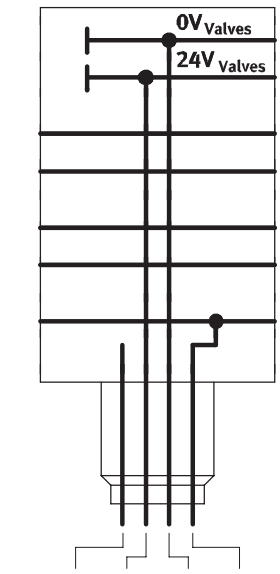
- 24 V DC supply voltage for valves

General technical data			
Type		CPX-GE-EV-V	CPX-GE-EV-V-7/8-4POL
Part No.		533 577	541 252
Electrical connection		M18	7/8", 4-pin
Nominal operating voltage	[V DC]	24	
Acceptable current load (per contact/contact rail)	[A]	16	
Protection class to EN 60529		Depending on connection block	
Ambient temperature	[°C]	–5 ... +50	
Corrosion resistance class CRC[1)]		2	
Material declaration		Conforms to RoHS	
Materials		Polymer	
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	

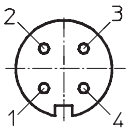
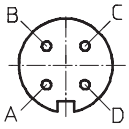
1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Pin allocation

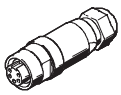
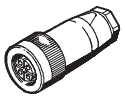
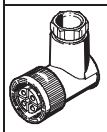
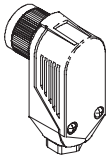
Wiring allocation



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 valves
	3	0 V
	4	FE
7/8" – 4-pin		
	A	n.c.
	B	24 V DC load voltage supply for valves
	C	FE
	D	0V

Ordering data

Designation			Type	Part No.
Connection sockets 7/8"				
	Power supply socket	5-pin	**NECU-G78G5-C2**	**543 107**
		4-pin	**NECU-G78G4-C2**	**543 108**
Connection sockets M18				
	Straight socket, screw terminal	PG9	**NTSD-GD-9**	**18 493**
		PG13.5	**NTSD-GD-13,5**	**18 526**
	Angled socket, screw terminal	PG9	**NTSD-WD-9**	**18 527**
	Angled socket, screw terminal	PG11	**NTSD-WD-11**	**533 119**
Mounting accessories				
	Screws for mounting the bus node/connection block on the plastic interlinking block	Metal bus node/connection block	**CPX-DPT-30X32-S-4X**	**550 218**

Terminal CPX

Technical data – Pneumatic interface MPA

FESTO

Function

The pneumatic interface MPA establishes the electromechanical connection between the terminal CPX and the valve terminal MPA.

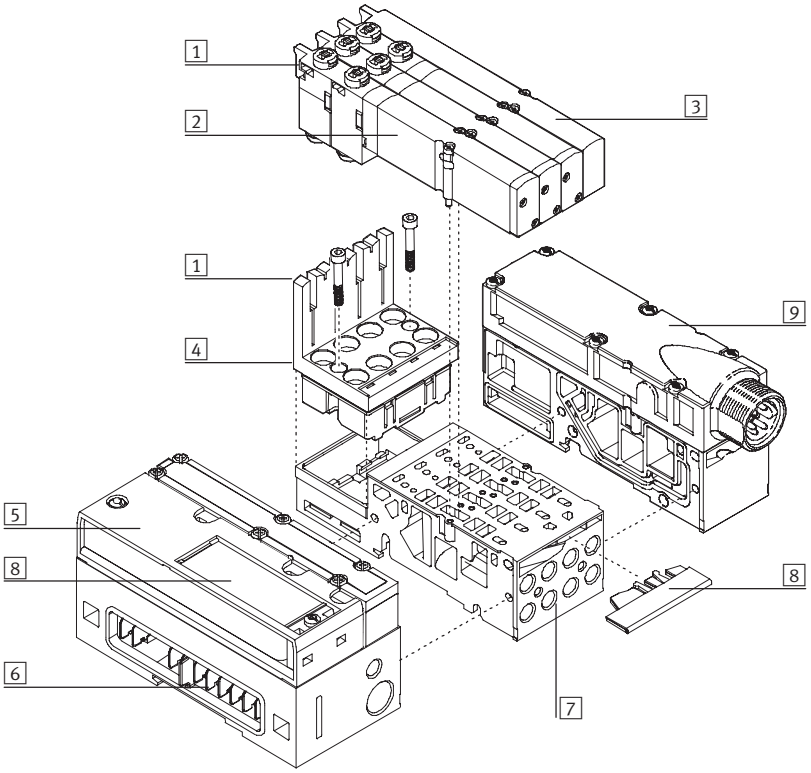
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA via the integrated CPX bus. The bus signal for activation of the solenoid coils is converted in the electronics module for 4 valves (max. 8 coils).

From a technical point of view, the individual MPA pneumatic modules each represent a separate electrical module with digital outputs. Valves, which are galvanically isolated, can be supplied with power via the interlinking block CPX-GE-EV-V.

Application

- Interface to the valve terminal MPA
- Max. 128 solenoid coils
- Max. 16 electronic modules
- Features of the electronics module of the valve terminal MPA can be parameterised, e.g. 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

Overview of pneumatic interface MPA and valve terminal MPA



1 LEDs
  – Outputs (yellow)
  – Error (red)
  – Module error (all LEDs red)
2 Valves
3 Blanking plate
4 Electronics module
5 Pneumatic interface MPA
6 Power supply and bus connection
7 Manifold block
8 Inscription fields
9 Valve power supply (creation of zones with power supply that can be activated separately)

Terminal CPX

Technical data – Pneumatic interface VTSA/VTSA-F

FESTO

Function

The pneumatic interface VTSA establishes the electromechanical connection between the terminal CPX 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 created using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Application

- Interface for 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, e.g. 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 Part No.			**VABA-S6-1-X1** **543 416**	**VABA-S6-1-X2** **550 663**
Connection for CPX interlinking blocks			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	
	Top cover		Polyamide	
Weight		[g]	485	

Terminal CPX

Technical data – Pneumatic interface MIDI/MAXI

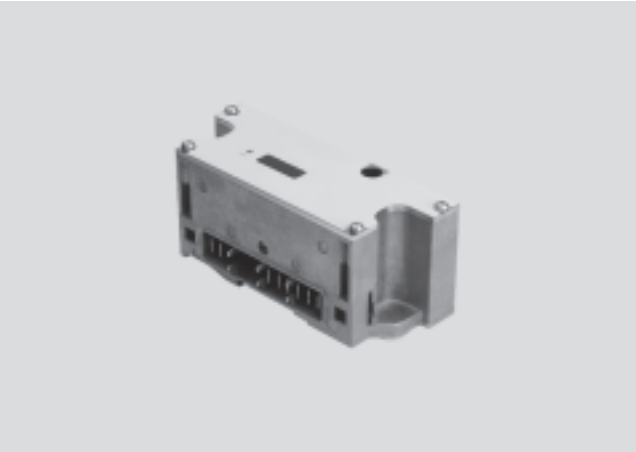
FESTO

Function

The pneumatic interface MIDI/MAXI connects the valve terminal MIDI/MAXI to the supported fieldbus protocols of the terminal CPX. A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the terminal CPX.
Different circuits for valves and electrical outputs are created using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Application

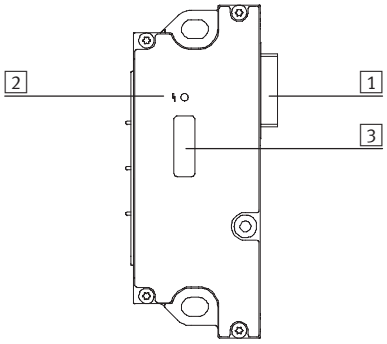
- Interface to valve terminals MIDI/MAXI
- Max. 26 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication being 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-GP-03-4,0**
Part No.			**195 738**	**556 775**
Connection for CPX interlinking blocks			Plastic	Metal
No. of solenoid coils			26	
Max. power supply	per module	[A]	4	
	per channel	[A]	0.2	
Fuse protection			Internal electronic fuse protection for each valve output	
Current consumption of modules for electronics		[mA]	Typ. 15	
Current consumption of modules for valves		[mA]	Typ. 30	
Nominal operating voltage		[V DC]	24	
Operating voltage range		[V DC]	21.6 ... 26.4	
Galvanic 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	Top cover		Steel	
			Die-cast aluminium	
Grid dimension		[mm]	50	
Dimensions W x L x H		[mm]	50 x 132 x 55	
Weight		[g]	390	

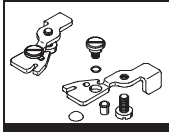
Connection and display components

CPX-GP-03-4,0



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

Ordering data

Designation		Type	Part No.
H-rail mounting			
	For mounting CPX terminal and valve terminal MIDI on H-rail	**CPX-03-4,0**	**526 033**
	For mounting CPX terminal and valve terminal MAXI on H-rail	**CPX-03-7,0**	**526 034**

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.

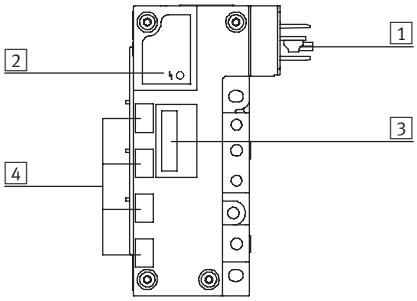
Application

- Interface to CPA10 and CPA14 valve terminals
- Max. 22 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. 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			CPX-GP-CPA-10	CPX-GP-CPA-14
Part No.			195 710	195 712
No. of solenoid coils			22	22
Max. power supply	per module	[A]	4	
	per channel	[A]	0.2	
Fuse protection			Internal electronic fuse protection for each valve output	
Current consumption of module from electronics/sensor supply		[mA]	Typ. 15	
Supply voltage for valves		[V]	24 DC +10% –15%	
Galvanic 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 valve 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	

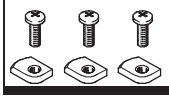
Connection and display components

CPX-GP-CPA-...



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

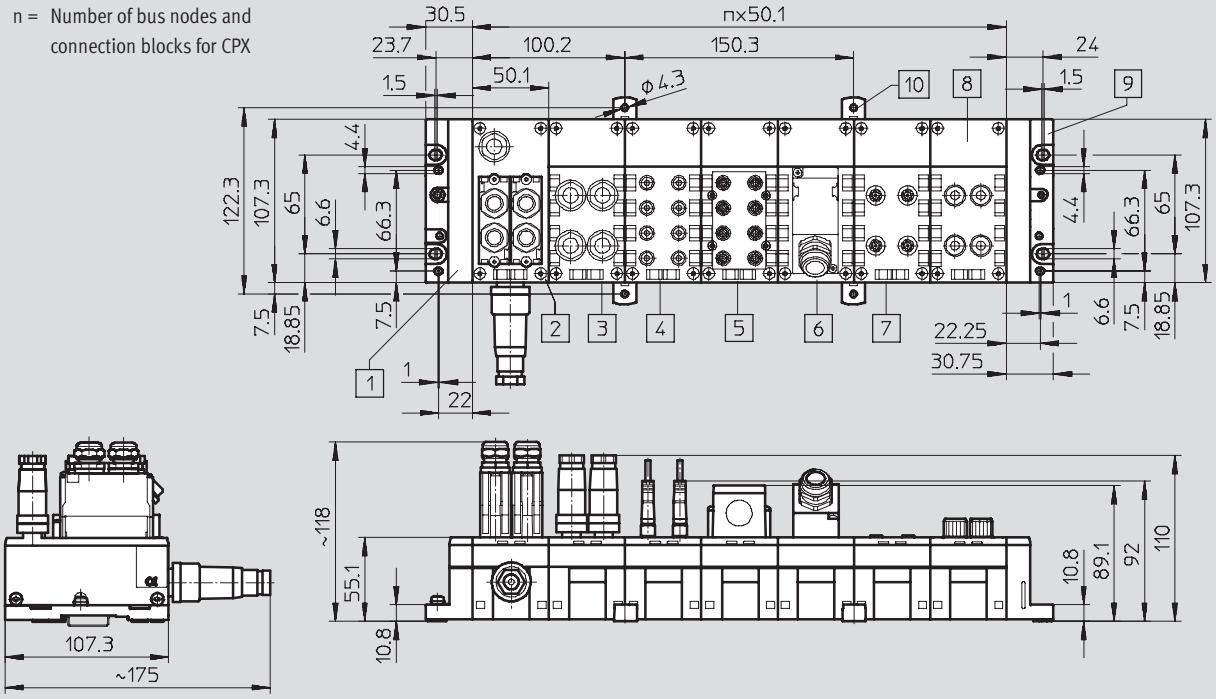
Ordering data

Designation		Type	Part No.
H-rail mounting			
	For mounting CPX terminal and valve terminal CPA on H-rail	**CPX-CPA-BG-NRH**	**526 032**

Dimensions – CPX terminal, plastic linking Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes and connection blocks

n = Number of bus nodes and connection blocks for CPX

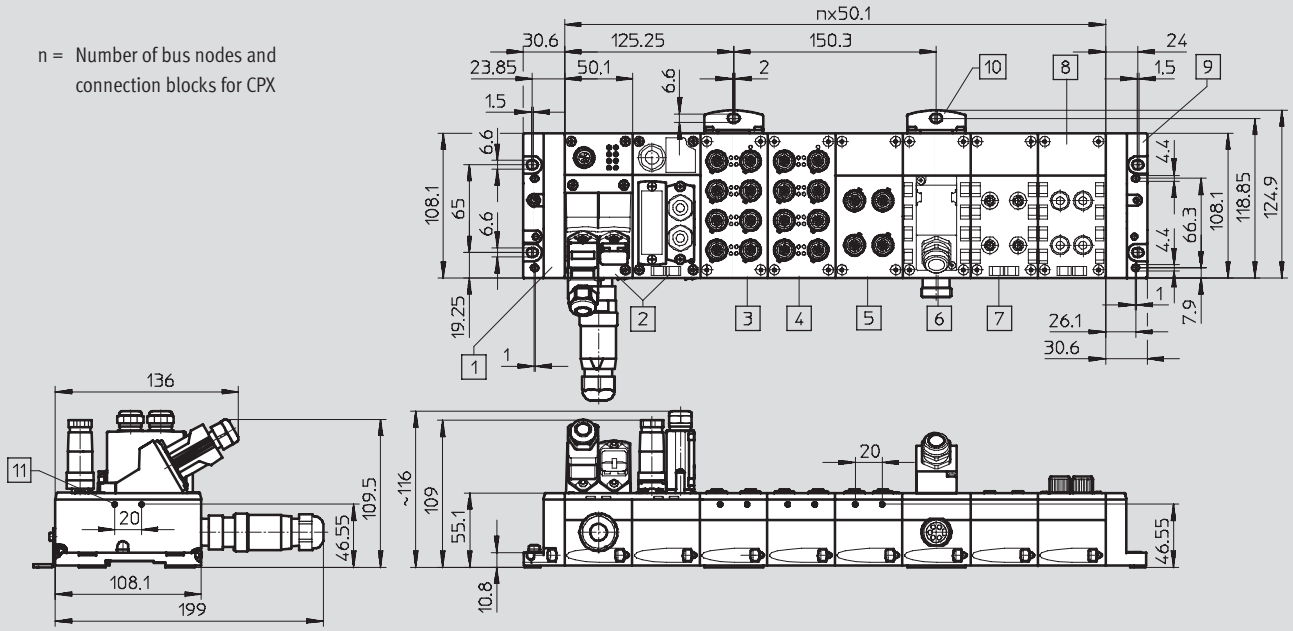


1 Left-hand end plate (earthing plate optional)
2 Bus node
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Right-hand end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

Dimensions – CPX terminal, metal linking Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes and connection blocks

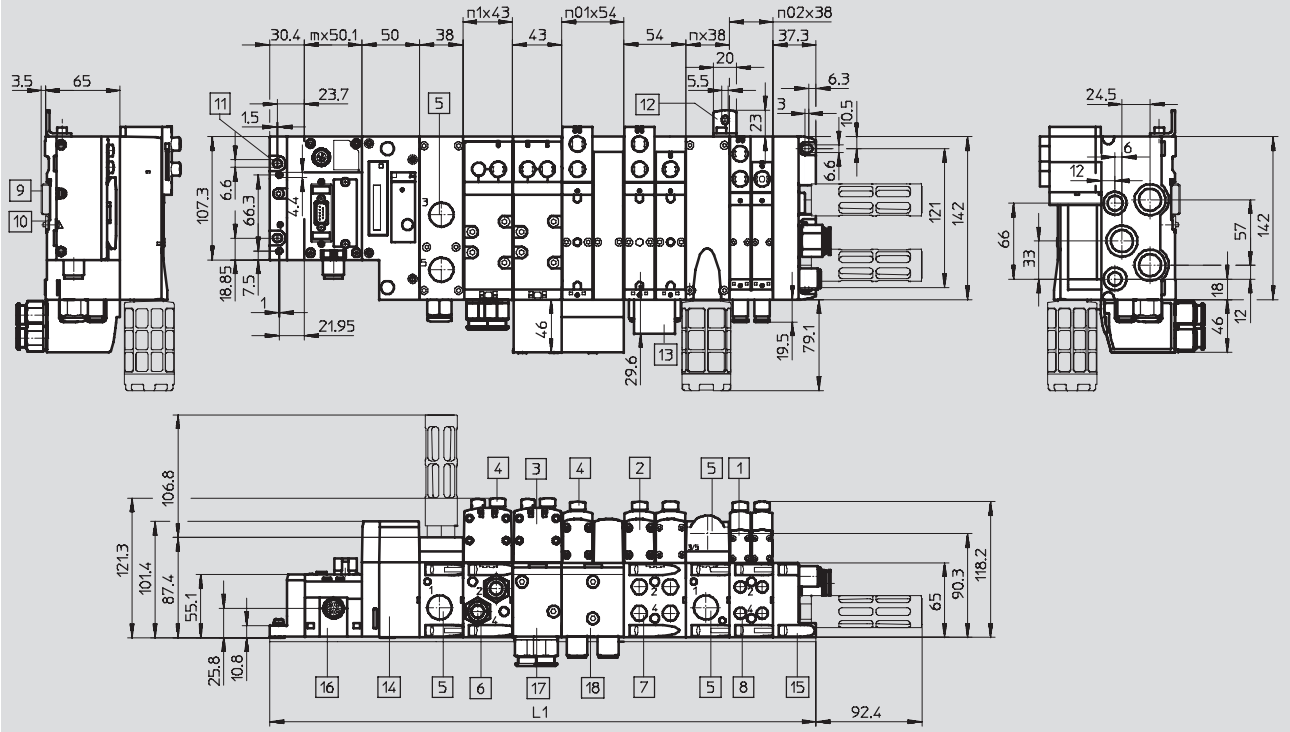
n = Number of bus nodes and connection blocks for CPX



1 Left-hand end plate
2 Bus node
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 fitting
11 Hole for self-tapping screw M2.5

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes and valve terminal type 44 VTSA



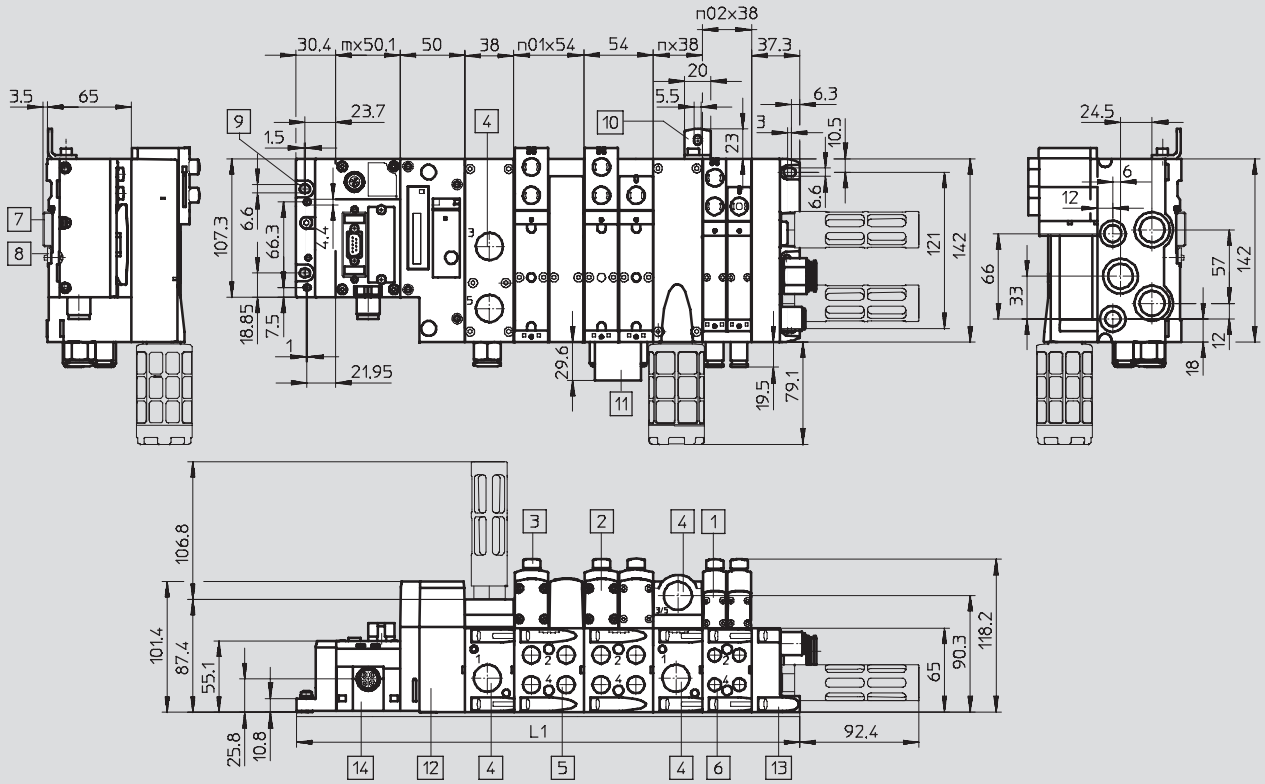
1 Solenoid valve 18 mm
2 Solenoid valve 26 mm
3 Solenoid valve 42 mm
4 Cover cap/manual override
5 Threaded connection G½ or ½NPT
6 Threaded connection G⅜ or ⅜NPT
7 Threaded connection G¼ or ¼NPT
8 Threaded connection G⅛ or ⅛NPT
9 H-rail
10 H-rail mounting
11 Mounting hole
12 Additional mounting bracket
13 Inscription label holder
14 Pneumatic interface CPX
15 End plate
16 CPX module/fieldbus node
17 90° connection plate, width 42 mm, G⅜
18 90° connection plate, width 18 mm, G⅛> width 26 mm, G¼

n02 Number of manifold blocks 18 mm
n01 Number of manifold blocks 26 mm
n1 Number of manifold blocks 42 mm
n Number of supply plates (only with end plate with selector plate)
m Number of CPX modules

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

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes and valve terminal type 45 VTSA-F



1 Solenoid valve 18 mm
2 Solenoid valve 26 mm
3 Cover cap/manual override
4 Threaded connection G½
5 Threaded connection G¼
6 Threaded connection G⅛
7 H-rail
8 H-rail mounting
9 Mounting hole
10 Additional mounting bracket
11 Inscription label
12 Pneumatic interface CPX
13 End plate
14 CPX module/fieldbus node

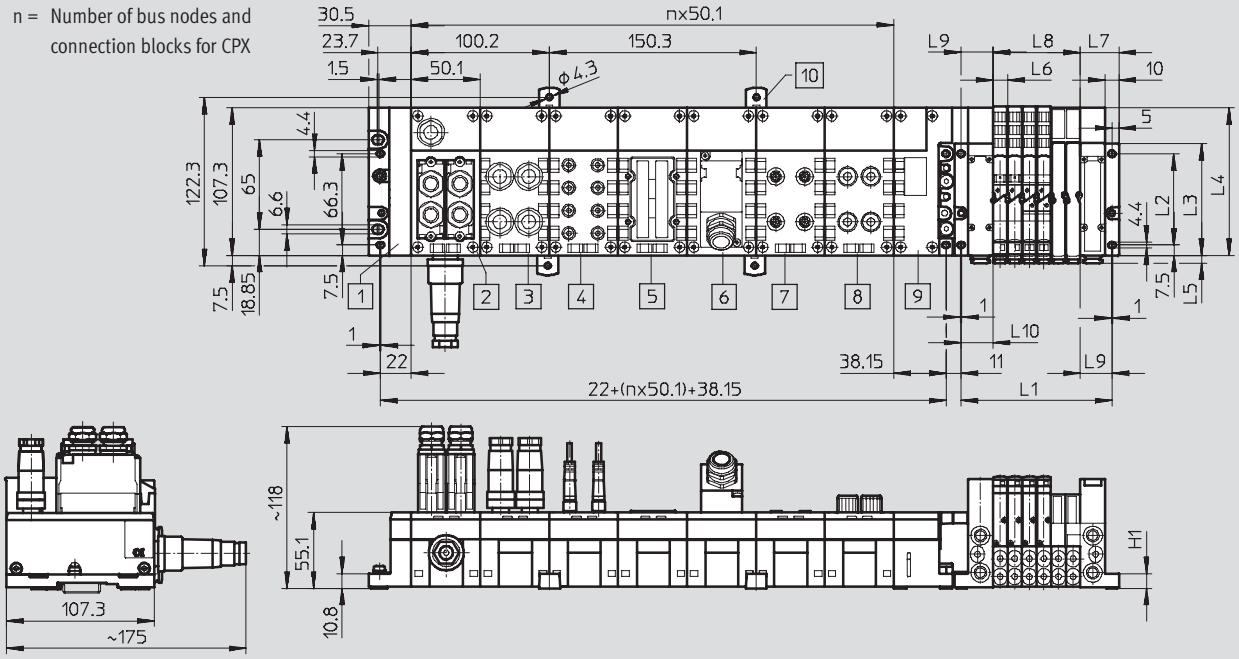
n02 Number of manifold blocks 18 mm
n01 Number of manifold blocks 26 mm
n Number of supply plates (only with selector end plate)
m Number of CPX modules

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 – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes, connection blocks and valve terminal CPA

n = Number of bus nodes and connection blocks for CPX



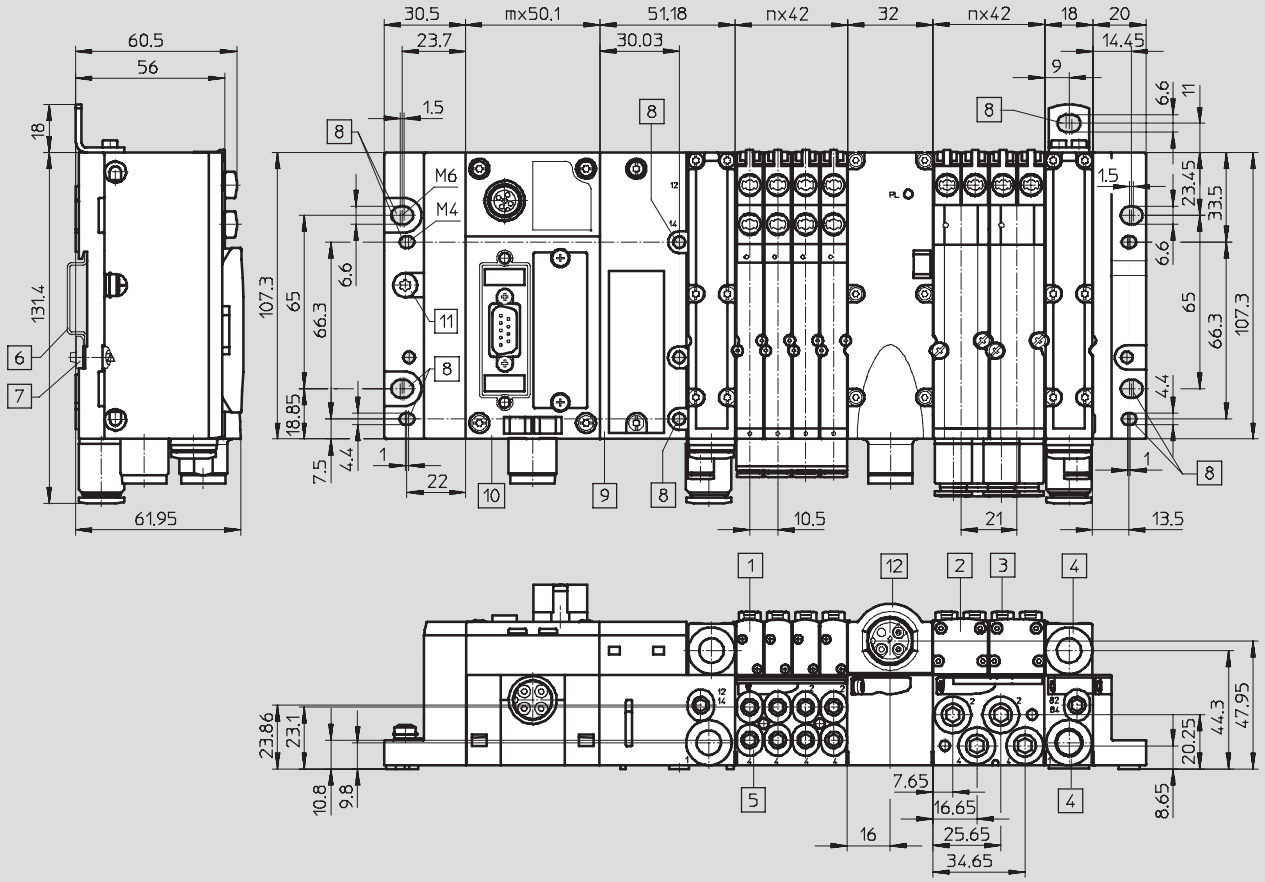
1 Left-hand end plate
2 Bus node
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Pneumatic interface CPA
10 Mounting clip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

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 – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

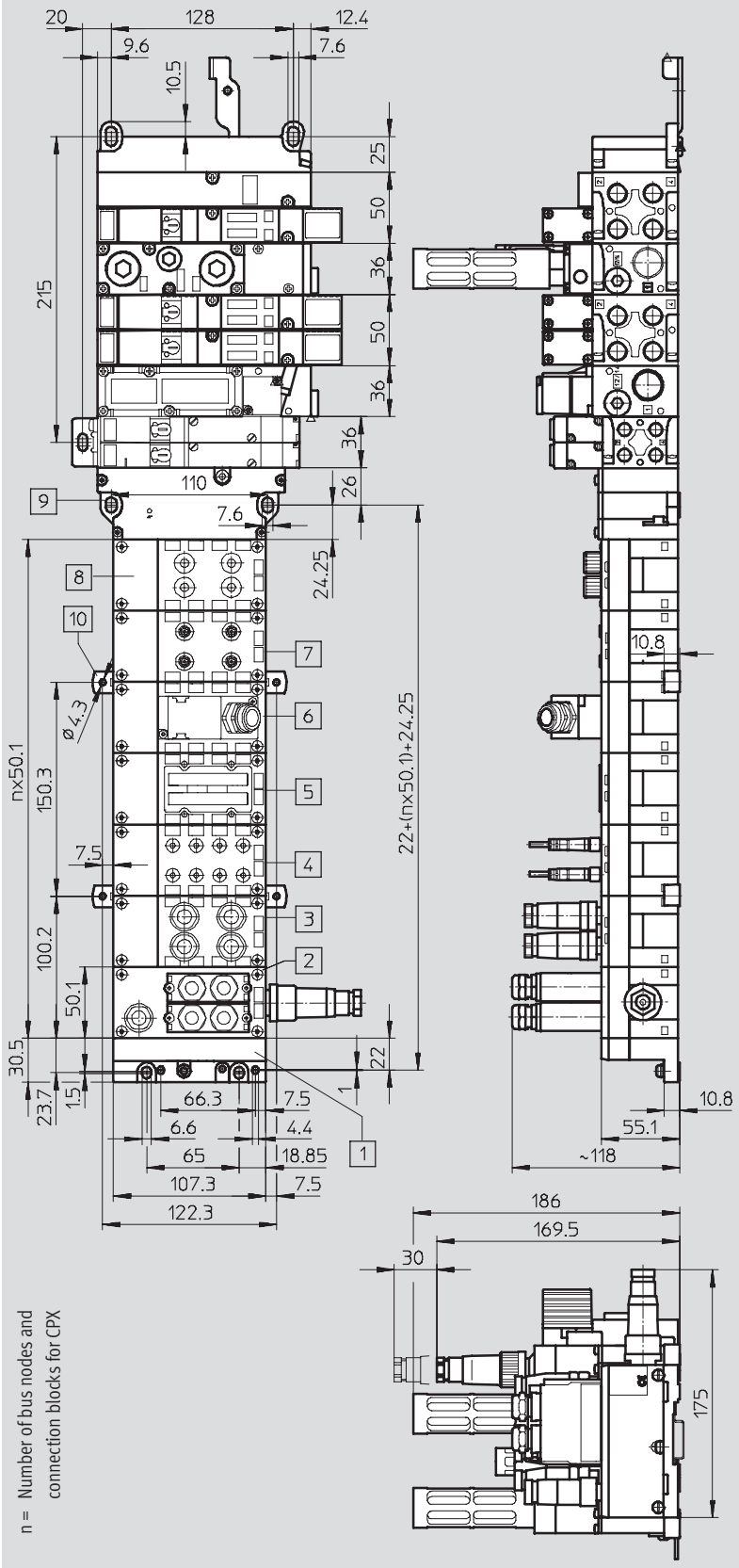
with bus nodes and valve terminal MPA



1	Solenoid valve MPA1	5	Working ports	9	Pneumatic interface MPA	n	Number of sub-bases in a grid of 4 MPA1 or 2 MPA2 valves
1	Solenoid valve MPA2	6	H-rail	10	CPX module		
3	Manual override	7	H-rail mounting	11	Earthing screw	m	Number of CPX modules
4	Supply/exhaust ports	8	Mounting holes				

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

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 node
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-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 information

Selection of CPX terminal and valve terminal-pneumatic components using module numbers

The module number defines the CPX terminal-valve terminal-pneumatic components combination.

The pneumatic part and the electrical part are configured with separate order codes. The order code for the electrical part CPX begins with 50E (plastic linking) or 51E (metal linking), while the order code for the pneumatic part depends on the selected valve terminal pneumatic components, e.g. 32P-... for MPA.

Note

The following pages contain only the module number with the ordering data for the CPX terminal without pneumatic components.

The ordering data for the valve terminal pneumatic components can be found in the respective valve terminal documentation.

Module No.	Combination	Order code
197 330	Electrical valve terminal CPX without pneumatic components with plastic interlinking blocks	50E-...
197 330	Electrical valve terminal CPX without pneumatic components with metal interlinking blocks	51E-...
539 217	Pneumatic valve terminal VTSA with threaded connection	44P-...
539 218	Pneumatic valve terminal VTSA with NPT thread	44PN-...
547 965	Pneumatic valve terminal VTSA-F with threaded connection	45P-...
547 966	Pneumatic valve terminal VTSA-F with NPT thread	45PN-...
530 411	Pneumatic valve terminal MPA	32P-...
173 520	Pneumatic valve terminal CPA10	12P-10-CX-...
174 001	Pneumatic valve terminal CPA14	12P-14-CX-...
18 980	Pneumatic valve terminal MIDI/MAXI	03P-...

General basic data and guidelines

The order code 50E/51E enables a large number of different combinations and thus supports the modular construction of the CPX terminal. The following system limits must be observed:
- One bus node
- Max. 9 I/O modules
- Max. one pneumatic interface
- Max. one interlinking block with system supply

Up to 10 module positions for electrical modules can be configured in the order code. For each module position, the electrical module (electronics module) is defined first, followed by the connection technology and then the supply (optional).

Please note the general guidelines, in particular:
- General basic data and guidelines for possible module positions (➔ 4 / 4.8-17)
- Supported electronics module-connection technology combinations (➔ 4 / 4.8-17)
- Restrictions with regard to the number of modules depending on the selected bus node in borderline cases (➔ 4 / 4.8-34)
- General limit values and guidelines with regard to supplies (➔ 4 / 4.8-30)

Order code

The order code maps the physical construction of the CPX terminal to a linear order code.

Each optional module has its own unique code letters, e.g. CPX-8DE = E, CPX-AB-4-M12x2-5POL = X

The module sequence defines their physical configuration within the CPX terminal.

This applies both to the bus node and to the I/O modules.

Order example

CPX terminal consisting of a bus node with system supply, 8 I/O modules and a pneumatic interface MIDI/MAXI.

Step 1 – Defining the electrical modules

Bus node

- One bus node CPX-FB13 with Sub-D plug for Profibus-DP and system supply (module position 0)

I/O modules

- Two digital input modules (8 inputs each), each with one 4xM12 connection block, 5-pin (module position 1 and 2)
- One digital output module (4 outputs) with one 4xM12 connection block, 5-pin (module position 3)
- One digital input/output module (8 inputs and 8 outputs) with one Sub-D connection block, 25-pin socket (module position 4)
- Three analogue modules (2 inputs each), each with one 4xM12 connection block, 5-pin (module position 5, 6 and 7)
- One analogue module (2 outputs) with one 4xM12 connection block, 5-pin (module position 8)

Module position	0	1	2	3	4	5	6	7	8	9
Electrical module	F13	E	E	A	Y	U	U	U	P	
Connection technology	GE	X	X	X	B	X	X	X	X	
Supply	S									

Resulting order code:
50E-F13GESEXEXAXYBUXUXUXPX

Step 2 – Defining the pneumatic interface/right-hand end plate

An additional code letter is assigned to each pneumatic interface or to the right-hand end plate for using the CPX terminal without pneumatic components.

This is appended to the order code and is separated from the rest of the code by a dash.
Example:
Pneumatic interface MIDI/MAXI = code letter A

The price for the pneumatic interface or for the right-hand end plate includes complete assembly as well as the testing of all individual and general functions, comprehensive instructions and any accessories that are required such as the left-hand end plate, for example.

Resulting order code:
50E-F13GESEXEXAXYBUXUXUXPX-A

Step 3 – Defining the required user documentation

The CPX user documentation of the example consists of the following:
- CPX system description
- Electronics description – Bus node CPX-FB13
- Description – I/O modules

Code letters are also used to select the user documentation language.
Example:
CPX manual in English = code letter E

If the corresponding code letter for the user's manual is missing, no accompanying documentation is supplied.

All manuals and descriptions are available in PDF format in the Download Area at:
➔ www.festo.com

Resulting order code:
50E-F13GESEXEXAXYBUXUXUXPX-A-E

M **Mandatory data** →

Module No.	Valve terminal, electrical part		Electrical module position 0 ... 9			
197 330	50E		**3 Electrical actuator/inputs and outputs for position 0 ... 9:** F06, F11, F13, F14, F23, F32, F33, T03, T05, T11, T12, T13, T14, T15, T16, T17, T18, F, E, D, O, M, L, A, Y, I, T, U, P, NM, NL			
				4 Connection technology for position 0 ... 9: GA, GB, GC, GD, GE, GF, GH, GI, GL, GM, GP, X, GW, W, R, GQ, GO, J, H, B, C, KA, KB		
					O **Options**	
					5 Supply for position 0 ... 9: S, Z, V, QS, QZ, QV, QP, QX, QR, QY, QU	
Order example			Module positions			
			0	1	2	3
197 330	**50E**	–	**F06 GI S**	**T15 V**	**E R**	**D X**
1	**2**		**3 + 4 + 5**			

Ordering table

				Condi-tions	Code		Enter code
M	**1**	Module No.	**197 330**				
	2	Valve terminal, electrical part	CPX modular electrical terminal		**50E**		
		Electrical module position 0 ... 9			-		-
	3	Electrical actuator/inputs and outputs	Fieldbus node for Interbus	1	**F06**		
		Position 0 ... 9	Fieldbus node for DeviceNet	1 2	**F11**		
			Fieldbus node for Profibus-DP	1	**F13**		
			Fieldbus node for CANopen	1	**F14**		
			Fieldbus node for CC-Link	1	**F23**		
			Fieldbus node for Ethernet/IP	1	**F32**		
			Fieldbus node for ProfiNet IO, 2x M12, metal	1	**F33**		
			Front End Controller Remote	1	**T03**		
			Front End Controller Remote I/O	1	**T05**		
			CP interface, 16 digital inputs/outputs	1	**T11**		
			CP interface, 32 digital inputs/outputs	1	**T12**		
			CP interface, 48 digital inputs/outputs	1	**T13**		
			CP interface, 64 digital inputs/outputs	1	**T14**		
			CP interface, 80 digital inputs/outputs	1	**T15**		
			CP interface, 96 digital inputs/outputs	1	**T16**		
			CP interface, 112 digital inputs/outputs	1	**T17**		
			CP interface, 128 digital inputs/outputs	1	**T18**		
			Input module, 4 digital inputs		**F**		
			Input module, 8 digital inputs		**E**		
			Input module, 8 digital inputs (channel diagnostics)		**D**		
			Input module, 8 digital inputs (NPN)		**O**		
			Input module, 16 digital inputs		**M**		
			Output module, 8 digital outputs		**L**		
			Output module, 4 digital outputs		**A**		
			Input/output module, 16-fold, 8 digital I/O each		**Y**		
			Input module, 4 analogue inputs (current)		**I**		
			Input module, 4 analogue inputs (temperature)		**T**		
			Input module, 2 analogue inputs		**U**		
			Output module, 2 analogue outputs		**P**		
			Input module, 16 digital inputs (channel diagnostics)	3	**NM**		
↓			Output module, 8 digital outputs (high current)	4	**NL**		

1 **F..., T...** Observe maximum number of inputs/outputs; → Tables 4 / 4.8-34
2 **F11** Only permissible in first module position
3 **NM** Only with connection technology KB
4 **NL** Only with connection technology GW, GQ, J, B, KA

M Mandatory data

Electrical module position 0 ... 9

3 Electrical actuator/inputs and outputs for position 0 ... 9: F06, F11, F13, F14, F23, F32, F33, T03, T05, T11, T12, T13, T14, T15, T16, T17, T18, F, E, D, O, M, L, A, Y, I, T, U, P, NM, NL

4 Connection technology for position 0 ... 9: GA, GB, GC, GD, GE, GF, GH, GI, GL, GM, GP, X, GW, W, R, GQ, GO, J, H, B, C, KA, KB

O Options

5 Supply for position 0 ... 9: S, Z, V, QS, QZ, QV, QP, QX, QR, QY, QU

Module positions

4	5	6	7	8	9
L R					

3 + 4 + 5

Ordering table

				Conditions	Code		Enter code
M	**4**	Connection technology for position 0 ... 9	Adapter, 2xM12, 5-pin, for DeviceNet/CANopen		**GA**		
			Connection set, 5-pin screw terminal, for DeviceNet/CANopen		**GB**		
			Without node-specific connection technology		**GC**		
			Straight plug, IP65 Sub-D, 9-pin, for DeviceNet/CANopen		**GD**		
			Straight plug, IP65 Sub-D, 9-pin, for Profibus-DP		**GE**		
			Adapter, 2xM12 B-coded, for Profibus-DP		**GF**		
			Connection set, IP65 RJ45, for Ethernet		**GH**		
			Connection set, IP65 2xSub-D, 9-pin, for Interbus	5	**GI**		
			Adapter, 5-pin screw terminal, for CC-Link		**GL**		
			Straight plug, IP65, Sub-D, 9-pin, for CC-Link		**GM**		
			Connection block, 2xM12 for Interbus	5	**GP**		
			Connection block, 4xM12, 5-pin, double		**X**		
			Connection block, 4xM12, 5-pin, double, metal thread		**GW**		
			Connection block, 4xM12, 5-pin, double, screened		**W**		
			Connection block, 8xM8, 3-pin		**R**		
			Connection block, 8xM8, 4-pin, double		**GQ**		
			Connection block, 2xM12, B-coded, 5-pin for Profibus-DP	6	**GO**		
			Connection block, 8x CageClamp clamps, 4-pin		**J**		
			Connection block, 4x Harax, 4-pin		**H**		
			Connection block, Sub-D, 25-pin, socket		**B**		
			Connection block, 4xM12, 8-pin (DNCV)		**C**		
			Connection block, 4xM12, 5-pin, double, metal		**KA**		
↓			Connection block, 8xM12, 5-pin, double, metal		**KB**		

5 **GI, GP** Only with electrical actuation/inputs and outputs F06 (fieldbus node for Interbus)

6 **GO** Only with electrical actuation/inputs and outputs F13 (fieldbus node for Profibus-DP)

FESTO

M Mandatory data

Pneumatic interface
Z, B, C, A, D, S
Z

6

Ordering table

				Conditions	Code		Enter code
0	5	Feed for position 0 ... 9	Interlinking block with system supply	7	S		
			Interlinking block with additional power supply	8	Z		
			Interlinking block with valve supply	8 9	V		
			Interlinking block with system supply, M18, 4-pin	7	QS		
			Interlinking block with additional power supply, M18, 4-pin	10	QZ		
			Interlinking block with valve supply, M18, 4-pin	9 10	QV		
			Interlinking block with system supply, 7/8", 5-pin	7 9	QP		
			Interlinking block with additional power supply, 7/8", 5-pin	11	QX		
			Interlinking block with system supply, 7/8", 4-pin	7	QR		
			Interlinking block with additional power supply, 7/8", 4-pin	12	QY		
			Interlinking block with valve supply, 7/8", 4-pin	9 12	QU		
M	6	Pneumatic interface	CPX end plate, right-hand	13	-Z		
			CPX pneumatic interface to CPA10	14	-B		
			CPX pneumatic interface to CPA14	15	-C		
			CPX pneumatic interface to Midi/Maxi	16	-A		
			CPX pneumatic interface to MPA	17	-D		
↓			CPX pneumatic interface to VTSA	18	-S		

7 **S, QS, QP, QR**
Always select to the left of the supply V, QV, QU (valve supply) or Z, QZ, QX, QY (additional power supply)

8 **Z, V**
Only with supply S (system supply).
Only at position 1 ... 9

9 **V, QV, QP, QU**
All manifold blocks with "electrical module, galvanically isolated" H must be selected in the pneumatic components of the MPA

10 **QZ, QV**
Only with supply QS (system supply, M18, 4-pin)

11 **QX**
Only with supply QP (system supply, 7/8", 5-pin)

12 **QY, QU**
Only with supply QR (system supply, 7/8", 4-pin)

13 **Z**
Only for CPX without pneumatic components (module no. 197 330), but essential in this case

14 **B**
Only for CPX with CPA-10 (module no. 173 520), but essential in this case

15 **C**
Only for CPX with CPA-14 (module no. 174 001), but essential in this case

16 **A**
Only for CPX with Midi/Maxi (module no. 18 980), but essential in this case

17 **D**
Only for CPX with MPA (module no. 530 411), but essential in this case

18 **S**
Only for CPX with VTSA (module no. 539 217), but essential in this case

➔ 0 **Options**

	User documentation		Electrical accessories		Socket, M18		Plug, M12		Plug for 2 cables		Plug, M8		Plug for connection block		Socket, 7/8"		H-rail mounting		Additional attachment
	D, E, F, I, J, S, V				...N, ...M, ...I, ...J		...S, ...T, ...W, ...P, ...GZ		...X, ...K		...C, ...R		...A, ...E		...GT, ...GS		H		U
–	**E**		+		**2N 10M**												**H**		**U**
	7		**8**																

Ordering table

Module No.			197 330	Conditions	Code		Enter code
0	**7**	User documentation	German		**-D**		
			English		**-E**		
			French		**-F**		
			Italian		**-I**		
			Japanese	19	**-J**		
			Spanish		**-S**		
			Swedish		**-V**		
	8	Electrical accessories			**+**		+
		Straight socket, M18, 4-pin, for operating voltage	Pg9 (1.5 mm²)		1 ... 99 (NTSD-GD-9)		**...N**	
			Pg13.5 (2.5 mm²)		1 ... 99 (NTSD-GD-13,5)		**...M**	
		Angled socket, M18, 4-pin, for operating voltage	Pg9 (1.5 mm²)		1 ... 99 (NTSD-WD-9)		**...I**	
			Pg11 (2.5 mm²)		1 ... 99 (NTSD-WD-11)		**...J**	
		Straight plug, M12, for sensors/actuators	4-pin, Pg7		1 ... 99 (SEA-GS-7)		**...S**	
			4-pin, Pg9		1 ... 99 (SEA-GS-9)		**...T**	
			4-pin, Pg7 (2.5 mm² cable ∅)		1 ... 99 (SEA-4GS-7-2,5)		**...W**	
			5-pin, Pg7		1 ... 99 (SEA-M12-5GS-PG7)		**...P**	
		Straight plug, M12, for Ethernet	D-coded		1 ... 99		**...GZ**	
		Straight plug, M12, for 2 cables (DUO)	4-pin, Pg11		1 ... 99 (SEA-GS-11-DUO)		**...X**	
			5-pin, Pg11		1 ... 99 (SEA-5GS-11-DUO)		**...K**	
		Straight plug, M8, 3-pin, for sensors/actuators	Screw-in		1 ... 99 (SEA-3GS-M8-S)		**...C**	
			Solderable		1 ... 99 (SEA-GS-M8)		**...R**	
		Straight plug, for sensors/actuators	Harax 4-pin		1 ... 99 (SEA-GS-HAR-4POL)		**...A**	
			IP65, Sub-D, 25-pin		1 ... 99 (SD-SUB-D-ST25)		**...E**	
		Straight socket, 7/8", for operating voltage	4-pin		1 ... 99		**...GT**	
			5-pin		1 ... 99		**...GS**	
		H-rail mounting			1 (CPA-BG-NRH)		**H**	
		Additional attachments for wall mounting			1	20	**U**	

19 **J** Only with electrical actuation/inputs and outputs F23 (fieldbus node for CC-Link)

20 **U** An additional attachment is recommended for more than 4 module positions

Terminal CPX – Metal linking

Ordering data – Modular products

FESTO

M **Mandatory data** →

Module No.	Valve terminal, electrical part		Electrical module position 0 ... 9			
197 330	51E		**3 Electrical actuator/inputs and outputs for position 0 ... 9:** F06, F11, F13, F14, F23, F32, F33, T03, T05, T11, T12, T13, T14, T15, T16, T17, T18, F, E, D, O, M, L, A, Y, I, T, U, P, NM, NL			
				4 Connection technology for position 0 ... 9: GA, GB, GC, GD, GE, GF, GH, GI, GL, GM, GP, X, GW, W, R, GQ, GO, J, H, KA, KB		
					O **Options**	
					5 Supply for position 0 ... 9: S, Z, V, QS, QZ, QV, QP, QX, QR, QY, QU	
Order example			Module positions			
			0	1	2	3
197 330	**51E**	–	**NM KB**	**NL KA**	**M GQ**	**M B**
1	**2**		**3 + 4 + 5**			

Ordering table

				Condi-tions	Code		Enter code
M	**1**	Module No.	**197 330**				
	2	Valve terminal, electrical part	CPX modular electrical terminal, metal linking		**51E**		
		Electrical module position 0 ... 9			-		-
	3	Electrical actuator/inputs and outputs	Fieldbus node for Interbus	1	**F06**		
		Position 0 ... 9	Fieldbus node for DeviceNet	1 2	**F11**		
			Fieldbus node for Profibus-DP	1	**F13**		
			Fieldbus node for CANopen	1	**F14**		
			Fieldbus node for CC-Link	1	**F23**		
			Fieldbus nodes for Ethernet/IP	1	**F32**		
			Fieldbus node for ProfiNet IO, 2x M12, metal	1	**F33**		
			Front End Controller Remote	1	**T03**		
			Front End Controller Remote I/O	1	**T05**		
			CP interface, 16 digital inputs/outputs	1	**T11**		
			CP interface, 32 digital inputs/outputs	1	**T12**		
			CP interface, 48 digital inputs/outputs	1	**T13**		
			CP interface, 64 digital inputs/outputs	1	**T14**		
			CP interface, 80 digital inputs/outputs	1	**T15**		
			CP interface, 96 digital inputs/outputs	1	**T16**		
			CP interface, 112 digital inputs/outputs	1	**T17**		
			CP interface, 128 digital inputs/outputs	1	**T18**		
			Input module, 4 digital inputs		**F**		
			Input module, 8 digital inputs		**E**		
			Input module, 8 digital inputs (channel diagnostics)		**D**		
			Input module, 8 digital inputs (NPN)		**O**		
			Input module, 16 digital inputs		**M**		
			Output module, 8 digital outputs		**L**		
			Output module, 4 digital outputs		**A**		
			Input/output module, 16-fold, 8 digital I/O each		**Y**		
			Input module, 4 analogue inputs (current)		**I**		
			Input module, 4 analogue inputs (temperature)		**T**		
			Input module, 2 analogue inputs		**U**		
			Output module, 2 analogue outputs		**P**		
			Input module, 16 digital inputs (channel diagnostics)	3	**NM**		
↓			Output module, 8 digital outputs (high current)	4	**NL**		

1 **F..., T...** Observe maximum number of inputs/outputs; → Tables 4 / 4.8-34
2 **F11** Only permissible in first module position
3 **NM** Only with connection technology KB
4 **NL** Only with connection technology GW, GQ, J, KA

M Mandatory data

Electrical module position 0 ... 9

3 Electrical actuator/inputs and outputs for position 0 ... 9: F06, F11, F13, F14, F23, F32, F33, T03, T05, T11, T12, T13, T14, T15, T16, T17, T18, F, E, D, O, M, L, A, Y, I, T, U, P, NM, NL

4 Connection technology for position 0 ... 9: GA, GB, GC, GD, GE, GF, GH, GI, GL, GM, GP, X, GW, W, R, GQ, GO, J, H, KA, KB

O Options

5 Supply for position 0 ... 9: QP, QX

Module positions

4	5	6	7	8	9
F32 GC S					

3 + 4 + 5

Ordering table

				Conditions	Code		Enter code
M	**4**	Connection technology for position 0 ... 9	Adapter, 2xM12, 5-pin, for DeviceNet/CANopen		**GA**		
			Connection set, 5-pin screw terminal, for DeviceNet/CANopen		**GB**		
			Without node-specific connection technology		**GC**		
			Straight plug, IP65 Sub-D, 9-pin, for DeviceNet/CANopen		**GD**		
			Straight plug, IP65 Sub-D, 9-pin, for Profibus-DP		**GE**		
			Adapter, 2xM12 B-coded, for Profibus-DP		**GF**		
			Connection set, IP65 RJ45, for Ethernet		**GH**		
			Connection set, IP65 2xSub-D, 9-pin, for Interbus	5	**GI**		
			Adapter, 5-pin screw terminal, for CC-Link		**GL**		
			Straight plug, IP65, Sub-D, 9-pin, for CC-Link		**GM**		
			Connection block, 2xM12 for Interbus	5	**GP**		
			Connection block, 4xM12, 5-pin, double		**X**		
			Connection block, 4xM12, 5-pin, double, metal thread		**GW**		
			Connection block, 4xM12, 5-pin, double, screened		**W**		
			Connection block, 8xM8, 3-pin		**R**		
			Connection block, 8xM8, 4-pin, double		**GQ**		
			Connection block, 2xM12, B-coded, 5-pin for Profibus-DP	6	**GO**		
			Connection block, 8x CageClamp clamps, 4-pin		**J**		
			Connection block, 4x Harax, 4-pin		**H**		
			Connection block, 4xM12, 5-pin, double, metal		**KA**		
			Connection block, 8xM12, 5-pin, double, metal		**KB**		

5 **GI, GP** Only with electrical actuation/inputs and outputs F06 (fieldbus node for Interbus)

6 **GO** Only with electrical actuation/inputs and outputs F13 (fieldbus node for Profibus-DP)

Terminal CPX – Metal linking

Ordering data – Modular products

→	M	**Mandatory data** →

Pneumatic interface
Z, A, D, S
Z

– **Z**

6

Ordering table

				Condi-tions	Code		Enter code
O	**5**	Supply for position 0 ... 9	Interlinking block with system supply, 7/8", 5-pin	7	**QP**		
			Interlinking block with additional power supply, 7/8", 5-pin	8	**QX**		
M	**6**	Pneumatic interface	CPX end plate, right-hand	9	**-Z**		
			CPX pneumatic interface to Midi/Maxi	10	**-A**		
			CPX pneumatic interface to MPA	11	**-D**		
↓			CPX pneumatic interface to VTSA	12	**-S**		

7 **QP** All manifold blocks with "electrical module, galvanically isolated" H must be selected in the pneumatic components of the MPA

8 **QX** Only with supply QP (system supply, 7/8", 5-pin)

9 **Z** Only for CPX without pneumatic components (module no. 197 330), but essential in this case

10 **A** Only for CPX with Midi/Maxi (module no. 18 980), but essential in this case

11 **D** Only for CPX with MPA (module no. 530 411), but essential in this case

12 **S** Only for CPX with VTSA (module no. 539 217), but essential in this case

Terminal CPX – Metal linking

Ordering data – Modular products

FESTO

➔ 0 **Options**

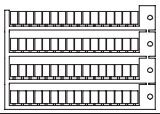
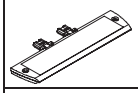
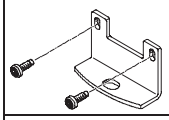
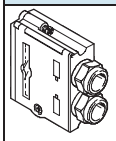
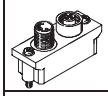
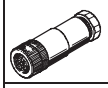
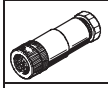
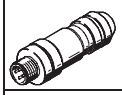
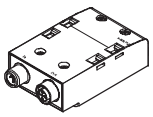
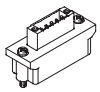
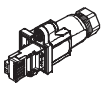
	User documentation		Electrical accessories	Socket, M18	Plug, M12	Plug for 2 cables	Plug, M8	Plug for connection block	Socket, 7/8”	H-rail mounting
	D, E, F, I, J, S, V			...N, ...M, ...I, ...J	...S, ...T, ...W, ...P, ...GZ	...X, ...K	...C, ...R	...A, ...E	...GS	H
–	**D**		+		**10S**					**H**
	7		**8**							

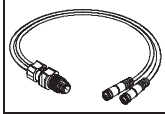
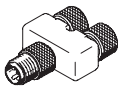
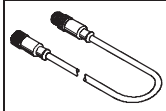
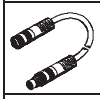
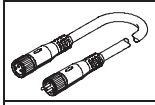
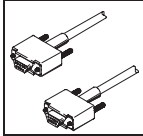
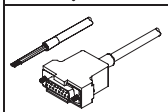
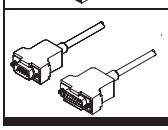
Ordering table

Module No.			197 330	Conditions	Code		Enter code
0	**7**	User documentation	German		**-D**		
			English		**-E**		
			French		**-F**		
			Italian		**-I**		
			Japanese	13	**-J**		
			Spanish		**-S**		
			Swedish		**-V**		
	8	Electrical accessories			**+**		+
		Straight socket, M18, 4-pin, for operating voltage	Pg9 (1.5 mm²)	1 ... 99 (NTSD-GD-9)		**...N**	
			Pg13.5 (2.5 mm²)	1 ... 99 (NTSD-GD-13,5)		**...M**	
		Angled socket, M18, 4-pin, for operating voltage	Pg9 (1.5 mm²)	1 ... 99 (NTSD-WD-9)		**...I**	
			Pg11 (2.5 mm²)	1 ... 99 (NTSD-WD-11)		**...J**	
		Straight plug, M12, for sensors/actuators	4-pin, Pg7	1 ... 99 (SEA-GS-7)		**...S**	
			4-pin, Pg9	1 ... 99 (SEA-GS-9)		**...T**	
			4-pin, Pg7 (2.5 mm² cable ∅)	1 ... 99 (SEA-4GS-7-2,5)		**...W**	
			5-pin, Pg7	1 ... 99 (SEA-M12-5GS-PG7)		**...P**	
		Straight plug, M12, for Ethernet	D-coded	1 ... 99		**...GZ**	
		Straight plug, M12, for 2 cables (DUO)	4-pin, Pg11	1 ... 99 (SEA-GS-11-DUO)		**...X**	
			5-pin, Pg11	1 ... 99 (SEA-5GS-11-DUO)		**...K**	
		Straight plug, M8, 3-pin, for sensors/actuators	Screw-in	1 ... 99 (SEA-3GS-M8-S)		**...C**	
			Solderable	1 ... 99 (SEA-GS-M8)		**...R**	
		Straight plug, for sensors/actuators	Harax 4-pin	1 ... 99 (SEA-GS-HAR-4POL)		**...A**	
			IP65, Sub-D, 25-pin	1 ... 99 (SD-SUB-D-ST25)		**...E**	
		Straight socket, 7/8”, for operating voltage	5-pin	1 ... 99		**...GS**	
		H-rail mounting		1 (CPA-BG-NRH)		**H**	

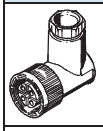
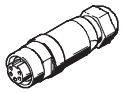
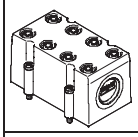
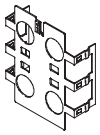
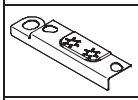
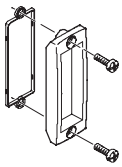
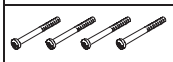
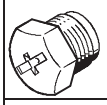
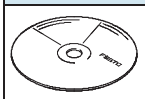
13 **J** Only with electrical actuation/inputs and outputs F23 (fieldbus node for CC-Link)

Ordering data – Accessories

	Designation		Type	Part No.
Inscription labels				
	Inscription labels, 6x10, 64 pieces, in frames		**IBS-6x10**	**18 576**
	Inscription label holder for connection block		**CPX-ST-1**	**536 593**
Module retainer				
	Attachment for wall mounting (for long valve terminals, 10 pieces), version for plastic interlinking plates		**CPX-BG-RW-10x**	**529 040**
	Attachment for wall mounting (for long valve terminals, 2 mounting brackets and 4 screws), version for metal interlinking plates		**CPX-M-BG-RW-2x**	**550 217**
Plug connector and accessories				
	Sub-D plug for INTERBUS	Incoming	**FBS-SUB-9-BU-IB-B**	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB-B**	**532 217**
	Sub-D plug for DeviceNet/CANopen		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Sub-D plug for Profibus-DP		**FBS-SUB-9-GS-DP-B**	**532 216**
	Sub-D plug for CC-Link		**FBS-SUB-9-GS-2x4POL-B**	**532 220**
	Sub-D plug		**FBS-SUB-9-GS-1x9POL-B**	**534 497**
	Bus connection M12 adapter plug (B-coded) for Profibus-DP		**FBA-2-M12-5POL-RK**	**533 118**
	Bus connection Micro Style 2xM12 for DeviceNet/CANopen		**FBA-2-M12-5POL**	**525 632**
	Socket for Micro Style connection, M12		**FBSD-GD-9-5POL**	**18 324**
	Plug for Micro Style connection, M12		**FBS-M12-5GS-PG9**	**175 380**
	Bus connection M12x1, 4-pin (D-coded) for Ethernet		**NECU-M-S-D12G4-C2-ET**	**543 109**
	Connection block M12 adapter (B-coded) for Profibus-DP		**CPX-AB-2-M12-RK-DP**	**541 519**
	Connection block M12 adapter (B-coded) for INTERBUS		**CPX-AB-2-M12-RK-IB**	**534 505**
	Bus connection Open Style for 5-pin terminal strip for DeviceNet/CANopen		**FBA-1-SL-5POL**	**525 634**
	Bus connection for 5-pin terminal strip for DeviceNet/CANopen		**FBSD-KL-2x5POL**	**525 635**
	Bus connection screw terminal for CC-Link		**FBA-1-KL-5POL**	**197 962**
	RJ45/plug		**FBS-RJ45-8-GS**	**534 494**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**

Ordering data – Accessories				
Designation			Type	Part No.
Connecting cables				
	DUO cable M12-2xM8, 4-pin/2x3-pin	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
	Push-in T-connector	2x socket M8, 3-pin 1x plug M8, 4-pin	**NEDU-M8D3-M8T4**	**544 391**
	Push-in T-connector	2x socket M12, 5-pin 1x plug M12, 4-pin	**NEDU-M12D5-M12T4**	**541 596**
		2x socket M8, 3-pin 1x plug M12, 4-pin	**NEDU-M8D3-M12T4**	**541 597**
	Connecting cable, M8-M8, straight plug-straight socket	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Extension cable M12-M12, 5-pin, straight plug-straight socket	1.5 m	**KV-M12-M12-1,5**	**529 044**
		3.5 m	**KV-M12-M12-3,5**	**530 901**
	Connecting cable M12-M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
	Connecting cable, M12-M12, 8-pin, straight plug-straight socket	2.0 m	**KM12-8GD8GS-2-PU**	**525 617**
	Connecting cable, M12-M12, 4-pin, straight plug-angled socket	1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	Connecting cable, M9, angled plug-angled socket	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable, M9, straight plug-straight socket	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
	Modular system for connecting cables		**NEBU-...** **➔ www.festo.com/catalogue/nebu**	**–**
	Programming cable		**KDI-PPA-3-BU9**	**151 915**
	Connecting cable FED		**FEC-KBG7**	**539 642**
	Connecting cable FED		**FEC-KBG8**	**539 643**

Ordering data – Accessories

Designation		Type	Part No.
Plug connector and accessories – Power supply			
 Plug socket for mains connection M18, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
	for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
Plug socket for mains connection M18, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
	for 2.5 mm²	**NTSD-WD-11**	**533 119**
 Power supply socket	7/8" connection, 5-pin	**NECU-G78G5-C2**	**543 107**
	7/8" connection, 4-pin	**NECU-G78G4-C2**	**543 108**
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		**AK-8KL**	**538 219**
Fittings kit		**VG-K-M9**	**538 220**
 Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
 Earthing element (5 pieces) for plastic right-hand/left-hand end plate		**CPX-EPFE-EV**	**538 892**
 Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
 Screws for mounting the bus node/connection block on the plastic interlinking block	Metal bus node/connection block	**CPX-DPT-30X32-S-4X**	**550 218**
Screws for mounting the bus node/connection block on the metal interlinking block	Plastic bus node/connection block	**CPX-M-M3x22-4x**	**550 219**
	Metal bus node/connection block	**CPX-M-M3x22-S-4x**	**550 216**
 Cover for RJ45 connection		**AK-Rj45**	**534 496**
 Protective cap for sealing unused sockets (10 pieces)	for M8 connections	**ISK-M8**	**177 672**
	M9	**FLANSCHDOSE SER.712**	**356 684**
	for M12 connections	**ISK-M12**	**165 592**
Software			
 CPX remote diagnostics and process visualisation		**CPX-WEB-MONITOR**	**545 413**
Programming software	German	**FST4.1DE**	**537 927**
	English	**FST4.1GB**	**537 928**
ePlan macro library		**GSWC-TE-EP-LA**	**537 041**