Control block 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 eight electric axes (recommended) in interpolated mode Of these, up to 3 axes can be 3D-interpolated and up to 5 axes can be linearly interpolated.
- 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 third-party 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 bus 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 etc.
- AS-Interface gateway

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

- CDPX
- Camera SBO...-Q

Key features

Advantages for users

Increased performance

Improved cycle times – more actuators can be connected.
The CPX terminal ensures compatibility with virtually all control systems on the market.

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

Reduced costs

As an intelligent remote I/O terminal to IP65/IP67, it reduces installation costs for standardised preprocessing directly at the machine.

The control blocks CPX-CEC-...-V3 are perfectly 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.

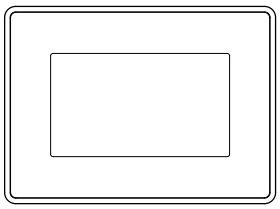
The only one in the world to IP65

The fully integrated automation platform for standard, proportional and servo-pneumatics, sensor and motion control to IP65.

And commissioning is really easy.

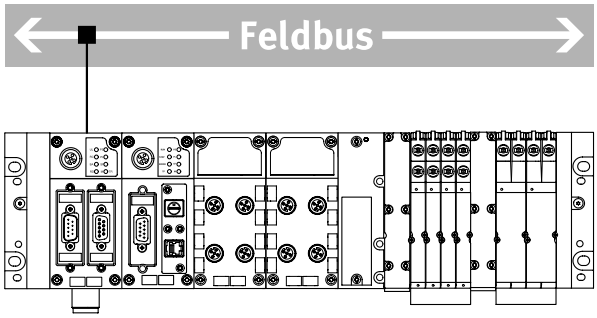
Classification of CPX-CEC in the portfolio for multi-axis controllers for electric drive technology

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.

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

Datasheet

- Industrial Ethernet
- TCP/IP
- EasyIP
- Web interface
- Email
- Data transfer

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 higher-order PLC via the bus 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 bus node
- 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.

Characteristics

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

Datasheet

General technical data			
Protocol			CODESYS Level 2
			EasyIP
			Modbus TCP
			TCP/IP
Processing time			Approx. 200 µs/1 k instructions
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			Diagnostics memory
			Channel and module-oriented diagnostics
			Undervoltage/short circuit of modules
LED indicators	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 elements			CPX diagnostic status, copy CPX diagnostic trace, read CPX module diagnostics, and more
Dimensions (including 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
LABS (PWIS) conformity	VDMA24364-B2-L

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

1) More information www.festo.com/x/topic/crc

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
Protection rating to EN 60529			IP65, IP67

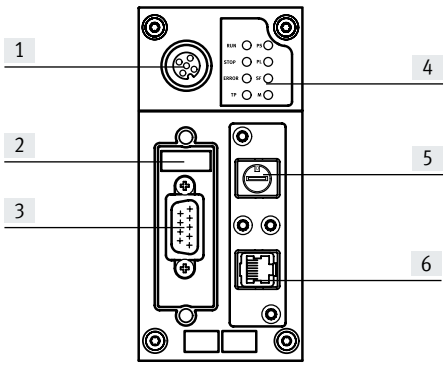
Datasheet

Technical data

Type			CPX-CEC-S1-V3	CPX-CEC-C1-V3	CPX-CEC-M1-V3
Additional functions			Diagnostic functions	Motion functions for electric drives	SoftMotion functions for electric drives
			RS232 communication function	–	–
CPU data	Flash	[MB]	32		
	RAM	[MB]	256		
	Processor	[MHz]	800		
Control interface			–	CAN bus	CAN bus
Parameterisation			CODESYS V3		
Configuration support			CODESYS V3		
Program memory, user program		[MB]	16		
Flags			CODESYS variable concept		
	Remanent data	[kB]	28		
Control elements			–	DIL switch for CAN termination	DIL switch for CAN termination
			Rotary switch for RUN/STOP	Rotary switch for RUN/STOP	Rotary switch for RUN/STOP
Total number of axes			–	127	31
Ethernet	No. of		1		
	Connection technology		RJ45 socket, 8-pin		
	Data transmission speed	[Mbps]	10/100		
	Supported protocols		TCP/IP, EasyIP, Modbus TCP		
Fieldbus interface	No. of		–	1	1
	Connection technology		–	Sub-D plug, 9-pin	Sub-D plug, 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	CAN bus
	Max. cable length	[m]	–	–	–
	Galvanic isolation		–	Yes	Yes
Data interface	No. of		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	–	–

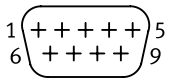
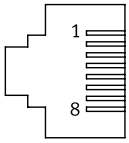
Datasheet

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



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

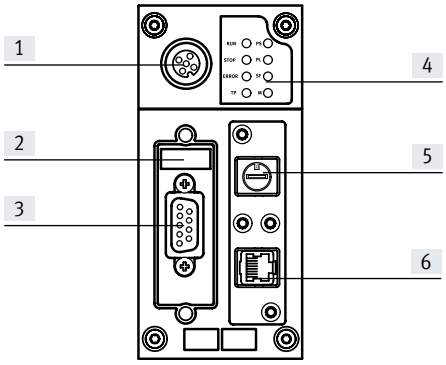
Pin assignment – CPX-CEC-C1-V3, CPX-CEC-M1-V3

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

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

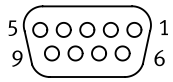
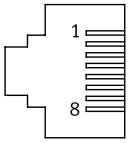
Datasheet

Connection and display elements CPX-CEC-S1-V3



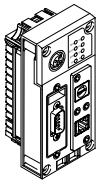
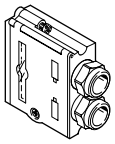
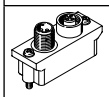
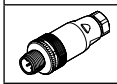
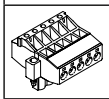
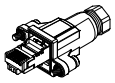
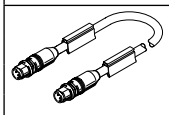
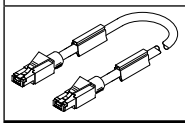
[1] CPX-FMT connection
[2] DIL switch
[3] RS232 interface (Sub-D socket, 9-pin)
[4] Status LEDs, bus-specific and product-specific
[5] RUN/STOP rotary switch
[6] Ethernet interface (RJ45 socket, 8-pin)

Pin assignment – CPX-CEC-S1-V3

	Pin	Signal	Meaning
RS 232 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
	Shielding	Shielding	Connection to functional earth
Ethernet interface, RJ45 plug			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Shielding	Shielding

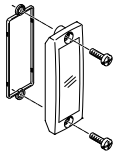
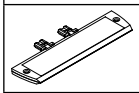
Accessories

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, 9-pin, for CANopen				532219	FBS-SUB-9-BU-2x5POL-B
	Micro style bus connection, 2xM12 for DeviceNet/CANopen				525632	FBA-2-M12-5POL
	Socket for micro style connection, M12				8162291	NECB-M12G5-C2
	Plug for micro style connection, M12				8162296	NECB-S-M12G5-C2
	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		Degree of protection IP 65, IP67		534494	FBS-RJ45-8-GS
	Cover for RJ45 connection		Degree of protection IP 65, IP67		534496	AK-RJ45
	Straight plug, RJ45, 8-pin	Straight plug, M12x1, 4-pin, D-coded	Degree of protection IP20	1 m	8040451	NEBC-D12G4-ES-1-S-R3G4-ET
				3 m	8040452	NEBC-D12G4-ES-3-S-R3G4-ET
				5 m	8040453	NEBC-D12G4-ES-5-S-R3G4-ET
				10 m	8040454	NEBC-D12G4-ES-10-S-R3G4-ET
	Straight plug, RJ45, 8-pin	Straight plug, RJ45, 8-pin	Degree of protection IP20	1 m	8040455	NEBC-R3G4-ES-1-S-R3G4-ET

Accessories

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 connection 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**