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ILC-AIU-M12-IOL8X2 Inline Converter – Analog to IO-Link Converter

Instructions for Use

Contents

1 About these instructions

These instructions describe the setup, functions and use of the product and help you to operate the product according to its intended purpose. Read these instructions carefully before using the product. This will prevent the risk of personal injury and damage to property. Keep these instructions safe 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

The following symbols are used in these instructions:

	**DANGER** DANGER indicates a hazardous situation with a high level of risk, which, if not avoided, will result in death or serious injury.
	**WARNING** WARNING indicates a hazardous situation with a medium level of risk, which, if not avoided, will result in death or serious injury.
	**CAUTION** CAUTION indicates a hazardous situation with a medium level of risk, which, if not avoided, will result in moderate or minor injury.
	**NOTICE** CAUTION indicates a situation which, if not avoided, may cause damage to property.
	**NOTE** NOTE indicates tips, recommendations and important information about special action steps and issues. The notes simplify your work and help you to avoid additional work.
▶	**MANDATORY ACTION** This symbol denotes actions that the user must carry out.
⇨	**RESULT OF ACTION** This symbol denotes the relevant results of an action.

1.3 Other documents

Besides this document, the following material can be found on the Internet at www.turck.com:

- Data sheet
- IODD file
- Approvals

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to techdoc@turck.com.

2 Notes on the product

2.1 Product identification

These instructions apply to the following analog IO-Link converters:

- ILC-AIU-M12-IOL8X2

2.2 Scope of delivery

The delivery consists of the following:

- Analog IO-Link converter
- Quick Start Guide

2.3 Turck service

Turck supports you in your projects – from the initial analysis right through to the commissioning of your application. The Turck product database at **www.turck.com** offers you several software tools for programming, configuring or commissioning, as well as data sheets and CAD files in many export formats.

The contact data for Turck branches is provided at [▷ 19].

3 For your safety

The product is designed according to state of the art technology. Residual hazards, however, still exist. Observe the following safety instructions and warnings in order to prevent danger to persons and property. Turck accepts no liability for damage caused by failure to observe these safety instructions.

3.1 Intended use

The analog IO-Link converter ILC-AIU-M12-IOL8X2 converts analog output signals from a connected sensor into an IO-Link signal.

The device must only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Obvious misuse

- The devices are not safety components and must not be used for personal or property protection.

3.3 General safety notes

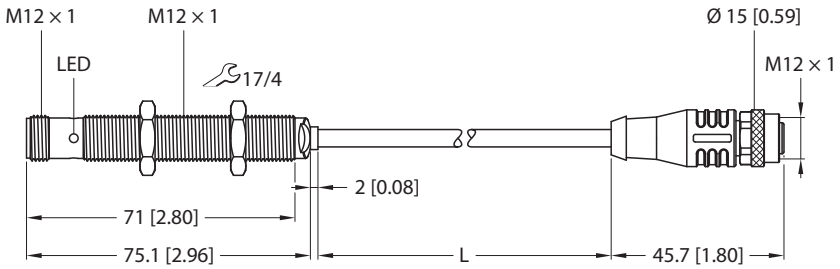
- The device must only be fitted, installed, operated, parameterized and maintained by trained and qualified personnel.
- Only use the device in compliance with the applicable national and international regulations, standards and laws.
- The device meets the EMC requirements for the industrial areas. When used in residential areas, take measures to prevent radio frequency interference.

4 Product description

The device is equipped with a 4-pin M12 male connector for connecting to an IO-Link master and a 5-pin M12 female connector for connecting to a sensor with analog output. The M12 female connector is designed with a 0.3-m connection cable. The analog IO-Link converter is contained in a metal housing.

The device has two switching outputs or one switching output and one IO-Link output.

4.1 Device overview



mm [Inch]

Fig. 1: Dimensions — ILC-AIU-M12-IOL8X2-H1141

4.1.1 Indication elements

The device has a 2-color status LED to indicate IO-Link communication.

4.2 Properties and features

- Analog: M12 female connector, A-coded
- IO-Link: M12 male connector, A-coded
- Adjustable output configuration: PNP/NPN/auto detection
- Output signal detection: Current/voltage/auto detection
- Resolution 16 bit
- Drift 45 ppm
- Sampling/conversion rate ≤ 200 Hz
- Protection class IP67

4.3 Functional principle

The connected sensor transmits an analog output signal to the IO-Link converter. The IO-Link converter forwards a digital IO-Link signal to the IO-Link master. Communication between the IO-Link converter and the IO-Link master is bidirectional.

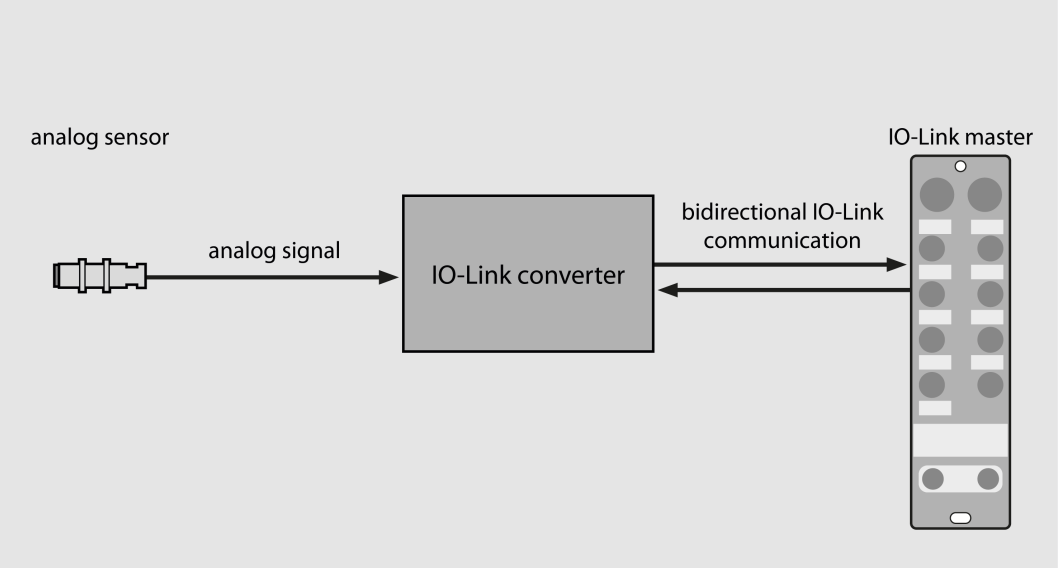


Fig. 2: Communication and data transmission with IO-Link converter

4.4 Functions and operating modes

The device converts analog output signals from a connected sensor into an IO-Link signal. If the auto detect function is activated for the switching output, the device automatically detects and activates the relevant type of output (PNP/NPN). The auto detect function is activated by default. The device supports Smart Sensor Profile 4.1.2.

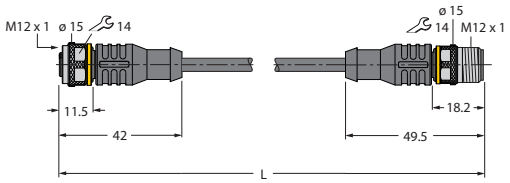
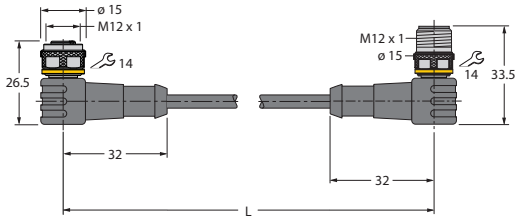
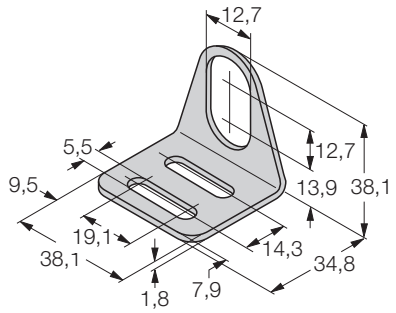
If the auto detect function is activated for the analog signal, the device automatically detects the analog output signal (current/voltage) from the sensor. The auto detect function is activated by default. The following analog output signals can be converted into an IO-Link signal by the device:

- 0…20 mA
- 0…10 V

4.4.1 IO-Link mode

The devices can be operated in IO-Link mode or in SIO mode. In order to operate in IO-Link mode, the devices must be connected to an IO-Link master. Bidirectional IO-Link communication takes place when operating with the analog IO-Link converter.

4.5 Technical accessories

Dimension Drawing	Type	ID	Description
	RKC4.4T-2-RSC4.4T/TEL	6625208	Connection cable, M12-Connector, straight, 4-pin, cable length: 2 m, sheating material: PVC, black; cULus approval; other cable lengths and types available, see www.turck.com
	WKC4.4T-2-WSC4.4T/TEL	6625256	Connection cable, M12-Connector, straight, 4-pin, cable length: 2 m, sheating material: PVC, black; cULus approval; other cable lengths and types available, see www.turck.com
	MW12	6945003	Mounting bracket for M12 x1 threaded barrel sensors; Stainless steel A2 1.4301 (AISI 304)

5 Installing

The device can be installed in any position.

- Install the device between the IO-Link master and the sensor.
- Protect the device connection against mechanical damage.
- Position the device so that the LED is visible during operation.

6 Connection

The device has an M12 female connector with a connection cable for connecting analog sensors. The device has an M12 male connector for connecting to the IO-Link master. The device is suitable for all IO-Link masters that support the IO-Link standard 1.0 or higher.

6.1 Wiring diagram

Pin assignment and wiring diagram for male connector

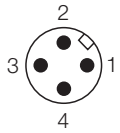


Fig. 3: Pin assignment

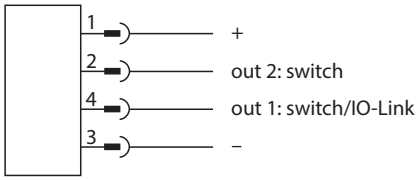


Fig. 4: Wiring diagram

Pin assignment and wiring diagram for female connector

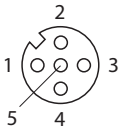


Fig. 5: Pin assignment

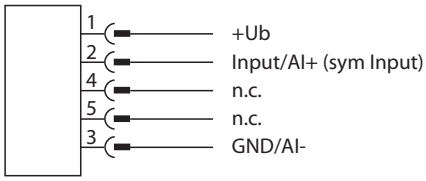


Fig. 6: Wiring diagram

7 Commissioning

The device is ready for operation 100 ms after the power supply is connected and switched on.

7.1 Initiating IO-Link mode

- ▶ Set a cycle time of at least 1.3 ms (COM 3) on the IO-Link master.
- ⇨ The device is operational.

7.2 Initiating SIO mode

- ▶ Connect the device to a standard I/O port or an analog port.
- ⇨ The device is operational after a delay of 500 ms.

The delay is necessary in SIO mode for the operation of preactuated sensors so that the sensor can exclude being connected to an IO-Link master. The operation delay has no effect on any potential IO-Link communication.

8 Operation

The device can be operated in either SIO mode or IO-Link mode.

8.1 LED

LED	Meaning
Green	Device is operational
Yellow	Switching output switched (SIO mode only)
Green flashing (0.9 s on, 0.1 s off)	IO-Link communication active
Yellow flashing (5 Hz)	Sensor error (e.g. short circuit)
Flashes alternately 2 × yellow and 2 × green	Flashing for sensor identification

9 Setting and parameterization

9.1 Settable functions and features

Parameter	Meaning
Reset device	The device is restarted. Communication is interrupted momentarily. The measured maximum vibration values are reset.
Reset application	The application-specific parameters are reset. Communication is not interrupted. The sensor is switched to a defined operating state. Identification parameters are not affected. The measured maximum vibration values are reset.
Restore factory settings	The factory settings of the device are restored. The device is restarted after the restoration.
Output 1 configuration	The switching outputs can be set for either PNP or NPN operation. The auto detect function is used to set the settings automatically. The auto detect function is activated by default.
Output 2 configuration	The switching outputs can be set for either PNP or NPN operation. The auto detect function is used to set the settings automatically. The auto detect function is activated by default.
Mode	Current or voltage can be set for the detection of the connected analog output signal from the sensor. The auto detect function is used to set the settings automatically. The auto detect function is activated by default.
Switching behavior	The following switching behaviors can be set: ■ Window mode ■ Single point mode ■ Two point mode

9.2 Setting via IO-Link

The device can be parameterized within the technical specifications (see data sheet) via the IO-Link communication interface – both offline, e.g. with the configuration tool as well as also online via the controller. An overview of the different functions and properties that can be set and used for IO-Link or SIO mode can be found in the chapter “Setting and parameterization” and via the IODDfinder. Detailed instructions on the parameterization of devices via the IO-Link interface are provided in the IO-Link commissioning manual.

All parameters can be changed in IO-Link mode via the controller, both during commissioning and during operation. In SIO mode, the device operates in accordance with the most recent setting configured in IO-Link mode.

9.3 Setting in SIO mode

In SIO mode, various sensor functions and adjustable properties can be used. The set functions can be analyzed using the switching signals or analog values for the respective output.

9.3.1 Configuring the device prior to initial commissioning

▶ Configure the sensor functions and properties via an IO-Link master or an IO-Link USB adaptor using a configuration tool.

⇨ The selected settings are saved and will be operational following the installation of the device in the plant.

9.3.2 Configuring the device following initial commissioning

- ▶ Disconnect the device from the control system.
- ▶ Configure the sensor functions and properties via an IO-Link master or an IO-Link USB adaptor using a configuration tool.
- ⇨ The selected settings are saved and will be operational following reinstallation in the plant.

10 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.

11 Maintenance

Ensure regularly that the plug connections and cables are in good condition.

The devices are maintenance-free, clean dry if required.

12 Repair

The device is not intended for repair by the user. The device must be decommissioned if it is faulty. Observe our return acceptance conditions when returning the device to Turck.

12.1 Returning devices

If a device has to be returned, bear in mind that only devices with a decontamination declaration will be accepted. This is available for download at
https://www.turck.de/en/return-service-6079.php
and must be completely filled in, and affixed securely and weather-proof to the outside of the packaging.

13 Disposal

The devices must be disposed of properly and do not belong in the domestic waste.

14 Technical data

Type	ILC-AIU-M12-IOL8X2-H1141
ID	100036698
Operating voltage	18…30 VDC (SELV, Class 2)
Communication protocol	IO-Link
Number of Channels	1
Input type	0/4…20 mA or -10/0…10 VDC
Output type	PNP/NPN
Adjustable input	Current: 0…20 mA
	Voltage: 0…10 V
Design	Cylindrical/threaded, M12
Dimensions	Ø 12 × 75 mm
Housing material	Metal/plastic, CuZn
Electrical connection	Connector, M12
Ambient temperature	-25…+70 °C
Protection class	IP67 (not evaluated by UL)
Operating height	Max. 2000 m
Approvals	CE
	UL

15 Turck branches — contact data

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