Modular controllers CECX

FESTO

Modular controllers CECX

Key features

At a glance

Versatile

The controller is functionally designed as a master and motion controller. It is a powerful control unit that can simultaneously execute both comprehensive PLC functions and multi-axis movements with interpolation.

Economical

The modular structure offers the right solutions for all requirements. It has a high component density, is easy to use and can be mounted on H-rails. It is fully compatible with all products from Festo and other manufacturers.

Controlling electric axes

Simple commissioning, programming and servicing:
With the SoftMotion module, the CoDeSys software offers a powerful programming environment for controlling all electric axes with CANopen fieldbus connection. Additionally available: module libraries, configuration tools and drivers.

Flexible

Programming to the IEC 61131-3 standard means the CECX is flexible and open for all types of control tasks. Numerous communication modules (PROFIBUS, CANopen, Ethernet) guarantee compatibility with other systems.

Reliable

It is certified to CE, UL/CSA, produced based on global experience in front end automation and uses standard hardware and CoDeSys standard software.

Product features

- Two product versions
  - Modular master controller with CoDeSys
  - Motion controller with CoDeSys and SoftMotion
- Easy configuration
- Automatic module detection
- Search function for finding controllers in the network
- DHCP-compatible
- Automatic transfer of the communication settings to the project

Module selection

CPU unit

- Power PC 400 MHz
- Ethernet interface
- CAN-Bus interface
- RS 485 interface
- USB interface
- Compact Flash card as removable storage
- Slots for optional modules

Optional modules

The controller CECX-X can be extended with the following optional modules:

- Ethernet interface
- CAN interface
- RS 232 serial interface
- RS 485-A/422-A serial interface

Input/output modules

- Digital modules
- Analogue modules for current and voltage
- Temperature input modules
- Encoder counter modules

Communication modules

- PROFIBUS master DP-V1
- PROFIBUS slave DP-V0
- PROFIBUS slave DP-V1
- 2x RS 232 serial interface

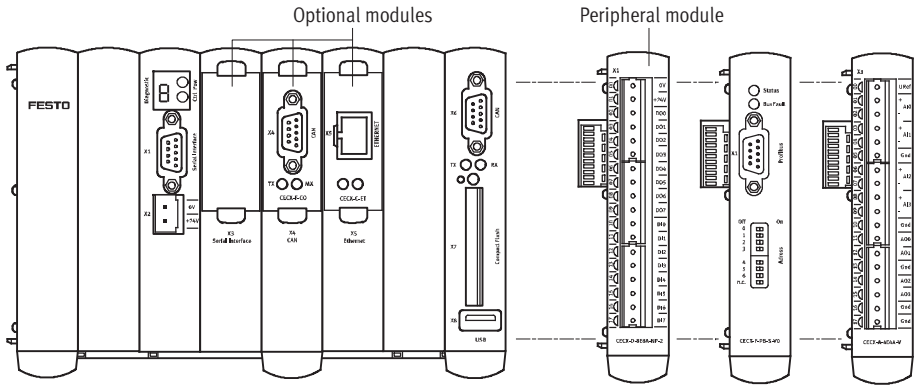
Actuating electric axes from Festo via CANopen interface

- Motor controllers CMMP-AS and CMMS-AS for servo motors
- Motor controller CMMS-ST for stepper motors
- Motor controllers SFC-DC and SFC-LAC
- Motor unit MTR-DCI

Modular controllers CECX

Key features

Controller CECX with peripheral modules and optional modules



Type	Brief description	➔ Page/Internet
Peripheral modules		
Input/output module, digital CECX-D-...E8A	• 6 or 8 digital inputs • 8 digital outputs	9
Input/output module, analogue CECX-A-4E4A-V	• 4 analogue voltage inputs • 4 analogue voltage outputs	11
Input/output module, analogue CECX-A-4E4A-A	• 4 analogue current inputs • 4 analogue current outputs	11
Input module, digital CECX-D-16E	• 16 digital inputs	14
Input module, analogue CECX-A-4E-V	• 4 analogue voltage inputs	16
Output module, digital CECX-D-14A-2	• 14 digital outputs	18
Output module, analogue CECX-A-4A-V	• 4 analogue voltage outputs	20
Input module, analogue CECX-E-...E-T-P...	• 4 or 6 temperature inputs	22
Encoder interface CECX-C-2G2/-2G1	• 2 encoder inputs/4 encoder inputs SSI (RS 422)	25
Bus interface CECX-F-PB-S-V...	• PROFIBUS slave DP-V0 • PROFIBUS slave DP-V1	28
Bus interface CECX-F-PB-V1	• PROFIBUS master DP-V1	30
Bus interface CECX-B-CO	• Connection via CAN bus to the modular controller • For connecting decentralised peripheral modules in series	32
Electrical interface CECX-C-2S1	• 2 RS 232 serial interfaces	34
Optional modules		
Bus interface CECX-F-CO	• CAN interface	36
Electrical interface CECX-C-ET	• Ethernet interface	38
Electrical interface CECX-C-S1	• RS 232 serial interface	40
Electrical interface CECX-S-S4	• RS 485-A/422-A serial interface	40

- Note

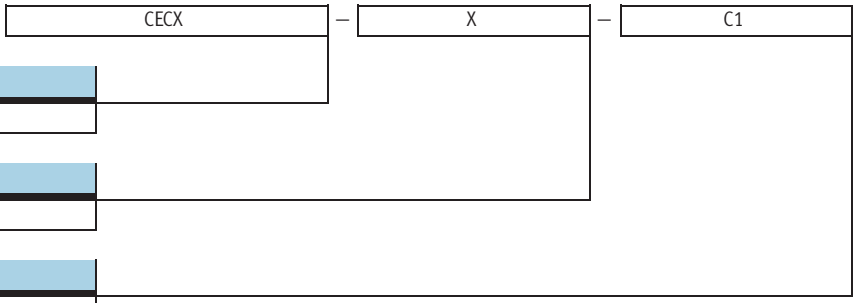
Max. 12 peripheral modules can be mounted.

Mounting rules ➔ System manual.

Modular controllers CECX

Key features

Type codes



Type	
CECX	Modular controller

Controller	
X	CPU

Control type	
C1	CoDeSys
M1	MotionControl

Modular controllers CECX

Technical data

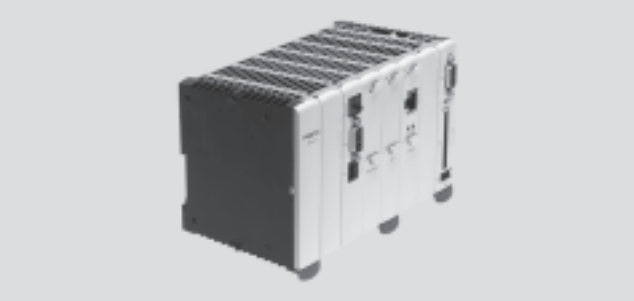
Controller CECX-X-C1
Modular master controller
with CoDeSys

Controller CECX-X-M1
Motion controller with CoDeSys
and SoftMotion

The controller is the central module in the modular control unit. It provides the resources for executing the application software.
The controller has three plug-in slots for optional modules to effect the following connections for interfaces:

- CAN bus interface
- Ethernet electrical interface
- RS 232 serial interface

The controller is equipped with the optional module for the Ethernet electrical interface by default.

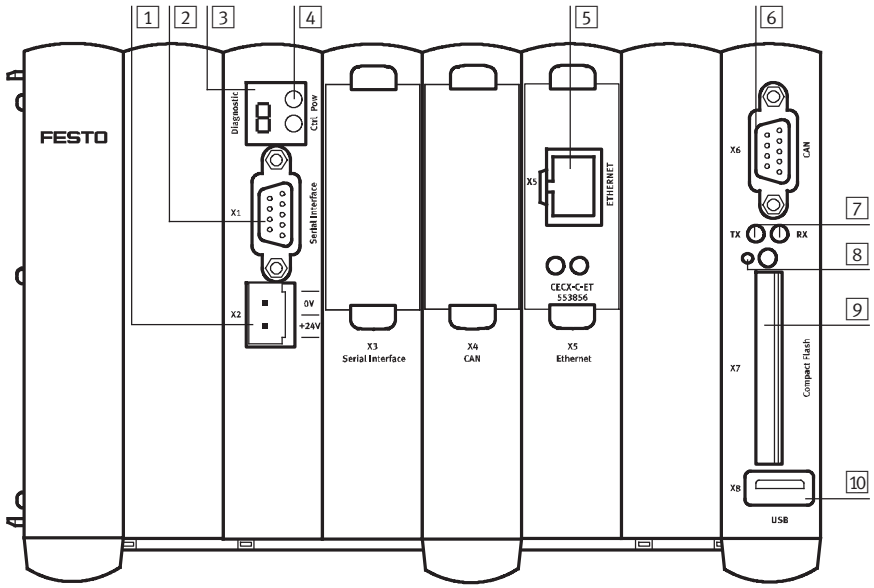


General technical data			
		CECX-X-C1	CECX-X-M1
Operating voltage range	[V DC]	19.2 ... 30	
Power consumption at 24 V	[W]	14	
Max. power output at 5 V	[W]	10	
Max. power output at 24 V	[W]	45	
Max. power consumption	[W]	69	
Resistance to shock		EN 60068-2-27 EA	
		15 g, 11 ms (half sine)	
Resistance to vibration		EN 60068-2-6-FC	
		5 ... 9 Hz, 3.5 mm	
		9 ... 150 Hz, 1g	
Control elements		CTRL button	
CPU data		64 MB DRAM	
		400 MHz processor	
Programming software		CoDeSys provided by Festo	CoDeSys provided by Festo
		–	SoftMotion
Programming language		SFC, IL, FCH, LD and ST to IEC 61131-3	SFC, IL, FCH, LD and ST to IEC 61131-3
		Additionally CFC	Additionally CFC
Status displays		7-segment display	
		LED green = power	
Slots		1x CAN optional module ➔ 36	
		1x Compact Flash type 1	
		1x Ethernet optional module ➔ 38	
		1x serial interface module ➔ 40	
USB interface		USB 1.1	
Protection class		IP20	
Electrical protection class		III	
Product weight	[g]	580	
Materials			
Note on materials		Contains PWIS (paint-wetting impairment substances)	
		RoHS-compliant	

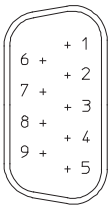
Technical data – Interfaces			
		CECX-X-C1	CECX-X-M1
Ethernet			
Connector plug		RJ45 socket, 8-pin	
Data transmission speed	[Mbps]	10/100	
Supported protocols		TCP/IP, EasyIP and Modbus TCP	
Fieldbus interface			
Type		CAN bus	
Connection technology		Sub-D plug, 9-pin	
Transmission rate	[kbps]	125; 250; 500; 800; 1,000	
		Adjustable via software	
Galvanic isolation		No	
Serial interface			
Type		RS 485-A	
Number		1	
Connection technology		Sub-D plug, 9-pin	
Transmission rate	[bps]	1,200 ... 115,000	
		Adjustable via software	
Galvanic isolation		No	

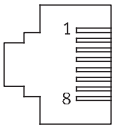
Operating and environmental conditions		
Ambient temperature	[°C]	+5 ... +55
Storage temperature	[°C]	–40 ... +70
Relative air humidity	[%]	10 ... 95
CE mark (see declaration of conformity)		To EU EMC Directive
Certification		cULus listed (OL)

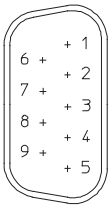
Connection and display components



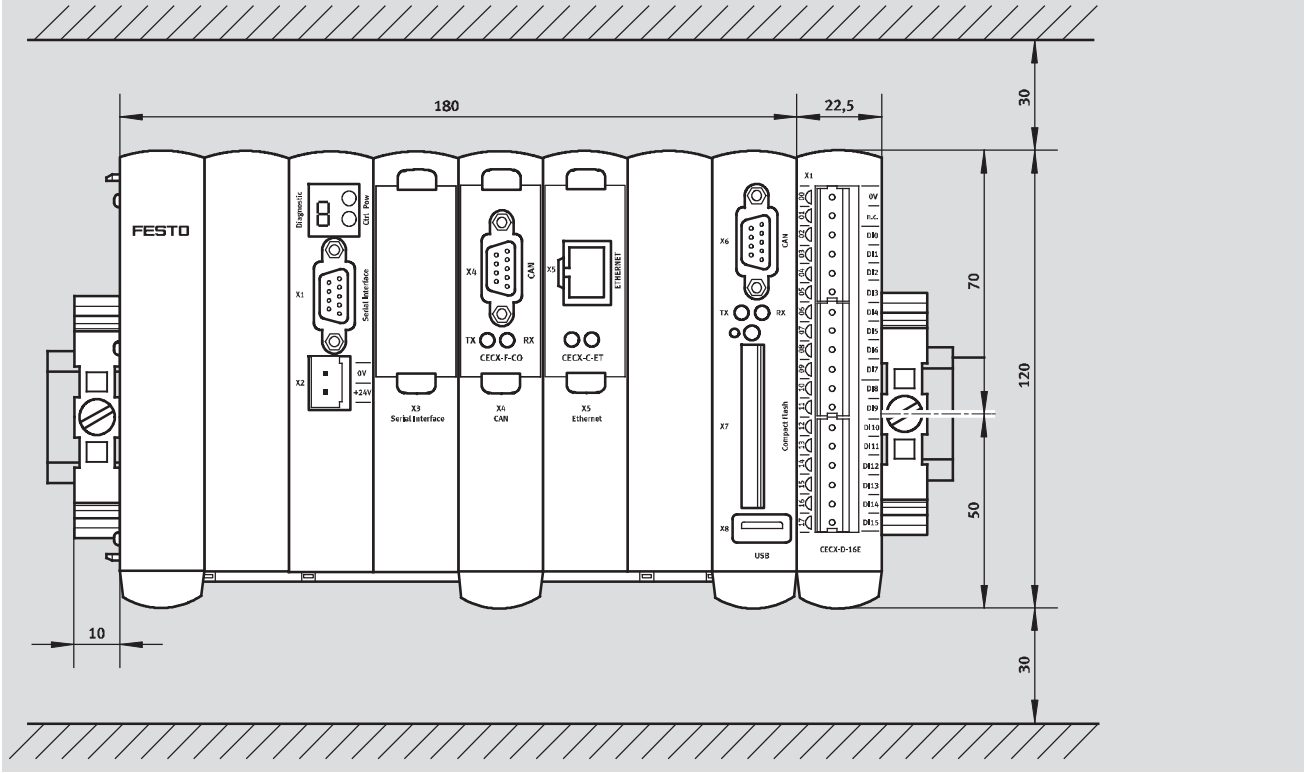
1 Operating voltage connection (X2)
2 RS 485 serial interface (X1)
3 7-segment display
4 Power LED
5 Ethernet interface (X5)
6 CAN interface (X6)
7 CAN status LEDs (TX, RX)
8 Compact Flash status LED
9 Compact Flash plug-in slot (X7)
10 USB interface (X8)

Pin allocation – RS 485 serial interface (X1)			
	Pin	Signal	Meaning
Sub-D plug			
	1	GND	Ground
	2	Therm B	Terminating resistor
	3	B / B'	Transmit/receive +
	4	n.c.	Not connected
	5	GND	Ground
	6	n.c.	Not connected
	7	Therm A	Terminating resistor
	8	A / A'	Transmit/receive –
	9	n.c.	Not connected

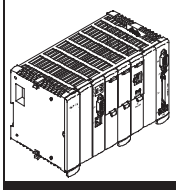
Pin allocation – Ethernet interface (X5)			
	Pin	Signal	Meaning
RJ45 plug			
	1	TD+	Transmitted data +
	2	TD–	Transmitted data –
	3	RD+	Received data +
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD–	Received data –
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screened	Screened

Pin allocation – CAN interface (X6)			
	Pin	Signal	Meaning
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	SGND	Signal ground
	4	TERM1	Connection for activating the internal terminating resistor
	5	TERM1	Connection for activating the internal terminating resistor
	6	GND	Ground
	7	CAN_H	CAN high
	8	TERM2	Connection for activating the internal terminating resistor
	9	TERM2	Connection for activating the internal terminating resistor
	Housing	Screened	Screened

Dimensions Download CAD data ➔ **www.festo.com**



Ordering data

Controller		Part No.	Type
	With CoDeSys	**553852**	**CECX-X-C1**
	With CoDeSys and SoftMotion	**553853**	**CECX-X-M1**

Modular controllers CECX

Technical data

Input/output module, digital
CECX-D-...E8A
There are 6 or 8 digital inputs and 8 digital outputs available for processing digital process signals.

The following functions are available:
- Address setting
- Short circuit monitoring for outputs
- Debounce function for inputs
- Interrupt function DI0 and DI1

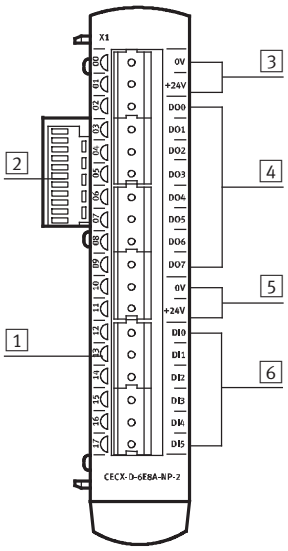
General technical data		
Operating voltage range	[V DC]	19.2 ... 30
Electrical connection technology for I/O		Socket strip, grid 5.08 mm
Power consumption at 5 V	[W]	0.4
Power consumption at 24 V	[W]	1.9
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 ... 9 Hz, 3.5 mm
		9 ... 150 Hz, 1g
Protection class		IP20
Electrical protection class		III
Product weight	[g]	135
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interfaces			
		CECX-D-6E8A-PN	CECX-D-8E8A-NP
Digital inputs			
Number		6	8
Fast clock pulse inputs		2, interruptible, response time 50 µs	
Input voltage/current	[V DC]	24	
Nominal value for FALSE	[V DC]	≤ 5	
Nominal value for TRUE	[V DC]	≥15	
Input signal delay	[ms]	2, 100, adjustable	20, 100, adjustable
	[kHz]	12 with interrupt input	
Electrical isolation		Yes, via optocoupler	
Status display	[V DC]	LED green	
Switching logic		Negative logic (NPN)	Positive logic (PNP)
Digital outputs			
Number		8	
Contact		Transistor	
Output voltage	[V DC]	24	
Output current	[A]	2 with 50% concurrence	
Short circuit proof		Yes	
Electrical isolation		Yes, via optocoupler	
Status display	[V DC]	LED orange	
Switching logic		Negative logic (NPN)	Positive logic (PNP)

Operating and environmental conditions			
		CECX-D-6E8A-PN	CECX-D-8E8A-NP
Ambient temperature	[°C]	+5 ... +55	+5 ... +55
Storage temperature	[°C]	–40 ... +70	–40 ... +70
Relative air humidity	[%]	10 ... 95	10 ... 95
CE mark (see declaration of conformity)		–	To EU EMC Directive
Certification		c UL us - Listed (OL)	c UL us - Listed (OL)

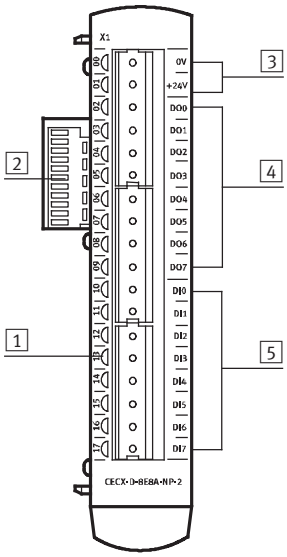
Connection and display components

CECX-D-6E8A-PN



1 Digital output or digital input status LEDs
2 Bus plug
3 Power supply for outputs
4 Digital output DO0 ... DO7
5 Power supply for inputs
6 Digital input DI0 ... DI5

CECX-D-8E8A-NP



1 Digital output or digital input status LEDs
2 Bus plug
3 Power supply
4 Digital output DO0 ... DO7
5 Digital input DI0 ... DI7

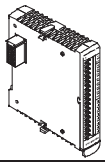
Pin allocation

Pin	Designation	Meaning
Socket strip		
00	0 V	0 V power supply for outputs
01	24 V	24 V power supply for outputs
02 ... 09	DO0 ... DO7	Digital output 0 ... 7
10	0 V	0 V power supply for inputs
11	24 V	24 V power supply for inputs
12 ... 17	DI0 ... DI5[1)]	Digital input 0 ... 5

Pin	Designation	Meaning
Socket strip		
00	0 V	0 V power supply
01	24 V	24 V power supply
02 ... 09	DO0 ... DO7	Digital output 0 ... 7
10 ... 17	DI0 ... DI7[1)]	Digital input 0 ... 7

1) DI0, DI1: interrupt inputs

Ordering data

Input/output module, digital		Part No.	Type
	With 6 digital inputs and 8 digital outputs	**553972**	**CECX-D-6E8A-PN-2**
	With 8 digital inputs and 8 digital outputs	**552099**	**CECX-D-8E8A-NP-2**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

Input/output module, analogue
CECX-A-4E4A-V
4 analogue voltage inputs/outputs for processing analogue process signals.

Input/output module, analogue
CECX-A-4E4A-A
4 analogue current inputs/outputs for processing analogue process signals.

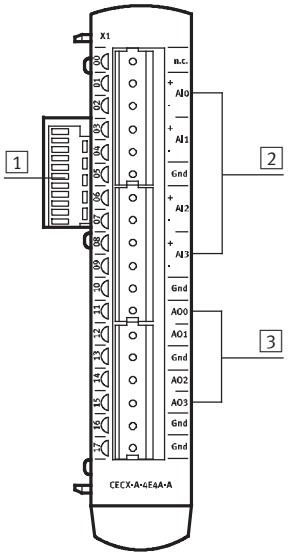
The following function is available:
- Sensor failure detection

General technical data			
		CECX-A-4E4A-V	CECX-A-4E4A-A
Electrical connection technology for I/O		Socket strip, grid 5.08 mm	
Power consumption at 5 V	[W]	0.3	0.3
Power consumption at 24 V	[W]	3.3	3.6
Resistance to shock		EN 60068-2-27 EA	
		15 g, 11 ms (half sine)	
Resistance to vibration		EN 60068-2-6-FC	
		5 … 9 Hz, 3.5 mm	
		9 … 150 Hz, 1g	
Protection class		IP20	
Electrical protection class		III	
Product weight	[g]	135	
Materials			
Note on materials		Contains PWIS (paint-wetting impairment substances)	
		RoHS-compliant	

Technical data – Interfaces			
		CECX-A-4E4A-V	CECX-A-4E4A-A
Analogue inputs			
Number		4	4
Resolution	[bit]	14	14
Signal range	[V]	0 … 10 Vref	–
		±10	–
	[mA]	–	0 … 20
		–	4 … 20
Value of the least significant bit (LSB)	[mV]	1.3	–
	[µA]	–	1.35
Supply voltage for actuators	[V DC]	10 ±2.5% (max. 20 mA)	–
Input resistance	[Ω]	10 10^6	< 200
Absolute accuracy at 25 °C	[%]	±0.01	±0.01
Sampling repeat time	[ms]	1	1
Galvanic isolation		No	No
Analogue outputs			
Number		4	4
Resolution	[bit]	12	12
Max. load resistance	[Ω]	≥ 1,000	≤ 600
Signal range	[V]	±10	–
	[mA]	–	0 … 20
Value of the least significant bit (LSB)	[mV]	5.32	–
	[µA]	–	5.39
Conversion time	[ms]	1	1
Absolute accuracy at 25 °C	[%]	±0.15	±0.15

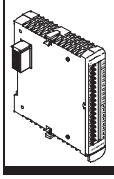
Operating and environmental conditions		
Ambient temperature	[°C]	+5 ... +55
Storage temperature	[°C]	–40 ... +70
Relative air humidity	[%]	10 ... 95
CE mark (see declaration of conformity)		To EU EMC Directive
Certification		c UL us - Listed (OL)

Connection and display components



1 Bus plug
2 Analogue input AI0 ... AI7
3 Analogue output AO0 ... AO7

Pin allocation			
Pin	Designation	Meaning	
		CECX-A-4E4A-V	CECX-A-4E4A-A
Socket strip			
00	V_{REF} / n.c.	Reference voltage	Not connected
01	AI0+	Positive voltage input signal AI0	Positive current input signal AI0
02	AI0–	Negative voltage input signal AI0	Negative current input signal AI0
03	AI1+	Positive voltage input signal AI1	Positive current input signal AI1
04	AI1–	Negative voltage input signal AI1	Negative current input signal AI1
05	GND	Reference potential GND	Reference potential GND
06	AI2+	Positive voltage input signal AI2	Positive current input signal AI2
07	AI2–	Negative voltage input signal AI2	Negative current input signal AI2
08	AI3+	Positive voltage input signal AI3	Positive current input signal AI3
09	AI3–	Negative voltage input signal AI3	Negative current input signal AI3
10	GND	Reference potential GND	Reference potential GND
11	AO0	Voltage output signal AO0	Current output signal AO0
12	AO1	Voltage output signal AO1	Current output signal AO1
13	GND	Reference potential GND	Reference potential GND
14	AO2	Voltage output signal AO2	Current output signal AO2
15	AO3	Voltage output signal AO3	Current output signal AO3
16	GND	Reference potential GND	Reference potential GND
17	GND	Reference potential GND	Reference potential GND

Ordering data			
Input/output module, analogue		Part No.	Type
	With 4 analogue voltage inputs/outputs	**552100**	**CECX-A-4E4A-V**
	With 4 analogue current inputs/outputs	**552101**	**CECX-A-4E4A-A**

- - Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

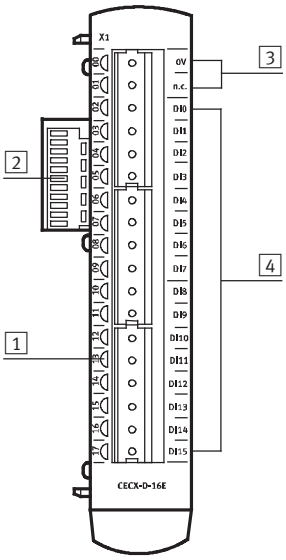
Input module, digital
CECX-D-16E
There are 16 digital inputs available
for processing digital process signals.

General technical data		
Electrical connection technology for I/O		Socket strip, grid 5.08 mm
Power consumption at the system bus	[W]	0.4
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Protection class		IP20
Electrical protection class		III
Product weight	[g]	130
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interface		
Digital inputs		
Number		16
Fast clock pulse inputs		2, interruptible, response time 100 µs
Input voltage/current	[V DC]	24
Nominal value for FALSE	[V DC]	≤ 5
Nominal value for TRUE	[V DC]	≥ 15
Input signal delay	[ms]	20, 200, adjustable
		Additionally 0.2 ms with interrupt inputs
Electrical isolation		Yes, via optocoupler
Status display	[V DC]	LED
Switching logic		Positive logic (PNP)

Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95

Connection and display components



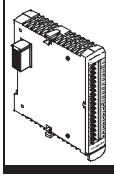
1 Digital input status LEDs
2 Bus plug
3 Reference potential
4 Digital input DI0 ... DI15

Pin allocation

Pin	Designation	Meaning
Socket strip		
00	0 V	Reference potential
01	n.c.	Not connected
02 ... 17	DI0 ... DI15	Digital input 0 ... 15[1)]

1) DI0 and DI1 are interruptible

Ordering data

Input module, digital		Part No.	Type
	With 16 digital inputs	**552096**	**CECX-D-16E**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

Input module, analogue
CECX-A-4E-V
There are 4 analogue voltage inputs available for processing analogue process signals.

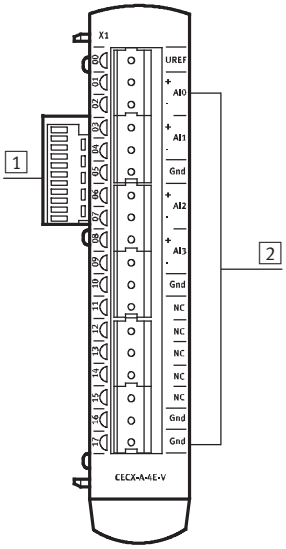
The following function is available:
- Sensor failure detection

General technical data		
Electrical connection technology for I/O		Socket strip, grid 5.08 mm
Power consumption at 5 V	[W]	0.3
Power consumption at 24 V	[W]	2
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Protection class		IP20
Electrical protection class		III
Product weight	[g]	132
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interfaces		
Analogue inputs		
Number		4
Resolution	[bit]	14
Signal range	[V]	0 … 10 Vref
	[V]	±10
Value of the least significant bit (LSB)	[mV]	1.3
Supply voltage for actuators	[V DC]	10 ±2.5 % (max. 20 mA)
Input resistance	[MΩ]	10
Absolute accuracy at 25 °C	[%]	±0.01
Sampling repeat time	[ms]	1
Galvanic isolation		No

Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95
Certification		cULus listed (OL)

Connection and display components

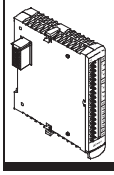


1 Bus plug
2 Analogue voltage input AI0 ... AI3

Pin allocation

Pin	Designation	Meaning
Socket strip		
00	V_{REF} / n.c.	Reference voltage
01	AI0+	Pos. voltage input signal AI0
02	AI0–	Neg. voltage input signal AI0
03	AI1+	Pos. voltage input signal AI1
04	AI1–	Neg. voltage input signal AI1
05	GND	Reference potential GND
06	AI2+	Pos. voltage input signal AI2
07	AI2–	Neg. voltage input signal AI2
08	AI3+	Pos. voltage input signal AI3
09	AI3–	Neg. voltage input signal AI3
10	GND	Reference potential GND
11	n.c.	Not connected
12	n.c.	Not connected
13	n.c.	Not connected
14	n.c.	Not connected
15	n.c.	Not connected
16	GND	Reference potential GND
17	GND	Reference potential GND

Ordering data

Input module, analogue		Part No.	Type
	With 4 analogue voltage inputs	**553975**	**CECX-A-4E-V**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

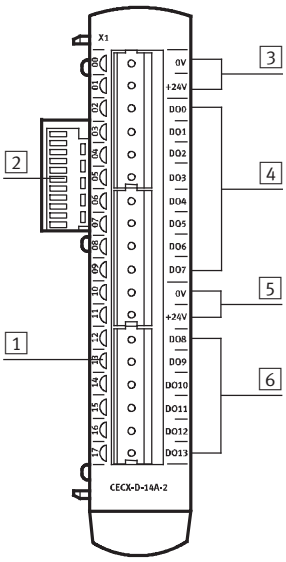
Output module, digital
CECX-D-14A-2
There are 14 digital outputs available for processing digital process signals.

General technical data		
Operating voltage range	[V DC]	24 +25%/–15%
Electrical connection technology for I/O		Socket strip, grid 5.08 mm
Power consumption at the system bus	[W]	0.4
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Protection class		IP20
Electrical protection class		III
Product weight	[g]	135
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interface		
Digital outputs		
Number		14
Contact		Transistor
Output voltage	[V DC]	24
Output current	[A]	2 with 50% concurrence per group
Short circuit proof		Yes
Electrical isolation		Yes, via optocoupler
Electrical isolation in groups		Yes, in 2 groups
Status display	[V DC]	LED
Switching logic		Positive logic (PNP)

Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95

Connection and display components

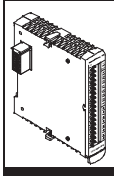


1 Digital output status LEDs
2 Bus plug
3 Voltage supply for DO0 ... DO7
4 Digital output DO0 ... DO7
5 Voltage supply for DO8 ... D013
6 Digital output DO8 ... DO13

Pin allocation

Pin	Designation	Meaning
Socket strip – group 1		
00	0 V	0 V voltage supply for DO0 ... DO7
01	+24 V	24 V voltage supply for DO0 ... DO7
02 ... 09	DO0 ... DO7	Digital output 0 ... 7
Socket strip – group 2		
10	0 V	0 V voltage supply for DO8 ... D013
11	+24 V	24 V voltage supply for DO8 ... D013
12 ... 17	DO8 ... DO13	Digital output 8 ... 13

Ordering data

Output module, digital		Part No.	Type
	With 14 digital outputs	**552097**	**CECX-D-14A-2**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

Output module, analogue
CECX-A-4A-V
There are 4 analogue voltage outputs available for processing analogue process signals.

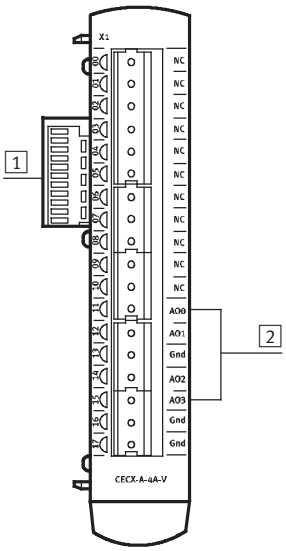
The following function is available:
- Sensor failure detection

General technical data		
Electrical connection technology for I/O		Socket strip, grid 5.08 mm
Power consumption at 5 V	[W]	0.3
Power consumption at 24 V	[W]	1.9
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Protection class		IP20
Electrical protection class		III
Product weight	[g]	132
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interfaces		
Analogue outputs		
Number		4
Resolution	[bit]	12
Max. load resistance	[Ω]	≥ 1,000
Signal range	[V]	±10
Value of the least significant bit (LSB)	[mV]	5.32
Conversion time	[ms]	1
Absolute accuracy at 25 °C	[%]	±0.15

Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95
Certification		cULus listed (OL)

Connection and display components

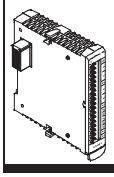


1 Bus plug
2 Analogue voltage output AO0 ... AO3

Pin allocation

Pin	Designation	Meaning
Socket strip		
00	n.c.	Not connected
01	n.c.	Not connected
02	n.c.	Not connected
03	n.c.	Not connected
04	n.c.	Not connected
05	n.c.	Not connected
06	n.c.	Not connected
07	n.c.	Not connected
08	n.c.	Not connected
09	n.c.	Not connected
10	n.c.	Not connected
11	AO0	Voltage output signal AO0
12	AO1	Voltage output signal AO1
13	GND	Reference potential GND
14	AO2	Voltage output signal AO2
15	AO3	Voltage output signal AO3
16	GND	Reference potential GND
17	GND	Reference potential GND

Ordering data

Output module, analogue		Part No.	Type
	With 4 analogue voltage outputs	**553976**	**CECX-A-4A-V**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

Input module, analogue
CECX-E-4E-T-P1

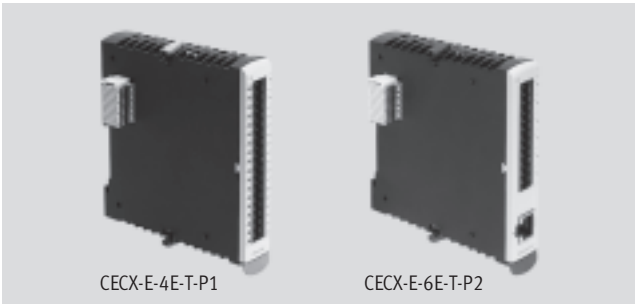
There are 4 temperature inputs available for the temperature sensor PT 100.
The following function is available:

- 2-wire and 4-wire connection

Input module, analogue
CECX-E-6E-T-P2

There are 6 temperature inputs available for the thermoelement type J, K and L.
The following function is available:

- Internal and external cold junction compensation



CECX-E-4E-T-P1 CECX-E-6E-T-P2

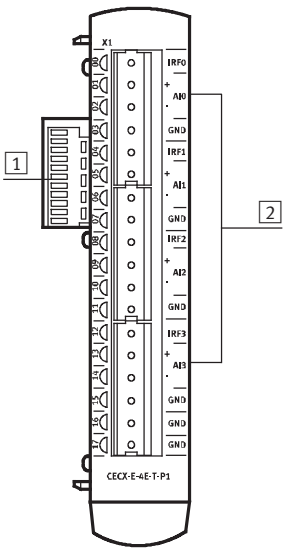
General technical data			
		CECX-E-4E-T-P1	CECX-E-6E-T-P2
Electrical connection technology for I/O		Socket strip, grid 5.08 mm	
		–	Gold contacts
Power consumption at 5 V	[W]	0.3	0.6
Power consumption at 24 V	[W]	2.5	1.6
Resistance to shock		EN 60068-2-27 EA	
		15 g, 11 ms (half sine)	
Resistance to vibration		EN 60068-2-6-FC	
		5 … 9 Hz, 3.5 mm	
		9 … 150 Hz, 1g	
Protection class		IP20	
Electrical protection class		III	
Product weight	[g]	134	142
Materials			
Note on materials		Contains PWIS (paint-wetting impairment substances)	
		RoHS-compliant	

Technical data – Interfaces			
		CECX-E-4E-T-P1	CECX-E-6E-T-P2
Analogue inputs			
Number		4	6
Resolution	[bit]	14	
Signal range		PT100 (-100 … +850 °C)	–
		–	Thermoelement
		–	Type J (Fe-CuNi, -100 … +700 °C)
		–	Type K (NiCr-Ni, -100 … +1,000 °C)
		–	Type L (Fe-CuNi, -100 … +700 °C)
Value of the least significant bit (LSB)	[°C]	0.058	–
Input resistance	[Ω]	10 10^6	> 10 10^3
Absolute accuracy at 25 °C	[%]	±0.01	± 1.0 °C
Internal cycle time	[ms]	2	100
Galvanic isolation		No	Yes

Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95
Certification		cULus listed (OL)

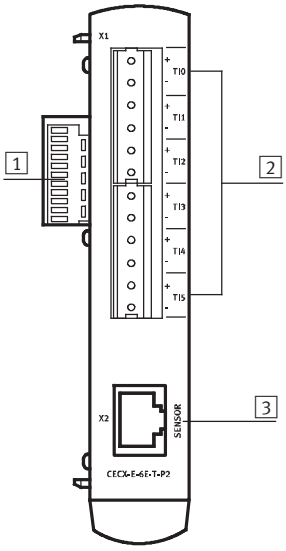
Connection and display components

CECX-E-4E-T-P1



1 Bus plug
2 Analogue input for temperature sensor AI0 ... AI3

CECX-E-6E-T-P2

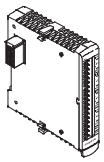
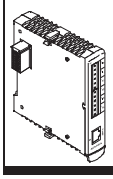


1 Bus plug
2 Analogue input for temperature sensor TI0 ... TI5
3 Sensor interface for external temperature compensation

Pin allocation

Pin	Designation	Meaning
Socket strip		
00	IRf 0	
01	AI0+	Temperature sensor0 +
02	AI0–	Temperature sensor0 –
03	GND	Reference potential GND
04	IRf 1	
05	AI1+	Temperature sensor1 +
06	AI1–	Temperature sensor1 –
07	GND	Reference potential GND
08	IRf 2	
09	AI2+	Temperature sensor2 +
10	AI2–	Temperature sensor2 –
11	GND	Reference potential GND
12	IRf 3	
13	AI3+	Temperature sensor3 +
14	AI3–	Temperature sensor3 –
15	GND	Reference potential GND
16	GND	Reference potential GND
17	GND	Reference potential GND

Pin	Designation	Meaning
Socket strip		
00	+TI0	Temperature sensor0 +
01	– TI0	Temperature sensor0 –
02	+TI1	Temperature sensor1 +
03	– TI1	Temperature sensor1 –
04	+TI2	Temperature sensor2 +
05	– TI2	Temperature sensor2 –
06	+TI3	Temperature sensor3 +
07	– TI3	Temperature sensor3 –
08	+TI4	Temperature sensor4 +
09	– TI4	Temperature sensor4 –
10	+TI5	Temperature sensor5 +
11	– TI5	Temperature sensor5 –

Ordering data			
Input module, analogue		Part No.	Type
	With 4 temperature inputs for the temperature sensor PT 100	**553973**	**CECX-E-4E-T-P1**
	With 6 temperature inputs for the thermoelements type J, K and L	**553974**	**CECX-E-6E-T-P2**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

Encoder interface
CECX-C-2G2

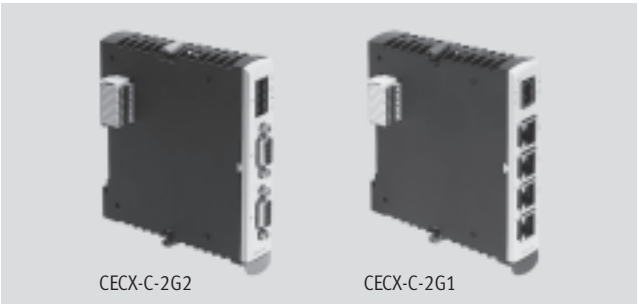
The following functions are available:

- Displacement measurement: incremental/decremental counter (displacement measurement) using A and B track, 1-way, 2-way, 4-way evaluation, 32-bit resolution
- Pulse counter on track A, 32-bit resolution
- Pulse counter on track A with direction evaluation for track B, 32-bit resolution
- Speed measurement by means of sampling with internal time basis
- Shaft encoder monitoring using zero-track information
- Counter reading latch function via an external latch input
- Counter reading latch function via zero pulse
- Sensor rupture monitoring for tracks A, B and zero

Encoder interface
CECX-C-2G1

The following function is available:

- Power/receive status display
- Binary/grey signal range



CECX-C-2G2 CECX-C-2G1

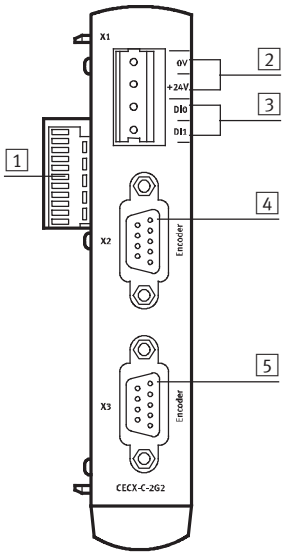
General technical data			
		CECX-C-2G2	CECX-C-2G1
Operating voltage range	[V DC]	19.2 ... 30	
Electrical connection technology for I/O		Socket strip, grid 5.08 mm	
Power consumption at 5 V	[W]	0.6	0.65
Resistance to shock		EN 60068-2-27 EA	
		15 g, 11 ms (half sine)	
Resistance to vibration		EN 60068-2-6-FC	
		5 ... 9 Hz, 3.5 mm	
		9 ... 150 Hz, 1g	
Status displays		–	LED green = power
			LED yellow = receive
Protection class		IP20	
Electrical protection class		III	
Product weight	[g]	135	140
Materials			
Note on materials		Contains PWIS (paint-wetting impairment substances)	
		RoHS-compliant	

Technical data – Interfaces			
		CECX-C-2G2	CECX-C-2G1
Digital inputs			
Fast clock pulse inputs		2 (latch) response time 20 µs NPN/PNP	–
Electrical isolation		No	–
Encoder inputs			
Number		2	4
Connection technology		Sub-D socket, 9-pin	RJ45
Resolution	[bit]	Speed measurement: 32	16 ... 32
	[bit]	Displacement measurement: 24	Adjustable via software
Encoder supply voltage	[V DC]	24	24 (250 mA/channel)
	[V DC]	5.05 ±4 % (100 mA/channel)	–
Max. input frequency	[kHz]	250	–
Baud rate	[kbps]	–	125; 250; 500; 1,000
			Adjustable via software
Signal range		5 differential (RS 422)	SSI (RS 422)
		24 single-ended	Binary/grey can be set using software
Galvanic isolation		–	No

Operating and environmental conditions			
		CECX-C-2G2	CECX-C-2G1
Ambient temperature	[°C]	+5 … +55	+5 … +55
Storage temperature	[°C]	–40 … +70	–40 … +70
Relative air humidity	[%]	10 … 95	10 … 95
CE mark (see declaration of conformity)		To EU EMC Directive	–
Certification		c UL us - Listed (OL)	c UL us - Listed (OL)

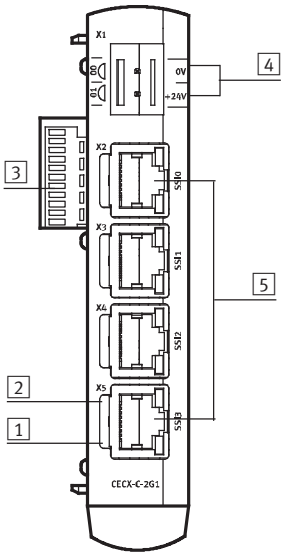
Connection and display components

CECX-C-2G2

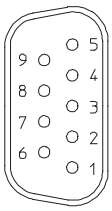
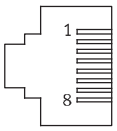


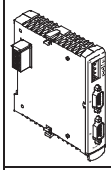
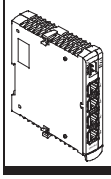
1 Bus plug
2 Power supply
3 Latch inputs
4 Encoder input X2
5 Encoder input X3

CECX-C-2G1



1 LED
2 LED
3 Bus plug
4 Power supply
5 SSI interface SSI0 … SSI3

Pin allocation				
	Pin	Signal	Meaning	
			Signal range 5 V	Signal range 24 V
Sub-D socket				
	1	GND	Ground	
	2	24 V	Encoder supply	
	3	0+	Zero track+	
	4	B+	Track B+	
	5	A+	Track A+	
	6	5 V (max. 100 mA)	Encoder supply	
	7	0–	Zero track–	Do not connect
	8	B–	Track B–	Do not connect
	9	A–	Track A–	Do not connect
RJ45 socket				
	1	n.c.	Not connected	
	2	n.c.	Not connected	
	3	DI+	Data input +	
	4	CK–	Clock input –	
	5	CK+	Clock input +	
	6	DI–	Data input –	
	7	24 V	Encoder supply	
	8	0 V	Encoder supply	

Ordering data			
Encoder interface		Part No.	Type
	With 2 encoder inputs	**552117**	**CECX-C-2G2**
	With 4 encoder inputs SSI (RS 422)	**553977**	**CECX-C-2G1**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

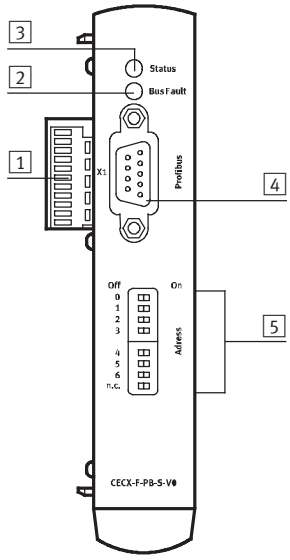
Bus interface
CECX-F-PB-S-V...
The modular controller can be connected to the PROFIBUS DP-V0 or to the PROFIBUS DP-V1 as a slave using this peripheral module.

General technical data		
Power consumption at 5 V	[W]	1.4
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 ... 9 Hz, 3.5 mm
		9 ... 150 Hz, 1g
Status displays		LED (status)
		LED red = bus fault
Protection class		IP20
Electrical protection class		III
Product weight	[g]	140
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interface			
CECX-F-PB-S-		V0	V1
Fieldbus			
Type		PROFIBUS slave DP-V0	PROFIBUS slave DP-V1
Connection technology		Sub-D socket, 9-pin	
Transmission rate		9.6 kbps ... 12 Mbps	
Galvanic isolation		Yes	

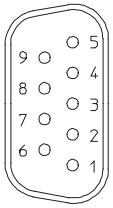
Operating and environmental conditions			
CECX-F-PB-S-		V0	V1
Ambient temperature	[°C]	+5 ... +55	
Storage temperature	[°C]	–40 ... +70	
Relative air humidity	[%]	10 ... 95	
CE mark (see declaration of conformity)		To EU EMC Directive	–
Certification		c UL us - Listed (OL)	

Connection and display components

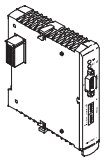


1 Bus plug
2 Bus fault LED
3 Status LED
4 PROFIBUS interface
5 DIP switch

Pin allocation

	Pin	Signal	Meaning
Sub-D socket			
	3	RxD/TxD-P	Received/transmitted data P, B cable
	4	RTS	Signal is HIGH if module is sending data
	5	GND	Ground (galvanically isolated)
	6	5 V	5 V (galvanically isolated)
	8	RxD/TxD-N	Received/transmitted data N, A cable

Ordering data

Bus interface		Part No.	Type
	As a slave to the PROFIBUS DP-V0	**552102**	**CECX-F-PB-S-V0**
	As a slave to the PROFIBUS DP-V1	**565598**	**CECX-F-PB-S-V1**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

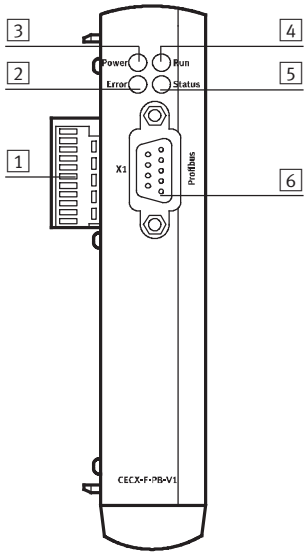
Bus interface
CECX-F-PB-V1
The modular controller can be connected to the PROFIBUS DP-V1 as a master using this peripheral module.

General technical data		
Power consumption at 5 V	[W]	2
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Status displays		LED yellow = RDY, STA
		LED green = RUN
		LED red = ERR
Protection class		IP20
Electrical protection class		III
Product weight	[g]	138
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interface	
Fieldbus	
Type	PROFIBUS master DP-V1
Connection technology	Sub-D socket, 9-pin
Transmission rate	9.6 kbps … 12 Mbps
	Adjustable via software
Galvanic isolation	Yes

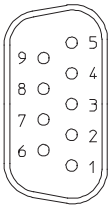
Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95
Certification		cULus listed (OL)

Connection and display components

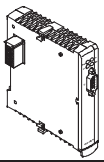


1 Bus plug
2 Error LED
3 Power LED
4 Run LED
5 Status LED
6 PROFIBUS interface

Pin allocation

	Pin	Signal	Meaning
Sub-D socket			
	3	RxD/TxD-P	RS-485-A: B cable
	5	GND	Ground (galvanically isolated)
	6	5 V	5 V (galvanically isolated)
	8	RxD/TxD-N	RS-485-A: A cable

Ordering data

Bus interface		Part No.	Type
	As a master to the PROFIBUS DP-V1	**553981**	**CECX-F-PB-V1**

Note

Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

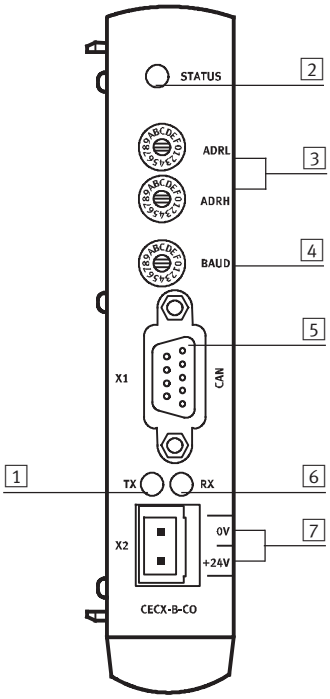
Bus interface
CECX-B-CO
The peripheral module is connected to the modular connector via CAN bus. Decentralised modules can then be connected in series to this module.

General technical data		
Operating voltage range	[V DC]	19.2 ... 30
Power consumption at 24 V	[W]	6.5
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 ... 9 Hz, 3.5 mm
		9 ... 150 Hz, 1g
Status displays		LED (status)
		LED yellow = transmit
		LED green = receive
Protection class		IP20
Electrical protection class		III
Product weight	[g]	121
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

Technical data – Interface		
Fieldbus		
Type		CAN bus
Connection technology		Sub-D plug, 9-pin
Transmission rate		125; 250; 500; 800; 1,000 kbps
		Can be adjusted using rotary switch
Galvanic isolation		No
Electrical connection technology for I/O		Socket strip, grid 5.08 mm
Output voltage/power output	[W]	24 V: 45
		5 V: 8.5

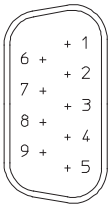
Operating and environmental conditions		
Ambient temperature	[°C]	+5 ... +55
Storage temperature	[°C]	–40 ... +70
Relative air humidity	[%]	10 ... 95
Certification		cULus listed (OL)

Connection and display components

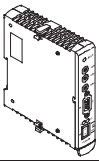


1 TX yellow LED
2 Status LED
3 Rotary switch for address setting
4 Rotary switch for transmission rate
5 CAN interface
6 RX green LED
7 Power supply

Pin allocation

	Pin	Signal	Meaning
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	SGND	Signal ground
	4	TERM1	Connection for activating the internal terminating resistor
	5	TERM1	Connection for activating the internal terminating resistor
	6	GND	Ground
	7	CAN_H	CAN high
	8	TERM2	Connection for activating the internal terminating resistor
	9	TERM2	Connection for activating the internal terminating resistor
	Housing	Screened	Screened

Ordering data

Bus interface		Part No.	Type
	To the CAN bus	**553980**	**CECX-B-CO**

Note

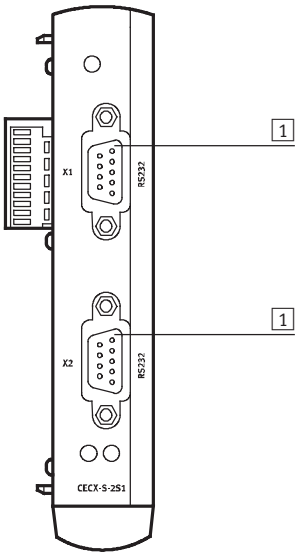
Accompanying manuals in German and English can be found on the CD-ROM supplied with the controller CECX-X.

Electrical interface
CECX-S-2S1
Peripheral module for extending the controller with two RS 232 serial interfaces.

General technical data		
		CECX-S-2S1
Type		RS 232
Number		2
Connection technology		Sub-D plug, 9-pin
Transmission rate	[bps]	1,200 ... 115,000
		Adjustable via software
Power consumption at 5 V	[W]	0.4
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 ... 9 Hz, 3.5 mm
		9 ... 150 Hz, 1g
Status display		LED (status)
Galvanic isolation		No
Protection class		IP20
Electrical protection class		III
Product weight	[g]	132
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

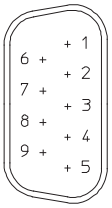
Operating and environmental conditions		
Ambient temperature	[°C]	+5 ... +55
Storage temperature	[°C]	–40 ... +70
Relative air humidity	[%]	10 ... 95
Certification		cULus listed (OL)

Connection and display components

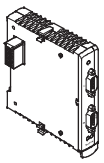


1 RS 232 connection

Pin allocation

	Pin	Signal	Meaning
Sub-D plug			
	1	n.c.	Not connected
	2	RxD	Receive data (input)
	3	TxD	Transmit data (output)
	4	n.c.	Not connected
	5	GND	Ground
	6	n.c.	Not connected
	7	RTS	Request to send (output)
	8	CTS	Clear to send (input)
	9	n.c.	Not connected
	Housing	Screened	Screened

Ordering data

Electrical interface		Part No.	Type
	2x RS 232 serial interface	**553978**	**CECX-S-2S1**

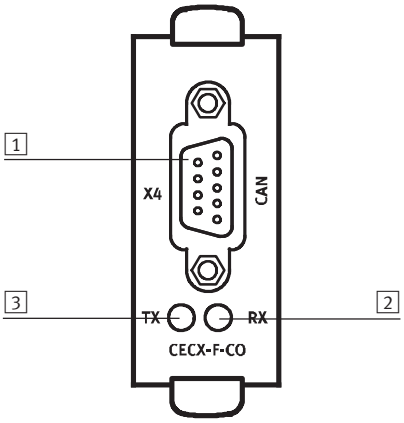
Bus interface
CECX-F-CO
Optional module for extending
the controller with a CAN interface.

General technical data		
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Status displays		LED yellow = transmit
		LED green = receive
Electrical protection class		III
Product weight	[g]	27
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

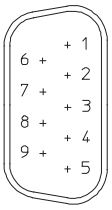
Technical data – Interface	
Fieldbus	
Type	CAN bus
Connection technology	Sub-D plug, 9-pin
Transmission rate	125; 250; 500; 800; 1,000 kbps
	Adjustable via software
Galvanic isolation	No

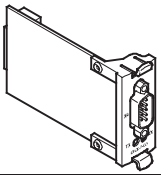
Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95
CE mark (see declaration of conformity)		To EU EMC Directive
Certification		c UL us - Listed (OL)

Connection and display components



1 CAN interface
2 TX yellow LED
3 RX green LED

Pin allocation			
	Pin	Signal	Meaning
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	SGND	Signal ground
	4	TERM1	Connection for activating the internal terminating resistor
	5	TERM1	Connection for activating the internal terminating resistor
	6	GND	Ground
	7	CAN_H	CAN high
	8	TERM2	Connection for activating the internal terminating resistor
	9	TERM2	Connection for activating the internal terminating resistor
	Housing	Screened	Screened

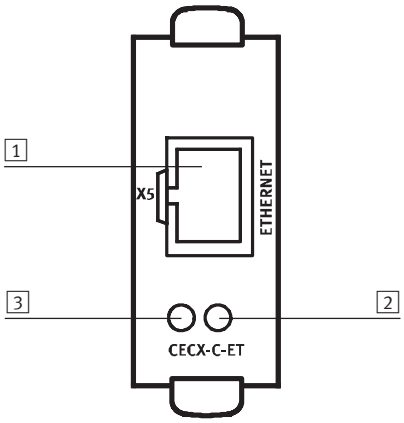
Ordering data			
Bus interface		Part No.	Type
	CAN interface	**553854**	**CECX-F-CO**

Electrical interface
CECX-C-ET
Optional module for extending the controller with an Ethernet interface.

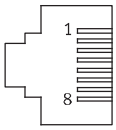
General technical data		
Connector plug		RJ45 socket, 8-pin
Data transmission speed	[Mbps]	10/100
Supported protocols		TCP/IP, EasyIP and Modbus TCP
Power consumption at the system bus	[W]	0.5
Resistance to shock		EN 60068-2-27 EA
		15 g, 11 ms (half sine)
Resistance to vibration		EN 60068-2-6-FC
		5 … 9 Hz, 3.5 mm
		9 … 150 Hz, 1g
Status displays		LED yellow = transmit/receive
		LED green = link
Electrical protection class		III
Product weight	[g]	23
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)
		RoHS-compliant

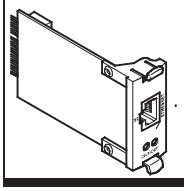
Operating and environmental conditions		
Ambient temperature	[°C]	+5 … +55
Storage temperature	[°C]	–40 … +70
Relative air humidity	[%]	10 … 95
Certification		cULus listed (OL)

Connection and display components



1 Ethernet interface
2 Green LED
3 Yellow LED

Pin allocation			
	Pin	Signal	Meaning
RJ45 socket			
	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
	Metal covering	Screened	Screened

Ordering data			
Electrical interface		Part No.	Type
	Ethernet interface	**553856**	**CECX-C-ET**

Electrical interface CECX-C-S1
Optional module for extending the controller with an RS 232 serial interface.

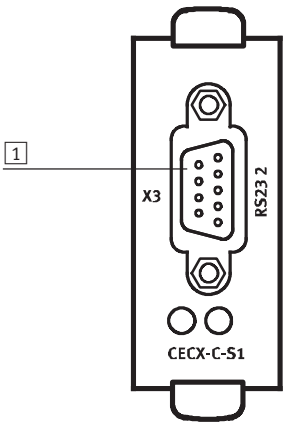
Electrical interface CECX-S-S4
Optional module for extending the controller with an RS 485-A/422-A serial interface.

General technical data			
		CECX-C-S1	CECX-S-S4
Type		RS 232	RS 485-A/422-A
Connection technology		Sub-D plug, 9-pin	
Transmission rate	[bps]	1,200 ... 115,000	
		Adjustable via software	
Power consumption at the system bus	[W]	0.2	–
Resistance to shock		EN 60068-2-27 EA	
		15 g, 11 ms (half sine)	
Resistance to vibration		EN 60068-2-6-FC	
		5 ... 9 Hz, 3.5 mm	
		9 ... 150 Hz, 1g	
Galvanic isolation		No	No
Protection class		–	IP20
Electrical protection class		III	III
Product weight	[g]	31	31
Materials			
Note on materials		Contains PWIS (paint-wetting impairment substances)	
		RoHS-compliant	

Operating and environmental conditions		
Ambient temperature	[°C]	+5 ... +55
Storage temperature	[°C]	–40 ... +70
Relative air humidity	[%]	10 ... 95
Certification		cULus listed (OL)

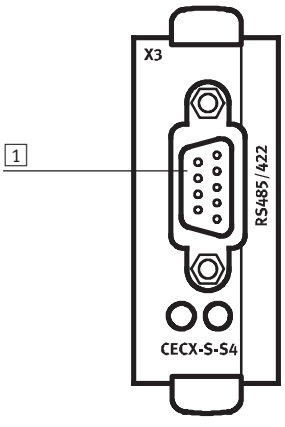
Connection and display components

CECX-C-S1



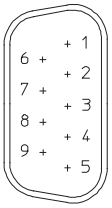
1 RS 232 connection

CECX-S-S4



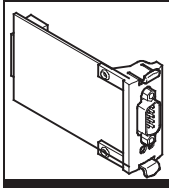
1 RS 485-A/422-A connection

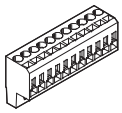
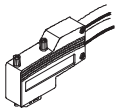
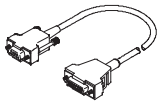
Pin allocation – Sub-D plug



Pin	Signal	Meaning
RS 232		
1	n.c.	Not connected
2	RxD	Receive data (input)
3	TxD	Transmit data (output)
4	n.c.	Not connected
5	GND	Ground
6	n.c.	Not connected
7	RTS	Request to send (output)
8	CTS	Clear to send (input)
9	n.c.	Not connected
Housing	Screened	Screened
RS 485-A		
1	GND	Ground
2	Term B	Terminating resistor
3	B / B'	Transmit/receive +
4	n.c.	Not connected
5	GND	Ground
6	n.c.	Not connected
7	Term A	Terminating resistor
8	A / A'	Transmit/receive –
9	n.c.	Not connected
Housing	Screened	Screened
RS 422-A		
1	GND	Ground
2	Term B	Terminating resistor
3	B'	Receive +
4	B	Transmit +
5	GND	Ground
6	n.c.	Not connected
7	Term A	Terminating resistor
8	A'	Receive –
9	A	Transmit –
Housing	Screened	Screened

Ordering data

Electrical interface	Part No.	Type
 RS 232 serial interface	**553855**	**CECX-C-S1**
RS 485-A/422-A serial interface	**553979**	**CECX-S-S4**

Ordering data			
	Brief description	Part No.	Type
Plug			
	Plug for peripheral modules, 2-pin	**553857**	**NECC-L1G2-C1**
	Plug for peripheral modules, 4-pin	**553858**	**NECC-L1G4-C1**
	Plug for peripheral modules, 6-pin	**553859**	**NECC-L1G6-C1**
	Plug for peripheral modules, 8-pin	**553860**	**NECC-L1G8-C1**
	Plug for peripheral modules, 18-pin	**553861**	**NECC-L1G18-C1**
	Plug for PROFIBUS interface, Sub-D, 9-pin, without terminating resistor	**533780**	**FBS-SUB-9-WS-PB-K**
	Plug for CAN-Bus interface, Sub-D, 9-pin, without terminating resistor	**533783**	**FBS-SUB-9-WS-CO-K**
Cable			
	Cable for connecting an FED via RS 485 Cable length 2.5 m Straight socket, Sub-D, 15-pin Straight socket, Sub-D, 9-pin	**563782**	**NEBC-S1G15-K-2.5-N-B-S1G9-V**