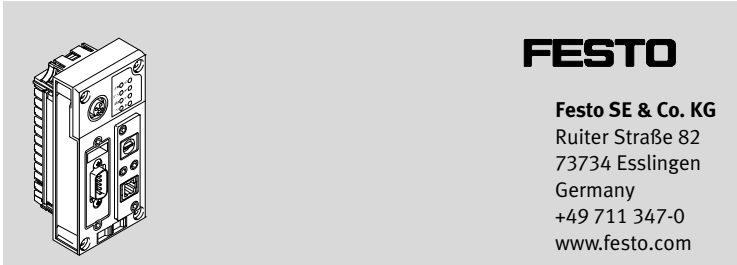


Control block
CPX-CEC



Brief description (Translation of the original instructions) CODESYS controller
8060496
2018-05c
[8060498]

Control block CPX-CEC English

- 1 Use for intended purpose
The control block is intended exclusively for use in machines or automated systems.
The control block serves as CODESYS controller for:
- Controlling CPX terminals
- Controlling pneumatic and electric actuators
- Communication via Ethernet
The control block may only be used as follows:
- As intended in industrial environments. Outside of industrial environments, e.g. in commercial and mixed-residential areas, actions to suppress interference may have to be taken.
- In its original condition, without unauthorised modifications.
- In faultless technical condition.
- Only in combination with approved components.
- Within the limits of the product defined through the technical data.
Additional information:
- In the description of the control block -> Fig. 1
- In the CPX system description -> CPX-SYS-...
- On Modbus TCP -> www.modbus.org

All available documents for the product -> www.festo.com/pk.

CANopen®, CODESYS®, MODBUS® are registered trademarks of the respective trademark owners in certain countries.

This product uses open-source software which is subject to the "GNU General Public License, Version 2". The license terms of the GPL are available within the programming system as well as at the following addresses:
- http://www.gnu.org/copyleft/gpl.html
- Internal CPX-CEC-...-V3 web server: http://<IP address of the device>/cgi-bin/system-about

Variants

The control block is available in the following variants:

Table with 4 columns: Control block, CODESYS, Interface, Description. Rows include CPX-CEC, CPX-CEC-C1, CPX-CEC-M1, CPC-CEC-S1-V3, CPX-CEC-C1-V3, and CPX-CEC-M1-V3.

1) Discontinued 12/2015, alternative product: CPX-CEC-M1-V3

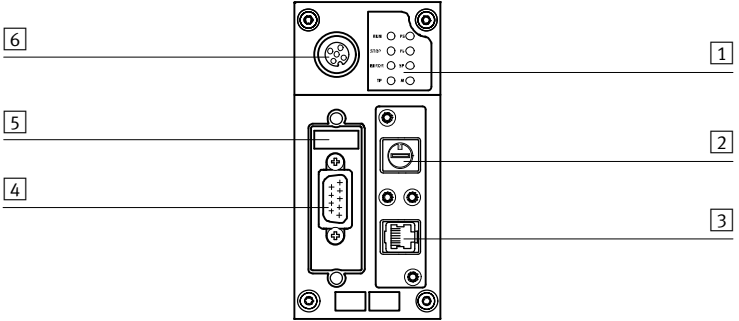
Fig. 1 Variants of the control block

Training of qualified personnel
The product must only be commissioned by trained experts in control and automation technology who are familiar with:
- Mounting, installation, operation and diagnostics of control systems, networks and fieldbus systems.
- The applicable regulations for accident prevention and occupational safety.
- The documentation for the product.

Service
Contact your regional Festo contact person if you have technical questions
-> www.festo.com.

- 2 Safety
- Before assembly or installation work:
 - Switch off the power supply.
 - Switch off the compressed air supply.
 - Exhaust any pneumatic components.
- Observe the instructions for correctly mounting the CPX terminal.
- For the electric power supply, use only PELV circuits that ensure a reliable electric disconnection from the mains network.
- Observe IEC 60204-1/EN 60204-1.
- Observe the handling specifications for electrostatically sensitive devices.
- Observe the notes on installation and power supply as well as potential equalisation (earthing measures) in the CPX system description -> CPX-SYS-...
- Use connectors with the required degree of protection -> Ensuring the degree of protection.
- Seal unused connections with covers to achieve the required degree of protection -> Ensuring the degree of protection.
- Observe the specifications in the CPX system description, in the descriptions of the valve terminal used as well as in the assembly instructions of the individual components.
- Place only a completely mounted and wired CPX terminal into operation.
- Only switch on the compressed air and load voltage if the system has been professionally installed, configured and parameterised.
- When performing maintenance and repair work, use suitable interlocks to prevent unintended movements of the actuators.

3 Connection and display components



- 1 LED indicators
2 RUN/STOP rotary switch
3 Ethernet interface
4 Communication interface1)
5 DIL switch
6 Service interface2)
1) For CPX-CEC-C1/M1/C1-V3/M1-V3: CANopen interface (plug, 9-pin, Sub-D), for CPX-CEC/-S1-V3; RS232 interface (socket, 9-pin, Sub-D).
2) Socket, M12, A-coded, 5-pin; for the operator unit CPX-MMI.

Fig. 2 Connection and display components

3.1 Ethernet interface

The Ethernet interface connection of a programming unit, PC or operator unit to the control block.

Table with 4 columns: Connection, Pin, Signal, Explanation. Rows show pin connections for TD+, TD-, RD+, RD-, and shield.

Fig. 3 Ethernet interface, socket, 8-pin, RJ45

3.2 CANopen interface (CPX-CEC-C1/M1/C1-V3/M1-V3)

Connection	Pin	Signal	Explanation
	1	N.c.	Not connected
	2	CAN_L	CAN Low
	3	CAN_GND	CAN Ground
	4	N.c	Not connected
	5	CAN_SHLD	Functional earth
	6	CAN_GND ¹⁾	CAN Ground (optional) ¹⁾
	7	CAN_H	CAN High
	8	N.c.	Not connected
	9	N.c.	Not connected
	Housing (plug)	–	Functional earth

1) Do not use pin 6 (CAN_GND) if a motor controller with external power supply is connected.

Fig. 4 CANopen interface, plug, 9-pin, Sub-D

The connected CAN-bus slaves are **not** supplied with voltage through the CANopen interface.

3.3 RS232 interface (CPX-CEC/-S1-V3)

Connection	Pin	Signal	Explanation
	1	–	Not connected
	2	RxD	Received data
	3	TxD	Transmitted data
	4	–	Not connected
	5	GND	Data reference potential
	6	–	Not connected
	7	–	Not connected
	8	–	Not connected
	9	–	Not connected
	Shield	–	Shield, functional earth

Fig. 5 RS 232 interface, socket, 9-pin, Sub-D

3.4 LED indicators – normal operating status

	1	PS	Electronics supply, sensor supply (green)
	2	PL	Load supply (green)
	3	SF	System fault (red)
	4	M	Modify/forcing active (yellow)
	5	TP	Ethernet connection link/traffic (green)
	6	ERROR	PLC run-time error (red)
	7	STOP	PLC status: stopped (yellow)
	8	RUN	PLC status: started (green)

- 1) PS: Electronics supply, sensor supply (green)

2) PL: Load supply (green)

3) SF: System fault (red)

4) M: Modify/forcing active (yellow)

5) TP: Ethernet connection link/traffic (green)
- 6) ERROR: PLC run-time error (red)

7) STOP¹⁾: PLC status: stopped (yellow)

8) RUN¹⁾: PLC status: started (green)

1) The LEDs RUN [8] and STOP [7] display the status of the RUN/STOP rotary switch.

Fig. 6 LED indicators

Behaviour of the LED indicators in normal operating status:

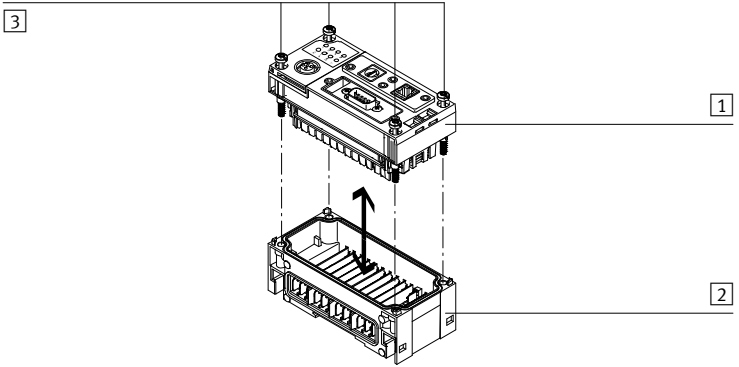
- The green LEDs [PS] and [PL] are illuminated.
- The red LEDs [SF] and [ERROR] are off.

The yellow LED [M] lights up only when “System start with saved paramet-erisation and CPX configuration” is set.

4 Assembly and disassembly

Before mounting, dismantling or installation work:

- Switch off the power supply.
- Switch off the compressed air supply.
- Exhaust any pneumatic components.



- 1 Control block CPX-CEC-...

2 Interlinking block
- 3 Screws

Fig. 7 Assembly and disassembly

4.1 Assembly

For a control block with CODESYS V2:
Mount CPX-CEC/-C1/-M1 to the left end position of the CPX terminal (position 0).

1. Check seal and seal surfaces. Replace damaged parts.
2. Insert the module into the interlinking block and push it in up to the stop.
3. Turn the screws into the existing thread.
4. Tighten the screws in diagonally opposite sequence. Tightening torque: 1 Nm ± 10 %.

4.2 Dismantling

1. Unscrew the screws.
2. Pull the control block without tilting out of the interlinking block.

5 Power supply



Caution

Risk of injury due to electric shock

- For the electric power supply, use only PELV circuits that ensure a reliable electric disconnection from the mains network.
- IEC 60204-1/EN 60204-1 to be screwed in.
- Always connect all circuits for operating and load voltage supplies U_{EL}/SEN, U_{VAL} and U_{OUT}.

The operating and load voltage supplies of the CPX terminal are supplied through an interlinking block, an end plate or a bus node → CPX system description CPX-SYS-...

6 Set switch elements

6.1 RUN/STOP rotary switch



Note

The RUN/STOP rotary switch is set to position “1” at the factory.

- Set the RUN/STOP rotary switch to position “0” (STOP) during installation to prevent automatic program start after the voltage is switched on or by commissioner.

The switch setting of the RUN/STOP rotary switch is detected by the control block and is available in CODESYS.

To set the RUN/STOP rotary switch:

- Dismount cover.

Switch setting		Function
	0	Stop Control block stopped. The STOP LED is illuminated yellow.
	1 ... F	RUN Control block started. The RUN LED is illuminated green.

Fig. 8 RUN/STOP rotary switch

6.2 DIL switch 1: Reserved

Switch setting	Function
 DIL 1.1: OFF DIL 1.2: OFF	Reserved Leave both switch elements of the DIL switch 1 set to OFF.

Fig. 9 DIL switch1

6.3 DIL switch 2: CAN bus termination

To set DIL switch 2:

- Dismount inspection cover or pull the plug from the communication interface  (→ Fig. 2).

Switch setting	Function ¹⁾
 DIL 2.1: OFF DIL 2.2: OFF	CAN bus termination (120 Ω) is switched off (factory setting).
 DIL 2.1: ON DIL 2.2: OFF	CAN bus termination (120 Ω) is switched on (only for CPX-CEC-C1/M1/C1-V3/M1-V3).
 DIL 2.1: OFF DIL 2.2: ON	Reserved
 DIL 2.1: ON DIL 2.2: ON	Reserved

1) DIL switch 2: no function in CPX-CEC/-S1-V3

Fig. 10 DIL switch2

7 Ensuring the degree of protection



Note

Short circuit
Malfunction or damage to the electronics.

- Use connection hardware with the required degree of protection.
- Seal unused connections, rotary switches and DIL switches with covers.

Mount cover

- Check seal and seal surfaces.
- Place cover and press it on.
- Tighten the screws. Tightening torque: max. 0.4 Nm.

Connection/switch	Connection technology	Cover
Ethernet	FBD plug RJ45-8-GS	Cover AK-RJ45 ¹⁾
CAN bus	Plug connector FBS-SUB-9-BU-2x5POL-B	Inspection cover AK-SUB-9/15-B ²⁾
RS232	Plug connector FBS-SUB-9-GS-1x9POL-B	
Service interface	Connecting cable for operator unit CPX-MM I KV-M12-M12-...	Cover cap ISK-M12
Rotary switch	–	Cover AK-RJ45 ¹⁾

1) Included in the scope of delivery
2) Inspection cover also for DIL switches

Fig. 11 Connectors and covers

For further information on connectors → Description of the control block, www.festo.com/catalogue.

8 Commissioning

Information regarding commissioning → Description of the control block.

9 Notes on module replacement



Note

If the “Modify” LED (M) is continuously illuminated or flashes, parameterisation is not automatically performed by the higher-level system when the control block or CPX terminal is replaced during servicing.

- Note the required settings before replacement, and re-establish them after replacement.

If the “Modify” LED (M) lights up permanently or flashes after the system start, “System start with saved parameterisation and saved CPX configuration” is set or “Force” is active.

10 Technical data

Type	CPX-CEC-...
General technical data of the CPX terminal	CPX system description CPX-SYS-... → www.festo.com/sp
Additional technical data on the control block	Description of the control block → www.festo.com/sp
Degree of protection	IP65/IP67
Nominal operating voltage	24 V DC
Load voltage	
Without pneumatics	18.0 V DC ... 30.0 V DC
With pneumatics type Midi/Maxi	21.6 V DC ... 26.4 V DC
With pneumatics type CPA	20.4 V DC ... 26.4 V DC
With pneumatics type MPA	18.0 V DC ... 30.0 V DC
Intrinsic current consumption at 24 V DC from operating voltage supply U _{EL} /SEN	Typ. 85 mA
Mains buffering time	10 ms
Product weight	155 /135 g
Dimensions W x L x H	50 mm x 107 mm x 55 mm

Fig. 12 Technical data