GB

Operating instructions
IO-Link output module (IP 69K)
AL2236

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1 Preliminary note

You will find instructions, technical data, approvals and further information using the QR code on the unit / packaging or at documentation.ifm.com.

1.1 Symbols used

✓	Requirement
▶	Instructions
▷	Reaction, result
[...]	Designation of keys, buttons or indications
→	Cross-reference
!	Important note Non-compliance may result in malfunction or interference.
i	Information Supplementary note

1.2 Warnings

Warnings indicate the possibility of personal injury and damage to property. This enables safe product handling. Warnings are graded as follows:

WARNING

Warning of serious personal injury

▷ If the warning is not observed, fatal and serious injuries are possible.

CAUTION

Warning of minor to moderate personal injury

▷ If the warning is not observed, minor to moderate injuries are possible.

ATTENTION

Warning of damage to property

▷ If the warning is not observed, damage to property is possible.

2 Safety instructions

- The unit described is a subcomponent for integration into a system.
  - The system architect is responsible for the safety of the system.
  - The system architect undertakes to perform a risk assessment and to create documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the architect of the system.
- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Intended use).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, operation and maintenance of the product must be carried out by qualified personnel authorised by the machine operator.
- Protect units and cables against damage.

3 Intended use

The device has 12 digital outputs that can be used to control actuators on IO-Link masters.

The device is suited for use in the food and beverage industry (use of cleaning agents under high pressure and at high temperatures).

4 Function

After power on, the device is in the normal operating mode.

4.1 IO-Link

This unit has an IO-Link communication interface which enables direct access to process and diagnostic data. In addition it is possible to set the parameters of the unit while it is in operation. Operation of the unit via the IO-Link interface requires an IO-Link master.

With a PC, suitable IO-Link software and an IO-Link adapter cable, communication is possible while the system is not in operation.

The IODDs necessary for the configuration of the unit, detailed information about process data structure, diagnostic information, parameter addresses and the necessary information about the required IO-Link hardware and software can be found at www.ifm.com.

4.1.1 Response when the IO-Link communication is interrupted

The parameter [Output state COM lost / PD invalid] (index 15000) is used to set how the outputs are to respond when the IO-Link communication is interrupted. For every output it can be defined separately if it:

- is to be switched on (HIGH)
- is to be switched off (LOW)
- or is to keep the last state

4.2 Electrical separation of the voltage supply

The voltage supply of the outputs is electrically separated from the IO-Link master. Moreover, the voltage supplies of the left and right side are electrically separated from each other in the device (UAL and UAR to connector X31).

4.3 Visual indication

The device signals

- the current state of the outputs (yellow LED DO1/DO2)
- correct operation (green LEDs UAL, UAR, ⊕ and US are on)
- an error (red LED INT, L or R)

Detailed description: LEDs (→ 🗋 11)

4.4 Parameter setting

IO Device Description (IODD) with all parameters and process data of the unit can be found at documentation.ifm.com.

4.5 Digital outputs

The device has 12 digital outputs.

Each port (X1.0...X1.5) has 2 outputs (pin 2 and pin 4). → Connecting the device

4.6 Separate deactivation of the outputs

The outputs of the left side are electrically separated from the outputs of the right side. Therefore the outputs of one side can be switched off without switching off the outputs of the other side. This does not disturb the IO-Link communication.

4.7 Variable output currents

The device monitors the total currents of both output sides. 1800 mA can be switched on every side. The individual outputs have no additional current limitation and can therefore be loaded variably. If the total current of one side is too high, the device switches off the overloaded side and locks it.

Release the outputs of the locked side again:

▶ Set process data output byte 0 and byte 2 to 0 via IO-Link.

▷ The left side is enabled.

AND / OR

▶ Set process data output byte 1 and byte 3 to 0 via IO-Link.

▷ The right side is enabled.

OR

▶ Disconnect the sensor and connect it again.

▷ Both sides are enabled.

OR

▶ Execute the IO-Link system command [ResetSCL].

▷ The left side is enabled.

AND / OR

▶ Execute the IO-Link system command [ResetSCR].

The right side is enabled.

4.8 Behaviour in case of undervoltage

If the supply voltage of the outputs of one side falls below 16.5 V, all outputs on this side switch off.

5 Installation

▶ Disconnect the power of the machine before installation.

▶ For installation choose a flat mounting surface.

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

6 Electrical connection

The unit must be connected by a qualified electrician.

Observe the national and international regulations for the installation of electrical equipment.

Voltage supply according to SELV, PELV.

Do not apply external voltage to the outputs.

6.1 Connecting the device

▶ Disconnect power.

▶ Connect the unit as follows:

M12 plug, A-coded, IO-Link (X1)

1: L+ (US)
2: not used
3: L- (US)
4: IO-Link

M12 connector voltage supply (X31)

1: L+ (UAL)
2: L- (UAR)
3: L- (UAL)
4: L+ (UAR)

Outputs left (X1.0, X1.2, X1.4)

1: not used
2: DO2
3: L- (UAL)
4: DO1

Outputs right (X1.1, X1.3, X1.5)

1: not used
2: DO2
3: L- (UAR)
4: DO1

6.1.1 IO-Link connection

The IO-Link port must be connected according to the IO-Link specification.

6.1.2 Mounting the connector

The threaded connections in the device correspond to the M12 standard. To ensure compliance with the specified protection rating, only cables that comply with this standard may be used. In the case of self-assembled cables, the system manufacturer is responsible for the protection rating.

▶ Use connectors with gold-plated contacts.

▶ During installation, place the connectors vertically so that the coupling nut will not damage the thread.

▶ Observe the coding of the connectors during installation.

If connector in the device:

▶ Tighten the cable sockets according to the torque specifications indicated by the cable vendor. Maximum permissible tightening torque: 0.8 Nm

If sockets in the device:

▶ Tighten the cable plug using 1.0 ± 0.1 Nm.

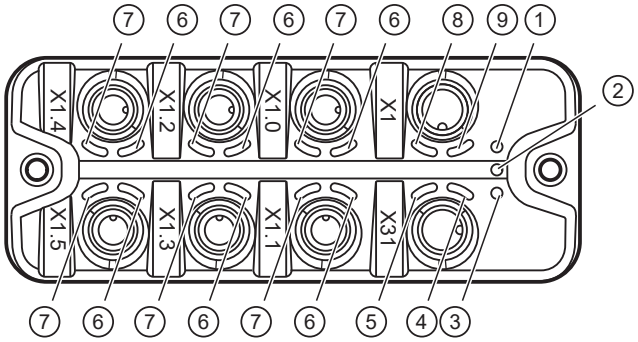
▶ Cover unused connections with protective covers. Tightening torque: 0.6...0.8 Nm

▶ Provide all outgoing cables with suitable strain relief after a maximum of 200 mm. Observe the minimum bending radius of the cables (→ information from the cable manufacturer).

6.1.2.1 Maximum cable length

- Without IO-Link communication: 30 m on each side
- With IO-Link communication: 20 m on the master side

7 Operating and display elements



1: LED INT Internal error
2: LED L Error on the left side
3: LED R Error on the right side
4: LED UAL Supply voltage left side ok
5: LED UAR Supply voltage right side ok
6: LED DO2 Status output DO2
7: LED DO1 Status output DO1
8: LED ⊛ IO-Link communication
9: LED US Supply voltage

7.1 LEDs

LED	Colour	Status	Designation
INT	Red	On	Internal error
L	Red	On	Short circuit or undervoltage on the left side
		Off	No error on the left side Device in operating mode
R	Red	On	Short circuit or undervoltage on the right side
		Off	No error on the right side Device in operating mode
UAL	Green	On	Voltage supply on the left side ok
		Off	Voltage on the left side < 16.5 V
UAR	Green	On	Voltage supply on the right side ok
		Off	Voltage on the right side < 16.5 V
DO1, DO2	Yellow	On	Output signal high
		Off	Output signal low
⊛	Green	On	IO-Link communication active
		Off	IO-Link communication not active
US	Green	On	Voltage supply ≥ 17 V
		Off	Voltage supply < 17 V

8 Maintenance, repair and disposal

The unit is maintenance-free.

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

Cleaning the unit:

▶ Disconnect the unit from the voltage supply.

▶ Clean the unit from dirt using a soft, chemically untreated and dry micro-fibre cloth.