Control blocks CPX-CEC-...-V3

FESTO

Control blocks CPX-CEC-...-V3

Key features

Application

Controller

The control blocks CPX-CEC-...-V3 are modern control systems for CPX terminals that enable programming with CODESYS to IEC 61131-3.

Programming in a global language

CODESYS V3 provided by Festo offers a convenient user interface with the following functions:

- Integrated module libraries
- Library Manager for integrating further libraries
- Visualisation editor
- Simulation mode
- Integrated project documentation
- Debugging functions for fault finding
- Configuration and parameterisation of the controller using the control configuration
- Object-oriented programming

Basic functions

The control blocks CPX-CEC-...-V3 offer the following basic functions:

- Programming with CODESYS to IEC 61131-3
- Communication via Ethernet (Modbus/TCP, EasyIP, TCP/IP)
- Process visualisation using operator unit CDPX or OPC server
- Communication via fieldbus in combination with a fieldbus node in the CPX terminal
- Diagnostics and quick commissioning of CPX modules via handheld CPX-FMT

CPX-CEC-C1-V3 offers

- All basic functions
- CANopen master for controlling up to 127 CANopen stations. Electric axes can be controlled in point-to-point mode

CPX-CEC-M1-V3 offers

- All basic functions
- CANopen master for controlling up to 8 electric axes (recommended) in interpolated mode (3 of these axes with circular interpolation and 5 additionally with linear interpolation)
- SoftMotion function library for coordinated multi-axis movements

CPX-CEC-S1-V3 offers

- All basic functions
- RS232 interface for operating external devices

Note

When using external devices, data communication must be programmed by the user.

Bus connection

The control blocks CPX-CEC-...-V3 are remote controllers that can be connected to a higher-order PLC via the fieldbus nodes of the CPX terminal or via Ethernet, for example:

- PROFINET
- EtherNet/IP
- EtherCAT
- PROFIBUS
- DeviceNet

Operating modes

- Stand-alone
- Remote controller on the fieldbus
- Remote controller on Ethernet

System expansion

CANopen connects CPX-CEC with valve terminals and electric drive controllers from Festo:

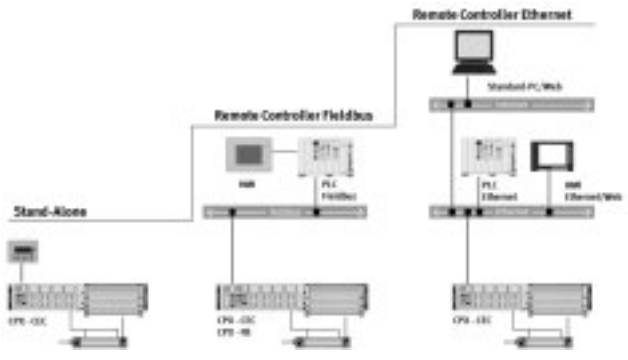
- CPX, CPV
- CMMP-AS, CMMS-AS/-ST, etc.
- AS-Interface gateway

Ethernet connects CPX-CEC with additional controllers and operator units from Festo:

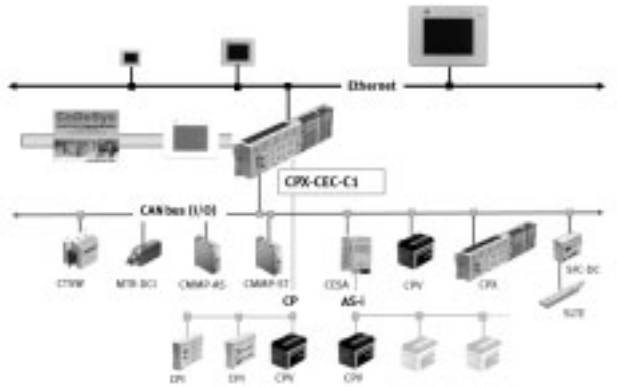
- CDPX
- Camera SBO...-Q

System expansion (examples)

CPX-CEC as a stand-alone or remote controller



CPX-CEC-C1 as a CANopen fieldbus master



Control blocks CPX-CEC-...-V3

Key features

Advantages for users

Increased performance

Improved cycle times – more connectable actuators.
Compatibility with almost all control systems on the market is ensured via the CPX terminal.

The extensive CODESYS function library provides diagnostics and condition monitoring options.

Reduced costs

For standardised pre-processing: reduces installation costs as an intelligent remote I/O terminal to IP65/IP67 directly at the machine.

The control blocks CPX-CEC-...-V3 are ideally adapted to CPX and motion applications with up to 127 axes.

Simple, yet efficient: decentralised structures

The modular I/O system with up to 512 I/Os and CAN master functionality offers complete flexibility, whether for open-loop or closed-loop control.

Stand-alone for low-cost automation of manual workstations, for example, or remote control with pre-processing.

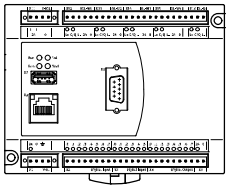
The only one in the world to IP65

The fully integrated automation platform for standard, proportional and servopneumatics, sensors and motion control to IP65.

Simple commissioning is also included.

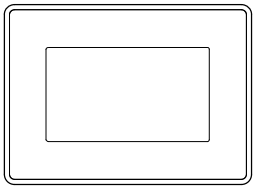
Classification of CPX-CEC in the portfolio for multi-axis controllers for electric drive technology

Compact controller CECC



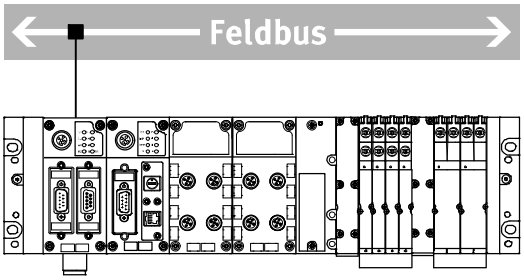
Compact and with more functions. For controlling electric and pneumatic drives for small tasks.
Stand-alone or in mechatronic solutions via CODESYS V3 provided by Festo.

Integrated controller in CDPX



Display generation with integrated controller with CODESYS V3 provided by Festo, powerful processors, combined with widescreen technology for greater functionality, higher resolution and versatile access options.

Integrated control blocks in CPX terminal: CPX-CEC

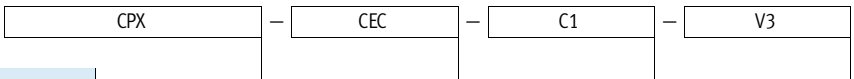


CODESYS V3 provided by Festo for the best valve/sensor terminal on the market: CPX-CEC reduces installation costs as an intelligent remote system to IP65/IP67 directly at the machine.

Ideal for CPX terminal and motion applications with up to 127 electric drives, PTP and SoftMotion applications up to 3D plus auxiliary axes.

Control blocks CPX-CEC-...-V3

Type codes



Type	
CPX	Modular electrical terminal

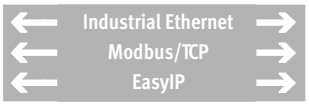
Electrical actuation	
CEC	Control block

Interface and function	
C1	CANOpen
M1	CANopen, SoftMotion
S1	RS232

Parameterisation	
V3	CODESYS V3

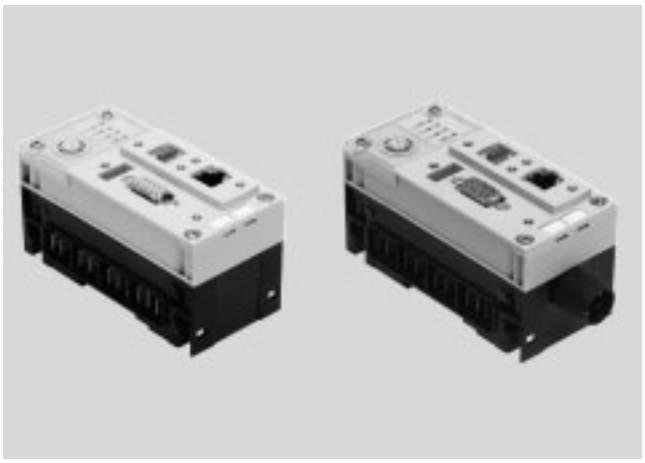
Control blocks CPX-CEC-...-V3

Technical data



IT services:

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



Application

Bus connection

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

Communication protocols

- Fieldbus via CPX fieldbus nodes
- Modbus/TCP
- EasyIP

Operating modes

- Stand-alone
- Remote controller, fieldbus
- Remote controller, Ethernet

Setting options

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

- For the CPX-FMT
- Ethernet interface for IT applications
- Remote diagnostics

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

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

Features

- Easy actuation of valve terminal configurations with MPA, VTSA
- Diagnostics with flexible monitoring options for pressure, flow rate, cylinder operating time, air consumption
- Actuation of decentralised installation systems on the basis of CPI actuation of applications in proportional pneumatics
- AS-Interface actuation via gateway
- Connection to all fieldbuses as a remote controller and for pre-processing
- Actuation of electric drives as individual axes via CANopen (CPX-CEC-C1-V3 and CPX-CEC-M1-V3)
- Early warnings and visualisation options
- Closed-loop pneumatic applications

Control blocks CPX-CEC-...-V3

Technical data

General technical data			
Protocol			CODESYS Level 2
			EasyIP
			Modbus TCP
			TCP/IP
Processing time			Approx. 200 µs/1 k instruction
Programming software			CODESYS provided by Festo
Programming language			To IEC 61131-3
			Sequential function chart (SFC)
			Instruction list (IL)
			Function chart (FCH), additional continuous function chart (CFC)
			Ladder diagram (LD)
			Structured text (ST)
Programming	Operating language		German, English
	Support for file handling		Yes
Device-specific diagnostics			Diagnostic memory
			Channel and module-oriented diagnostics
			Undervoltage/short circuit of modules
LED displays	Bus-specific		TP: Link/traffic
	Product-specific		RUN: PLC status
			STOP: PLC status
			ERR: PLC runtime error
			PS: Electronics supply, sensor supply
			PL: Load supply
			SF: System fault
			M: Modify/forcing active
IP address setting			DHCP
			Via CODESYS
			Via MMI
Function blocks			CPX diagnostic status, copy CPX diagnostic trace, read CPX module diagnostics, etc.
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 55
Product weight		[g]	135

Materials	
Housing	Reinforced PA
	PC
Note on materials	RoHS-compliant

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

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

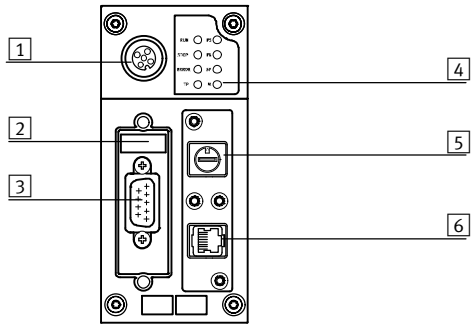
Control blocks CPX-CEC-...-V3

Technical data

Electrical data			
Nominal operating voltage		[V DC]	24
Load voltage	Nominal operating voltage	[V DC]	24
	With pneumatics type VTSA	[V DC]	21.6 ... 26.4
	With pneumatics type MPA	[V DC]	18 ... 30
	Without pneumatics	[V DC]	18 ... 30
Power failure buffering		[ms]	10
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 85
Degree of protection to EN 60529			IP65, IP67

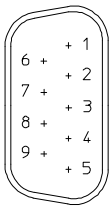
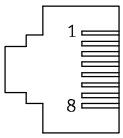
Technical data					
Type			**CPX-CEC-S1-V3**	**CPX-CEC-C1-V3**	**CPX-CEC-M1-V3**
Additional functions			Diagnostic functions		
			RS232 communication function	Motion functions for electric drives	SoftMotion functions for electric drives
CPU data	Flash	[MB]	32	32	32
	RAM	[MB]	256	256	256
	Processor	[MHz]	800	800	800
Control interface			–	CAN bus	CAN bus
Parameterisation			CODESYS V3	CODESYS V3	CODESYS V3
Configuration support			CODESYS V3	CODESYS V3	CODESYS V3
Program memory, user program		[MB]	16	16	16
Flags			CODESYS variable concept		
	Remanent data	[kB]	28	28	28
Control elements			–	DIL switch for CAN termination	
			Rotary switch for RUN/STOP	Rotary switch for RUN/STOP	
Total number of axes			–	127	31
Ethernet	Number		1		
	Connection technology		RJ45 socket, 8-pin		
	Data transmission speed	[Mbps]	10/100		
	Supported protocols		TCP/IP, EasyIP, Modbus TCP		
Fieldbus interface	Number		–	1	
	Connection technology		–	Sub-D plug connector, 9-pin	
	Data transmission speed, can be set via software	[kbps]	–	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000
	Supported protocols		–	CAN bus	
	Galvanic isolation		–	Yes	
Data interface	Number		1	–	
	Connection technology		Sub-D socket, 9-pin	–	
	Data transmission speed, can be set via software	[kbps]	9.6 ... 230.4	–	
	Supported protocols		RS232 interface	–	
	Max. cable length	[m]	30	–	
	Galvanic isolation		Yes	–	

Connection and display components CPX-CEC-C1-V3, CPX-CEC-M1-V3



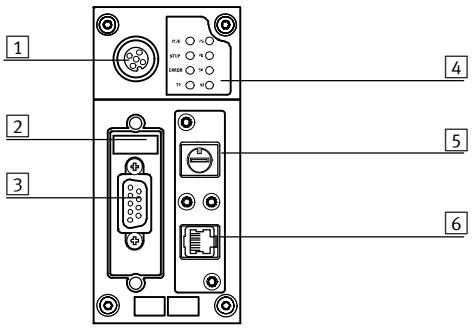
1 CPX-FMT connection
2 DIL switch
3 Fieldbus interface (Sub-D plug connector, 9-pin)
4 Status LEDs, bus-specific and product-specific
5 RUN/STOP rotary switch
6 Ethernet interface (RJ45 socket, 8-pin)

Pin allocation – CPX-CEC-C1-V3, CPX-CEC-M1-V3

	Pin	Signal	Meaning
Fieldbus interface, Sub-D plug connector			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	CAN_GND	CAN ground
	4	n.c.	Not connected
	5	CAN_SHLD	Connection to functional earth FE
	6	CAN_GND	CAN ground (optional) [1]
	7	CAN_H	CAN high
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	Screening	Plug connector housing must be connected to FE
Ethernet interface, RJ45 plug connector			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screening	Screening

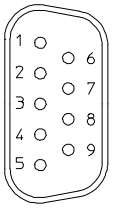
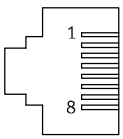
1) If a drive controller with external power supply is connected, CAN ground (optional), pin 6, on the CPX-CEC-C1-V3 and CPX-CEC-M1-V3 must not be used.

Connection and display components CPX-CEC-S1-V3



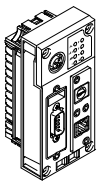
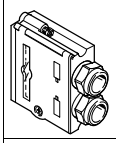
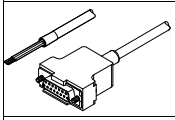
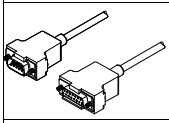
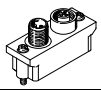
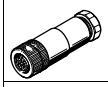
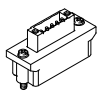
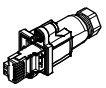
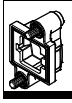
1 CPX-FMT connection
2 DIL switch
3 RS232 interface (Sub-D socket, 9-pin)
4 Status LEDs, bus-specific and product-specific
5 RUN/STOP rotary switch
6 Ethernet interface (RJ45 socket, 8-pin)

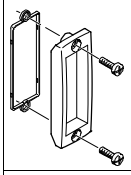
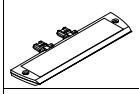
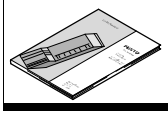
Pin allocation – CPX-CEC-S1-V3

	Pin	Signal	Meaning
RS232 interface, Sub-D socket			
	1	n.c.	Not connected
	2	RXD	Received data
	3	TXD	Transmitted data
	4	n.c.	Not connected
	5	GND	Data reference potential
	6	n.c.	Not connected
	7	n.c.	Not connected
	8	n.c.	Not connected
	9	n.c.	Not connected
	Screening	Screening	Connection to functional earth
Ethernet interface, RJ45 plug connector			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screening	Screening

Control blocks CPX-CEC-...-V3

Accessories

Ordering data			
Designation		Part No.	Type
Control block			
	Motion functions for electric drives	**3473128**	**CPX-CEC-C1-V3**
	SoftMotion functions for electric drives	**3472765**	**CPX-CEC-M1-V3**
	RS232 communication function	**3472425**	**CPX-CEC-S1-V3**
Fieldbus interface			
	Sub-D plug connector, 9-pin, for CANopen	**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Connecting cable for RS232 interface	**539642**	**FEC-KBG7**
	Connecting cable for RS232 interface	**539643**	**FEC-KBG8**
	Micro Style bus connection, 2xM12 for DeviceNet/CANopen	**525632**	**FBA-2-M12-5POL**
	Socket for Micro Style connection, M12	**18324**	**FBSD-GD-9-5POL**
	Plug connector for Micro Style connection, M12	**175380**	**FBS-M12-5GS-PG9**
	Open Style bus connection for 5-pin terminal strip for DeviceNet/CANopen	**525634**	**FBA-1-SL-5POL**
	Terminal strip for Open Style connection, 5-pin	**525635**	**FBSD-KL-2x5POL**
Ethernet interface			
	RJ45 plug connector	**534494**	**FBS-RJ45-8-GS**
	Cover for RJ45 connection	**534496**	**AK-Rj45**

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