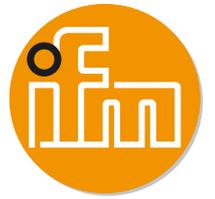


ifm electronic





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Point-to-point communication:
more details in our IO-Link video:
www.io-link.ifm



ifm – the company matching your requirements

Close to you:

Our worldwide sales and service team is here to help you at any time.

Engineering “Made in Germany”:

German engineering available worldwide.

Flexible:

Not only our service but our broad product portfolio perfectly suit the most varying requirements.

Innovative:

More than 750 patents and in 2016 about 60 patent applications.

Reliable:

5-year warranty on ifm products.



System instead of just components
ifm provides you with a broad portfolio for flexible automation of your production. Our range of more than 7,800 articles guarantees flexibility and compatibility.



Quality as part of our philosophy

Quality is an inherent part of our philosophy. We use our customers' feedback to continuously improve the quality of our products. Our sensors are tested with values far beyond the indicated limits using special procedures.



We are there for you

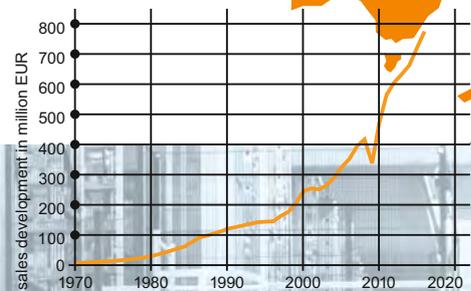
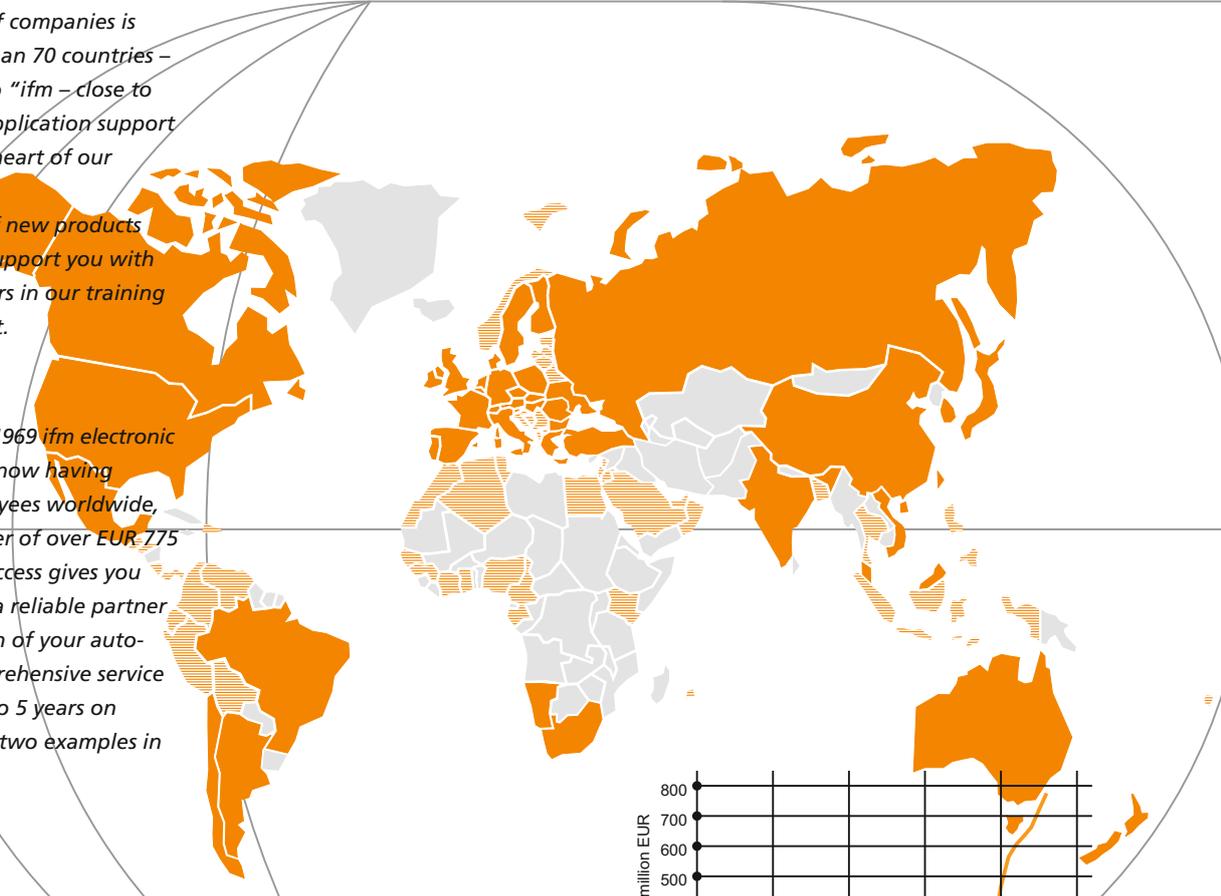
Close contact with our customers is part of our success. We have consistently developed our sales network right from the start.

Today the ifm group of companies is represented in more than 70 countries – according to the motto “ifm – close to you!” Your personal application support and service are at the heart of our operation.

For the introduction of new products and technologies we support you with workshops and seminars in our training centres or in your plant.

Security by success

Since its foundation in 1969 ifm electronic has constantly grown, now having more than 6000 employees worldwide, and achieved a turnover of over EUR 775 million in 2016. This success gives you the security of having a reliable partner for the implementation of your automation projects. Comprehensive service and a warranty of up to 5 years on standard units are just two examples in this context.



Product availability

Your deadlines matter to us. That is why we are constantly optimising our production processes. In order to be able to quickly and flexibly produce large quantities at a constantly high quality – and to continue to shorten delivery times.

See the current ifm company film to get to know us better:
www.ifm.com/gb/close-to-you



The ifm sales platform



Overview:

The ifm product range is clearly structured and the individual product platforms ensure quick orientation.

Selectors:

Choose between the most important technical data and you will get the product selection suitable for your requirements.

Compare:

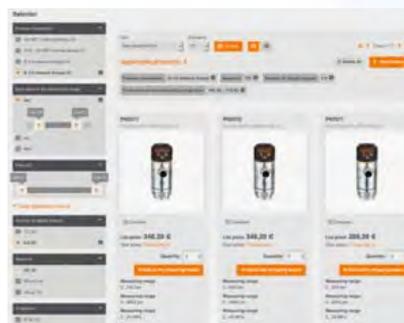
You can compare the technical data of up to 3 products. Differences are marked in colour.

Search and find:

Enter the search term in the full text search and get suggestions for products, topics and product groups.

Order:

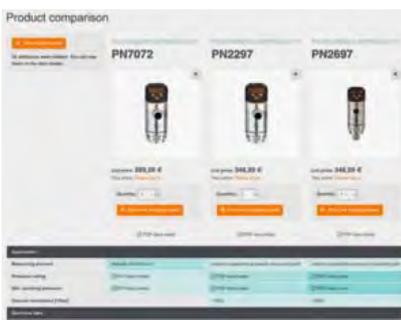
We provide a quick-order and csv import function for the shopping basket on the product pages.



More clarity

For each product group you can make a first selection via the platforms.

A clear visual language and explanatory texts give you a first impression of the products.



Compare products with each other

The selectors are the heart of the product search. The displayed selection criteria are adapted to each product range and the technical features of the products. The results can be displayed as tiles or lists.

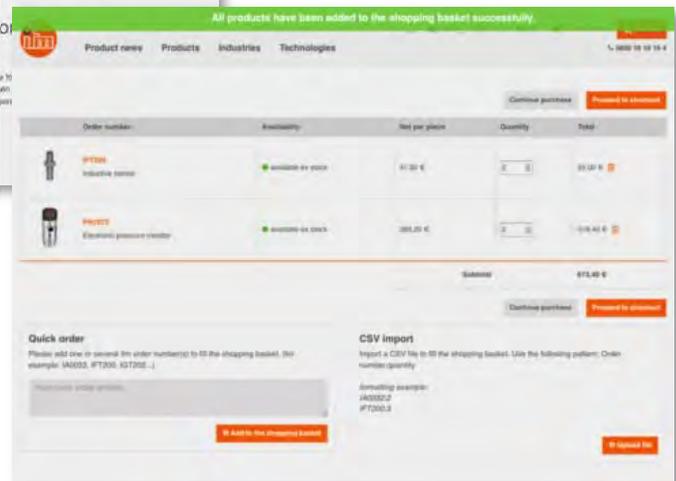
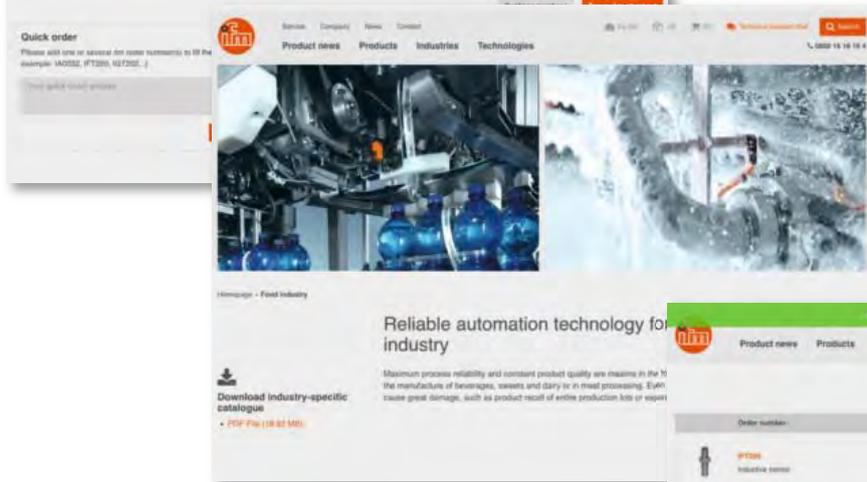


Easy purchasing

You are in control of everything in the shopping basket: quantity, modes of shipment and payment. We provide you with everything you can expect from a modern shop.

Customers relying on long-standing tried-and-tested articles can quickly order by entering the article number in the shopping basket. This saves time, in particular when a product has to be quickly reordered.

Navigation in the menu structure is no longer necessary.



For all types of display

Whether PC, laptop, tablet or smartphone – the design of the sales platform adapts to any screen size thus increasing user-friendliness. This also makes it possible to buy products using mobile equipment such as a smartphone.

Try us.
Click here to directly get to our homepage:
www.ifm.com



Your start into the industrial revolution. IO-Link solutions from ifm.



Simple:

The sensor parameters can be set from the controller or the master. No crawling or climbing required to set the sensor.

Transparent:

Many sensors supply measured values to the switching signals via IO-Link. The goal is a constant product quality with less energy and raw material consumption.

Reliable:

Transmission that is prone to errors and conversion of analogue signals is replaced with digital measured value transmission.

Low-cost:

Process information, switching status, diagnostic functions are transmitted without loss via a single port to the controller. Expensive analogue signal processing is no longer needed.

Fascination IO-Link

In the past binary switches usually provided simple switching signals or analogue values. Today the data from intelligent sensors is the basis for the next industrial revolution.

Sensors that extract all the information from your machines and equipment using the key technology IO-Link.

Leading manufacturers from the fields of sensors, actuators and control technology have developed IO-Link.

Together they developed a standardised and field-bus independent interface for automation providing the user with a point-to-point connection without complex addressing.

Benefit from the appeal of IO-Link, talk to us and stay as productive and competitive for your manufacturing processes of tomorrow.





Head start with IO-Link

Use the advantages! Today IO-Link sensors from ifm give the user completely new options.

Additional sensor data, for example, is generated to achieve maximum efficiency and cost saving.

This allows process transparency from the machine to ERP to optimise your existing automation. Furthermore IO-Link has a lot more to offer:



No external influence of the signal

Data transfer is based on a 24 V signal. Screened cables and associated grounding are no longer necessary.



Tamper free

No wrong settings by operators.



No measured value losses

The entire measured value transmission is digital. Transmission that is prone to errors and conversion of analogue signals is replaced.



Identification

Only like for like replacement. No wrong sensors accepted.



Easy sensor replacement

All sensor parameters are stored in the master and transferred to the replaced unit.



Wire-break detection / diagnostics

Wire-break or short-circuit is immediately detected.



IO-Link in all industries

Successful due to digital transmission

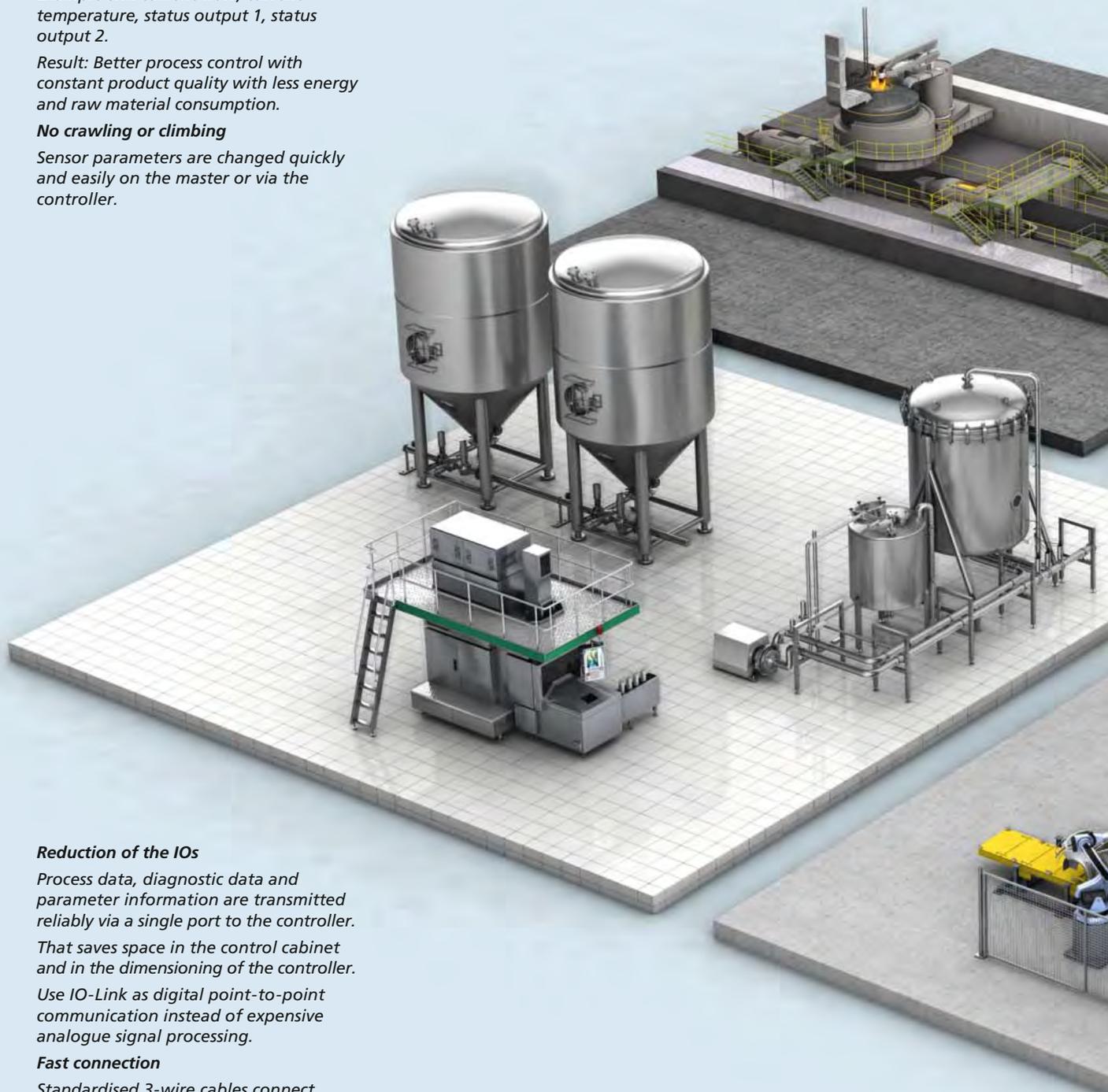
From digital sensors come sensors which provide a process value.

Example SM: current flow, current temperature, status output 1, status output 2.

Result: Better process control with constant product quality with less energy and raw material consumption.

No crawling or climbing

Sensor parameters are changed quickly and easily on the master or via the controller.



Reduction of the IOs

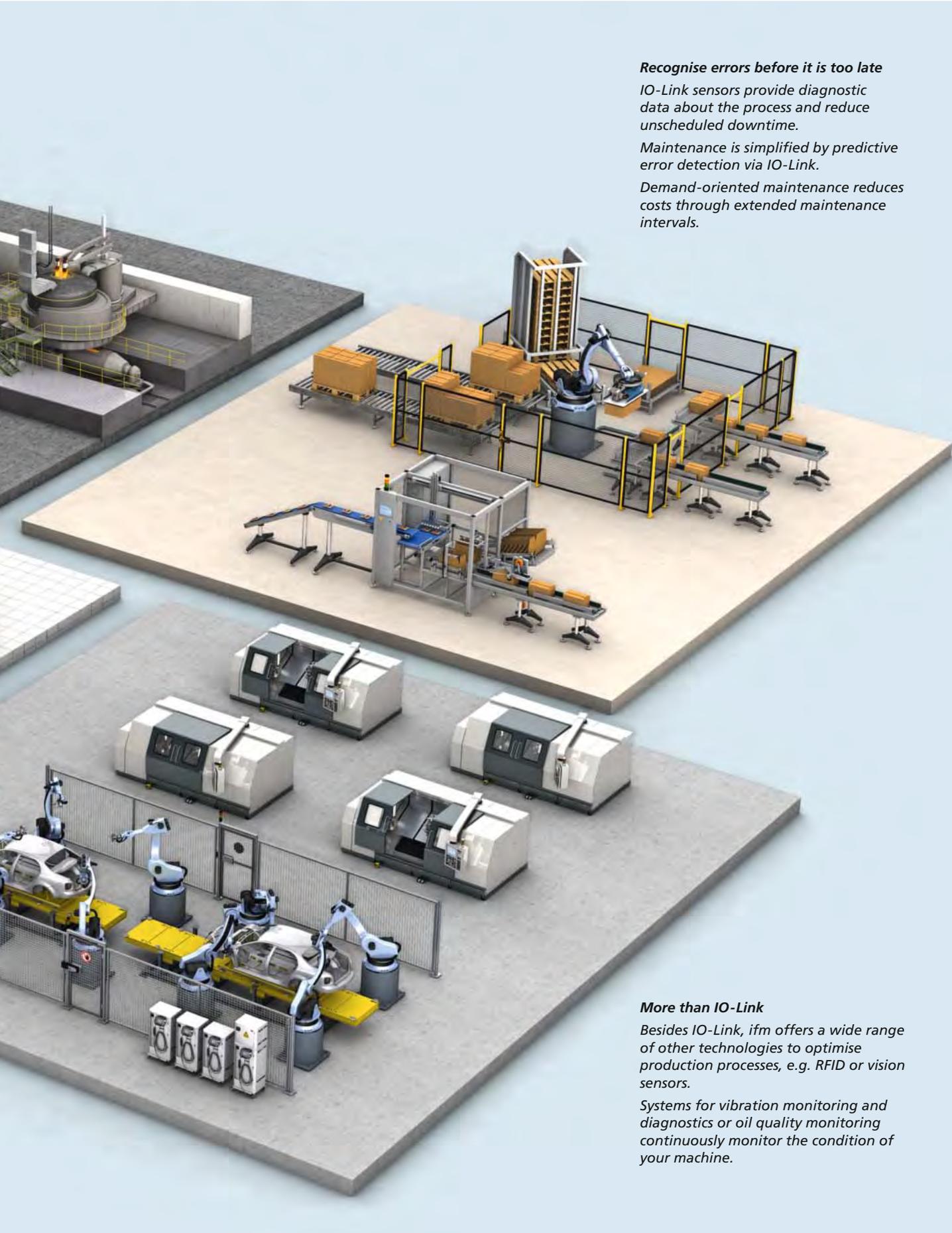
Process data, diagnostic data and parameter information are transmitted reliably via a single port to the controller.

That saves space in the control cabinet and in the dimensioning of the controller.

Use IO-Link as digital point-to-point communication instead of expensive analogue signal processing.

Fast connection

Standardised 3-wire cables connect sensors, actuators and modules to the master.



Recognise errors before it is too late

IO-Link sensors provide diagnostic data about the process and reduce unscheduled downtime.

Maintenance is simplified by predictive error detection via IO-Link.

Demand-oriented maintenance reduces costs through extended maintenance intervals.

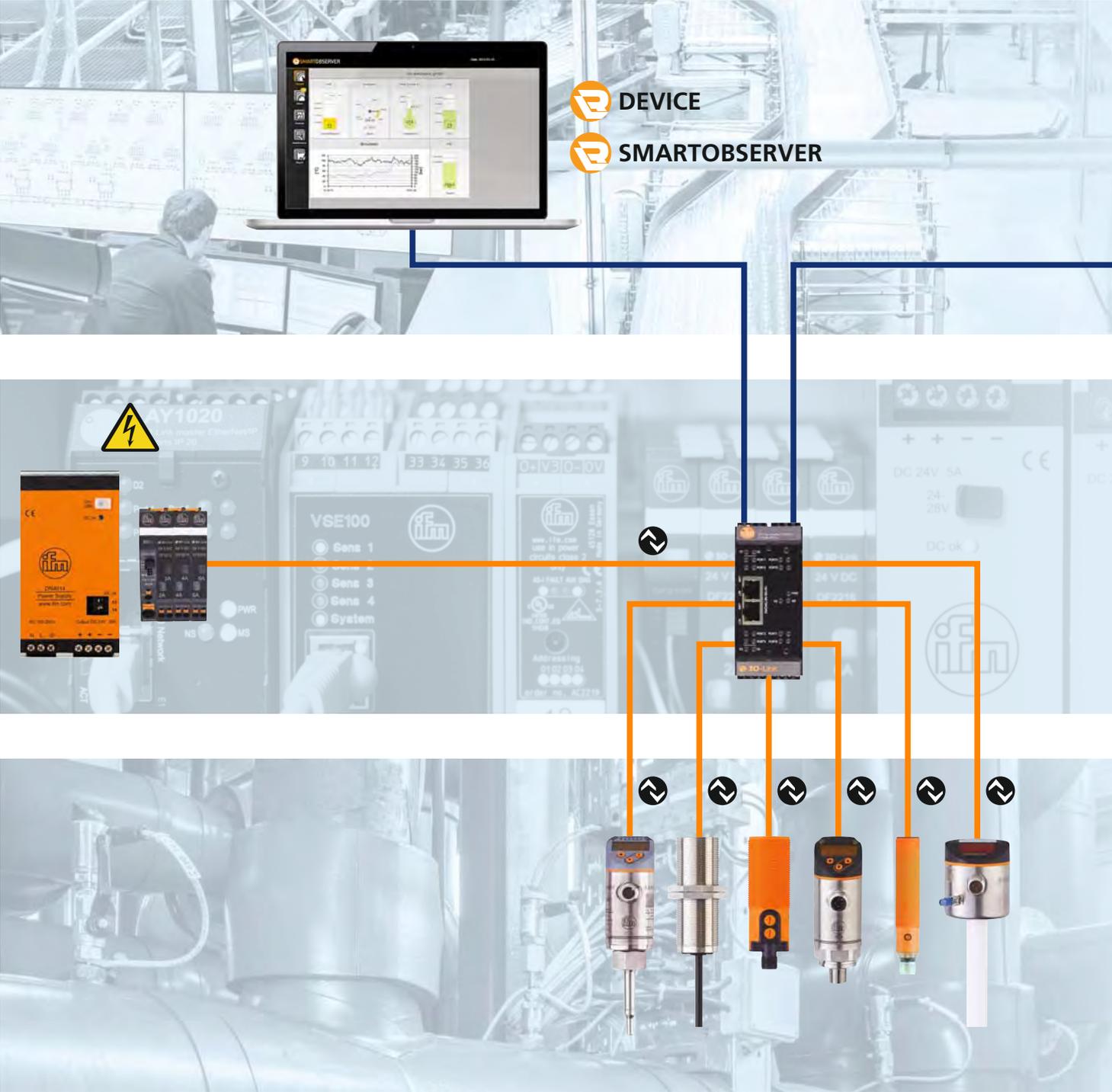
More than IO-Link

Besides IO-Link, ifm offers a wide range of other technologies to optimise production processes, e.g. RFID or vision sensors.

Systems for vibration monitoring and diagnostics or oil quality monitoring continuously monitor the condition of your machine.

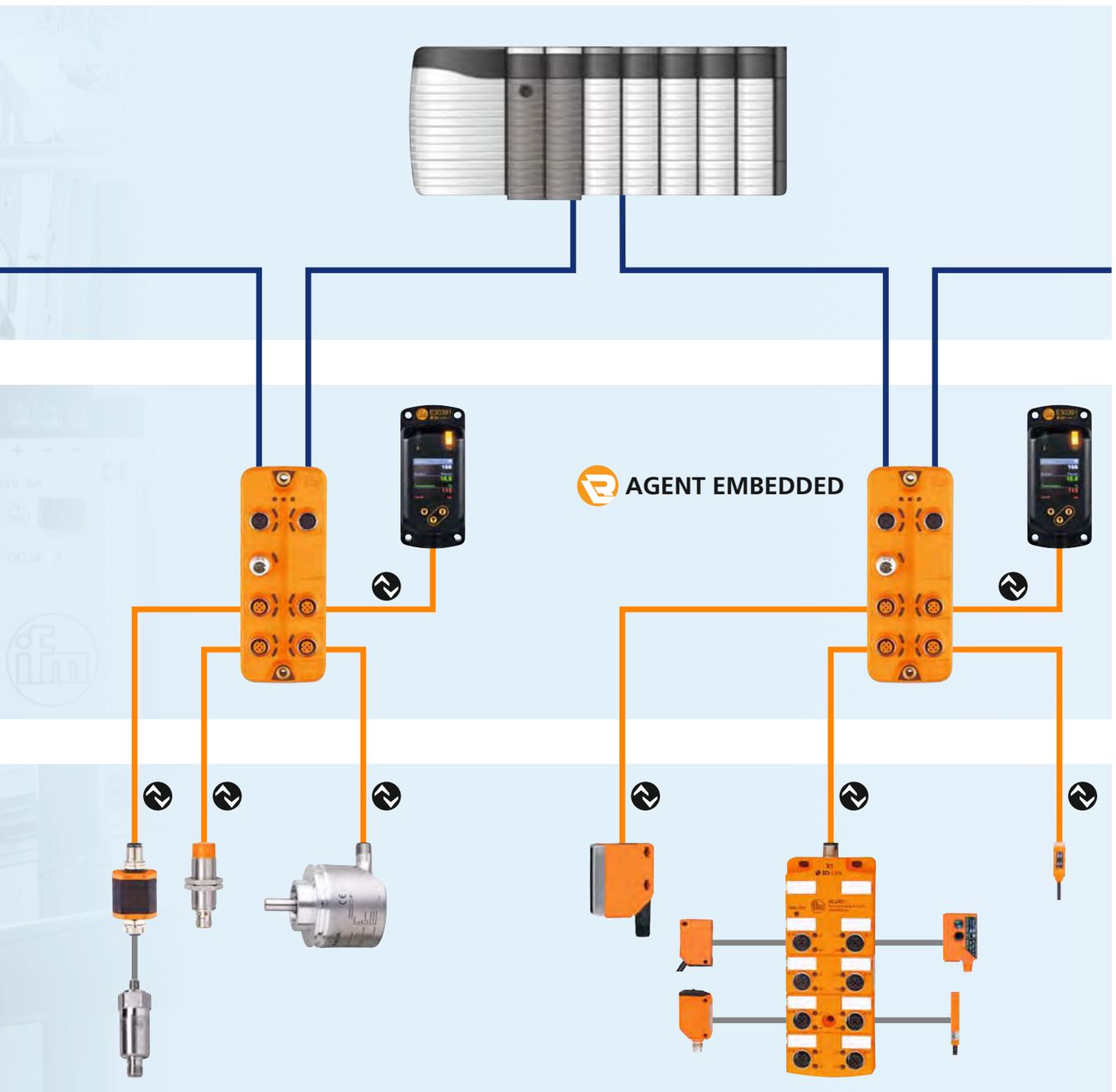
Future-oriented technology meets user-friendly concepts

IO-Link plant configuration

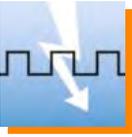




ifm offers the widest and most consistent product portfolio of IO-Link sensors, masters and software



No external influence of the signal



IO-Link data transfer is based on a 24 V signal and is therefore extremely insensitive to external influence. IO-Link sensors are connected with standard M12 connectors. Screened cables and associated grounding are no longer necessary.



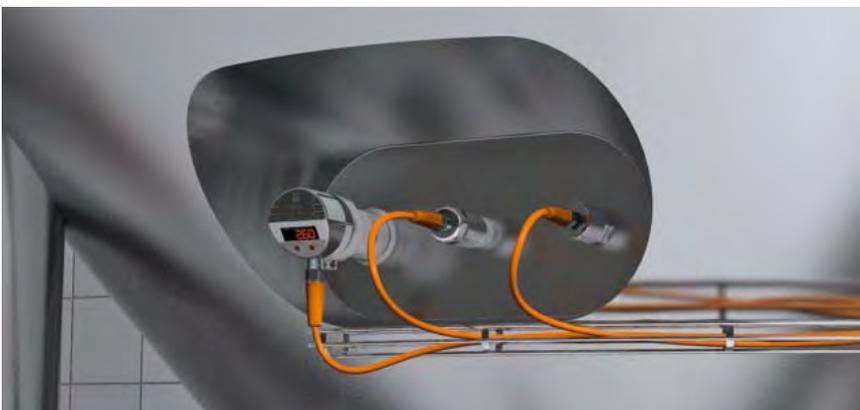
ifm PN type pressure sensors are used to monitor the pressure in a hydraulic system. Process signals, events and parameters are transferred to the master via IO-Link. Furthermore up to 8 IO-Link sensors can be directly connected to the master which transfers the data to the controller via PROFINET, EtherCat, EtherNet/IP or PROFIBUS.



No measured value losses



The entire measured value transmission is digital. Transmission that is prone to errors and calculation of analogue signals is replaced. The digitally transferred measured values can be directly displayed in the control room.



The level in the pressure tanks is continuously detected via type PI hygienic pressure sensors. Due to the losses during transfer of the measured value and the EMC influences there used to be considerable imprecision / deviations when the tank level is detected. Thanks to IO-Link the continuous detection of the tank level is now possible with high precision.

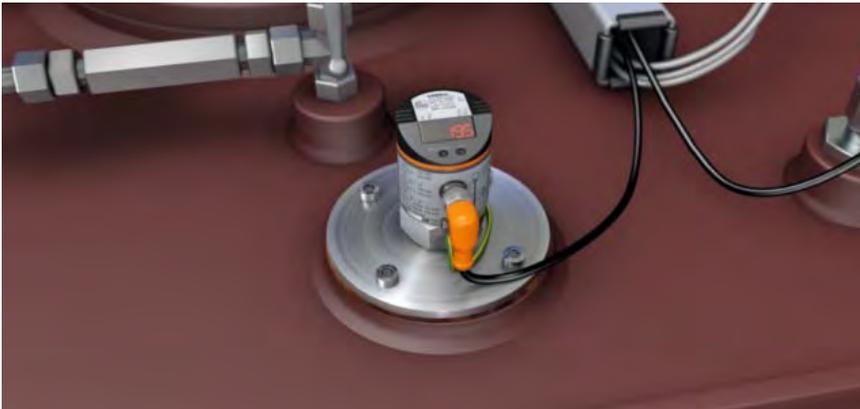
00010100011110010100
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Simple replacement of sensors

**PLUG
and
PLAY**

The IO-Link master stores all parameters of the connected sensors. After replacement the previous parameters are automatically written to the new sensor. Looking up the required sensor settings is not necessary.



The LR level sensor is used to measure the level on a hydraulic power pack. The setting of all parameters and programming of the switch points can be made via two programming buttons or IO-Link. During replacement the parameters are automatically copied to the new sensor. They do not have to be entered manually.



Tamper free



The standardised unit parameter setting allows locking of the operating keys on the device. Therefore wrong settings by the operators is no longer possible. Documentation of the parameters is possible at any time.



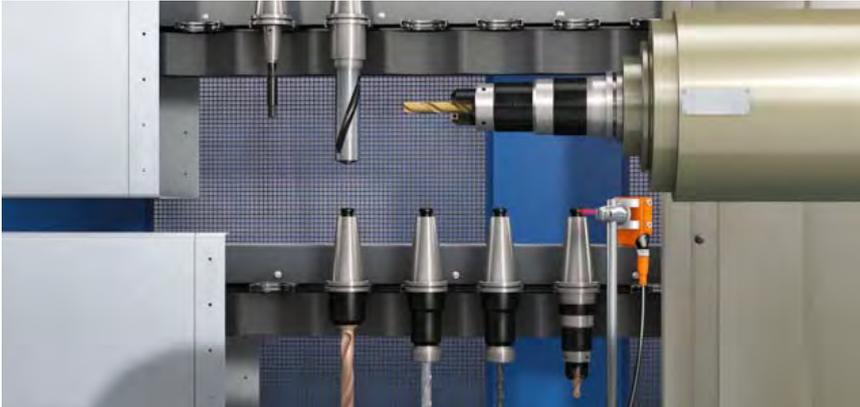
The SD type compressed air meters continuously detect the consumption of the treated compressed air. Via IO-Link, the measured values can be directly processed for consumption metering. Unintended readjustment of the parameters would lead to incorrect measurements. Locking of the keys via IO-Link prevents tampering.



Identification



IO-Link ensures unambiguous device identification. Sensors with IO-Link capability are clearly identified by vendor and device ID. Exclusive use of original spares is ensured.



Identification and detection of interchangeable tools. The O5D photoelectric sensors detect if the selected tool is present in the fixture. IO-Link ensures that only a sensor of the same type is used for replacement.



Wire-break detection / diagnostics



With IO-Link transfer of process and service data takes place simultaneously. Wire-break or short-circuit is immediately detected by the master. The diagnostic data can be accessed even during operation.



The flow rate in a cooling circuit is precisely monitored using magnetic-inductive inline volumetric flow sensors of the SM series. If an error occurs, the diagnostic data is transferred from the master to the controller. The failed sensor is identified unambiguously.

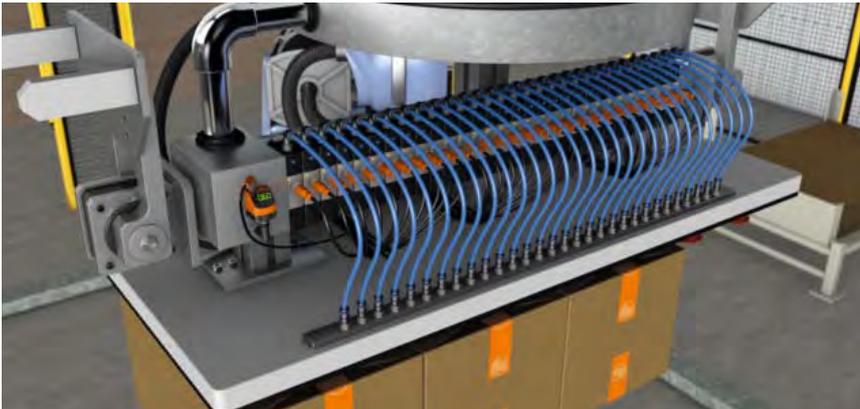




Control / diagnostics

It is also possible to control actuators with IO-Link. The use of IO-Link for valve islands, for example, permits control and diagnostics via a standard 3-wire cable.

Here ifm offers ecolink-type connectors with a larger cross-section for lower voltage drop.



A valve island is controlled via IO-Link. Reduced wiring and simultaneous diagnostics facilitate operation, in particular of moving machine parts, e.g. on a robot arm. The IO-Link master from the AL series processes both sensor data and controls valve islands.



IO-Link

IO-Link masters: connection for intelligent sensors



StandardLine Coolant



4 or 8 IO-Link ports with full V1.1 functionality

Profinet or EtherNet/IP

Master and devices configurable via the LR DEVICE software

Industry 4.0 ready via LR AGENT EMBEDDED

Voltage supply via standard M12 sensor cable, A-coded



Robust field bus modules with safe connection

The decentralised IO-Link master modules are used as gateways between intelligent IO-Link sensors and the fieldbus. They are the perfect choice, even in the most difficult environments: The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVC product series. The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.

Energy limitation for UL class 2 units

Many sensors require an energy-limited supply with UL class 2 approval. The limitation of energy is usually achieved via a corresponding power supply. With the AL series IO-Link master, sensors can be supplied according to UL class 2 without using an energy-limited power supply approved to UL class 2.



Advantages and customer benefits

• Sensor configuration with LR DEVICE

The intuitive software finds all IO-Link masters in the network and creates an overview of the whole plant. Besides, all sensors connected are indicated with the respective parameters. This means that parameter setting of all sensors in the system is possible from one central point.

• Easy sensor connection

The sensors and actuators are connected via standard M12 connection cables without screening. Depending on the device type, up to 4 or 8 IO-Link sensors can be connected and supplied with up to 3.6 A. With the EVC693 accessories, additional auxiliary power for the connection of IO-Link actuators can be supplied. The cable can be up to 20 m long.

• Reliable digital data

The sensor data is transferred digitally. Unlike analogue signals, contact resistance and EMC interference cannot corrupt the signals.

• Direct connection to the IT

The integrated LR AGENT EMBEDDED is capable of transmitting the process values directly to ERP systems, without detour via the PLC.

This second communication path is available in parallel to the fieldbus via the bus wiring.

Connection technology

Type	Description	Order no.
Ethernet cable (fieldbus)		
	0.5 m	E12490
	2 m	E12090
	5 m	E12491
	10 m	E12492
M12 socket 1 mm² (power)		
	2 m	EVC706
	5 m	EVC707
	10 m	EVC708
	20 m	EVC709
M12 connection cable 0.34 mm² (sensor)		
	1 m	EVC042
	2 m	EVC043
	5 m	EVC044
	10 m	EVC493

Products

Type	Description	Order no.
IO-Link master StandardLine Coolant		
	Profinet 4-port	AL1100
	EtherNet/IP 4-port	AL1120
	Profinet 8-port	AL1102
	EtherNet/IP 8-port	AL1122
IO-Link module Coolant		
	Input module 4 x 2DI	AL2400
	input module 8 x 2DI	AL2401
	Output module 6 x 2DO	AL2330

Technical data

IO-Link master StandardLine Coolant	Order no.	
	AL1100 AL1120	AL1102 AL1122
Operating voltage	[V DC]	20...30
Total current consumption	[A]	≤ 3.9
IO-Link version		1.1
Number of IO-Link ports	4 A ports	8 A ports
Number of binary inputs (IO-Link in SIO mode)	4 + 4	8 + 8
Number of binary inputs (IO-Link in SIO mode)	4	8
Parameter memory		•
Current for all ports (device supply)	[A]	≤ 3.6
Protection		IP 65, IP 67
Ambient temperature	[°C]	-25...60
Housing materials		polyamide; socket: nickel-plated brass

Accessories

Type	Description	Order no.
	LR DEVICE (supplied on USB flash drive) Software for online and offline parameter setting of IO-Link sensors and actuators	QA0011
	Y splitter, for connection of two sensors to a port, M12 connector / 2x M12 socket	EBC113
	Protective caps M12 (10 pcs)	E73004



IO-Link

IO-Link master for intelligent sensors in hygienic areas



StandardLine Food



4 or 8 IO-Link ports with full V1.1 functionality

IP 69K field module for the food industry

Master and devices configurable via the LR DEVICE software

Industry 4.0 ready via LR AGENT EMBEDDED

Voltage supply via standard M12 sensor cable, A-coded



Robust field bus modules for demanding applications

The decentralised IO-Link masters are used as gateways between intelligent IO-Link sensors and the fieldbus. Thanks to their special housing materials and high ingress resistance (IP 69K), they can be used directly in wet areas in the food industry. The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVF product series.

The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.

High-quality materials especially suited to the application and intensive monitoring during and after production guarantee maximum quality standards.



Advantages and customer benefits

- **Configuration of sensors with LR DEVICE**

The intuitive software finds all IO-Link masters in the network and creates an overview of the whole plant. Besides, all sensors connected are indicated with the respective parameters. This means that parameter setting of all sensors in the system is possible from one central point.

- **Use as masters for the food industry**

These masters can now also be used in hygienic applications due to the materials used and their innovative housing design.

- **Easy sensor connection**

The sensors and actuators are connected via standard M12 connection cables without screening. Depending on the device type, up to 4 or 8 IO-Link sensors can be connected and supplied with up to 3.6 A. The cable can be up to 20 m long.

- **Reliable digital data**

The sensor data is transferred digitally. Unlike analogue signals, contact resistance and EMC interference cannot corrupt the signals.

- **Direct connection to the IT**

The integrated LR AGENT EMBEDDED is capable of transmitting the process values directly to ERP systems, without detour via the PLC. This second communication path is available in parallel to the fieldbus via the bus wiring.

Connection technology

Type	Description	Order no.
M12 socket 1 mm² (power)		
	2 m	EVF480
	5 m	EVF481
	10 m	EVF482
	20 m	EVF483
M12 connection cable 0.34 mm² (sensor)		
	1 m	EVF042
	2 m	EVF043
	5 m	EVF044
	10 m	EVF045
Ethernet cable (fieldbus)		
	1 m	EVF530
	2 m	EVF531
	5 m	EVF532
	10 m	EVF533

Products

Type	Description	Order no.
IO-Link master StandardLine Food		
	Profinet 4-port	AL1101
	EtherNet/IP 4-port	AL1121
	Profinet 8-port	AL1103
	EtherNet/IP 8-port	AL1123
IO-Link-Module Food		
	Output module 6 x 2DO	AL2230

Technical data

IO-Link master StandardLine Food	Order no.	
	AL1101 AL1121	AL1103 AL1123
Operating voltage	[V DC]	20...30
Total current consumption	[A]	≤ 3.9
IO-Link version		1.1
Number of IO-Link ports	4 A ports	8 A ports
Number of binary inputs (IO-Link in SIO mode)	4 + 4	8 + 8
Number of binary inputs (IO-Link in SIO mode)	4	8
Parameter memory		•
Current for all ports (device supply)	[A]	≤ 3.6
Protection		IP 65, IP 67, IP 69K
Ambient temperature	[°C]	-25...60
Housing materials		polyamide; socket: stainless steel

Accessories

Type	Description	Order no.
	LR DEVICE (supplied on USB flash drive) Software for online and offline parameter setting of IO-Link sensors and actuators	QA0011
	Y splitter, for connection of two sensors to a port, M12 connector / 2x M12 socket	EBF006
	Protective caps M12 4 pcs., stainl. st.	E12542



IO-Link

IO-Link master with extra power



PowerLine Coolant



4 or 8 IO-Link ports with full V1.1 functionality

Feed-through of the power supply possible

Master and devices configurable via the LR DEVICE software

Industry 4.0 ready via LR AGENT EMBEDDED

Voltage supply via power cable, M12, T-coded



Robust field bus modules with safe connection

The decentralised IO-Link masters are used as gateways between intelligent IO-Link sensors and the fieldbus. They are the perfect choice, even in the most difficult environments: The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVC product series. The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.

Extra power

The IO-Link masters are equipped with two T-coded M12 connections for voltage supply. With this power cabling, the current path can simply be daisy-chained.

The B ports of the 8-port IO-Link master allow direct connection of IO-Link actuators, such as valve islands.



Advantages and customer benefits

• Sensor configuration with LR DEVICE

The intuitive software finds all IO-Link masters in the network and creates an overview of the whole plant. Besides, all sensors connected are indicated with the respective parameters. This means that parameter setting of all sensors in the system is possible from one central point.

• Easy sensor connection

The sensors and actuators are connected via standard M12 connection cables without screening. Depending on the device type, up to 4 or 8 IO-Link sensors can be connected and supplied with up to 3.6 A. With the EVC693 accessories, additional auxiliary power for the connection of IO-Link actuators can be supplied. The cable can be up to 20 m long.

• Direct connection to the IT

The integrated LR AGENT EMBEDDED is capable of transmitting the process values directly to ERP systems, without detour via the PLC. This second communication path is available in parallel to the fieldbus via the bus wiring.

• 12 amperes on an M12 connector

The master supply and the auxiliary power for the actuators are supplied via T-coded M12 connectors. The energy can be looped through the master (daisy chain).

Connection technology

Type	Description	Order no.
Ethernet cable (fieldbus)		
	0.5 m	E12490
	2 m	E12090
	5 m	E12491
	10 m	E12492
M12 socket 1.5 mm² (power)		
	0.5 m	E12494
	2 m	E12430
	5 m	E12495
	10 m	E12496
M12 connection cable 0.34 mm² (sensor)		
	1 m	EVC042
	2 m	EVC043
	5 m	EVC044
	10	EVC493
Y splitter		
	Y splitter, for connection of two sensors to a port, M12 connector / 2x M12 socket	EBC113

Products

Type	Description	Order no.
IO-Link master PowerLine coolant		
	Profinet 4-port	AL1200
	Profinet 8-port	AL1202
	EtherNet/IP 4-port	AL1220
	EtherNet/IP 8-port	AL1222
IO-Link module Coolant		
	Input module 4 x 2DI	AL2400
	Input module 8 x 2DI	AL2401
	Output module 6 x 2DO	AL2330

Technical data

IO-Link master PowerLine Coolant	Order no.	
	AL1200 AL1220	AL1202 AL1222
Operating voltage [V DC]	20...30	
Total current consumption US / UA [A]	≤ 3.9 / ≤ 3.6	
IO-Link version	1.1	
Number of IO-Link ports	4 A ports	4 A ports and 4 B ports
Number of binary inputs (IO-Link in SIO mode)	4 + 4	4 + 8
Number of binary inputs (IO-Link in SIO mode)	4	8
Parameter memory	•	
Current for all A ports (device supply) [A]	≤ 3.6	
Current for all B ports (actuator supply) [A]	≤ 3.6	
Protection	IP 65, IP 67	
Ambient temperature [°C]	-25...60	
Housing materials	polyamide; socket: nickel-plated brass	

Accessories

Type	Description	Order no.
	LR DEVICE (supplied on USB flash drive) Software for online and offline parameter setting of IO-Link sensors and actuators	QA0011
	Protective caps M12 (10 pcs)	E73004



IO-Link

8-port IO-Link master: closing the gap in the field



Master for field applications



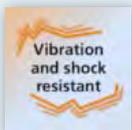
**8 IO-Link ports with full V1.1
functionality: COM1, COM2,
COM3 and SIO mode**

4 additional binary inputs

**2 Ethernet ports 10/100 Mbps/s
with switch for the field bus
connection**

**Protection IP 65 and IP 67 with
full potting, all connections
via M12 plug-in**

**An integrated parameter
memory facilitates device
replacement**



Fieldbus modules for all controllers

The 8-port IO-Link masters are field-compatible input / output modules for the connection of up to 8 IO-Link devices, for example sensors, valves or binary input / output modules. Process signals, events and parameters are transferred to the controller via PROFINET, EtherCat, Ethernet/IP or PROFIBUS.

Connection of sensors and actuators

Up to 8 IO-Link sensors can be connected. Four of the eight ports are designed as B ports and supply auxiliary energy for the connection of IO-Link actuators.

The total current consumption per module can total up to 12 A.



Advantages and customer benefits

- **12 amperes on an M12 connector**

The module supply and the auxiliary power are supplied via the T-coded M12 connector. The energy can be looped through the module (daisy chain).

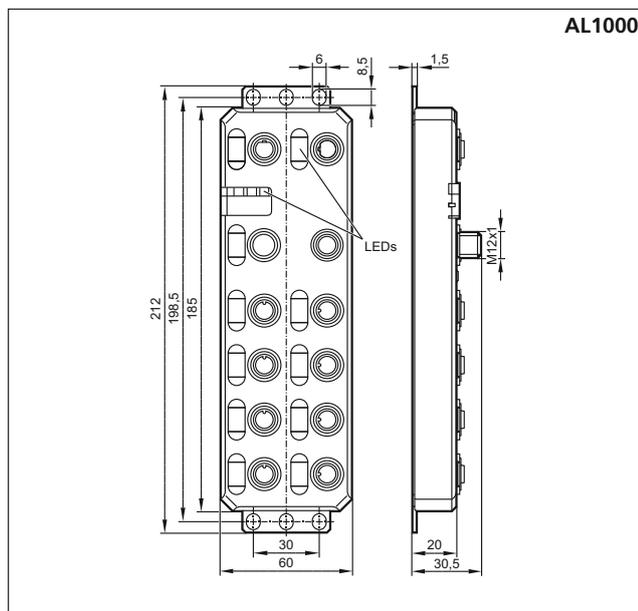
- **Easy sensor connection**

The sensors and actuators are connected via standard M12 connection cables without screening. The cable may be up to 20 m long.

- **Reliable digital data**

The sensor data is transferred digitally. Contact resistance and EMC interference cannot falsify the signals.

Dimensions



The products

Type	Description	Order no.
Unit versions		
	Fieldbus, PROFINET	AL1000
	Fieldbus, PROFIBUS	AL1010
	Fieldbus, EtherNet/IP	AL1020
	Fieldbus, EtherCAT	AL1030

Technical data

IO-Link master field modules		
Operating voltage	[V DC]	18...31.2
Total current consumption	[A]	12
IO-Link version		1.1
Number of IO-Link ports		8
Number of binary inputs		4 + 8 (IO-Link in SIO mode)
Parameter memory		•
Port A /port B		4 / 4
Protection		IP 65, IP 67
Ambient temperature	[°C]	-25...60
Housing material		PA; Socket: Nickel-plated brass



IO-Link

8-port IO-Link master module with LR AGENT embedded



Master for the control cabinet



8 IO-Link ports V1.1 with COM1, COM2, COM3 and SIO support

10 extra binary inputs 24 V DC and 2 configurable binary inputs / outputs

2 Ethernet ports 10/100 Base-TX with integrated switch

Slim housing for control cabinet mounting

Extended temperature range of 0...70 °C



Interface for factory networking

With the integrated LR AGENT, this master enables direct networking of all connected IO-Link devices with a local server via an Ethernet network. Using this connection, machine data, process parameters and diagnostic data can be directly read and processed by the IT.

The easy-to-use server software LR SMARTOBSERVER* enables data evaluation by means of customer-specific cockpits. Sensor data can be directly transmitted to management software – and this on a factory-wide or even worldwide level.

Using the same communication mechanisms, it is possible to directly couple machines and exchange production-related data.

**LR SMARTOBSERVER is a server-based software for data storage, predictive maintenance and quality monitoring.*



Special features

Ethernet interface for PLC connection

This IO-Link master operates as an input/output card with a total of 20 I/Os, of which 8 are for IO-Link devices and the rest for binary signals.

All signals can be easily transmitted to compatible controllers via the standard fieldbuses EtherNet/IP or Profinet.

Two ways simultaneously = PLC and server in parallel

So far, all sensor signals had to be sent by the PLC to higher-level systems. This is now done via a parallel communication path (Y path). The PLC program remains unchanged.

Integrated web server for configuration and diagnostics

No special software is required for configuration. All IO-Link settings can be made via the integrated web interface. To do so, a standard PC with Ethernet connection and web browser is required.

Convenient IODD integration

Via the web interface, up to 8 different IODDs (IO-Link device descriptions) can be loaded into the master. After connection of the IO-Link devices, the corresponding IODDs are automatically assigned to the connected IO-Link devices and the corresponding ports.

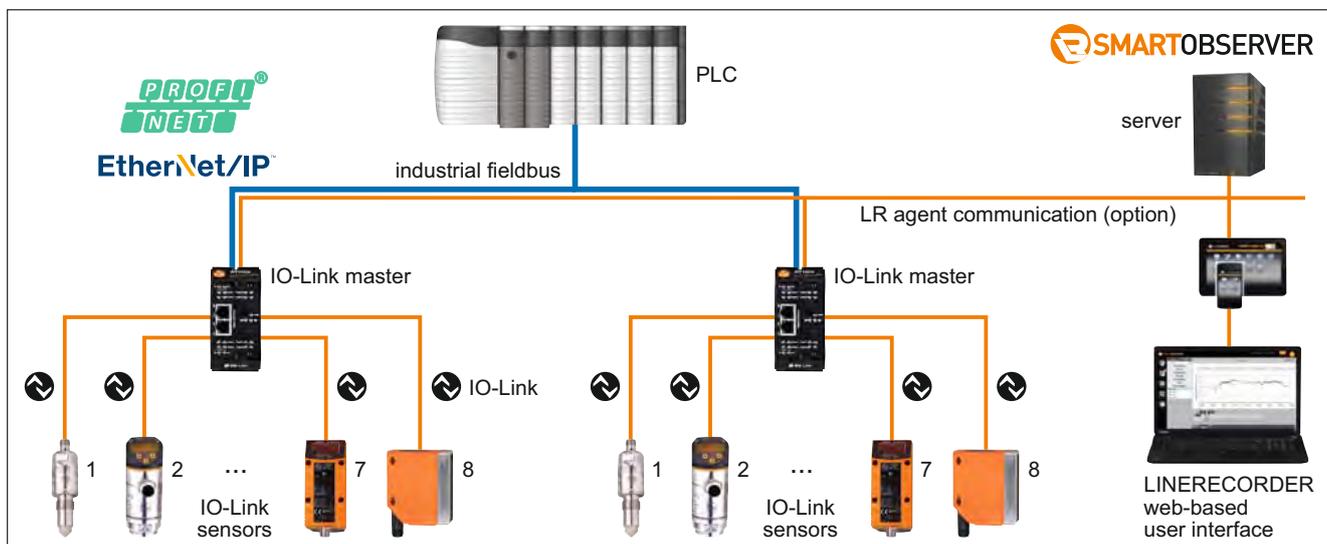
Technical data

IO-Link master module for connection to fieldbuses

"Y" path for PLC data exchange and a parallel connection to the server via LINERECORDER AGENT

Order no.	AY1020	AY1000
Fieldbus connection	EtherNet/IP	Profinet
Further protocols	Modbus / TCP (slave)	
Supply voltage	[V]	18...30 DC
Current consumption	[A]	2 (24 V)
IO-Link version	1.1	
Number of IO-Link ports	8	
Parameter memory	•	
IO-Link port A / port B	up to 8, configurable	
Inputs/outputs	IO-Link / SIO	configurable
IO-Link baud rates	COM 1...3	4.8k, 38.4k, 230.4kBaund
Digital inputs max.	DI	8 (16) +2
Digital outputs max.	DO	8 + 2
IO-Link / DI / DO status LEDs	20	
Ethernet connections	2x (10/100 BASE-Tx)	
Module / Ethernet status LEDs	7	
Ethernet sockets	RJ45	
Electrical connections	screw terminals	
Protection	IP 20	
Housing material	polyamide plastics	
Ambient temperature	[°C]	0...70
Installation	DIN rail	

Parallel sensor communication





IO-Link

AS-i and IO-Link – a good connection



AS-Interface I/O modules



Easy parameter setting of the IO-Link devices

Extended diagnosis for IO-Link devices

Loss free data transmission

IO-Link master for sensors and actuators

Communication down to the sensor



AS-i and IO-Link

IO-Link is the intelligent connection between the device (sensor or actuator) on one side and PLC or field module on the other side.

With the IO-Link AS-i module you combine the advantages of the AS-i wiring system with the standardised IO-Link communication. Using the simple AS-i connection technology you establish the data connection and energy supply for IO-Link devices – sensors and actuators.

The sensor settings can be saved via the AS-i module and transferred to a new sensor, if necessary.



Advantages and customer benefits

• Parameters

During set-up, sensors are fine-adjusted and switch points are set. These parameters can be saved in the system.

If necessary, these parameters are returned to the sensors. This ensures error-free documentation and short downtimes.

• Exact data transmission

IO-Link and AS-i transfer analogue values in a digitalised manner, i.e. without conversion losses. Distorted signals by electromagnetic interference or contact resistances are excluded.

• Diagnosis

Status LEDs indicate important AS-i and IO-Link operating states. IO-Link devices transmit additional information via the standard M12 sensor cable. Exceeding the operating temperature or measuring range, for example, is reliably detected. Diagnostic information can be transmitted up to the control level. Additional wiring is not necessary.

• AS-i connection technology

The AS-i module provides a simple connection technology for data and energy:

The yellow flat cable can be inserted from three different directions. A slide locks upper part and lower part. Quick and secure installation are guaranteed.

Application

IO-Link devices are used where a high-precision exchange of data and high plant uptime are required. Parameters can be managed and saved centrally. This minimises complex parameter setting and shortens machine set-up times.

Applications:

- Machine tools
- Special machines

Technical data

AC5225 AS-i IO-Link module 2 ports		
Operating voltage (AS-i)	[V DC]	26.5...31.5
AS-i current consumption	[mA]	max. 300
IO-Link current consumption	[mA]	max. 200 per module (e.g. 150 port 1 and 50 port 2)
Sensor supply from AS-i only		•
Operating temperature	[°C]	-25...70
Protection		IP 67
AS-i specification		3.0
IO-Link specification		1.0
AS-i profile		S-7.5.5
IO-Link function		SIO (DI / DO) / IO-Link communication

IO-Link sensors (extract)

Type	Description	Order no.
	Pressure sensor Measuring pressure: max. 400 bar	PP7550
	Temperature sensor Measuring range: -50...150 °C	TN2511
	Control monitor for temperature sensors Measuring range: -100...600 °C	TR7439
	Flow sensor for liquid and gaseous media Pressure resistance: 300 bar	SI5010



IO-Link

IO-Link I/O module minimises wiring costs for sensors



IO-Link modules



**Up to 8 locations with two
binary inputs each**

**Unscreened standard M12 cable
sufficient for data and energy
transmission**

High protection rating IP 67

Robust due to full potting



Field modules with IO-Link connection

Up to 8 or 16 conventional sensors can be connected to these modules. IO-Link transfers the signals to any IO-Link master / PLC via one unscreened M12 connection cable. Wiring costs are reduced because there are no longer any complex cable trees. As opposed to bus systems IO-Link does not require any configuration or addressing. This simplifies installation.

Two binary inputs per M12 socket

Pin 4 and pin 2 of each socket are used for one input. That means that dual sensors, normally closed or normally open, can be connected without any problem.

Robust field device

The modules allow use in a wide temperature range of -25...70 °C. The high EMC and the robust mechanics guarantee high availability even in difficult environments.



Advantages and customer benefits

- **IO-Link replaces multi-pole cable**

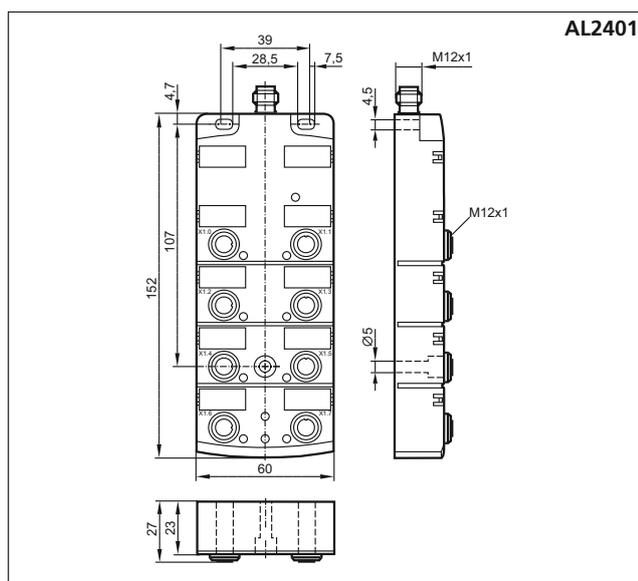
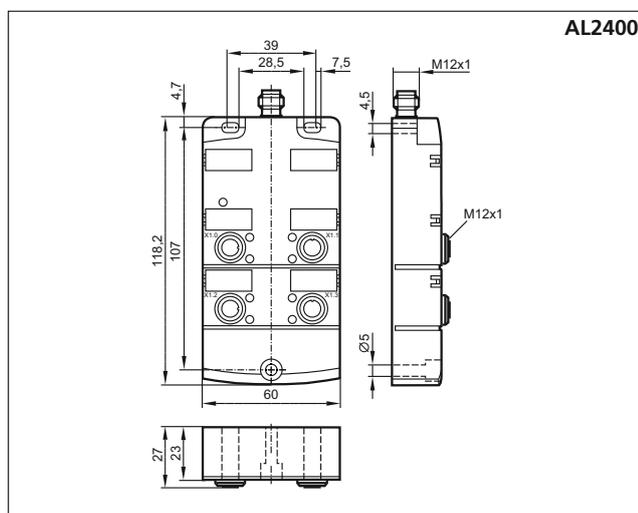
Multi-wire cables and connectors are a matter of the past. Standard M12 connections between the input module and an IO-Link master transfer up to 16 binary input signals.

- **Support of interchangeable tools**

The tree-wire connection minimises complex cabling for interchangeable tools.

The input modules can store a tool number so that the PLC can easily identify and differentiate tools.

Dimensions



Technical data

IO-Link input modules		
Operating voltage	[V DC]	18...30
IO-Link version		1.1 and 1.0
Type of transmission		COM2 (38 kBaud)
Min. cycle time process data	[ms]	2.3
Protection		IP 67
Ambient temperature	[°C]	-25...70
Short-circuit protection		•
Overload protection		•

Unit versions			
Order no.	AL2400	AL2401	
M12 sockets	4	8	
Number of binary inputs	4 x 2	8 x 2	
Total current consumption	[mA]	≤ 450	≤ 850
Current rating for all inputs, total	[mA]	400	800



IO-Link

Two IO-Link displays: process values at a glance



IO-Link displays



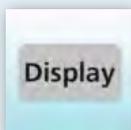
Plug & play process value display for ifm IO-Link sensors

Display for freely defined texts, measured values and messages

Up to four process values / texts with unit and description

Two clearly visible LEDs

Easy integration into each IO-Link structure



More plant transparency

The two IO-Link displays are a flexible solution to display process conditions and messages in plant modules or small plants.

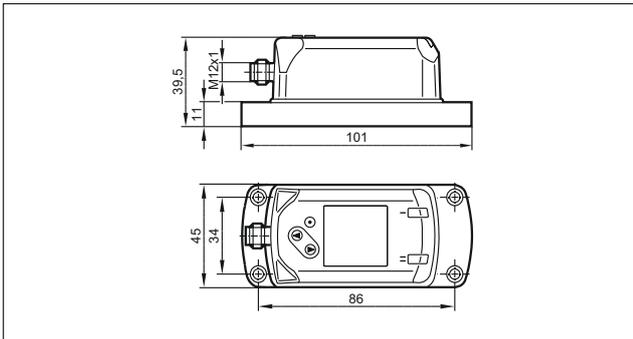
Integration and function

The E30391 IO-Link display is controlled by a PLC via IO-Link. It displays process values, freely defined texts, messages, and QR codes. Clear text and a colour change of text and background guarantee a quick overview. By means of buttons the user can trigger control actions of the PLC or acknowledge messages.

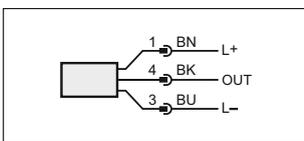
The E30430 IO-Link inline display is installed between sensor and IO-Link master. It receives process values directly from the sensor. No PLC programming is required. It displays up to four process values and two switching states. For ifm units operated in the IO-Link mode, it is a plug & play solution. Alternatively, texts and settings can be predetermined via an IO-Link device tool such as LR DEVICE.



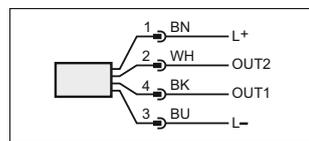
Dimensions



Wiring



E30391



E30430

Accessories

Type	Description	Order no.
	DIN rail clip, PA; 1.4567 (V2A)	E30429
	T splitter M12 plug / 2 x M12 socket	E12481

Resolution pixels	Display type	Display illumination	Order no.
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IO-Link display, connection to master

128 x 128	1,44" TFT	LED	E30391
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IO-Link display, connection between master and sensor (incl. T splitter)

128 x 128	1,44" TFT	LED	E30430
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Technical data

IO-Link displays		
Operating voltage	[V DC]	18...30
Current consumption	[mA]	< 47
Protection rating / protection class		IP 65, IP 67 / III
Reverse polarity protection		•
Communication interface		
IO-Link device		
Type of transmission		COM2 (38.4 kbaud)
IO-Link revision		1.1
SDCI standard		IEC 61131-9
Ambient temperature	[°C]	0...60
EMC		EN 61000-6-2 EN 61000-6-4
Shock resistance	[g]	20 (11 ms)
Vibration resistance	[g]	20 (10...50 Hz)
Housing materials		Stainless steel (303/1.4305); PC; PBT-GF 30; PPS; PA 6.6; FKM
Connection		M12 connector

Connection technology

Type	Description	Order no.
	M12 jumper 1 m black, PUR cable	EVC042
	M12 jumper 2 m black, PUR cable	EVC043
	M12 jumper, 3 m black, PUR cable	EVC102
	M12 jumper, 5 m black, PUR cable	EVC044
	M12 jumper, 10 m black, PUR cable	EVC493



IO-Link

DataLine SmartPLC : flexible automation system



AS-Interface controllers / gateways



Quick and easy set-up

Flexible and future-proof thanks to connective hardware and CODESYS V3

Various protocols on different interfaces

Designed for Industry 4.0 applications

Unbeatable price / performance ratio



Communicative PLC

The DataLine SmartPLC is freely programmable via CODESYS V3 and offers full access to all interfaces of the system. Two Ethernet ports act as fieldbus / slave interface (PROFINET, EtherNet/IP, EtherCAT) and enable high-performance communication to other PLC systems. Different communication protocols can be used in parallel via two further Ethernet ports, e.g. EtherCAT master, EtherNet/IP scanner, Modbus TCP master and slave, TCP/IP, UDP/IP or OPC/UA server.

Designed for Industry 4.0

The DataLine SmartPLC is best-equipped for Industry 4.0 applications. Towards the PLC, it acts like a classic AS-i gateway and towards IT, any process values can be made available via different communication protocols. An integrated real-time clock and an SD card slot complete the features.



Advantages and customer benefits

Communication interfaces:

EtherNet/IP:

Certified EtherNet/IP functionality
Ethernet switch with 2 integrated ports

PROFINET:

PROFINET class B
PROFINET switch with 2 integrated ports

EtherCAT:

Certified EtherCAT functionality

AS-Interface:

1 and 2 AS-i masters pursuant to M4 profile

Configuration interface:

- 2 Ethernet ports with the following functions:
 - Web server
 - CODESYS V3 programming interface
 - Multifunctional communication interface (EtherCAT master, Modbus TCP, EtherNet/IP scanner, OPC-UA server, Web visualisation)

Connections:

- AS-i and auxiliary supply: plug-in terminals (supplied with the unit)
- EtherNet/IP and Profinet 2 x RJ45
- Configuration interface 2x RJ45

Functions

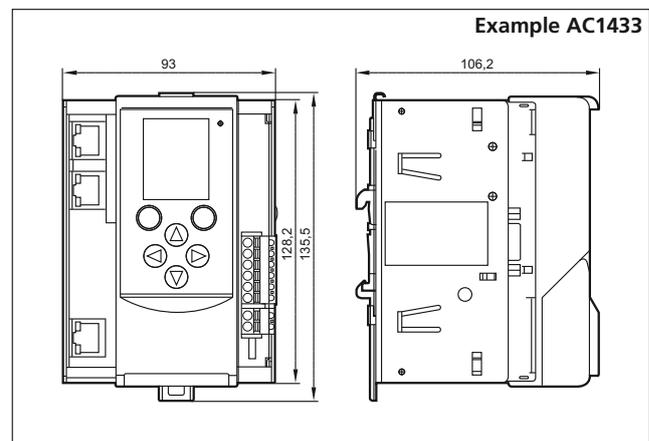
The DataLine SmartPLC supports a number of different communication protocols via its both configuration interfaces in order to supply additional input / output data to the integrated PLC or realise a data exchange with other units / systems.

For Industry 4.0 applications, there is, amongst others, an OPC server functionality available that enables an easy data transfer into your IT world.

Products

Type	Description	Order no.
DataLine SmartPLC		
	PROFINET device interface 1 AS-i master with M4 profile	AC1403
	PROFINET device interface 2 AS-i masters with M4 profile	AC1404
	EtherNet/IP device interface 1 AS-i master with M4 profile	AC1423
	EtherNet/IP device interface 2 AS-i masters with M4 profile	AC1424
	EtherCat slave interface 1 AS-i master with M4 profile	AC1433
	EtherCat slave interface 2 AS-i masters with M4 profile	AC1434

Dimensions





IO-Link

Industry 4.0 made easy – apps instead of expensive programming



Apps



**Fast integration of
IO-Link sensors**

**Straightforward web
configuration**

No special PC software required

**Connection via the fieldbus
protocols Profinet, Profibus,
EtherNet/IP**

**Smart additional functions
tailored to the sensors selected**



Until now: complex programming

Modern sensors offer more and more intelligent functions that can also be made available to the PLC via interfaces like IO-Link or TCP/IP.

To use them, the PLC programmer has to individually implement the functionalities in the PLC. This is very time-consuming and costly, especially when it comes to implementing the required user interfaces.

From now on: fit for Industry 4.0 – ifm System Solutions

With the new ifm System Solution Apps ifm electronic has developed a system which is easy to create. It allows process data from different sensors to be transmitted to common fieldbus systems, and their parameters are easily accessible.

For this purpose, ifm now offers tailored apps which can be loaded into the ifm fieldbus gateway without any programming software.



ifm System Solution Apps

The centrepiece for using the ifm System Solution App is the AC14 SmartPLC. On the one hand, the device has a certified fieldbus interface (Profinet, Profibus, EtherNet/IP) for the connection to a PLC.

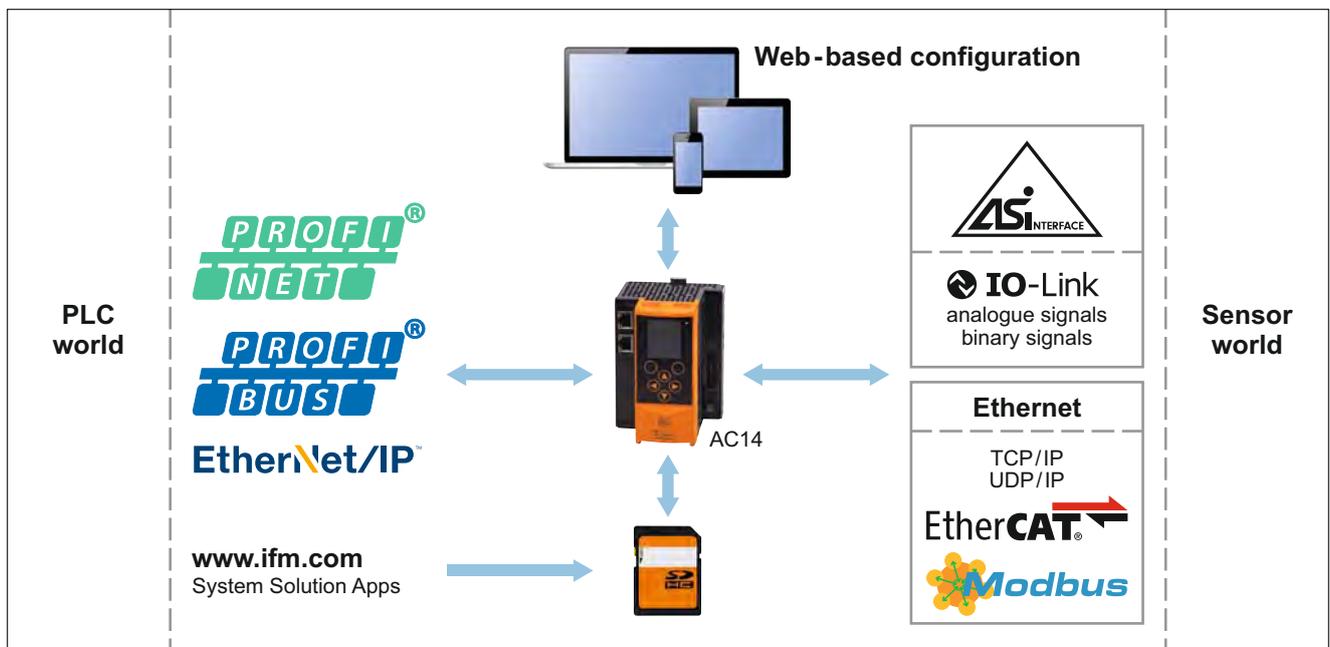
On the other hand, the AC14 features excellent communication possibilities via an additional Ethernet interface and up to two AS-i masters for connection to a variety of sensors and actuators.

Loading and configuration of the app is made via the integrated web interface, i.e. all necessary settings can be carried out conveniently via a device with an internet browser.

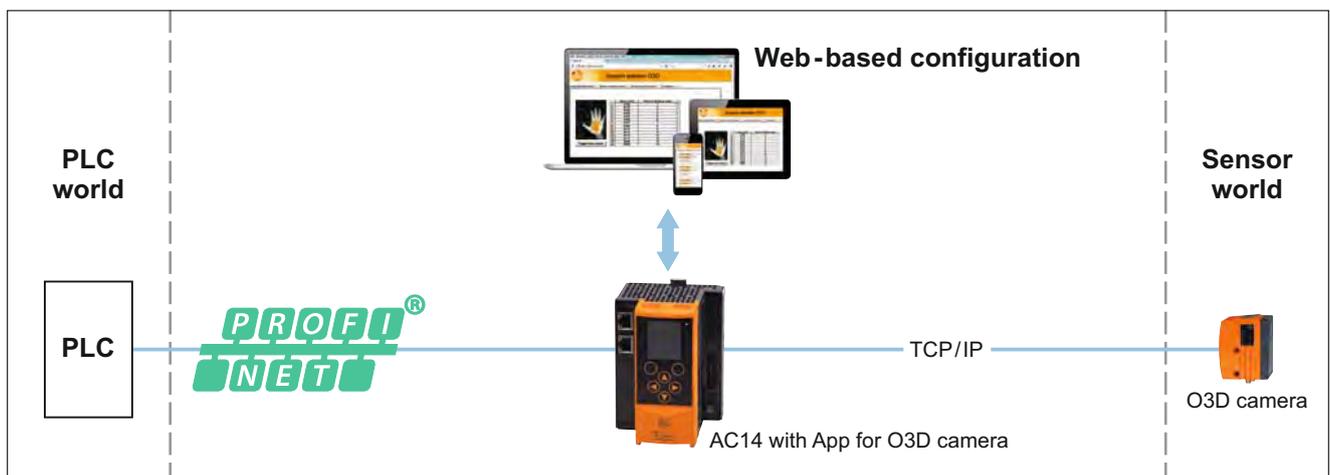
The products

ifm System Solution Apps	Order no.
IO-Link scanner and configurator	AP3002
Field bus connection of up to five type O2I multi-code readers to Profibus, Profinet, EtherNet/IP	AP3022
Field bus connection of up to three type O3D200 multi-code readers to Profibus, Profinet, EtherNet/IP	AP3032
AS-i based DTA ID systems: user-friendly writing of RFID tags, history data	AP3042
Data collector: up to 30 process data can be freely named and scaled, history data with time stamp can be stored on SD card, fieldbus connection to Profibus, Profinet and EtherNet/IP	AP3052
Tool changeover: via the fieldbus (Profibus, Profinet, EtherNet/IP) free selection of predefined AS-i configurations	AP3062

System overview



Example: ifm System Solutions App for O3D camera





IO-Link

LR DEVICE Parameter setting software via IO-Link master



IO-Link software

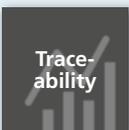


Easy and fast IO-Link master parameter setting

Clear representation

Easy and fast device parameter setting (point-to-multipoint connection)

Transferable parameter sets



Features

- Online and offline parameter setting
- Supports all IO-Link devices
- Software and parameter description in all supported languages
- Detailed description texts of all parameter contents
- Parameter sets grouped according to topics
- Parameter setting of IO-Link master (AL11XX-series)
- Supports the latest ifm IO-Link devices
- Supports IO-Link actuators
- Parameter setting of devices via network

Customer benefits

- Optimised by means of graphic visualisation of the process values
- Shortened set-up time
- Optimised device replacement process
- Paperless recording of parameter sets



DEVICE

Graphic representation of the process values

- Graphic comparison of process values with each other and with switching outputs
- Simple, clear representation of the process values
- Export of the process values to the table

Documentation and archiving

- Save / load parameter sets
- Archive parameter sets as PDF file

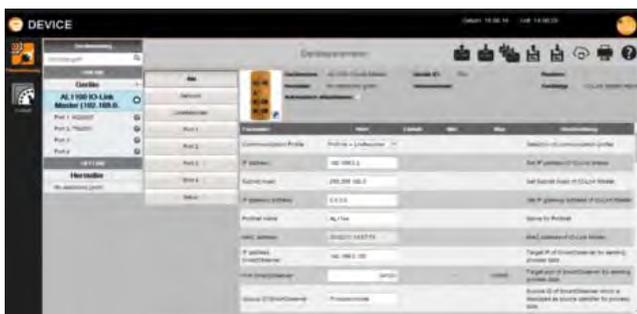
Device detection

- Automatic identification of IO-Link masters and the connected IO-Link sensors / actuators
- Automatic identification of the ifm IO-Link sensors
- Display of the characteristic sensor values
- Save correct parameter transfer by recognising non-compatible devices
- Particularly easy adding of new and updated IODD files

Features

- Parameter setting of IO-Link masters and IO-Link devices via network
- Simultaneous writing of parameters to multiple devices at the same time
- Help texts and value limits support parameter entry at the input stage
- Operational reliability by device detecton and restoration of default values
- Display of the IO-Link communication quality
- Create and display equipment identification (application-specific tag)
- Add and update existing ifm IODDs with a mouse click *)

*) if internet connection available

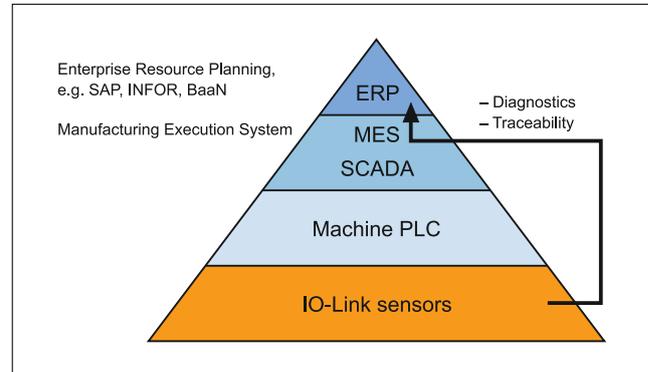


Parameter setting App

Further processing of the sensor values with the freely scalable LINERECORDER modules

The software framework LINERECORDER closes the information circuit from the sensor signal to the world of ME systems and ERP solutions (e.g. SAP).

From sensor to ERP



System requirements:

- Windows 7 SP1, Windows 8.1, Windows 10, Windows Server 2008 R2 SP1, Windows Server 2012, Windows Server 2012 R2, Windows Server 2016
- CPU Intel Dual Core 2.0 GHz
- 2 GB RAM
- 5 GB free hard disk space
- Web browser
Chrome, Firefox, Internet Explorer 11, Microsoft Edge

Technical data

Description	Order no.
LR DEVICE (supplied on USB flash drive) Software for online and offline parameter setting of IO-Link sensors and actuators	QA0011

List of articles

Order no.	Approvals	Catalogue page	Order no.	Approvals	Catalogue page
AL1010	CE, CUL, PI	49	E37340		79
AY1020	CE, CUL	49	E37350		79
DF2100	CE	133	E40096		89, 91
DF2208	CE	133	E40097		91
DF2210	CE	133	E40099	CRN	89, 91
DF2212	CE	133	E40107	CRN	91
DF2214	CE	133	E40228		87
DF2216	CE	133	E40229		87
DI5026	CE	69	E40230		87
DI523A	CE	69	E40231		87
DP2200	CE	73	E40249		93
E10031		69	E40250		93
E10737		47, 69	E40258		89
E11996	CE	47	E43203		105, 107
E12432		103, 65	E43207		105, 107
E12460		65	E43211		105, 107
E20721		53, 55	E43214		105, 107
E20873		69	E43218		105, 111
E20875		69	E43300	EC 19352004, EHEDG, FDA	99
E20938		53, 55	E43301	EC 19352004, EHEDG, FDA	99
E20940		53, 55	E43306	EC 19352004, EHEDG, FDA	101
E20951		53, 55, 61	E43307	EC 19352004, EHEDG, FDA	101
E21083		61	E43311	EC 19352004, EHEDG, FDA	131
E21084		61	E43312	EC 19352004, EHEDG, FDA	131
E21087		61	E43333		107, 109
E21207		53, 55	E43334		107, 109
E21267		59	E43340	EC 19352004, EHEDG, FDA	111
E21268		59	E43341	EC 19352004, EHEDG, FDA	111
E21269		59	E43346	EC 19352004, EHEDG, FDA	111
E21270		59	E60205		65
E21271		59	E89010		69
E21289		57	E89208		73
E30013	EC 19352004, EHEDG, FDA	83	EVC001	CE, CUL	115, 47, 89
E30055	EC 19352004, EHEDG, FDA	101, 131	EVC002	CE, CUL	87, 93
E30122	ACS, EC 19352004, EHEDG, FDA, Reg31	101	EVC004	CE, CUL	105, 107
E30130	ACS, CRN, EC 19352004, EHEDG, FDA	129, 81	EVC005	CE, CUL	115, 123, 87
E30135		77	EVC013	CE, CUL	123
E30390	CE	117, 119	EVC033	CE, CUL	123
E30396	CE	103, 115	EVC034	CE, CUL	123
E30398	CE, CUL	103, 115	EVC04A	CE, IEC	101
E30420		75	EVC150	CUL	57, 79
E30421		75	EVC151	CUL	57, 79
E30422		75	EVC152	CUL	79
E33208	CRN, EC 19352004, EHEDG, FDA	129, 81	EVC153	CUL	79
E33209	CRN, EC 19352004, EHEDG, FDA	129, 81	EVC154	CUL	79
E33401	EC 19352004, EHEDG, FDA	101, 131	EVC155	CUL	79
E33402	EC 19352004, EHEDG, FDA	131	EVT001	CE, CUL	129, 131, 81
E33601	EC 19352004, EHEDG, FDA	83	EVT004	CE, CUL	125, 127
E33612	EC 19352004, EHEDG, FDA	83	EVT064	CE, CUL	93
E33622	EC 19352004, EHEDG, FDA	83	EVT248	CUL	59

Order no.	Approvals	Catalogue page	Order no.	Approvals	Catalogue page
IF6123	CE, CUL, EAC	47	LR8000	CE, CUL	105
IF6124	CE, CUL, EAC	47	LR9020	CE, CUL	107
IG6615	CE, CUL, EAC	47	O5D100	CE, CUL	61
IG6616	CE, CUL, EAC	47	O5D101	CE, CUL	61
I15973	CE, CUL, EAC	47	O5D150	CE, CUL	61
I15974	CE, CUL, EAC	47	O5D151	CE, CUL	61
IM5172	CE, CUL, EAC	47	O6E309	CE, CUL, EAC, (CCC)	59
IM5173	CE, CUL, EAC	47	O6H309	CE, CUL, EAC, (CCC)	59
JN2200	CE	71	O6P309	CE, CUL, EAC, (CCC)	59
JN2201	CE	71	O6S305	CE, CUL, EAC, (CCC)	59
KG5065	CE, CUL	51	O6T309	CE, CUL, EAC, (CCC)	59
KG5069	CE, CUL	51	O8H200	CE, EAC	57
KG5071	CE, CUL	51	O8H202	CE, EAC	57
KG5307	CE, EAC	49	O8H204	CE, EAC	57
KG5309	CE, EAC	49	O8H206	CE, EAC	57
KG5311	CE, EAC	49	O8H208	CE, EAC	57
KG6000	CE, EAC	49	O8H210	CE, EAC	57
KI5083	CE, CUL	51	O8H212	CE, EAC	57
KI5085	CE, CUL	51	O8H214	CE, EAC	57
KI5087	CE, CUL	51	O8H216	CE, EAC	57
KI5307	CE, CUL, EAC	49	O8H218	CE, EAC	57
KI5309	CE, CUL, EAC	49	O8H220	CE, EAC	57
KI5311	CE, CUL, EAC	49	O8H222	CE, EAC	57
KI6000	CE, CUL, EAC	49	OID200	CE, CUL	63
KQ5100	CE, UL	51	OID201	CE, CUL	63
KQ5101	CE, UL	51	OID204	CE, CUL	63
KQ6002	CE, CUL	51	OID250	CE, CUL	63
KQ6004	CE, CUL	51	OID251	CE, CUL	63
LMC100	CE	103	OID254	CE, CUL	63
LMC110	CE	103	PI2203	CE, CUL, EHEDG, FDA, EC19352004	85
LMC400	CE	103	PI2204	CE, CUL, EHEDG, FDA, EC19352004	85
LMC410	CE	103	PI2205	CE, CUL, EHEDG, FDA, EC19352004	85
LMC500	CE	103	PI2206	CE, CUL, EHEDG, FDA, EC19352004	85
LMC502	CE, CUL	103	PI2207	CE, CUL, EHEDG, FDA, EC19352004	85
LMC510	CE	103	PI2209	CE, CUL, EHEDG, FDA, EC19352004	85
LMT01A	CE, EC19352004, EHEDG, FDA	101	PI2303	CE, CUL, EHEDG, FDA, EC19352004	85
LMT03A	CE, EC19352004, EHEDG, FDA	101	PI2304	CE, CUL, EHEDG, FDA, EC19352004	85
LMT04A	CE, EC19352004, EHEDG, FDA	101	PI2305	CE, CUL, EHEDG, FDA, EC19352004	85
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LMT102	ACS, CE, CRN, CUL, EC19352004, EHEDG, FDA	99	PI2307	CE, CUL, EHEDG, FDA, EC19352004	85
LMT104	ACS, CE, CUL, EAC, EC19352004, EHEDG, FDA	99	PI2309	CE, CUL, EHEDG, FDA, EC19352004	85
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TD2901	CE, CUL, EC19352004, EHEDG, FDA	127			
TD2907	CE, CUL, EC19352004, EHEDG, FDA	125			



More than just sensors: The ifm group of companies offers a wide range of solutions with IO-Link. On the following pages you will find an overview of all the products summarized into categories. In addition to the system descriptions we will also show you the most important features of the units. For more information please visit us online at www.io-link.ifm

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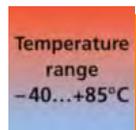


For industrial applications

Inductive sensors with M12, M18, M30 and 40 x 40 mm housings



- Accurate position monitoring – transmission of the distance as linearised process value via IO-Link
- Reduced stock-keeping – function and polarity selectable via IO-Link
- Very high repeatability
- Wide temperature range from -40...+85 °C for universal use



Much more than a pulse pick-up!

ifm's new inductive sensors with IO-Link incorporate several functions in one unit. They can be used as switching sensors with adjustable switch point or measuring systems with a measured value transmitted via IO-Link. The output signal can be set to NC or NO and PNP or NPN allowing many possible combinations. This allows reduction of the multitude of types, reducing the cost of stock.

Highest precision

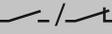
The new sensors are so precise that they detect even minute changes. Even the true run of a spindle or the tension of a saw blade is reliably detected. If the target leaves the detection zone or comes too close to the sensing face, a warning may be given. All data acquired can be transmitted and recorded via IO-Link. This new development is unbeatable.

IO-Link highlights:

- Current process value plus two binary readings available
- Function and polarity selectable
- Output response: One-point, two-point or window function
- Adjustable hysteresis
- Counter for operating hours and switching operations
- Warning when the target leaves the detection zone
- Warning when the target gets too close to the sensing face



Sensors for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · DC PNP/NPN								
	M12 / L = 60	0.375...3.75 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	600	100	IF6123
	M12 / L = 60	0.7...7 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	600	100	IF6124
	M18 / L = 60	0.75...7.5 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	300	100	IG6615
	M18 / L = 60	1.3...13 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	300	100	IG6616
	M30 / L = 65	1.3...13 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	II5973
	M30 / L = 65	2.3...23 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	II5974
	40 x 40 x 54	2.1...21 f	PA (polyamide)	10...30	IP 67	100	100	IM5172
	40 x 40 x 54	2.6...26 nf	PA (polyamide)	10...30	IP 67	100	100	IM5173

f = flush / nf = non flush / qf = quasi-flush

Accessories

Type	Description	Order no.
	Angle bracket · for type M30 · Housing materials: stainless steel	E10737
	Mounting clamp · Ø 30 mm · with end stop · For sensors with 45° chamfer · for type M30 · Housing materials: PC	E11996

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC001



For industrial applications

Capacitive sensors with LED signal display



- Precise evaluation of the application by visualisation of the process value via IO-Link
- One sensor for many applications: PNP / NPN, NC / NO and time function selectable
- Better adjustment to difficult applications thanks to extended settings
- Unique display and operating concept via LED visualisation
- See and compensate switch point movement



Visualised switch point

The capacitive sensors stand out not only because of their excellent technical data but most of all with their new and unique visualisation concept. The LED display makes it much easier for the user to set the optimal switch point, which is in the centre of the display. The green LEDs either side of the switch point indicate the reliability of the switch point. Deposits, material changes etc. are displayed directly on the sensor and the user can readjust the switch point precisely as needed.

Easy diagnostic support

If help is needed with the effects of process changes this is much easier to explain and rectify with the clear switch-point visualisation.

IO-Link highlights:

- Current process value plus binary reading available
- NO or NC function with switch-on and switch-off delay
- Output response: One-point, window function adjustable
- Potentiometer can be activated or deactivated
- Counter for operating hours and switching operations

Capacitive sensors

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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 M12 connector · Output function  /  · DC PNP

	M30 / L = 80	25 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	40	200	KI6000
	M18 / L = 92.5	15 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	30	200	KG6000

 M12 connector · Output function  · DC PNP

	M30 / L = 80	25 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	40	200	KI5309
	M30 / L = 80	15 qf	PBT	10...30	IP 65 / IP 67 / IP 69K	40	200	KI5311
	M18 / L = 92.5	15 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	30	200	KG5309
	M18 / L = 92.5	10 qf	PBT	10...30	IP 65 / IP 67 / IP 69K	30	200	KG5311

 M12 connector · Output function  · DC PNP

	M30 / L = 80	25 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	40	200	KI5307
	M18 / L = 92.5	15 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	30	200	KG5307

f = flush / nf = non flush / qf = quasi-flush

Accessories

Type	Description	Order no.
	IO-Link master with EtherNet/IP interface · I/O modules for use in the control cabinet · IO-Link master 8 ports A and B variable · LineRecorder Agent embedded · 2 Ethernet ports with integrated switch · Additional binary inputs and outputs can be configured · Housing for DIN rail mounting · Screw terminal · Housing materials: housing: polyamide	AY1020
	IO-Link master with Profibus interface · I/O modules for field applications · Sockets M12 x 1 · Housing materials: housing: PA / socket: Brass nickel-plated	AL1010

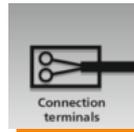


For industrial applications

Capacitive sensors – display of the process value with IO-Link



- Precise evaluation of the application by visualisation of the process value via IO-Link
- Sensing range adjustable by means of a potentiometer or pushbuttons
- Plastic or metal housings for different applications
- Different mounting accessories for tank and sight glass (bypass)



Detection of non-metallic objects

Capacitive sensors are used for non-contact detection of any types of objects and for level monitoring. Typical applications are in the wood, paper, glass, plastic, food and chemical industries. In packaging systems, capacitive sensors can check the presence of cardboard boxes, or monitor the medium level in a carton (e.g. full / empty check in milk cartons). Another application is the detection of sheets of glass or wood panels on a roller conveyor.

Parameter setting

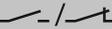
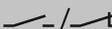
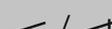
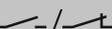
The parameters can either be set via the buttons on the sensor or via IO-Link interface. This can be done using the USB interface or a memory plug. The LR DEVICE parameter setting software identifies the connected IO-Link sensors automatically and offers graphic visualisation of the process values.

IO-Link highlights:

- Current process value plus binary reading available
- Switch-on and switch-off delay
- Damping of the switching output
- Adjustable hysteresis
- Teach buttons can be activated and deactivated



Capacitive sensors, round and rectangular designs

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f AC / DC [Hz]	I _{load} AC / DC [mA]	Order no.
M12 connector · Output function 								
	M18 / L = 87	12 nf	PBT	10...36	IP 65 / IP 67	10	200	KG5065
	M18 / L = 87	8 nf	PBT	10...36	IP 65 / IP 67	10	200	KG5071
Cable 2 m · Output function 								
	M18 / L = 77	8 nf	PP	10...36	IP 65 / IP 67	10	200	KG5069
M12 connector · Output function 								
	M30 / L = 90	20 nf	PBT	10...36	IP 65 / IP 67	10	200	KI5083
	M30 / L = 90	8 f	High-grade st. steel	10...30	IP 65 / IP 67	10	100	KI5085
	M30 / L = 90	15 nf	High-grade st. steel	10...30	IP 65 / IP 67	10	100	KI5087
Cable 2 m · Output function 								
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6002
Cable with connector 0.04 m · Output function 								
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6004
Cable 2 m · Output function 								
	20 x 7 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ5100
Cable with connector 0.1 m · Output function 								
	20 x 7 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ5101

f = flush / nf = non flush / qf = quasi-flush



For industrial applications

Ultrasonic sensors in stainless steel housing



- Improved measuring accuracy due to digital transmission of the distance value via IO-Link
- Extended diagnostic information for faster error detection
- Robust high-grade stainless steel housing for demanding applications
- Range up to 2.2 m for M18 housing
- Retro-reflective operation for orientation-independent object detection



The alternative for difficult surfaces

Ultrasonic sensors transmit and receive sound waves in the ultrasonic range. The object to be detected reflects the sound waves and the distance information is determined via time of flight measurement. As opposed to photoelectric sensors, colour, transparency or the object's surface shine do not play a role.

Blister packages in packaging technology or transparent plastic bowls in the food industry, for example, can be reliably detected.

High performance

The ifm ultrasonic sensors in M18 design provide a particularly small blind zone and long sensing ranges which are usually only achieved by sensors of a considerably larger design.

The sensors operate reliably with heavy soiling so that they can be used in applications in which photoelectric sensors meet their limits.

IO-Link highlights:

- Current process value plus two binary readings available
- NO or NC function with switch-on and switch-off delay
- Output response: One-point, two-point or window function
- Adjustable hysteresis
- Filter function for fast movements
- Diagnostics of echo quality
- Counter for operating hours and switching operations
- Pushbutton can be activated and deactivated
- Background suppression

Ultrasonic diffuse-reflection sensors

Type	Dimensions [mm]	Sensing range [mm]	Material	U_b [V]	Protection	f [Hz]	I_{load} [mA]	Order no.
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M12 connector · Output function 2 x normally open / closed programmable · 4-wire · DC PNP

	M18 / L = 97.5	1600	1.4404	10...30	IP 67	3	100	UGT509
	M18 / L = 97.5	2200	1.4404	10...30	IP 67	3	100	UGT512

M12 connector · Output function 1 x NO / NC programmable + 1 x current output · 4-wire · DC PNP

	M18 / L = 97.5	1600	1.4404	10...30	IP 67	3	100	UGT510
	M18 / L = 97.5	2200	1.4404	10...30	IP 67	2	100	UGT513

M12 connector · Output function 1 x NO / NC programmable + 1 x voltage output · 4-wire · DC PNP

	M18 / L = 97.5	1600	1.4404	10...30	IP 67	3	100	UGT511
	M18 / L = 97.5	2200	1.4404	10...30	IP 67	2	100	UGT514

Accessories

Type	Description	Order no.
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20721
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: high-grade stainless steel / fixture: high-grade stainless steel	E21207
	mounting rod · Ø 12 / M10 · Length: 130 mm · straight · Housing materials: stainless steel 316Ti / 1.4571	E20938
	mounting rod · Ø 12 / M10 · Length: 200 mm · angled · Housing materials: stainless steel 316Ti / 1.4571	E20940
	Cube · M10 · aluminium profile · Housing materials: diecast zinc	E20951



For industrial applications

Ultrasonic sensors in plastic housing



- Improved measuring accuracy due to digital transmission of the distance value via IO-Link
- Extended diagnostic information for faster error detection
- Easy setting via teach button or IO-Link
- Range up to 2.2 m for M18 housing



The alternative for difficult surfaces

Ultrasonic sensors transmit and receive sound waves in the ultrasonic range. The object to be detected reflects the sound waves and the distance information is determined via time of flight measurement. As opposed to photoelectric sensors colour, transparency or the object's surface shine do not play a role.

Blister packages in packaging technology or transparent plastic bowls in the food industry, for example, can be reliably detected.

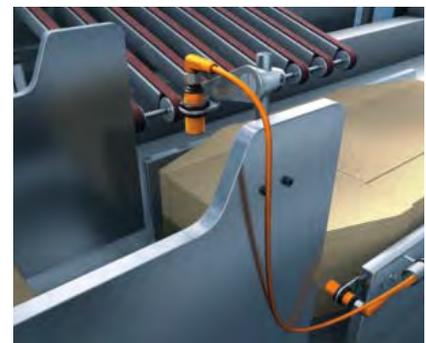
High performance

The ifm ultrasonic sensors in M18 design provide a particularly small blind zone and long sensing ranges which are usually only achieved by sensors of a considerably larger design.

The sensors operate reliably with heavy soiling so that they can be used in applications in which photoelectric sensors meet their limits.

IO-Link highlights:

- Current process value plus two binary readings available
- NO or NC function with switch-on and switch-off delay
- Output response: One-point, two-point or window function
- Adjustable hysteresis
- Filter function for fast movements
- Diagnostics of echo quality
- Counter for operating hours and switching operations
- Pushbutton can be activated and deactivated
- Background suppression



Ultrasonic diffuse-reflection sensors

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function 2 x normally open / closed programmable · 4-wire · DC PNP

	M18 / L = 97.5	1600	PBT	10...30	IP 67	3	100	UGT203
	M18 / L = 97.5	2200	PBT	10...30	IP 67	2	100	UGT206

M12 connector · Output function 1 x NO / NC programmable + 1 x current output · 4-wire · DC PNP

	M18 / L = 97.5	1600	PBT	10...30	IP 67	3	100	UGT204
	M18 / L = 97.5	2200	PBT	10...30	IP 67	2	100	UGT207

M12 connector · Output function 1 x NO / NC programmable + 1 x voltage output · 4-wire · DC PNP

	M18 / L = 97.5	1600	PBT	10...30	IP 67	3	100	UGT205
	M18 / L = 97.5	2200	PBT	10...30	IP 67	2	100	UGT208

Accessories

Type	Description	Order no.
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20721
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: high-grade stainless steel / fixture: high-grade stainless steel	E21207
	mounting rod · Ø 12 / M10 · Length: 130 mm · straight · Housing materials: stainless steel 316Ti / 1.4571	E20938
	mounting rod · Ø 12 / M10 · Length: 200 mm · angled · Housing materials: stainless steel 316Ti / 1.4571	E20940
	Cube · M10 · aluminium profile · Housing materials: diecast zinc	E20951



Tiny photocell



- Quicker setup: Range can be set to the nearest millimetre via IO-Link
- Extended diagnostic information via IO-Link for faster identification of errors
- Tiny O8 photo cell with extremely reliable background suppression
- Colour-independent range up to 80 mm
- Precise detection of very small components



Photoelectric miniature sensor with maximum precision

The new powerful O8 sensor is an optimum choice for applications where space is at a premium, such as assembly and robotics. It might be small, but the sensor achieves a range of 80 mm independent of colour and finish of the surface to be detected. Moreover the background suppression is extremely reliable and precise even for the detection of very small, flat or reflective objects. The O8 reliably copes even with constantly changing backgrounds, e.g. on robot arms. Their reliability and precision far exceed the benchmark of conventional sensors.

IO-Link highlights:

- Range can be set
- Light-on or dark-on mode selectable
- Switch-on and switch-off delays adjustable
- Reduction of mutual interference
- Counter for operating hours and switching operations
- Transmitter can be switched on and off



Rectangular O8 design

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
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Cable 2 m · 10...30 DC · metal · IP65 / IP67

	Background suppression	1...30 mm	Red	4	H PNP	O8H206
	Background suppression	1...50 mm	Red	4	H PNP	O8H212
	Background suppression	1...80 mm	Red	4.5	H PNP	O8H218
	Background suppression	3...15 mm	Red	4	H PNP	O8H200

Cable with connector 0.3 m, 3 poles · 10...30 DC · metal · IP65 / IP67

	Background suppression	1...30 mm	Red	4	H PNP	O8H208
	Background suppression	1...50 mm	Red	4	H PNP	O8H214
	Background suppression	1...80 mm	Red	4.5	H PNP	O8H220
	Background suppression	3...15 mm	Red	4	H PNP	O8H202

Cable with connector 0.3 m, 4 poles · 10...30 DC · metal · IP65 / IP67

	Background suppression	1...30 mm	Red	4	H PNP	O8H210
	Background suppression	1...50 mm	Red	4	H PNP	O8H216
	Background suppression	1...80 mm	Red	4.5	H PNP	O8H222
	Background suppression	3...15 mm	Red	4	H PNP	O8H204

Accessories

Type	Description	Order no.
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	Angle bracket · O8 · for type O8 · Housing materials: stainless steel 316L / 1.4404	E21289
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Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
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Socket M8, 4-pole, 4-wire

	2 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC150
	5 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC151



For hygienic
and wet areas

Photoelectric sensors



- Extended diagnostic information via IO-Link allow excess gain readings
- Ideal for series applications: Range can be easily set via IO-Link
- Stainless steel housing with protection rating IP 65 / IP 67 / IP 68 / IP 69K
- Diffuse reflection sensors with reliable background suppression
- Well-defined light spot for precise object detection, no scattered light



Best performance

The diffuse reflection sensors distinguish themselves by reliable background suppression, even in case of highly reflective backgrounds.

A special feature is the automatic switch point adjustment that guarantees reliable operation even in steam, smoke or highly reflective environments.

The WetLine series features a particularly robust stainless steel housing with protection rating IP 65 / IP 67 / IP 68 / IP 69K.

The potentiometer with double sealing ensures maximum ingress resistance. The flush front lens ensures cleaning without residues.

IO-Link highlights:

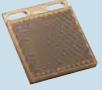
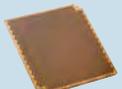
- Range can be set
- Light-on or dark-on mode selectable
- Potentiometer can be activated or deactivated
- Switch-on and switch-off delays adjustable
- Transmitter can be switched on and off
- Excess gain diagnostics
- Counter for operating hours and switching operations



O6 series WetLine with rectangular housing for hygienic and wet areas

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
M8 connector, 4 poles · 10...30 DC · high-grade stainless steel · IP65 / IP67 ; IP68 / IP69K						
	Transmitter	10 m	Red	300	–	O6S305
	Receiver	10 m	Red	–	H/D PNP	O6E309
	Polarisation filter	0.05...5 m	Red	150	H/D PNP	O6P309
	Background suppression	2...200 mm	Red	8	H/D PNP	O6H309
	Diffuse reflection sensor	5...500 mm	Red	15	H/D PNP	O6T309

Accessories

Type	Description	Order no.
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 0.3 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT248
	Angle bracket · O6 · for type O6 · Housing materials: stainless steel 316Ti / 1.4571	E21271
	Prismatic reflector · 18 x 18 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: Solidchem	E21267
	Prismatic reflector · 56 x 38 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: Solidchem	E21268
	Prismatic reflector · 48 x 48 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: Solidchem	E21269
	Prismatic reflector · 96 x 96 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: Solidchem	E21270



Photoelectric sensors in rectangular housing with time off light technology (PMD)



- **Extended information:** The measured distance is transmitted via IO-Link
- **Protection against manipulation:** Teach buttons can be activated and deactivated
- **Reliable background suppression and colour-independent detection**
- **Shiny surfaces are detected reliably (e.g. stainless steel)**
- **New improved performance, e.g. particularly small hysteresis**



Time of flight technology as standard sensor

The OID / O5D with time of flight measurement (PMD = Photonic Mixer Device) combines the following advantages: long range, reliable background suppression, visible red light and high excess gain. In the same price range as standard sensors, it is a clever alternative.

Easy handling

The switch point is easily and precisely set via "+/-" buttons and display or IO-Link, which also allows read-out of the current distance value.

Easy mounting on any surface

Whether shiny, matt, dark or light objects of any colour: The OID / O5D features reliable background suppression. The unit allows any angle of incidence and thus flexibility of mounting. This simplifies installation and saves costs.

IO-Link highlights:

- Transmission of the current distance value and the binary reading
- Range can be set
- NO or NC function with switch-on and switch-off delay
- Teach buttons, display and laser can be activated and deactivated



Class 1 laser product

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm

	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	O5D150
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: inch

	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	O5D151
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Class 2 laser product

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm

	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	O5D100
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: inch

	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	O5D101
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Accessories

Type	Description	Order no.
	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21087
	Mounting set · Clamp mounting · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21083
	Mounting set · Clamp mounting · With protective cover · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21084
	Cube · M10 · aluminium profile · Housing materials: diecast zinc	E20951



For industrial applications

Photoelectric sensors in M30 housing with time off light technology (PMD)



- **Extended information:** The measured distance is transmitted via IO-Link
- **Protection against manipulation:** Setting rings can be activated and deactivated
- **Reliable background suppression and colour-independent detection**
- **Versions with simple switch point setting by setting dial (lock function)**
- **New improved performance,** e.g. particularly small hysteresis



Time of flight technology as standard sensor

The OID with time of flight technology (PMD = Photonic Mixer Device) combines the following advantages: long range, reliable background suppression, visible laser light and high excess gain. In the same price range as standard sensors, it is a clever alternative.

Easy handling

The switch point can be set easily by turning the dial (easy turn). A scale shows the distance set. The switch point can thus be set before installation. As an alternative, the version without setting ring features the high protection rating IP69 K.

Easy mounting on any surface

Reliable detection of polished, matt, dark or light objects independent of the colour. The unit allows any angle of incidence and thus flexibility of mounting. This simplifies installation and saves costs.

IO-Link highlights:

- Transmission of the current distance value and the binary reading
- Range can be set
- NO or NC function with switch-on and switch-off delay
- Laser can be activated and deactivated



Cylindrical OI housing (M30) for optical distance measurement, laser class 1

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm, inch						
	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	OID250
Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm						
	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	OID251
Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 / IP68 / IP69K · Display unit: cm						
	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	OID254

Cylindrical OI housing (M30) for optical distance measurement, laser class 2

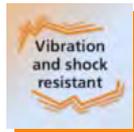
Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm, inch						
	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	OID200
Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm						
	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	OID201
Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 / IP68 / IP69K · Display unit: cm						
	Background suppression	0.03...2 m	Red	< 5	2 switching outputs normally open / closed complementary, PNP	OID204



Programmable incremental encoders with display



- **Reduced stock-keeping:**
Can be used as encoder, speed sensor or counter
- **Ideal for series applications:**
Operating modes and configuration can be set via IO-Link
- **Resolution of 1...10,000 and signal level (TTL / HTL) freely programmable**
- **Display: Two-colour electronic rotatable display of the process values**
- **Versatile: M12 connector can be used radially or axially**



No compromises

The magnetic sensing principle provides the accuracy of photoelectric encoders and the robustness of magnetic systems.

Simple

Resolution and signal level can be programmed.

The encoders have a wide voltage range of 4.75...30 V DC and are therefore suited for universal use.

Multifunctional

Performance Line encoders have an integrated signal evaluation for speed monitoring, counter functions and detection of the direction of rotation.

Intuitive

The encoders provide easy setting, position indication by means of display and operating keys and intuitive menu navigation.

Networked

Diagnostic and parameter data are reliably transferred via IO-Link. This makes the products fit for Industry 4.0.

IO-Link highlights:

- Selection and configuration of the operating mode: encoder, speed sensor or counter
- Signal level can be set in TTL or HTL logic
- Operating hours counter
- Output response: window function, NO / NC function, hysteresis adjustable



Encoders with display, programmable via IO-Link or pushbuttons

Type	Shaft	U _b [V]	Ambient temperature [°C]	Description	Order no.
M12 connector · 8 pole · Output function HTL, TTL 50 mA					
	12 F7	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP520
	12 F7	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP521
	6	4.75...30	-40...85	Solid shaft encoder · display · Magnetic detection system · Synchro-flange · Connector, radial, can also be used axially	RUP500
	10	4.75...30	-40...85	Solid shaft encoder · display · Magnetic detection system · Clamping flange · Connector, radial, can also be used axially	RVP510

Accessories

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	Jumper · straight / straight · Free from halogen · 0.3 m · Housing materials: PUR	E12432
	Stator coupling · Housing materials: stainless steel	E60205
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011
	Jumper · straight / straight · Gold-plated contacts · 0.3 m · Housing materials: plug: Brass / Socket: TPU	E12460
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398

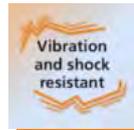


For industrial applications

Programmable incremental encoders with IO-Link



- **Ideal for series applications:** Thanks to the software, IO-Link parameters can be quickly reproduced
- **Flexible:** Resolution of 1...10,000 freely programmable
- **Simple:** Signal level can be set in TTL or HTL logic
- **Universal:** Radial or axial M12 connector or cable entry
- **Standard fitting:** Solid shaft (clamp / synchro flange) or hollow shaft design



Universally adaptable

The magnetic sensing principle provides the accuracy of photoelectric encoders and the robustness of magnetic systems. The days of confusing type variety and encoders with complicated programming are finally over. The new incremental encoders from ifm can be used universally due to the intelligent product and functional design and stand out thanks to a superb price / performance ratio. The rotatable M12 connector or cable entry can be used radially or axially.

IO-Link highlights:

- Adjustable resolution
- Signal level can be set in TTL or HTL logic
- Counting direction selectable
- Operating hours counter

Hollow shaft encoders, programmable via IO-Link

Type	Shaft	U _b [V]	Ambient temperature [°C]	Description	Order no.
M12 connector · 5-pole · Output function HTL, TTL 50 mA					
	6 H7	4.75...30	-40...85	Hollow shaft encoder open to one side · Magnetic detection system · Connector, radial, can also be used axially	RA3100
	12 F7	4.75...30	-40...85	Hollow shaft encoder open to one side · Magnetic detection system · Connector, radial, can also be used axially	RO3100
Cable 2 m · Output function HTL, TTL 50 mA					
	6 H7	4.75...30	-40...80	Hollow shaft encoder open to one side · Magnetic detection system · Cable, radial, can also be used axially	RA3500
	12 F7	4.75...30	-40...80	Hollow shaft encoder open to one side · Magnetic detection system · Cable, radial, can also be used axially	RO3500

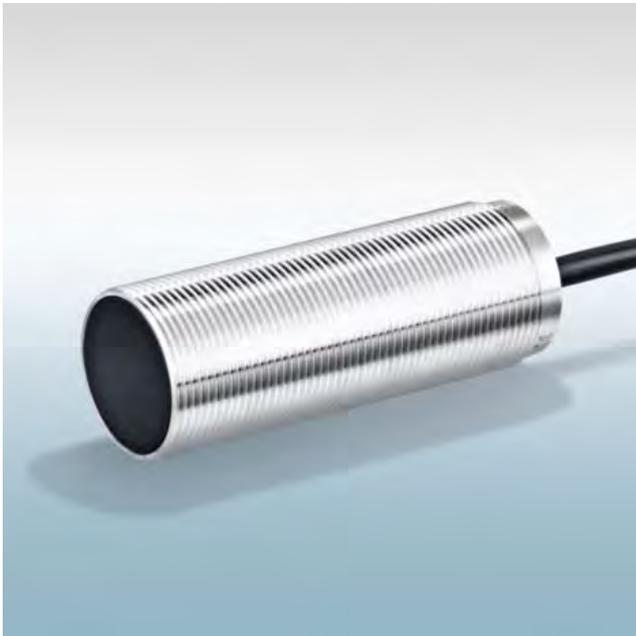
Solid shaft encoders, programmable via IO-Link

Type	Shaft	U _b [V]	Ambient temperature [°C]	Description	Order no.
M12 connector · 5-pole · Output function HTL, TTL 50 mA					
	6	4.75...30	-40...85	Solid shaft encoder · Magnetic detection system · Connector, radial, can also be used axially	RB3100
	6	4.75...30	-40...85	Solid shaft encoder · Synchro-flange · Magnetic detection system · Connector, radial, can also be used axially	RU3100
	10	4.75...30	-40...85	Solid shaft encoder · Clamping flange · Magnetic detection system · Connector, radial, can also be used axially	RV3100
Cable 2 m · Output function HTL, TTL 50 mA					
	6	4.75...30	-40...80	Solid shaft encoder · Magnetic detection system · Cable, radial, can also be used axially	RB3500
	6	4.75...30	-40...80	Solid shaft encoder · Synchro-flange · Magnetic detection system · Cable, radial, can also be used axially	RU3500
	10	4.75...30	-40...80	Solid shaft encoder · Clamping flange · Magnetic detection system · Cable, radial, can also be used axially	RV3500



For industrial applications

Speed sensors with ATEX approval and IO-Link



- Detect actual speed and set parameters via IO-Link
- ATEX approval group II, category 3D
- Ideal in combination with a PLC
- Flush installation
- Robust M30 metal housing, no additional impact protection housing required



Compact speed monitoring

The new speed sensors are the compact solution for speed monitoring because the evaluation electronics are integrated in the sensor housing.

The limit at the speed of which the output switches is set via a potentiometer or IO-Link. Both rotary and linear movements can be monitored for overspeed, under-speed and blockage.

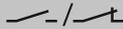
As compared to its predecessors, these new sensors feature a robust metal housing for flush mounting. A special version with ATEX approval is available for which no additional impact protection is required.

IO-Link Highlights:

- Current process value plus two binary readings available
- Limit value and window can be set
- Start-up delay

Speed monitor with integrated sensor

Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
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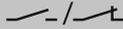
Cable 2 m · Output function  · DC PNP/NPN

	M30 / L = 80	10 f	DC PNP/NPN	10...36 DC	5...3600	0...30	DI5026
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f = flush / nf = non flush / qf = quasi-flush

Speed monitors with integrated sensor, ATEX category 3D

Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
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Cable 2 m · Output function  · DC PNP/NPN

	M30 / L = 80	10 f	DC PNP/NPN	10...36 DC	5...3600	0...30	DI523A
------------------------------------------------------------------------------------	--------------	------	------------	------------	----------	--------	--------

f = flush / nf = non flush / qf = quasi-flush

Accessories

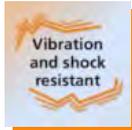
Type	Description	Order no.
	Target wheel · Plastic disk with 8 screws as "target" · Centered drill holes	E89010
	Angle bracket · for type M30 · Housing materials: stainless steel	E10737
	Lock nuts metal · M30 x 1.5 · Housing materials: stainless steel 316Ti / 1.4571	E10031
	Mounting set · Ø 30.2 mm · Clamp mounting · free-standing M12 · for type OI, II, KI · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20873
	Mounting set · Ø 30.2 mm · Clamp mounting · aluminium profile · for type II, KI, OID, OI · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc / Cube: diecast zinc	E20875
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: I O-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



Robust and precise inclination sensors



- Quicker troubleshooting thanks to extended diagnostic functions, such as self-test
- Reduced stock-keeping: an inclination sensor and a vibration sensor in one unit
- Highest accuracy over the entire angular and temperature range
- Configurable current and voltage output functions
- Adjustable filter functions for different applications



Precision counts

The 2-axis inclination sensors are designed for high measurement accuracies over the whole angular and temperature range. All functions can be configured via IO-Link.

Thanks to active temperature compensation and high protection rating, they operate reliably even at extreme temperatures and in rough environments.

Vibration monitoring

Alternatively, JN2200 can also be used for 3-axis vibration monitoring. Up to 3 axes can be included into the calculation of the characteristic value.

Typical applications are the detection of structural vibration or tower vibration to ISO 4866, or machine monitoring to ISO 10816.

IO-Link highlights:

- Current angular and vibration values plus two binary readings are available
- Angular ranges can be set independently of each other for analogue and digital outputs
- Output response: window function, NO / NC function, hysteresis adjustable
- Switch-on and switch-off delay
- Analogue output 4...20 mA or 2...10 V selectable
- Filter function for angular and vibration measurement
- Provision of all diagnostic parameters, such as measuring cell and ambient temperature



Inclination sensors

Type	Description	Order no.
	Inclination sensor · $\pm 180^\circ$ · Self-test function · IO-Link interface · Analogue interfaces (voltage / current) · Analogue / binary outputs · housing: diecast zinc nickel-plated	JN2200
	Inclination sensor · $\pm 45^\circ$ · Self-test function · IO-Link interface · Analogue interfaces (voltage / current) · Analogue / binary outputs · housing: diecast zinc nickel-plated	JN2201

Accessories

Type	Description	Order no.
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398



For industrial applications

Decentralised display, preprocessing and conversion of analogue signals



- Upgrading to IO-Link: Conversion of analogue measured values to an IO-Link communication
- Extended diagnostic data is available via IO-Link, such as minimum and maximum value memory
- Mini display to monitor values
- Clearly visible display with red / green colour change
- Compact design with protection rating IP 67



Analogue signals at a glance

The compact connector unit is simply inserted in the connection cable of analogue sensors (4...20 mA). It displays the measured values locally. The user can set a switch point or limit at which the transistor output switches. A colour change (red / green) of the display indicates this unmistakably. Critical process states or operational problems are reliably signalled.

Converter for Industry 4.0

A special feature is the signal conversion: The threshold display converts analogue signals to digital IO-Link signals.

Today they are required in almost any modern industrial environment and for Industry 4.0 applications.

IO-Link highlights:

- Current process value plus binary reading available
- Minimum / maximum value memory
- Damping of the measured signal
- Pushbuttons can be activated and deactivated
- Parameter settings for the display
- NO or NC function with switch-on and switch-off delay
- Output response: window function, hysteresis adjustable



Multifunctional displays for analogue standard signals

Type	Description	Order no.
	Threshold display · 4...20 mA analogue input · transistor output · IO-Link interface · 4-digit alphanumeric display / alternating indication of red and green · Conversion of analogue measured values to an IO-Link communication · M12 connectors · Housing materials: PA	DP2200

Accessories

Type	Description	Order no.
	Mounting clip · Housing materials: 2.1247	E89208
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

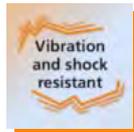


For industrial applications

Pressure sensors with two switching outputs and display



- **Condition-based maintenance:**
Overload counter detects pressure peaks
- **Extended diagnostics:** minimum and maximum value memory detects pressure fluctuations
- **Clearly indicate the acceptable ranges:** programmable red / green display
- **The process connection can be rotated** for optimum alignment
- **Fast switch point setting:** Setting via 3 pushbuttons



Powerful pressure monitoring

The pressure sensors of the PN series are characterised by a modern and user-friendly design. The maximum robustness, high protection rating and captive laser labelling ensure reliable operation of the sensors even in harsh industrial environments. Thanks to their high overload protection, IP 67 and captive laser labelling, the new PN sensors excel even in harshest environments.

Set-up, maintenance and operation are facilitated by a 4-digit LED display, which is visible from all sides even at greater distances, and two switching status LEDs on the sensor head. The display can be switched from the indication of "red" to an alternating indication of "red - green". So, switching states can be highlighted or an independent colour window can be created.

The screwed-on sensor can be rotated in any direction. Mounting brackets, which can be obtained as an option, allow installation in any position.

IO-Link highlights:

- Current process value plus 2 binary readings available
- Configurable overload counter
- Configuration of the switch points
- Pushbuttons can be locked for protection against undesired tampering.
- Selectable units: bar / kPa / psi / inHG
- Display functions, such as orientation, refresh rate, colour change can be configured
- Minimum / maximum value memory
- NO or NC function with switch-on and switch-off delay, PNP or NPN
- Output response: window function, hysteresis adjustable



Sensors with switching outputs and display with IO-Link

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN							
	G ¼ female	Display unit	0...600	800	2500	18...30	PN7160
	G ¼ female	Display unit	0...400	800	1700	18...30	PN7070
	G ¼ female	Display unit	0...250	500	1100	18...30	PN7071
	G ¼ female	Display unit	0...100	300	650	18...30	PN7092
	G ¼ female	Display unit	0...25	150	350	18...30	PN7093
	G ¼ female	Display unit	-1...10	75	150	18...30	PN7094
	G ¼ female	Display unit	0...2.5	20	50	18...30	PN7096
	G ¼ female	Display unit	-1...1	20	50	18...30	PN7099
	G ¼ female	Display unit	0...1	10	30	18...30	PN7097
	G ¼ male / M5 female	Display unit	0...600	800	2500	18...30	PN7560
	G ¼ male / M5 female	Display unit	0...400	800	1700	18...30	PN7570
	G ¼ male / M5 female	Display unit	0...250	500	1100	18...30	PN7571
	G ¼ male / M5 female	Display unit	0...100	300	650	18...30	PN7592
	G ¼ male / M5 female	Display unit	0...25	150	350	18...30	PN7593
	G ¼ male / M5 female	Display unit	-1...10	75	150	18...30	PN7594
	G ¼ male / M5 female	Display unit	0...2.5	20	50	18...30	PN7596
	G ¼ male / M5 female	Display unit	-1...1	20	50	18...30	PN7599
	G ¼ male / M5 female	Display unit	0...1	10	30	18...30	PN7597

Accessories

Type	Description	Order no.
	Angle bracket · Housing materials: PA66-	E30421
	Protective cover · for fluid sensors with M12 connector · Housing materials: Polypropylene homopolymer	E30420
	Label tag · for fluid sensors · Housing materials: PA	E30422

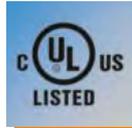
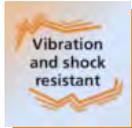


For industrial applications

Combined pressure sensors and transmitters



- **Extended diagnostics:**
Minimum / maximum value memory detects pressure fluctuations
- **Recognition of critical plant conditions,**
e.g. overload processes
- **Compact design**
- **High switch point accuracy**
- **Low-cost and robust**



Miniaturisation for industrial applications

The new PV pressure sensor features a thin-film measuring cell directly welded with the process connection. This technology guarantees high accuracy in a very compact housing with only 19 mm across flats at an optimum price/performance ratio.

Application

With the sealless design of the process connection the sensors can be used not only in hydraulic applications but also in inert gases.

In industrial applications the laser labelling on the housing is also advantageous. Even in adverse environmental conditions, the sensor remains permanently identifiable. Another advantage is the integrated IO-Link interface. Thanks to IO-Link the new pressure sensor continuously transmits process values and other important data, e.g. a pressure peak counter. Moreover, the digital measurement results are more accurate because there are no conversion losses by D/A converters or external influences (e.g. cable lengths).

IO-Link highlights:

- Current process value plus configurable binary information available
- Detects overload processes
- Minimum / maximum value memory
- Output response: window function, hysteresis adjustable
- Zero point calibration
- PNP or NPN selectable



Sensors with switching outputs and IO-Link

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN							
	G ¼ male / M5 female	–	0...400	1000	1700	18...30	PV7000
	G ¼ male / M5 female	–	0...250	625	1200	18...30	PV7001
	G ¼ male / M5 female	–	0...100	250	1000	18...30	PV7002
	G ¼ male / M5 female	–	0...60	150	900	18...30	PV7023
	G ¼ male / M5 female	–	-1...25	65	600	18...30	PV7003
	G ¼ male / M5 female	–	-1...10	25	300	18...30	PV7004

Accessories

Type	Description	Order no.
	Adapter · G ¼ - G ½ · Housing materials: stainless steel 316Ti / 1.4571 / sealing: FPM	E30135
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

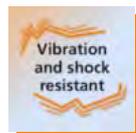


For industrial applications

Compact pressure sensors for pneumatics



- **Extended diagnostics:** minimum and maximum value memory detects pressure fluctuations
- **Slanted display for good readability and handling**
- **Two-colour display for indication of the switching status**
- **Easy installation using integrated mounting holes and accessories**
- **One switching and one analogue output for great flexibility in use**



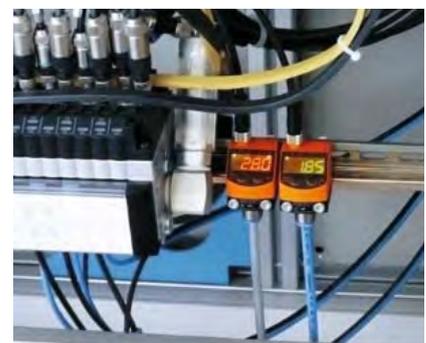
Pneumatics at a glance

The PQ series pressure sensors are designed to monitor system pressure in pneumatic and compressed-air networks of machines and plants. The sensors can be used for both relative and differential pressure measurement. This makes them particularly suited for monitoring of filters for soiling or clogging. The measuring cell is insensitive to liquids or deposits that might occur in the system. It is overload protected and highly accurate.

A 4-digit LED display, which can be seen from a distance and easily read, and two pushbuttons allow easy set-up, maintenance and operation of the sensor. The display can be switched from the indication of "red" to an alternating indication of "red - green". So, switching states can be highlighted or an independent colour window can be created.

IO-Link highlights:

- Current process value plus configurable binary information available
- Zero point calibration
- Display functions, such as orientation, refresh rate, colour change can be configured
- Selectable units: bar / MPa / psi / inHg
- Minimum / maximum value memory
- Output response: window function, NO / NC function, hysteresis adjustable
- Pushbuttons can be locked for protection against undesired tampering



Thanks to the two-coloured display, interpreting the indicated values is easy.

Sensors for pneumatic applications

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M8 connector · Output function 1 x NO / NC programmable + 1 x current output · DC PNP							
	G 1/8 female / M5 female	Display unit	-1...1	20	30	18...32	PQ3809
	G 1/8 female / M5 female	Display unit	-1...10	20	30	18...32	PQ3834

Accessories

Type	Description	Order no.
	DIN rail clip · Housing materials: stainless steel	E37340
	Adapter · R1/8 - R1/8 · rotatable · Housing materials: Brass nickel-plated	E37350

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M8, 4-pole, 4-wire								
	2 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC150
	5 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC151
	10 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC152
	2 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC153
	5 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC154
	10 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC155



For hygienic
and wet areas

Pressure sensors with Aseptoflex Vario process connection



- Extended diagnostics: minimum and maximum value memory detects pressure fluctuations
- Quicker set-up and error diagnostics thanks to simulation function
- Aseptoflex Vario – new G 1 process connection with four sealing options
- Hygienic, flush design with high-purity ceramic measuring cell
- High overall accuracy (0.2 %) and electronic temperature compensation



Pressure measurement for special requirements

The PI27 series pressure sensors have a robust stainless steel housing. The housing design is, in particular, distinguished by its resistance to cleaning agents used in the food and pharmaceutical industries.

The robust flush ceramic measuring cell is distinguished by its resistance to pressure peaks, solids and harsh chemicals.

The sensors meet all common approvals for use in hygienic applications, such as EHEDG, 3A, EG1935/2004.

IO-Link highlights:

- Current process value plus configurable binary information available
- Minimum / maximum value memory
- Switch-on and switch-off delays
- Damping of the measured signal
- Simulation of pressure values
- Pushbuttons can be locked



Flush pressure sensors with switching and analogue output, IO-Link

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 1 x normally open / normally closed programmable + 1 x normally open / normally closed programmable or 1 x analogue (4...20 / 20...4 mA, scalable)							
	Aseptoflex Vario	Display unit	-1...25	100	350	20...32	PI2793
	Aseptoflex Vario	Display unit	-1...10	50	150	20...32	PI2794
	Aseptoflex Vario	Display unit	-1...4	30	100	20...32	PI2795
	Aseptoflex Vario	Display unit	-0.124...2.5	20	50	20...32	PI2796
	Aseptoflex Vario	Display unit	-0.05...1	10	30	20...32	PI2797
	Aseptoflex Vario	Display unit	-0.0124...0.25	10	30	20...32	PI2798
	Aseptoflex Vario	Display unit	-1...1	10	30	20...32	PI2799
	Aseptoflex Vario	Display unit	-0.005...0.1	4	30	20...32	PI2789

Adapters

Type	Description	Order no.
	Clamp adapter · with leakage port · Clamp · 1-1.5" · with sealing ring · ISO 2852 · for units with Aseptoflex Vario adapter · Housing materials: stainless steel 316L / 1.4435	E33208
	Aseptoflex Vario adapter · with leakage port · Clamp · 2" · with sealing ring · ISO 2852 · for units with Aseptoflex Vario adapter · Housing materials: stainless steel 316L / 1.4435	E33209
	Welding adapter · Ø 50 mm · with leakage port · for units with Aseptoflex Vario adapter · Sealing by sealing ring · Housing materials: stainless steel 316L / 1.4435	E30130

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT004
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT001



For hygienic
and wet areas

Pressure sensors with male G 1 process connection



- **Extended diagnostics:**
minimum and maximum value memory
detects pressure fluctuations
- **Quicker set-up and error diagnostics**
thanks to simulation function
- **Hygienic, flush design with high-purity**
ceramic measuring cell
- **High overall accuracy (0.2 %)**
and electronic temperature compensation
- **High temperature resistance,**
therefore suitable for SIP and CIP processes



Robust and resistant pressure sensors

The PI28 series pressure sensors have a robust stainless steel housing. The housing design is distinguished by its resistance to cleaning agents used in the food and pharmaceutical industries.

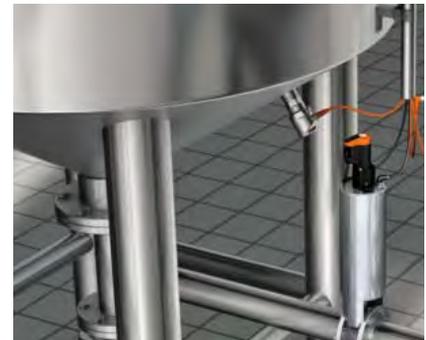
The robust flush ceramic measuring cell is particularly resistant to pressure peaks, harsh chemicals and solids.

A variety of process adapters allows easy integration into the application.

The sensors meet all common approvals for use in hygienic applications., such as EHEDG, 3A, EG1935/2004, etc.

IO-Link highlights:

- Current process value plus configurable binary information available
- Minimum / maximum value memory
- Switch-on and switch-off delays
- Damping of the measured signal
- Simulation of pressure values
- Pushbuttons can be locked



Flush pressure sensors with switching and analogue output, IO-Link

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 1 x normally open / normally closed programmable + 1 x normally open / normally closed programmable or 1 x analogue (4...20 / 20...4 mA, scalable)							
	Sealing cone G1 male	Display unit	-1...25	100	350	20...32	PI2893*
	Sealing cone G1 male	Display unit	-1...10	50	150	20...32	PI2894*
	Sealing cone G1 male	Display unit	-1...4	30	100	20...32	PI2895*
	Sealing cone G1 male	Display unit	-0.124...2.5	20	50	20...32	PI2896*
	Sealing cone G1 male	Display unit	-0.05...1	10	30	20...32	PI2897*
	Sealing cone G1 male	Display unit	-0.0124...0.25	10	30	20...32	PI2898*
	Sealing cone G1 male	Display unit	-1...1	10	30	20...32	PI2899*
	Sealing cone G1 male	Display unit	-0.005...0.1	4	30	20...32	PI2889*

* Attention: The unit must only be installed in a process connection for G1 sealing cone!
The G1 male sealing cone of the unit is only suited for adapters with metal end stop!

Adapters

Type	Description	Order no.
	Clamp adapter · Clamp · 1-1.5" · ISO 2852 · for units with G 1 adaptation · Housing materials: stainless steel 316L / 1.4435	E33601
	Pipe fitting · Hygienic pipe fitting · Hygienic pipe fitting · DN40 (1.5") · DIN 11851 · for units with G 1 adaptation · Housing materials: stainless steel 316L / 1.4435	E33612
	Clamp adapter · Varivent Adapter · Varivent type N · DN40...DN150 (1.5...6"), D = 68 · for units with G 1 adaptation · Housing materials: stainless steel 316L / 1.4435	E33622
	Welding adapter · G 1 - Ø 50 mm · Housing materials: stainless steel 316L / 1.4404	E30013

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT004
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT001



For hygienic
and wet areas

Pressure sensors with 1.5" and 2" clamp process connection



- Extended diagnostics: minimum and maximum value memory detects pressure fluctuations
- Quicker set-up and error diagnostics thanks to simulation function
- Pressure monitoring in the temperature range from -25 to 200 °C
- Integrated 1.5" or 2" clamp diaphragm seal with stainless steel diaphragm
- 6-point calibration certificate included



Pressure sensor for high temperatures ranges

The PI22 / PI23 series pressure sensors are designed for high-temperature applications in the food and beverage industry such as UHT (ultra high temperature) plants. A 4-digit LED display, which is visible from all sides even at greater distances, facilitates set-up, maintenance and operation.

Parameter setting is performed via the buttons on the sensor. The sensor can also be configured via IO-Link, using, for example, a USB interface. The LR DEVICE software is used to visualise, transfer and archive parameter sets.

IO-Link highlights:

- Current process value plus configurable binary information available
- Minimum / maximum value memory
- Switch-on and switch-off delays
- Damping of the measured signal
- Simulation of pressure values
- Pushbuttons can be locked



Full-metal high-temperature sensors up to 200 °C for hygienic and wet areas with switching output and analogue output, IO-Link

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 1 x normally open / normally closed programmable + 1 x normally open / normally closed programmable or 1 x analogue (4...20 / 20...4 mA, scalable)							
	Clamp DN 38 / 1 1/2"	Display unit	-1...25	80	150	20...32	PI2203
	Clamp DN 38 / 1 1/2"	Display unit	-1...10	50	100	20...32	PI2204
	Clamp DN 38 / 1 1/2"	Display unit	-1...4	30	50	20...32	PI2205
	Clamp DN 38 / 1 1/2"	Display unit	-0.124...2.5	20	50	20...32	PI2206
	Clamp DN 38 / 1 1/2"	Display unit	-0.05...1	10	30	20...32	PI2207
	Clamp DN 38 / 1 1/2"	Display unit	-1...1	10	30	20...32	PI2209
	Clamp DN 51 / 2"	Display unit	-1...25	80	150	20...32	PI2303
	Clamp DN 51 / 2"	Display unit	-1...10	50	100	20...32	PI2304
	Clamp DN 51 / 2"	Display unit	-1...4	30	50	20...32	PI2305
	Clamp DN 51 / 2"	Display unit	-0.124...2.5	20	50	20...32	PI2306
	Clamp DN 51 / 2"	Display unit	-0.05...1	10	30	20...32	PI2307
	Clamp DN 51 / 2"	Display unit	-1...1	10	30	20...32	PI2309

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	–	EVT004
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	–	EVT001



For industrial applications

Inline volumetric flow sensors for precise measurement of liquids up to 900 l/min



- Makes the purchase of further sensors superfluous: Measurement and transmission via IO-Link
- Minimum / maximum memory and simulation mode for extended diagnostics
- Suited for liquids with a conductivity from 20 $\mu\text{S}/\text{cm}$
- Integrated empty pipe detection and simulation mode
- With volumetric flow quantity, total quantity and temperature indication



Compact and low cost.

efector mid – a volumetric flow sensor up to 900 l/min, with electronics and evaluation unit in one of the most compact housings. It is not only more compact but also less expensive than comparable sensors.

Three functions

One single sensor monitors the volumetric flow quantity, the total quantity as well as the temperature.

Data processing

Analogue, binary, pulse and frequency outputs offer various options to process the measured data. The sensor is designed for the machine tool, solar and water industries. It is used in conductive liquids (conductivity: $\geq 20 \mu\text{S}/\text{cm}$ / viscosity: $< 70 \text{ mm}^2/\text{s}$ at 40 °C).

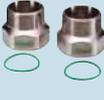
IO-Link highlights

- Current volumetric flow quantity, totaliser and temperature plus two binary readings are available
- Damping of the switching output
- Configuration of the analogue, binary, pulse and frequency outputs
- Display functions, such as orientation and refresh rate, can be configured
- Selectable units: l/min or m^3/h
- Minimum / maximum value memory for flow and temperature
- Simulation of flow and temperature values
- The flow direction of the sensor can be flexibly adjusted to suit the individual application

Magnetic-inductive flow meters with integrated temperature measurement

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
Output function OUT1: normally open / normally closed programmable or pulse or frequency or empty pipe detection or IO-Link OUT2: normally open / normally closed programmable or analogue (4...20 mA; 0...10 V, scalable) or empty pipe detection							
	G2 flat seal	6.5...300	-10...70	16	< 0.35	18...32	SM9000
	G2 flat seal	8...600	-10...70	16	< 0.35	18...32	SM2000
	G2 flat seal	10...900	-10...70	16	< 0.35	18...32	SM0510
	G2 flat seal	6.5...300	-10...70	16	< 0.35	18...32	SM9100
	G2 flat seal	8...600	-10...70	16	< 0.35	18...32	SM2100

Adapters

Type	Description	Order no.
	Adapter · 1½" NPT · for flow sensors type SM2, SM9 · Housing materials: stainless steel 316Ti / 1.4571	E40229
	Adapter · G 1½ · for flow sensors type SM2, SM9 · Housing materials: stainless steel 316Ti / 1.4571	E40230
	Adapter · 2" NPT · for flow sensors type SM2, SM9 · Housing materials: stainless steel 316Ti / 1.4571	E40228
	Adapter · R 2" A · for flow sensors type SM2, SM9 · Housing materials: stainless steel 316Ti / 1.4571	E40231
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC002
	5 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC005



For industrial applications

Calorimetric flow meters for liquids and gases



- Optimised for water, oils, glycol and air
- Fast response time and integrated temperature measurement
- Red/green colour change for process values
- Internal pipe diameter selectable from 15...400 mm
- The process connection can be rotated for optimum alignment



Measurement technique

The SA type flow meter operates on the calorimetric measuring principle. Two measuring elements as well as a heat source are located on the measuring tip. The physical effect that a flowing medium absorbs heat energy and conducts it away is used. The resulting temperature change is an indication of flow.

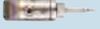
Device function

The new SA type sensor has been designed to detect and measure flow and temperature even in large internal pipe diameters up to 400 mm. Therefore it serves different applications. Switching outputs, analogue signals and IO-Link provide various options to further process the signals.

IO-Link highlights:

- Current flow and temperature plus two binary readings are available
- Configuration of analogue and binary outputs
- Minimum / maximum value memory for flow and temperature
- Adjustable setting options for water, glycol, oil and air
- Pushbuttons can be locked for protection against undesired tampering
- Switch-on and switch-off delay

Flow meters with integrated temperature measurement

Type	Setting range liquids / gases [cm/s]	Material sensor tip	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector							
	0.05...3	stainless steel (316L / 1.4404)	-20...90	100	0.5	18...30	SA5000
	0.05...3	stainless steel (316L / 1.4404)	-20...100	50	0.5	18...30	SA4100
	0.05...3	stainless steel (316L / 1.4404)	-20...100	50	0.5	18...30	SA4300

Adapters

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	Adapter · M18 x 1.5 - G 1/2 · Insertion depth of the probe of SID, SFD, TN: · 21 mm · Housing materials: stainless steel 316L / 1.4404	E40096
	Adapter · M18 x 1.5 - G 1/4 · Insertion depth of the probe of SID, SFD, TN: · 13.5 mm · Housing materials: stainless steel 316L / 1.4404	E40099
	Progressive ring fitting · Ø 8 mm - G1/2 · Housing materials: stainless steel	E40258

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC001
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT001

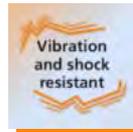


For industrial applications

Calorimetric flow sensors in robust stainless steel housing



- Digital signal transmission for improved transmission of measured values
- Increased repeatability across the extended measuring range
- Simplified setting mode for quick set-up
- Variable process connection using adapters
- Reliable monitoring of gases and liquids



Simple, fast and flexible installation.

The flow sensors of the SI5 series can be integrated into almost every application by means of a wide selection of process adapters. Their robust stainless steel housing provides high reliability even in harsh environmental conditions.

Ease of use and high functionality

A pushbutton is used to set the flow range and adjust the switch. Current flow and switch point are indicated locally by multi-coloured LEDs. Electronic locking of the settings and factory reset of the parameters provide additional safety.

IO-Link highlights:

- Current flow and temperature plus two binary readings are available
- Configuration of the binary outputs
- Teach buttons can be activated and deactivated
- Switch-on and switch-off delay



Compact flow sensors

Type	Setting range liquids / gases [cm/s]	Material sensor tip	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector							
	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	300	1...10	18...36	SI5002
	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	300	1...10	18...36	SI5007
	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	300	1...2 / 1...10	18...36	SI5010

Adapters

Type	Description	Order no.
	Adapter · M18 x 1.5 - G 1/2 · Insertion depth of the probe of SID, SFD, TN: · 21 mm · Housing materials: stainless steel 316L / 1.4404	E40096
	Adapter · M18 x 1.5 - G 1/2 · Insertion depth of the probe of SID, SFD, TN: · 21 mm · Housing materials: 2.0401	E40097
	Adapter · M18 x 1.5 - G 1/4 · Insertion depth of the probe of SID, SFD, TN: · 13.5 mm · Housing materials: stainless steel 316L / 1.4404	E40099
	Adapter · M18 x 1.5 - 1/2" NPT · Insertion depth of the probe of SID, SFD, TN: · 23 mm · Housing materials: stainless steel 316L / 1.4404	E40107

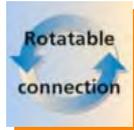


For industrial applications

Inline vortex flow meters with versatile multi-colour display



- Makes the purchase of further sensors superfluous: Measurement and transmission via IO-Link
- Minimum / maximum value memory for extended diagnostics
- Electronically rotatable multi-colour display
- Rotatable G, R or NPT process connections as option
- Can be used for water with and without conductivity (deionised water)



Turbulence as a measure for the flow

Behind a bluff body integrated in the measuring pipe, the flowing medium generates swirling vortices depending on its velocity. These vortices are detected by a piezo-ceramic sensor. If the cross-section is known, the number of the vortices allows to determine the flow rate.

This flow rate measurement principle, known as vortex principle, is virtually independent of pressure and temperature fluctuations of the medium. It allows a simple design and thus a low-cost production of sensors for flow rate measurement.

The current flow and temperature are provided either as standardised current signal (4...20 mA), as frequency signal, switching output or via IO-Link.

IO-Link highlights:

- Current flow and temperature plus two binary readings are available
- Teach buttons can be activated and deactivated
- Minimum / maximum value memory for flow and temperature
- Configuration of the outputs and display function

Flow meters with integrated temperature measurement

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector							
	G ½	1...20	-10...90	12	< 1	18...30	SV4200
	Rc ½	1...20	-10...90	12	< 1	18...30	SV4500
	G ½	2...40	-10...90	12	< 1	18...30	SV5200
	Rc ½	2...40	-10...90	12	< 1	18...30	SV5500
	G ¾	5...100	-10...90	12	< 1	18...30	SV7200
	Rc ¾	5...100	-10...90	12	< 1	18...30	SV7500
	½" NPT	0.26...5.28	14...194	12	< 1	18...30	SV4610
	½" NPT	0.55...10.55	14 ... 194	12	< 1	18...30	SV5610
	¾" NPT	1.3...26.4	14...194	12	< 1	18...30	SV7610

Accessories for flow sensors

Type	Description	Order no.
	Mounting plate · Housing materials: stainless steel 316L / 1.4404	E40249
	Regulating valve · G ½ - G ½ · lockable · Housing materials: Brass nickel-plated / EPDM	E40250
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC002
	2 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT064



For industrial applications

Inline mechatronic flow meters with display



- Makes the purchase of further sensors superfluous: Measurement and transmission via IO-Link
- Integrated temperature measurement
- No inlet and outlet pipe lengths required
- Red/green colour change for process values
- Very fast response time of < 10 ms



Mechatronic flow sensor

The flow sensor works according to the spring-supported piston principle: The piston, located in the valve seat in the housing, is lifted by the flowing medium against the spring resistance.

The piston position is monitored via a magnetic field sensor and is output as an analogue signal. The spring resistance forces the piston to return to its original position with decreasing flow. This ensures position-independent installation of the flow sensor preventing backflow.

The sensor head can be rotated by 360 °C so that it can be read in any position.

IO-Link highlights:

- Current flow and temperature plus two binary readings are available
- Configuration of the outputs and display function
- Minimum / maximum value memory for temperature

Mechatronic flow sensors with display

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	Rp 3/4	0.3...15	-10...100	40	0.01	18...30	SBY232
	Rp 3/4	0.5...25	-10...100	40	0.01	18...30	SBY233
	Rp 3/4	1...50	-10...100	40	0.01	18...30	SBY234
	Rp 1	2...100	-10...100	25	0.01	18...30	SBY246
	Rp 1 1/2	4...200	-10...100	25	0.01	18...30	SBY257
	G 1/2	0.3...15	-10...100	40	0.01	18...30	SBG232
	G 1/2	0.5...25	-10...100	40	0.01	18...30	SBG233
	G 1/2	1...50	-10...100	40	0.01	18...30	SBG234
	G 3/4	2...100	-10...100	25	0.01	18...30	SBG246
	G 1 1/4	4...200	-10...100	25	0.01	18...30	SBG257

Accessories for flow sensors

Type	Description	Order no.
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396

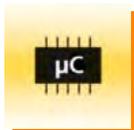


For industrial applications

Compressed air meters with display and totaliser function



- Fast response time and high response sensitivity
- Volumetric flow quantity, total quantity and temperature indication
- Analogue, switching and pulse outputs for signal processing



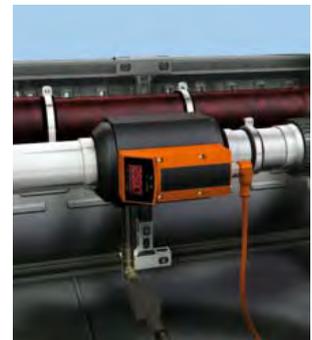
Calorimetric measuring principle

The compressed air meter directly detects the standard volume flow (according to ISO 2533). This makes corrections, in case of temperature or pressure fluctuations, unnecessary. The high measurement dynamics of the system enables reliable detection of even minute quantities, e.g. leakage. High accuracy and repeatability are ensured by the integration of the sensor's measuring elements into a defined pipe length.

Whether peak consumption, present or accumulated consumption: Set switching or alarm values can be programmed and read simply by pressing a pushbutton. All settings can be protected using the electronic lock function.

IO-Link highlights:

- Current volumetric flow quantity, totaliser and temperature plus two binary readings are available
- Minimum / maximum value memory for flow and temperature
- Teach buttons can be activated and deactivated
- Configuration of the outputs



Compressed air meters

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
Output function OUT1: normally open / closed programmable or pulse OUT2: normally open / closed programmable or analogue (4...20 mA scaleable)						
	G ¼ (DN8)	0.04...15.00	16	< 0.1	18...30	SD5000
	R½ (DN15)	0.2...75.0	16	< 0.1	18...30	SD6000
	R1 (DN25)	0.7...225.0	16	< 0.1	18...30	SD8000
	R1½ (DN40)	1.3 (1.5)...410	16	< 0.1	18...30	SD9000
	R2 (DN50)	2.3 (3)...700	16	< 0.1	18...30	SD2000

Compressed air meter for special gases

Type	Process connection	Setting range [Nm ³ /h]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
Output function OUT1: normally open / closed programmable or pulse OUT2: normally open / closed programmable or analogue (4...20 mA scaleable)							
	G ¼ (DN8)	N ₂ : 0.04...15.00 Ar: 0.08...24.04 CO ₂ : 0.04...14.36	0...60	16	< 0.1	18...30	SD5100
	R½ (DN15)	N ₂ : 0.2...75.0 Ar: 0.4...122.0 CO ₂ : 0.2...74.7	0...60	16	< 0.1	18...30	SD6100
	R1 (DN25)	N ₂ : 0.8...225.0 Ar: 1.2...366.6 CO ₂ : 0.8...223.6	0...60	16	< 0.1	18...30	SD8100

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC004



For hygienic
and wet areas

Point level sensors for hygienic installations



- Quicker adaptation to changing conditions: transmission of the process value instead of reprogramming
- Adjustment to the medium is either preset (LMT100 / 110 / 121) or can be done using IO-Link
- Hygienic design with maintenance-free sealing concept
- Resistant to foam and deposits
- Easy mounting thanks to orientation-independent installation



Reliable even if covered in residues

LMT series point level sensors have been designed for the monitoring of the levels of liquids, viscous media and powders in food applications. The sensor uses high-frequency capacitance spectrum profiling technology to effectively eliminate challenges with deposits, residue and foam build-up that commonly cause traditional point-level sensors to output false results.

Media adjustment

The distinction of two media is possible due to the two switching outputs which can be set independently.

IO-Link highlights:

- Transmission of the current process value plus two binary readings
- Monitoring of the phase separation in the process (change from product to rinse water)
- Configuration of the binary outputs: normally closed or normally open, hysteresis or window function
- Can be set to almost any liquid or viscous medium and bulk materials



(A) The LMT sensor monitors the level of mayonnaise using the high-frequency capacitance spectrum profiling technology.
(B) Despite deposits on the sensor the empty tank is detected reliably.

Point level sensors

Type	Process connection	Process pressure max. [bar]	Application	Protection	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN					
	G 1/2 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT100
	G 1/2 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT102
	G 3/4 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT202
	G 1 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT302
	G 1/2 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT104
	G 1/2 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT105
	G 1/2 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT110
	G 1/2 male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT121

Adapters

Type	Description	Order no.
	Welding adapter · G 1/2 - Ø 29 mm · for pipes · Housing materials: stainless steel 316L / 1.4435	E43301
	Welding adapter · G 1/2 - Ø 30 mm · for tanks · Housing materials: stainless steel 316L / 1.4435	E43300

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	–	EVT004



For hygienic
and wet areas

Point level sensors for hygienic installations in hazardous areas



- Quicker adaptation to changing conditions: transmission of the process value instead of reprogramming
- Approved for ATEX areas of category 3D/3G
- Can be set to other media, such as alcohols, using IO-Link
- Hygienic design with maintenance-free sealing concept
- Shock and vibration resistant in a robust stainless steel housing



Level detection in explosive atmospheres

LMT sensors reliably detect levels in storage tanks in explosive areas. They can be used in zones 2 and 22.

Food-grade

The sensor with its high-quality housing materials such as high-grade stainless steel (316L / 1.4404) and PEEK meets all requirements for hygienic areas. This includes approvals such as EHEDG and FDA.

Versatile sensor for all media

Via IO-Link, the LMT can be adjusted to almost all liquid and viscous media as well as powders. The distinction between two media in the same application is possible due to the two switching outputs which can be set independently.

IO-Link highlights:

- Transmission of the current process value plus two binary readings
- Monitoring of the phase separation in the process (change from product to rinse water)
- Configuration of the binary outputs: normally closed or normally open, hysteresis or window function
- Can be set to almost any liquid or viscous medium and bulk materials

Point level sensors for the hazardous areas

Type	Process connection	Process pressure max. [bar]	Application	Protection	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN					
	G ½ male	-1...40	liquids, viscous media and powders	IP 67	LMT01A
	G ½ male	-1...40	liquids, viscous media and powders	IP 67	LMT03A
	G ½ male	-1...40	liquids, viscous media and powders	IP 67	LMT04A

Accessories

Type	Description	Order no.
	Clamp adapter · Clamp · 1-1.5" · ISO 2852 / DIN 32676 · for units with G ½ adaptation · Housing materials: stainless steel 316L / 1.4404	E33401
	Clamp adapter · G ½ · Varivent type F · DN25 (1"), D = 50 · Housing materials: stainless steel 316L / 1.4435	E43306
	Clamp adapter · G ½ · Varivent type N · DN40...DN150 (1.5...6"), D = 68 · Housing materials: stainless steel 316L / 1.4435	E43307
	Welding adapter · Ø 50 mm · for units with Aseptoflex Vario adapter · Sealing by sealing ring · Housing materials: stainless steel 316L / 1.4435	E30122
	Welding adapter · G ½ · Ø 35 mm · Housing materials: stainless steel 316L / 1.4404	E30055

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4 poles, 4 wires, cat. 2D / 3G								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / stainless steel 316L / 1.4404	60 AC 60 DC	-20...60	IP 67	–	EVC04A



For oils and coolants

Point level sensors for general use



- Most reliable deposit suppression on the market
- Flexible installation independent of the orientation
- Quicker adaptation to changing conditions: transmission of the process value instead of reprogramming
- Factory set for simple “plug & play”
- Differentiation of media by switch point setting



Level under control

The LMC family of sensors reliably monitor limit levels, e.g. in tool machines or wastewater management, and protect pumps from running dry. Rear installation permits variable installation depths and application-specific installation.

Versatile sensor for all media

The LMC can be set to almost any liquid or viscous medium and bulk materials. Permanent medium temperatures up to 100 °C or a heavy build-up are no problem. The distinction of two media is possible due to the two switching outputs which can be set independently. The parameters can be set via IO-Link and USB interface accessory E30396.

IO-Link highlights:

- Transmission of the current process value plus two binary readings
- Monitoring of the phase separation in the process (change from product to rinse water)
- Configuration of the binary outputs: normally closed or normally open, hysteresis or window function
- Can be set to almost any liquid or viscous medium and bulk materials



Point level sensors for oils and lubricants

Type	Process connection	Output	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
M12 connector (according to EN 61076-2-101)						
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable, PNP/NPN	18...30	-25...100	100 (...60 °C) / 50 (...85 °C)	LMC100
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable, PNP/NPN	18...30	-25...100	100 (...60 °C) / 50 (...85 °C)	LMC400
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable, PNP/NPN	18...30	-25...100	100 (...60 °C) / 50 (...85 °C)	LMC110
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable, PNP/NPN	18...30	-25...100	100 (...60 °C) / 50 (...85 °C)	LMC410
	½" NPT	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable, PNP/NPN	18...30	-25...100	100 (...60 °C) / 50 (...85 °C)	LMC510
	½" NPT	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable, PNP/NPN	18...30	-25...100	100 (...60 °C) / 50 (...85 °C)	LMC500
M12 connector						
	½" NPT	2 x normally open / closed programmable, PNP/NPN	18...30	–	100	LMC502

Accessories

Type	Description	Order no.
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	Jumper · straight / straight · Free from halogen · 0.3 m · Housing materials: PUR	E12432
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



For industrial applications

Modular guided-wave radar level sensors



- Improved processes due to digital transmission of process values
- One sensor for different tank heights thanks to modular sensor concept (sensor lengths up to 160 cm)
- The probe can be cut to length, if needed
- Reduced stock-keeping
- Direct indication of the current level by LED display



Application

The LR level sensor operates according to the guided microwave principle and measures the level using electromagnetic pulses in the nanosecond range. The sensor is suitable for continuous level monitoring of almost all liquids. Deposits on the probe, quick pressure and temperature changes do not affect the measurement.

Installation

The sensor is installed in the tank using a process connection or flange. If necessary, the probe can be easily shortened and adapted to the tank by the user.

Setting

The setting of all parameters and programming of the switch points and indication of the current level can be made via two programming buttons and a 4-digit alphanumeric display or more conveniently via IO-Link.

IO-Link highlights

- Transmission of the current level plus binary information
- Loss-free transmission of the level
- Configuration of the sensor parameters

Variable level sensors, guided wave radar

Type	Process connection	Probe length [mm]	Active zone [mm]	Inactive zone [mm]	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
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M12 connector (according to EN 61076-2-101) · Output function normally open / closed programmable; 4...20 mA or 0...10 V · DC PNP



G 3/4 male	–	L-40 (L-60)	30 / 10 (30)	18...30	0...80	200	LR3000
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M12 connector (according to EN 61076-2-101) · Output function 2 x normally open / closed programmable · DC PNP



G 3/4 male	–	L-40 (L-60)	30 / 10 (30)	18...30	0...80	200	LR7000
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M12 connector (according to EN 61076-2-101) · Output function 4 x normally open / closed programmable · DC PNP



G 3/4 male	–	L-40 (L-60)	30 / 10 (30)	18...30	0...80	200	LR8000
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Accessories

Type	Description	Order no.
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Probe · Probe length: 240 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43203
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Probe · Probe length: 1000 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43207
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Coaxial pipe · Length: 240 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43211
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Coaxial pipe · Length: 1000 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43214
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Coaxial pipe · Length: 450 mm · 3/4" NPT · for level sensors LR · Housing materials: stainless steel / centring piece: PP / fixing bracket: stainless steel	E43218
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Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
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Socket M12, 5/4-pole, 4-wire



2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC004
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For industrial applications

Modular guided-wave radar level transmitters



- Improved processes due to accurate digital transmission of process values
- Robust and reliable in harsh environments
- One sensor for different tank heights thanks to modular probe concept
- The probe can be cut to length, if needed (10...160 cm)
- Reduced stock-keeping



Robust and reliable

The LR9020 reliably resists harsh environmental conditions or high-pressure cleaning. Its small design allows installation in restricted spaces. Deposits on the probe, quick pressure and temperature changes do not affect the measurement.

Successful thanks to modular concept

The probes can be shortened, or changed, so the LR reduces stock-keeping and simplifies replacement.

User-friendly setting

Even before installation the user can set the sensor parameters via IO-Link on the PC. The data record of the parameter setting can be copied to other sensors, e.g. for installations of identical design.

IO-Link highlights:

- Current level as digital process value
- Loss-free transmission of the level
- Configuration of the analogue output: 4...20 mA or 0...10 V

Variable level sensors, guided wave radar, industrial applications

Type	Process connection	Probe length [mm]	Active zone [mm]	Inactive zone [mm]	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
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M12 connector (according to EN 61076-2-101) · DC

	G 3/4 male	–	L-40 (L-60)	30 / 10 (30)	18...30	0...80	–	LR9020
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Accessories

Type	Description	Order no.
	Probe · Probe length: 240 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43203
	Probe · Probe length: 1000 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43207
	Coaxial pipe · Length: 240 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43211
	Coaxial pipe · Length: 700 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: NBR / centring piece: PP / fixing bracket: stainless steel	E43333
	Coaxial pipe · Length: 1000 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43214
	Coaxial pipe · Length: 1200 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43334

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
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Socket M12, 5/4-pole, 4-wire

	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC004
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For industrial applications

Modular guided-wave radar level sensors



- Improved processes due to accurate digital transmission of process values
- Quicker set-up and error diagnostics thanks to simulation function
- Installation adjustment for increased operational safety
- One sensor for different tank heights thanks to modular probe concept
- The probe can be cut to length, if needed (15...200 cm)



Application

Harsh environment conditions or high temperatures leave the LR2050 cold. Installation in confined spaces or detection of oils in mono-rod operation is no problem for LR, either. LR flexibly adapts to any application thanks to the installation adjustment and the modular concept.

Successful thanks to modular concept

The probes can be shortened, or changed, so the LR reduces stock-keeping and simplifies replacement.

User-friendly setting

Even before installation the user can set the sensor parameters via pushbuttons or IO-Link on the PC. Installation adjustment is made on site via pushbutton, if required.

IO-Link highlights:

- Transmission of the current level plus binary information
- Adjustable damping of the measured signal
- Pushbuttons can be activated and deactivated
- Configuration of the display parameters: cm/inch, level in %
- Configuration of the binary outputs: NO, NC, window function, hysteresis selectable
- Simulation of levels
- Adjustment to operating conditions, e.g. tank

Variable level sensors, guided wave radar, industrial applications

Type	Process connection	Probe length [mm]	Active zone [mm]	Inactive zone [mm]	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
M12 connector (according to EN 61076-2-101) · Output function OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable or analogue (4...20 mA scalable, invertable) · DC PNP/NPN								



G 3/4 male	–	L-40 / (L-60)	30 / 10 (30)	18...30	-20...100	150	LR2050
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Accessories

Type	Description	Order no.
	Probe · Probe length: 240 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43203
	Probe · Probe length: 1000 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43207
	Coaxial pipe · Length: 240 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43211
	Coaxial pipe · Length: 700 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: NBR / centring piece: PP / fixing bracket: stainless steel	E43333
	Coaxial pipe · Length: 1000 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43214
	Coaxial pipe · Length: 1200 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43334

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC004



For hygienic
and wet areas

Modular guided-wave radar level sensors for high medium temperatures



- Improved processes due to accurate digital transmission of process values
- Quicker set-up and error diagnostics thanks to simulation function
- A great variety of process adapters is available
- Rod lengths of 15...200 cm
- Suitable for permanent medium temperatures up to 150 °C



EC 1935/
2004

FDA

EHEDG

A³

Versatile use

Whether smaller storage tanks, compensating tanks, separators or in filling processes: There are no limits to applications for LR. Even adverse operating conditions such as foam or high temperature do not affect precise level detection.

Successful thanks to modular concept

The probes can be shortened, or changed, so the LR reduces stock-keeping and simplifies replacement. IO-Link means the fiddly parameter setting on the device is a matter of the past.

Resistant materials

High-quality materials such as PEEK and EPDM as sealing material or the high-grade stainless steel housing are suitable for internal and external cleaning and resist the most adverse operating conditions.

IO-Link highlights:

- Transmission of the current level plus binary information
- Adjustable damping of the measured signal
- Pushbuttons can be activated and deactivated
- Configuration of the display parameters: cm/inch, level in %
- Simulation of levels
- Adjustment to operating conditions, e.g. tank

Variable level sensors, guided wave radar, hygienic areas

Type	Process connection	Probe length [mm]	Active zone [mm]	Inactive zone [mm]	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
M12 connector (according to EN 61076-2-101) · Output function OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable or analogue (4...20 mA scaleable, invertable) · DC PNP/NPN								



Aseptoflex Vario	–	L-40	30 / 10	18...30	-40...150	150	LR2750
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Accessories

Type	Description	Order no.
	Probe · Probe length: 240 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43203
	Probe · Probe length: 1000 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43207
	Probe · Probe length: 300 mm · hygienic, for LR level sensors · hygienic systems · Housing materials: stainless steel	E43346
	Probe · Probe length: 500 mm · hygienic, for LR level sensors · hygienic systems · Housing materials: stainless steel	E43340
	Probe · Probe length: 1000 mm · hygienic, for LR level sensors · hygienic systems · Housing materials: stainless steel	E43341
	Coaxial pipe · Length: 240 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43211
	Coaxial pipe · Length: 1000 mm · G 3/4 · for level sensors LR · Housing materials: stainless steel / sealing: Tesnit / centring piece: PP / fixing bracket: stainless steel	E43214
	Coaxial pipe · Length: 450 mm · 3/4" NPT · for level sensors LR · Housing materials: stainless steel / centring piece: PP / fixing bracket: stainless steel	E43218

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC004



For industrial applications

Temperature sensors with temperature probe and display



- **Extended diagnostics:**
Minimum / maximum value memory detects temperature fluctuations
- **Improved measuring accuracy due to digital transmission of the temperature value via IO-Link.**
- **Measuring range of -50...150 °C, response time T05 / T09 = 1s / 3s**
- **Clearly indicate the acceptable ranges: programmable red / green display**
- **Versions with analogue (4...20 mA/0...10 V) or switching output (2 x PNP/NPN)**



Quick and resistant

The compact TN type temperature sensors are distinguished by excellent response times, high pressure resistance and adaptive process connections. The sensors easily resist applications with temperatures up to 150 °C and high pressure loads up to 400 bar. The measuring range is freely scalable.

More convenience and clarity

Quick and easy handling via three pushbuttons. The display can be switched from the indication of "red" to an alternating indication of "red - green". So, switching states can be highlighted or an independent colour window can be created. The sensor head can be rotated and offers optimum readability from any position.

Thanks to captive laser labelling on the stainless steel housing, the units can still be identified after years.

IO-Link highlights:

- Current process value plus configurable binary information available
- Minimum / maximum value memory
- Zero point calibration
- Pushbuttons can be locked for protection against undesired tampering.
- Display functions, such as orientation, refresh rate or colour change can be configured
- Output response: window function, hysteresis adjustable
- PNP or NPN selectable

Compact temperature sensors with display

Type	Measuring range [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · Output function 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V, scalable) · DC PNP/NPN						
	-50...150 / -58...302	M18 x 1.5	45	18...32	1 / 3 **	TN2511
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN						
	-50...150 / -58...302	M18 x 1.5	45	18...32	1 / 3	TN7511
M12 connector · Output function 2 x normally open / closed programmable or 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V) · DC PNP/NPN						
	-50...150 / -58...302	G 1/2	30	18...32	1 / 3 **	TN2405
	-50...150 / -58...302	G 1/2	50	18...32	1 / 3 **	TN2415
	-50...150 / -58...302	G 1/2	100	18...32	1 / 3 **	TN2435
	-50...150 / -58...302	G 1/2	150	18...32	1 / 3 **	TN2445
	-50...150 / -58...302	1/2" NPT	30	18...32	1 / 3 **	TN2303
	-50...150 / -58...302	1/2" NPT	50	18...32	1 / 3 **	TN2313
	-50...150 / -58...302	G 1/4	25	18...32	1 / 3 **	TN2105
	-50...150 / -58...302	G 1/4	50	18...32	1 / 3 **	TN2115
	-50...150 / -58...302	1/4" NPT	25	18...32	1 / 3 **	TN2603
	-50...150 / -58...302	1/4" NPT	50	18...32	1 / 3 **	TN2613

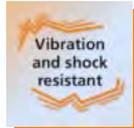


For industrial applications

Combined temperature sensors and transmitters



- **Extended diagnostics:**
Minimum / maximum value memory
- **Recognition of critical plant conditions,**
e.g. overload processes
- **Two solutions: Two in one:**
process values plus two switched outputs
- **Measuring range -50...150 °C**
- **Extremely high accuracy of +/- 0.3 K**



Flexible in use

The functionality of the temperature sensor TV is impressive. Thanks to its extremely compact design, the TV can even be installed where space is at a premium. The device has two switch points, operates with an extremely high precision and can be set easily and quickly via IO-Link using the software LR Device.

Efficient and reliable thanks to IO-Link

IO-Link allows the new temperature sensor to continuously transmit process values and other important data, e.g. minimum / maximum temperature values. The digital measurement results are more accurate because there are no conversion losses by D/A converters or external influences (e.g. cable lengths). Devices with preset measuring ranges (analogue start and end points) are no longer needed because the real process value is transmitted. This reduces stock. Soon conventional transmitters will be a thing of the past.

IO-Link highlights:

- Current process value plus configurable binary information available
- Detects configured overload processes
- Minimum / maximum value memory
- Output response: window function, hysteresis adjustable
- Zero point calibration
- PNP or NPN selectable



Compact temperature sensors

Type	Measuring range [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN						
	-50...150 / -58...302	G 1/4	25	18...32	1 / 3	TV7105
	-50...150 / -58...302	G 1/2	30	18...32	1 / 3	TV7405
	-50...150 / -58...302	1/4" NPT	25	18...32	1 / 3	TV7603
	-50...150 / -58...302	1/2" NPT	30	18...32	1 / 3	TV7303

Accessories

Type	Description	Order no.
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC001
	5 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	–	EVC005



For industrial applications

Modular temperature sensors



- **Extended diagnostics:** minimum and maximum value memory detects temperature fluctuations
- **Improved measuring accuracy** due to digital transmission of the temperature value via IO-Link.
- **Clearly indicate the acceptable ranges:** programmable red / green display
- **Flexible installation** thanks to modular concept
- **Versions with analogue** (4...20 mA/0...10 V) or switching output (2 x PNP/NPN)



One unit for many sensors

The TR evaluation unit is suited for connection of PT100 / PT1000 sensors (TT, TM and TS series).

Automatic detection of the probe

The evaluation unit automatically detects whether two-wire, three-wire or four-wire Pt100 or Pt10000 sensors are connected.

Wide measuring range

Thanks to the extended measuring range of -100...600 °C, an enormous number of common temperature measurement and monitoring tasks in the manufacturing and process industries can be solved. And, of course, ifm also offers the corresponding temperature sensors.

IO-Link highlights:

- Current process value plus configurable binary information available
- Minimum / maximum value memory
- Pushbuttons can be locked for protection against undesired tampering.
- Display functions, such as orientation, refresh rate, colour change can be configured
- Output response: window function, hysteresis adjustable
- Zero point calibration
- PNP or NPN selectable

Control monitors for temperature sensors

Type	Measuring range [°C]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
M12 connector · Output function 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V, scalable) · DC PNP/NPN							

	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR2439
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M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN

	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR7439
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Connectors

Type	Description	Order no.
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Temperature sensor for connection to evaluation units , 4-pole

	Temperature sensor for connection to evaluation units · Ø 6 mm · Ø 6 mm · Installation length EL: 50 mm · Cable with connector · 2 m · Housing materials: stainless steel 316Ti / 1.4571 / PFA/PTFE	TS2451
	Temperature sensor for connection to evaluation units · Ø 6 mm · Ø 6 mm · Installation length EL: 100 mm · Cable with connector · 2 m · Housing materials: stainless steel 316Ti / 1.4571 / PFA/PTFE	TS2452
	Temperature sensor for connection to evaluation units · Ø 6 mm · Ø 6 mm · Installation length EL: 150 mm · Cable with connector · 2 m · Housing materials: stainless steel 316Ti / 1.4571 / PFA/PTFE	TS2453
	Temperature sensor for connection to evaluation units · Ø 6 mm · Ø 6 mm · Installation length EL: 200 mm · Cable with connector · 2 m · Housing materials: stainless steel 316Ti / 1.4571 / PFA/PTFE	TS2454

Software

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



Compact temperature transmitters



- Improved measuring accuracy due to digital transmission of the temperature value via IO-Link
- LED for visualisation of the operating status
- Fast response time $T_{05} / T_{09} = 1 \text{ s} / 3 \text{ s}$
- Pressure-resistant up to 400 bar
- Different installation lengths from 25...150 mm



Versatile

The TA type temperature sensor is a universal transmitter with a 4...20 mA current output which can be scaled over the -50 to 150 °C measuring range. Scaling is easy with the integrated IO-Link interface.

Flexible

The compact design, the integrated process connections and a multitude of probe lengths enable particularly simple installation.

Transparent

An integrated LED clearly signals the readiness for operation.

Fast and precise

A high level of accuracy is achieved using a class A accuracy Pt1000 sensor and factory calibration. In addition, ifm's tried and tested film technology ensures excellent dynamic response times. So this sensor is suited for all highly precise and rapid processes. Devices with preset measuring ranges (analogue start and end points) are no longer needed because the real process value is transmitted. This reduces stock. Soon conventional transmitters will be a thing of the past.

IO-Link highlights:

- Current process value available
- Configuration of the analogue output
- Zero point calibration

Temperature transmitters

Type	Factory setting [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · high-grade stainless steel · DC						
	-50...150 / -	G ½	30	18...32	1 / 3	TA2405
	-50...150 / -	G ½	50	18...32	1 / 3	TA2415
	-50...150 / -	G ½	100	18...32	1 / 3	TA2435
	-50...150 / -	G ½	150	18...32	1 / 3	TA2445
	0...100 / -	G ½	50	18...32	1 / 3	TA2417
	0...100 / -	G ½	100	18...32	1 / 3	TA2437
	0...100 / -	G ½	150	18...32	1 / 3	TA2447
	-50...150 / -	G ¼	25	18...32	1 / 3	TA2105
	-50...150 / -	G ¼	50	18...32	1 / 3	TA2115
	-50...150 / -	G ¼	100	18...32	1 / 3	TA2135
	-50...150 / -	G ¼	150	18...32	1 / 3	TA2145

Software

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



For hygienic
and wet areas

Compact temperature transmitters



- Improved measuring accuracy due to digital transmission of the temperature value via IO-Link
- Measuring range of -50...200 °C, scalable via IO-Link 1.1
- Very fast response time:
T05 / T09 = < 0.5 s / < 2 s
- Versions with different hygienic process connections
- Different installation lengths from 25...150 mm



Analogue and IO-Link

The temperature transmitter has an analogue output with 4...20 mA. The parameters are set via the integrated IO-Link interface.

Fast and precise

The class A Pt1000 measuring element achieves a high precision with the factory-internal calibration. The innovation besides the wide measuring range is the excellent response time. Therefore the sensor is suitable for all highly-precise and fast processes in hygienic environments.

Transparent and flexible

An LED clearly signals the readiness for operation. Compact design, integrated process connections and different probe lengths enable easy and flexible installation. Devices with pre-set measuring ranges (analogue start and end points) are no longer needed because the real process value is transmitted. This reduces stock. Soon conventional transmitters will be a thing of the past.

IO-Link highlights:

- Current process value available
- Configuration of the analogue output
- Zero point calibration



Temperature transmitters for hygienic and wet areas

Type	Factory setting [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · DC · Analogue output · 4...20 mA						
	0...200 / -	3/4" clamp (ISO 2852)	25	18...32	< 0.5 / < 2.0	TA2002
	0...200 / -	3/4" clamp (ISO 2852)	60	18...32	< 0.5 / < 2.0	TA2012
	0...200 / -	1.5" clamp (ISO 2852)	30	18...32	< 0.5 / < 2	TA2800
	- / 0...350	1.5" clamp (ISO 2852)	30	18...32	< 0.5 / < 2	TA2804
	0...200 / -	1.5" clamp (ISO 2852)	50	18...32	< 0.5 / < 2	TA2812
	- / 0...350	1.5" clamp (ISO 2852)	50	18...32	< 0.5 / < 2	TA2814
	0...200 / -	1.5" clamp (ISO 2852)	100	18...32	< 0.5 / < 2	TA2832
	- / 0...350	1.5" clamp (ISO 2852)	100	18...32	< 0.5 / < 2	TA2834
	0...200 / -	1.5" clamp (ISO 2852)	150	18...32	< 0.5 / < 2	TA2842
	- / 0...350	1.5" clamp (ISO 2852)	150	18...32	< 0.5 / < 2	TA2844
	0...200 / -	G½ with sealing cone	30	18...32	< 0.5 / < 2	TA2502
	0...200 / -	G½ with sealing cone	50	18...32	< 0.5 / < 2	TA2512
	0...200 / -	G½ with sealing cone	100	18...32	< 0.5 / < 2	TA2532
	0...200 / -	G½ with sealing cone	150	18...32	< 0.5 / < 2	TA2542
	0...200 / -	Ø 6 mm	50	18...32	< 0.5 / < 2	TA2212
	0...200 / -	Ø 6 mm	100	18...32	< 0.5 / < 2	TA2232
	0...200 / -	Ø 6 mm	150	18...32	< 0.5 / < 2	TA2242

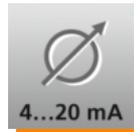
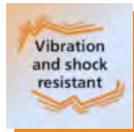


For industrial applications

Modular temperature sensors



- Improved measuring accuracy due to digital transmission of the temperature value via IO-Link
- Small, light housing with M12 connections
- Reduced mounting complexity and error sources
- Pt100 / Pt1000 evaluation from -50...300 °C scalable via IO-Link
- Status LED signals the operating status



Minimised installation and error sources.

Using two standardised M12 connections, the installation complexity of the TP temperature plug is reduced to a minimum as compared to a common head / DIN rail transmitter. Furthermore, error sources such as cable clamps are eliminated.

Versatile use.

Thanks to 4-wire Pt100 / Pt1000 evaluation, the transmitter can also be connected to a Pt element using connection cables. Due to its small size, it is also suited for harsh applications because it can be installed in a safe position. In addition, using the USB interface E30396, the scalability of the TP from -50...300 °C enables individual adaptation of the measuring range to almost any application.

IO-Link highlights:

- Current process value available
- Configuration of the analogue output
- Zero point calibration



Use of a modular TP transmitter instead of a common head / DIN rail transmitter.

Modular temperature transmitters

Type	Factory setting [°C / °F]	Process connection	U _b [V]	Ambient temperature [°C]	Measuring element	Order no.
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M12 connector · Output function 4...20 mA analogue · DC

	0...100 / -	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3237
	-50...150 / -	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3231
	-50...300 / -	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3232
	- / 0...300	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3233

M12 connector · Output function 0...10 V analogue · DC

	0...100 / -	M12	18...32	-25...70	for Pt100 and Pt1000 measuring elements	TP9237
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Software

Type	Description	Order no.
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30396

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
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Socket M12, 5/4-pole, 4-wire

	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC004
	5 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC005

Jumper M12 plug / M12 socket, 4/5-pole, 4-wire

	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC013
	2 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC033
	5 m black PUR cable	4 x 0.34 mm ² , Ø 4.9 mm	TPU / Brass	250 AC 300 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC034



For hygienic
and wet areas

Temperature transmitters for hygienic applications up to 100 °C



- Improved measuring accuracy due to digital transmission of the temperature value via IO-Link
- Bright 4-digit LED display for optimum readability
- Fast response time $T_{05/09} = 1/3s$
- Available in various probe lengths from 30...250 mm
- Hygienic and robust design: high-grade stainless steel (316L/1.4404) and IP 69K



TD temperature transmitters

The TD series temperature transmitters are distinguished by a compact, hygienic design with integrated process connections and a display for local indication of the temperature.

Easy installation and set-up

The integrated clamp and G 1/2" process connections as well as the 6 mm rods allow fast and easy installation. No complex set-up is required because the transmitters are supplied with a pre-scaled measuring range. For special applications the temperature range can be scaled via IO-Link.

Devices with preset measuring ranges (analogue start and end points) are no longer needed because the real process value is transmitted. This reduces stock. Soon conventional transmitters will be a thing of the past.

Robust and durable

Protected to IP 69K standards and featuring a fully welded stainless steel housing, the transmitters are designed to operate in particularly harsh applications.

IO-Link highlights:

- Current process value available
- Configuration of the analogue output
- Zero point calibration
- Display functions, such as orientation, refresh rate and unit can be configured



Compact temperature sensors with display, IO-Link

Type	Factory setting [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · DC · Analogue output · 4...20 mA						
	0...100 / -	1.5" clamp (ISO 2852)	30	18...32	1 / 3	TD2807
	0...100 / -	1.5" clamp (ISO 2852)	50	18...32	1 / 3	TD2817
	0...100 / -	1.5" clamp (ISO 2852)	100	18...32	1 / 3	TD2837
	0...100 / -	1.5" clamp (ISO 2852)	150	18...32	1 / 3	TD2847
	0...100 / -	2" clamp (ISO 2852)	30	18...32	1 / 3	TD2907
	0...100 / -	2" clamp (ISO 2852)	50	18...32	1 / 3	TD2917
	0...100 / -	2" clamp (ISO 2852)	100	18...32	1 / 3	TD2937
	0...100 / -	2" clamp (ISO 2852)	150	18...32	1 / 3	TD2947
	0...100 / -	G½ with sealing cone	30	18...32	1 / 3	TD2507
	0...100 / -	G½ with sealing cone	50	18...32	1 / 3	TD2517
	0...100 / -	G½ with sealing cone	100	18...32	1 / 3	TD2537
	0...100 / -	G½ with sealing cone	150	18...32	1 / 3	TD2547
	0...100 / -	Ø 6 mm	50	18...32	1 / 3	TD2217
	0...100 / -	Ø 6 mm	100	18...32	1 / 3	TD2237
	0...100 / -	Ø 6 mm	150	18...32	1 / 3	TD2247
	0...100 / -	Ø 6 mm	250	18...32	1 / 3	TD2267

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT004



For hygienic
and wet areas

Temperature transmitters for hygienic applications up to 150 °C



- Improved measuring accuracy due to digital transmission of the temperature value via IO-Link
- Bright 4-digit LED display for optimum readability
- Fast response time T05/09 = 1/3s
- Available in various probe lengths from 30...250 mm
- Hygienic and robust design: high-grade stainless steel (316L/1.4404) and IP 69K



TD temperature transmitters

The TD series temperature transmitters are distinguished by a compact, hygienic design with integrated process connections and a display for local indication of the temperature.

Easy installation and set-up

The integrated clamp and G 1/2" process connections as well as the 6 mm rod models allow fast and easy installation. No complex set-up is required because the transmitters are supplied with a pre-scaled measuring range. For special applications the temperature range can be scaled via IO-Link.

Robust and durable

Protected to IP 69K standards and featuring a fully welded stainless steel housing, the transmitters are designed to operate in particularly harsh applications.

IO-Link highlights:

- Current process value available
- Configuration of the analogue output
- Zero point calibration
- Display functions, such as orientation, refresh rate and unit can be configured



Compact temperature sensors with display, IO-Link

Type	Factory setting [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · DC · Analogue output · 4...20 mA						
	-10...150 / -	1.5" clamp (ISO 2852)	30	18...32	1 / 3	TD2801
	-10...150 / -	1.5" clamp (ISO 2852)	50	18...32	1 / 3	TD2811
	-10...150 / -	1.5" clamp (ISO 2852)	100	18...32	1 / 3	TD2831
	-10...150 / -	1.5" clamp (ISO 2852)	150	18...32	1 / 3	TD2841
	-10...150 / -	2" clamp (ISO 2852)	30	18...32	1 / 3	TD2901
	-10...150 / -	2" clamp (ISO 2852)	50	18...32	1 / 3	TD2911
	-10...150 / -	2" clamp (ISO 2852)	100	18...32	1 / 3	TD2931
	-10...150 / -	2" clamp (ISO 2852)	150	18...32	1 / 3	TD2941
	-10...150 / -	G½ with sealing cone	30	18...32	1 / 3	TD2501
	-10...150 / -	G½ with sealing cone	50	18...32	1 / 3	TD2511
	-10...150 / -	G½ with sealing cone	100	18...32	1 / 3	TD2531
	-10...150 / -	G½ with sealing cone	150	18...32	1 / 3	TD2541
	-10...150 / -	Ø 6 mm	50	18...32	1 / 3	TD2211
	- / 0...300	Ø 6 mm	50	18...32	1 / 3	TD2213
	-10...150 / -	Ø 6 mm	100	18...32	1 / 3	TD2231
	- / 0...300	Ø 6 mm	100	18...32	1 / 3	TD2233
	- / 0...300	Ø 6 mm	150	18...32	1 / 3	TD2243
	-10...150 / -	Ø 6 mm	150	18...32	1 / 3	TD2241
	-10...150 / -	Ø 6 mm	250	18...32	1 / 3	TD2261
	- / 0...300	Ø 6 mm	250	18...32	1 / 3	TD2263

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT004



For hygienic
and wet areas

Temperature transmitters with diagnostic function, Aseptoflex Vario process connection



- Condition-based maintenance through drift detection of the measuring elements
- Cost savings possible through reduced calibration intervals
- Permanent drift monitoring between the individual calibration intervals increases process reliability
- Analogue and diagnostic outputs for process temperature and drift warning / alarm
- A great variety of hygienic fittings and adapters is available

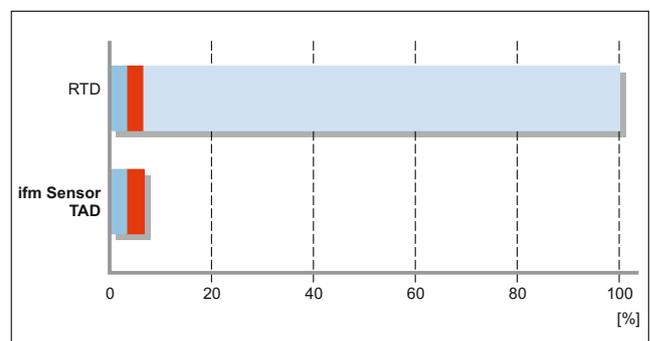
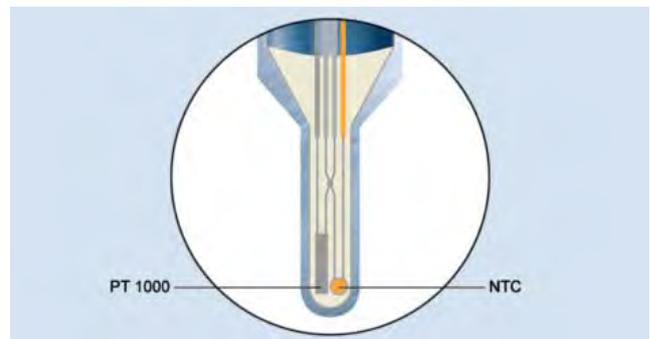


Increased process reliability due to self-monitoring

The TAD temperature transmitter features two high-precision sensor elements (Pt1000 and NTC) that monitor the process and each other. This guarantees that any developing drift of the sensor elements is detected and reliably diagnosed. If one element fails, the process continues with the second measuring element (back-up function). With this technology, the TAD provides long-term, highly accurate temperature measurements in hygienic applications in food, beverage and pasteurization processes. With IO-Link, drift threshold and parameter setting is easy. After the switch points are set, the TAD continuously and independently monitors temperature drift. By providing immediate temperature drift detection, cyclical monitoring of the calibration is no longer necessary.

IO-Link highlights:

- Temperature values of the 2 measuring elements, average temperature and binary information are available
- Configuration of the analogue outputs
- Configuration of the drift warning threshold
- Configuration of the diagnostic output and behaviour in case of redundancy switching
- Minimum / maximum value memory
- PNP or NPN selectable



Cost comparison: in contrast to the TAD sensor, conventional sensors have to be calibrated twice a year.
Dark blue: sensor cost
Red: installation cost
Light blue: calibration cost

Temperature transmitters with diagnostic output, IO-Link

Type	Factory setting [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
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M12 connector · Output function normally open / normally closed / heartbeat programmable, 4...20 mA analogue · DC PNP/NPN

	0...150 / 32...302	Aseptoflex Vario	87.5	18...32	3 / 6	TAD181
	0...150 / 32...302	Aseptoflex Vario	33	18...32	3 / 6	TAD981
	0...150 / 32...302	Aseptoflex Vario	50	18...32	3 / 6	TAD081

Adapters

Type	Description	Order no.
	Clamp adapter · with leakage port · Clamp · 1-1.5" · with sealing ring · ISO 2852 · for units with Aseptoflex Vario adapter · Housing materials: stainless steel 316L / 1.4435	E33208
	Aseptoflex Vario adapter · with leakage port · Clamp · 2" · with sealing ring · ISO 2852 · for units with Aseptoflex Vario adapter · Housing materials: stainless steel 316L / 1.4435	E33209
	Welding adapter · Ø 50 mm · with leakage port · for units with Aseptoflex Vario adapter · Sealing by sealing ring · Housing materials: stainless steel 316L / 1.4435	E30130

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
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Socket M12, 5/4-pole, 4-wire

	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT004
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT001

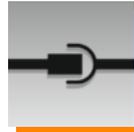


For hygienic
and wet areas

Temperature transmitters with diagnostic function, G 1/2 process connection



- Condition-based maintenance through drift detection of the measuring elements
- Cost savings possible through reduced calibration intervals
- Permanent drift monitoring between the individual calibration intervals increases process reliability.
- Analogue and diagnostic outputs for process temperature and drift warning / alarm
- Variety of hygienic fittings and adapters available

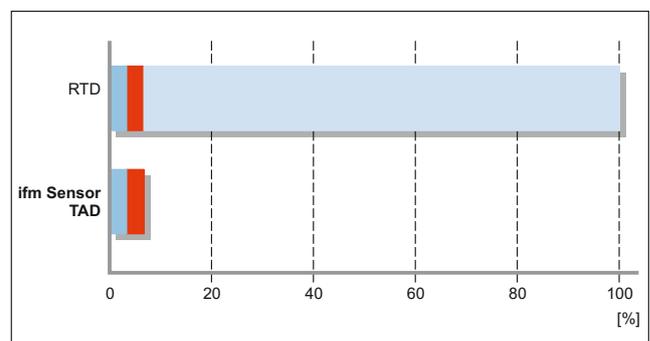
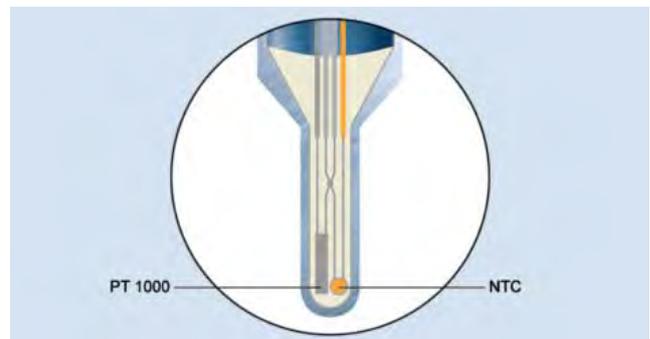


Increased process safety due to self-monitoring

The TAD temperature transmitter features two high-precision sensor elements (Pt1000 and NTC) that monitor the process and each other. This guarantees that any developing drift of the sensor elements is detected and reliably diagnosed. If one element fails, the process continues with the second measuring element (back-up function). With this technology, the TAD provides long-term, highly accurate temperature measurements in hygienic applications in food, beverage and pasteurization processes. Drift thresholds and parameters are easy to set via software, e.g. IO-Link. After the switch points are set, the TAD continuously and independently monitors temperature drift. By providing immediate temperature drift detection, cyclical monitoring of the calibration is no longer necessary.

IO-Link highlights:

- Temperature values of the two measuring elements, average temperature and binary information are available
- Configuration of the analogue outputs
- Configuration of the drift warning threshold
- Configuration of the diagnostic output and behaviour in case of redundancy switching
- Minimum / maximum value memory
- PNP or NPN selectable



Cost comparison: in contrast to the TAD sensor, conventional sensors have to be calibrated twice a year.
Dark blue: sensor cost
Red: installation cost
Light blue: calibration cost

Temperature transmitters with diagnostic output, IO-Link

Type	Factory setting [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · Output function normally open / normally closed / heartbeat programmable, 4...20 mA analogue · DC PNP/NPN						
	0...150 / 32...302	G ½ male	87.5	18...32	3 / 6	TAD191
	0...150 / 32...302	G ½ male	33	18...32	3 / 6	TAD991
	0...150 / 32...302	G ½ male	50	18...32	3 / 6	TAD091

Adapters

Type	Description	Order no.
	Clamp adapter · Clamp · 1-1.5" · ISO 2852 / DIN 32676 · for units with G ½ adaptation · Housing materials: stainless steel 316L / 1.4404	E33401
	Clamp adapter · Clamp · 2" · ISO 2852 / DIN 32676 · for units with G ½ adaptation · Housing materials: stainless steel 316L / 1.4404	E33402
	Clamp adapter · G ½ · with leakage port · Clamp · 1-1.5" · ISO 2852 / DIN 32676 · with leakage port · Housing materials: stainless steel 316L / 1.4435	E43311
	Clamp adapter · G ½ · with leakage port · Clamp · 2" · ISO 2852 / DIN 32676 · with leakage port · Housing materials: stainless steel 316L / 1.4435	E43312
	Welding adapter · G ½ - Ø 35 mm · Housing materials: stainless steel 316L / 1.4404	E30055

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Socket M12, 5/4-pole, 4-wire								
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT004
	5 m orange PVC cable	4 x 0.34 mm ² , Ø 4.9 mm	PVC / stainless steel 316L / 1.4404	250 AC 300 DC	-25...100	IP 65 / IP 67 / IP 68 / IP 69K	-	EVT001

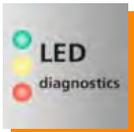


For industrial applications

Electronic 24 V circuit breakers



- Indication of the trigger enables quick diagnostics
- Current and voltage measurement of each load circuit for more plant transparency
- Modular and selective protection in plants and machinery
- Reliable circuit protection allows reduction of wire cross-sections
- Fast replacement using innovative connection technology



Safety on the 24 V side

As opposed to the 230 V primary side, the circuit protection in the secondary circuit is often neglected. Another issue is that in the event of a failure of the 24 V DC voltage supply, standard mechanical circuit breakers often do not trigger. This may happen with long cables, for example.

The electronic circuit breakers from ifm monitor the circuit ideally and, if required, disconnect reliably. Individual branch circuits can be selectively disconnected. This allows a reduction of wire cross-sections in the load circuit of the switched-mode power supplies. The system has a modular structure and can be ideally adapted to the circuits of plant and machinery.

IO-Link highlights:

- The present current value of each protection channel is available
- Transmits the status messages for each load circuit
- Transmission of the trigger signal
- Decentralised reset after tripping
- Sequential switch-on and switch-off of the load circuits

Electronic circuit protection modules

Type	Description	Order no.
	Supply module, IO-Link · Input current (max. total current) 40 A · for circuit protection modules DF22xx	DF2100
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 2 x 2 A · for supply module DF2100	DF2212
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 2 x 4 A · for supply module DF2100	DF2214
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 2 x 6 A · for supply module DF2100	DF2216
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 1 x 8 A · for supply module DF2100	DF2208
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 1 x 10 A · for supply module DF2100	DF2210

Accessories

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR DEVICE"	E30390
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

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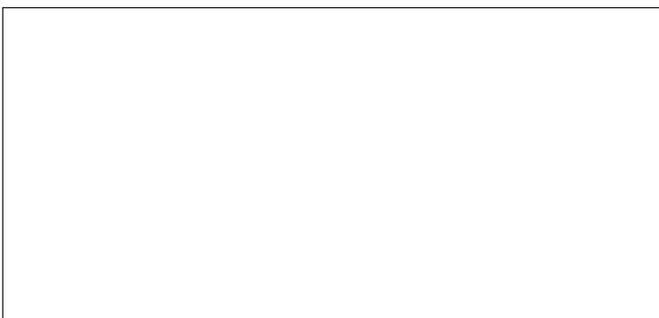
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