

Bus node
CTEU-AS

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Table with 2 columns: Description, 8101686
Installation and interfaces, 2018-11a
Translation of the original instructions, [8101688]

CE
Bus node CTEU-AS English
For all available product documentation -> www.festo.com/pk

1 Instructions on this description
This description includes information for mounting the bus node on an I-port-compatible device from Festo (e.g. valve terminal with I-port interface) and for installation of this combination in a higher-level control system.

AS-Interface® and TORX® are registered trademarks of the respective trademark owners in certain countries.

2 Intended use
The bus node type CTEU-AS has been designed exclusively for use as a slave on the AS-interface fieldbus. It may only be used in its original status without unauthorised modifications and only in perfect technical condition.
The bus node 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.

3 Target group
The target group for this description consists of trained specialists in control and automation technology who have experience with installation of stations on the AS-interface fieldbus.

4 Mounting
Warning
Danger of injury to people, damage to the machine and system resulting from uncontrolled movements of the actuators and undefined switching states
• Switch off the operating and load voltage supplies.
• Switch off compressed air supply.
• Exhaust the pneumatics valve terminal.

Note
Damage to the electronics
The bus node includes electrostatically sensitive devices.
• Do not touch any electrical/electronic components.
• Observe the handling specifications for electrostatically sensitive devices.

Note
Use cover caps to seal unused connections. You will then achieve degree of protection IP65/IP67.

Information on mounting the bus node on the decentralised electrical connecting plate CAPC-... can be found in the mounting instructions that accompany the connecting plate.
The bus node CTEU-AS supports only the X1 connection of the electrical connecting plate CAPC-.... The X2 connection on the electrical connecting plate CAPC-... is without a function for the CTEU-AS bus node.

For mounting the bus node on a valve terminal with I-Port interface, proceed as follows:
1. Inspect the seals and sealing surfaces on bus node and valve terminal.
2. Plug the bus node onto the valve terminal in the right position and without tilting.
3. Screw the three self-tapping screws in by hand. You can use the threads already present when you screw it in again.
4. Tighten the screws by hand in diagonally opposite sequence, with a tightening torque of 0.7 ± 0.1 Nm.
5 Connection and display components
The following electrical connection and display components can be found on the bus node:

Fig. 1
Diagram of the bus node showing components: 1 DIL switch group, 2 Status LEDs, 3 M12 plug, 4 M12 socket.

6 Connect AS-interface bus and auxiliary power supply
The bus node also supplies voltage to equipment connected via the I-port interface.

Warning
Danger of electric shock
• Only use PELV circuits in accordance with IEC/EN 60204-1 (protective extra-low voltage, PELV) for the electrical power supply.
• Observe also the general requirements for PELV power circuits in accordance with IEC/EN 60204-1.
• Only use voltage sources which guarantee reliable electrical isolation of the operating voltage in accordance with IEC/EN 60204-1.

Through the use of PELV circuits, protection against electric shock (protection against direct and indirect contact) is ensured in accordance with IEC/EN 60204-1. Observe with branch lines:
- the maximum overall length of the AS-interface bus (100 m without repeater/ extender)
- the line length of the load voltage connection cable (depends on the current consumption of the valve terminal and fluctuations in load voltage).

Table with 3 columns: M12 plug, AS-interface In, Pin, Allocation. It maps pins 1-4 to AS-interface +, 0V, AS-interface -, and 24V.

Fig. 2

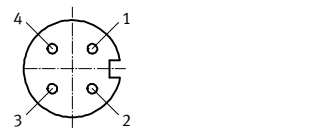
M12 socket, AS-interface Out	Pin	Allocation
	1	AS-interface +
	2	0 V (auxiliary power supply)
	3	AS-interface –
	4	24 V (auxiliary power supply)

Fig. 3

Note

Electromagnetic interference

- Make the connection to functional earth via the connected device or the electrical connecting plate CAPC-....

Functional test:

- The LED “PS” is illuminated green when the power supply is correctly presented.
- The LED “X1” is lit green if a device is connected and the I-Port communication is ready to function (→ chap. 8).

7 Basic settings for fieldbus communication

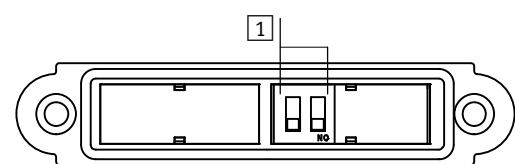
7.1 Removal of the DIL switch cover

To set the DIL switches, the cover must be removed:

- Switch off the power supply.
- Unscrew the two mounting screws of the transparent cover and remove the cover.

7.2 Setting the DIL switches

The bus node has a DIL switch group with 2 DIL switches. Set the valve configuration with DIL switches 1 and 2.



1 DIL switches 1 and 2

Fig. 4

I/O configuration, AS-interface slaves	Valve configuration	DIL switches	
		1	2
8I/8O	- The first 8 solenoid coils are actuated. - The number of valves is not checked. - The profile for both AS-interface slaves is 7.A.7 (factory setting).	OFF	OFF
16I/16O	- The first 16 solenoid coils are actuated. - The number of valves is not checked. - The profile for both AS-interface slaves is 7.A.A.	ON	OFF
4I/4O	- The first 4 solenoid coils are actuated. - The number of valves is not checked. - The profile of the AS-interface slave is 7.F.E. (standard slave).	OFF	ON
–	Reserved	ON	ON

Fig. 5

7.3 Mounting of the DIL switch cover

- Place the cover carefully on the bus node. Make sure that the seal is seated correctly!
- Tighten the mounting screws with max. 0.4 Nm with a Torx screwdriver (size T10) or a slot screwdriver that fits.

7.4 Address allocation

Before connecting to the AS-Interface bus: Assign a free address to the slave. Addressing can be performed via an AS-interface addressing device in accordance C.S.2.1, an addressing cable and through an AS-interface master. The number of connected solenoid coils is set through the DIL switches (→ chap. 7.2). Depending on this setting, the number of slave addresses, IO and ID code are automatically configured and saved (→ subsequent table).

Number of solenoid coils	Slave address	Profile 1	Profile 2	AS-interface-master type
1 ... 4	1 Standard	S-7.FE	–	M1 ... M4
1 ... 8	1 Extended A+B	S-7.A.7	S-7.A.7	M4
1 ... 16	1 Extended A+B	S-7.A.A	S-7.A.A	M4

Fig. 6

Assignment of slave addresses to physical outputs/valves of the connected devices can be found in the respective product documentation.

8 Status display/diagnostics

8.1 Status display via LEDs

PS (power system) – X1 (I-port)		
LED indicator		Status and significance
PS	X1	
		Both LEDs light green: – additional voltage present
		LED “PS” lights green, LED “X1” flashes green – additional voltage present – short circuit at a solenoid coil or other diagnosis of the I-port device (peripheral area)
		Both LEDs flash green: – additional voltage missing
		LED “PS” lights green, LED “X1” flashes red: – additional voltage present – no I-port device detected – peripheral faults
		LED “PS” illuminated green, LED “X1” illuminated red: – additional voltage present – short circuit/overload behind the AS-interface coil – peripheral error, I-port connection interrupted

Fig. 7

AS-i (AS-interface)	
LED indicator	Status and significance
	LED illuminated green: – AS-interface voltage applied – no error is present.
	LED is off: – AS-Interface voltage not applied
	LED illuminated red: – AS-interface address not set (equals 0) – no communication
	LED flashes red/green: – peripheral fault (e.g. no additional voltage, no I-port)

Fig. 8

Note

AS-interface has an integrated watchdog function, which can be activated/deactivated via the parameter bit P0.

Valid is:

- P0 = 1 → Watchdog activated (delivery status)
- P0 = 0 → Watchdog deactivated

If Watchdog is activated, the outputs are reset as soon as bus communication malfunctions.

8.2 Error diagnostics via AS-interface bus

AS-interface parameter-entry bits				Faults
P3	P2	P1	P0	
–	1	1	0	short circuit/overload behind the AS-interface coil
–	1	0	1	no additional voltage
–	0	1	1	no I-port device found
–	1	0	0	short circuit at a solenoid coil

Fig. 9

9 Technical data

General	
Degree of protection through housing (in accordance with EN 60529)	IP65/67 ^{1) 2)}
AS-interface specification	3.0
Protection against electric shock (Protection against direct and indirect contact in accordance with IEC/DIN 60204-1)	Through use of PELV circuits
Electromagnetic compatibility (EMC) ³⁾ – emitted interference – resistance to interference	See declaration of conformity ➔ www.festo.com
Vibration and shock (as per EN 60068)	Severity level (SL) ⁴⁾ for mounting on
– vibration (part 2 – 6)	Wall: SG 2, H-rail: SG 1
– shock (part 2 – 27)	Wall: SG 2, H-rail: SG 1
– continuous shock (part 2 – 29)	Wall and H-rail: SG 1
Temperature range	
– storage/transport	–20 ... +70 °C ²⁾
– environment, operation	–5 ... +50 °C ²⁾
Materials	PA (reinforced), PC, NBR, steel (galvanized), RoHS-compliant circuit boards

- 1) Requirement: Bus node mounted completely, plug connector in the plugged-in status or provided with cover cap.
- 2) Note that connected devices may only satisfy a lower degree of protection, a smaller temperature range, etc.
- 3) The bus node 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.
- 4) Explanation of the severity level ➔ subsequent tables

Fig. 10

Vibration load					
Frequency range [Hz]		Acceleration [m/s²]		Deflection [mm]	
Severity level 1	SL2	SL1	SL2	SL1	SL2
2 ... 8	2 ... 8	–	–	±3.5	±7
8 ... 27	8 ... 27	10	10	–	–
27 ... 58	27 ... 60	–	–	±0.15	±0.75
58 ... 160	60 ... 160	20	50	–	–
160 ... 200	160 ... 200	10	10	–	–

Fig. 11

Shock load					
Acceleration [m/s²]		Duration [ms]		Shocks per direction	
SL1	SL2	SL1	SL2	SL1	SL2
±150	±300	11	11	5	5

Fig. 12

Continuous shock load		
Acceleration [m/s²]	Duration [ms]	Shocks per direction
±150	6	1000

Fig. 13

Power supply	
AS-interface bus connection	
– voltage range (protected against incorrect polarity)	26.5 ... 31.6 V DC
– residual ripple	≤20 mVpp
AS-interface auxiliary power supply	
– voltage range (protected against incorrect polarity)	24 V DC ±10%
– residual ripple	4 mVpp
Intrinsic current consumption	
– bus node electronics	Max. 30 mA
– bus node on device (e.g. valve terminal)	Max. 60 mA
– bus node on electrical connecting plate CAPC-...	Max. 30 mA
Load current for the AS-interface slave	Max. 700 mA (A load of max. 700 mA can be connected to the “AS-interface Out” socket.)

Fig. 14

 Technical data of the connected equipment can be found in the respective product documentation.