Terminal CPX

FESTO

- Open to all fieldbus protocols
- Selectable connection technology
- Integrated diagnostic and service function
- CPX as a dedicated remote I/O module
- CPX controls MPA, CPA, MIDI/MAXI

Terminal CPX

Key features

Modular

- Up to 9 electrical input/output modules plus bus nodes and pneumatic interface
- Extensive range of functions and connection options for the electrical modules
- Choice of multiple valve terminal types for different applications
- Economical from the smallest configuration level right up to the maximum number of modules

Versatile

- Serves more than 90% of the most commonly used fieldbus systems
- Variable connection options for the valve terminal pneumatic components
- Flexible electrical connection technology for sensors and actuators
- Module characteristics can be adjusted using software parameters

Reliable

- CE certification
- Suitable for direct machine mounting with IP65/IP67 protection or with a terminal connection with IP20 protection in a protected fitting space
- Supports module and channel-oriented diagnosis of inputs, outputs and valves

Easy to assemble

- Fully assembled and tested unit
- Wall or H-rail mounting

Terminal CPX

Key features

CPX terminal variants

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.

The CPX terminal can also be used without a valve terminal as a remote I/O module.

with valve terminal CPA

with valve terminal MIDI/MAXI

with valve terminal MPA

as a remote I/O module

Bus node and electrical connection variants

Bus node

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

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

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:

- M12-5PIN
- M12-8PIN
- M8-3PIN
- Sub-D
- Harax®
- CageClamp®

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 required actuation and the selected components of the 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.

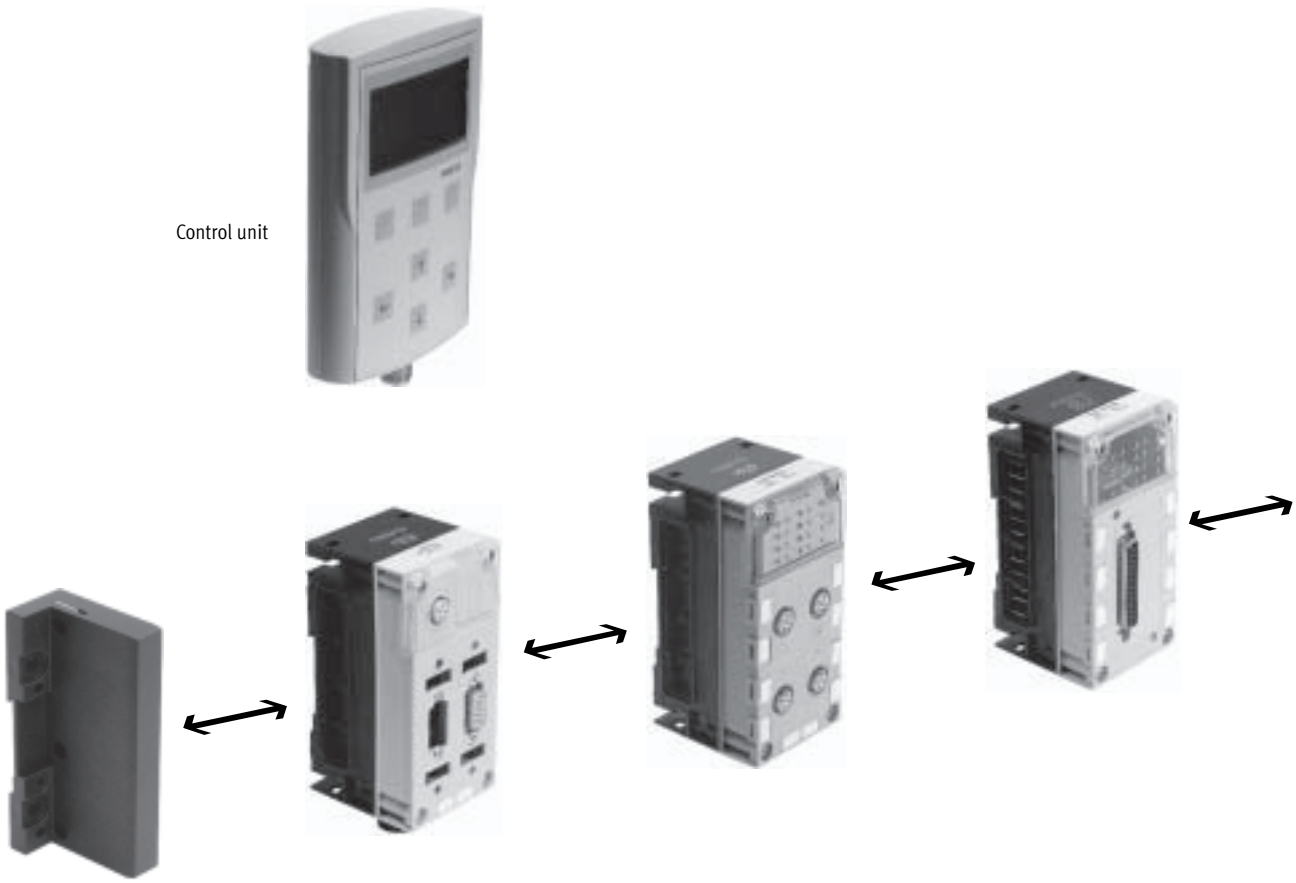
The electrical peripherals type CPX can naturally also be configured without a valve terminal and can be used on a fieldbus. For this order, you only require the order code for the electrical peripherals.

The order lists for the electrical peripherals type CPX can be found in this chapter, while the order lists for the pneumatic components can be found in

- ➔ Valve terminal type 12 CPA, Compact Performance
  4 / 2.1-79
- ➔ Valve terminal type 32 MPA, Modular Performance
  4 / 2.2-1
- ➔ Valve terminal type 03 VIMP-/VIFB-03, multi-functional MIDI/MAXI
  4 / 2.2-44

Complete overview of modules

Control unit



End plate

- Mounting holes for wall mounting
- Functional earthing connection

Bus node

- Fieldbus connection using various types of connection technology
- Setting of fieldbus parameters via DIL switch
- Display of fieldbus and peripheral equipment status via LED

Control unit

- Connection to bus nodes
- Display and modification of parameter settings
- Normal text display for texts, messages, menus, etc.

Input/output modules

Combination of

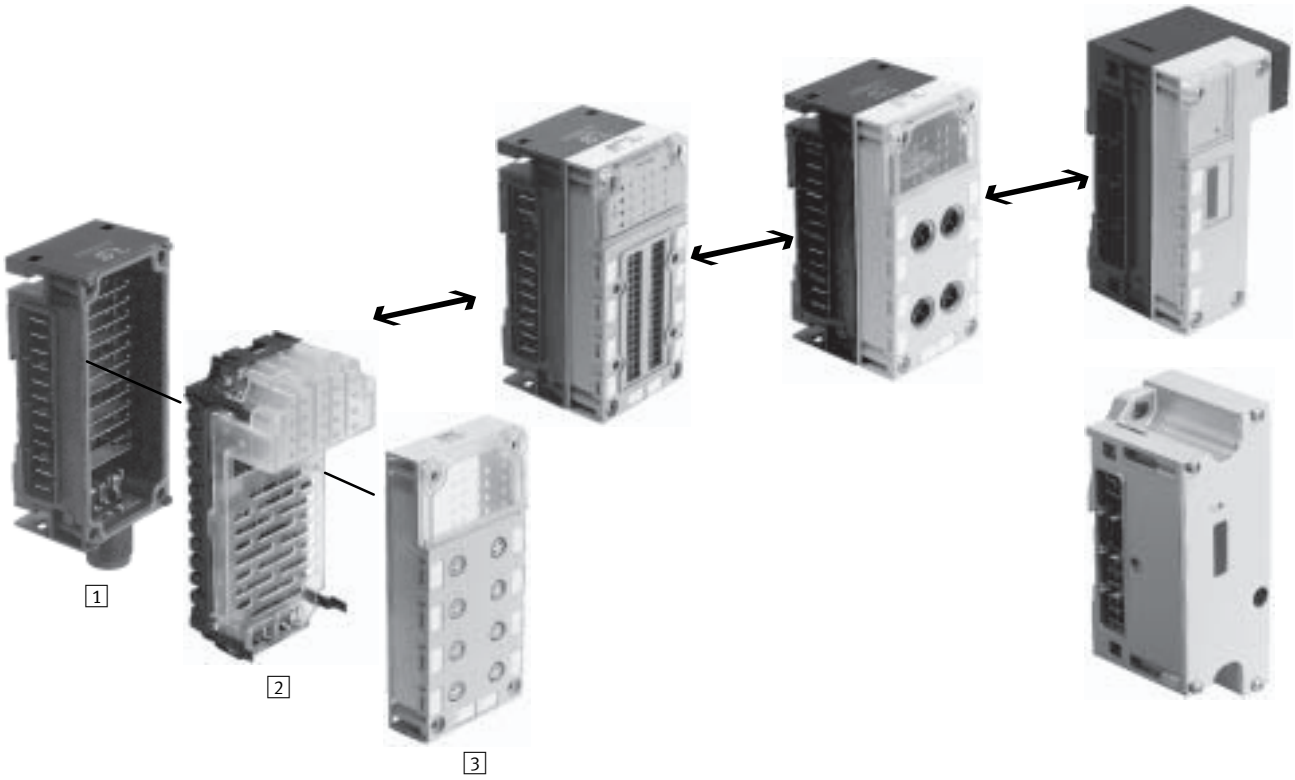
- Interlinking block
- Electronics module
- Connection block

Terminal CPX

Peripherals overview

FESTO

Complete overview of modules



Input/output modules

1 Interlinking block

- Internal linking of the power supply and serial communication
- External power supply of the entire system
- Additional power supply for outputs or valves

2 Electronics module

- Digital inputs for connecting the sensors
- Digital outputs for activation of additional actuators
- Analogue inputs
- Analogue outputs

3 Connection block

- Selectable connection technology with 6 variants
- Protection class IP65/IP67 or IP20
- Freely combinable with the electronics modules

Pneumatic interface

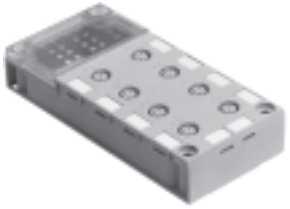
- Activation of the solenoid coils
- CPA10/14
- MIDI/MAXI
- MPA

Individual overview of modules

Bus node

Bus node for
- Profibus DP
- Interbus
- DeviceNet
- CANopen
- CC-Link

Connection block



Direct machine mounting
(protection class IP65/IP67)
- M12-5PIN
- M12-8PIN
- M8-3PIN
- Sub-D
- Harax®

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

Electronics module for inputs/outputs (digital)

Digital inputs and outputs
- 8 digital inputs
- 4 digital inputs
- 4 digital outputs (1 A per channel)

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

Electronics module for inputs/outputs (analogue)

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

Interlinking block

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

System supply
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)

Terminal CPX

Peripherals overview

FESTO

Individual overview of modules

Pneumatic interface CPA ➔ 4 / 4.8-72

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

Pneumatic interface MIDI/MAXI ➔ 4 / 4.8-74

Valve terminal with
- MIDI valves (500 l/min) or/and MAXI valves (1250 l/min)
- Up to 26 solenoid coils
- Setting of the number of valves via DIL switch

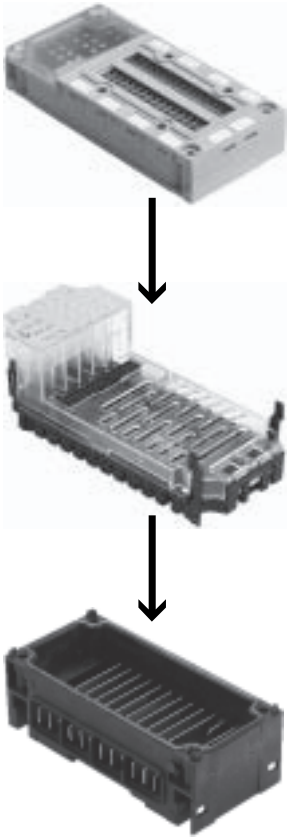
Pneumatic interface MPA ➔ 4 / 4.8-71

Valve terminal
- MPA (360 l/min)
- Up to 64 solenoid coils
- Up to 8 modules can be configured

End plate

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

General basic data and guidelines



- One bus node
  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
  - With CPA and type 03:
    fixed operating range, set using DIL switch
  - With MPA:
    8 modules can be configured
- Address volume max. 512 inputs and 512 outputs
  depending on bus node
- One system supply
  freely positionable
- Multiple additional power supplies always positioned to the right of the system supply
- The connection blocks can, with just a small number of exceptions, be freely combined with the electronics modules for inputs/outputs (➔ table below)
- All electronics modules for inputs/outputs can be combined with any interlinking block

Connection block and electronics modules for inputs/outputs combinations

Connection blocks	Electronics modules for inputs/outputs					
	CPX-8DE	CPX-4DE	CPX-4DA	CPX-8DE-8DA	CPX-2AE	CPX-2AA
CPX-AB-4-M12x2-5POL	■	■	■	–	■	■
CPX-AB-8-M8-3POL	■	■	■	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	■	■
CPX-AB-1-SUB-BU-25POL	■	■	■	■	■	■
CPX-AB-4-HARx2-4POL	■	■	■	–	–	–
CPX-AB-4-M12-8POL	–	–	–	■	–	–

Electrical connection – Connection block

CPX-AB-4-M12x2-5POL with M12-5pin connection

- Pre-assembled and sturdy with 2 signals per socket
- 4 sockets
- 5-pin design for each socket

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

- Compact for pre-assembled individual connection
- 8 sockets
- 3-pin design for each socket

CPX-AB-8-KL-4POL with clamped terminals (CageClamp®) connection

- Fast connection technology for use in control cabinets
- 32 CageClamp® spring-loaded terminals
- 4 terminals per signal
- Wire cross-sections 0.05 ... 1.5 mm^2

Electrical connection – Connection block

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

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

CPX-AB-4-HARx2-4POL with HARAX connection

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

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

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

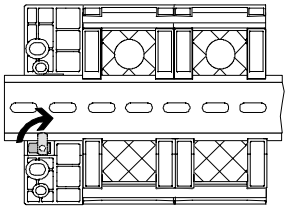
Terminal CPX

Key features – Mounting types

Mounting options

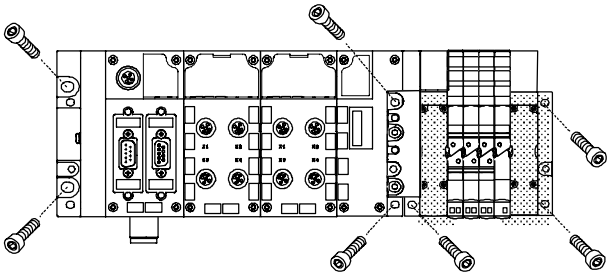
Valve terminals with the CPX terminal support different mounting methods for direct machine mounting with high protection and control cabinet installation.

H-rail mounting



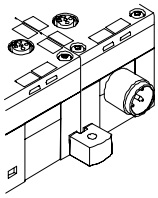
The H-rail mounting is pressed into the profile on the reverse side of the CPX modules. The CPX terminal can be attached to the H-rail using the H-rail mounting.

Wall mounting



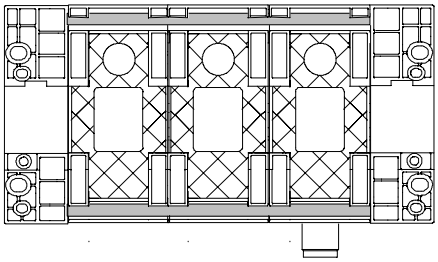
The end plates of the CPX terminal, the valve terminal and the pneumatic interface include mounting holes for wall mounting.

Mounting bracket



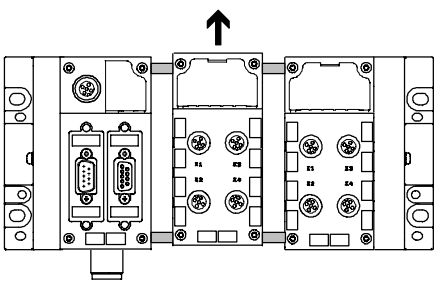
For longer valve terminals, there are additional mounting brackets for the CPX terminal that can be fitted in any module.

Tie rod



The mechanical connection between the CPX modules is created using special tie rods. Two screws in the end plates are all that are needed to mount the entire unit.

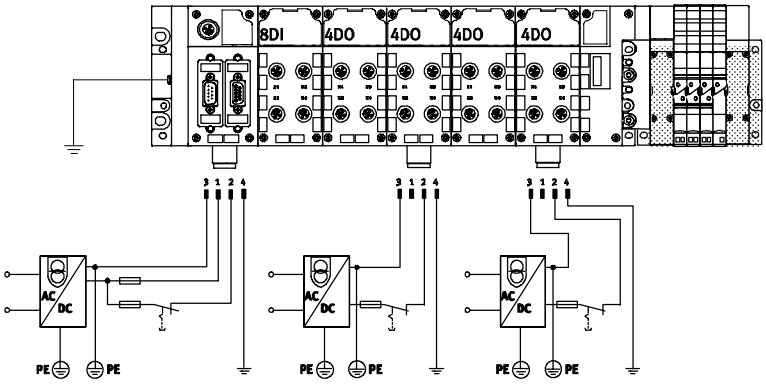
The tie rod ensures that the unit resists high mechanical loads and is therefore the “mechanical backbone” of the CPX terminal.



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

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 supply all voltages using a single socket.
A distinction is made between supply for
- electronics plus sensors
- valves plus actuators

in this case.

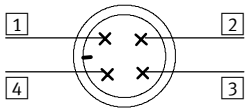
Interlinking blocks

However, 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 different interlinking blocks
- with system supply
- without power supply
- with additional power supply for electrical outputs
- with additional power supply for valves

supports the separation of voltages for valves, different voltage segments for electrical outputs and sensors.

The supply voltages are supplied using a 4-pin M18 plug.



System supply
CPX-GE-EV-S

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 Earth terminal

Without power supply
CPX-GE-EV

Additional power supply for outputs
CPX-GE-EV-Z

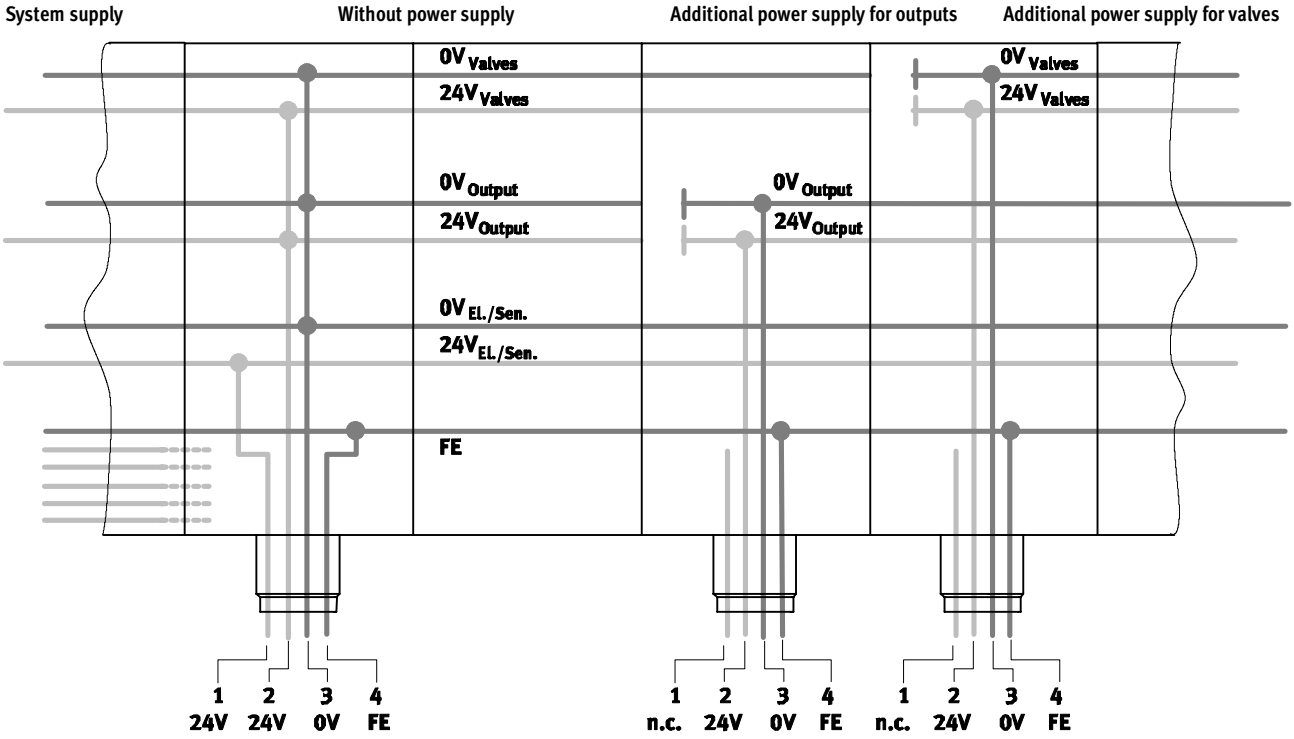
1 Unused
2 24 V DC load voltage supply for outputs
3 0 V
4 Earth terminal

Additional power supply for valves
CPX-GE-EV-V

1 Unused
2 24 V DC load voltage supply for valves
3 0 V
4 Earth terminal

Power supply concept

Basic linking structure



General limit values and guidelines

System supply

The system supply provides the internal voltage for the entire CPX system with

- max. 16 A for sensors and electronics
- max. 16 A for valves and actuators

The connected electronics module for inputs/outputs or bus node tap off the required voltage.

Without power supply

All voltages are fed through to the next module by means of system linking.

The connected electronics module for inputs/outputs or bus node tap off the required voltage.

Additional power supply for outputs

The additional power supply for outputs interrupts the voltage of the outputs (0 V and 24 V) and supplies a new voltage

- max. 16 A for outputs per additional power supply

All other voltages are fed through.

Isolation ensures that the output modules are electrically isolated from one another.

A connected output module and all subsequent modules to the right of it are supplied with the new voltage for outputs.

The power supply for the valves continues to be supplied by the system supply.

The additional power supply for the outputs must always be located to the right of the system supply.

There is no limit to the number of additional supply modules that can be used.

Additional power supply for valves

The additional power supply for valves interrupts the voltage of the valves (0 V and 24 V) and supplies a new voltage

- max. 16 A for valves per additional power supply

All other voltages are fed through.

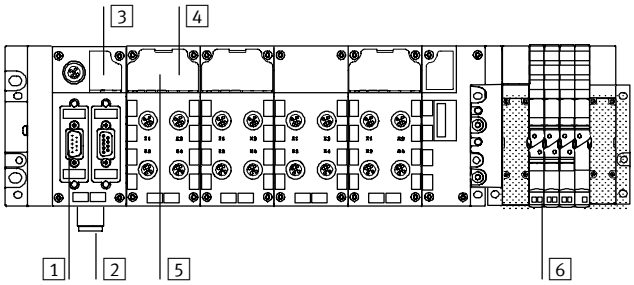
Isolation ensures that the valves are electrically isolated from one another.

The additional power supply for the valves must always be located to the right of the system supply.

Only one additional power supply module may be used.

Diagnosis

System performance



1 Diagnosis using fieldbus
2 Undervoltage monitor
3 Diagnostic overview LED
– Fieldbus status
– CPX status
4 Status and diagnostic LED module and I/O channels
5 Module and channel-specific diagnosis
6 Valve-specific diagnostic module and solenoid coils

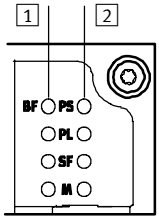
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on the spot diagnosis using LEDs or control unit and diagnosis using fieldbus.

The CPX terminal supports on the spot diagnosis 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 diagnosis is supported, e.g.
- Undervoltage identification for the outputs and valves
- Short circuit detection for sensors, outputs and valves
- Open-load detection for a missing solenoid coil
- Storage of the last 40 causes of errors with error start and error end

The diagnostic messages can be read via fieldbus diagnostics in the master controller and visualised for the central recording and evaluation of error causes. This is done using the individual fieldbus-specific channels.

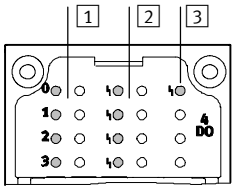
Overview of LEDs on the bus node



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, e.g.
– Power system
– Power load
– System errors
– Modification parameters

Input/output module status and diagnostic LEDs

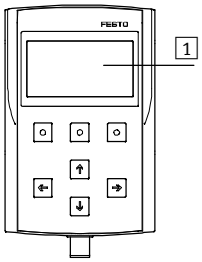


1 Status LEDs for inputs and outputs
Each input and output channel is assigned a status LED.

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

3 Central diagnostic LED
An LED displays a collective diagnosis for each module.

Control unit display



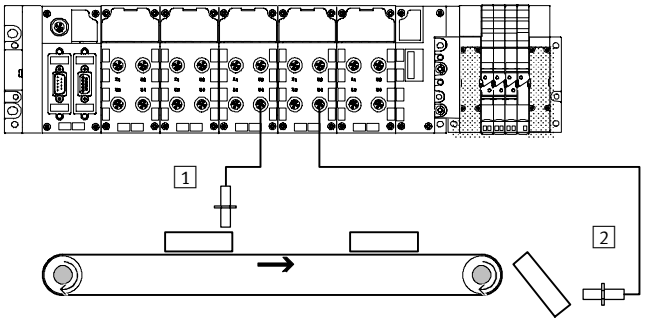
1 LCD graphical display for normal text diagnosis

Parameterisation

Changes to the application are often required during commissioning. Thanks to the parameterisable characteristics of CPX modules, functions can be very easily changed via fieldbus by means of configuration software. This reduces the number of modules and, consequently, the amount of storage space required.

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

As an alternative to parameterisation via fieldbus, the control unit CPX-MMI can be used for setting the parameters.



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

Addressing

General information about 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.

The maximum system extension
- 1 bus node
- 9 I/O modules
- 1 pneumatic interface

or
- 8 MPA modules

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-8DE	8	–
CPX-4DE	4	–
CPX-4DA	–	4
CPX-8DE-8DA	8	8
CPX-2AE	2 x 16	–
CPX-2AA	–	2 x 16
CPX-GP-CPA-10	–	8, 16, 24[1)]
CPX-GP-CPA-14		
CPX-GP-03-4,0	–	8, 16, 24, 32[1)]
VMPA1-FB-EMS-8	–	8
VMPA1-FB-EMG-8	–	8

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

Overview – Address space for CPX bus nodes

	CPX-FB6	CPX-FB11	CPX-FB13	CPX-FB14	CPX-FB23
Bus protocol	Interbus	DeviceNet	Profibus	CANopen	CC-Link
Max. total					
Inputs	96 bit	512 bit	512 bit	192 bit	–
Outputs	96 bit	512 bit	512 bit	192 bit	–
Max. digital					
Inputs	96 DI	512 DI	512 DI	64 DI (+ 64 DI)	64 DI
Outputs	96 DO	512 DO	512 DO	64 DO (+ 64 DO)	64 DO
Max. analogue					
Inputs	6 AI	18 AI	18 AI	8 AI (+ 8 AI)	16 AI
Outputs	6 AO	18 AO	18 AO	8 AO (+ 8 AO)	16 AO

Example – CPX-FB6 (Interbus)

	Digital inputs	Digital outputs
3x CPX-8DE	24	–
1x CPX-8DE-8DA	8	8
2x CPX-2AE	64	–
1x CPX-2AA	–	32
1x CPA10	–	24
Allocated address space	96	96

- The address space is occupied with 7 CPX I/O modules plus pneumatic interface
- No additional modules can be configured

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

Plug SEA-GS-7

SEA – GS – 7
- 7: Cable connection PG7 (cable opening 4 … 6 mm)
- GS: Straight plug
- SEA: Plug for inputs/outputs, M12x1 connection, 4-pin

Plug SEA-GS-9

SEA – GS – 9
- 9: Cable connection PG9 (cable opening 6 … 8 mm)
- GS: Straight plug
- SEA: Plug for inputs/outputs, M12x1 connection, 4-pin

Plug SEA-4GS-7-2,5

SEA – 4GS – 7 – 2.5
- 2.5: Cable opening 2.5 … 2.9 mm
- 7: Cable connection PG7
- 4GS: 4-pin, straight plug
- SEA: Plug for inputs/outputs, M12x1 connection

Plug SEA-GS-11-DUO

SEA – GS – 11 – DUO
- DUO: For 2 cables
- 11: Cable connection PG11 (cable opening 3 … 5 mm)
- GS: Straight plug
- SEA: Plug for inputs/outputs, M12x1 connection, 4-pin

Plug SEA-M12-5GS-PG7

SEA – M12 – 5GS – PG7
- PG7: Cable connection PG7
- 5GS: 5-pin, straight plug
- M12: M12x1 connection
- SEA: Plug for inputs/outputs

Plug SEA-3GS-M8-S

SEA – 3GS – M8 – S
- S: With screw terminals
- M8: M8x1 connection
- 3GS: 3-pin, straight plug
- SEA: Plug for inputs/outputs (cable opening 2.5 … 5 mm)

Plug SEA-GS-M8

SEA – GS – M8
- M8: M8x1 connection
- GS: Straight plug
- SEA: Plug for inputs/outputs, 3-pin, solderable connection (cable opening 3.5 … 5 mm)

Plug SEA-GS-HAR-4POL

SEA – GS – HAR – 4POL
- 4POL: 4-pin
- HAR: Harax fast connection technology
- GS: Straight plug
- SEA: Plug for inputs/outputs, M12x1 connection

Plug SD-SUB-D-ST25

SD – SUB-D – ST25
- ST25: Connection pin, 25-pin
- SUB-D: Sub-D design
- SD: Plug for inputs/outputs

Bus connection FBA-2-M12-5POL

FBA – 2 – M12 – 5POL
- 5POL: 5-pin
- M12: M12x1 connection
- 2: 2 connections
- FBA: Bus connection, 9-pin Sub-D socket to 1x M12x1 pin, 5-pin and 1x M12x1 socket, 5-pin

Bus connection FBA-2-M12-5POL-RK

FBA – 2 – M12 – 5POL – RK
- RK: Reverse Key coded
- 5POL: 5-pin
- M12: M12x1 connection
- 2: 2 connections
- FBA: Bus connection, 9-pin Sub-D pin to 1x M12x1 pin, 5-pin and 1x M12x1 socket, 5-pin

Bus connection FBA-1-SL-5POL

FBA – 1 – SL – 5POL
- 5POL: 5-pin
- SL: Pin strip
- 1: 1 connection
- FBA: Bus connection, Sub-D socket, 9-pin to pin strip, 5-pin

Plug FBS-SUB-9-BU-2x4POL

FBS – SUB – 9 – BU – 2x4POL
- 2x4POL: 2x PG threaded connector, 2 x 4-pin terminal block
- BU: Socket
- 9: 9-pin
- SUB: Sub-D connection
- FBS: Plug for bus connection, Sub-D socket, 9-pin to 2x PG9 threaded connector

Plug FBS-SUB-9-GS-9

FBS – SUB – 9 – GS – 9
- 9: PG9 threaded connector, 2x 4-pin terminal block
- GS: Straight plug
- 9: 9-pin
- SUB: Sub-D connection
- FBS: Plug for bus connection, Sub-D pin, 9-pin to 2x PG9 threaded connector

Plug FBS-SUB-9-BU-IB

FBS – SUB – 9 – BU – IB

- IB: Interbus
- BU: Socket
- 9: 9-pin
- SUB: Sub-D connection
- FBS: Plug for bus connection, Sub-D socket, 9-pin to 1x PG9 threaded connector, 5-pin terminal block

Plug FBS-SUB-9-GS-IB

FBS – SUB – 9 – GS – IB

- IB: Interbus
- GS: Straight plug
- 9: 9-pin
- SUB: Sub-D connection
- FBS: Plug for bus connection, Sub-D pin, 9-pin to 1x PG9 threaded connector, 5-pin terminal block

Plug socket NTSD-GD-9

NTSD – GD – 9

- 9: PG9
- GD: Straight socket
- NTSD: Power supply socket, M18x1, 4-pin (cable opening 6 ... 8 mm)

Plug socket NTSD-WD-11

NTSD – WD – 11

- 11: 11 mm opening
- WD: Angled socket
- NTSD: Power supply socket, M18x1, 4-pin (cable opening 6 ... 11 mm)

Terminal CPX

Technical data

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 for the components used.

Example

Protection class IP65/IP67 applies only to the fully assembled system with fitted plugs or covers. 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. CageClamp connection block with IP20 protection or CPA pneumatics with IP65 protection.

General technical data		
Module No.		**197 330**
Max. no. of modules	Bus node	1
	I/O modules	9
	Pneumatic interface	1
Max. address volume	Inputs	64 bytes
	Outputs	64 bytes
Internal cycle time		< 1 ms
Configuration support		Fieldbus-specific
LED displays	Bus node	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
Diagnosis		■ Channel and module-oriented diagnosis for inputs/outputs and valves ■ Detection of module undervoltage for the different voltage potential values ■ Storage of the last 40 errors with timestamp (acyclic access)
Parameterisation		Module-specific and entire system, e.g.: ■ Diagnostic behaviour ■ Profile of inputs ■ Failsafe response of outputs and valves
Commissioning support		Forcing of inputs and outputs

Terminal CPX

Technical data

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General technical data		
Module No.		**197 330**
Protection class to EN 60 529		IP65/IP67
Power supply	System supply	
	Electronics plus sensors	24 V, max. 16 A
	Actuators plus valves	24 V, max. 16 A
	Additional power supply	
	Actuators	24 V, max. 16 A per supply
	Additional power supply	
	Valves	24 V, max. 16 A per supply
Current consumption		Depending on system extension
Power failure buffering (bus electronics only)		10 ms
Voltage supply connection		M18, 4-pin
Protection concept		Per module with electronic fuses
Temperature range, electronics	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Temperature range, electronics plus pneumatic components	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +40 °C
Relative air humidity (non-condensing)		5 ... 90%
Tests	Vibration test	To DIN/IEC 68/EN 60 068 Part 2 – 6 ■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
	Shock test	To DIN/IEC 68/EN 60 068 Part 2 – 27 ■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 2
PWIS classification		PWIS-free (of paint wetting impairment substances)
Interference immunity		EN 50 082 T2 (industry)
Interference emission		EN 61 000-6-2 (industry)
Isolation test for electrically isolated circuits to IEC 1131 Part 2		DC 500 V
Protection against direct and indirect contact		PELV
Materials		Polymer
Grid dimension		50 mm

Weights [g]						
Bus node	FB6	125.0		I/O module		38.0
	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
Interlinking block	without power supply	80.0			5-fold	73.0 ±2.5
	with system supply	100.0			6-fold	86.5 ±2.5
Connection block		70.0			7-fold	100.0 ±2.5
Pneumatic interface	CPA	150.0			8-fold	113.5 ±2.5
	MIDI/MAXI	390.0			9-fold	127.0 ±2.5
End plate	left	77.0			10-fold	140.5 ±2.5
	right	70.0				

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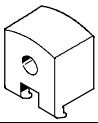
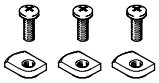
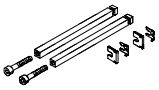
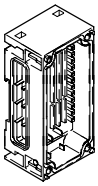
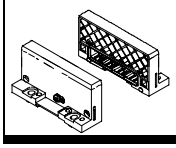
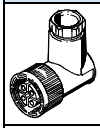
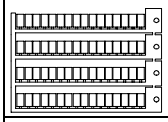
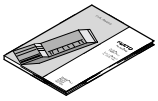
Ordering data – Accessories

Designation		Type	Part No.
Mounting			
	Attachment for wall mounting (for long valve terminals, 10 pieces)	**CPX-BG-RW-10x**	**529 040**
	Attachment for H-rail	CPX without pneumatics	**CPA-BG-NRH**	**173 498**
		CPX-CPA	**CPX-CPA-BG-NRH**	**526 032**
		CPX-MIDI	**CPX-03-4,0**	**526 033**
		CPX-MAXI	**CPX-03-7,0**	**526 034**
		CPX-MPA	**CPX-CPA-BG-NRH**	**526 032**
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**
Electrical interlinking			
	Interlinking block	Basic unit, without voltage input	**CPX-GE-EV**	**195 742**
		with system supply	**CPX-GE-EV-S**	**195 746**
		with additional power supply for outputs	**CPX-GE-EV-Z**	**195 744**
		with additional power supply for valves	**CPX-GE-EV-V**	**533 577**
End plates			
	End plate	right	**CPX-EPR-EV**	**195 714**
		left	**CPX-EPL-EV**	**195 716**

Ordering data – Accessories				
Designation			Type	Part No.
Plug sockets				
	Plug socket for mains connection, 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, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Inscription labels				
	Inscription labels, 6x10, 64 pieces, in frames		**IBS-6x10**	**18 576**
User documentation				
	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**

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. Diagnosis

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.

User documentation overview

Type	Title	Description
Electronics		
P.BE-CPX-SYS-...	System description – Installing and commissioning CPX terminals	Overview of the design, components and mode of operation of the CPX terminal; installation and commissioning instructions as well as basic principles for parameterisation.
P.BE-CPX-EA-...	CPX I/O modules, digital	Connection technology and assembly, installation and commissioning instructions for input and output modules of type CPX-... as well as the CPA, MIDI/MAXI and MPA pneumatic interface.
P.BE-CPX-AX-...	CPX I/O modules, analogue	Connection technology and assembly, installation and commissioning instructions for input and output modules of type CPX-... as well as the CPA, MIDI/MAXI and MPA pneumatic interface.
P.BE-CPX-FB...	CPX fieldbus nodes	Instructions for the assembly, installation, commissioning and diagnosis of the relevant bus nodes.
Pneumatics		
P.BE-CPA-...	Valve terminals with CPA pneumatics	Instructions for the assembly, installation, commissioning and diagnosis of the CPA pneumatic components.
P.BE-Midi/Maxi-03-...	Valve terminals with MIDI/MAXI pneumatics	Instructions for the assembly, installation, commissioning and diagnosis of the MIDI/MAXI pneumatic components.
P.BE-MPA-...	Valve terminals with MPA pneumatics	Instructions for the assembly, installation, commissioning and diagnosis of the MPA pneumatic components.

User documentation – GSD, EDS, etc.

Device description files and icons are used to explain 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	**GSWD-AT-EEP**
Part No.	**537 041**

Engineering – Total service:
ePLan macros for fast and reliable engineering of electrical projects in combination with valve terminals. Available in German and English.

Systematically more reliable:
The CPX macro library provides access to symbols, graphics and master data. The 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.

Basic technical data

- CD with CPX macro library ePLAN 5 for terminal CPX (supports the engineering 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, bills of material 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

Engineering example:

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

↓

Problem definition/ engineering of electrical project

↓

Efficient PC-based design system

↓

CPX macro

↓

ePLAN CAE software for electrical applications

↓

PC

↓

Documentation

Circuit diagrams
bills of material in paper format, optional representation in browsers (HTML)

Terminal CPX

Technical data – Control unit

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Width
81 mm

The control unit is a small, handy commissioning and service device for the CPX terminal. It provides data request, configuration and diagnosis 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
- Normal text diagnosis of module and channel-oriented errors
- Display of the last 40 error events with timestamp
- Identification of sporadic causes of errors through display of the diagnostic history
- Password protection

Connection

The control unit is connected to the CPX bus nodes using a pre-assembled M12 cable.
The voltage for the control unit is supplied through the CPX bus node ...-P-Plug&Work.

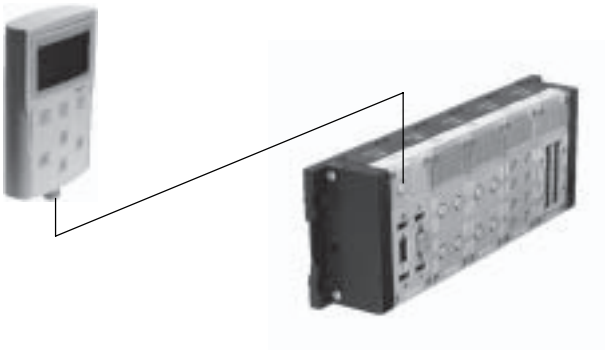
Communication

Once connected to the CPX terminal, the control unit loads the available configuration for the I/O modules and valves.
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

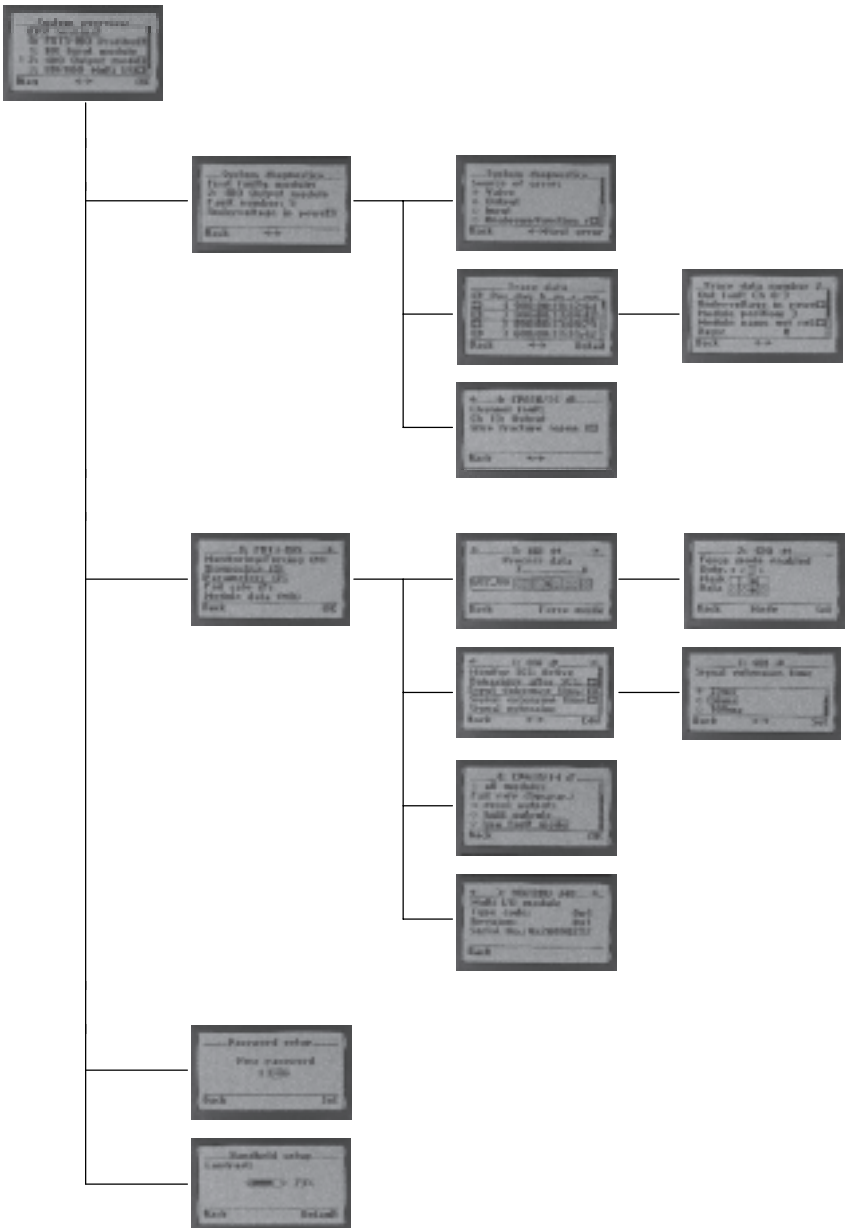
A mounting bracket for the control unit offers the option of wall or H-rail mounting.
The mounting bracket also has an option for temporary mounting using a hanging device.

Connection



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

Function examples



System overview

- Overview of configured modules and current diagnostic messages

Diagnosis

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

Commissioning

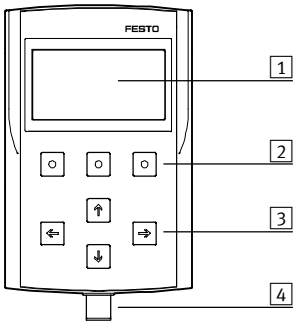
- Selection of module-specific data and parameters
- Display and modification of the current status of the inputs and outputs of a module
- Display and modification of the current settings for module-specific parameters

Setup

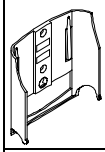
- Setting of access permission (password)
- Contrast setting of the display

General technical data		
Type		**CPX-MMI-1**
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, pin
Electromagnetic compatibility		Interference emission tested to EN 50 081-2, industry
		Interference immunity tested to EN 61 000-6-2, industry
Operating voltage		24 V, supplied from the connected device
Current consumption		Max. 55 mA
Protection class to EN 60 529		IP65
Relative air humidity		90%, non-condensing
Vibration resistance		Tested to DIN/IEC 68/EN 60 068, Parts 2-6 ■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
Shock resistance		Tested to DIN/IEC 68/EN 60 068, Parts 2-27 ■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
Temperature range	Operation	0 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polyamide, reinforced
Dimensions (W x H x D)		81 x 137 x 28 mm
Weight		150 g

Connection and display components



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

Ordering data				
Designation			Type	Part No.
Cable				
	Extension cable M12-M12	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**
	Attachment for H-rail		**CPX-MMI-1-NRH**	**536 689**

Terminal CPX

Technical data – Bus node CPX-FB6

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

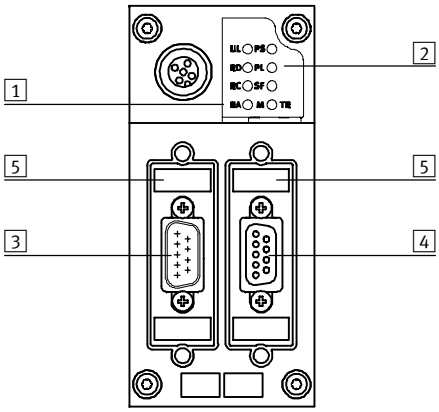
General technical data		
Type		**CPX-FB6**
Part No.		**195 748**
Fieldbus interface		Sub-D, 9-pin, socket and pin
Baud rates		500 kBaud and 2 MBaud
Bus type		Remote bus
Ident. code		1, 2 or 3 (configuration-specific) 243 (PCP channel activated)
Profile		12 (I/O device)
PCP channel		Yes, 16 bit (optional via DIL switch)
Configuration support		Icons for CMD software
Max. no. of process data bits	Inputs	96 bit
	Outputs	96 bit
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		Peripherals errors
Parameterisation		■ Start-up parameterisation via user functions (CMD) ■ 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	24 V (reverse polarity protected)
	Permissible range	18 ... 30 V
	Power failure buffering	10 ms
Current consumption		Max. 200 mA
Protection class to EN 60 529		IP65/IP67
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block) W x L x H		50 x 107 x 50 mm
Weight	without interlinking block	125 g
	incl. interlinking block without power supply	205 g
	incl. interlinking block with system supply	225 g

Note

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

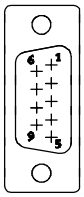
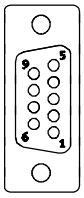
Connection and display components

The following connection and display components can be found on the bus node cover:



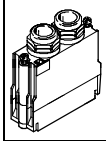
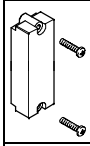
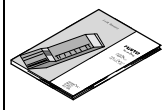
1 INTERBUS-specific LEDs
2 CPX-specific status LEDs
3 Fieldbus connection, incoming (9-pin Sub-D, pins)
4 Fieldbus connection, outgoing (9-pin Sub-D, socket)
5 DIL switch

Pin allocation for the INTERBUS interface

Terminal allocation	Pin No.	Signal	Designation
Incoming			
Viewed from the pin side 	1	DO1	Data out
	2	DI1	Data in
	3	GND	Reference conductor/earth
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	/DO1	Data out inverse
	7	/DI1	Data in inverse
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	Screening	Connection to FE via R/C combination
Outgoing			
Viewed from the socket side 	1	DO2	Data out
	2	DI2	Data in
	3	GND	Reference conductor/earth
	4	n.c.	Not connected
	5	+5 V	Station detection[1)]
	6	/DO2	Data out inverse
	7	/DI2	Data in inverse
	8	n.c.	Not connected
	9	RBST	Station detection[1)]
	Housing	Screening	Connection to FE

The incoming interface is electrically isolated from the CPX peripherals. The plug housing is connected to the functional earthing 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				
	Plug, Sub-D	Incoming	**FBS-SUB-9-BU-IB**	**525 673**
		Incoming	**FBS-SUB-9-BU-IB-B**	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB**	**525 674**
		Outgoing	**FBS-SUB-9-GS-IB-B**	**532 217**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Cover cap		**AK-SUB-9/15**	**18 577**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation – 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 with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the 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 Cyclic method is used for the transmission of cyclic I/O data. The type of transmission can be selected in the network configuration.

The device diagnosis for all bus nodes CPX-FB11 is effectively gathered with Strobed I/O and displayed in the input table of the controller.
In addition to cyclic data transmission, acyclic communication is supported through Explicit Messaging, which allows detailed device diagnosis and parameterisation.

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

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

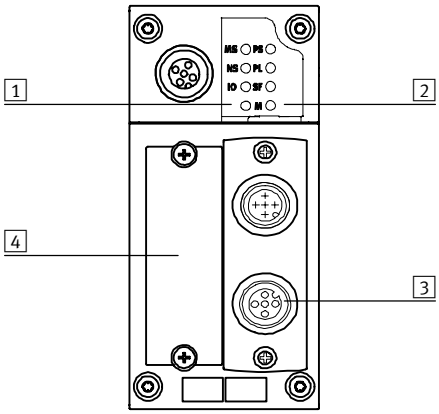
General technical data		
Type		**CPX-FB11**
Part No.		**526 172**
Fieldbus interface		Either ■ MicroStyle bus connection: 2xM12 protection class IP65/IP67 ■ OpenStyle bus connection: 5-pin terminal strip IP20
Baud rates		125, 250, 500 kbps
Addressing range		0 ... 63 Set using DIL switch
Product	Type	Communication adapter (12 dec.)
	Code	4554 dec.
Communication types		Polled I/O, Change of State/Cyclic, Strobed I/O and Explicit Messaging
Configuration support		EDS file and bitmaps
Max. address volume	Inputs	64 bytes
	Outputs	64 bytes
LED displays (bus-specific)		MS = Module Status NS = Network Status IO = I/O Status
Device-specific diagnostics		Module and channel-oriented diagnosis through manufacturer-specific diagnosis object
Parameterisation		■ Module and system parameterisation via configuration interface in normal 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	24 V
	Permissible range	18 ... 30 V
	Power failure buffering	10 ms
Current consumption		Max. 200 mA
Protection class to EN 60 529		IP65/IP67
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block) W x L x H		50 x 107 x 50 mm
Weight	without interlinking block	120 g
	incl. interlinking block without power supply	200 g
	incl. interlinking block with system supply	220 g

Note

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

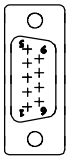
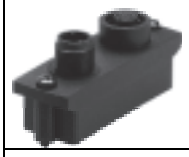
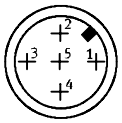
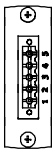
Connection and display components

The following connection and display components can be found on the bus node cover:

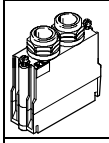
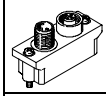
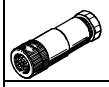
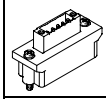
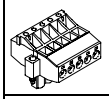
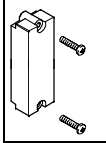
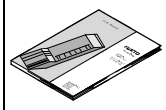


1 Bus-specific LEDs
2 CPX-specific status LEDs
3 Selectable fieldbus connection
Micro Style
Open Style
4 DIL switch cover

Pin allocation for the DeviceNet interface

	Terminal allocation	Pin No.	Signal-specific core colour[1)]	Signal	Designation
Plug, Sub-D					
		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	Screening	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 supply CAN interface
Bus connection Micro Style (M12)					
		1	blank	Screening	Connection to housing
		2	red	24 V DC bus	24 V 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	Screening	Connection to housing
		4	white	CAN_H	Received/transmitted data high
		5	red	24 V DC bus	24 V supply CAN interface

1) Typical for DeviceNet cables

Ordering data				
Designation			Type	Part No.
Bus connection				
	Plug, Sub-D		**FBS-SUB-9-BU-2x4POL**	**197 960**
			FBS-SUB-9-BU-2x5POL-B	**532 219**
	Bus connection Micro Style 2xM12		**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 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**
	Cover cap		**AK-SUB-9/15**	**18 577**
User documentation				
	User documentation – 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 with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the Profibus-specific fault LED.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket with a typical Profibus allocation (to EN 50 170).

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 50 170 Volume 2 for cyclic I/O exchange, parameterisation and diagnostic functions (DPV0).

In addition to DPV0, acyclic communication to the advanced specification DPV1 is supported. DPV1 provides acyclic access to advanced system information and 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.

Terminal CPX

Technical data – Bus node CPX-FB13

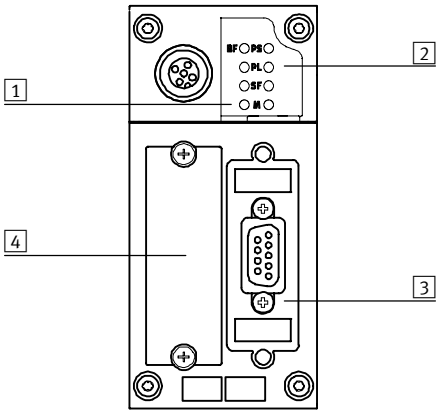
General technical data		
Type		**CPX-FB13**
Part No.		**195 740**
Fieldbus interface		Sub-D socket, 9-pin (EN 50 170) Electrically isolated 5 V
Baud rates		9.6 kBaud ... 12 MBaud
Addressing range		1 ... 125 Set using DIL switch
Product family		4: Valves
Ident. number		0x059E
Communication types		DPV0: Cyclic communication DPV1: Acyclic communication
Configuration support		GSD file and bitmaps
Max. address volume	Inputs	64 bytes
	Outputs	64 bytes
LED displays (bus-specific)		BF: Bus Fault
Device-specific diagnostics		Identifier and channel-specific diagnosis to EN 50 170 (Profibus standard)
Parameterisation		■ Start-up parameterisation via configuration interface in normal text (GSD) ■ Acyclic parameterisation via DPV1
Additional functions		■ Storage of the last 40 errors with timestamp (access via DPV1) ■ 8 bit system status in image table for inputs ■ 2 byte inputs and 2 byte outputs, system diagnostics in image table
Operating voltage	Nominal value	24 V
	Permissible range	18 ... 30 V
	Power failure buffering	10 ms
Current consumption		Max. 200 mA
Protection class to EN 60 529		IP65/IP67
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block) W x L x H		50 x 107 x 50 mm
Weight	without interlinking block	115 g
	incl. interlinking block without power supply	195 g
	incl. interlinking block with system supply	215 g

Note

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

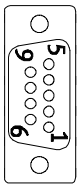
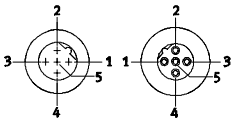
Connection and display components

The following connection and display components can be found on the bus node cover:

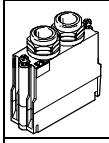
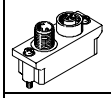
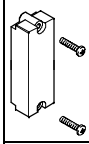
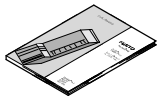


1 Bus status LED / Bus Fault
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D, socket)
4 DIL switch cover

Pin allocation for Profibus DP interface

	Terminal allocation	Pin No.		Signal	Designation
Plug, Sub-D					
		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)					
	Plug and socket 	Plug	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
		Socket	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

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

Ordering data				
Designation			Type	Part No.
Bus connection				
	Plug, Sub-D		**FBS-SUB-9-GS-9**	**18 529**
			FBS-SUB-9-GS-DP-B	**532 216**
	Bus connection M12 adapter plug (B-coded)		**FBA-2-M12-5POL-RK**	**533 118**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Cover cap		**AK-SUB-9/15**	**18 577**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation – 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**

Terminal CPX

Technical data – Bus node CPX-FB14\

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 with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The different CANopen statuses and the fieldbus communication status are 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 screw terminals available for the 4 contacts (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 the 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 volume, 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.

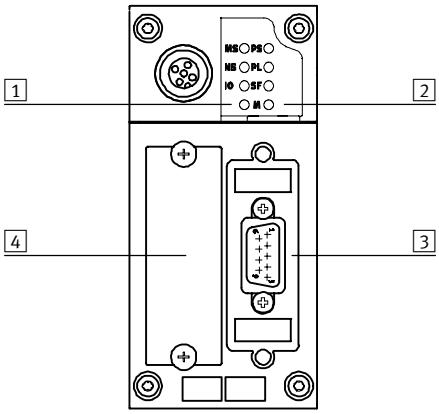
General technical data		
Type		**CPX-FB14**
Part No.		**526 174**
Fieldbus interface		Sub-D pin, 9-pin (to DS 102) Bus interface electrically isolated via optocoupler 24 V supply CAN interface via bus
Baud rates		125, 250, 500 and 1000 kBaud can be set via DIL switch
Addressing range		Node ID 1 ... 127 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 volume	Inputs	16 byte digital, 16 analogue channels
	Outputs	16 byte 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	24 V
	Permissible range	18 ... 30 V
	Power failure buffering	10 ms
Current consumption		Max. 200 mA
Protection class to EN 60 529		IP65/IP67
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block) W x L x H		50 x 107 x 50 mm
Weight	without interlinking block	115 g
	incl. interlinking block without power supply	195 g
	incl. interlinking block with system supply	215 g

- Note

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

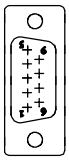
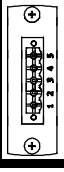
Connection and display components

The following connection and display components can be found on the bus node cover:

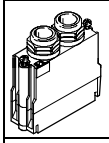
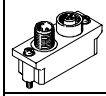
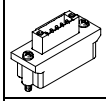
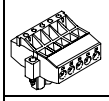
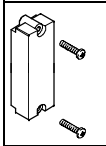
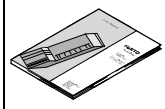


1 Bus-specific LEDs
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D, pin plug)
4 DIL switch cover

Pin allocation for the CANopen interface

	Terminal allocation	Pin No.	Signal	Designation
Plug, Sub-D				
		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 supply CAN interface
		Housing	Screening	Connection to FE
Bus connection Micro Style (M12)				
		1	Screening	Connection to FE
		2	CAN_V+	24 V 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	Screening	Connection to FE
		4	CAN_H	Received/transmitted data high
		5	CAN_V+	24 V supply CAN interface

1) Connected internally via Pin 3

Ordering data				
Designation			Type	Part No.
Bus connection				
	Plug, Sub-D		**FBS-SUB-9-BU-2x4POL**	**197 960**
			FBS-SUB-9-BU-2x5POL-B	**532 219**
	Bus connection Micro Style (M12)		**FBA-2-M12-5POL**	**525 632**
	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**
	Cover cap		**AK-SUB-9/15**	**18 577**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation – 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 with the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 CC-Link-specific LEDs.

Application

Bus connection

The bus connection can be selected when ordering and is established 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. V1.11).

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. Cyclic 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

Terminal CPX

Technical data – Bus node CPX-FB23

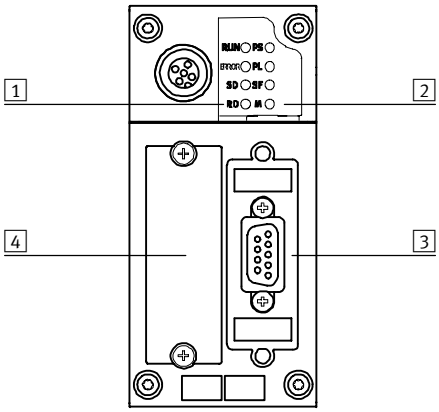
General technical data		
Type		**CPX-FB23**
Part No.		**526 176**
Fieldbus interface		Either ■ Sub-D socket, 9-pin ■ Bus connection screw terminal, IP20
Baud rates		156 kBaud ... 10 MBaud
Addressing range		1 ... 64 Set using DIL switch
Number of stations per slave		1, 2, 3 or 4 stations Set using DIL switch
Vendor code		0x0177
Machine type		0x3C
Communication types		Cyclic communication
Configuration support		–
Max. address volume, inputs	digital	Station 1, 2, 3, 4 = 64 Rx
	analogue	Station 1, 2, 3, 4 = 16 RWr
Max. address volume, 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	24 V
	Permissible range	18 ... 30 V
	Power failure buffering	10 ms
Current consumption		Max. 200 mA
Protection class to EN 60 529		IP65/IP67
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block) W x L x H		50 x 107 x 50 mm
Weight	without interlinking block	115 g
	incl. interlinking block without power supply	195 g
	incl. interlinking block with system supply	215 g

- Note

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

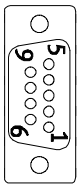
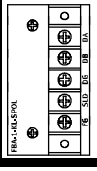
Connection and display components

The following connection and display components can be found on the bus node cover:

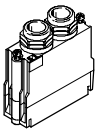
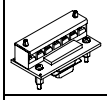
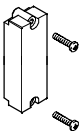
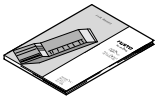


1 Bus-specific status LED
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D, socket)
4 DIL switch cover

Pin allocation for the CC-Link interface

	Terminal allocation	Pin No.	Signal	Designation
Plug, Sub-D				
		1	n.c.	Not connected
		2	DA	Data A
		3	DG	Data reference potential
		4	n.c.	Not connected
		5	FE[1)]	Functional earthing
		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 earthing/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				
	Plug, Sub-D		**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**
	Cover cap		**AK-SUB-9/15**	**18 577**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation – Bus node CPX-FB23	German	**P.BE-CPX-FB23-DE**	**526 403**
		English	**P.BE-CPX-FB23-EN**	**526 404**

Terminal CPX

Technical data – Input module, digital

FESTO

Function

Digital input modules allow 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 different connection concepts with different numbers of sockets (single or double allocation).

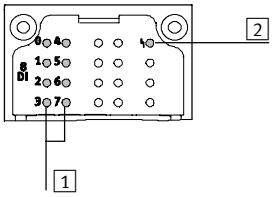
Applications

- Input modules for 24 V DC sensor voltage supply
- PNP 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 diagnosis through integrated electronic fuse protection

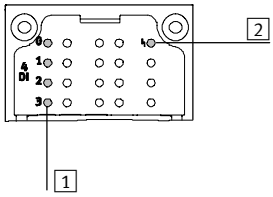
General technical data			
Type		CPX-8DE	CPX-4DE
Part No.		195 750	195 752
No. of inputs		8	4
Max. power supply	per module	0.5 A	
	per channel	0.5 A	
Fuse protection		Internal electronic fuse protection for sensor supply	
Module current consumption (input logic level OFF)		Typical 15 mA	
Supply voltage of sensors		24 V DC ±15%	
Electrical isolation	Channel – Channel	No	
	Channel – Internal bus	No	
Switching level	Signal 0	≤ 5 V	
	Signal 1	≥ 11 V	
Switch-on debounce time		3 ms (0.1 ms, 10 ms, 20 ms parameterisable)	
Input characteristic curve		IEC 1131-2	
Switching logic		Positive logic (PNP)	
LED displays	Group diagnosis	1	1
	Channel diagnosis	–	–
	Channel status	8	4
Diagnosis		Short circuit/overload, sensor supply	
Parameterisation		■ Module monitoring ■ Behaviour after short circuit ■ Switch-on debounce time ■ Signal stretching time	
Protection class to EN 60 529		Depending on connection block	
Temperature range	Operation	–5 ... +50 °C	
	Storage/transport	–20 ... +70 °C	
Materials		Polymer	
Grid dimension		50 mm	
Dimensions (including interlinking block and connection block) W x L x H		50 x 107 x 50 mm	
Weight		38 g	

Connection and display components

CPX-8DE



CPX-4DE



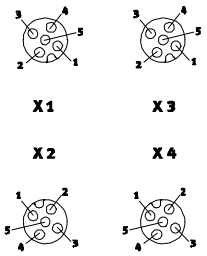
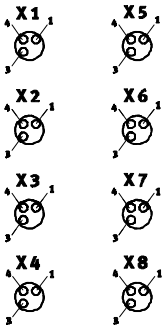
[1] Status LEDs (green)
Allocation to inputs
➔ Pin allocation for module

[2] Error LED (red)

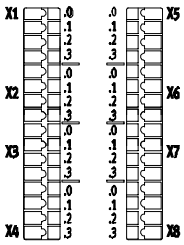
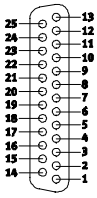
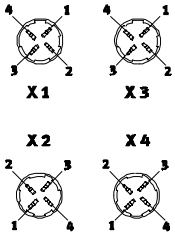
Connection block/digital input module combinations

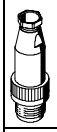
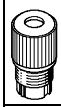
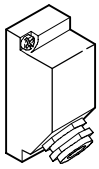
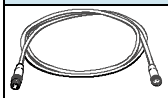
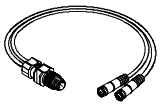
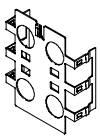
Connection blocks	Part No.	Digital input modules	
		CPX-8DE	CPX-4DE
CPX-AB-4-M12X2-5POL	**195 704**	■	■
CPX-AB-8-M8-3POL	**195 706**	■	■
CPX-AB-8-KL-4POL	**195 708**	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■
CPX-AB-4-HAR-4POL	**525 636**	■	■
CPX-AB-4-M12-8POL	**526 178**	–	–

Pin allocation

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

Pin allocation

Connection block inputs		CPX-8DE		CPX-4DE	
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+2 X3.3: FE X4.0: 24 V_{SEN} X4.1: 0 V_{SEN} X4.2: Input x+3 X4.3: FE	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input x+4 X5.3: FE X6.0: 24 V_{SEN} X6.1: 0 V_{SEN} X6.2: Input x+5 X6.3: FE X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input x+6 X7.3: FE X8.0: 24 V_{SEN} X8.1: 0 V_{SEN} X8.2: Input x+7 X8.3: FE	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
CPX-AB-1-SUB-BU-25POL					
		1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 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+4 15: Input x+5 16: Input x+6 17: Input x+7 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+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
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: 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	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

Ordering data				
Designation			Type	Part No.
Plug				
	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 plug, 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**
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**
	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**
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 – Output module, digital

FESTO

Function

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

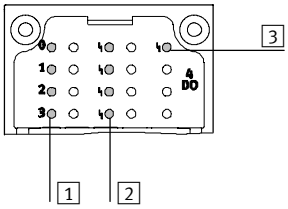
Applications

- Output module for 24 V DC supply voltage
- PNP logic
- Supports connection blocks with M12, M8, Sub-D, Harax and terminal connection
- 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 diagnosis through integrated electronic fuse protection in each channel

General technical data		
Type		**CPX-4DA**
Part No.		**195 754**
No. of outputs		4
Max. power supply	per module	4 A
	per channel	1 A (24 W lamp load, 4 channels can be connected in parallel)
Protection (short circuit)		Internal electronic fuse protection for each channel
Module current consumption (voltage supply for electronics)		Typical 16 mA
Supply voltage		24 V DC ±25%
Electrical isolation	Channel – Channel	No
	Channel – Internal bus	Yes, using an intermediate supply
Output characteristic curve		To IEC 1131-2
Switching logic		Positive logic (PNP)
LED displays	Group diagnosis	1
	Channel diagnosis	4
	Channel status	4
Diagnosis		■ Short circuit/overload, channel x ■ Load voltage outputs
Parameterisation		■ Module monitoring ■ Behaviour after short circuit ■ Failsafe channel x ■ Forcing channel x ■ Idle mode channel x
Protection class to EN 60 529		Depending on connection block
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block and connection block) W x L x H		50 x 107 x 50 mm
Weight		38 g

Connection and display components

CPX-4DA

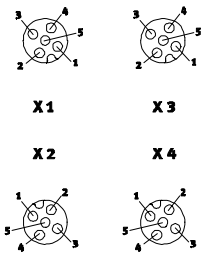
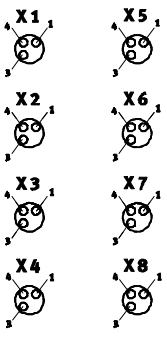


1 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module
2 Channel-oriented error LEDs (red)
3 Error LED (red, module error)

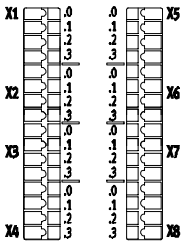
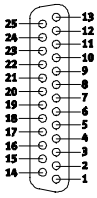
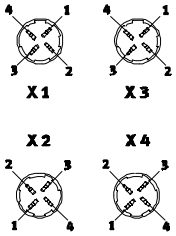
Connection block/digital output module combinations

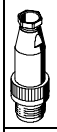
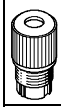
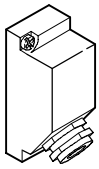
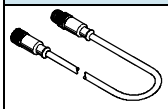
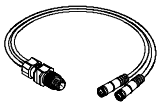
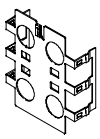
Connection blocks	Part No.	Digital output module
		CPX-4DA
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-8-M8-3POL	**195 706**	■
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-HAR-4POL	**525 636**	■
CPX-AB-4-M12-8POL	**526 178**	–

Pin allocation

Connection block outputs		CPX-4DA	
CPX-AB-4-M12X2-5POL			
		X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE X2.1: n.c. X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X2.5: FE	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2 X3.5: FE X4.1: n.c. X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3 X4.5: FE
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.

Pin allocation

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

Ordering data				
Designation			Type	Part No.
Plug				
	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 plug, 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**
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**
	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**
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**

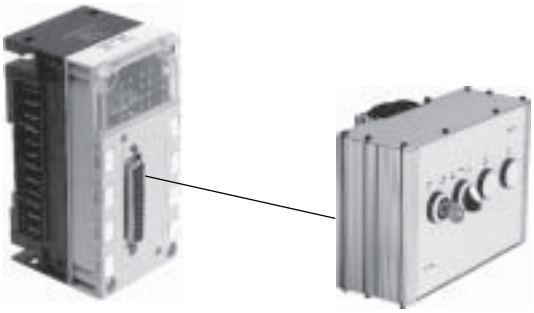
Terminal CPX

Technical data – Input/output module, digital

Applications

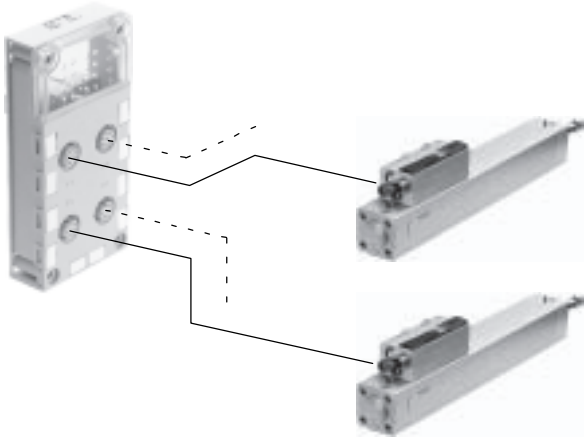
- Digital multi I/O module for 24 V DC supply voltage
- Supports connection blocks with Sub-D, terminal connection and M12 connection (8-pin)
- Module features can be parameterised
- The inputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive the voltage supply for the electronics and outputs from the interlinking block
- Module protection and diagnosis 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. 2 inputs and 2 outputs per socket are supported for each cylinder-valve combination. 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 IP65 protection, the terminal connection block produces an identical result for installation with IP20 protection.

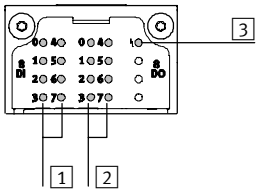
Terminal CPX

Technical data – Input/output module, digital

General technical data		
Type		**CPX-8DE-8DA**
Part No.		**526 257**
Number	Inputs	8
	Outputs	8
Max. power supply per module	Sensor supply	0.5 A
	Outputs	4 A
Max. power supply per channel	Sensor supply	0.5 A
	Outputs	0.5 A
Max. power supply per channel		0.5 A (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 current consumption	Inputs	Typical 22 mA
	Outputs	Typical 34 mA
Supply voltage	Sensors	24 V DC ±25%
	Outputs	24 V DC ±25%
Electrical isolation, inputs	Channel – Channel	No
	Channel – Internal bus	No
Electrical 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	≤ 5 V
	Signal 1	≥ 11 V
Switch-on debounce time		3 ms (0.1 ms, 10 ms, 20 ms parameterisable)
Switching logic		Positive logic (PNP)
LED displays	Group diagnosis	1
	Channel diagnosis	–
	Channel status	16
Diagnosis	Inputs	■ Short circuit/overload, sensor supply
	Outputs	■ Short circuit/overload, output channel x ■ Load voltage outputs
Parameterisation	Inputs	■ Module monitoring ■ Behaviour after short circuit, sensor supply ■ Switch-on debounce time ■ Signal stretching time, inputs
	Outputs	■ Behaviour after short circuit ■ Failsafe channel x ■ Forcing channel x ■ Idle mode channel x
Protection class to EN 60 529		Depending on connection block
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block and connection block) W x L x H		50 x 107 x 50 mm
Weight		38 g

Connection and display components

CPX-8DE-8DA



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

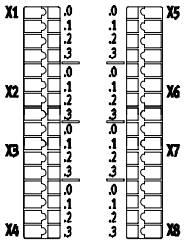
2 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module

3 Error LED (red)
(module error)

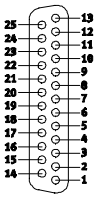
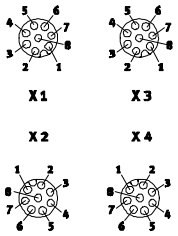
Connection block/digital input/output module combinations

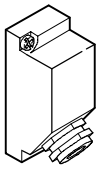
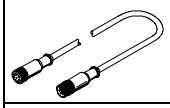
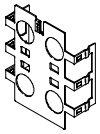
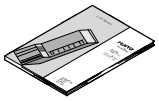
Connection blocks	Part No.	Digital I/O module
		CPX-8DE-8DA
CPX-AB-4-M12X2-5POL	**195 704**	–
CPX-AB-8-M8-3POL	**195 706**	–
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-HAR-4POL	**525 636**	–
CPX-AB-4-M12-8POL	**526 178**	■

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

Pin allocation

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

Ordering data				
Designation			Type	Part No.
Plug				
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Cable				
	Connecting cable M12		**KM12-8GD8GS-2-PU**	**525 617**
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 standard analogue interface such as pressure switches, temperature, flow rate, filling level, etc. Depending on the connection block selected, the analogue module supports different connection concepts with different numbers of sockets or clamps.

Applications

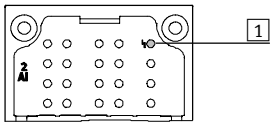
- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without electrical isolation possible
- The analogue module receives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

General technical data		
Type	**CPX-2AE-U-I**	
Part No.	**526 168**	
	Voltage input	Current input
Number of analogue inputs	2	
Max. power supply per module	0.7 A	
Fuse protection	Internal electronic fuse protection for sensor supply	
Current consumption from 24 V sensor supply (quiescent current)	Max. 100 mA	
Current consumption from 24 V sensor supply (at full load)	Max. 0.7 A	
Supply voltage of sensors	24 V DC ±25%	
Signal range (parameterisable for each channel by means of DIL switch or software)	0 ... 10 V	0 ... 20 mA 4 ... 2 mA
Resolution	12 bit	
No. of units	4096	
Absolute precision	±0.5%	±0.6%
Linearity errors (no software scaling)	±0.05%	
Repetition accuracy (at 25 °C)	0.15%	
Input resistance	100 kΩ	≤ 100 Ω
Max. permissible input voltage	30 V	–
Max. permissible input current	–	40 mA
Conversion time per channel	Typical 70 µs	
Cycle time (module)	≤ 2.5 ms	

General technical data		
Type		**CPX-2AE-U-I**
Part No.		**526 168**
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
Line length		Max. 30 m (screened)
Electrical isolation	Channel – Channel	No
	Channel – Internal bus	Yes, with external sensor supply
	Channel – Sensor supply	Yes, with external sensor supply
LED displays	Group diagnosis	1
	Channel diagnosis	Yes, by means of flashing frequency of group diagnosis
Diagnosis		■ Short circuit/overload, sensor supply ■ Parameterisation errors ■ Value falling below nominal range/full-scale value ■ Value exceeding nominal range/full-scale value ■ Wire break
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 ■ Signal range ■ Measured value smoothing
Protection class to EN 60 529		Depending on connection block
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Polymer
Grid dimension		50 mm
Dimensions (including interlinking block and connection block) W x L x H		50 x 107 x 50 mm
Weight		38 g

Connection and display components

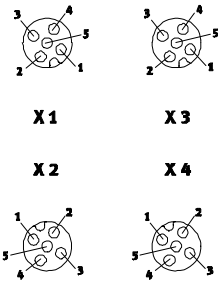
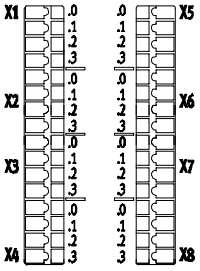
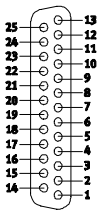
CPX-2AE-U-I



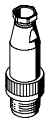
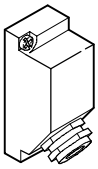
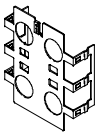
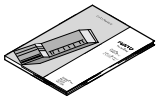
1 Error LED (red; module error)

Connection block/analogue module combinations		
Connection blocks	Part No.	Analogue module
		CPX-2AE-U-I
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-8-M8-3POL	**195 706**	–
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-HAR-4POL	**525 636**	–
CPX-AB-4-M12-8POL	**526 178**	–

Pin allocation

Connection block inputs		CPX-2AE-U-I	
CPX-AB-4-M12X2-5POL			
		X1.1: 24 V_{SEN} X1.2: Input U0+ X1.3: 0 V_{SEN} X1.4: Input U0– X1.5: FE X2.1: 24 V_{SEN} X2.2: Input I0+ X2.3: 0 V_{SEN} X2.4: Input I0– X2.5: FE	X3.1: 24 V_{SEN} X3.2: Input U1+ X3.3: 0 V_{SEN} X3.4: Input U1– X3.5: FE X4.1: 24 V_{SEN} X4.2: Input I1+ X4.3: 0 V_{SEN} X4.4: Input I1– X4.5: FE
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
CPX-AB-1-SUB-BU-25POL			
		1: Input U0– 2: Input U0+ 3: Input I0– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: Screen[1)]	14: Input U1– 15: Input U1+ 16: Input I1– 17: Input I1+ 18: 24 V_{SEN} 19: n.c. 20: 24 V_{SEN} 21: n.c. 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE Socket: FE

1) Connect screening to functional earthing 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**
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 different connection concepts with different numbers of sockets or clamps.

Applications

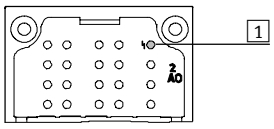
- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without electrical isolation possible
- The analogue module receives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

General technical data			
Type		CPX-2AA-U-I	
Part No.		526 170	
		Voltage output	Current output
Number of analogue outputs		2	
Max. actuator supply per module		2.8 A	
Fuse protection		Internal electronic fuse protection for actuator supply	
Current consumption from 24 V sensor supply (at full load)		Typical 150 mA	
Current consumption from 24 V actuator supply (at full load)		4 ... 10 A	
Supply voltage for actuators		24 V DC ±25%	
Signal range (parameterisable for each channel by means of DIL switch or software)		0 ... 10 V	0 ... 20 mA 4 ... 2 mA
Resolution		12 bit	
No. of units		4096	
Absolute precision		±0.6%	
Linearity errors (no software scaling)		±0.1%	
Repetition accuracy (at 25 °C)		0.05%	
Encoder selection	Load resistance for ohmic load	Min. 1 kΩ	Max. 500 Ω
	Load resistance for capacitive load	Max. 1 µF	–
	Load resistance for inductive load	–	Max. 1 mH
	Short circuit protection analogue output	Yes	–
	Short circuit current analogue output	Approx. 20 mA	–
	Open circuit voltage	–	18 V
	Destruction limit against externally applied voltage	15 V	
	Actuator connection	2 wires	
Cycle time (module)		≤ 2.5 ms	

General technical data			
Type		CPX-2AA-U-I	
Part No.		526 170	
		Voltage output	Current output
Response time	for ohmic load	0.1 ms	
	for capacitive load	0.7 ms	–
	for inductive load	–	0.5 ms
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	
Line length		Max. 30 m (screened)	
LED displays	Group diagnosis	1	
	Channel diagnosis	Yes, by means of flashing frequency of group diagnosis	
Diagnosis		■ 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 60 529		Depending on connection block	
Temperature range	Operation	–5 ... +50 °C	
	Storage/transport	–20 ... +70 °C	
Materials		Polymer	
Grid dimension		50 mm	
Dimensions (including interlinking block and connection block) W x L x H		50 x 107 x 50 mm	
Weight		38 g	

Connection and display components

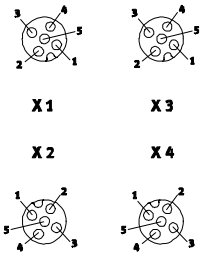
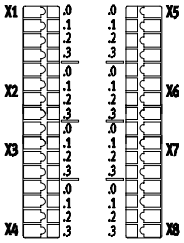
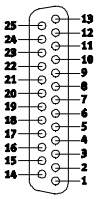
CPX-2AA-U-I



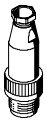
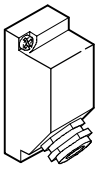
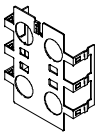
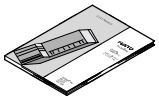
1 Error LED (red; module error)

Connection block/analogue module combinations		
Connection blocks	Part No.	Analogue module
		CPX-2AA-U-I
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-8-M8-3POL	**195 706**	–
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-HAR-4POL	**525 636**	–
CPX-AB-4-M12-8POL	**526 178**	–

Pin allocation

Connection block outputs		CPX-2AA-U-I	
CPX-AB-4-M12X2-5POL			
		X1.1: 24 V_{OUT} X1.2: Output U0+ X1.3: 0 V_{OUT} X1.4: Output GND X1.5: FE X2.1: 24 V_{OUT} X2.2: Output I0+ X2.3: 0 V_{OUT} X2.4: Output GND X2.5: FE	X3.1: 24 V_{OUT} X3.2: Output U1+ X3.3: 0 V_{OUT} X3.4: Output GND X3.5: FE X4.1: 24 V_{OUT} X4.2: Output I1+ X4.3: 0 V_{OUT} X4.4: Output GND X4.5: FE
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: Screen[1)]	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) Connect screening to functional earthing 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**
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 – Pneumatic interface MPA

FESTO

Function

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

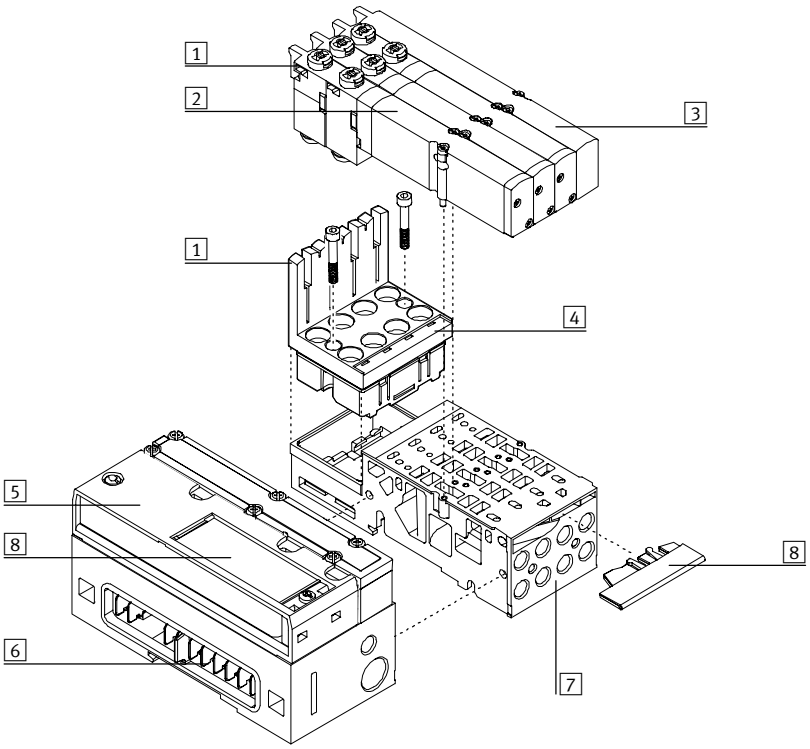
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA via the integrated CPX bus. The bus signal for activation of the solenoid coils is converted in the electronics module for 4 valves (max. 8 coils).

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

Applications

- Interface to the valve terminal MPA
- Max. 64 solenoid coils
- 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)
- 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:
  Detecting undervoltage of valves

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 Sub-base
8 Inscription area

Terminal CPX

Technical data – Pneumatic interface CPA

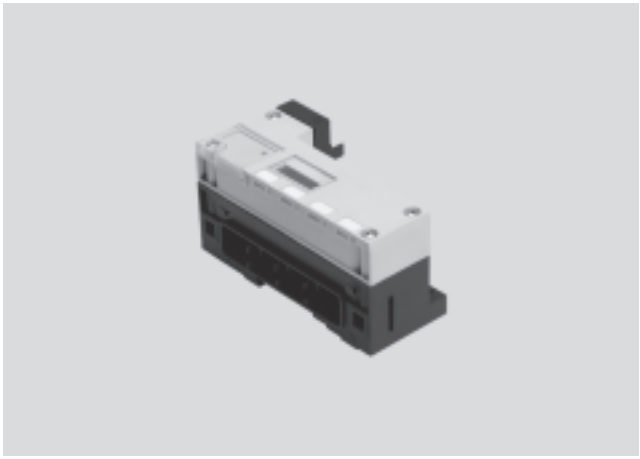
FESTO

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

Applications

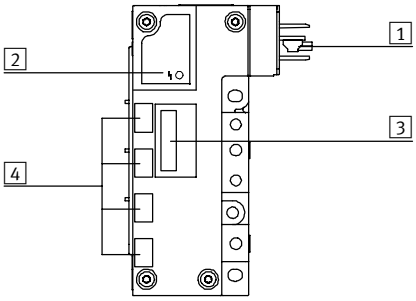
- Interface to CPA10 and CPA14 valve terminals
- Max. 22 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication 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 Part No.		**CPX-GP-CPA-10** **195 710**	**CPX-GP-CPA-14** **195 712**
Number of solenoid coils		22	22
Max. power supply	per module	4 A	
	per channel	0.2 A	
Fuse protection		Internal electronic fuse protection for each valve output	
Module current consumption from electronics/sensor supply		Typical 15 mA	
Supply voltage for valves		24 V DC +10% –15%	
Electrical isolation	Channel – Channel	No	
	Channel – Internal bus	Yes, using an additional power supply for valves (in preparation)	
LED displays	Group diagnosis	1	
	Channel diagnosis	–	
	Channel status	– (on valves)	
Diagnosis		■ 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 60 529		IP65	
Temperature range	Operation	–5 ... +50 °C	
	Storage/transport	–20 ... +70 °C	
Materials		Polymer	
Grid dimension		50 mm	
Dimensions W x L x H		50 x 110 x 58 mm	
Weight		150 g	

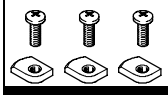
Connection and display components

CPX-GP-CPA-...



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

Ordering data

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

Terminal CPX

Technical data – Pneumatic interface MIDI/MAXI

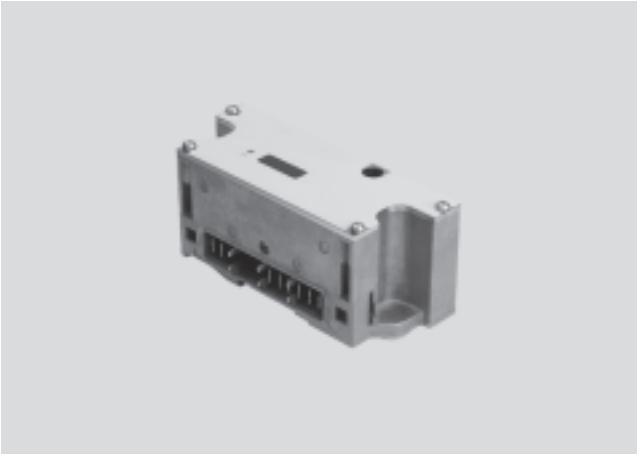
FESTO

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

Applications

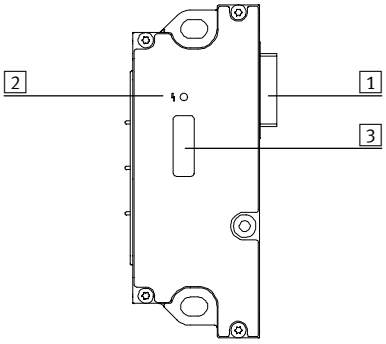
- Interface to valve terminals MIDI/MAXI
- Max. 26 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication being 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**
Part No.		**195 738**
Number of solenoid coils		26
Max. power supply	per module	4 A
	per channel	0.2 A
Fuse protection		Internal electronic fuse protection for each valve output
Module current consumption from electronics/sensor supply		Typical 15 mA
Supply voltage for valves		24 V DC +10% –15%
Electrical isolation	Channel – Channel	No
	Channel – Internal bus	Yes, using an additional power supply for valves (in preparation)
LED displays	Group diagnosis	1
	Channel diagnosis	–
	Channel status	– (on valves)
Diagnosis		■ Load voltage of valves
Parameterisation		■ Module monitoring ■ Fail-safe behaviour, channel x
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials		Die-cast aluminium
Grid dimension		50 mm
Dimensions W x L x H		50 x 132 x 55 mm
Weight		390 g

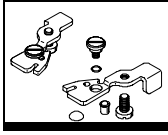
Connection and display components

CPX-GP-03-4,0



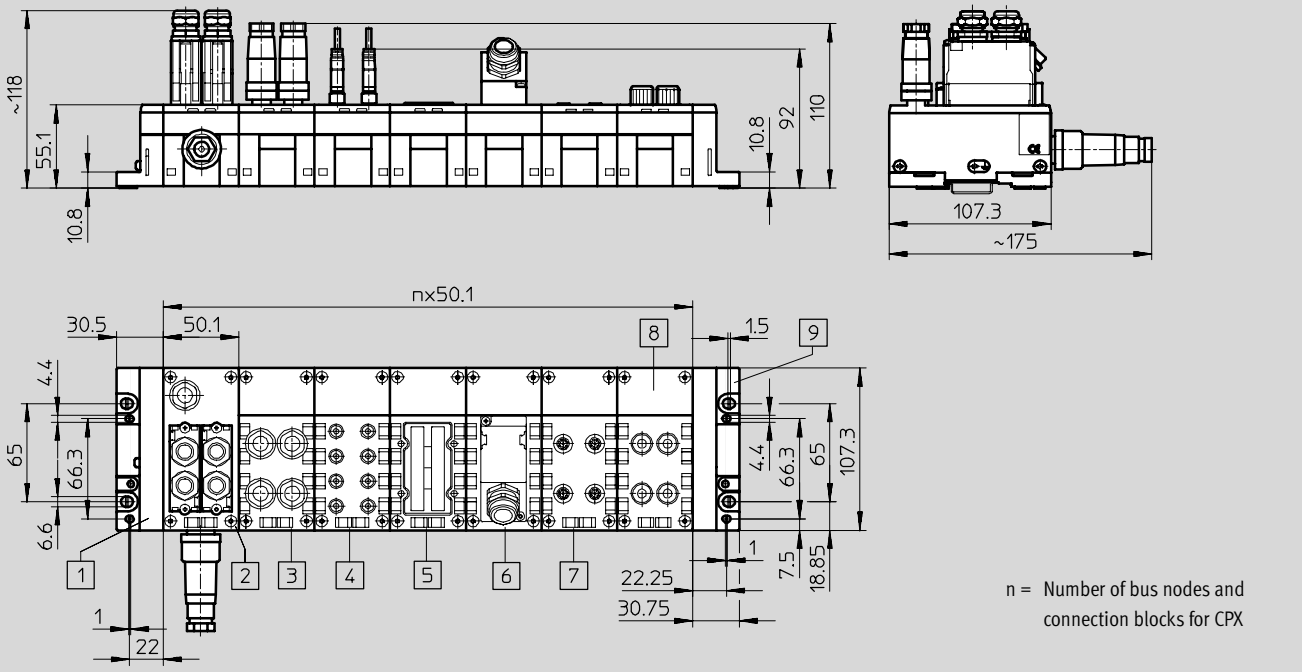
1 Connecting plug to valves
2 Error LED (red)
3 DIL switch under transparent cover

Ordering data

Designation		Type	Part No.
Attachment for 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**

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

with bus nodes and connection blocks

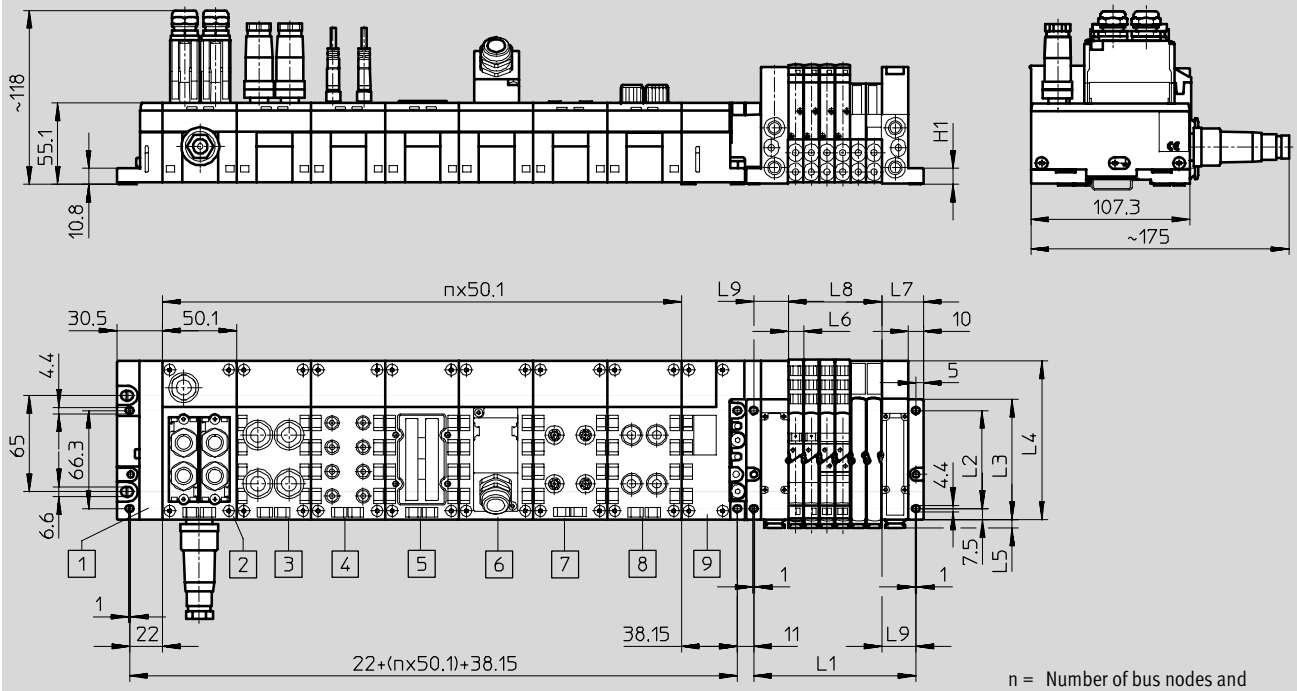


n = Number of bus nodes and connection blocks for CPX

1 End plate, left-hand
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 End plate, right-hand

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

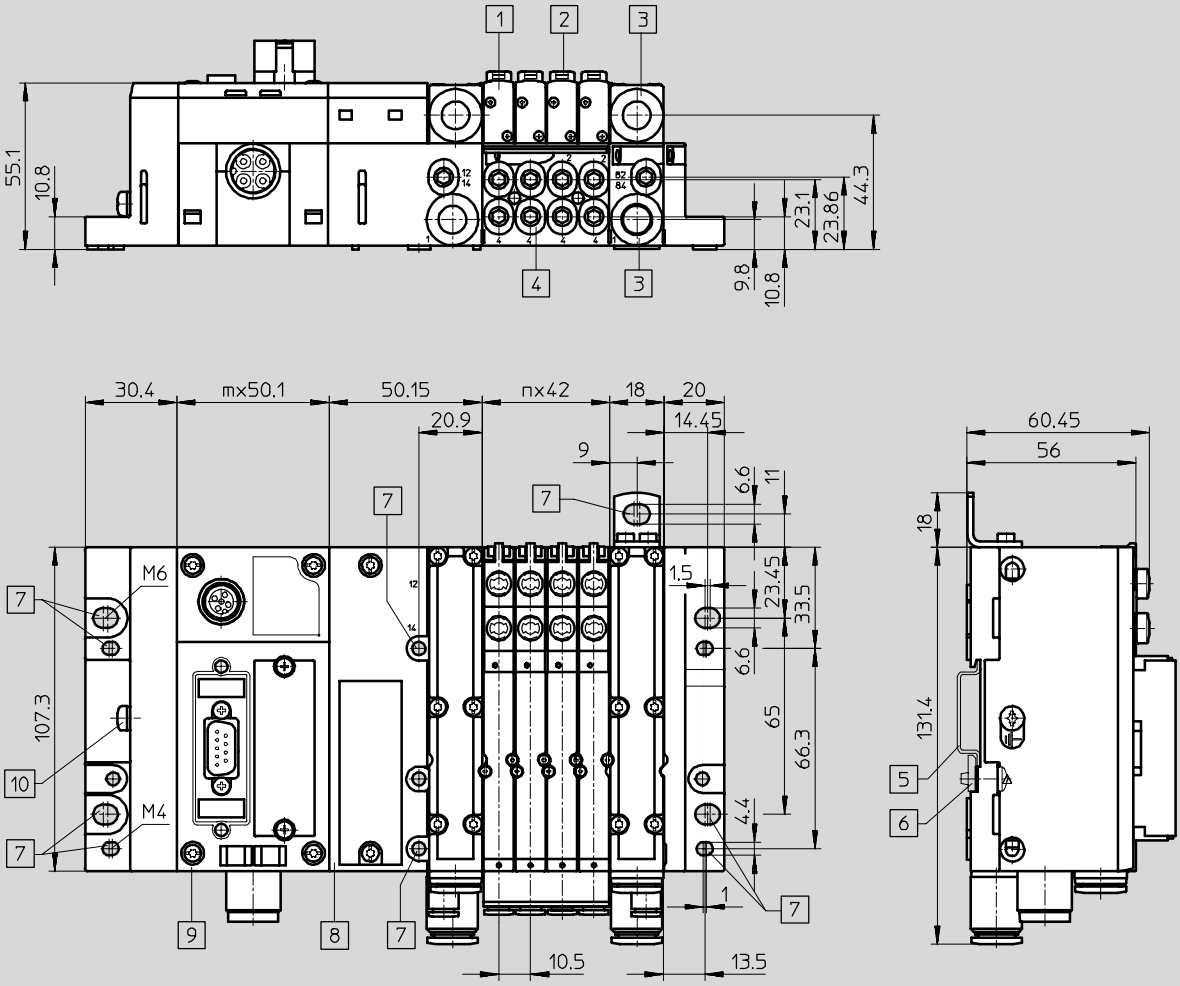
1 End plate, left-hand
2 Bus node
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Pneumatic interface CPA

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



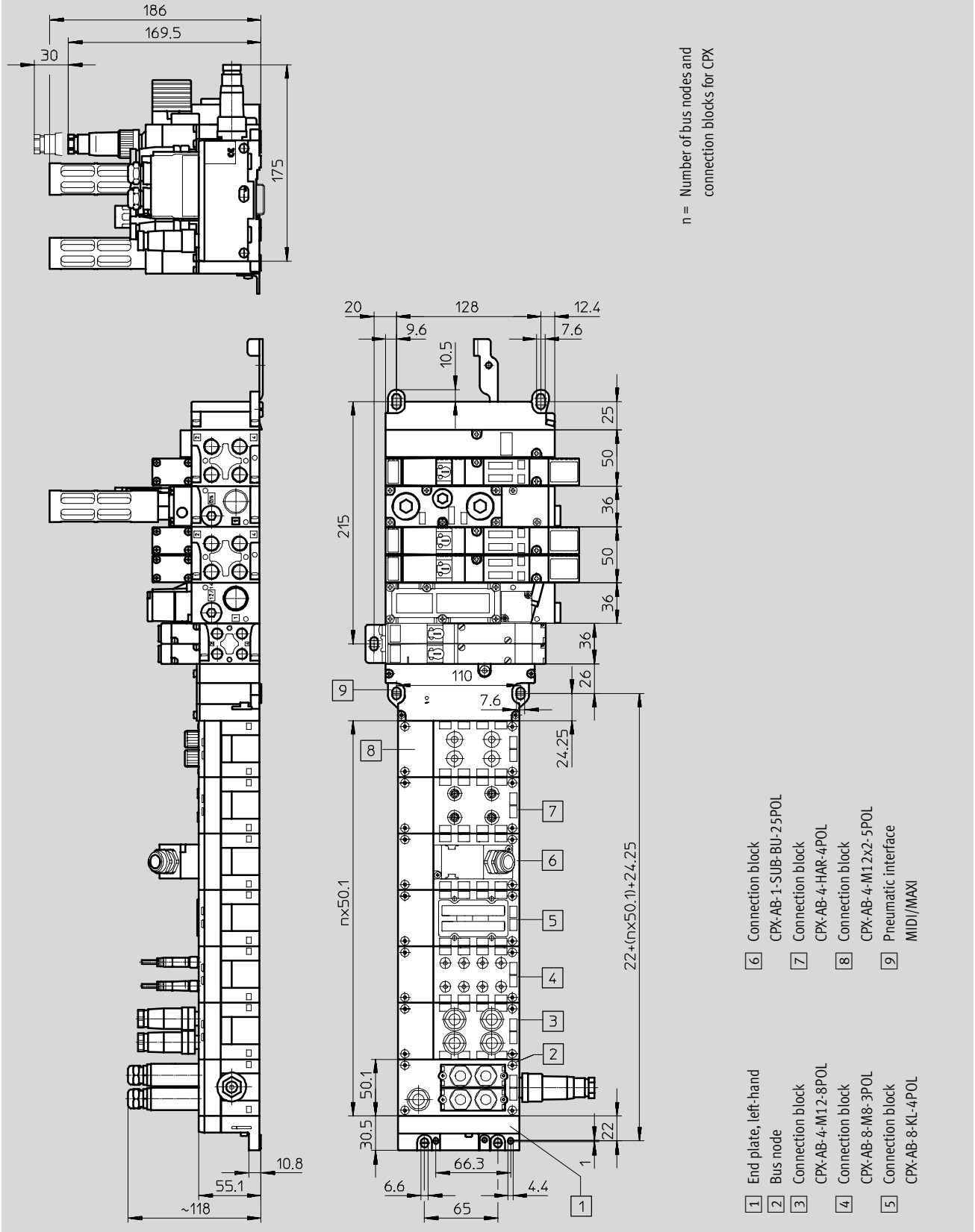
m = Number of bus nodes and connection blocks for CPX

n = Number of sub-bases in a grid of 4 valves

1 Solenoid valve
2 Manual override
3 Supply/exhaust ports
4 Working lines
5 H-rail
6 H-rail mounting
7 Mounting holes
8 Pneumatic interface MPA
9 Bus node
10 Earthing screw

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

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



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, while the order code for the pneumatic part depends on the selected valve terminal pneumatic components, e.g. 12P-14-CX-... for CPA14

- 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	CPX without pneumatics	50E-...
530 411	Valve terminal MPA with CPX	50E-... 32P-CX-...
173 520	Valve terminal CPA10 with CPX	50E-... 12P-10-CX-...
174 001	Valve terminal CPA14 with CPX	50E-... 12P-14-CX-...
18 980	Valve terminal MIDI/ MAXI with CPX	50E-... 03P-...

General basic data and guidelines

The order code 50E allows 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 / 4.8-8)
- Supported electronics module-connection technology combinations (➔ 4 / 4.8-8)
- Restrictions with regard to the number of modules depending on the selected bus node in borderline cases (➔ 4 / 4.8-16)
- General limit values and guidelines with regard to supplies (➔ 4 / 4.8-13)

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.

Ordering example

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

The next two pages show the same example in modular form.

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 from the example consists of the following:

- System description – CPX
- 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

The user documentation for the CPX terminal is included in the price for the pneumatic interface or right-hand end plate.

The code letter B stands for an express waiver of the user documentation where the relevant manual is already available. A credit note will be given for the amount in question.

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

M **Mandatory data** ➔

Module No.	Valve terminal, electrical part	Electrical module position 0 … 9

		Electrical actuator/ inputs and outputs position 0 … 9	Connection technology position 0 … 9
197 330	50E	F06 Fieldbus node for INTERBUS-S F11 Fieldbus node for DeviceNet F13 Fieldbus node for PROFIBUS DP F14 Fieldbus node for CANopen F23 Fieldbus node for CC-Link E Input module, 8 digital inputs F Input module, 4 digital inputs A Output module, 4 digital outputs Y Input/output module, 16-fold, 8 digital inputs/ outputs each U Input module, 2 analogue inputs P Output module, 2 analogue outputs	GA Fieldbus connection, 2xM12 5-pin DNet/CAN GB Connection set, 5-pin clamp, for DNet/CAN GC Connection, 9-pin Sub-D, no fieldbus connector GD Fieldbus connector IP65 for DNet/CAN GE Sub-D fieldbus connector for PROFIBUS DP GF Connection set, 2xM12, 5-pin RK, for PROFIBUS DP GI Connection set, 9-pin, Sub-D INTERBUS GL Fieldbus connection screw terminal for CC-Link GM Fieldbus connection IP65, 9-pin, Sub-D for CC-Link X Connection block, 4xM12, 5-pin, double W Connection block, 4xM12, 5-pin, double, screened R Connection block, 8xM8, 3-pin J Connection block, 8x CageClamp clamps, 4-pin H Connection block, Harax, 4x4-pin B Connection block, Sub-D, 25-pin socket C Connection block, 4xM12, 8-pin (DNCV)

Ordering example

Module positions

		0	1	2	3	4	5	6	7	8	9	
197 330	**50E**	–	**F13**	**E**	**E**	**A**	**Y**	**U**	**U**	**U**	**P**	–
			GE	**X**	**X**	**X**	**B**	**X**	**X**	**X**	**X**	
			S									

S Interlinking block with system supply
Z Interlinking block with additional power supply
V Interlinking block with valve supply

Supply position 0 … 9

O **Options**

M Mandatory data				O Options
Pneumatic interface		**User documentation**		**Electrical accessories**
Z CPX end plate, right-hand B CPX pneumatic interface to CPA10 C CPX pneumatic interface to CPA14 A CPX pneumatic interface to Midi/Maxi D CPX pneumatic interface to MPA		D German E English F French I Italian J Japanese S Spanish V Swedish B Express waiver - no manual to be included		...N Power supply socket, straight (for 1.5 mm²) ...M Power supply socket, straight (for 2.5 mm²) ...I Power supply socket, angled (for 1.5 mm²) ...J Power supply socket, angled (for 2.5 mm²) ...S Sensor plug straight, M12, PG7 ...T Sensor plug straight, M12, PG9 ...W Sensor plug, 4-pin, M12, for 2.5 mm cable ∅ ...P Sensor plug M12, 5 pin ...X DUO plug M12 for 2 cables ...K DUO plug M12 for 2 cables, 5-pin ...C Sensor plug, straight, M8, screw-in ...R Sensor plug, straight, M8, solderable ...A Sensor plug, Harax, 4-pin ...E Sub-D plug, 25-pin H H-rail attachment suitable for CPX
A	–	**E**	+	**1M20X1E**

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M **Mandatory data** ➔

Module No.	Valve terminal, electrical part	Electrical module position 0 … 9									
		Electrical actuator/ inputs and outputs position 0 … 9					Connection technology position 0 … 9				
Ordering example		Module positions 0	1	2	3	4	5	6	7	8	9
197 330	50E	– F13	E	E	A	Y	U	U	U	P	–
		GE	X	X	X	B	X	X	X	X	
		S									
		Supply position 0 … 9									
		O **Options**									

Ordering table

			Condi-tions	Code	Enter code
M	Module No.	**197 330**			
	Valve terminal, electrical part	CPX modular electrical terminal		**50E**	50E
	Electrical module position 0 … 9			**-**	-
	Electrical actuator/inputs and outputs position 0 … 9	Fieldbus node for INTERBUS-S	1	**F06**	
		Fieldbus node for DeviceNet	1	**F11**	
		Fieldbus node for PROFIBUS DP	1	**F13**	
		Fieldbus node for CANopen	1	**F14**	
		Fieldbus node for CC-Link	1	**F23**	
		Input module, 8 digital inputs		**E**	
		Input module, 4 digital inputs		**F**	
		Output module, 4 digital outputs		**A**	
		Input/output module, 16-fold, 8 digital inputs/outputs each		**Y**	
		Input module, 2 analogue inputs		**U**	
		Output module, 2 analogue outputs		**P**	
	Connection technology position 0 … 9	Fieldbus connection, 2xM12 5-pin, DNet/CAN		**GA**	
		Connection set, 5-pin clamp, for DNet/CAN		**GB**	
		Connection, 9-pin Sub-D, no fieldbus connector		**GC**	
		Fieldbus connector IP65 for DeviceNet/CAN		**GD**	
		Sub-D fieldbus connector for PROFIBUS DP		**GE**	
		Connection set, 2xM12, 5-pin RK, for PROFIBUS DP		**GF**	
		Connection set, 9-pin, Sub-D INTERBUS		**GI**	
		Fieldbus connection screw terminal for CC-Link		**GL**	
		Fieldbus connection IP65, 9-pin, Sub-D for CC-Link		**GM**	
		Connection block, 4xM12, 5-pin, double		**X**	
		Connection block, 4xM12, 5-pin, double, screened		**W**	
		Connection block, 8xM8, 3-pin		**R**	
		Connection block, 8x CageClamp clamps, 4-pin		**J**	
		Connection block, Harax, 4x4-pin		**H**	
		Connection block, Sub-D, 25-pin socket		**B**	
		Connection block, 4xM12, 8-pin (DNCV)		**C**	
O	Feed for position 0 … 9	Interlinking block with system supply		**S**	
		Interlinking block with additional power supply	2	**Z**	
↓		Interlinking block with valve supply	2	**V**	

1 **F...** Observe maximum number of inputs/outputs; ➔ Tables 4 / 4.8-16.

2 **Z, V** Always to the right of system supply S.

Terminal CPX

Ordering data – Modular products

FESTO

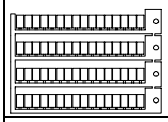
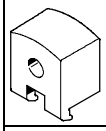
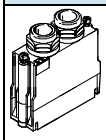
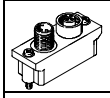
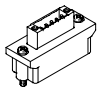
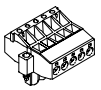
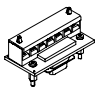
[M] Mandatory data				[O] Options
Pneumatic interface		**User documentation**		**Electrical accessories**
A	–	**E**	+	**1M20X1E**

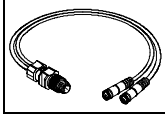
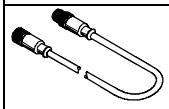
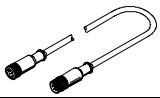
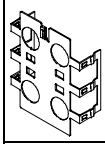
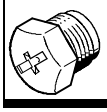
Ordering table

Module No.			197 330	Condi-tions	Code		Enter code
↓ [M]	Pneumatic interface		CPX end plate, right-hand	[3]	**-Z**		
			CPX pneumatic interface to CPA10	[4]	**-B**		
			CPX pneumatic interface to CPA14	[5]	**-C**		
			CPX pneumatic interface to Midi/Maxi	[6]	**-A**		
			CPX pneumatic interface to MPA	[7]	**-D**		
	User documentation		German		**-D**		
			English		**-E**		
			French		**-F**		
			Italian		**-I**		
			Spanish		**-S**		
			Swedish		**-V**		
			Express waiver - no manual to be included (already available)		**-B**		
[O]	Electrical accessories				**+**		+
	Power supply socket, straight for	1.5 mm²	1 … 99 (NTSD-GD-9)		**…N**		
		2.5 mm²	1 … 99 (NTSD-GD-13,5)		**…M**		
	Power supply socket, angled for	1.5 mm²	1 … 99 (NTSD-WD-9)		**…I**		
		2.5 mm²	1 … 99 (NTSD-WD-11)		**…J**		
	Sensor plug, straight, M12	PG7	1 … 99 (SEA-GS-7)		**…S**		
		PG9	1 … 99 (SEA-GS-9)		**…T**		
	Sensor plug, M12	4-pin, for 2.5 mm cable ∅	1 … 99 (SEA-4GS-7-2,5)		**…W**		
		5-pin	1 … 99 (SEA-5GS-PG7)		**…P**		
	DUO plug, M12	for 2 cables	1 … 99 (SEA-GS-11-DUO)		**…X**		
		for 2 cables, 5-pin	1 … 99 (SEA-5GS-11-DUO)		**…K**		
	Sensor plug, straight, M8	screw-in type	1 … 99 (SEA-GS-M8)		**…C**		
		solderable	1 … 99 (SEA-3GS-M8-5)		**…R**		
	Sensor plug, Harax	4-pin	1 … 99 (SEA-HAR-4POL)		**…A**		
	Plug, Sub-D	25-pin	1 … 99 (SD-SUB-D-ST25)		**…E**		
	H-rail attachment (to match your CPX order)		1 (CPA-BG-NRH)		**H**		

[3] **Z** Only for CPX without pneumatics (197 330), but then essential.
[4] **B** Only for CPX with CPA10 (173 520), but then essential.
[5] **C** Only for CPX with CPA14 (174 001), but then essential.
[6] **A** Only for CPX with Midi/Maxi (18 980), but then essential.
[7] **D** Only for CPX with MPA (530 411), but then essential.

Ordering data – Accessories

Designation		Type	Part No.
Inscription labels			
	Inscription labels, 6x10, 64 pieces, in frames	**IBS-6x10**	**18 576**
Mounting			
	Attachment for wall mounting (for long valve terminals, 10 pieces)	**CPX-BG-RW-10x**	**529 040**
Plugs, sockets and accessories			
	Plug Sub-D for INTERBUS	Incoming	**FBS-SUB-9-BU-IB**	**525 673**
			FBS-SUB-9-BU-IB-B	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB**	**525 674**
			FBS-SUB-9-GS-IB-B	**532 217**
	Plug Sub-D for DeviceNet/CANopen		**FBS-SUB-9-BU-2x4POL**	**197 960**
			FBS-SUB-9-BU-2x5POL-B	**532 219**
	Plug Sub-D for Profibus DP		**FBS-SUB-9-GS-9**	**18 529**
			FBS-SUB-9-GS-DP-B	**532 216**
	Plug Sub-D for CC-Link		**FBS-SUB-9-GS-2x4POL-B**	**532 220**
	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**
	Bus connection Open Style for 5-pin terminal strip for DeviceNet/CANopen		**FBA-1-SL-5POL**	**525 634**
	Bus connection 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**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**

Ordering data – Accessories				
Designation			Type	Part No.
Cables and accessories				
	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**
	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**
	Connecting cable M12		**KM12-8GD8GS-2-PU**	**525 617**
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
	Cover cap (10 pieces)	for M8 connections	**ISK-M8**	**177 672**
		for M12 connections	**ISK-M12**	**165 592**