Controller CECC-D/LK/S



Brief description (Translation of the original instructions) CODESYS controller FESTO

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English

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CE

Controller CECC-D/LK/S

1 Use for intended purpose

The CECC-D/LK/S controller is intended exclusively for use in machines or automated systems.

- The controller serves as CODESYS controller for
- Controlling pneumatic and electric actuators
- Interrogating electric sensor signals
- Communication via Ethernet
- The controller may be used only as follows:
- As intended in industrial environments. Outside of industrial environments, e.g. in commercial and mixed-residential areas, actions to suppress interference may have to be taken.
- In its original condition, without unauthorised modifications.
- In faultless technical condition.
- Only in combination with approved components.
- Within the limits of the product defined through the technical data.
 In case of installation in the field, in a separate housing that surrounds everything, or within an overall housing of the end product.
 - Take the following into consideration for the destination:
 - Regulations and standards
 - Regulations of testing organisations and insurers
 - National specifications
 - All notes on intended use, the safety instructions and warnings as well as all further specifications for the controller also apply to the associated software libraries.

Additional information:

On the controller CECC → Description "CECC" → www.festo.com/sp
 On Modbus TCP → www.modbus.org





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of the respective trademark owners in certain countries.

This product uses open-source software, which is subject to the "GNU General Public License, Version 2". The terms of the GPL are available within the programming system as well as at the following address \rightarrow http://www.gnu.org/copyleft/gpl.html

Training of qualified personnel

The product must only be commissioned by trained experts in control and automation technology who are familiar with:

- Mounting, installation, operation and diagnostics of control systems, networks and fieldbus systems
- The applicable regulations for accident prevention and occupational safety
- The documentation for the product

Service

Contact your regional Festo contact person if you have technical questions → www.festo.com

Range of application and certifications

The information in this section, in combination with the UL marking on the product, must be observed in order for there to be compliance with the certification conditions of Underwriters Laboratories Inc. (UL) for USA and Canada \rightarrow Section 4 Power supply and Section 8 Technical data.

Information on UL certification

Product category code	NRAQ (USA) NRAQ7 (Canada)
File number	E239998
Valid standards	UL 61010-1 Edition 3 UL 61010-2-201 Edition 1 CAN/CSA-C22.2 No. 61010-1-12 Edition 3 CAN/CSA-C22.2 No. 61010-2-201:14 Edition 1
CE marking	

Fig. 1 Information on UL certification

2 Safety

- Prior to mounting, installation and maintenance work: Switch off power supply and secure it from being switched back on.
- For the electric power supply, use only PELV circuits that ensure a reliable electric disconnection from the mains network.
- Observe IEC 60204-1/EN 60204-1.
- Connect an earthing cable of sufficient conductor cross section to the connection on the product marked with the earth symbol.
- Observe the handling specifications for electrostatically sensitive devices.
- Only switch on the compressed air and load voltage if the system has been professionally installed, configured and parameterised.
- When performing maintenance and repair work, use suitable interlocks to prevent unintended movements of the actuators.

3 Connection and display components



- 1 X8: Ethernet interface
- 2 X7: USB interface
- Functional earthX11: Infeed
- X11: Infeed Load voltage supply for IO-Link (CECC-LK and CECC-S) Operating voltage supply for encoder (CECC-S)
- 5 LED displays Run, Error, Net, Mod
- 6 X12 ... X16: interfaces IO-Link (CECC-LK and CECC-S) RS232 and ENC/RS485/RS422 (CECC-S)
- 7 X6: CANopen fieldbus interface8 X5: Infeed
- Operating voltage supply for I/O interfaces
- 9 X2 ... X4: I/O interfaces
- (digital input, digital output)
 X1: Operating voltage supply of the controller
- Fig. 2 CECC (example CECC-LK)
- Plug NECC-L2G... for the interfaces X1 ... X5 and X11 ... X16 → www.festo.com/catalogue

→ _{Note}

• Use connecting cables approved for a temperature range up to at least 70 °C.

3.1 I/O interfaces X2 ... X4 (digital input, digital output) Pin Explanation Explanation

X2.0 X2.1	High-speed digital inputs
X2.2 X2.7	Digital inputs
X3.0 X3.5	Digital inputs
X4.0 X4.7	Digital outputs

Fig. 3 I/O interfaces X2 ... X4

3.2 Fieldbus interface X6

Pin		Signal	Explanation
	1	N.c.	Not connected
(+ 1 6 +	2	CAN_L ¹⁾	CAN-Bus signal (dominant low)
7 + 2	3	CAN_GND	CAN Ground
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	4	N.c.	Not connected
	5	CAN_SHLD	Functional earth
	6	CAN_GND	CAN Ground (optional)
	7	CAN_H ¹⁾	CANBus signal (dominant high)
	8	N.c.	Not connected
	9	N.c.	Not connected

1) If the controller is at the end of the cable:

Connect pin 2 and pin 7 using a terminating resistor (120 ohms/0.25 W). Appropriate CAN bus plugs (adapters) from Festo → www.festo.com/catalogue

Fig. 4 Fieldbus interface X6

3.3 USB interface X7

The USB interface enables external storage media to be connected using USB plug type A.



Malfunction due to undefined switching statuses of the electronics. If a USB hard disk without its own power supply is used, the maximum permitted current consumption can be exceeded, e.g. when the USB hard disk is running up. Controller CECC-D and CECC-LK:

• Use only storage media with current consumption ≤ 100 mA. Controller CECC-S:

USB storage medium and encoder are supplied from a common power source.

 Use USB storage medium and encoder whose total current consumption ≤ 500 mA.

3.4 Ethernet interface X8

The Ethernet interface $\boxed{1} \Rightarrow$ Fig. 2 enables connection of a programming unit, PC or operator unit to the controller.

The Ethernet interface is designed as an RJ45 socket.

3.5 Serial interfaces X12 and X13 (CECC-S)

Pin		Designation/	Explanation	
RS232-1	RS232-2	signal		
X12.1	X13.1	G	Data reference potential	
X12.2	X13.2	TX	Transmitted data	
X12.3	X13.3	RX	Received data	
X12.4	X13.4	S	Shield, functional earth	

Fig. 5 Serial interface modules X12 and X13

3.6 Multiple interface X14 (CECC-S)

The controller CECC-S has a combined interface with the following connection options:

- Encoder (ENC, RS422-based encoders only)
- RS422
- RS485
 - Simultaneous use of these connection options is not possible.
 - Configure and use only one of the three connection options with CODESYS.

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Pin	Designation/ signal	Encoder	RS422	RS485
X14.1	G	Load		
X14.2	A+	Track A+	Transmitted data+ ¹⁾	Transmitted/received data+ ¹⁾
X14.3	A–	Track A –	Transmitted data- ¹⁾	Transmitted/received data-1)
X14.4	В+	Track B+	Received data+1)	N.c.
X14.5	В-	Track B–	Received data-1)	N.c.
X14.6	N+	Zero track+	N.c.	N.c.
X14.7	N-	Zero track-	N.c.	N.c.
X14.8	S	Shield, functional earth		

I) If the controller is at the end of the cable:

 $\begin{array}{l} {\sf Connect pin X14.2 and pin X14.3 using a terminating resistor (120 ohms/0.25 W).} \\ {\sf Connect pins X14.4 and X14.5 using a terminating resistor (120 ohms/0.25 W).} \end{array}$

Fig. 6 Multiple interface X14

3.7 Communication interfaces IO-Link

4 x IO-Link Master Port X12 ... X15 (CECC-LK: IOL-M ...)

Pin	Designation/ signal	Explanation
X12 X15.1	L+	Operating voltage supply (24 V)
X12 X15.2	C/Q	Data communication
X12 X15.3	L-	Operating voltage supply (0 V)
X12 X15.4	24	Load voltage supply (24 V) from X11
X12 X15.5	0	Load voltage supply (0 V) from X11

Fig. 7 IO-Link Master Port X12 ... X15

1 x IO-Link Master Port X15 (CECC-S: IOL-M)

Pin	Designation/ signal	Explanation
X15.1	L+	Operating voltage supply (24 V)
X15.2	C/Q	Data communication
X15.3	L-	Operating voltage supply (0 V)
X15.4	24	Load voltage supply (24 V) from X11
X15.5	0	Load voltage supply (0 V) from X11

Fig. 8 IO-Link Master Port X15

1 x IO-Link Device Port X16 (CECC-LK and CECC-S: IOL-D)

Pin	Designation/ signal	Explanation
X16.1	L+	Operating voltage supply (24 V) from X1
X16.2	C/Q	Data communication
X16.3	L-	Operating voltage supply (0 V) from X1

Fig. 9 IO-Link Device Port X16

3.8 LED indicators

The following LED indicators signal the normal operating status of the controller:

LED			Meaning
Run	X	Lights up green	Program running
Error	0	Off	No error
Net	×	Flashes red	Controller has been identified in the network

Fig. 10 LED indicators

All LED indicators → Appendix.

Power supply



Risk of injury due to electric shock

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

\rightarrow _{Note}

The product may only be supplied from a single power source that fulfils the requirements of energy-limited circuits in conformity with IEC/EN/UL/CSA 61010-1 or of an energy-limited voltage source (limited power sourse, LPS) in conformity with IEC/EN/UL/CSA 60950-1 or IEC/EN/UL/CSA 62368-1 or of a class 2 circuit in conformity with NEC or CEC.

4.1 Operating voltage supply X1 (V-El.)

Pin	Designation/ signal	Explanation
X1.1	24	Operating voltage supply (+24 V DC)
X1.2	0	Operating voltage supply (load)
X1.3	Ŧ	Functional earth
X1.4	-	Not connected

Fig. 11 Operating voltage supply X1

Besides the power supply of the controller, the power supply of the following interfaces also flows through this connection:

 Fieldbus interface 	X6
 USB interface 	X7
 Ethernet interface 	X8
- Serial interface modules	X12 and X13 (CECC-S)
 Multiple interface 	X14 (CECC-S)
 IO-Link Device Port 	X16 (CECC-LK and CECC-S)
 Encoder interface 	X11 (CECC-S) 🗲 Section 4.4

The operating voltage supply for the I/O interfaces and the load voltage supply for the IO-Link Master Port are fed in separately.

4.2 Infeed of operating voltage supply X5 for the I/O interfaces

Pin	Designation/ signal	Explanation
X5.1	24	Infeed of operating voltage supply (+24 V DC) for the I/O interfaces X2 X4 (digital input, digital output)
X5.2	0	Infeed of operating voltage supply (load) for the I/O interfaces X2 X4 (digital input, digital output)

Fig. 12 Operating voltage supply X5 for the I/O interfaces

4.3 Infeed of load voltage supply X11 for IO-Link Master Ports

This connection is used for infeeding the load voltage supply of IO-Link Devices, which are connected via IO-Link-Master Ports.

Connection to CECC-LK (V-IOL)

Pin	Designation/ signal	Explanation
X11.1	24	Infeed of load voltage supply (+24 V DC)
X11.2		for IO-Link Master Ports X12.4 X15.4.
X11.3	0	Infeed of load voltage supply (load)
X11.4		for IO-Link Master Ports X12.5 X15.5.

Fig. 13 Infeed of load voltage supply X11 at the CECC-LK

Connection to CECC-S (24 V DC/UE)

Note

Damage to the controller from mixing up the connection pins.

 Use only the connecting pins X11.1 and X11.2 for infeed of the load voltage supply of the IO-Link Master Ports at the CECC-S.

Pin	Designation/ signal	Explanation
X11.1	24	Infeed of load voltage supply (+24 V DC) for IO-Link Master Port X15.4.
X11.2	0	Infeed of load voltage supply (load) for IO-Link Master Port X15.5.

Fig. 14 Infeed of load voltage supply X11 at the CECC-S

4.4 Operating voltage supply X11 for encoders

Connection to CECC-S (24 V DC/UE)



Damage to the controller from mixing up the connection pins.

 Use only the connecting pins X11.3 and X11.4 for the load voltage supply of the encoder at the CECC-S.

Pin	Designation/ signal	Explanation
X11.3	UG	Operating voltage supply (GND) for encoder X14
X11.4	UE	Operating voltage supply (5 V) for encoder X14

Fig. 15 Operating voltage supply X11 for encoders

Note

Malfunction due to undefined switching statuses of the electronics.

Use USB storage medium and encoder whose total current consumption is maximum 0.5 A → Section 3.3.

Mounting, dismounting 5

- Prior to mounting, installation and maintenance work: Switch off power supply and secure it from being switched back on.
- Mount the controller on an H-rail $(\rightarrow 5.1)$ or on the wall $(\rightarrow 5.2)$.

Note

Malfunction due to heat accumulation.

- Mount the controller with sufficient space for heat dissipation.
- Comply with limits of the ambient temperature ranges → Section 8.

5.1 H-rail mounting





1 Spring-loaded clip

Fig. 16 Mounting/dismounting with H-rail mounting

Assembly

- The tilt position of the CECC when setting it onto the H-rail requires a minimum distance between the H-rail edge and the mounting surface so the CECC can be placed onto the H-rail without tilting.
 - Use H-rail with a minimum depth of 9 mm.
- 1. Place controller onto the H-rail from above.
- 2. Press the controller in the direction of the arrow.

The spring-loaded clip engages audibly on the H-rail.

Disassembly

- 1. Remove connections from the controller.
- 2. Pull the spring-loaded clip of the controller in the direction of the arrow using a suitable tool (e.g. screwdriver). This unlocks the controller.
- 3. Tilt the unlocked controller from the bottom away from the H-rail.
- 4. Lift controller upward from the H-rail.

5.2 Wall mounting



1 Mounting holes

Fig. 17 Mounting holes for wall mounting

Assembly



Damage to the controller from mounting onto uneven or flexible surfaces.

- Mount the controller only on even, torsionally rigid surfaces.
- 1. Plan sufficient space for connecting the supply cables.
- 2. Drill holes into the mounting surface. Note the distances between the mounting holes.
 - 3. Fasten the controller with screws:
 - Make sure that the housing is not damaged.
 - Use M4 screws of appropriate length and a screw head diameter of maximum 7.0 mm. Tightening torque: 0.8 Nm ± 20 %.

Dismounting

- 1. Remove connections from the controller.
- 2. Remove the mounting screws.
- 3. Remove the controller from the mounting surface.

6 Commissioning

Information on commissioning → Description CECC.

7 Accessories

→ www.festo.com/catalogue

Technical data 8

CECC	D	LK	S	
Operating voltage X1	19.2 V DC 30.0 V DC		20.4 V DC 30.0 V DV	
Nominal current consumption at	100 mA			
Ambient temperature	0 °C 55 °C			
Storage temperature	−25 °C +70 °C			
Relative humidity	95 %, nor	1-condensing		
Degree of protection	IP20 (use	in inside spaces)		
Protection class	Ш			
Dimensions	1			
Length x width x height	130 mm x	106 mm x 48.15 mm		
Product weight	200 g			
Resistance test				
Against vibration	In accord	ance with EN 61131-2	2	
Against shock	In accord	ance with EN 61131-2	2	
Electrical connection technology I/O	Socket st	rip, grid 3.5 mm		
Status displays	LED			
High-speed digital counter inputs X2.0 ar	nd X2.1			
Number	2			
Switching frequency	≤ 180 kHz	2		
Signal delay (debounce time)	1 µs, fact	ory setting, configura	ble with CODESYS	
Digital inputs X2.2 X2.7 and X3.0 X3.	5			
Number	12			
Switching frequency	≤ 1 kHz			
Signal delay (debounce time)	3 ms, fact	tory setting, configura	able with CODESYS	
All digital inputs X2 and X3	Desitive I			
		Ugic (PNP)		
Nominal value for TPUE	24 V DC			
Nominal value for FALSE	< 5 V DC			
Disconnection	19100			
Digital inputs from the internal	Digital inputs from the internal Galvanically separated			
switching logic of the CECC		,		
External power supply of	Galvanically separated			
the interface from the operating				
Status indication	LED			
Permissible connecting cable length	30 m			
Digital outputs X4	50 111			
Number	8			
Switching logic	Positive l	ngic (PNP)		
Contact	Transistor			
	24 V DC			
Output current	500 mA			
Disconnection				
Digital outputs from the internal	Galvanica	Illy separated		
switching logic of the CECC				
External power supply of	Galvanica	Illy separated		
the interface from the operating voltage supply of the CECC				
Switching frequency	≤ 1 kHz			
Short-circuit proof	Yes			
Fieldbus interface X6				
Туре	CAN bus			
Connection technology	Plug, Sub-D, 9-pin			
Transmission rate	10, 20, 50	, 100, 125, 250, 500,	800, 1000 kBit/s	
	configurable with CODESYS			
Disconnection				
Signal lines of the interface from	Galvanically separated			
the internal switching logic of the				
Internal power supply of the	Galvanica	Illy separated		
interface from the operating				
voltage supply of the CECC				

CECC	D	LK	S	
USB interface X7	USB 1.1			
Ethernet interface X8				
Connector plug	RJ45			
Quantity	1			
Transmission speed	10/100 N	Abit/s		
Supported protocols	TCP/IP, E	asyIP, Modbus TCP		
IO-Link-interfaces	-	X12 X16	X15 X16	
Protocol	-	IO-Link Device Port: IO-Link Master Port	V 1.0 : V 1.1	
Connection technology, plug	-	IO-Link Device Port: 3-pin		
Communication mode	_	Can be configured y	ia software	
communication mode		IO-Link Device Port: COM1, COM2, COM3		
		IO-Link Master Port	: SIO, COM1, COM2, COM3	
Permitted cable length	-	20 m		
Port type	-	IO-Link Device Port:	: A . P	
Number of ports	_	1 IO-Link Device Port	: D rt	
Number of ports		4 IO-Link Master	1 IO-Link Master Port	
		Ports	TIO-LINK Master Fort	
Output current operating voltage (L+, L-)	-	≤ 200 mA/IO-Link Po	ort	
Output current load voltage (24, 0)	-	≤ 3.5 A/IO-Link Mast	ter Port	
Communication	-	C/Q LED green		
		C/Q LED red		
Ready status display	-	L+ LED green on		
		L+ LED green off		
Process data width OUT	-	IO-Link Master: 2 32 byte, can be		
Process data width IN	_	IO-Link Master 2	32 hyte, can be	
		parameterised	J2 byte, can be	
Storage	-	2 kByte/IO-Link Ma	ster Port	
Minimum cycle time	-	IO-Link Device Port: 3.2 ms		
Device ID	-	0x550000, 0x55000	1. 0x550002. 0x550003.	
		0x550004	,,	
Serial interface modules	-	-	X12 X14	
Туре	-	-	2 x RS232	
Connection technology	_	_	1 X K5485-A/422-A	
Transmission rate		_	300 375000 bit/c	
Encoder interface	-	_	300 37 3000 bit/3	
Bosolution	-	-	A14	
Cignal range	-	-	52 DIL	
	1	_	5 v, unerentiat (K5422)	
Operating voltage supply	E	_	5 V DC	
for encoders	-	_	5 v DC	
Programming languages	In accord	ance with IEC 61131	3 AS, AWL, FUP, KOP, ST	
Programming software	CODESYS	S V3 pbF		
Approvals	RCM mark			
UL certification	COLUS-			
Contamination level	2			
Setup altitude	≤ 2000 m			
Total power rating of the operating	4.3 A	6 A ¹⁾		
and load voltage power supplies at				
Load rating of the operating voltage	125 mA	<u> </u>		
Load rating of the operating voltage	4.1 A			
supply of the I/O interfaces X5			254	
supply X11	-	5.8/5 A	3.5 A	
CE marking → www.festo.com/sp → Declaration of conformity	In accord	ance with EU EMC Di	irective ^{2),3)}	

1) The outputs of the CECC may be loaded only to the extent that the maximum total of input currents at

The controller is intended for use in an industrial environment: Outside of industrial environments, e.g. in commercial and mixed-residential areas, actions to suppress interference may have to be taken.
 The controller is classified in zone A in accordance with EN 61131-2:2007.

Fig. 18 Technical data

8.1 Hardware and memory

CECC	D	LK	S	
Processor (CPU)	400 MHz			
Processing time	Approx. 250	µs/1k instructio	ns	
RAM memory (projects, variables, constants)	16 MB, from 44 MB	16 MB, from Revision 04: 44 MB 44 MB		
Flash memory (boot project, project archive, web visualisation, application data)	2 MB, from F 16 MB	Revision 04:	16 MB	
Flag (flag memory)	8 KB			
Inputs	8 KB	8 KB		
Outputs	8 KB	8 KB		
Remanent variables	7120 bytes			

Fig. 19 Hardware and memory

8.2 Remanent variables

The controller makes available a maximum of 7120 bytes for storing remanent variables (retain and persistent-retain variables). They are automatically shared based on the variable declaration within the application.

The following sample combinations for assigning the memory are possible.

Retain variable	Persistent-retain variable
7120 bytes	0 bytes (only if there is no persistent variable list)
0 bytes	7076 bytes (44 bytes for identification)
300 bytes	7076 - 300 bytes = 6776 bytes (44 bytes for identification)
x byte	7076 - x bytes (44 bytes for identification)

Fig. 20 Memory assignment of the remanent variables (examples)

\rightarrow _{Note}

Error due to memory overflow.

• Comply with maximum memory capacity for remanent variables: 7120 bytes.

9 Specified standards

Version

IEC 60204-1: 2005, modified	EN 60204-1:2006
IEC 60950-1:2005, modified + Cor.:2006 +	EN 60950-1:2006 + A11:2009 + A1:2010 +
A1:2009, modified + A1:2009/Cor.:2012 +	A12:2011 + AC:2011 + A2:2013
A2:2013, modified	
IEC 61010-1 Edition 3	EN 61010-1:2010
IEC 61131-3:2013 Edition 3.0	EN 61131-2:2007
IEC 62368-1:2014, modified + Cor.:2015	EN 62368-1:2014 + AC:2015
UL 60950-1 Edition 2	CAN/CSA-C22.2 No. 60950-1-07 Edition 2
UL 61010-1 Edition 3, May 11, 2012,	CAN/CSA-C22.2 No. 61010-1-12 Edition 3,
Revised April 29, 2016	Update No. 2 April 2016
UL 61010-2-201 Edition 1 -	CAN/CSA C22.2 No. 61010-2-201:14 Edition 1,
Revision date 2017/02/20	Issue Date 2014/01/01
UL 62368-1 Edition 2	CAN/CSA-C22.2 No. 62368-1-14 Edition 2

Fig. 21 Standards specified in the document

10 Appendix

10.1 All LED indicators

LED			Meaning	Explanation
Run	×	Lights up green	Program running	Application status
	×	Lights up yellow	Program is stopped	
	0	Off	Run-time system is not running	
Error	ب	Lights up red	Class 4 error	PLC run-time error
	×.	Flashes red	Class 2 error	
	0	Off	No error/class 1 error	
Net	*	Flashes red	Controller has been identified in the network	Identification, e.g. through Festo Field Device Tool (FFT)
Mod	0	Off	-	Reserved

LED			Meaning	Explanation
Operating v	/oltage supj	oly X1 (V-El.)		
24	Ж́:	Lights up green	Controller is ready for operation	Power supply
	<u>×</u>	Flashes green	Undervoltage	
	0	Off	Controller is switched off	
I/O interfac	es X2 X4	(digital inpu	t, digital output)	
.07	×	Lights up green	At the input, 24 V is present, e.g. at X2.1 or X3.5	Voltage is present at the inputs or outputs
	×	Lights up yellow	At the output, 24 V is present, e.g. at X4.0	
Infeed of lo	ad voltage	supply for I/	O interfaces X5	[
24	×	Lights up green	Voltage is present	Power supply for the I/O interfaces
	0	Off	No voltage	
Ethernet X8	3			
Left	×	Lights up green	Data transfer with 100 Mbit/s	Speed LED: speed of data transfer
	0	Off	Data transfer with 10 Mbit/s	
To the right	×	Lights up green	Connection is made	Link/activity LED: connection and data transfer
	<u>×</u>	Flashes green	Data transfer is active	
	0	Off	No connection	
Infeed of lo	ad voltage	supply for er	ncoder X11 (24 V DC/UE)	L
UE	×	Lights up green	Voltage is present	Power supply for encoder
	0	Off	No voltage	
IO-Link inte	rfaces CECC	C-LK: X12 X	16 (IOL-M, OL-D), CECC	-S: X15 X16 (IOL-M, OL-D)
L+	×	Lights up green	IO-Link Master is act- ive	Status indication
	×	Flashes green	IO-Link Master is not ready for operation	
C/Q	×	Lights up green	Connection is made	Link/activity LED: connection and data transfer
C/Q	×	Lights up red	Data transfer is inactive	Link/activity LED: connection and data transfer
Serial inter	face module	es CECC-S: X	12 and X13 (RS232-1/-2)	-
ТХ	×	Lights up green	CECC transmits data	Data transmission
RX	×	Lights up green	CECC receives data	
Multiple int	terface CEC	C-S: X14 (EN	C/RS485/RS422)	
A+	×	Flashes green	Encoder ticks track A	Encoder turns slowly, LED flashes in the cycle of the rotary frequency and visualises the counting pulses (encoder ticks)
	×	Flickers green		Encoder rotates quickly
	*	Flickers green	Transmitted data for RS422 Transmitted/received data with RS485	Display of data transmission
B+	*	Flashes green	Encoder ticks track B	Encoder turns slowly, LED flashes in the cycle of the rotary frequency and visualises the counting pulses (encoder ticks)
	$\frac{1}{2}$	green Flickers	Received data with	Display of data transmission
N+		green Flashes	RS422 Encoder ticks zero	Encoder turns slowly. LFD flashes in
	×.	green	track	the cycle of the rotary frequency and visualises the counting pulses (encoder ticks)
	÷ۆ	Flickers green		Encoder rotates quickly

Fig. 22 LED indicators