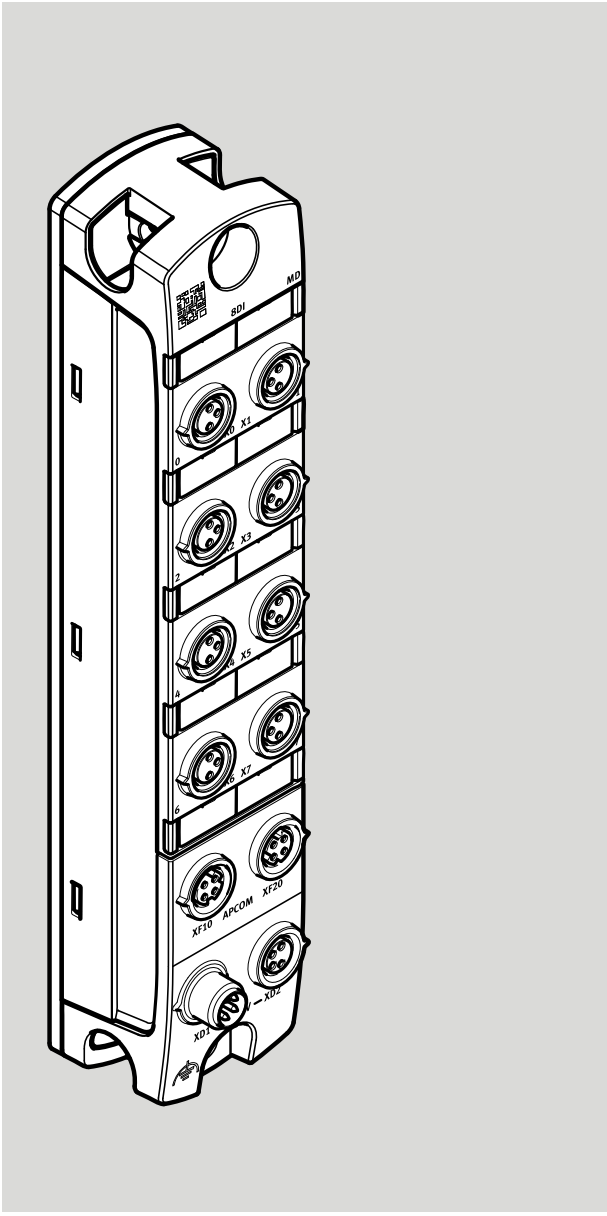
CPX-AP-I-8DI-M8-3P

Digital input module



FESTO

Instructions | Operating

8099684
2019-06
[8099686]

Translation of the original instructions

Table of contents

1 About this document

1.1 Applicable documents

All available documents for the product ➔ www.festo.com/pk.

Document	Contents
Instruction manual for automation system CPX-AP	Instruction manual and important information on assembly, electrical installation and maintenance tasks as well as description of the automation system CPX-AP

Tab. 1 Applicable documents

1.2 Product version

This document refers to the following product versions:

Product	Version
CPX-AP-I-8DI-M8-3P	Digital input module CPX-AP-I-8DI-M8-3P revision 1 or later

Tab. 2 Product version

The product version can be identified from the product labelling.

There may be an updated version of this document for these or later product versions ➔ www.festo.com/sp.

1.3 Product labelling

The product labelling is located on the right-hand side of the module. The Data Matrix code is on the connection side. Scanning the printed Data Matrix Code with an appropriate device opens the Festo Support Portal with the information appropriate for the product. Alternatively, the Product Key (11-digit alphanumeric code on the product labelling) can be entered in the search field of the Support Portal ➔ www.festo.com/sp.

1.4 Specified standards

Version		
IEC 60204-1:2016-10		DIN 46211:1965-03
IEC 61131-2:2017-08		DIN 46225:1976-12
EN 60204-1:2018-09		DIN 46234:1980-03
EN 60529:1991-10		–

Tab. 3 Standards specified in the document

2 Safety

2.1 Safety instructions

- Take into consideration the legal regulations for the respective destination.
- Use the product only within the defined values ➔ 12 Technical data.
- Observe labelling on the product.
- Observe further applicable documents.
- Store the product in a dry, UV- and corrosion-protected environment.
- Before working on the product:
  Switch off the power supply and secure it against being switched on again.

2.2 Intended use

The product described in this document is intended only for use in an automation system CPX-AP.
Use the product only as follows:

- Use only in an industrial environment. Outside of industrial environments, e.g. in commercial and residential/mixed-use areas, it may be necessary to take measures to suppress radio interference.
- Use only in combination with modules and components that are permissible for the respective product variant ➔ www.festo.com/catalogue.
- Only use the product if it is in perfect technical condition.

2.3 Training of qualified personnel

Installation, commissioning, maintenance and disassembly should only be conducted by qualified personnel. The qualified personnel must be familiar with installation of electrical control systems.

3 Additional information

- Accessories ➔ www.festo.com/catalogue.

4 Service

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

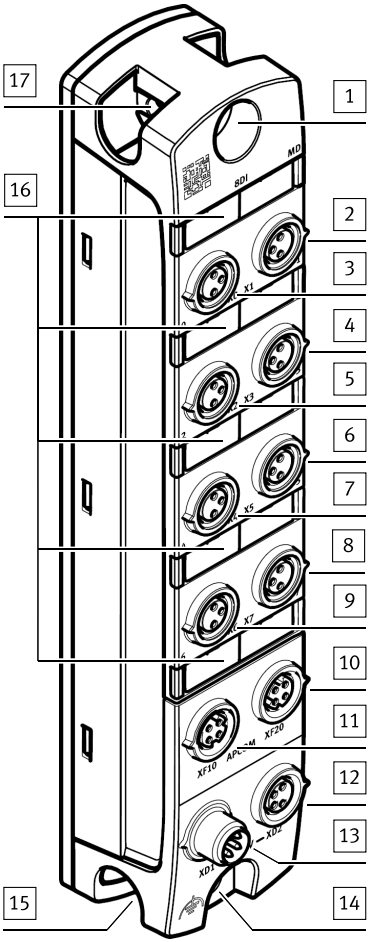
5 Product overview

5.1 Function

The module provides digital inputs for the connection of sensors in an automation system CPX-AP, thereby enabling the recording and further processing of digital input signals. The sensors are supplied by the module with a voltage of 24V DC and return a logic 0 or 1 to the inputs.
The module behaviour can be parameterised ➔ 9 Parameterisation.
Status and error messages can be shown by LED indicators on the module and reported to the interface via the system communication.
The sensor supply has an electronic fuse for protection against short circuit or overload. If this electronic fuse responds, the sensor supply of the module is switched off and the error is shown by an LED indicator on the module. After the elimination of the short circuit or the overload, the sensor supply is switched on again automatically. The electronic fuse of the module is slow-blowing. Sensors can therefore also be connected with a temporarily higher current requirement.

5.2 Configuration

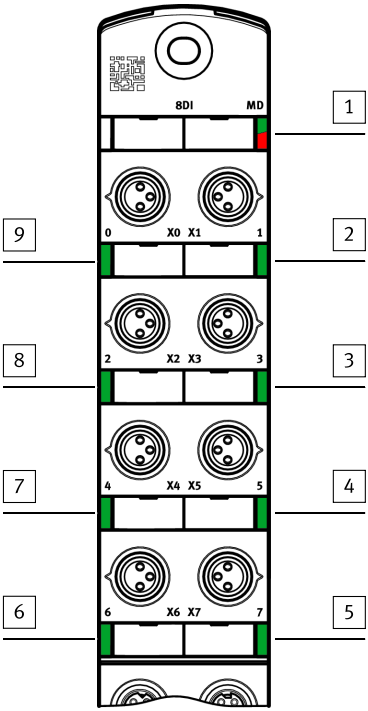
5.2.1 Product design



1 Mounting interface connection side top
2 Connection for input 1 [X1]
3 Connection for input 0 [X0]
4 Connection for input 3 [X3]
5 Connection for input 2 [X2]
6 Connection for input 5 [X5]
7 Connection for input 4 [X4]
8 Connection for input 7 [X7]
9 Connection for input 6 [X6]
10 Connection for system communication forwarding [XF20]
11 Connection for system communication [XF10]
12 Connection for voltage forwarding [XD2]
13 Connection for power supply [XD1]
14 Mounting interface connection side bottom and connection functional earth FE
15 Mounting interface, lateral bottom and connection for functional earth FE
16 Inscription label (optional)
17 Mounting interface, lateral top

Fig. 1 Product design

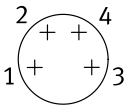
5.2.2 LED displays



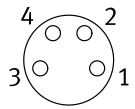
1 Module diagnostics [MD] (green, red)
2 Status of input 1 [X1.1] (green)
3 Status of input 3 [X3.3] (green)
4 Status of input 5 [X5.5] (green)
5 Status of input 7 [X7.7] (green)
6 Status of input 6 [X6.6] (green)
7 Status of input 4 [X4.4] (green)
8 Status of input 2 [X2.2] (green)
9 Status of input 0 [X0.0] (green)

Fig. 2 LED displays

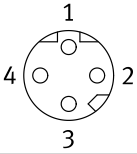
5.2.3 Connecting elements

Connection for power supply [XD1]		
Plug M8, 4-pin, A-coded		Signal
	1	+24 V DC logic supply PS
	2	0 V DC load supply PL
	3	0 V DC logic supply PS
	4	+24 V DC load supply PL

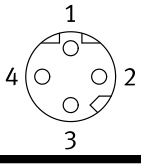
Tab. 4 Connection for power supply

Connection for voltage forwarding [XD2]		
Socket M8, 4-pin, A-coded		Signal
	1	+24 V DC logic supply PS
	2	0 V DC load supply PL
	3	0 V DC logic supply PS
	4	+24 V DC load supply PL

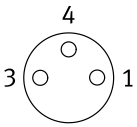
Tab. 5 Connection for voltage forwarding

Connection for system communication [XF10]			
Socket M8, 4-pin, D-coded		Signal	
	1	TX–	Transmitted data –
	2	RX+	Received data +
	3	TX+	Transmitted data +
	4	RX–	Received data –

Tab. 6 Connection for system communication

Connection for system communication [XF20]			
Socket M8, 4-pin, D-coded		Signal	
	1	RX–	Received data –
	2	TX+	Transmitted data +
	3	RX+	Received data +
	4	TX–	Transmitted data –

Tab. 7 Connection for system communication

Connection for inputs [X0] … [X7]		
Socket M8, 3-pin, A-coded		Signal
	1	+24 V DC inputs
	3	0 V DC inputs
	4	Input 0 … 7

Tab. 8 Connection for inputs

6 Assembly

- Assemble the module as outlined in the “Instruction manual for automation system CPX-AP"➔ 1.1 Applicable documents.

7 Installation

- Carry out the installation according to the "Instruction manual for automation system CPX-AP"➔ 1.1 Applicable documents.

8 Commissioning

- Commission the automation system CPX-AP in accordance with the "Instruction manual for automation system CPX-AP" ➔ 1.1 Applicable documents.

Behaviour of the display components of the module after error-free commissioning

[MD]

Illuminated green

Tab. 9 Behaviour of the LED displays of the module after error-free commissioning

i

Information on troubleshooting in the event of incorrect behaviour:
➔ Instruction manual for automation system CPX-AP
➔ 10 Diagnostics and fault clearance

9 Parameterisation

Various parameters are available for reading out information about the modules in an automation system CPX-AP and adapting the modules to the application situation.
Write access to the parameters is typically performed by the higher-level controller using the device descriptions specific to the host system.

ID	Parameter	Instance-s	Data type	Access[1)]	Arraysize
70	Part number	1	UINT32	ro	–
246	Fieldbus serial number	1	UINT32	ro	–
791	Product key	1	CHAR	ro	12
960	Firmware version	1	CHAR	ro	30
20000	Module code	1	UINT32	ro	–

ID	Parameter	Instance-s	Data type	Access[1)]	Arraysize
20014	Input debounce time – 0: 0.1 ms – 1: 3.0 ms (factory setting) – 2: 10 ms – 3: 20 ms	4	UINT8	rw	–
20085	Measured value temperature AP-ASIC [°C]	1	INT16	ro	–
20087	Current measured value of logic supply PS [mV]	1	UINT16	ro	–
20088	Current measured value of load supply PL [mV]	1	UINT16	ro	–
20093	Hardware version	1	UINT8	ro	–

1) ro = read only; rw = read write

Tab. 10 Parameter

10 Diagnostics and fault clearance

10.1 Diagnostic messages

ID hex (dec)	Message	Description	
01 ı 01 ı 010B (16843019)	Short circuit/overload in sensor supply	A short-circuit/overload of the sensor supply was detected.	
		Remedy	– Check connected load for correct function, in particular for power consumption. – Check sensor and wiring.
		Diagnostic status	Error
02 ı 01 ı 0016 (33619990)	Undervoltage in logic supply PS 24 V DC	Undervoltage of the logic supply PS 24 V DC was detected.	
		Remedy	– Check logic supply PS.
		Diagnostic status	Warning Error
02 ı 01 ı 0017 (33619991)	Overvoltage in logic supply PS 24 V DC	Overvoltage in the logic supply PS 24 V DC detected.	
		Remedy	– Check logic supply PS.
		Diagnostic status	Error

Tab. 11 Diagnostic messages

10.2 LED displays

Module diagnostics [MD]		
LED (red, green)	Meaning	Remedy
 Off	Logic supply PS not available.	Check connection of logic supply PS.
 Illuminated green	No module diagnostics active	–
 Flashes green	Module diagnostics active Degree of severity "Information" e. g. switching off load supply PL	–
 Flashes red	Module diagnostics active Degree of severity "Warning" e. g. parameterisation error	Take appropriate remedial action, e. g. check parameterisation.
 Illuminated red	Module diagnostics active Degree of severity "Error" e. g. undervoltage in load supply PL	Take appropriate remedial action, e. g. check load supply PL.
 LED flashes red quickly	Module ramp-up not yet completed. System communication not yet initialised.	–
 Flashes quickly green	Module identification (service function)	–

Tab. 12 LED module diagnostics [MD]

Status of input		
LED (green)	Meaning	Remedy
 Illuminated	Input active (logic 1) Logic 1 at input	–
 Off	Input inactive (logic 0) Logic 0 at input	–

Tab. 13 LED status of input

11 Disposal

ENVIRONMENT!

Send the packaging and product for environmentally sound recycling in accordance with the current regulations ➔ www.festo.com/sp.

12 Technical data

General technical data		
General technical data for automation system CPX-AP		Instruction manual for automation system CPX-AP ➔ 1.1 Applicable documents
Dimensions (length × width × height)	[mm]	170 × 30 × 35
Product weight	[g]	124
Ambient temperature	[°C]	–20 ... +50
Storage temperature	[°C]	–40 ... +70
Storage time	[Years]	2 (max.)
Humidity (non-condensing)	[%]	5 ... 95
Assigned address space (inputs/outputs)	[Bytes]	1/–
Module code (hex/dec)		0x2007/8199d
Module identification		CPX-AP-I-8DI-M8-3P
Degree of protection in accordance with EN 60529		IP65/IP67 (if lines are connected and connections that are not required are closed with a cover cap)
Protection against electric shock (protection against direct and indirect contact in accordance with IEC 61010-1)		through the use of SELV/PELV circuits (safe extra-low voltage/protected extra-low voltage)
Electromagnetic compatibility		See declaration of conformity ➔ www.festo.com
Mounting position		Any

Tab. 14 General technical data

Power supply		
Logic supply PS	[V DC]	24 ± 25 %
Intrinsic current consumption at nominal operating voltage 24 V from PS	[mA]	Typ. 32
Diagnostic message, undervoltage in logic supply PS	[V DC]	< 18

Tab. 15 Power supply

Digital inputs		
Number of inputs		8
Type in accordance with IEC 61131-2		3 (24 V DC)
Cable length	[m]	30 (max.)
Design	[V DC]	0 … 30, positive logic (PNP)
Logic level (logic 0/1)	[V DC]	≤ 5/ ≥ 11
Input debounce time		Can be parameterised
Electrical isolation between the channels		No
Electrical isolation between inputs and PS		No
Sensor supply		
Sensor power supply SEN	[V DC]	24 ± 25 %
Voltage drop at short-circuit protection (reduction SEN)	[V DC]	≤ 1
Reverse polarity protection 24 V SEN against 0 V SEN		oYes
Potential difference between 0 V SEN external and 0 V SEN internal		Not permissible
Sensor power supply short circuit protection		
Short-circuit protection		Electronic
Trigger level	[A]	> 1.8
Characteristic		Slow-blowing
Behaviour after end of overload		Automatic return

Tab. 16 Digital inputs

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