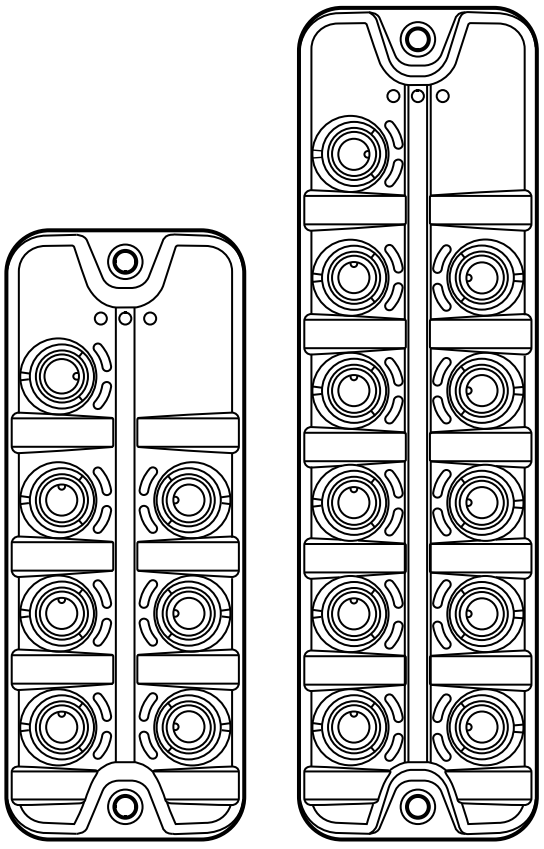
UK

Operating instructions
IO-Link module

AL2240
AL2340
AL2241
AL2341



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Contents

1 Preliminary note

▶ Instructions

> Reaction, result

Important note
Non-compliance may result in malfunction or interference.

Information
Supplementary note.

UK

2 Safety instructions

- Please read the operating instructions prior to set-up of the device. Ensure that the product is suitable for your application without any restrictions.
- The unit complies with the relevant regulations and EU directives.
- Improper or non-intended use may lead to malfunctions of the unit or to unwanted effects in your application.
- Installation, electrical connection, set-up, operation and maintenance of the unit must be carried out by qualified personnel authorised by the machine operator.

3 Functions and features

The unit converts the input states of the digital type 2 inputs and the status of the sensor supply into IO-Link signals.

The AL2240 / AL2241 unit has a grey housing and is suitable for use in the food and beverage industry (use of cleaning agents at high pressure and high temperatures).

The AL2340 / AL2341 unit (orange) must not be used in these areas.

3.1 IO-Link

3.1.1 General information

The unit has an IO-Link communication interface which requires an IO-Link capable module (IO-Link master).

The IO-Link interface enables direct access to diagnostic data and provides the possibility to set the device parameters during operation.

3.1.2 Device-specific information

You will find the IODDs necessary for the configuration of the IO-Link unit and detailed information about process data structure, diagnostic information and parameter addresses at www.ifm.com.

3.1.3 Parameter setting tools

You will find all necessary information about the required IO-Link hardware and software at www.ifm.com.

4 Function

After power on, the unit is in the RUN mode (normal operating mode).

4.1 Visual indication

The unit

- indicates the current physical state of the inputs (yellow LED DI1/DI2)
- signals a correct operation (green LED US on, red LED L/R off, red LED INT off)
- signals a short circuit of min. one sensor supply on the left side (red LED L on) and on the right side (red LED R on)
- signals an internal fault (red LED INT on)

4.2 Parameter setting

Device-specific parameter lists for IO-Link parameter setting are available at www.ifm.com.

4.3 Digital inputs

The unit AL2240 / AL2340 has 6x2 digital inputs.
The unit AL2241 / AL2341 has 10x2 digital inputs.

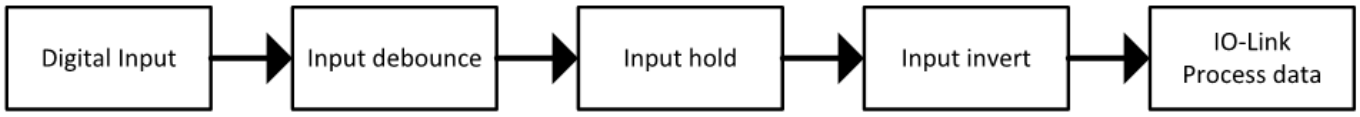
4.4 Sensor supply

The unit AL2240 / AL2340 has 6 sensor supplies. The unit AL2241 / AL2341 has 10 sensor supplies. Every sensor supply is limited to 100 mA. For the units AL2240 / AL2340 the total current is max. 700 mA; for the units AL2241 / AL2341 max. 1100 mA. Every sensor supply has its own short-circuit monitoring. The output voltage of the sensor supplies is proportional to the operating voltage which can vary within the IO-Link specification (18...30 V DC).

4.5 Digital input filters

The input signals can be changed via different filters before they are transmitted via IO-Link. The following filters are available and are applied to the input signal in this order:

1. Debounce
2. Hold
3. Invert



Each of these filters can be configured separately via IO-Link. More information is available in the IODD at www.ifm.com.

The unit detects signals of a length of min. 1.5 ms. Shorter signals are not detected.

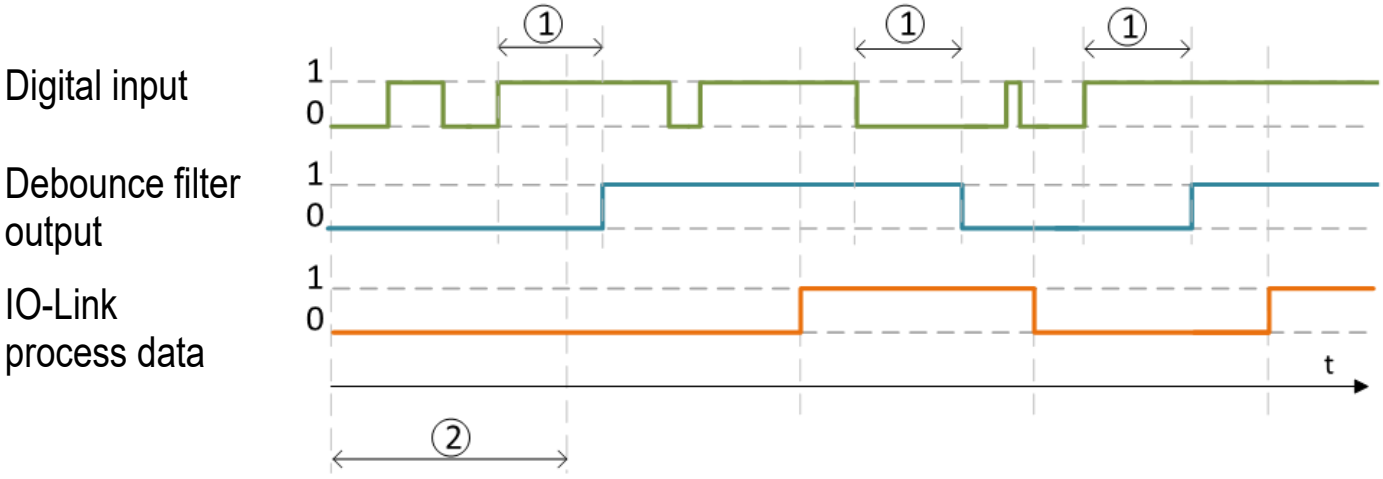
Periodic signals are only detected reliably if the signal period is at least twice as long as the cycle time.

The precision of the digital input filters is ± 1 ms.

4.5.1 Debounce

The input debounce filter suppresses noise signals caused by mechanical switches. The filter switches the input signals to the filter output with a delay (debounce time). All signals shorter than the set debounce time are ignored by the filter.

Time diagram debounce filter:



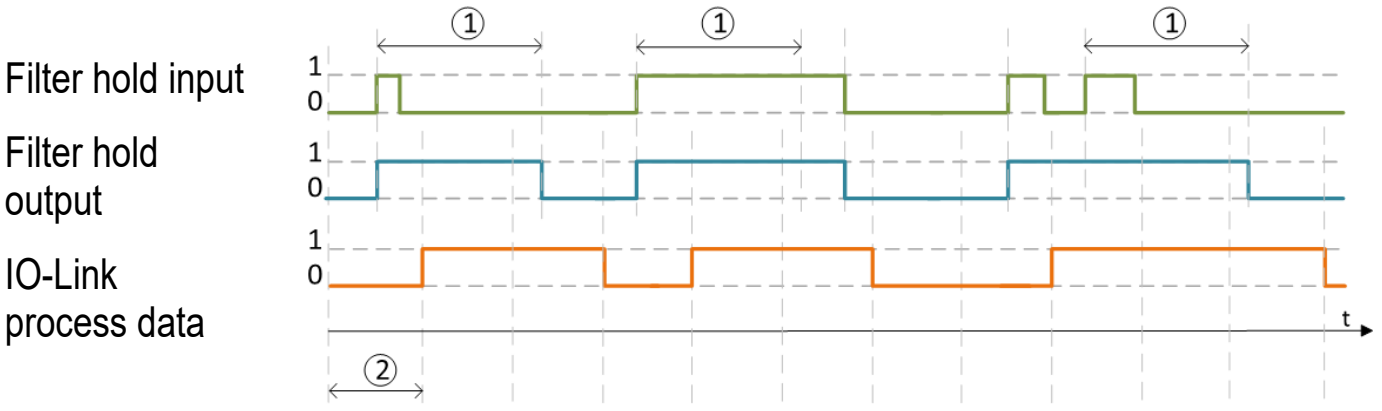
1: Debounce time
2: Cycle time

4.5.2 Hold

This filter stretches short input pulses. Via the following parameters the filter is configured:

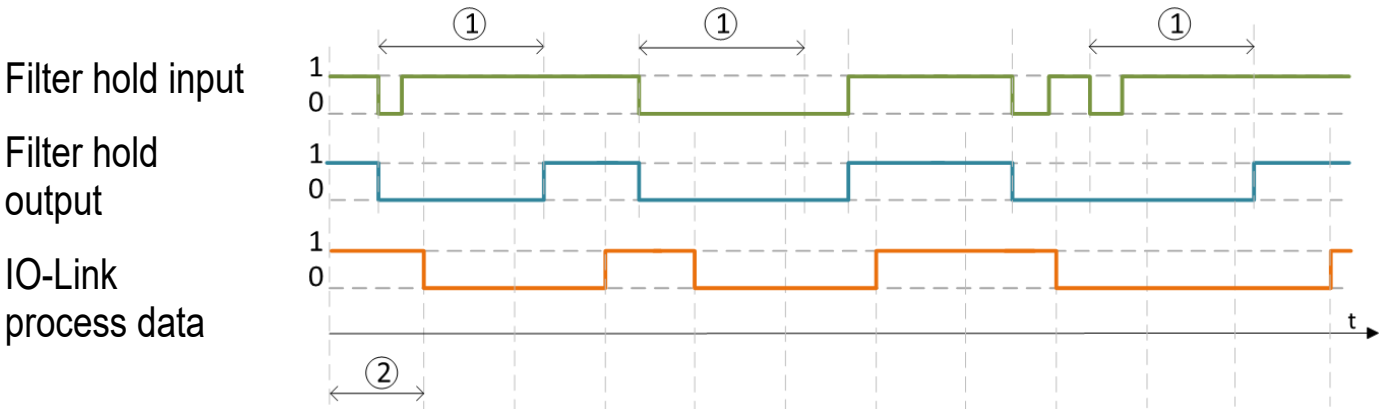
- Hold time: Pulse duration to which short pulses are to be stretched. Pulses that are present for a longer time than the hold time are not stretched.
- Hold status: Input level to be stretched (HIGH or LOW)

Time diagram filter hold with hold status HIGH:



1: Hold time
2: Cycle time

Time diagram filter hold with hold status LOW:



1: Hold time
2: Cycle time

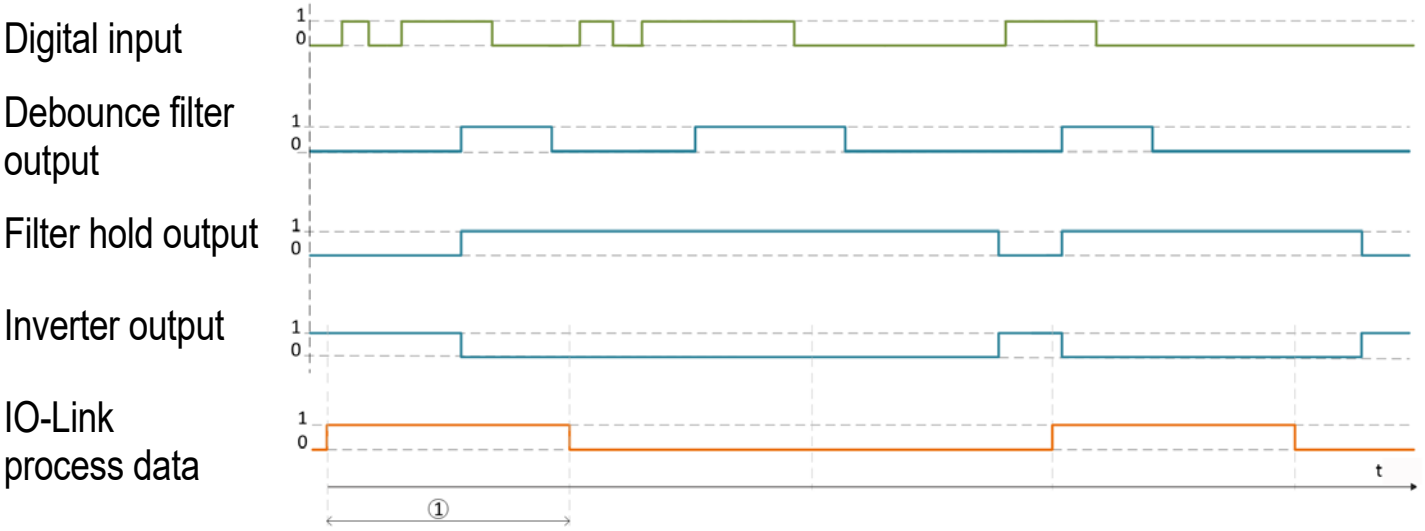
Input signals shorter than the cycle time are not reliably transmitted. To ensure a correct signal transmission via IO-Link the filter hold must be used.

4.5.3 Invert

This filter inverts incoming input signals.

4.5.4 Combination of different input filters

The different input filters can be combined. In the following example all 3 filters are used:



1: Cycle time

5 Installation

▶ Disconnect power before installation.

▶ For installation choose a flat mounting surface.

▶ Fasten the module onto the mounting surface using M5 screws and washers. Tightening torque 1.8 Nm.

▶ Connect the plugs of the sensors to the M12 sockets. Tightening torque max. 1 Nm.

▶ Cover unused sockets with protective caps (E12542). Tightening torque 0.6...0.8 Nm.

Observe the maximum tightening torque of the connection cables.

6 Electrical connection

The unit must be connected by a qualified electrician.

The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply to SELV, PELV

▶ Disconnect power.

▶ Connect the unit.

6.1 IO-Link connection

The IO-Link port must be connected according to the IO-Link specification. The current required by the units depends on the current load of the sensor supplies.

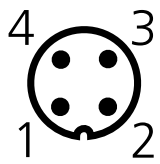
6.2 Input configuration

The unit has digital type 2 inputs. Connected units must be suitable for these inputs.

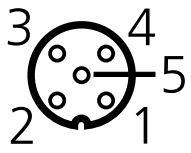
Maximum cable length: 30 m

7 Pin configuration

M12 connector IO-Link (X1)
1: + 24 V DC (US)
2: not connected
3: GND (US)
4: IO-Link

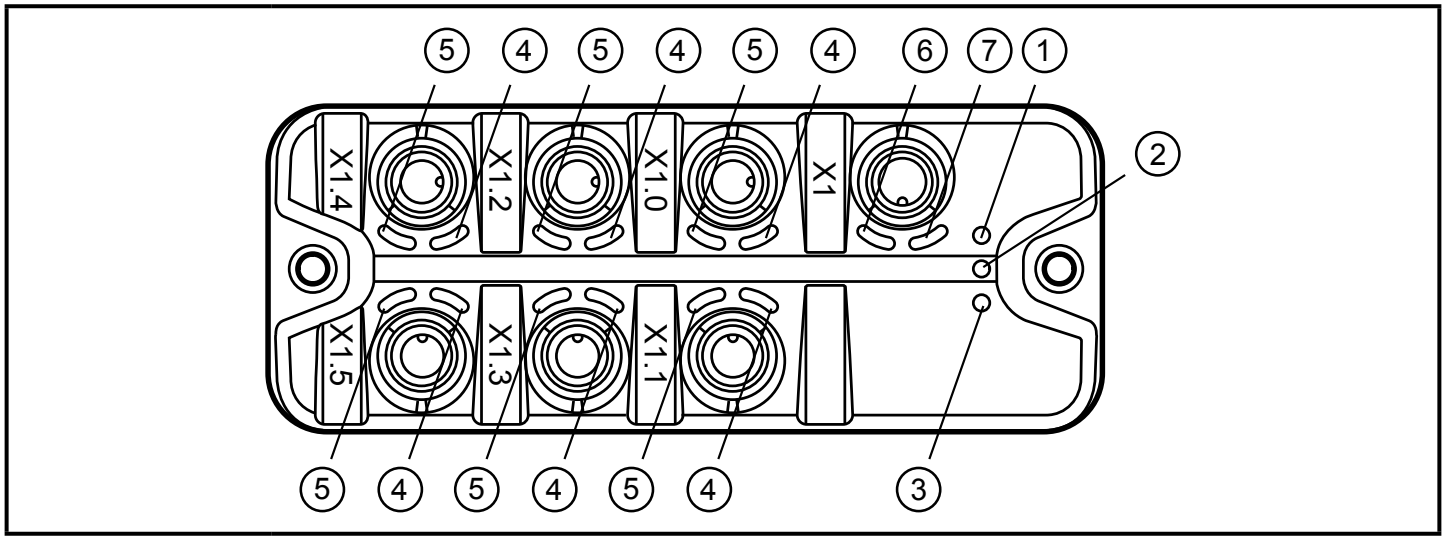


Inputs (X1.0...X1.9*)
1: + 24 V DC (US)
2: input DI2
3: GND (US)
4: input DI1
5: not connected

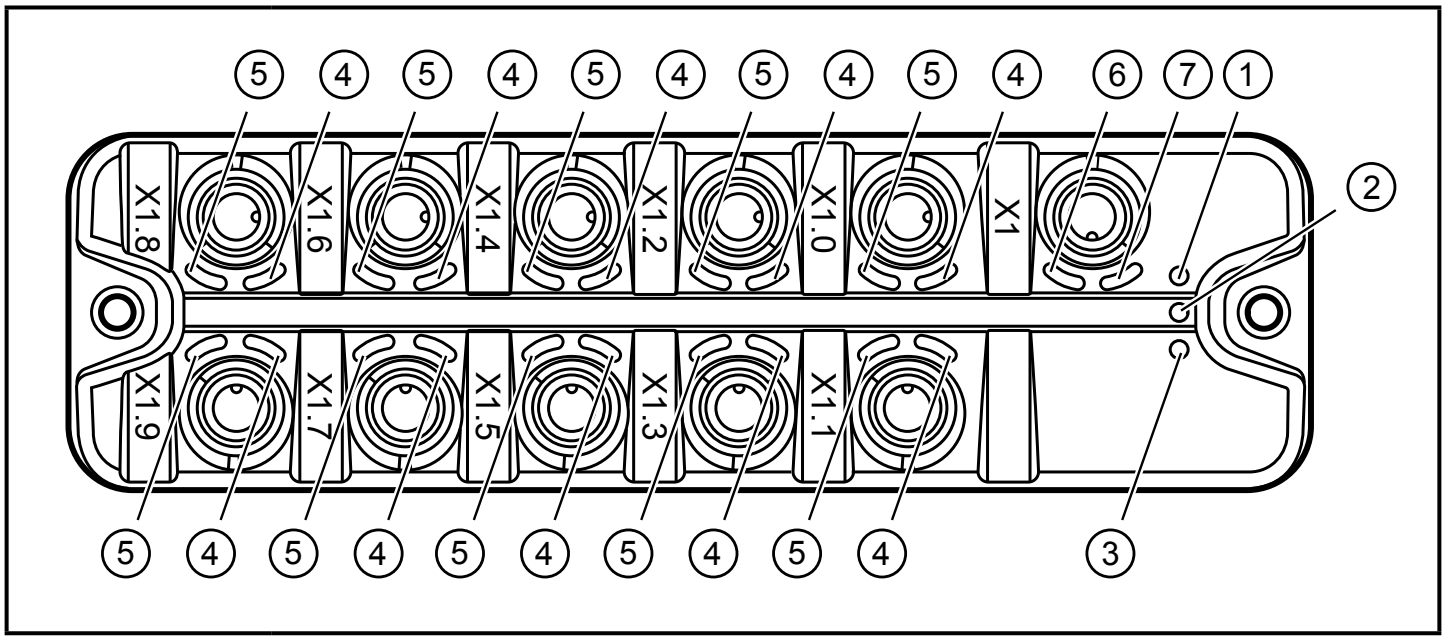


* X1.6...X1.9 only with AL2241 / AL2241

8 Operating and display elements



AL2240 / AL2340



AL2241 / AL2341

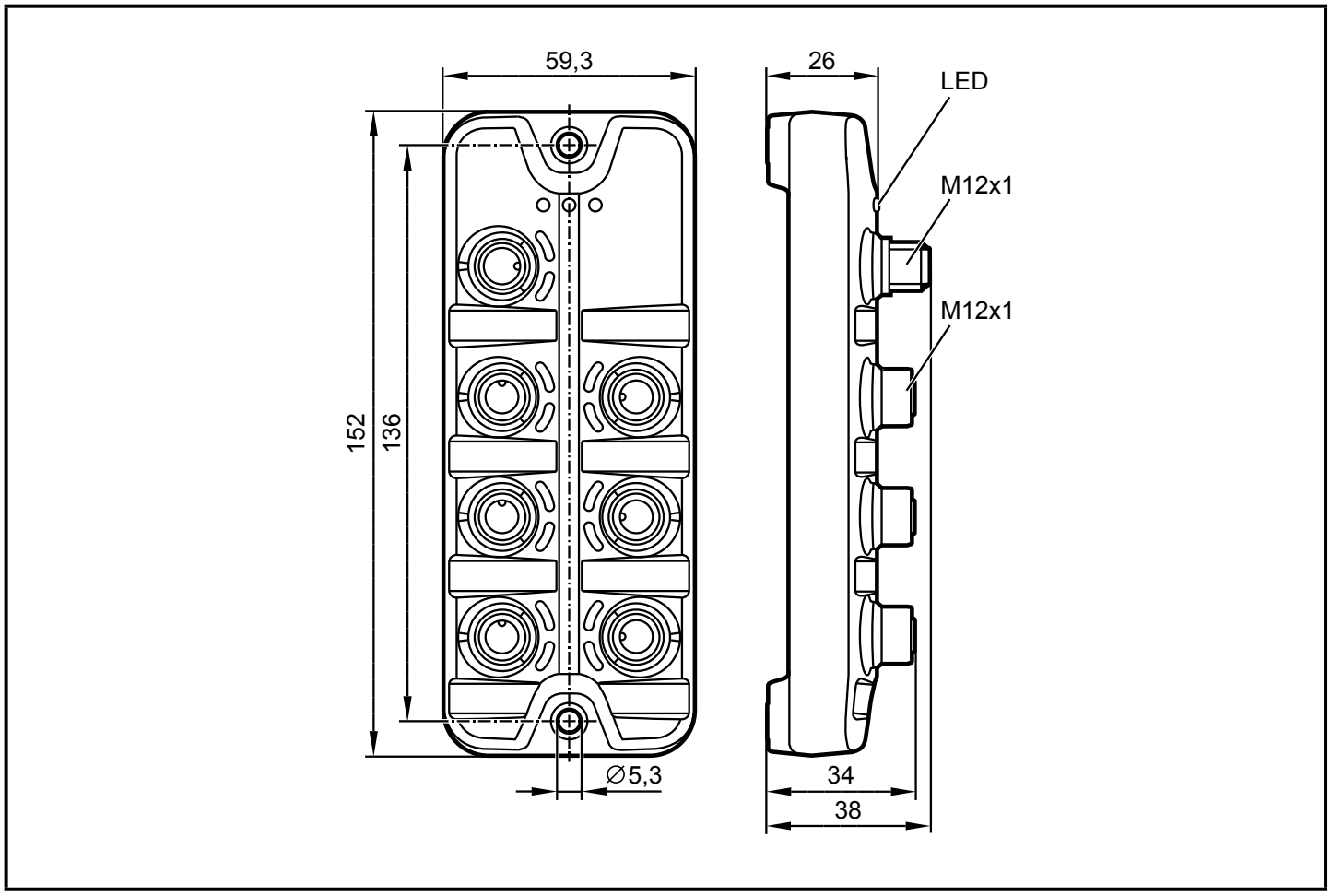
1: LED INT internal fault
2: LED L fault on the left side
3: LED R fault on the right side
4: LED DI2 status input DI2
5: LED DI1 status input DI1
6: LED IO-Link communication
7: LED US supply voltage

8.1 LEDs

LED	Colour	State	Description
INT	red	on	internal fault
		off	no internal fault unit in the operating mode
L	red	on	short circuit on the left side
		off	no fault on the left side unit in the operating mode
R	red	on	short circuit on the right side
		off	no fault on the right side unit in the operating mode
DI1, DI2	yellow	on	input signal high
		off	input signal low
⇆	green	on	IO-Link communication active
		off	IO-Link communication not active
US	green	on	voltage supply ≥ 17.5 V
		off	voltage supply < 15.5 V

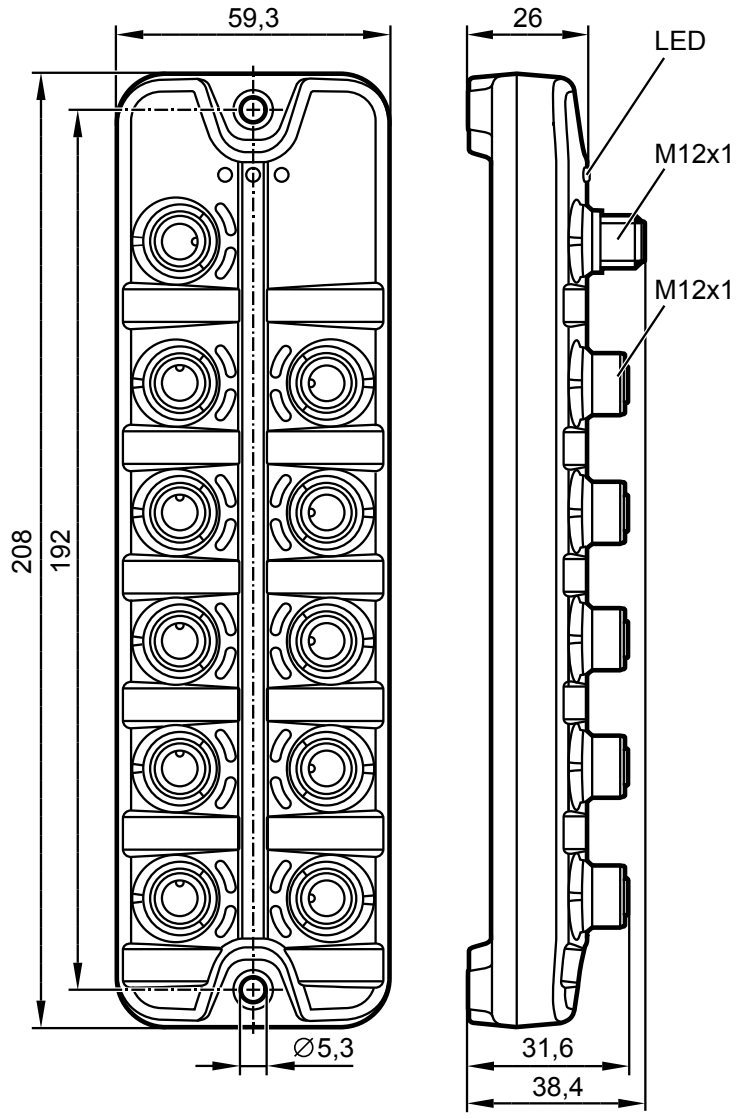
9 Scale drawing

9.1 AL2240 / AL2340



Dimensions [mm]

9.2 AL2241 / AL2341



Dimensions [mm]

10 Technical data

Technical data and further information at www.ifm.com

11 Maintenance, repair and disposal

The operation of the unit is maintenance-free.

After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations.

11.1 Cleaning the housing surface

- ▶ Disconnect the unit.
- ▶ Clean the unit from dirt using a soft, chemically untreated and dry cloth.
- ▶ In case of heavy dirt, use a damp cloth.

Micro-fibre cloths without chemical additives are recommended.

12 Approvals/standards

EU declarations of conformity, approvals etc. can be downloaded at: www.ifm.com