THE ORANGE BOOK

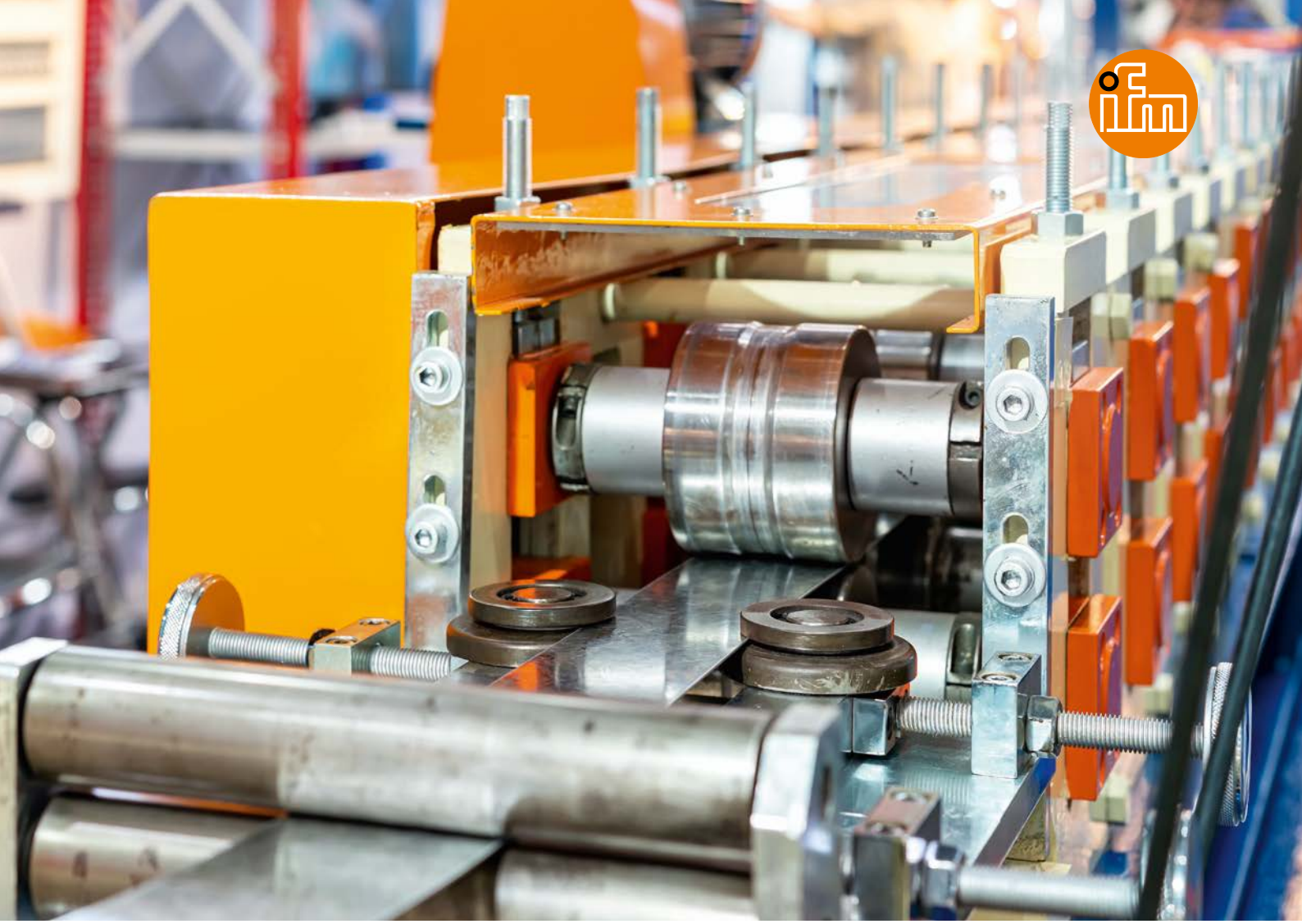
PRODUCT **FACTSHEETS**

2025

INSPIRATION FOR AUTOMATION

5 YEARS
Warranty
on **ifm products**

Our product news:
ifm.com/cnt/productnews



P|Prox: detection with micrometre precision

Accurate detection of distances to metallic surfaces

- Non-contact, inductive detection principle, suitable for all types of metal
- Ready for use out of the box, high repeatability
- Simple 1-point or even more accurate 3-point calibration possible
- Robust industrial design for a wide range of applications

IP69K

IO-Link

ifm – close to you!

Type [mm]	Installation	Measuring range [mm]	Adjustable switch point [mm]	Order no.
M8 x 1 x 60	flush	0.05...1.5	0.05...1.5	**IEP200**
M8 x 1 x 60	non-flush	0.05...3	0.05...3	**IEP201**
M12 x 1 x 60	flush	0.2…2	0.2...1.9	**IFP200**
M12 x 1 x 60	non-flush	0.4…4	0.4…3.8	**IFP201**
M18 x 1 x 60	flush	0.5…5	0.5…4.75	**IGP200**
M18 x 1 x 60	non-flush	0.8…8	0.8…7.6	**IGP201**
M30 x 1.5 x 60	flush	1…10	1…9.5	**IIP200**
M30 x 1.5 x 60	non-flush	1.5…15	1.5…14.25	**IIP201**

Inexpensive alternative to expensive measuring systems

Many industrial applications require accurate detection of distances to metallic surfaces, for example, sheet metal detection in the automotive industry or distances at grinding mills in the food sector. In these applications, the new distance sensors are an inexpensive and powerful alternative to expensive measuring systems.

Accurate distance detection

Using an inductive and, thus, non-contact detection principle, these sensors detect distances in the micrometre range and provide them as distance values via IO-Link. The type of metal has no influence on the measured value. Only the shape factor of the target influences the possible measuring range and the accuracy of the sensor. The sensor is factory calibrated and ready for immediate use. Thanks to 1-point or the even more accurate 3-point calibration, IO-Link guarantees high accuracy even with deviating target shape factors.

Robust design

The sensors are available in 60 mm long industry standard M8, M12, M18 or M30 housings for flush or non-flush mounting. Moreover, the sensors are magnetic field resistant and have a stainless steel threaded sleeve. As a result, they have a high protection rating of up to IP69K and can be easily used in demanding environments.

Technical data		
Communication interface		IO-Link
Type of transmission		COM2 (38.4 kbaud)
IO-Link revision		1.1
SIO mode		yes
Required master port class		A
Min. process cycle	[ms]	3.2
Ambient temperature	[°C]	-25…70
Indication		4x yellow LED
Protection rating		IP65, IP66, IP67, IP68, IP69K

BEST FRIENDS

moneo|configure free
Software for parameter setting of the IO-Link infrastructure

IO-Link interface
For setting the parameters of IO-Link devices on the PC

IO-Link masters
Field-compatible masters with Profinet interface

For further technical details, please visit: ifm.com/fs/IEP200

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Precision in confined spaces

Miniature inductive sensors

- M5 housing or cylindrical smooth 4 mm housing for confined installation conditions
- Longer sensing range for accurate and reliable position detection
- High switching frequency for dynamic processes
- Robust housing for demanding industrial environments
- Simplify connection

IP67

ifm – close to you!

Type	Electrical design	Switching output	M8 connector Order no.	2 m cable Order no.
M5x0,5	PNP	NO	**IY5062**	**IY5066**
M5x0,5	PNP	NC	**IY5063**	**IY5067**
M5x0,5	NPN	NC	**IY5064**	**IY5069**
M5x0,5	NPN	NO	**IY5065**	**IY5068**
Ø 4 mm	PNP	NO	**IZ5057**	**IZ5061**
Ø 4 mm	PNP	NC	**IZ5058**	**IZ5062**
Ø 4 mm	NPN	NC	**IZ5059**	**IZ5064**
Ø 4 mm	NPN	NO	**IZ5060**	**IZ5063**

Applications

The inductive IY/IZ type sensors are used in various industrial areas where space is limited, for example, in machine tools, assembly automation and electronics production. They detect end positions of small grippers and clamps, can be used to accurately monitor speed of gears and rotary movements.

Longer sensing range for stable processes

The longer sensing range makes it easy to position the sensors. The position detection is reliable even in case of mechanical tolerances, avoiding accidental switching. This increases the process reliability.

Installation

The M5 thread makes it easy to screw in the IY housing. The IZ housing has a 4 mm smooth sleeve and can be fastened precisely and efficiently using the corresponding holder.

Protection rating IP67 for challenging environmental conditions

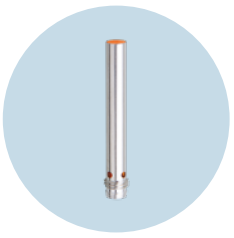
The robust housing has been specially developed for demanding industrial environments and offers durability and reliability. Thanks to protection rating IP67, the sensors guarantee reliable performance even under extreme conditions such as dust, moisture and vibrations, which improves process stability and efficiency in various industrial sectors.

Technical data		
Sensing range	[mm]	1.5
Installation		flush mountable
Current rating	[mA]	100
Operating voltage	[V]	10…30
Switching frequency	[Hz]	2000
Housing material		Sensing face: POM orange Housing: stainless steel
Switching status indication		LED yellow
Protection rating		IP65 | IP67

BEST FRIENDS

Connection cables M8
Reliable connections for harsh environments

Inductive sensors M8
Compact housings and long sensing ranges



Smooth sleeve inductive sensors
Space-saving sensors for limited space

For further technical details, please visit: ifm.com/fs/IY5062

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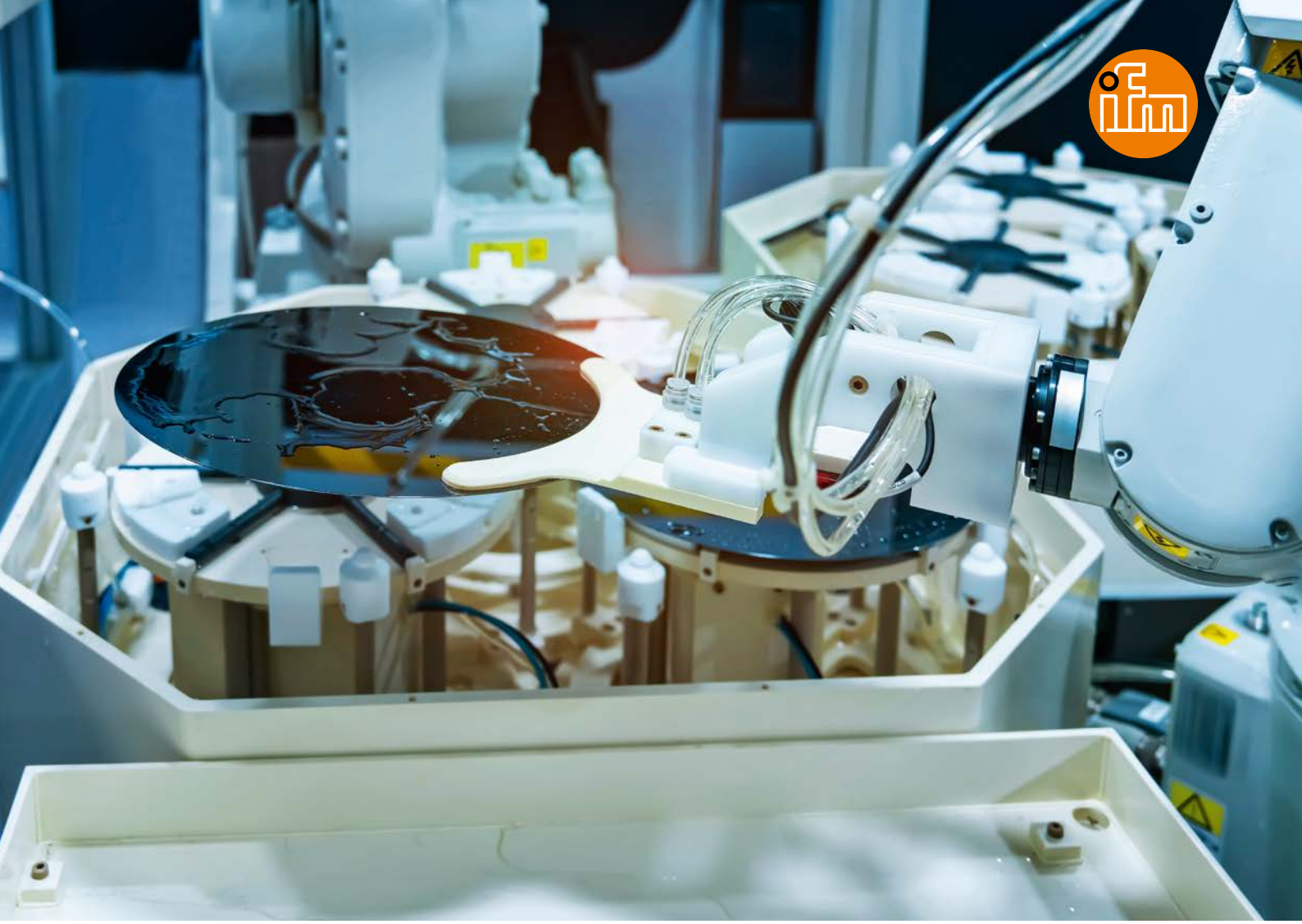
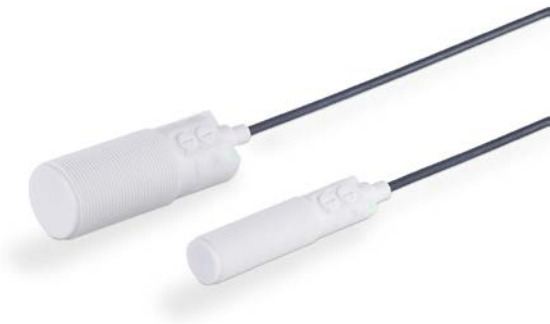


Perfectly setting the switch point

Chemically resistant capacitive sensors

- Unique visualisation and operating concept via LED display
- See and readjust deviations of the switch point
- Chemically resistant PP housing
- Free from PFAS
- High electromagnetic compatibility



IP67

IO-Link

ifm – close to you!

Type	Setting range [mm]	Output	Connection cable	Order no.
M18	0.5…30	PNP	2 m PUR, 3-wire	**KG6015**
M18	0.5…30	NPN	2 m PUR, 3-wire	**KG6016**
M30	0.5…40	PNP	10 m PUR, 3-wire	**KI6005**
M30	0.5…40	NPN	10 m PUR, 3-wire	**KI6006**

Perfect switch point setting

The new capacitive sensors impress with their outstanding technical data and the innovative, patented ifm visualisation concept. The sensor's LED bar display enables the ideal adjustment of the switch point to the application conditions. The switch point is always in the centre of the display, green LEDs on both sides indicate the reliability. Deposits and material changes are directly visible so that the switch point can be easily and precisely readjusted using a potentiometer or IO-Link.

Chemically resistant

The robust and chemically resistant PP housing is specially designed to last in areas with acids and alkalis. This makes the sensor particularly durable and reliable, even in demanding industrial environments, and it is typically used in the semiconductor, solar and chemical industries.

Avoid production downtimes

The IO-Link process value provides information about installation and possible deposits, increases production safety and prevents downtime, which saves costs and ensures smooth operation.

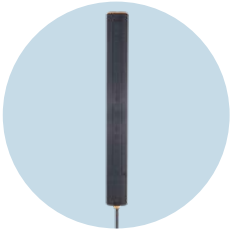
The risk of failures or shutdowns is minimised by detecting and avoiding impending faults in good time. The intuitive LED display facilitates process adjustments and enables simple switch point adjustments by the user.

Common technical data		
Output function		normally open / normally closed (adjustable)
Housing material		Polypropylene (PP)
Switching frequency	[Hz]	40
Ambient temperature	[°C]	-25…80
Medium temperature	[°C]	-25…110
Protection rating		IP65 | IP67

BEST FRIENDS

IO-Link masters
Masters with Profinet interface for use in the field

Inductive conductivity sensor
Resistant to aggressive media



Continuous level sensor
Detection through non-metallic and non-conductive surfaces

For further technical details, please visit: ifm.com/fs/KG6015

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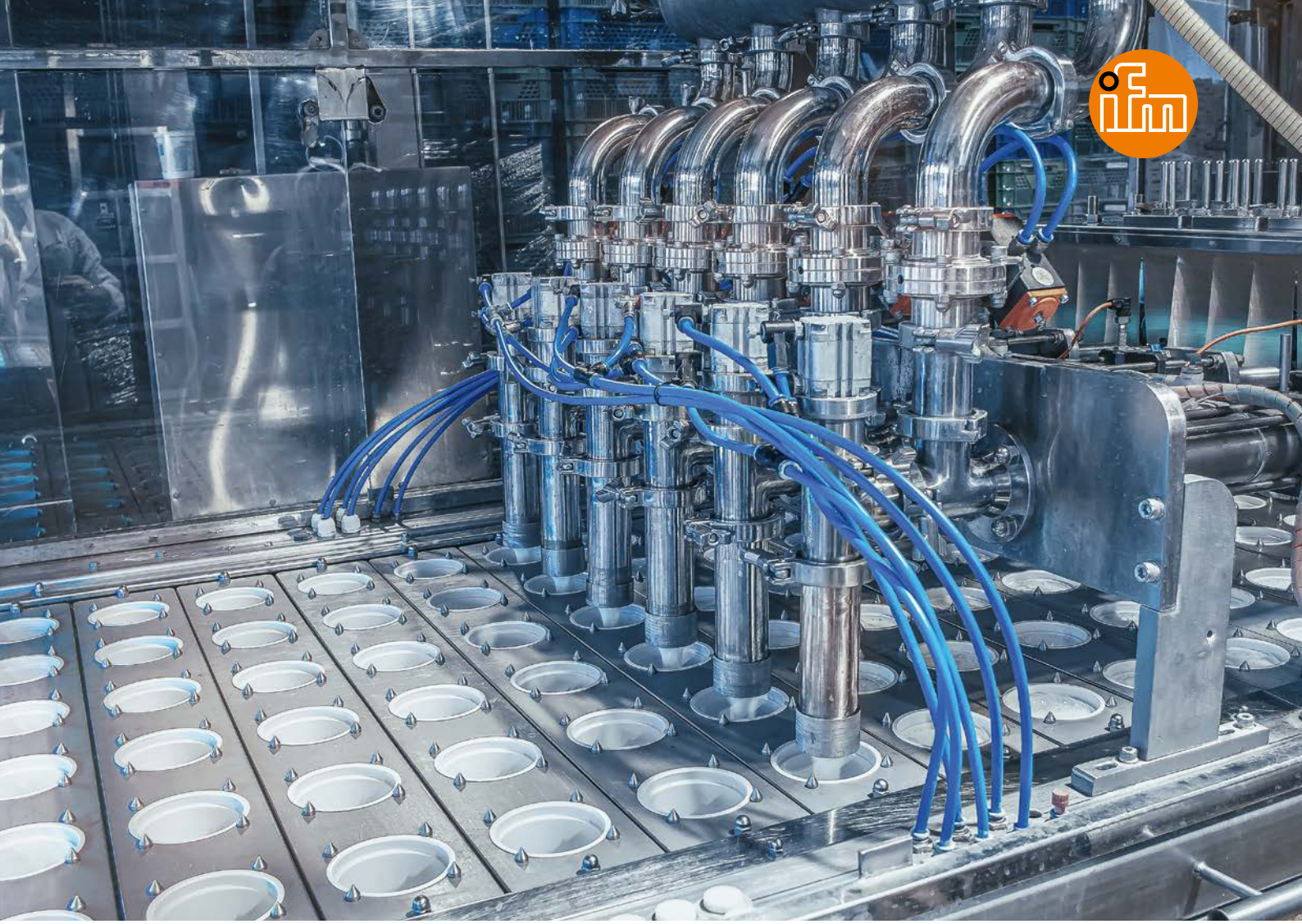

Non-contact distance detection

Full-metal ultrasonic sensor for harsh environments

- Continuous non-contact level measurement and object detection regardless of environmental conditions
- Resistant to aggressive media
- Long ranges of up to 2,500 mm
- Digital or analogue measured value output
- Easy parameter setting, measured value transmission and diagnostic information via IO-Link

IP69K

IO-Link

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Output	Range [mm]	Switching frequency [Hz]	Operating temperature range [°C]	Order no.
M18 · IO-Link				
2x PNP / 2x NPN	50…400	10	-10…70	**UGT300**
PNP + 4…20 mA / NPN + 4…20 mA	50…400	10	-10…70	**UGT301**
PNP + 0...10 V / NPN + 0…10 V	50…400	10	-10…70	**UGT302**
2x PNP / 2x NPN	100...1,000	6	-20…70	**UGT303**
PNP + 4…20 mA / NPN + 4…20 mA	100...1,000	6	-20…70	**UGT304**
PNP + 0...10 V / NPN + 0…10 V	100...1,000	6	-20…70	**UGT305**
M30 · IO-Link				
2x PNP / 2x NPN	250…2,500	1	-10…60	**UIT300**
PNP + 4…20 mA / NPN + 4…20 mA	250…2,500	1	-10…60	**UIT301**
PNP + 0...10 V / NPN + 0…10 V	250…2,500	1	-10…60	**UIT302**

Level monitoring in any application

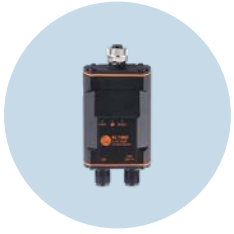
Whether in tanks or silos, whether liquids, bulk material or individual objects: The universal level and distance measurement using ultrasound is reliable and accurate. However, even if there is no direct contact with the medium, aggressive vapours and fumes can severely affect the function and life of a sensor. But thanks to ifm's new full-metal ultrasonic sensor, this is now a thing of the past. From the diaphragm to the connector, the sensor is completely enclosed in resistant high-grade stainless steel. Thus, it is resistant to external influences and benefits from an extended service life. This makes it ideal for use in the food industry and other hygienic applications.

IO-Link included

Using IO-Link communication, distance values can be transmitted digitally or the measuring range can be set. Thanks to the feedback on the echo quality, the alignment of the sensor can be optimised during installation and the functional reliability can be continuously monitored.

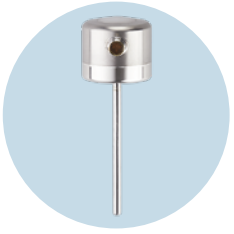
Common technical data		
Operating voltage	[V]	10…30
Current rating switching output	[mA]	100
Temperature compensation		yes
Housing material		high-grade stainless steel
Connection		M12 connector
Switching status indication		yellow
Protection rating		IP65 | IP67 IP68 | IP69K

BEST FRIENDS



USB IO-Link master
For parameter setting and analysis of devices

MVQ position sensor
Monitoring and diagnostics of quarter-turn actuators



TCC temperature sensor
Including self-monitoring for maximum process reliability

For further technical details, please visit:
ifm.com/fs/UGT300

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Keep a close eye on more than just the end positions

T-slot and C-slot cylinder sensors with IO-Link

- Monitoring end positions with flexible tolerances
- End position setting aid with second LED
- Inline quality monitoring with 50 mm detection range
- Monitoring critical pneumatic cylinders using the switching cycle counter
- Fast fault localisation thanks to extensive diagnostic functions

IP67

IO-Link

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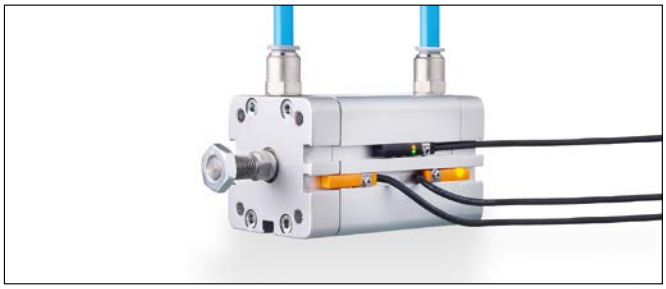
Number of outputs physical / digital	Connection type	Connector type	Number of conductors	T-slot Order no.	C-slot Order no.
1 / 2	2 m cable	–	3	–	**MK5800**
2 / 2	2 m cable	–	4	**MK5904**	–
1 / 2	0.3 m pigtail	M8 fix	3	**MK5905**	**MK5801**
1 / 2	0.3 m pigtail	M8 rotatable	3	**MK5906**	**MK5802**
2 / 2	0.3 m pigtail	M8 rotatable	4	**MK5907**	–
2 / 2	0.3 m pigtail	M12 rotatable	4	**MK5908**	–
1 / 2	0.3 m pigtail	M12 rotatable	3	–	**MK5803**
1 / 2	6 m cable	–	3	–	**MK5804**
2 / 2	6 m cable	–	4	**MK5909**	–

Versatile cylinder monitoring

This IO-Link sensor with two configurable hardware outputs will upgrade your machine in no time. The outputs can be configured to your application requirements. A high-resolution process value with a detection range of 50 mm enables continuous monitoring as well as digital transmission via IO-Link. Thanks to the teach function and the Bluetooth adapter, the installed sensor can be easily adjusted from outside the machine.

Integrated diagnostic functions

Combined functions, such as the stroke counter (switching cycle counter), time monitoring between both end positions or device temperature provide servicing assistance and enable maintenance to be carried out as required.



One sensor instead of two: On short-stroke cylinders, one IO-Link cylinder sensor (upper groove) is now sufficient to detect both end positions instead of two conventional sensors (lower groove) as was previously the case.

Common technical data		
Operating principle		3D Hall
Electrical design		PNP / NPN (selectable)
Output function		NO / NC (selectable)
Output functions		Switch point / counter / diagnostic (selectable)
Switching frequency	[Hz]	200
Setting range	[mm]	typ. 50
Linearity	[%]	< 5
Resolution	[mm]	typ. 0.01
Repeatability	[mm]	< 0.2
Protection rating		IP67

BEST FRIENDS

moneo|configure free
Software for parameter setting of the IO-Link infrastructure

moneo|blue
Manage IO-Link devices conveniently via smartphone app

IO-Link interface
For setting the parameters of IO-Link devices on the PC

For further technical details, please visit: ifm.com/fs/MK5800

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Distance measurement even in poor visibility

Radar sensor for harsh environmental and weather conditions

- Long ranges and a wide temperature range
- Reliable measurements even in precipitation, fog, dust and dirt
- Simultaneous detection of distance and speed
- Adaptable to specific applications thanks to various operating modes
- Intuitive set-up and visualisation of the measured data using the ifm Vision Assistant software

IP69K

IO-Link

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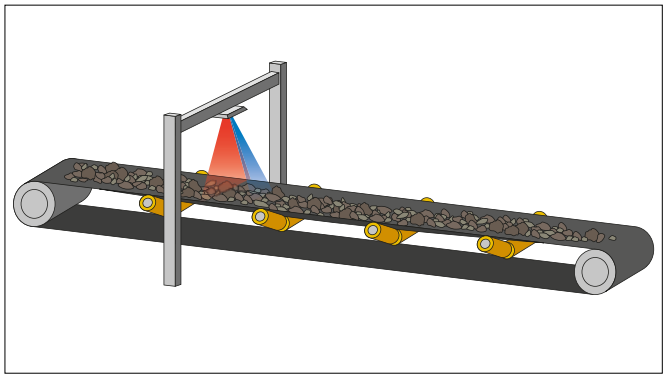
Type	Angle of aperture horizontal x vertical [°]	Frequency [GHz]	Outputs (2x configurable)	Order no.
Distance sensor	40 x 30	60...64	IO-Link | binary | 4...20 mA | 0...10 V	**R1D100**
Distance sensor	40 x 30	60…64	CAN J1939	**R1D101**
Distance sensor with reduced transmitter power	40 x 30	60...64	IO-Link | binary | 4...20 mA | 0...10 V	**R1D102**
Distance sensor	40 x 20	77...81	IO-Link | binary | 4...20 mA | 0...10 V	**R1D200**
Distance sensor	40 x 20	77…81	CAN J1939	**R1D201**

The application area of the device depends on the base frequency used and the country in which it is operated. You will find an overview in the operating instructions and at ifm.com.

Distance sensor

The distance sensor detects objects by means of a focused radar beam. The powerful technology also allows the detection of targets whose reflection properties are poor.

The data obtained in this way can be clearly visualised using the "Vision Assistant" software. For example, the distance profile can show multiple objects simultaneously, while their relative speed can also be output at the same time.



The radar sensor detects the load height and speed of a conveyor belt.

Common technical data		
Temperature range	[°C]	-40…80
Protection rating		IP65 | IP67 | IP69K

Reliable detection in harsh environments

With its long range, shock and vibration resistance properties and different operating modes, the radar sensor is designed to accurately detect objects even in the most adverse conditions. Whether in rain, snow, strong wind or extreme dust: the powerful radar sensor technology ensures reliable operation at all times.

Application areas

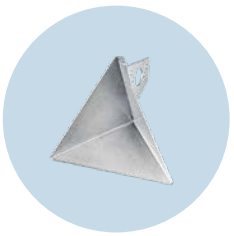
The result is a wide range of applications for the sensor, for example the detection of vehicles such as trucks and ships, during docking processes at loading and unloading ramps.

In addition, the radar sensor enables conveyor belt monitoring with regard to load and speed and scores in car washes with its robustness against spray. In a nutshell: a true all-rounder in distance and speed measurement.

BEST FRIENDS

IO-Link interface
For setting the parameters of IO-Link devices on the PC

io-key
Sending sensor data to the cloud via a mobile network



Corner reflectors
Used as set-up aid and as a reliable target object

For further technical details, please visit: ifm.com/fs/R1D100

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Area surveillance in all weather conditions

3D radar sensor for mobile use

- Simultaneous detection of several objects and intelligent target selection by distance, signal strength or RCS
- Output of position (x, y, z), distance and speed of the objects via IO-Link and CAN
- Large angle of aperture, freely adjustable 3D detection field

IP69K

IO-Link

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Type	Angle of aperture horizontal x vertical [°]	Frequency [GHz]	Output (2x configurable)	Order no.
3D Distance	140 x 50	60...64	IO-Link | binary | 4...20 mA | 0...10 V	**R2D100**
3D Distance & 3D Area	140 x 50	60...64	CAN J1939	**R2D101**
3D Area	140 x 50	60...64	IO-Link | binary	**R2D110**
3D Distance	140 x 30	77...81	IO-Link | binary | 4...20 mA | 0...10 V	**R2D200**
3D Distance & 3D Area	140 x 30	77...81	CAN J1939	**R2D201**
3D Area	140 x 30	77...81	IO-Link | binary	**R2D210**

The application area of the respective device depends on the base frequency used and the country in which it is operated.
You will find an overview in the operating instructions and at ifm.com.

Reliable object detection in any weather

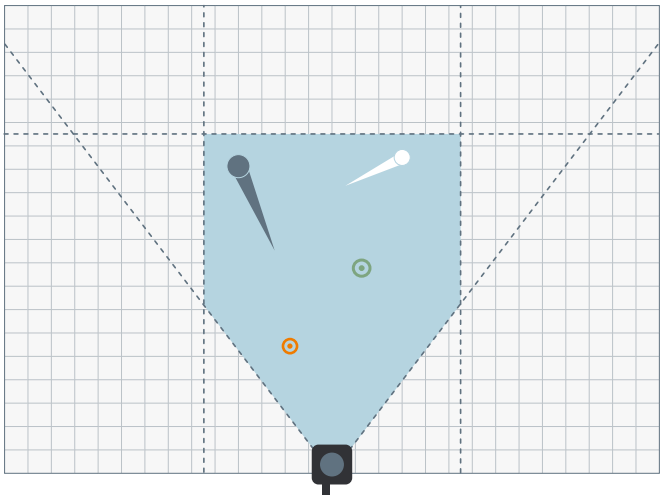
Detecting objects, determining their direction of movement and speed – even in the presence of precipitation, dust, fog and dirt: the R2D is the perfect addition to your mobile machines when it comes to avoiding collisions with objects. Whether alone or in combination with the mobile 3D sensors from ifm: the robust radar sensors ensure reliable distance detection even in poor visibility.

Two versions, many setting options

The large horizontal angle of aperture of 140° ensures maximum area coverage. In the "3D Distance" version, the sensor transmits the x, y and z coordinates of the objects in the form of a dense point cloud. The "3D Area" type sensor summarises the information itself into objects, transmitting their position, direction of movement and speed.

The detection field of both versions can be limited individually. Various filter options and other settings such as warning zones and early warning times further increase the effectiveness of the R2D.

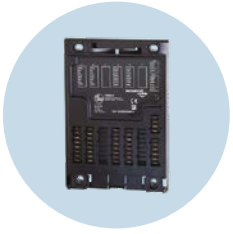
Common technical data		
Temperature range	[°C]	-40…80
Protection rating		IP65 | IP67 | IP69K



The radar detection field can be customised. Static and dynamic targets are displayed differently.

BEST FRIENDS

Graphic display
Programmable HMI for the control of mobile machines



BasicController
Controller with H-bridge, 16 inputs and outputs

3D sensor suitable for mobile use
Robust distance measurement using time-of-flight technology

For further technical details, please visit: ifm.com/fs/R2D100

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Smart pressure indication in hygienic areas

Electronic manometer with LED visualisation

- Optimum interpretation of measured values, e.g. through operating ranges that can be customised in colour as well as threshold and trend displays
- Pressure peak and overload-resistant ceramic measuring cell with diagnostic function
- Fast compensation of dynamic temperature changes
- Permanent 150°C medium temperature
- Very high resolution thanks to 32-bit process value transmission via IO-Link

IP69K

IO-Link

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Factory setting of the measuring range [bar]	Measuring range of the relative pressure [bar]	Process connection	Order no.
0...25	-1...25	G1 / Aseptoflex Vario	**PG1703**
0...10	-1...10	G1 / Aseptoflex Vario	**PG1704**
0...4	-1...4	G1 / Aseptoflex Vario	**PG1705**

Further versions in preparation

Tried-and-tested pressure sensor combined with an innovative LED manometer display

ifm pressure sensors have proven to be a reliable solution in the food and beverage industry for many years. Following the successful updates to the transmitters and display versions, the PG manometer has now also been revised and boasts new and improved features.

The multicolour LED display enables clear and unambiguous visualisation of pressure ranges, switching points, minimum and maximum values and trend curves. Mechanical pointers, which are prone to errors, are replaced by durable and highly visible LEDs. This technological advancement ensures improved clarity and reliability.

Robust ceramic measuring cell for maximum reliability

The pressure sensor itself impresses with its extremely robust ceramic measuring cell which can easily withstand even extreme pressure peaks and overloads. Thanks to the measuring cell's high resistance to abrasive media, it offers a durable and reliable solution for demanding applications.

Unlike conventional sensors with a metallic diaphragm, the ceramic measuring cell does not require oil as a pressure transfer medium. This completely eliminates the risk of medium contamination when the sensor is damaged. This property makes it particularly suitable for the strict hygiene requirements of the food and beverage industry.

An integrated diagnostic function continuously monitors the status of the measuring cell. This increases process reliability and meets the high requirements of critical applications.

Technical data		
Accuracy (in % of the span) Deviation of the characteristics (to DIN EN 61298-2)		< ±0.2
Medium temperature	[°C]	-25...150
Materials (wetted parts)		ceramics 99.9 %, PTFE, stainless steel (1.4435 / 316L)
Communication interface		IO-Link 1.1 COM3
Protection rating		IP67, IP69K

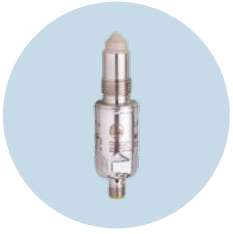
IO-Link

In addition to typical functions such as parameter setting and process value transmission, the manometer offers further information and options via IO-Link:

- Display optimisation (brightness, colour, layout)
- Measuring cell diagnostics
- Min. and max. memory, counter
- Device temperature

BEST FRIENDS

TCC temperature sensor
Including self-monitoring for maximum process reliability



LMT level sensor
Point level detection even with difficult media

SM Foodmag
Magnetic-inductive flow meter for the food industry

For further technical details, please visit: ifm.com/fs/PG1703

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Flush and tight

G½ pressure sensor

- Resistant to viscous and abrasive media thanks to its ceramic measuring cell
- Measuring principle extremely resistant to pressure peaks
- True flush design prevents deposits and pipe clogging
- Continuous transmission of pressure and temperature at a single measuring point

IO-Link

IP68

ifm – close to you!

Measuring range factory setting [bar]	Measuring range relative pressure [bar]	Order no.
G½ process connection		
0...160	0...160	**PL1512**
0...100	0...100	**PL1502**
0...60	0...60	**PL1523**
0...40	-1...40	**PL1543**
0...25	-1...25	**PL1503**
0...16	-1...16	**PL1514**
0...10	-1...10	**PL1504**
0...6	-1...6	**PL1515**
0...2.5	-0,125...2.5	**PL1506**
0...1	-0.05...1	**PL1507**

Defies high pressures and abrasive media

Wherever highly viscous or abrasive media such as adhesives, sealants or glue are conveyed through pipes under exact and high pressure, the compact G½ pressure transmitter PL15 is the ideal choice. The flush design provides no dead space for media to adhere to, effectively preventing clogging of the pipe. The ceramic measuring cell also resists extreme pressure peaks and permanently withstands abrasive contents such as glass balls or other solid particles.

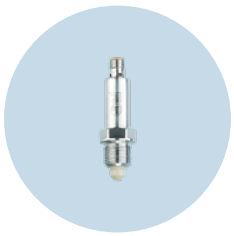
ifm's own, extremely safe sealing concept of the PL15 prevents fluid media such as water or lacquers from entering the threaded area of the measurement connection under high pressure, from depositing there, or from mixing / contaminating subsequent media further into the process.

Common technical data		
Step response time analogue output	[ms]	12 (2L) / 3 (3L)
Operating voltage	[V DC]	9.6...30
Accuracy / deviation (in % of the span) Deviation of the characteristics (to DIN IEC EN 62828-1)		< ± 0.5
Temperature monitoring Accuracy	[K]	±2.5 + (0.045 x (ambient temperature - medium temperature))
Medium temperature	[°C]	-25...110
Materials (wetted parts)		Ceramics, PTFE; FKM, high-grade stainless steel (1.4435 / 316L)
Communication interface		IO-Link 1.1 COM2 (38.4 kbaud)
Protection rating		IP67, IP68

2 in 1: pressure and temperature via IO-Link

The PL15 can be used both as a two-wire analogue and digitally via IO-Link. In the latter case, the pressure and temperature can be read continuously, as the pressure transmitter also transmits the temperature of the medium so that a second measuring point is not necessary. The operating hours can also be read via IO-Link.

BEST FRIENDS



LMC level sensor
Level detection on tanks and containers

VVB vibration sensor
Easy condition monitoring for pumps

SA flow sensor
Simultaneous detection of flow and temperature

For further technical details, please visit: ifm.com/fs/PL1512

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Perfect for pneumatic applications

Pressure sensor with G⅛ process connection

- Continuous transmission of process values via IO-Link, 2 switching outputs
- Robust stainless steel housing with high shock and vibration resistance
- Extensive parameter setting options and advanced diagnostics via IO-Link

IP69K

IO-Link

ifm – close to you!

Measuring range of the relative pressure [bar]	Switch point accuracy [% of the span] [1]	Repeatability [% of the span] [2]	Characteristics deviation [% of the span] [3]	Order no.
-1…0	< ±2.5	< ±0.25	< ±2.5	**PV7829**
-1…1	< ±1.5	< ±0.15	< ±1.5	**PV7809**
-1…10	< ±0.5	< ±0.05	< ±0.5	**PV7804**

[1] to DIN EN 61298-2
[2] in case of temperature fluctuations <10 K
[3] linearity, incl. hysteresis and repeatability, limit value setting according to DIN EN IEC 62828-1

Robust sensors for pneumatic applications

The pressure sensors have a G⅛ process connection, combined with a welded thin-film measuring cell. While offering an unbeatable price/performance ratio, this technology provides for high measuring accuracy in a very compact and robust housing with only 19 mm across flats.

Further advantages

Thanks to the welded measuring cell, the sensors can be used in both pneumatic and inert gas applications.

Another advantage in industrial applications is the robust stainless steel housing. The latter comes with laser labelling, making the sensor permanently identifiable even in demanding environmental conditions.

IO-Link technology allows the pressure sensor to continuously transmit the system pressure and to output other diagnostic data, such as peak counters. Moreover, IO-Link enables loss-free data transmission: conversion losses are excluded and external influences, such as magnetic fields, have no effect on the data transmission.

Technical data		
Outputs		2 x PNP/NPN, IO-Link
Ambient temperature / medium temperature	[°C]	-40…90
Communication interface		IO-Link 1.1, COM2
Protection rating		IP67, IP69K

BEST FRIENDS

AS-i AirBox
Decentralised control of pneumatic cylinders and quarter-turn actuators

PQ pressure sensor
Detects the system pressure in pneumatic systems

Leakage detector
Hand-held device for easy localisation of compressed air leaks

For further technical details, please visit:
ifm.com/fs/PV7829

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Flow measurement in mobile applications

The SU Puresonic Mobile ultrasonic sensor

- Accurate flow measurement of water-based media, glycol and oil
- Displayless design enables use at high media temperatures
- Component-free stainless steel measuring pipe offers high media resistance and permanent ingress resistance
- Conclusions about the signal quality possible on the basis of the signal strength provided

IP69K

IO-Link

ifm – close to you!

Process connection	Measuring range		Order no. [l/min] + [gpm]
	[l/min]	[gpm]	Water, glycol, oil
G½ (DN15)	0.5...65	0.13...17.17	**SU6050**
G¾ (DN20)	0.5...75	0.13...19.81	**SU7050**
G1 (DN25)	1...240	0.25...63.4	**SU8050**
G1¼ (DN32)	1...275	0.25...72.64	**SU9050**
G2 (DN50)	5...1000	1.32...264.18	**SU2050**
½ NPT	0.5...65	0.13...17.17	**SU6651**
¾ NPT	0.5...75	0.13...19.81	**SU7651**
1 NPT	1...240	0.25...63.4	**SU8651**
2 NPT	5...1000	1.32...264.18	**SU2651**

Ensuring process quality for mobile machines

The SU Puresonic Mobile ultrasonic sensor is characterised by its displayless design and high temperature resistance. It is ideal for mobile applications and processes with permanent media temperatures of up to 120 °C.
Examples include temperature control processes, fertiliser machines in agricultural technology and concrete mixers. The sensor reliably detects the volumetric flow rates of a wide range of water-based media, including pesticides, glycol mixtures and oils.

Robust measuring pipe without structures

The measuring pipe of the SU Puresonic Mobile is made of stainless steel and is free of measuring elements, seals and moving parts. This means that faults due to damage, leaks or blockages are excluded from the outset, as are design-related pressure drops.

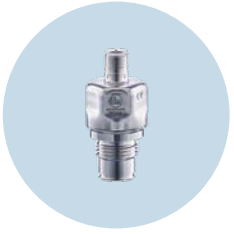
Technical data		
Operating voltage	[V DC]	8...32
Pressure rating	[bar]	<100
Output functions		IO-Link, analogue output 4...20 mA, pulse output, switching output, diagnostic output
Flow		
Accuracy (in the measuring range)		
SU2, SU8, SU9		±(1.0 % MW + 0.5 % MEW)
SU6, SU7		±(2.0 % MW + 0.5 % MEW)
Repeatability		±0.2 % MEW
Minimum conductivity	[µS]	from 0
Temperature		
Measuring range	[°C]	-40...120
Accuracy	[K]	±2.5
Protection rating		IP67, IP69K

MW = Measuring range value
MEW = Measuring range end value

BEST FRIENDS

Graphic display
Programmable HMI for the control of mobile machines

TU temperature transmitter
Robust and accurate, ideal for mobile machines



Pressure transmitter PL15
Compact design for mobile and industrial applications

For further technical details, please visit:
ifm.com/fs/SU6050

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Measuring flow rates without any obstacles

The SU Puresonic ultrasonic sensor

- Accurate flow measurement of conductive and non-conductive media
- Component-free stainless steel measuring pipe offers high media resistance and permanent ingress resistance
- Conclusions about the signal quality possible on the basis of the signal strength provided
- Sensor status always in view via the operating status LED

IO-Link

IP67

ifm – close to you!

Process connection	Measuring range		Order no. [l/min]		Order no. [l/min] + [gpm]	
	[l/min]	[gpm]	Water	Water, glycol, oil	Water	Water, glycol, oil
G½ (DN15)	0.5...65	0.13...17.17	**SU6020**	**SU6030**	**SU6021**	**SU6031**
G¾ (DN20)	0.5...75	0.13...19.81	**SU7020**	**SU7030**	**SU7021**	**SU7031**
G1 (DN25)	1...240	0.25...63.4	**SU8020**	**SU8030**	**SU8021**	**SU8031**
G1¼ (DN32)	1...275	0.25...72.64	**SU9020**	**SU9030**	**SU9021**	**SU9031**
G2 (DN50)	5...1000	1.32...264.18	**SU2020**	**SU2030**	**SU2021**	**SU2031**
½ NPT	0.5...65	0.13...17.17	-	-	**SU6621**	**SU6631**
¾ NPT	0.5...75	0.13...19.81	-	-	**SU7621**	**SU7631**
1 NPT	1...240	0.25...63.4	-	-	**SU8621**	**SU8631**
2 NPT	5...1000	1.32...264.18	-	-	**SU2621**	**SU2631**

Ensuring process quality easily and permanently

The SU Puresonic ultrasonic sensor detects flows of conductive and non-conductive media with high precision. Water, glycol mixtures, coolants and oils are all detected with equal reliability.

Robust measuring pipe without structures

The measuring pipe of the SU Puresonic is made of stainless steel and is free of measuring elements, seals and moving parts. This means that faults due to damage, leaks or blockages are excluded from the outset, as are design-related pressure drops.

Condition monitoring made easy

Equipped with IO-Link and a highly visible status LED, the SU Puresonic has everything you need to continuously monitor process quality. In this way, the status of the signal quality can be quickly read both at the IT level and in the field. If it is decreasing, this can be an indication of increased particle density or deposits on the inner wall of the pipe.

Technical data		
Pressure rating	[bar]	< 100
Output functions		IO-Link, analogue output 4...20 mA, pulse output, switching output, diagnostic output
Flow		
Accuracy (in the measuring range)		
SU2, SU8, SU9		±(1.0 % MW + 0.5 % MEW)
SU6, SU7		±(2.0 % MW + 0.5 % MEW)
Repeatability		±0.2 % MEW
Minimum conductivity	[µS]	from 0
Temperature		
Measuring range	[°C]	-20...100
Accuracy	[K]	±2.5
Protection rating		IP67

MW = Measuring range value
MEW = Measuring range end value

BEST FRIENDS

SV vortex flow meter
Also detects deionised water and cooling water

LDL conductivity sensor
Measures the conductivity of a medium, such as ultrapure water

IO-Link master
Field-compatible masters with Profinet interface

For further technical details, please visit: ifm.com/fs/SU6020

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Hygienic and accurate flow measurement

Ultrasonic sensor SU Puresonic Hygienic

- Measurement of ultrapure water, water-based media and food oils
- Component-free stainless steel measuring pipe offers high media resistance and permanent ingress resistance
- Conclusions about the signal quality possible on the basis of the signal strength provided
- Clamp process connection for hygienic dead space-free adaptation

IP69K

IO-Link

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Clamp process connection [DIN 32676]	Measuring range		Order no. Clamp series A	Order no. Clamp series C	Order no. Clamp series C	Order no. Clamp series C
			Without display		With display	
	[l/min]	[gpm]	[l/min]+ [gpm]	[l/min]+ [gpm]	[l/min]+ [gpm]	[l/min]
½"	0.5...65	0.13...17.17	**SUH120**	-	-	-
¾"	0.5...75	0.13...19.81	**SUH820**	**SUH801**	-	-
1"	1…240	0.26…63.4	**SUH220**	-	**SUH201**	**SUH200**
2"	5…1000	1.32…264.18	**SUH420**	-	**SUH401**	**SUH400**
2.5"	20…2400	5.2…634.0	**SUH520**	**SUH501**	-	-
3"	25…3600	6.6…951.0	**SUH620**	**SUH601**	-	-
4"	45…6000	11.8…1585.0	**SUH720**	**SUH701**	-	-

Ensuring process quality easily and permanently

The SU Puresonic Hygienic ultrasonic sensor detects flows of conductive and non-conductive media with high precision. Ultrapure water, water or food oils, such as sunflower or rapeseed oil, are reliably detected.

Robust measuring pipe without structures

The stainless steel measuring tube is free of measuring elements, seals and moving parts. This means that faults due to damage, leaks or blockages are excluded from the outset, as are design-related pressure drops.

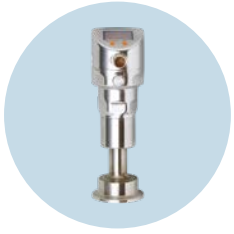
Hygienic adaptation

The clamp process connection offers a simple and reliable way to install or change the SU Puresonic Hygienic quickly and without tools. Dead spaces are avoided and cleaning and sterilisation (CIP/SIP) are facilitated, which increases the efficiency and reliability of processes.

Technical data		
Pressure rating	[bar]	16
Output functions		IO-Link, analogue output 4...20 mA, pulse output, switching output, diagnostic output
Flow		
Accuracy (in the measuring range)		
SUH1...SUH4, SUH8		±(1.0 % MW + 0.5 % MEW)
SUH5...SUH7		±(2.0 % MW + 0.5 % MEW)
Repeatability		±0.2 % MEW
Minimum conductivity	[µS]	from 0
Temperature		
Measuring range	[°C]	-40...120
Accuracy	[K]	±2,5
Protection rating		IP67, IP69K

MW = Measuring range value
MEW = Measuring range end value

BEST FRIENDS



PI pressure sensor
Specifically for the food and beverage industry

Conductivity sensor
Measures the conductivity of a medium, such as ultrapure water

IO-Link master
Field-compatible masters with Profinet interface

For further technical details, please visit: ifm.com/fs/SUH120

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The game changer

Hygienic flow meter with IO-Link

- Magnetic-inductive flow meter completes the portfolio for the food industry
- Reduces the need for measuring points by providing flow rate, total volume, temperature and conductivity
- Easy to set up thanks to app-based menu and guided installation

IP69K

IO-Link

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Nominal width	Measuring range [m³/h]	Order no.		
		Units of measurement: SI, EU With TFT display	Units of measurement: SI, EU, Imperial With TFT display	Units of measurement: SI, EU, Imperial Without TFT display
DN40 (1 ½")	0.3…45	**SMF320**	**SMF321**	**SMF350**
DN50 (2")	0.6…72	**SMF420**	**SMF421**	**SMF450**
DN65 (2 ½")	1.2…120	**SMF520**	**SMF521**	**SMF550**
DN80 (3")	1.8…180	**SMF620**	**SMF621**	**SMF650**
DN100 (4")	3.0…300	**SMF720**	**SMF721**	**SMF750**
DN125 (5")	4.5…450	**SMF820**	**SMF821**	**SMF850**
DN150 (6")	6.0…600	**SMF920**	**SMF921**	**SMF950**

No more blind spots in the digital process

The SM Foodmag magnetic-inductive flow meter takes the flow measurement of liquid and creamy foods to a new level. Equipped with IO-Link, the sensor is the first of its kind to enable digital data transmission from the process, eliminating the last blind spot in the digitalised, transparent production process. On site, the display itself and the all-round visible status LED provide information on the current status. The sensor version without display can be used for installation situations in which no visualisation of the process values is required.

Measures what matters

The sensor detects the current flow rate, total volume and flow direction, as well as the presence of the medium (often referred to as empty pipe detection). It also transmits conductivity and temperature to the control system and IT level. This can reduce the need for additional measuring points in the system.

Convenience, clarity, safety

The integration of the SM Foodmag almost takes care of itself. Combined with our patented cables, the standard M12 connection ensures a fast, waterproof and error-free connection to the data infrastructure. Standard installation dimensions and a flexible choice of seals and process adapters make it easy to integrate into existing systems.

The app-based menu structure and guided installation make parameter setting a breeze. Locally and digitally, the SM Foodmag ensures maximum visibility inside the pipe - for greater process reliability.

Technical data		
Accuracy, flow rate under reference conditions, optional (subject to a charge)	[%]	± 0.5 MW + 1.5 mm/s ± 0.2 MW + 2 mm/s
Response time	[s]	0.3
Repeatability	[%]	± 0.1 MW
Medium temperature	[°C]	-20...150 (continuously)
Accuracy, temperature	[K]	± 1
Measuring range, conductivity	[µS/cm]	100...100,000
Accuracy, conductivity 100... 20,000 µS/cm 20,000... 100,000 µS/cm	[%]	 ± 10 MW ± 20 MW
Materials (wetted parts)		PFA; High-grade stainless steel (316L/1.4435)
Protection rating		IP67 | IP69K

MW: measured value

BEST FRIENDS

IO-Link masters
Field-compatible masters for use in hygienic areas

Conductivity sensor
Precise distinction of liquid media based on their conductivity

Pressure sensor
Hygienic, with robust and flush-mounted ceramic measuring cell

For further technical details, please visit: ifm.com/fs/SMF320

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Rapid detection of compressed air leaks

Hand-held device for an easy location of leaks

- The smallest leaks are detected and visualised on the display
- The amount of loss is calculated directly along with the savings potential
- The free reporting software helps simplify ISO 50001 documentation

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Description	Order no.
Hand-held device for the location of leaks, including headphones, power supply and carrying case	**SDL100**

Rapid location of detected leaks

The hand-held device for the location of leaks is an ideal complement for the sensor-based monitoring of the compressed air system. Firstly, data analysis can be used to detect the leak and confine it to a certain area. Then the hand-held device is employed. It can rapidly and easily identify, measure and document the leak from a loss of just 0.1 litres per minute.

Transparency over the cost of leaks at one glance

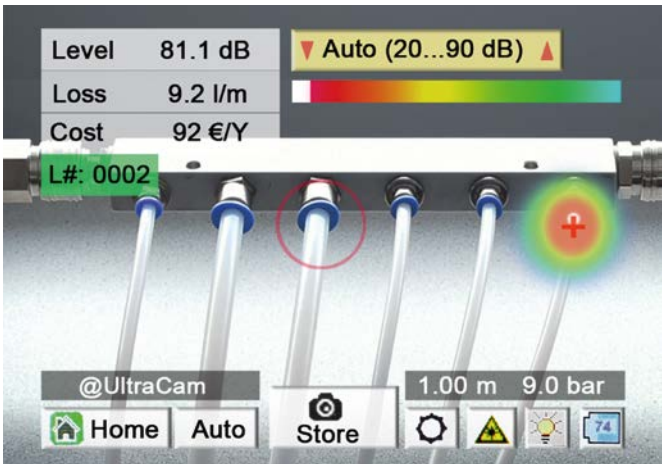
The SDL100 is equipped with 30 ultrasonic microphones, laser distance measurement, camera and a 3.5-inch display. The microphones detect leaking sounds even at high ambient noise levels. The inaudible ultrasound is converted and delivered as an acoustic signal to the headphones. What is more, the leak is visualised in the live camera image on the display. The ongoing compressed air loss and its cost incurred are displayed, too.

Simplified reporting according to ISO 50001

On site, all information about the leak and its maintenance can be digitally recorded on the SDL100 and then transferred to the free software using a data stick. This simplifies reporting according to ISO 50001.

Find out more about our integrated solutions for efficient compressed air monitoring.
ifm.com/gb/compressed-air

Technical data		
Operating frequency (tolerance)	[kHz]	40 (±2)
Sensitivity		0.1 l/min, at 6 bar, 5 m distance
Operating temperature	[°C]	-5...50
Laser class		2
Weight	[g]	698



The SDL100's display shows all relevant information about the leak. The leak itself (shown right in the image) is also visualised.

BEST FRIENDS

SD compressed air meter
Detecting flow and pressure in the pipe system

PQ pressure sensor
Detects the system pressure in pneumatic systems

MK cylinder sensor
Position detection and condition monitoring in one go

For further technical details, please visit: ifm.com/fs/SDL100

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Machine condition in all dimensions

VVB as 3-axis vibration sensor with IO-Link

- Automatic monitoring of the relevant condition indicators
- Integrated unbalance and bearing analysis
- IO-Link simplifies integration into existing control systems and IT-based maintenance planning

IP69K

IO-Link

ifm – close to you!

Proven indicators monitored in 3 dimensions

The VVB30x continuously detects the vibrations in three measurement axes and uses them to calculate proven indicators for evaluating the machine condition. This provides the user with information on fatigue (v-RMS), mechanical friction (a-RMS), impacts (a-Peak) and bearing wear (Crest). The surface temperature is also transmitted as an additional wear indicator.

In the Basic condition monitoring version, the sensor also analyses machine unbalance and detects the machine operating hours based on the vibration level. The DataScience condition monitoring version also has the integrated option of bearing analysis BearingScout™.

Data flow towards control system and IT level

All data is transmitted simultaneously both to the control system and to the IT level via IO-Link, so that the user has all relevant indicators for IT-based condition monitoring, for example in the **moneo** IIoT platform.

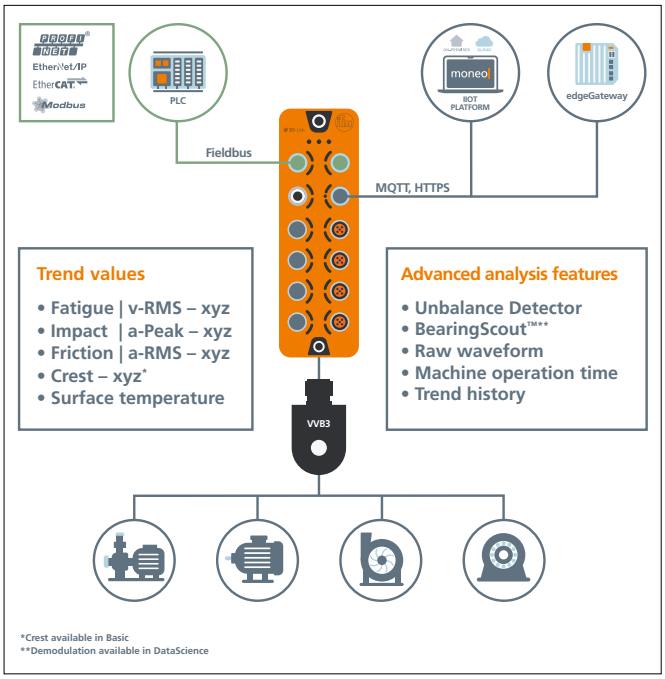
Simple limit value setting to ISO 20816-3

Setting the vibration limit values is also easy with the VVB30x: based on the ISO 20816-3 standard, the machine category can be selected and the limit values defined for this can be transferred to the sensor by system command. If a limit value is exceeded, a detailed fault analysis is easily possible thanks to the integrated BLOB ring memory. Up to 12 seconds of raw data can be provided automatically. In addition, the sensor is equipped with an internal characteristic value history that provides an overview of the last nine days.

Thanks to the VVB30x, a comprehensive vibration analysis and precise machine monitoring is easier than ever before.

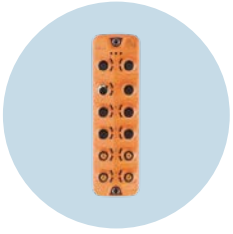
Version Condition monitoring	Units of measurement	Order no.
Basic	m/s, m/s², °C	**VVB301**
DataScience	m/s, m/s², °C	**VVB302**
Basic	mm/s, mg, °C	**VVB305**
DataScience	mm/s, mg, °C	**VVB306**

Technical data		
Frequency range	[Hz]	2...5600
Measuring range velocity	[mm/s]	0...300
Measuring range acceleration	[g]	0...16
Ambient temperature	[°C]	-30...80
Protection rating		IP67 | IP68 | IP69K

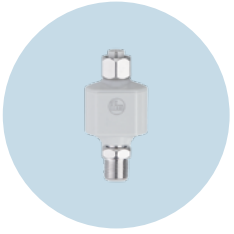


BEST FRIENDS

moneo IIoT platform
Analysis software for simple condition monitoring



IO-Link masters
Field-compatible, transmits data to PLC and IT simultaneously



Bluetooth mesh
Connection to the IT level without complex wiring

For further technical details, please visit: ifm.com/fs/VVB301

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Analogue signals that add up

Evaluation unit for analogue standard signals

- Monitoring, analysis and offsetting of two analogue values
- Ideal for determining differential values, e.g. pressure, flow, level or temperature values
- Limit value indication via two separate relay outputs
- Extensive and convenient parameter setting via IO-Link
- Clearly visible OLED display for actual value indication and parameter setting

IP20

IO-Link

ifm – close to you!

Technical data DL3003	
Input	2x analogue (4...20 mA or 0...10 V)
Output	2x relay, 1x analogue (4...20 mA), IO-Link, 24 V DC (for sensor supply)
Operating voltage	110...250 V AC or 24 V DC
Protection rating	IP20

Monitoring analogue process values

Everywhere in industry, electronic sensors are used to detect process values such as temperature, pressure or flow.

Process value monitoring often takes place directly in the sensor. However, sometimes separate monitoring devices are required, for example if two measured values are to be offset against each other and the resulting value is to be monitored.

Calculating and evaluating measured values

The evaluation unit has various operating modes and two analogue sensors can be connected.

This way, two switching points can be assigned to a measured signal, or a limit value can be assigned to two measured values. The two measured signals can be scaled and linked with each other using mathematical functions such as addition or subtraction.

The process value calculated in this way can be monitored with up to two switching points and can be output as an analogue signal (4...20 mA).

Measured values can be transmitted digitally to a higher-level controller via IO-Link. The device's extensive parameter setting is also conveniently carried out via IO-Link.

Differential pressure measurement on filters
Two pressure sensors measure the pressure before and after the filter. If the filter becomes clogged over time, the differential pressure increases.

Pressure measurement in a fermentation tank
In addition to the hydrostatic pressure at the bottom of the tank, the pressure of the gas above the medium, which increases as a result of fermentation, is measured and subtracted from the hydrostatic pressure to determine the level.

BEST FRIENDS

moneo|RTM
Analysis software for simple condition monitoring

Pressure sensors
Precise detection of pressure values and levels

Temperature sensors
Reliable temperature detection

For further technical details, please visit:
ifm.com/fs/DL3003

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AI for person detection and collision avoidance

Fully integrated 2D/3D camera that is suitable for mobile use

- Reliable person and obstacle detection, optimised for off-highway applications
- Integrated person and object detection, based on ifm deep learning
- 2D/3D sensor fusion and plausibility check to avoid false alarms
- Robust functionality even in bright sunlight or twilight

AI TECHNOLOGY

ToF

IP69K

ifm – close to you!

Deep learning at the highest level – made by ifm

With mobile machines that are difficult to manoeuvre, reliable person detection is essential. The first AI-supported 2D/3D camera with PMD technology worldwide, designed specifically for mobile machines, combines excellent person detection with proven PMD 3D technology for obstacle detection. By fusing 2D and 3D sensors with a powerful AI processor, this solution delivers unrivalled detection performance. It functions as a fully embedded system.

AI-supported person detection for real-time safety

The intelligent camera reliably distinguishes between persons and other obstacles, giving the driver graduated warning signals in the event of danger. Warnings are only generated if there is a risk of a potentially dangerous collision with persons or obstacles. Unnecessary alarms are avoided so as not to needlessly distract the driver.

The integrated obstacle detection works completely autonomously, without any additional hardware. The system monitors itself for tampering or malfunctioning, such as soiling of the front pane or voltage drops. Besides, a live video stream is transmitted via Fast Ethernet, optionally in H.264, H.265 or MJPEG format.

Perfect for robust operating conditions

Designed to withstand the rigours of mobile machine applications, the camera is built to last. With its die-cast aluminium housing, hardened front pane, IP67/IP69K protection rating and excellent vibration and shock resistance, it guarantees maximum reliability, even in extreme conditions.

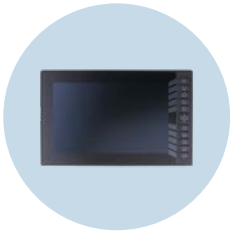
Customisable – your individual logic, integrated in the camera

The O3M AI camera allows users to run their own logic and complex mathematical functions directly on the camera, with the results being transferred to the machine controller via the available interfaces. What is more, customised overlays can be created and displayed in the video stream on an event-driven basis. Adjustments can be made easily using the drag-and-drop interface of the Vision Assistant parameter setting software.

Description	Order no.
O3M AI 2D/3D camera with AI person detection	**O3M372**
IR illumination unit	**O3M970**

Technical data		
Person detection		up to 25 m, ifm deep learning integrated, can be updated
Interface		1x CAN (CANopen, SAE J1939) 1x Fast Ethernet (UDP, RTP, RTSP, H.264, H.265, MJPEG)
Analogue and digital inputs/outputs		optional IO module ZZ1102
Maximum latency	[ms]	60
Protection rating		IP67, IP69K
Approval		E1, type approval according to the UN ECE R10 regulation is being sought
2D camera		
Resolution	[Pixel]	1280 x 960 (1.3 MP)
FOV horizontal x vertical	[°]	143 x 112
Sensor type		CMOS (HDR)
3D camera		
FOV horizontal x vertical	[°]	97 x 44
Sensor type		PMD time-of-flight

BEST FRIENDS



Graphic display
Programmable with CANopen and Ethernet

Pushbutton module
With rotary knob, buttons and joystick function

ecomatController
Powerful PLC with Safety support

For further technical details, please visit: ifm.com/fs/O3M372

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Uniting all senses

Versatile perception platform

- Central processing of image and sensor information
- Synchronisation of several cameras for 360° coverage
- Standardised SDKs for Docker architecture as well as Python, C++, CUDA and ROS
- Latest time-of-flight imager with high extraneous light stability

ToF

ifm – close to you!

Video Processing Unit (VPU)	
Version	**Order no.**
Video Processing Unit (VPU), Connection for up to 6 cameras, Gigabit Ethernet interface for sensor signals	**OVP810**

Camera heads			
Dimensions [mm]	**Image resolution [pixel]**	**Angle of aperture [°]**	**Order no.**
90 x 31 x 26	38 K	60 x 45	**O3R222**
90 x 31 x 26	38 K	105 x 78	**O3R225**
90 x 31 x 26	307,2 K (VGA)	60 x 45	**O3R252**

Integrated and upgradeable vision system

The O3R platform is the comprehensive solution for centralised, synchronised processing of image and sensor information in autonomous mobile robots such as automated guided vehicles. The simplified integration and reliable interaction of cameras and sensors enables the robust implementation of relevant functions such as collision avoidance, navigation and positioning.

In addition, analysis and dimensioning of stationary objects can be implemented, and is handled more effectively by means of several cameras. Examples include the measurement of pallets, logs, packages or suitcases.

Powerful and open

The core of the system is a powerful computing unit called Video Processing Unit (VPU). Based on a yocto-Linux and Docker architecture, open development environments such as Python, C++, CUDA and ROS are supported. The VPU analyses information from up to six camera heads as well as sensor information via the Gigabit Ethernet interface. All relevant "senses" that an AGV needs for safe autonomous navigation are thus available at a central point.

Camera head with imager developed in-house

ifm also offers suitable, high-performance camera heads as part of the platform solution: the 2D/3D cameras have an angle of aperture of either 60 or 105 degrees and are equipped with the latest time-of-flight imager from pmdtechnologies ag. This company of the ifm group of companies develops all sensors for the vision products of the automation specialist and adapts them precisely to the respective requirements.

Thanks to the modulated infrared light, the 2D/3D camera detects objects with maximum reliability even with increased exposure to ambient light.

BEST FRIENDS

Graphic display
Programmable HMI for the control of mobile machines

Multiturn encoders
Precise detection of positions and rotational movement

ecomatController
Powerful 32-bit controllers reliably control AGVs

For further technical details, please visit: ifm.com/fs/OVP810

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The faster way to the pallet

Complete solution for pallet pocket recognition

- Powerful video processing unit with pre-installed “Pallet Detection System (PDS)” software
- Interfaces for 6 camera heads and other sensors for efficient AGV controller
- High frame rate ensures reliable and fast tracking during pallet movement

ToF

ifm – close to you!

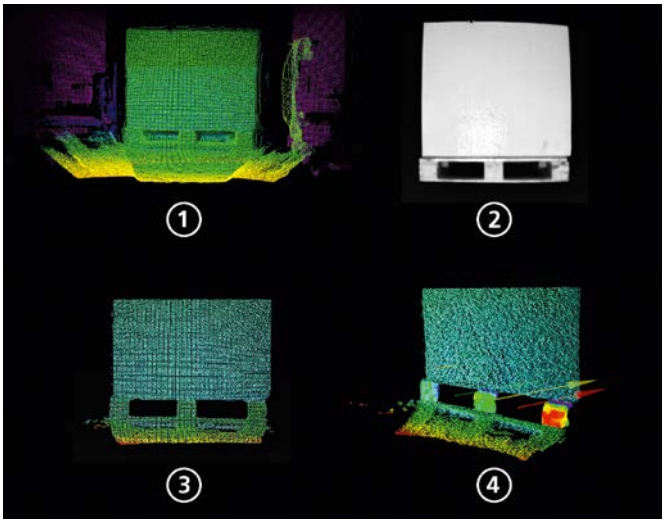
Video Processing Unit (VPU)	
Version	**Order no.**
Connection for up to 6 cameras, Gigabit Ethernet interface for sensor signals; integrated pallet detection system	**OVP812**
With additional collision protection	**OVP813**

Camera heads			
Dimensions [mm]	**Image resolution [pixels]**	**Angle of aperture [°]**	**Order no.**
90 x 31 x 26	38 K	60 x 45	**O3R222**

Powerful solution for more efficiency

The Pallet Detection System PDS contributes to more efficient intralogistics processes by accelerating autonomous and semi-autonomous pallet handling. The proven combination of powerful 2D/3D camera heads and an equally high-performance video processing unit has been extended to include software that quickly and precisely identifies all standard pallet types with two pockets, fully automatically and regardless of their position, and takes over the navigation of the forks down to the centimetre.

The quality of the camera heads and the high repetition rate ensure the availability of meaningful 3D point clouds even in dynamic and difficult operating conditions. Unexpected pallet movements are quickly detected so that the programme can quickly implement fork tracking.



In a first step, the PDS pallet detection processes the amplitude and distance data detected by the O3R2xx vision sensor ①. Unlike the 2D image ②, the 3D image may still contain artefacts and interference. This is why the image is filtered in the next step to "clean" the image and eliminate unwanted pixels ③. The filtered image is then used to exactly determine the location and position of the pallet and its pockets in three dimensions ④.

BEST FRIENDS

Graphic display
Programmable HMI for the control of mobile machines

Multiturn encoders
Precise detection of positions and rotational movement

ecomatController
Powerful 32-bit controllers reliably control AGVs

For further technical details, please visit: ifm.com/fs/OVP812

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A first: full-metal housing offers robust safety

Fail-safe inductive sensors for industrial and mobile applications

- Robust full-metal housing
- Wide temperature range of -40...85°C
- Shock and vibration resistance
- TÜV-approved safety
- Safe state if target is absent

PL/SIL

IP69K

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Type	Total length [mm]	Enable zone [mm]	Safe switch-off distance [mm]	Order no.
4-wire · M12 connector				
M12	60	0...1.5	> 6	**GF761S**
M18	60	0…3.5	> 10.5	**GG761S**
M30	65	0…6	> 18	**GI761S**

Robust safety

Fail-safe sensors protect both man and machine. To date, ifm is the only supplier to market fail-safe inductive sensors in a robust full-metal housing in order to ensure maximum reliability even under extreme conditions. The full-metal housing offers optimum protection against permanent moisture. In addition, the sensors are well secured against shock and vibration loads that are particularly prevalent in mobile machines. Due to the extended temperature range of -40 to 85 °C, they can be used in freezing cold and summer heat, indoors and outdoors on vehicles and machines.

Applications

Typical applications for fail-safe sensors can be service lids or manholes, where they ensure that the machine cannot start until the lid is closed. On mobile machines such as mobile cranes or cherry pickers, safety sensors often monitor the out-riggers that are extended to prevent the vehicle from tipping over.

Common technical data		
Operating voltage	[V DC]	9…32
Housing materials		sensing face: stainless steel housing: stainless steel
Output function		2x OSSD
Safety-related sub-function		target is absent
Ambient temperature	[°C]	-40…85
Safety classification		ISO 13849-1: category 2, PL d IEC 61508: SIL 2, HFT=0, SC 2
Protection rating		IP65, IP66, IP67, IP68, IP69K

BEST FRIENDS

Safety relay
With potential-free relay contacts

Controller for mobile applications
Safety controller with CANopen Safety

Fail-safe inductive sensors
No special target required

For further technical details, please visit: ifm.com/fs/GF7615

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Full metal ensures maximum safety

Fail-safe inductive sensors for the food industry

- Robust full-metal housing with high protection rating
- Wide temperature range of -25...100°C
- Shock and vibration resistant
- TÜV-tested safety
- Safe state if target is absent

PL/SIL

IP69K

ifm – close to you!

Type	Housing length [mm]	Enable zone [mm]	Safe switch-off distance [mm]	Order no.
4-wire · M12 connector				
M12	60	0...1.5	> 6	**GF762S**
M18	60	0…3.5	> 10.5	**GG762S**
M30	65	0…6	> 18	**GI762S**

Safety in full metal

To date, ifm is the only supplier to market fail-safe inductive sensors in a robust full-metal housing in order to ensure maximum safety even under extreme conditions. The full-metal housing offers optimum protection against permanent moisture. Thanks to the extended temperature range of -25 to 100 °C, the sensors are ideally suited for applications in the food and beverage industry.

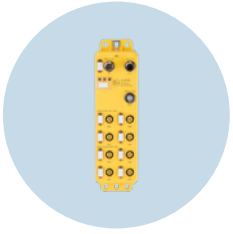
Applications

Typical applications for fail-safe sensors can be found on service lids or manholes on tanks or silos, where they ensure that processes cannot start until the lids are closed to eliminate any risk to individuals and machinery. The full-metal housing shows all its benefits on valves or valve manifolds that are subject to frequent cleaning processes, as it can easily withstand permanent moisture or wetness. These fail-safe sensors are also ideal for monitoring high-speed doors in cold stores.

Common technical data		
Operating voltage	[V DC]	10…30
Housing materials		Sensing face: stainless steel Housing: stainless steel
Output function		2x OSSD
Safety-related sub-function		Target is absent
Ambient temperature	[°C]	-25…100
Safety classification		ISO 13849-1: Category 2, PL d IEC 61508: SIL 2, HFT=0, SC 2
Protection rating		IP65, IP66, IP67, IP68, IP69K

BEST FRIENDS

Safety relay
With potential-free relay contacts



PROFIsafe IO-Link module
For PROFIsafe telegrams via IO-Link

Fail-safe inductive sensors
No special actuator required

For further technical details, please visit: ifm.com/fs/GF72S

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Linking digital IO signals in the field

I/O modules for PROFINET and EtherNet/IP

- Efficient network structure thanks to direct connection of sensors and actuators with the fieldbus level
- Integrated counter function for high-frequency counter applications and direct switching of the outputs
- Robust housing suited for use in environments with high hygiene requirements

IP67 IP69K

ifm – close to you!

Description	Order no.	
	Coolant (orange)	Food (grey)
StandardLine		
PROFINET	**AL4202**	**AL4203**
EtherNet/IP	**AL4222**	**AL4223**
Modbus TCP	**AL4242**	**AL4243**
PerformanceLine		
PROFINET	**AL4302**	**AL4303**
EtherNet/IP	**AL4322**	**AL4323**
Modbus TCP	**AL4342**	**AL4343**

Ethernet modules for field applications

The decentralised IO modules serve as a gateway between binary sensors / actuators and the fieldbus. This means that binary input and output signals in the field can be transmitted directly via the fieldbus. No further transmission systems are needed in the fieldbus topology.

Robust and permanently tight

In combination with ifm's ecolink connection technology, the ifm modules are the perfect choice, even for the most difficult applications. The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVC and EVF product series. The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.

Extension with digital input / output modules

The new Ethernet modules are the perfect addition to ifm's IO-Link master family. They feature the same design, port configuration and standardised M12 connections. The upper 4 output ports allow an output current of up to 3.6 A, while the lower 4 ports enable the connection of sensors.

Common technical data	
Voltage supply StandardLine PerformanceLine	 M12 A-code M12 L-code, daisy chain option
Number of inputs and outputs	4x 2 DO (UA) 4x 2 DI (US)
Current rating of the outputs StandardLine PerformanceLine	 3.6 A Port 1 + 4 3.6 A Port 1 + 2 3.6 A Port 3 + 4
Counter application	yes
Output switching function (SSC)	adjustable per counter
Passive safety	PL d
Coolant (orange) Protection rating Housing Socket / connector	 IP67 polyamide nickel-plated brass
Food (grey) Protection rating Housing Socket / connector	 IP69K polyamide stainless steel

Integrated counter function

Sensor pulses are counted within the module and are cyclically transmitted to the PLC as a counter packet. This provides an accurate count that is not affected by the controller's cycle time. Direct control of the outputs with different switching logics is thus enabled.

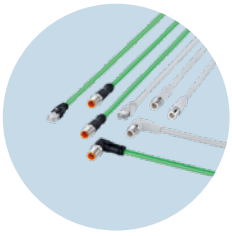
Powerful voltage supply

For power supply, the PerformanceLine modules have L-coded M12 connections with 2x16A. This allows daisy-chaining. The StandardLine modules offer A-coded M12 connections with 3.9 A (US) and 4 A (UA).

BEST FRIENDS

moneo|configure free
Software for parameter setting of the IO-Link infrastructure

IO-Link masters
Transmission of data and parameters to the PLC



Ethernet cables
Available in various lengths and versions

For further technical details, please visit: ifm.com/fs/AL4202

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AS-i modules for hygienic areas

Field modules with ecolink M12 screw connection

- The special plastic housing meets the high requirements for food production
- The ecolink screw connection offers ingress resistance up to IP69K
- Robust thanks to full potting
- Wide operating temperature range and high protection rating
- Clearly visible LEDs for operation, switching status and fault indication

IP69K

ASi

IO-Link

ifm – close to you!

Version	Current rating per port	Connection technology	Order no.
Passive splitter box, 4 ports	4 A	AS-i / IO-Link	**AC2950**
Passive splitter box, 8 ports	4 A	AS-i / IO-Link	**AC2951**
I/O module 2x (2 DI / 1 DO), 2 ports	100 mA (output, supply via AS-i)	AS-i	**AC2952**
I/O module 4 DI-Y, 4 ports	180 mA (inputs)	AS-i	**AC2954**
I/O module 4 DI-Y, 4 DO, 8 ports	180 mA (inputs), 1 A (outputs, via AUX; 3.5 A total)	AS-i / AUX	**AC2953**

Robust for demanding applications

The special PA housing design, the stainless steel connectors and the high ingress resistance to IP69K enable permanent use in areas with frequent intensive cleaning processes, for example in the food and beverage industry. Thanks to full potting, both the modules themselves and the ecolink M12 connectors reliably withstand shock and vibration loads over the long term. By the way: the ecolink connections are compatible with the M12 connectors usual in industry. However, maximum ingress resistance is only ensured with the ifm ecolink connectors.

Common technical data		
Ambient temperature	[°C]	-25...60
Materials Housing Connector Sealing		 PA grey Stainless steel (316L / 1.4404) EPDM
Protection rating		IP65, IP66, IP67, IP69K (operation with stainless steel protective caps: IP69K)

Versions

Passive splitter boxes

Passive voltage splitters essentially function like "multiple sockets" for AS-i networks, but also for IO-Link structures. They enable the voltage supply of components such as valve heads, quarter-turn sensors, motor controls and IO-Link masters. Short circuits and excessively high currents are clearly signalled by a red LED. This helps to quickly recognise and rectify malfunctions or damage to the infrastructure, the actuators or the entire system.

I/O modules

The digital I/O modules in extended addressing mode enable the connection of sensors and actuators that communicate with the controller via the AS-Interface. In contrast to conventional AS-i modules, the modules here do not use flat cable insulation displacement technology, but M12 round cable connection technology - both at the I/O ports and at the AS-i connection. In this way, they fulfil the special requirements for wet areas.

BEST FRIENDS

AS-i gateway
With PROFINET interface and integrated PLC

Inductive sensors
Robust stainless steel housing for the food industry

AS-i illuminated pushbutton module
Illuminated buttons in stainless steel housing

For further technical details, please visit: ifm.com/fs/AC2950

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Smooth flow of information

Field-compatible IO-Link master with OPC UA server

- Integrated IODD interpreter converts sensor data into readable information
- Direct data transfer to on-premises IT levels via OPC UA
- Fieldbus multiprotocol with PROFINET and EtherNet/IP provides flexibility in the choice of controller

IO-Link IP67 IP69K

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Description	Order no.	
	Coolant (orange)	Food (grey)
SolutionBlock		
PROFINET, EtherNet/IP, OPC UA	**AL1590**	**AL1591**

Multiprotocol capability provides flexibility in the choice of controller

The field-compatible SolutionBlock IO-Link master makes system digitalisation more convenient than ever: The multiprotocol capability allows free selection of PROFINET or EtherNet/IP as fieldbus, which makes connection to different controllers more flexible and reduces stock-keeping.

OPC UA server and IODD interpreter integrated in the master

In addition, the integrated OPC UA server and the additional IoT port ensure an uncomplicated, direct connection to the IT level. Thanks to the integrated IODD interpreter, the sensor data is converted into readable information directly in the IO-Link master, making software-supported data evaluation even easier.

Data reduction thanks to the moneo|configure plug-in

The moneo|configure plug-in makes it possible to select and reduce the cyclic data of an IO-Link device. The SolutionBlock IO-Link master receives all process values from the IO-Link devices, but only forwards the selected information to the controller. This significantly reduces cyclic data communication on the fieldbus.

Powerful and easy to connect

To minimise the need for cables, the SolutionBlock IO-Link master is equipped with a daisy chain functionality for both voltage supply with a maximum of 16 A via L-coding and for fieldbus and IoT communication, which enables the masters to be connected in series. Four A ports and four B ports provide sufficient options for connecting sensors and actuators.

Technical data		
Voltage supply		M12, L-code, 16 A (US), 16 A (UA) daisy chain option
Fieldbus port		M12, D-code PROFINET, EtherNet/IP, daisy chain option
IoT port		M12, D-code OPC UA, HTTP(S), MQTT, JSON daisy chain option
IO-Link ports		4 A ports, 4 B ports
Number of inputs and outputs		12 DI / 12 DO
Current rating of the outputs		
UA (total / port)	[A]	4 / 4
US (total / port)	[A]	3.9 / 2
Coolant (orange)		
Protection rating		IP67
Housing		polyamide
Socket / connector		nickel-plated brass
Food (grey)		
Protection rating		IP69K
Housing		polyamide
Socket / connector		stainless steel

BEST FRIENDS

moneo|configure free
Software for parameter setting of the IO-Link infrastructure

IP67 power supply
24 volt supply in the field, controllable via IO-Link

Ethernet switch
Extends the vehicle infrastructure by 6 ports

For further technical details, please visit: ifm.com/fs/AL1590

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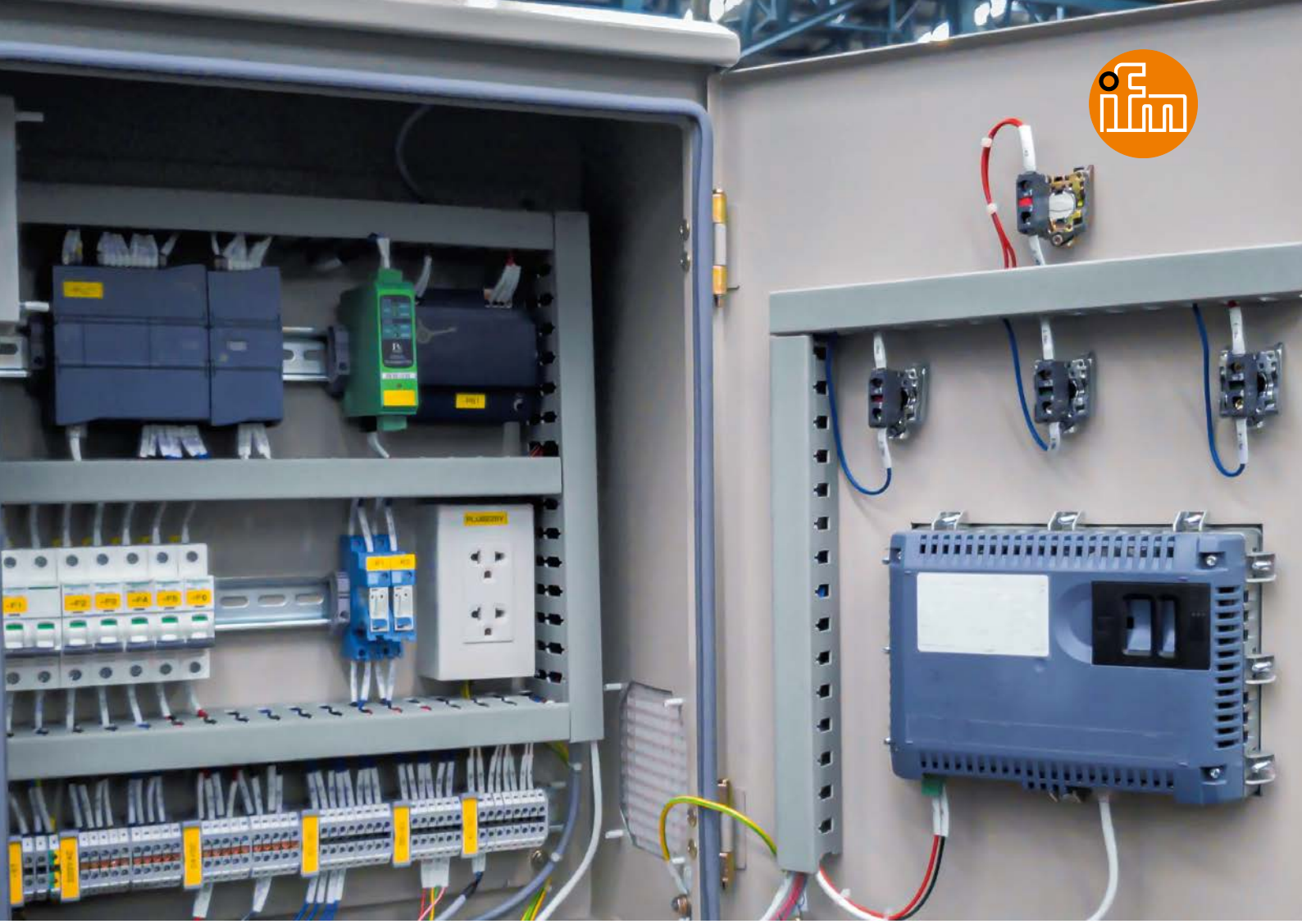

More IO-Link, less space

Space-saving I/O module for control cabinets

- Takes up little space thanks to its compact design
- Integrate up to 16 sensors and/or actuators quickly and easily
- Prepared for DIN rail mounting, wall mounting is also possible

IP20

IO-Link

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Description	Order no.
I/O module for IO-Link	**AL5121**

Technical data		
Operating voltage	[V DC]	18...30
Inputs/outputs (configurable)		16
Digital input circuit		PNP (type 3 (IEC 61131-2))
Max. current load of the outputs in total	[A]	1
Communication interface		IO-Link
Protection rating		IP20

For use in the control cabinet and in the field

The IO-Link I/O module simplifies integration of sensors and actuators with conventional wiring in the control cabinet as well as in field applications with low IP protection class requirements, such as in protected machine housings or under clean room conditions.

Simple digitalisation of up to 16 devices

Up to 16 devices (sensors and/or actuators) can be integrated via the I/O module. Thanks to the spring clamp system, assembly is quick and uncomplicated. The ports of the I/O module allow for flexible configuration as inputs or outputs.

If sensors are connected to the IO-Link data communication technology via the I/O module, the sensor information can be read out centrally at IT level. IO-Link devices can also be configured centrally and conveniently via the IT level.

Power supply for external actuators

The module is supplied with power from an IO-Link A-port master. The total current consumption of all I/Os can be up to 1 A, which ensures an efficient supply of external actuators.

Uncomplicated installation with low space requirements

The I/O module itself is also quick to install thanks to the integrated DIN rail mount and, being just 43 millimetres wide, takes up very little space.

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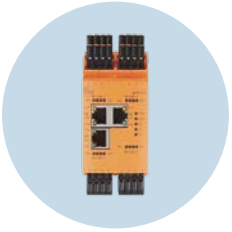

IO-Link master
For installation in control cabinets

24 V switched-mode power supply
Power supply of sensors and actuators

Air humidity sensor
Monitors temperature and humidity in the control cabinet

For further technical details, please visit:
ifm.com/fs/AL5121

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Switch off safely

I/O modules without interaction for IO-Link

- 8 independently configurable digital and analogue I/O ports for IO-Link communication
- Electrical separation between auxiliary voltage and IO-Link
- Without interaction in applications up to PL d (category 3)
- Digital input filters, powerful outputs (2 A each)
- Parameter setting and diagnostics via IO-Link

IP67 IP69K

ifm – close to you!

Input and output functions	Order no.	
	Coolant	Food
Module with DI, 0...10 V, 4...20 mA / DO	**AL2607**	**AL2507**
Module with DI / DO	**AL2627**	**AL2527**

Digital and analogue ports for IO-Link

With their IO-Link masters, ifm offers an ideal solution for recording sensor signals directly in the machine without using a control cabinet.

A machine controller, however, must also be able to record digital and analogue signals and control electrical actuators in addition to IO-Link information. The I/O modules for IO-Link offer precisely these functions, making them an ideal extension to the IO-Link masters.

For safety-related applications

A particular challenge is that in certain applications, the voltage of the actuators (UA) must be switched off in a safety-related way.

The modules have been developed so that they can be used in relevant safety-related applications up to PL d (category 3) without interaction.

Switching off without interaction

In classic safety technology, the voltage supply to hazardous actuators (UA) is switched off centrally via a safety relay.

In modern, decentralised fieldbus systems, however, the actuators are controlled via "non-safe" outputs of I/O modules, while the voltage supply to these I/O modules is increasingly being switched off centrally via an upstream safety relay or a safety controller.

Common technical data		
External voltage supply		L-code
US and UA electrically separated		yes
Switchable current per module	[A]	16
Non-interaction		PL d (category 3)
Operating voltage	[V DC]	18…30
Ambient temperature	[°C]	-25…60
Coolant (orange) Protection rating Housing Socket / connector		 IP67 polyamide nickel-plated brass M12
Food (grey) Protection rating Housing Socket / connector		 IP69K polyamide stainless steel M12

A dilemma here is that a fault could theoretically occur in the non-safe I/O modules, resulting in the output continuing to be supplied by US even though UA has been switched off. For this reason, the modules have been redesigned and built in such a way as to rule out this theoretical error.

Many competitors refer to "passive safety" in this context. However, the term is misleading as it suggests a safety device. This is why we expressly refer to "non-interaction" and "fault exclusion".

BEST FRIENDS

IO-Link master
Field-compatible master with EtherNet/IP interface

Safety relay
Signal output via potential-free relay contacts

IP67 power supply
24 volt supply in the field, controllable via IO-Link

For further technical details, please visit: ifm.com/fs/AL2607

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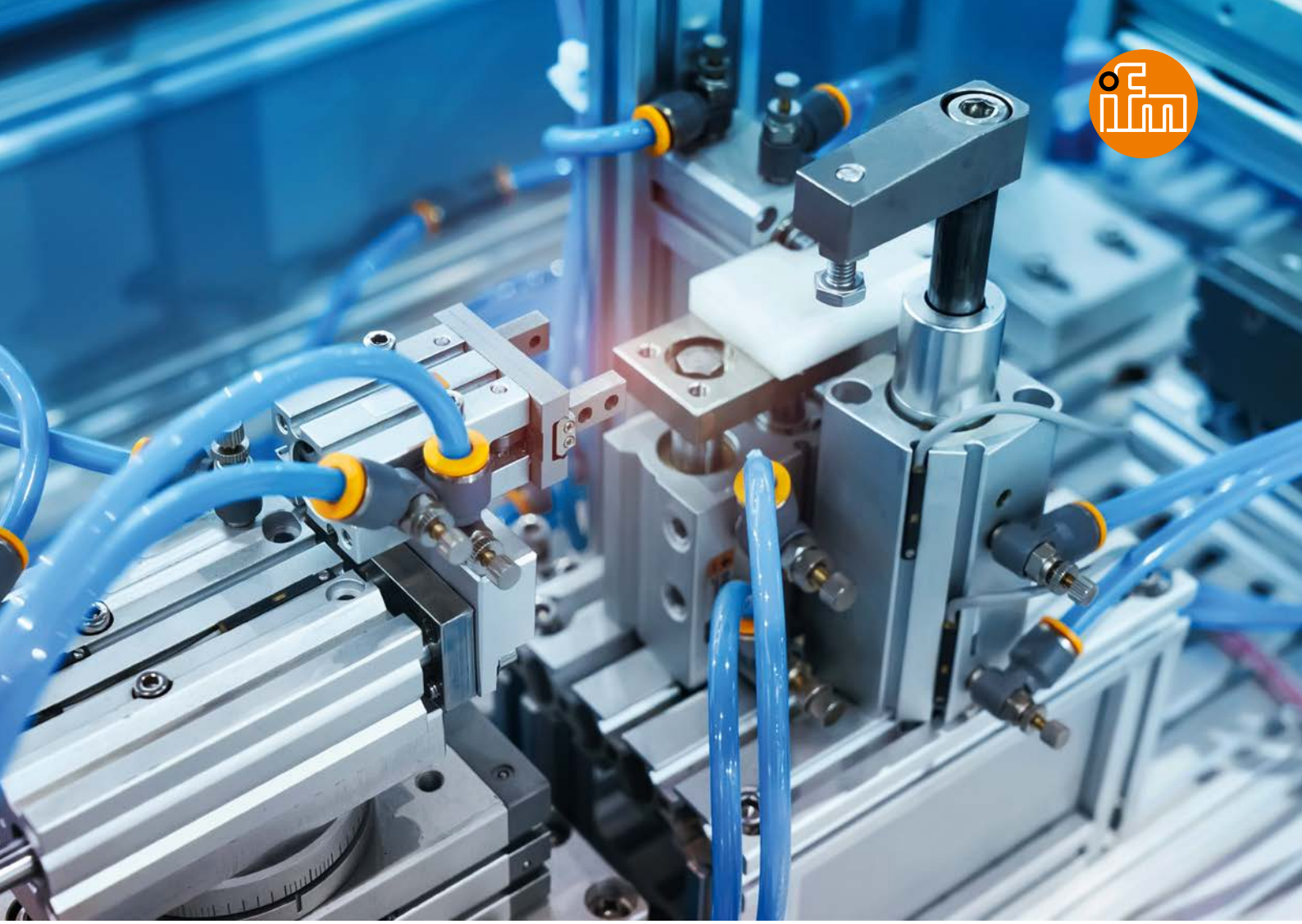

Controlling pneumatics via IO-Link

AirBoxes with IO-Link

- For decentralised control of cylinders and pneumatic actuators
- Combination of IO-Link I/O module and solenoid valve
- High energy efficiency due to application near the actuator
- Production data acquisition and diagnostics via IO-Link
- 4x 2 digital inputs, e.g. for the feedback of position sensors

IP67

IO-Link

ifm – close to you!

Applications

Pneumatic AirBoxes control cylinders or actuators using compressed air and are found in a wide range of industrial applications. They are used in almost all areas in which pneumatics are used for positioning. Examples include pick and place applications, machine tools, robotics, handling and conveyor belts. In filling systems, AirBoxes control actuators, for example during dosing or filling.

Thanks to their compact design, AirBoxes can be mounted close to the pneumatic actuators to be controlled. The short distance minimises the risk of leaks and therefore significantly increases energy efficiency. Besides, short pneumatic tubes allow for short switching times.

The AirBoxes provide digital inputs to which, for example, cylinder sensors for position feedback can be connected. Long, separate cable paths to the plant controller are not required.

IO-Link benefits

The electrical connection is made via a 24 V power supply, eliminating the need for additional auxiliary voltage and screened cables. This simplifies cabling considerably. Diagnostics are also made easier: Production data such as operating hours, switch-on operations and internal temperature are logged in the AirBox. This enables predictive maintenance and offers maximum transparency, for example for remote service purposes. External faults such as short circuits at the digital inputs are reliably detected. All in all, these advantages improve the efficiency, reliability and process quality of machines and systems.

Valve version	Order no.
2x 3/2-way valve	**AL5228**
1x 5/2-way valve, monostable	**AL5246**
1x 5/2-way, bistable	**AL5251**
1x 5/3-way valve, blocked middle position	**AL5270**

Common technical data		
Inputs		4 ports with 2 digital inputs each
Pressure range	[bar]	2/3…8
Air flow	[l/min]	500 (at 6 bar Δp 1 bar)
Compressed air		lubricated and non-lubricated
Compressed air connection		8 mm push-in
Required master port class		A
Protection rating		IP65 | IP67

BEST FRIENDS

IO-Link masters
Masters with Profinet interface for use in the field

Cylinder sensors
End position detection for different cylinder designs

PQ pressure sensor
System pressure monitoring in pneumatic systems

For further technical details, please visit: ifm.com/fs/AL5228

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Check your drive

Programmable frequency-to-current converter

- Monitoring speeds and pulse sequences for overspeed and underspeed
- Frequency-proportional current or voltage output
- High input frequency of up to 600,000 pulses / minute
- Extensive and convenient parameter setting via IO-Link
- Easy-to-read OLED display for actual value indication and parameter setting

IP20

IO-Link

ifm – close to you!

Description	Order no.
Frequency-to-current converter	**DW3003**

Drive monitoring

In many industrial applications, drives and various other rotating machines are expected to run at a defined speed. When using external sensors on shafts or drive wheels, speed-dependent signals can be generated and analysed with the help of the depicted frequency-to-current converter. Damage to the drive, such as slipping or even broken V-belts, can be detected in good time by comparing setpoints and then indicated via a switching signal. At the same time, the device outputs a current or voltage signal which is proportional to the speed and can be transmitted to a higher-level controller or used for other control processes.

High-performance evaluation unit

The measured value can be transmitted digitally via IO-Link which also facilitates the extensive and convenient parameter setting options, such as scaling of the analogue output signals or the definition of switch points.

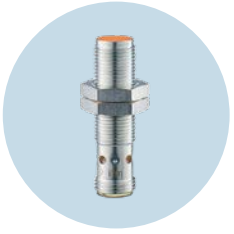
A particularly useful feature: the evaluation unit can be operated with both 24 V DC and 110...250 V AC. The unit provides 24 V DC to supply the sensors.

Technical data	
Input frequency	up to 600,000 pulses / minute
Input	1
Output	0...10 V, 4...20 mA, IO-Link, 2x switching output
Protection rating	IP20

BEST FRIENDS

moneo|IIoT Core
IIoT software for simple condition monitoring

IO-Link master
Field-compatible masters with Profinet interface



Inductive sensors
Detection of rotary movements on shafts and drive wheels

For further technical details, please visit: ifm.com/fs/DW3003

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Upgrade to IIoT? With ease wireless!

Bluetooth mesh system for easy retrofitting

- Sensors can be connected subsequently to the IT level without complex wiring
- Easy retrofitting and digitalisation of extensive systems
- New nodes can be incorporated via smartphone
- Password protection for your data security

IP67 IP69K IO-Link

ifm – close to you!

Description	Order no.
Bluetooth mesh IO-Link adapter	**EIO344**
Bluetooth mesh IoT base station	**EIO404**

Simple digitisation in the inventory

With the Bluetooth mesh system, you can easily evaluate sensor data from your existing system at the IT level. Use the information gained in this way to increase the efficiency of your system – with considerably reduced wiring complexity.

Up to 50 sensors in a mesh network

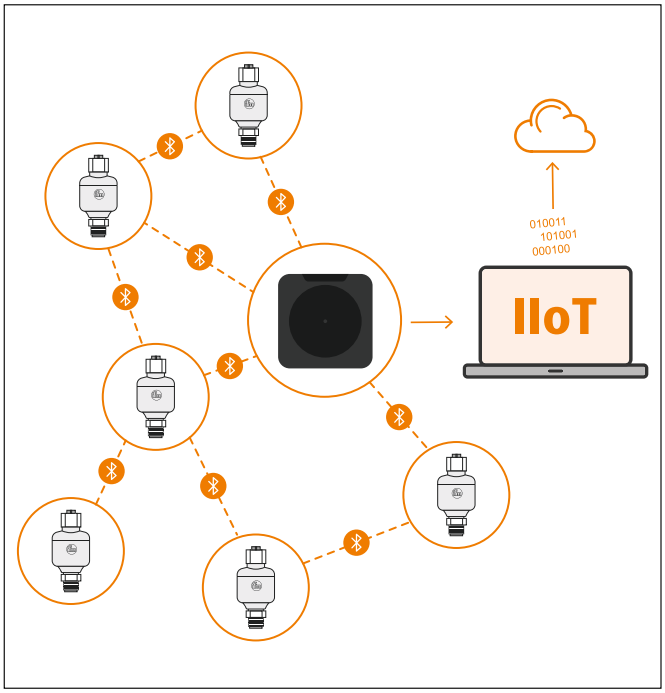
Starting from a base station, which is the interface for bidirectional communication with the IT level, up to 50 Bluetooth adapters communicate with each other in encrypted form. Even data packets from the most remote sensors are securely transmitted wirelessly to the base station via the resulting mesh network, which can span the entire system. The adapters can be screwed directly onto the sensor and are supplied with power via the existing cable. Depending on local conditions, the mesh nodes can be up to 20 metres apart, making the system suitable for large installations.

Convenient network management

You can easily manage the mesh network using our moneo software or the corresponding free smartphone app. Add new nodes, read out data or configure the sensors as required.

You can find more about setting up and managing the mesh network and further details about the Bluetooth mesh system on our website.

Technical data	
Maximum number of nodes	50
Maximum distance between nodes [m]	20
Encryption standard	AES128
Protection class Base station Adapter	 IP67 IP69K



BEST FRIENDS

edgeGateway
For secure transmission of system data to the IT level

moneo|IIoT Core Cloud
Cloud subscription to the moneo IIoT platform

VVB vibration sensor
Easy condition monitoring via IO-Link

For further technical details, please visit: ifm.com/fs/EIO344

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Controlling motors via CANopen

High-current CANopen relay for mobile applications

- PWM-controlled H-bridge with high current capability up to 10 A
- Three additional analogue or digital usable inputs
- Can be integrated as CANopen slave
- For 12 and 24 V on-board systems

IP67

E1

ifm – close to you!

Application areas

The ecomatRelay is an innovative high-current CANopen relay with integrated H-bridge that has been specially developed for the use in mobile machines. This device can be used to control electrical loads such as DC motors in a simple and efficient way - and with just two variables: one for the setpoint and one for the direction of rotation. The PWM-controllable H-bridge outputs enable a current load of up to 10 amperes and therefore offer maximum flexibility and performance.

Versatile expansion options

The ecomatRelay is ideally suited if additional I/O ports are missing or special functions such as PWM-controlled high-current outputs are required. Whether analogue or digital inputs, H-bridges or PWM outputs - the ecomatRelay covers a wide range of requirements.

Simple and efficient control

With support for the CANopen protocol, the ecomatRelay offers uncomplicated integration into control concepts. The variables can be easily mapped so that the set-up is completed quickly. The decentralised extension enables flexible adjustment to specific requirements, whether for new installations or retrofits.

Robustness for mobile applications

The device impresses with an extremely robust design and fulfils protection rating IP67, making it perfectly suited for use in demanding environments. It is vibration-resistant, E1-certified and supports both 12-volt and 24-volt on-board systems, making it ideal for mobile applications. These features ensure reliable operation even under the most difficult conditions.

The ecomatRelay is the perfect choice for users who are looking for a powerful and easy-to-integrate solution to implement motor applications or special I/O requirements in mobile machines.

Technical data CR3025		
Operating voltage	[V]	8…32
Output		1x H-bridge, PWM
Current rating output	[A]	10
Inputs		3x analogue (12 bits)
Current consumption sleep mode	[mA]	6
Interface		CANopen
Ambient temperature	[°C]	-40…85
Protection rating		IP67

BEST FRIENDS

ioControl
Decentralised connection of sensors, freely programmable

ecomatDisplay
Programmable robust HMI for mobile machines

ecomatBasic
Programmable controller for mobile machines

For further technical details, please visit: ifm.com/fs/CR3025

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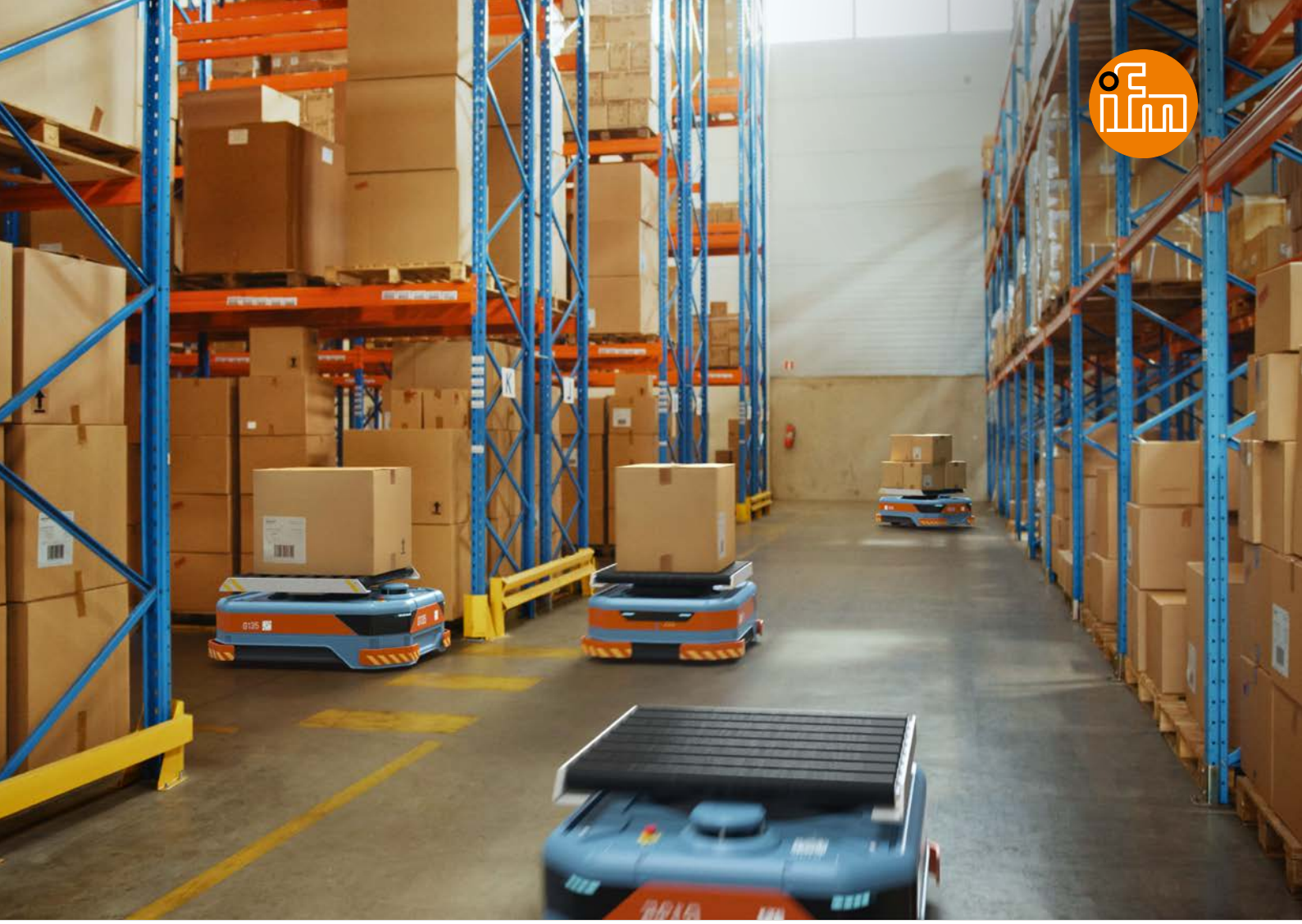

Strong, safe, multifunctional

The new generation of ecomatBasic controllers

- Powerful safety controller for mobile machines
- TÜV-certified library for simple implementation of safety-related functions
- Multifunctional inputs and current-controlled outputs ensure maximum adaptability

CODESYS

PL/SIL

IP20

ifm – close to you!

Interfaces	Safe inputs (analogue / resistor / frequency)	Outputs (of which safe)	Order no.
2x CAN, 1x Ethernet	16 (8/4/4)	16 (4)	**CR413S**
2x CAN	12 (4/4/4)	12 (-)	**CR403S**

Software library	Order no.
TÜV-certified, with safety POUs for CR413S and CR403S; workstation licence	**CP100S**

Common technical data		
Operating voltage	[V]	8…32
Nominal voltage	[V]	12 / 24
Programming language		CODESYS 3.5
Safety level		SIL 2; PL d; AgPL d; ASIL C
Safety interfaces	CAN: Ethernet:	CANopen safety J1939 safety CIP safety
Protection class		IP20

Two controllers in one

The new generation of ecomatBasic controllers has everything you need in terms of performance and flexibility to reliably control mobile machines. In addition to a controller for standard applications, the ecomatBasic also offers a separate controller for safety-related functions.

More power – also for retrofitting

With up to 16 multifunctional inputs and outputs each, the controller is designed to meet any customer-specific requirement – especially as the computing power has been more than doubled compared to the first generation. Utilising this extra performance and the convenience of CODESYS 3.5 in existing machines is easy: The dimensions of the CR403S are identical to those of the BasicController series.

Certified safety

Whether driverless transport system or mobile machine operated by a person: Safety comes first. Each input of the ecomatBasic can be used within the scope of functional safety. Besides, up to four safe outputs are available (CR413S).

In order to use safety-related functions, the optional TÜV-certified software library offered by ifm is required. It includes a large number of safety POUs with which the most common requirements can be easily and safely implemented.

BEST FRIENDS

mobile IoT gateway
For mobile transmission of data to the cloud

ioControl
Decentralised connection of sensors, freely programmable

Robust HMI
4.3-inch dialogue module with integrated controller

For further technical details, please visit: ifm.com/fs/CR413S

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Maximum performance in the smallest of spaces

The 4.3"ecomatDisplay sets new standards

- High-brightness display for maximum readability even in daylight conditions
- Ideally suited for demanding tasks thanks to high computing power and memory capacity
- Maximum freedom of communication thanks to the support of multiple protocols

IP67 E1 CODESYS

ifm – close to you!

New standard in the compact class

Whenever efficient communication, precision and performance in the smallest of spaces are required, the most compact member of the ecomatDisplay family is the perfect choice. Because the 4.3-inch HMI makes no compromises when it comes to human-machine interaction: 16.7 million colours, high-resolution display and good readability even at extreme angles or in extreme lighting conditions ensure clear information exchange in any situation. Versions with RGB keypad or capacitive touch screen are available for easy operation in any situation.

Easy to connect, economical, communicative

Numerous connection options and a wide range of supported communication protocols allow for simple and extensive integration of the ecomatDisplay into the machine. CODESYS 3.5 and the comprehensive ifm library of software modules enable convenient visualisation of the information. Besides, the Linux-based operating system can be used for customisation, such as visualisation via QT. The powerful DualCore processor and the 1 GB DDR4 RAM ensure reliable processing of all data and control commands. For all these technical feats, the compact HMI requires less than ten watts of power.

Tough

The robust housing, already known from other ecomatDisplays, provides the 4.3" device with maximum protection against external influences, making it ideally suited for use in extreme working environments.

Connections	Input	Order no.
1x CAN, 1x Ethernet	RGB keypad	**CR1140**
1x CAN, 1x USB	RGB keypad	**CR1141**
1x CAN, 1x Ethernet	Touch display	**CR1142**
1x CAN, 1x USB	Touch display	**CR1143**
1x CAN, 1x Ethernet	none, only display	**CR1144**

Technical data		
Processor		ARM dual core, 1.4 GHz
Memory / RAM		4 GB / 1 GB DDR4
Retain variables	[kB]	8
Communication protocols		CAN, CANopen, J1939, Modbus TCP, EtherNet/IP, OPC UA
Display resolution	[pixel]	800 x 480
Display brightness	[cd/m²]	1,000
Real-time clock		battery-buffered
Power consumption	[W]	5…8
Protection rating		IP67

BEST FRIENDS

ecomatBasic
Controller with H-bridge, 32 inputs and outputs

ecomatPanel
Keypad with rotary button and six keys, backlit

ioControl
Decentralised connection of sensors, freely programmable

For further technical details, please visit: ifm.com/fs/CR1140

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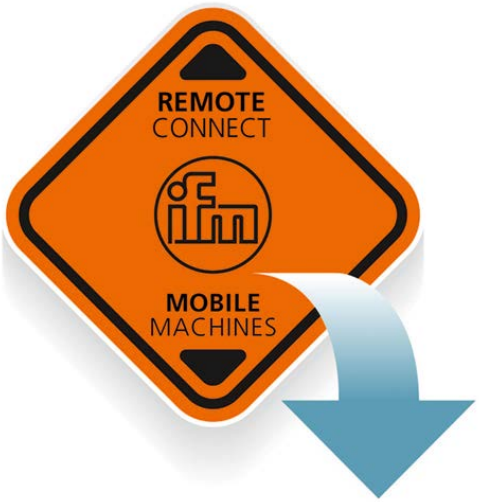
Worldwide, at any time

Remote access to mobile machines

- Remote access to machine components allows fast fault diagnosis
- Data-based damage analysis shortens the repair time
- Secure end-to-end encryption enables reliable connections and eliminates the need to be on site



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Remote maintenance planning

ifm's own "remoteConnect" solution for accessing machines from a distance allows users to connect to machines via a mobile network, view machine data and analyse the current maintenance needs or a specific damage pattern.
End-to-end encryption protects the communication channel from unauthorised access and enables secure data transfer.

Effective planning, less time required

By using "remoteConnect", users benefit from more effective maintenance processes. Maintenance teams can be dispatched directly to the site with a specific work order and the appropriate spare parts for the job. This reduces the amount of labour required on site and the time it takes to get the machine back up and running. In the case of software customisation, the time and cost of travel is completely eliminated.

Simple retrofitting, easy handling

The mobile IoT gateway required for remote access can be easily connected to the machine's controller. The add-on is just as easy to use. It integrates seamlessly with mobile IoT. With just a few clicks, the software is installed and the connection to the machine is established.

Description	Order no.
remoteConnect, 7-day access, excluding mobile network connection	**CZ0120**
remoteConnect, 7-day access, including mobile network connection	**CZ0121**

BEST FRIENDS

mobile IoT gateway
Global access to the machine via mobile communications

ecomatDisplay
Programmable HMI for the control of mobile machines

ecomatController
Controller for mobile applications, also for safety applications

For further technical details, please visit: ifm.com/fs/CZ0120

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Ideal and efficient illumination

Machine light in accordance with the Ecodesign Directive

- White light plus RGB LED: for lighting and status visualisation
- High light yield 450 lumens over a length of 250 mm, up to four light modules can be strung together
- Hygienic design with smooth surface
- Robust and resistant to chemicals
- Compliance with the Ecodesign Directive 2009/125/EC

IP69K

ifm – close to you!

Innovative machine light

The machine light combines compliance with the strict requirements of the Ecodesign Directive with exceptional robustness and versatile application options.

The device impresses with its elegant, smooth surface and hygienic design, making it perfect for use in demanding areas. The materials used are not only particularly robust, but also guarantee an impressively long service life. With a length of 250 mm and the option of connecting it via an M12 connection, it offers incredible flexibility. Up to four lights can be arranged in a row to create optimum illumination.

The machine light not only impresses with its efficient white light, but also with its vibrant RGB signal colours – and at a price that can easily compete with conventional products that only provide white light.
It is controlled via four 24 V DC channels, and the IO-Link integration via the DP1615 enables many different control options.

Robustness

Thanks to the tried-and-tested plastic injection moulding technology, the machine light is extremely robust and resistant to chemicals. The sheathing reliably protects the electronics and guarantees a long service life – even in demanding environmental conditions.

Versatile mounting options

It is mounted using a universal mounting clip, which can be attached with a screw, magnet or ifm clamp.

Description	Order no.
End module, 1x M12 RGBW module, 250 mm, 24 V DC	**DV3010**
Inline module, 2x M12 RGBW module, 250 mm, 24 V DC	**DV3011**

Ecodesign Directive

The Ecodesign Directive 2009/125/EC defines strict requirements for the energy efficiency, light yield and durability of electrical consumers, especially for lighting components. Conventional LED strips often do not fully meet these requirements and are therefore primarily used for status visualisation.

With the machine light, ifm presents a solution that fulfils all the requirements of the Ecodesign Directive. The product offers an impressive light yield of 450 lumens over a length of just 250 mm, combined with minimal energy consumption and a long service life. It can also signal the machine status in colour. These properties make the machine light a sustainable, energy-efficient and future-orientated lighting solution.

BEST FRIENDS

Control circuit device for LED strips
Versatile control of RGBW LEDs via IO-Link

Signal lamp
Clearly visible visualisation of operating states

IO-Link master
Field-compatible masters for use in hygienic areas

For further technical details, please visit: ifm.com/fs/DV3010

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Powerful all-rounder

IIoT controller for use in the field and in the control cabinet

- 2-in-1: cloud connector and powerful controller
- Perfect IO-Link integration
- Plug & Work access to the I/O level via Ethernet
- Version with IP20 protection rating for the control cabinet or with IP67 for use in the field
- Powerful technology for demanding applications

IP20 IP67 CODESYS

ifm – close to you!

Description	Order no.
IIoT controller for the control cabinet	**AE3100**
IIoT controller for use in the field	**AE3400**

Technical data		
Operating voltage	[V DC]	18...30 DC (PELV)
Ambient temperature	[°C]	-25...55
Housing material		Die-cast aluminium passivated, stainless steel
Dimensions	[mm]	AE3100: 125 x 125 x 36 AE3400: 251 x 125 x 34
Protection rating		IP20 (AE3100) IP67 (AE3400)

Powerful and versatile

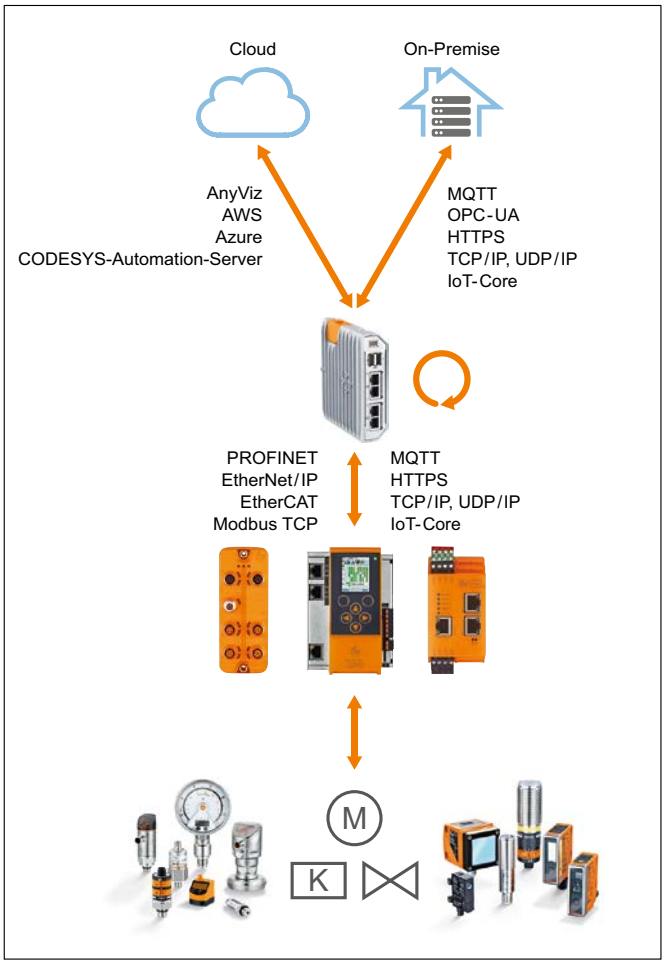
The IIoT controller is a powerful, communicative and flexible PLC solution in machine and plant digitalisation. Powerful, because at ambient temperatures of up to 55°C, the 1.3 GHz quad-core processor works at high performance level. Communicative, because it is a true language and translation talent with its various protocols, regardless of whether it is a matter of connections to the IT world or the integration of automation technology I/O data. In addition, even a Plug & Work connection of IO-Link devices is possible – including IODD interpretation. Flexible, as the IIoT controller is freely programmable via CODESYS V3.5.

You would like to manage the device remotely? No problem, the CODESYS Automation Server enables remote debugging and remote web visualisation.

Connection to different clouds

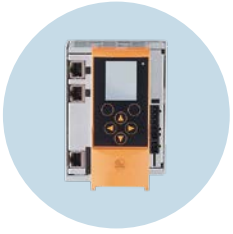
The IIoT controller allows for transmission of the recorded and prepared data to the most common cloud platforms such as AWS, Microsoft Azure and AnyViz. Furthermore, the IIoT controller speaks the common standard digitisation languages such as OPC UA and MQTT.

Whenever data is to be recorded and processed in real-time, I/Os can be read and controlled by using Industrial Ethernet protocols such as Profinet, EtherCAT, EtherNet/IP or Modbus TCP.



BEST FRIENDS

IO-Link master
For use in factory automation



Smart PLC
For data exchange with the sensor actuator level

Diagnostic electronics
Vibration monitoring of machines and equipment

For further technical details, please visit: ifm.com/fs/AE3100

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Secure remote access

moneo|edgeGateway S: flexible and secure

- Enables secure remote access to the automation infrastructure
- Easy and secure connection of the sensor level to the cloud with maximum flexibility
- Translation of incoming IO-Link process data into readable information

IP67

IO-Link

ifm – close to you!

Version	Order no.
moneo|edgeGateway S	**AE1400**
Cloud solution for remote access	
moneo|IIoT Core Cloud	**QCM100**

Powerful and secure

The **moneo|edgeGateway S** is the convenient and secure solution for remote access to systems and applications. The gateway also transmits data from the sensor level to the IT infrastructure and the cloud. Its centrepiece is the 1.4 GHz dual-core processor which works at maximum performance level in environments with ambient temperatures of up to 60°C. With its robust IP67 housing, the powerful hardware does not require an additional control cabinet.

Simple integration, simple dialogue

The **moneo|edgeGateway S** is not only robust and powerful, but also convenient: The guided integration into the IT structure and into the **moneo|cloud** simplifies set-up and enables fast and secure remote access to the automation level. Besides, the data from the system is available for further analysis in the **moneo|cloud** from any location. Despite its simple set-up, the gateway offers a high degree of flexibility in operation and handling that is essential for the holistic and efficient solution of comprehensive IIoT tasks.

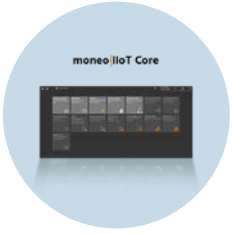
Turns data into information

The **moneo|edgeGateway S** can be integrated not only into ifm's IIoT platform but also into other common cloud solutions. As the gateway converts the incoming IO-Link process data into readable information, no further programming is required.

Technical data		
Communication interface		Ethernet
Protocol		TCP/IP, HTTPs, MQTTs
Transmission rate	[Mbit/s]	10; 100
Processor		ARM 64 bits dual core 1.4 GHz
RAM memory		2 GB RAM
Mass storage		4 GB flash
Ambient temperature	[°C]	-25...60
Protection rating		IP65, IP67

BEST FRIENDS

IO-Link masters
Field-compatible masters with PROFINET interface



moneo|IIoT Core
IIoT software for simple condition monitoring

Diagnostic electronics
Vibration monitoring of machines and equipment

For further technical details, please visit: ifm.com/fs/AE1400

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Wireless cloud connectivity

Industrial-grade LTE 4G router

- Reliable bridge between Ethernet and LTE Cat-4 for stable connectivity
- Web interface, firewall, NAT, DHCP server and nano SIM card slot are integrated
- Flexible voltage supply via terminals or Power over Ethernet (PoE)
- High protection rating IP66 / IP67 possible using optional accessories
- M50 thread for easy integration into control cabinets

IP67

ifm – close to you!

Version	Radio approval	Frequency band	Order no.
Industrial LTE router (EMEA)	CE/RED	B1, B3, B7, B8, B20, B28	**AE9000**
Industrial LTE router (US)	FCC	B2, B4, B5, B12, B13, B14, B25, B26, B66	**AE9001**

Interface between plant and cloud

The Industrial LTE 4G router from ifm is used in various application areas where a reliable internet or cloud connection is required, but a wired IT infrastructure is not available. Possible reasons for this can be long distances making grid connection uneconomical, or the fact that the system is still in the concept phase.

The router provides a cost-effective and fast solution to overcome these challenges and facilitate a reliable internet connection for applications.

For example, edgeDevices can use the Ethernet port to store relevant machine data in cloud services. With their **moneo|Cloud**, ifm offers an IIoT platform that provides basic functions for optimising machine availability, process quality and energy consumption without any programming knowledge.

The router is also the preferred choice for remote access and remote diagnostics in industrial environments.

Simple and protected installation

Thanks to the M50 thread, integration into control cabinets is easy, and the upper part of the device is protected to IP66 / IP67. The optional set of accessories (E90001) extends this protection to the entire housing and enables uncomplicated mounting on walls or masts with a diameter of 50...150 mm.

Common technical data	
Communication interfaces	GNSS, mobile communications, 1x Ethernet
Protocol	TCP/IP, UDP/IP
Integrated functions	Firewall, NAT, DHCP server
Protection rating	Upper part: IP66 | IP67 Connections: IP21 (IP67 when using the E90001 mounting set)

Mounting set	Order no.
For protection rating IP66 | IP67 for wall and mast mounting (Ø 50...150 mm)	**E90001**

BEST FRIENDS

edgeGateway control cabinet
Connection of the sensor level to the cloud

edgeGateway field applications
Connection of the sensor level to the cloud

moneo|Cloud
IIoT solution in the cloud

For further technical details, please visit: ifm.com/fs/ae9000

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Turning data into information

Software moneo|IIoT Core

- Visualising or analysing production processes and monitoring deviations in real time
- Predicting impending failures and preventing unplanned downtime
- Simple maintenance planning thanks to easy connection to SAP

IO-Link

ifm – close to you!

From parameter setting to condition monitoring

The **moneo|IIoT Core** is the basis of the **moneo** IIoT platform and bundles the most important functions. Whether as a cloud solution or in an on-premises environment: the **moneo|IIoT Core** enables uncomplicated, manufacturer-independent parameter setting of IO-Link sensors and an increasing number of IO-Link masters. With the intuitive drag-and-drop interface, user-defined dashboards for machines and processes can be created in no time at all to clearly visualise the collected data. Comprehensive data analyses provide valuable insights that help to increase efficiency, productivity and safety. If there are deviations from the target status, the software informs you immediately so that measures can be taken in good time to avoid efficiency losses or unplanned production downtimes.

From sensor level to cloud

The **moneo|IIoT Core** also offers seamless transmission of important process data to cloud and third-party applications. Tickets created in moneo can be automatically forwarded to predefined target systems. Maintenance teams are notified in real time via the integrated SAP connection. Orders and documents can be generated directly in the SAP system – end-to-end integration of shop floor data into the ERP world.

Remote maintenance with moneo|Cloud

With **moneo|remoteConnect**, it is possible to establish secure and manufacturer-independent remote access to PLCs, servers, sensors and other network devices from **moneo|Cloud**. Thanks to end-to-end encryption and targeted access configurations, data remains protected at all times. Remote maintenance and in-depth fault analyses can be carried out using the cloud. This helps to plan on-site maintenance efficiently and effectively and to reduce it to a minimum. This reduces the workload for specialised personnel and keeps machine availability high.

Add-ons expand the range of services

The range of services offered by the **moneo** IIoT platform can be expanded with add-ons such as **moneo|IIoT Insights**.

Description	Order no.
Cloud solution	
moneo|IIoT Core Cloud	**QCM100**
On-premise solution	
moneo|IIoT Core On-Premises	**QM9112**

Not yet available in all countries.

BEST FRIENDS

moneo|IIoT Insights
AI-supported data analysis and track & trace solution

IO-Link master
Field-compatible masters with Profinet interface

Vibration diagnostics
Diagnostic electronics for decentralised use

For further technical details, please visit: ifm.com/fs/QCM100

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Put an end to nasty surprises

Software add-on moneo|IIoT Insights

- Anomaly detection and automatic damage diagnostics for avoidance of unnecessary downtime
- Central localisation and tracking of objects in production and intralogistics
- Data-based optimisation of production processes and plant utilisation

AI TECHNOLOGY

IO-Link

ifm – close to you!

Comprehensive predictive maintenance thanks to AI

moneo|IIoT Insights is a software add-on for the **moneo** IIoT platform and complements the **moneo|IIoT Core**. The add-on makes it possible to analyse real-time data from production with the help of artificial intelligence.

The Industrial AI Assistant uses intelligent AI algorithms to automatically determine thresholds for individual plant behaviours in dynamic industrial processes. It can also predict the remaining service life of consumable components such as filters. If the software detects deviations from the target status, the user is informed immediately in the software.

Specific recommendations for maintenance

The asset health function complements moneo's software-supported maintenance approach with an automated damage analysis that provides specific repair recommendations for maintenance. This helps plant operators to identify maintenance requirements at an early stage and intervene in good time before efficiency losses or unplanned downtimes occur.

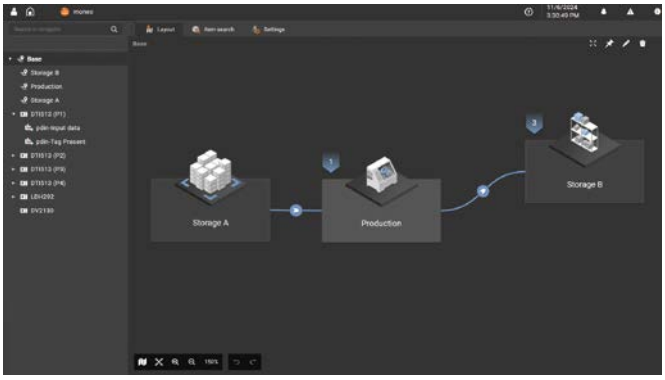
Full transparency in the inventory management process

In addition, **moneo|IIoT Insights** enables precise insights into current and past goods movements and production processes with the track & trace solution. Functions such as live localisation, KPI monitoring and fast search functions help to minimise bottlenecks and downtimes. A user-friendly drag-and-drop interface ensures intuitive operation.

The add-on can be operated both in the cloud version and in the on-premises environment of **moneo|IIoT Core**.

Description	Order no.
Cloud solution	
Software add-on **moneo|IIoT Insights** Cloud	**QCM500**
Required basic software **moneo|IIoT Core** Cloud	**QCM100**
On-premises solution	
Software add-on **moneo|IIoT Insights** On-Premises	**QM9113**
Required basic software **moneo|IIoT Core** On-Premises	**QM9112**

Not yet available in all countries.



The stations of your own intralogistics can be easily created and arranged in moneo|Track & Trace.

BEST FRIENDS

moneo|IIoT Core
IIoT software for simple condition monitoring

Vibration diagnostics
Diagnostic electronics for decentralised use

RFID compact device
For RFID tag detection in product tracking

For further technical details, please visit: ifm.com/fs/QCM500

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Making the right move

ifm mate: assistance system for manual workstations

- AI-based system helps with assembly and packaging activities
- Intuitive user guidance simplifies set-up and everyday handling
- Further information on work steps facilitates the learning process
- No additional tracking items such as wristbands or VR glasses required

ifm – close to you!

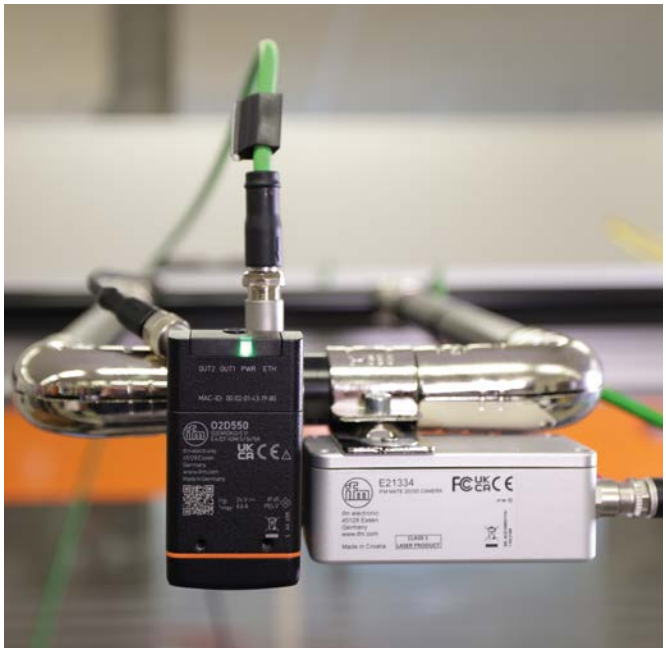
Support, the easy way

With **ifm mate** you gain a patient and – theoretically – omniscient colleague for your manual workstations. Whether assembly work or packaging tasks: With **ifm mate** you can define, explain and carry out every manual work process step by step.

The core of the system is an AI algorithm that recognises the worker's hands in combination with the camera mounted above the workstation – without additional and obstructive gadgets such as wristbands or VR glasses. The defined workflow of the process is shown on the display, as well as optional supporting content such as videos or graphics.

Quality assurance with a learning effect

mate also clearly indicates deviations from the defined workflow. The missed process step is repeated until it has been carried out correctly. This improves the learning curve for the worker and ensures a high quality of execution.



Description	Order no.
ifm mate worker assistance system	**OXZ100**
Event Logger for ifm mate	**OXZ001**

New opportunities for process optimisation

With the "Event Logger" licence extension, recurring errors and time-consuming sequences in assembly workflows can be easily identified. This helps to make production instructions clearer and further optimise manual work efficiency.

Sensor integration and central library

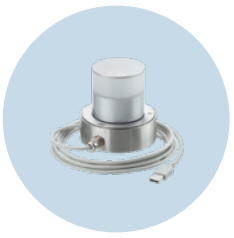
O2D5 vision sensors can be seamlessly integrated into **mate** for even more effective quality control of the workpieces, for example via target/actual contour analysis. Via REST API, the system can communicate with higher-level IT infrastructure and transmit information about the current order status or assembly progress. Dialogue with SAP is also possible so that order planning can be done centrally for the individual systems.

Learn more about the range of functions at **mate.ifm**.

BEST FRIENDS

O2D5 2D vision sensor
For the analysis of surfaces and contours

Monitor with touch panel
For display and operation of ifm mate



Signal lamp
LED lamp with USB connection for visual status indication

For further technical details, please visit: ifm.com/fs/OXZ100

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Protected signal transmission

Screened ecolink M12 cables for machine tools

- Resistant to oils and coolants
- Protected against electromagnetic interference
- Accurate and tight mounting by hand
- Permanently secured against loosening caused by vibration

IP69K

ifm – close to you!

Version	Straight connector	Straight connector	Straight connector	Straight connector / straight socket	Straight connector / straight socket	Straight connector / straight socket
	4 pins	5 pins	5 pins	4 pins	5 pins	4 pins
	Screened	Screened	Screen connected to the housing	Screen connected to the housing on both sides	Screen connected to the housing on both sides	Screen connected to the socket
2 m	**EVCB34**	**EVCB39**	**EVCB44**	**EVCB49**	**EVCB55**	-
5 m	**EVCB35**	**EVCB40**	**EVCB45**	**EVCB50**	**EVCB56**	**EVCB54**
10 m	**EVCB36**	**EVCB41**	**EVCB46**	**EVCB51**	**EVCB57**	-
15 m	**EVCB37**	**EVCB42**	**EVCB47**	**EVCB52**	**EVCB58**	-
25 m	**EVCB38**	**EVCB43**	**EVCB48**	**EVCB53**	**EVCB59**	-

Protecting sensitive signals

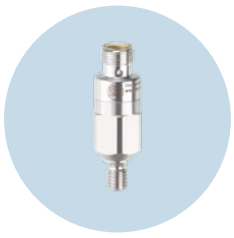
In industrial production facilities, screened connection cables are indispensable for the transmission of analogue sensor signals, as these are sensitive to electromagnetic interference. Sources of interference such as machines and frequency converters can cause signal noise or distortion, which can falsify measured data. Screening protects the signals from such influences, ensuring precise data transmission. This is essential to ensure controller accuracy, production quality and operational safety.

What makes ecolink special

ecolink is a connector solution developed by ifm that stands out for its excellent reliability and durability. Thanks to its sophisticated design, the seal remains reliable over time, even with toolless mounting. A mechanical end stop protects against over-tightening and, together with the integral O-ring, provides for optimum sealing. What is more, a vibration protection with saw-tooth contour ensures that the nut remains securely fixed even under shock and vibration loads. ecolink stands for quality and safety in demanding industrial applications and is compatible with industrial M8 and M12 connections.

Technical data		
Operating voltage	[V AC / V DC]	< 50 / < 60
Total current rating	[A]	4
Core cross-section	[mm²]	0.34
Ambient temperature	[°C]	-25…90
Moulded body material Coupling nut Cable		TPU nickel-plated brass PUR
Protection rating		IP67, IP68, IP69K

BEST FRIENDS



VSA acceleration sensor
Robust vibration sensor with high protection rating

Vibration monitor
Intuitive switch point setting via setting rings

IO-Link converter
Conversion between analogue and IO-Link signals

For further technical details, please visit: ifm.com/fs/EVCB34

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Protected from radiation and moisture

Screened ecolink M12 cables for wet areas

- Resistant to cleaning agents used in the food and beverage industry
- Protected against electromagnetic interference
- Accurate and tight mounting by hand
- Permanently secured against loosening caused by vibration

IP69K

ifm – close to you!

Version	Straight socket	Straight socket	Straight socket	Straight socket	Straight connector / straight socket	Straight connector / straight socket
	4 pins	5 pins	4 pins	5 pins	4 pins	5 pins
	Screened	Screened	Screen connected to the housing	Screen connected to the housing	Screen connected to the housing on both sides	Screen connected to the housing on both sides
2 m	**EVF381**	**EVF389**	**EVF397**	**EVF405**	**EVF700**	**EVF705**
5 m	**EVF382**	**EVF390**	**EVF398**	**EVF406**	**EVF701**	**EVF706**
10 m	**EVF383**	**EVF391**	**EVF399**	**EVF407**	**EVF702**	**EVF707**
15 m	**EVF416**	**EVF710**	**EVF698**	**EVF699**	**EVF703**	**EVF708**
25 m	**EVF384**	**EVF392**	**EVF400**	**EVF408**	**EVF704**	**EVF709**

Protecting sensitive signals

In food and beverage production facilities, screened connection cables are indispensable for the transmission of analogue sensor signals, as these are sensitive to electromagnetic interference. Sources of interference such as machines and frequency converters can cause signal noise or distortion, which can falsify measured data. Screening protects the signals from such influences, ensuring precise data transmission. This is essential to ensure controller accuracy, production quality and operational safety.

What makes ecolink special

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Technical data		
Operating voltage	[V AC / V DC]	< 50 / < 60
Total current rating	[A]	4
Core cross-section	[mm²]	0.34
Ambient temperature	[°C]	-25…100
Moulded body material Coupling nut Cable		PP Stainless steel 1.4404 MPPE
Protection rating		IP67, IP68, IP69K

BEST FRIENDS

Vibration transmitter
Permanent monitoring of the overall vibration level

VSA acceleration sensor
Robust vibration sensor with high protection rating

IO-Link converter
Analogue converter especially for the food industry

For further technical details, please visit: ifm.com/fs/EVF381

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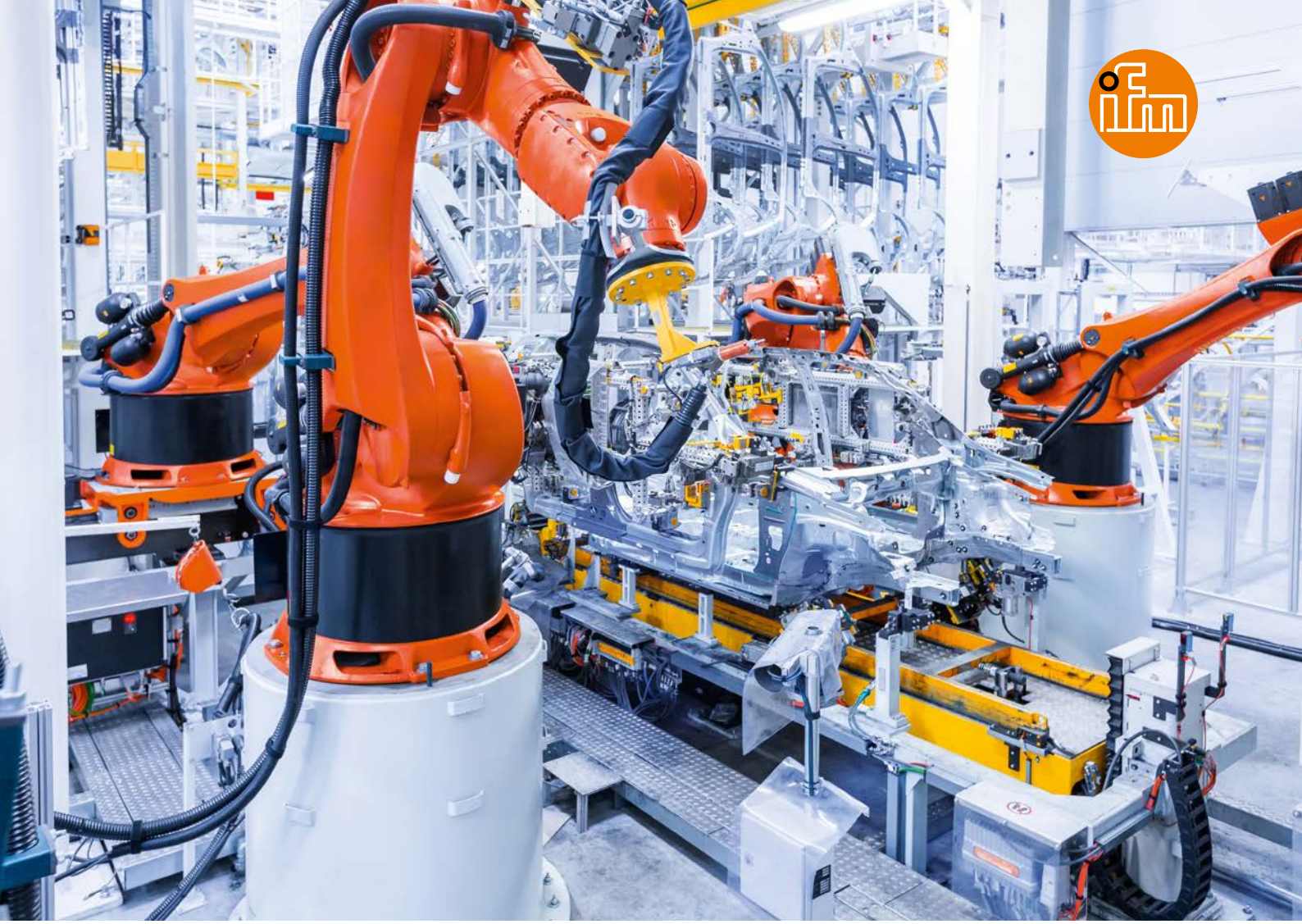


Current all around

L-coded 16 A power distributors

- Field modules with reliable ecolink M12 screw connection
- Robust thanks to full potting
- Permanently reliable sealing even when fastened by hand
- Versions for coolant and food applications

IP67 IP69K

ifm – close to you!

Application	Protection rating	Housing material	Socket / connector	Order no.
Coolant	IP67	PA orange	nickel-plated brass	**EBC171**
Food	IP69K	PA grey	stainless steel	**EBF017**

For powerful consumers

The L-coded passive power distributors are similar in principle to "multiple sockets" and provide a load capacity of up to 16 A. This makes them ideal for supplying powerful devices such as valve heads, quarter-turn sensors, motor controls, IO-Link masters or control components.

They are often connected directly to power supply units in order to increase the number of available outputs. However, thanks to convenient distribution options, the modules can also be used flexibly in the field to supply devices with power.

Robust for demanding applications

The fully potted modules and the ecolink M12 connectors are specially developed to withstand shock and vibration loads over the long term. Another advantage: The ecolink connections are compatible with all common M12 connectors used in industrial applications. For maximum ingress resistance, the use of ifm ecolink connectors is recommended.

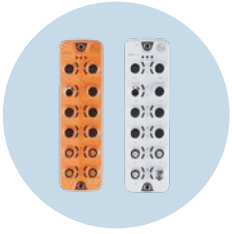
The version with grey housing is optimally adapted to the requirements of the food and beverage industry. The robust PA housing, the stainless steel connectors and the high protection rating IP69K ensure reliable operation even with frequent and intensive cleaning processes.

Technical data		
Operating voltage	[V DC]	20...30
Current rating		16 A (US) 16 A (UA)
Ambient temperature	[°C]	-25…60

BEST FRIENDS

IP67 power supply
24 volt supply in the field, controllable via IO-Link

L-coded jumpers
Large cable cross-section for transmitting high currents



IO-Link masters
Field-compatible PerformanceLine, up to 2 A per port

For further technical details, please visit: ifm.com/fs/EBC171

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Square-shaped design, easy-to-use and always tight

DIN A valve plug with ecolink technology

- All the benefits of the tried-and-tested M12 ecolink technology can now also be found on valve plugs
- Maximum tightness and fastening by hand
- Protection against unintended loosening, e.g. caused by vibration
- Status LED ring that is visible from all sides

IP69K

ifm – close to you!

Cable length [m]	Order no.		
	Connection cable with straight connector	Connection cable with angled connector	Connection cable with open cable end
0.3	**EVCB06**	**EVCB14**	**EVCB22**
0.6	**EVCB07**	**EVCB15**	**EVCB23**
1	**EVCB08**	**EVCB16**	**EVCB24**
1.5	**EVCB09**	**EVCB17**	**EVCB25**
2	**EVCB10**	**EVCB18**	**EVCB26**
3	**EVCB11**	**EVCB19**	**EVCB27**
5	**EVCB12**	**EVCB20**	**EVCB28**
10	**EVCB13**	**EVCB21**	**EVCB29**

Valve plugs now also feature all the benefits of ecolink

Fastening by hand

The special contour of the central fastening screw allows fastening by hand to the optimum tightening torque. An end stop prevents over-tightening, while recesses provide a secure grip.

Protection against unintended loosening

Unintended loosening of the centre screw, even in the event of vibrations, is prevented by a lock-in-place mechanism.

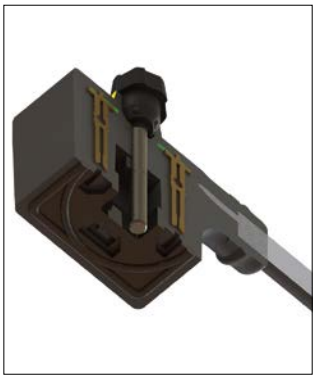
LED display

The LED ring that is visible from all sides combines status display and sealing function.

Optimum sealing

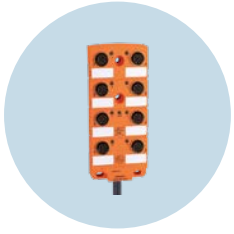
The mechanical end stop compresses the seal to a maximum of 30 %, thus ensuring maximum protection against moisture. The seal is captive and compatible with various counter contours.

Technical data	
Overvoltage protection	yes (VDR)
Housing material	PA
Sealing material	HNBR
Connection cable material	PUR
Protection rating	IP67, IP69K



The reliable ecolink connection technology is now also available for plug connectors.

BEST FRIENDS



Splitter box
Distributed integration of sensors and actuators

ioControl
Decentralised connection of sensors, freely programmable

Y-splitter
For various inputs and outputs in confined spaces

For further technical details, please visit: ifm.com/fs/EVCB06

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Intelligent voltage supply

Directly in the field

- Field mounting reduces voltage losses due to long cable runs
- No control cabinet required thanks to protection class IP67
- Outputs protected by electronic fuses
- Output voltage adjustable, current for each output can be set separately
- Status and diagnostic LEDs

IP67

IO-Link

ifm – close to you!

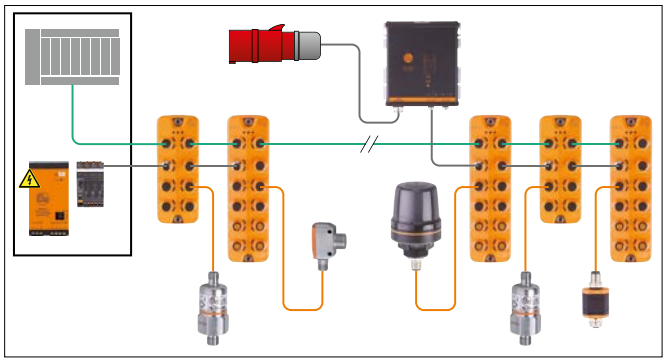
Operating voltage [V AC]	IO-Link	Output power (permanent) [W]	Number of output circuits	Plug for output circuits	Order no.
380...480 ±15% (3-phase)	–	500	4	2x M12, L-coded	**DN4234**
380...480 ±15% (3-phase)	•	500	4	2x M12, L-coded	**DN4237**
110...250 ±15% (1-phase)	•	300	4	2x M12, A-coded	**DN4218**
110...250 ±15% (1-phase)	•	200	2	1x M12, A-coded	**DN4217**

Power supply directly in the field

More and more users mount control components decentrally on the machine instead of in the control cabinet, for example IO-Link masters or other field modules.
With classic power supply from the control cabinet, critical voltage drops occur due to the high currents through the long cables. To prevent this, ifm offers a powerful power supply for mounting directly in the field.

Protection in the secondary circuit

Integrated electronic fuses reliably protect the components connected to the 24 V power supply against excessive current and short circuits.



Use of the power supply directly in the field

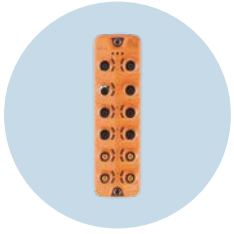
More reliability

Electronic fuses reliably detect short circuits even with high line resistances. Due to the four individually fused output circuits, a faulty circuit is selectively switched off, the intact circuits continue to function reliably.
Even with high current peaks, such as when switching capacitive loads, the supply is guaranteed.

Additional IO-Link functions

- Setting of the output voltage
- Transmission of the actual voltage on the primary and secondary side
- Transmission of the present current per channel
- Transmission of the triggered channel in case of a fault
- Resetting of the triggered channel

BEST FRIENDS



IO-Link masters
Field-compatible PerformanceLine, up to 2 A per port

IO-Link M12 modules
Connection of binary sensors to IO-Link masters

Vibration diagnostics
Diagnostic electronics for decentralised use

For further technical details,please visit: ifm.com/fs/DN4234

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Turning the dream of clockwork into reality

How the IIoT can help you achieve a perfectly synchronised supply chain

Reference 57260, Aeternitas Mega 4, Calibre 89. If this name gets you excited, then you are definitely someone who is fascinated by the art of watchmaking. And that is totally understandable. It really is incredible to see how countless complications – as a horologist calls the different functions of a watch – can be implemented in such a small space. It's all down to precise interaction of cogs, springs, levers and shafts. Of course, a work of art like this doesn't come about overnight.
It took around eight years for the 2,826 components of the Reference 57260 to be conceived, developed, produced and assembled, resulting in no less than 31 hands that provide 57 different functions. Sorry, we mean complications.

Complicated? It doesn't have to be that way.

The issue of time (and unfortunately sometimes also the issue of complications) plays a crucial role in supply chain management. Every unused or wasted unit of time costs money. Efficiency is to a supply chain manager what perfection is to a watchmaker. And they are essentially one and the same thing. To achieve maximum efficiency, all the units involved need to engage perfectly with one another, like clockwork, at all times. That is the only way to deliver the best possible results across all functions – ideally without any complications getting in the way. It sounds complicated but it's not really. At least not if you look for experienced supply chain specialists to perform the task, just like a watchmaker. They have perfected the craft of composing and synchronising all the cogs in the supply chain over many decades.

The first bit of good news is that you've already found these experts. The second bit of good news is that our seamless combination of sensors and software can turn your dream of perfectly clean, well-oiled and pleasantly whirring clockwork into a reality much more quickly than the example we talked about earlier.

Bringing two worlds together: GIB SCX meets Industry 4.0

How does it work? Very easy: We bring the production and IT levels closer together, ideally using existing frameworks. No matter whether we are talking about machine maintenance requirements, production capacity or intralogistic material flows: in Industry 4.0 they are all recorded using sensors, forwarded to the IT level and converted into readable information, for example using the moneo IIoT software. Our native "Shop Floor Integration" interface sends the information to SAP in real time. There, thanks to our "GIB SCX" supply chain solution, which also has native SAP integration and certification, all of the operational and strategic units involved access the exact same standardised data. This creates transparency and ensures that all subprocesses are perfectly synchronised. This means that everyone from purchasing to shipping can respond very quickly to even unscheduled maintenance requirements or spur-of-the-moment large orders. Everything is integrated and coordinated.

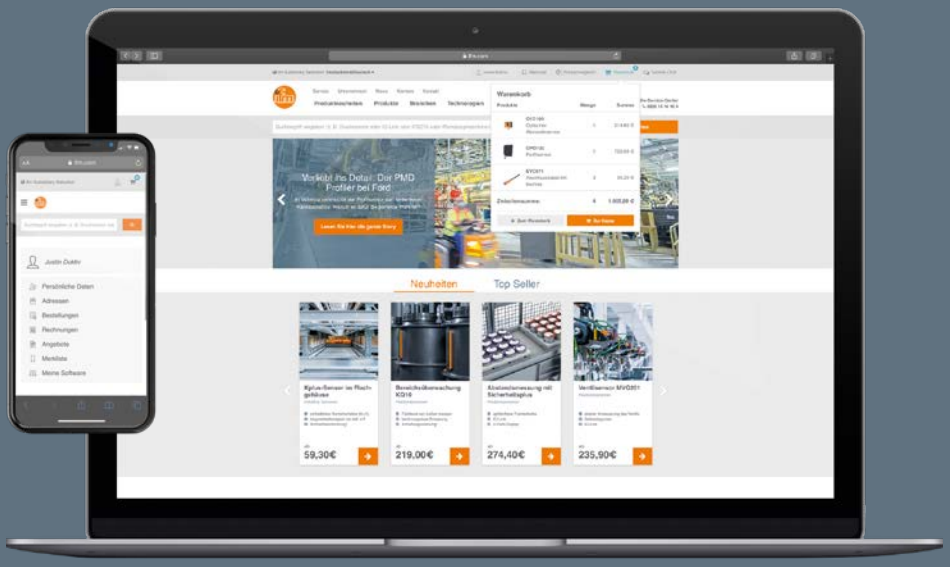
One cog engages with the other. Complex operations that were previously carried out manually run automatically in the background. Like the delicate work of art behind a clock face. An onlooker only sees the information displayed. But they know that the clockwork is running.

Precisely, cleanly and reliably. We turn the dream into a reality.

Everything the automation heart desires.

The online shop: Find more, search less.

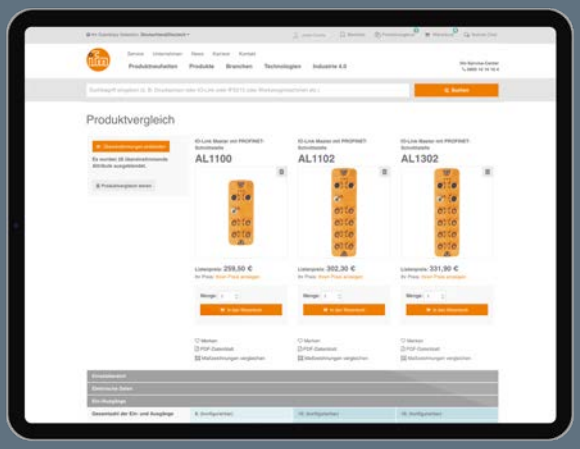
Where does efficient plant automation start? We think: when shopping! And that's why our online shop is designed to guide you to your desired product as quickly as possible. At the same time, we also want to offer you maximum service when shopping online. For example, the selectors help you to narrow down the search to the suitable product versions. In your personal my ifm account you can easily import comprehensive order lists, create your own offers in no time and convert them into an order with just one click.



Products, accessories and interesting facts

Are you looking for the suitable accessories for your product? No problem! We have compiled everything you need to know about installation, parameter setting and set-up and added it to the respective product page. Of course, in our online shop you will also find lots of interesting information about the technologies in our sensors, inspiration in the form of application reports, factory certificates for free download, and, and, and...

So if you are thinking about how to shop more efficiently, a visit to ifm.com is definitely worthwhile!



More transparency: Search for products, select, compare, get a support opinion, choose – and buy at your individual price.

More efficiency: Import order lists, create favourites, place previous orders again.

More flexibility: You decide how you pay and when we deliver. If you are in a hurry: use our express shipping.

More you: Create offers yourself, convert them into orders with one click, track shipments and status, save and retrieve invoices. my ifm – it's yours!

More future: Digitisation, Industry 4.0, finding solutions, downloading software, managing licences – all in one place.

More time: No closing times, no nasty surprises, shopping at any time, always up-to-date availability – and a reassuring 6 weeks' right of return.

That's it? Not by far!

Our entire product portfolio is available online!

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