Original operating instructions

MD 742-11-82IO5-12

I/O-Hub with IO-Link

The Sensor People

We reserve the right to make technical changes
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1 About These Instructions

These operating instructions describe the structure, functions and the use of the product and will help you to operate the product as intended. Read these instructions carefully before using the product. This is to avoid possible damage to persons, property or the device. Retain the instructions for future use during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

These instructions are aimed at qualified personal and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols used

The following symbols are used in these instructions:

Tab. 1.1: Warning symbols and signal words

	Symbol indicating dangers to persons
	Symbol indicating possible property damage
NOTE	Signal word for property damage Indicates dangers that may result in property damage if the measures for danger avoidance are not followed.
CAUTION	Signal word for minor injuries Indicates dangers that may result in minor injury if the measures for danger avoidance are not followed.
WARNING	Signal word for serious injury Indicates dangers that may result in severe or fatal injury if the measures for danger avoidance are not followed.
DANGER	Signal word for life-threatening danger Indicates dangers with which serious or fatal injury is imminent if the measures for danger avoidance are not followed.

Tab. 1.2: Other symbols

	Symbol for tips Text passages with this symbol provide you with further information.
	Symbol for action steps Text passages with this symbol instruct you to perform actions.
	Symbol for action results Text passages with this symbol describe the result of the preceding action.

1.3 Additional documents

The following additional documents are available online at www.leuze.com:

- Data sheet
- EU Declaration of Conformity
- Commissioning manual IO-Link devices

2 Notes on the Product

2.1 Product identification

This instruction is valid for following devices:

- MD 742-11-82IO5-12

2.2 Scope of delivery

The scope of delivery includes:

- I/O hub
- Dummy plugs for M12-connectors
- Label clips

2.3 Legal requirements

The device falls under the following EU directives:

- 2014/30/EU (electromagnetic compatibility)
- 2011/65/EU (RoHS Directive)

3 For Your Safety

The product is designed according to state-of-the-art technology. However, residual risks still exist. Observe the following warnings and safety notices to prevent damage to persons and property. Leuze electronic GmbH + Co. KG accepts no liability for damage caused by failure to observe these warning and safety notices.

3.1 Intended Use

These devices are designed solely for use in industrial areas.

The block module 742-11-82IO5-12 is an O-Link device (Class A) and serves as I/O hub between field devices (sensors) and the IO-Link master. The hub has 16 digital inputs. The device is designed in IP65/IP67/IP69K and can be mounted directly in the field.

⚠ CAUTION!
Observe intended use!! ↳ Only operate the device in accordance with its intended use. The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use. Leuze electronic GmbH + Co. KG is not liable for damages caused by improper use. ↳ Read these operating instructions before commissioning the device. Knowledge of the operating instructions is an element of proper use.

NOTE
Comply with conditions and regulations! ↳ Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

3.2 General safety notes

- The device may only be assembled, installed, operated, parameterized and maintained by professionally-trained personnel.
- The device may only be used in accordance with applicable national and international regulations, standards and laws.
- The device only meets the EMC requirements for industrial areas and is not suitable for use in residential areas.

NOTE
Do not modify or otherwise interfere with the device! ↳ Do not carry out modifications or otherwise interfere with the device. The device must not be tampered with and must not be changed in any way. The device must not be opened. There are no user-serviceable parts inside. Repairs must only be performed by Leuze electronic GmbH + Co. KG.

4 Product Description

The I/O hub MD 742-11-82IO5-12 connects up to 16 digital sensors with one IO-Link master port.

Eight M12 connectors are available for connecting the field devices. The I/O hub is connected to the IO-Link master via an M12 socket. The devices are designed in a fully encapsulated housing with degree of protection IP65/IP67/IP69K.

4.1 Device Overview

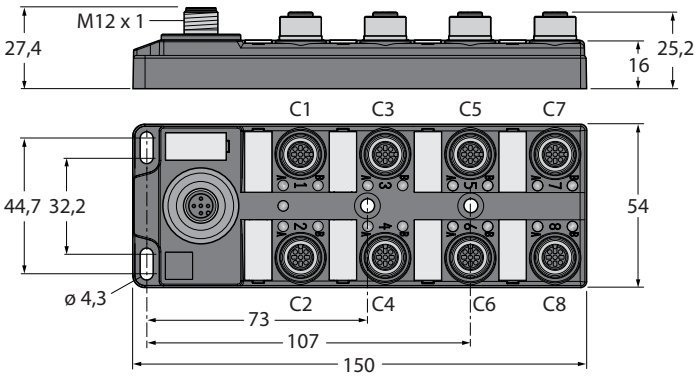

Fig. 4.1: Dimensions

4.1.1 Display elements

The device has the following LED indicators:

- IO-Link communication
- I/O status

4.2 Properties and features

- Fibre-glass reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection class IP65/IP67/IP69K
- IO-Link diagnostics for short-circuit and supply over- and undervoltage
- 2 universal digital channels per connector
- Metal connectors

4.3 Functions and Operating Modes

The I/O hub MD 742-11-82IO5-12 connects up to 16 digital sensors with one IO-Link master port.

The device provides diagnostics for power supply and short circuit of the sensors and actuators on the IO-Link master.

5 Installing

The device is mounted via four M4 screws on a flat and pre-drilled mounting surface.

↳ Fasten the module to the mounting surface with 4 M4 screws. The maximum tightening torque for the screws is 0.5 Nm.

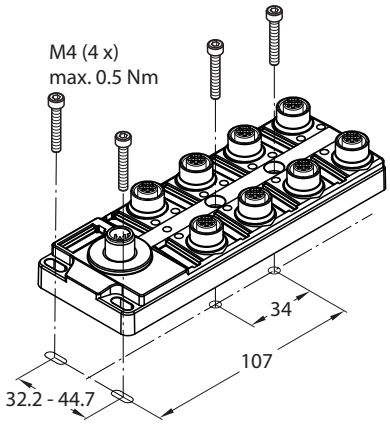

Fig. 5.1: Mounting the device to a mounting plate

6 Connecting

6.1 Connecting the supply voltage and IO-Link

The devices provide a 5-pin M12 connector for the connection to IO-Link.

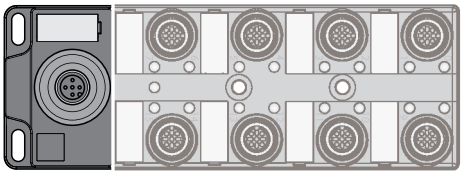

Fig. 6.1: M12 connector for the connection to IO-Link

↳ Connect the device to power supply IO-Link according to the pin assignment below.

6.2 Connecting digital sensors

For connecting digital sensors, 5-pin M12 connectors are available.

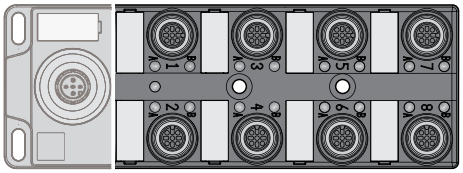

Fig. 6.2: M12 connector for connecting digital sensors (C1…C8)

↳ Connect the sensors to the device according to the pin assignment.

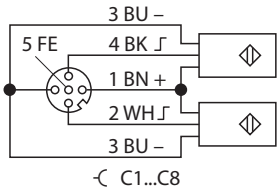

Fig. 6.3: Pin assignment MD 742-11-82IO5-12 (C1…C8)

Supply sensors externally

sensors which are supplied externally can also be connected to the MD 742 hubs. When sensors are supplied externally, the following safety regulations have to be observed:

↳ Supply sensors from SELV or PELV power supplies.

↳ Decouple external circuits that are not designed as SELV or PELV systems by opto-couplers, relays or other measures.

7 Parameterizing and Configuring

7.1 Parameters

IO-Link object directory - ISDU device parameters: Direct Parameter Page

ISDU Index Hex. (dec.)	Sub index	Object name	Access	Length in byte	Meaning/default value
0x00 (0)	Direct Parameter Page 1		Read only	16	
	0x07	Vendor ID	Read only	2	0x0152 (ID for Leuze)
	0x08				
	0x09	Device ID	Read only	3	MD 742-11-82IO5-12: 0x13EE
	0x0A				
	0x0B				

IO-Link object directory - ISDU device parameters: Identification

ISDU Index Hex. (dec.)	Object name	Access	Length in byte	Meaning/default value	Comment
0x10 (16)	Vendor name	Read only	16	Leuze	
0x11 (17)	Vendor text	Read only	32	www.leuze.com	
0x12 (18)	Product name	Read only	32	MD 742-11-82IO5-12	
0x13 (19)	Product ID	Read only	16	Ident-No. of the device: 50144901	
0x14 (20)	Product text	Read only	32	I/O hub	
0x15 (21)	Serial number	Read only	16	Sequential serial number	
0x16 (22)	Hardware ID	Read/write	8	Hardware version of the device, e.g. V1.0	
0x17 (23)	Firmware revision	Read only	16	Firmware version of the device, e.g. V1.0.7.0	
0x18 (24)	Application Specific Tag	Read/write	32	Default "****"	Customer-specific or application-specific data can be stored in this field.

IO-Link object directory - ISDU device parameters: Preferred Index (parameters and diagnostics of the digital in- and outputs)

ISDU Index Hex. (dec.)	Object name	Access	Length in byte	Meaning
0x40 (64)	Parameter ID	Read/write	4	Customer-specific ID, for free use
0x41 (65)	Inverting Input	Read/write	2	Invert digital input

Invert digital input - 0x41 (65), sub index 0

This parameter inverts the state of the digital input in the process image.

Format	Länge	
Byte	2 byte	1 bit per channel

The default values are written in **bold**.

Value	Meaning	
0	**No**	
1	Yes	Input signal inverted

Byte 0								Byte 1							
Bit offset								Bit offset							
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8
Sub index								Sub index							
9	10	11	12	13	14	15	16	1	2	3	4	5	6	7	8
C8P2 (B)	C8P4 (A)	C7P2 (B)	C7P4 (A)	C6P2 (B)	C6P4 (A)	C5P2 (B)	C5P4 (A)	C4P2 (B)	C4P4 (A)	C3P2 (B)	C3P4 (A)	C2P2 (B)	C2P4 (A)	C1P2 (B)	C1P4 (A)

7.2 System commands

The device supports the following system commands (System Command).

General system commands (according to IO-Link specification)

Command	
128	Device reset, the device is restarted.
130	Reset to factory settings

8 Operating

⚠ CAUTION
Operating the device outside the specification **Slight injuries and equipment damage possible.** ↳ Operate the unit only within the operating temperature specified in the technical data. ↳ Use only thermally suitable connection cables.

8.1 LED displays

The device has the following LED indicators:

- IO-Link communication
- I/O status

8.1.1 IO-Link

IO-Link LED	Meaning
Green flashing (1 Hz)	IO-Link communication OK, valid process data are sent
Red	IO-Link communication error or module error
Red flashing (1 Hz)	IO-Link communication OK, invalid process data or diagnostic message
Off	No voltage supply

8.1.2 Channel-LEDs

LED C1 A/B…C8 A/B	Meaning
Green	Input active
Off	Input inactive

8.2 IO-Link events

Event Code	Description	Event Mode	
0x5000	Hardware error	0xF4 (appears)	
		0xB4 (disappears)	
0x5110	Overvoltage	0xF4 (appears)	Overvoltage at supply
		0xB4 (disappears)	
0x5111	Undervoltage	0xF4 (appears)	Undervoltage at supply
		0xB4 (disappears)	
0x7710	Overcurrent	0xF4 (appears)	Group event: Overcurrent of the sensor supply at one of the connectors (C1…C8)
		0xB4 (disappears)	

8.3 IO-Link error codes

Error code	Description	
0x8011	Index not available	
0x8012	Sub index not available	
0x8023	Accesss denied	Index cannot be written
0x8030	Parameter value out of range	
0x8033	Parameter length overrun	Length of data to be written does not match the length defined for this parameter.
0x8034	Parameter length underrun	
0x8035	Function not available	Function not available in the device
0x8041	Inconsistent parameter set	

9 Troubleshooting

If the device does not function as expected, first check whether ambient interference is present. If there is no ambient interference present, check the connections of the device for faults

If there are no faults, there is a device malfunction. In this case, decommission the device and replace it with a new device of the same type.

10 Care, maintenance and disposal

10.1 Cleaning

Ensure that the plug connections and cables are always in good condition.
The devices are maintenance-free, clean dry if required.

10.2 Servicing

The device does not normally require any maintenance by the operator.
Repairs to the device must only be carried out by the manufacturer.

↳ For repairs, contact your responsible Leuze electronic subsidiary or Leuze electronic customer service (see chapter 11 „Service and support“).

10.3 Disposing

↳ For disposal observe the applicable national regulations regarding electronic components.

11 Service and support

Service hotline

You can find the contact information for the hotline in your country on our website www.leuze.com under **Contact & Support**.

Repair service and returns

Defective devices are repaired in our service centers competently and quickly. We offer you an extensive service packet to keep any system downtimes to a minimum.

Our service center requires the following information:

- Your customer number
- Product description or part description
- Serial number and batch number
- Reason for requesting support together with a description

Please register the merchandise concerned. Simply register return of the merchandise on our website www.leuze.com under **Contact & Support > Repair Service & Returns**.

To ensure quick and easy processing of your request, we will send you a returns order with the returns address in digital form.

What to do should servicing be required?

NOTE
Please use this chapter as a master copy should servicing be required! ↳ Enter the contact information and fax this form together with your service order to the fax number given below.

Customer data (please complete)

Device type:	
Serial number:	
Firmware:	
Display messages	
Status of LEDs:	
Error description:	
Company:	
Contact person/department:	
Phone (direct dial):	
Fax:	
Street/No:	
ZIP code/City:	
Country:	

Leuze Service fax number:

+49 7021 573 - 199

12 Technical Data

Technical Data	
Power supply	
Operating/load voltage	24 VDC
Permisible range	20.4…30 VDC
Sensor/actuator supply VAUX	Connector C1…C8 from power supply, short-circuit proof, max. 120 mA per connector
Power loss, typical	≤ 3,6 W
Inputs	
Number of channels	16 digital pnp inputs (EN 61131-2)
Type of input diagnostics	Group diagnostics
Signal voltage, low level	-3…5 VDC (EN 61131- 2, type 1 and 3)
Signal voltage, high level	11…30 VDC (EN 61131- 2, type 1 and 3)
Input delay	0.010 ms
Max. input current	15 mA
Potential isolation	Inputs to FE, 500 VDC
IO-Link	
IO-Link specification	Specified according to version 1.1
Parameterization	FDT/DTM, IODD
Transmission rate	COM 2: 38.4 kbit/s
Transmission physics	3-wire physics (PHY2)
Minimum cycle time	2.3 ms
Connectors	
IO-Link	M12 × 1, 5-pole
Input/output	M12 × 1, 5-pole
Permissible torques • IO-Link • I/O channels • Mounting (M4 screws)	 0.8 Nm 0.8 Nm 0.5 Nm
Standard/Directive conformity	
Vibration test	According to EN 60068-2-6
Shock test	According to EN 60068-2-27
Drop and topple	According to IEC 60068-2-31/IEC 60068-2-32
Electro-magnetic compatibility	According to EN 61131-2/-6-4
Approvals	CE, cULus

Technical Data	
General Information	
Dimensions (B × L × H)	54 × 150 × 27.4 mm
Operating temperature	-40…+70 °C (for total current up to 4 A)
Storage temperature	-40…+85 °C
Protection class	IP65 IP67 IP69K
MTTF	139 years
Housing material	PA6-GF30
Housing color	Black
Halogen-free	Yes
Mounting	4 mounting holes, Ø 4.3 mm
Approvals	CE

13 EC Declaration of Conformity

The IO-Link devices of the MD 742 series have been developed and manufactured in accordance with the applicable European standards and directives.

The manufacturer of the product, Leuze electronic GmbH + Co. KG in D-73277 Owen, possesses a certified quality assurance system in accordance with ISO 9001.

The EC Declaration of Conformity is available in the product download area at www.leuze.com.