



# Technology for Mining Industry



[ifm.com/mining](https://ifm.com/mining)



### ifm – your partner for mining industry



The ifm group of companies stands for a large range of different sensors and systems for automation technology.

For more than 50 years the family-run company has been researching, developing and producing with the aim of optimising technical processes and conserving resources.

With industry and application know-how, ifm electronic - one of the leading manufacturers of automation technology - provides successful system solutions that are both innovative and economical.

A product range which meanwhile amounts to more than 7800 articles provides sufficient flexibility to meet customer requirements in the most varied industries: from an individual sensor, matching accessories to a complete system solution. Of course, all relevant approvals are available.

As one of the global players, ifm guarantees worldwide availability of the units. More than 70 branch offices worldwide ensure competent advice on-site.

ifm - close to you!





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## ifm electronic portrait

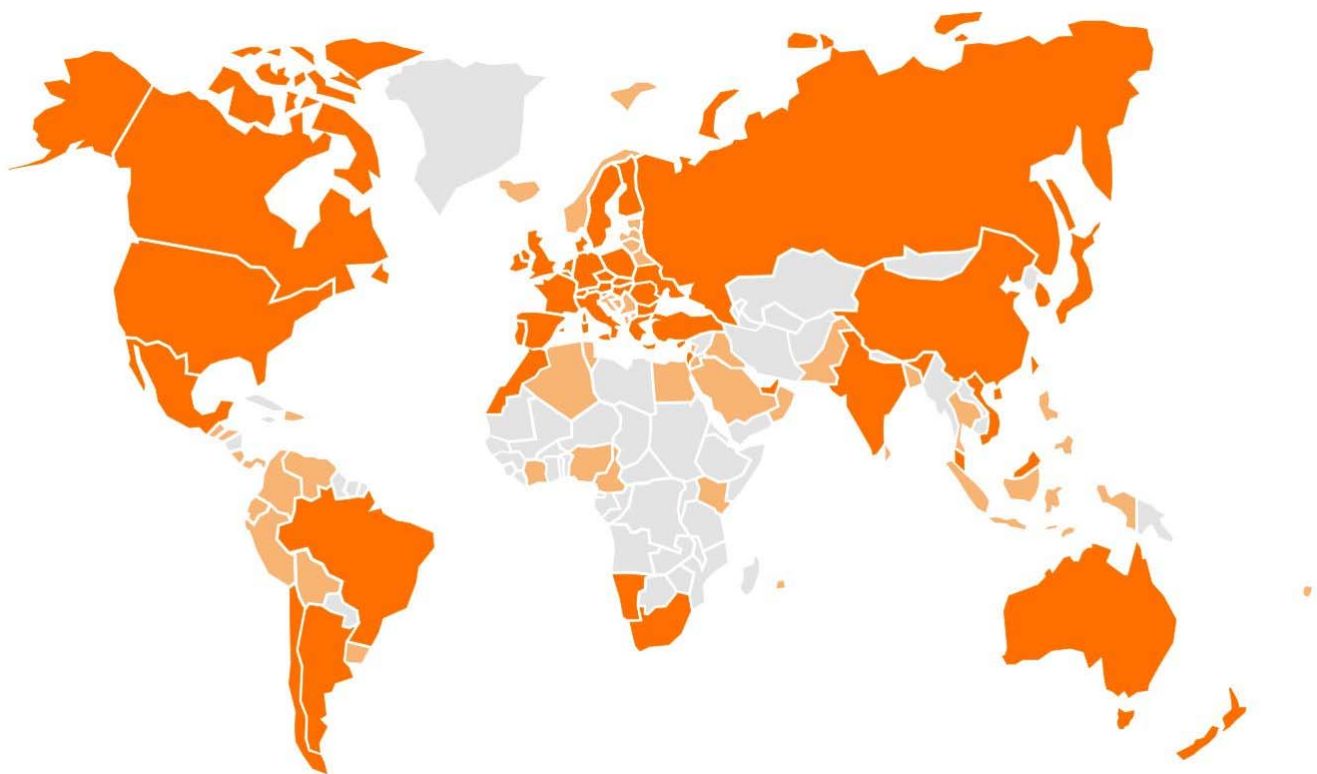
Close customer contact - presence with potential.

The customer has been at the focus of our activities since the company was founded in 1969.

More than 7,300 employees

Competent local support for more than 174,000 customers in more than 95 countries – close to you!

More than 2,500 customers worldwide receive our personal attention every day.  
98 % of sales are direct sales.



■ ifm subsidiary  
■ trade partner



## ifm local services

- More than 3.500 customers daily are consulted with competent on-site customer and application support by more than 1.700 sales engineers and service staff worldwide.
- Workshops and seminars for our customers.
- The ifm service center: 85 % of the calls worldwide are directly answered - without waiting loop.
- The ifm internet service:  
All the important information in 23 languages can be directly accessed worldwide.
- The ifm delivery service:  
98 % of the catalogue units are available worldwide within max. 4 days

## Industry in focus

In the OEM sector

- conveyor technology
- handling, mounting and robotics
- mobile vehicles
- machine tools

In End User industries

- Automotive industry
- Food industry
- Pharmaceutical, cosmetic and chemical industry
- Steel + Mining industry
- Environmental technology and building automation



## The ifm sales platform



### Overview:

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

### Selectors:

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

### Compare:

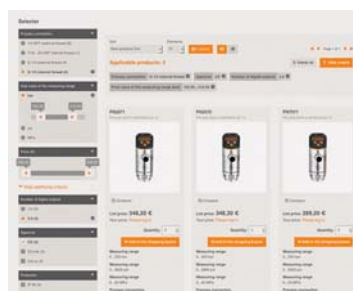
You can compare the technical data of up to 3 products. Differences are marked in colour.

### Search and find:

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

### Order:

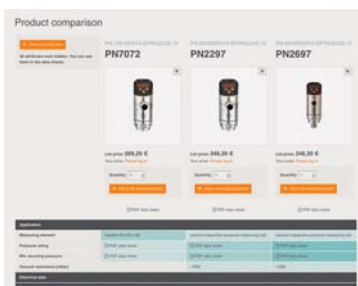
We provide a quick-order and csv import function for the shopping basket on the product pages.



### More clarity

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

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

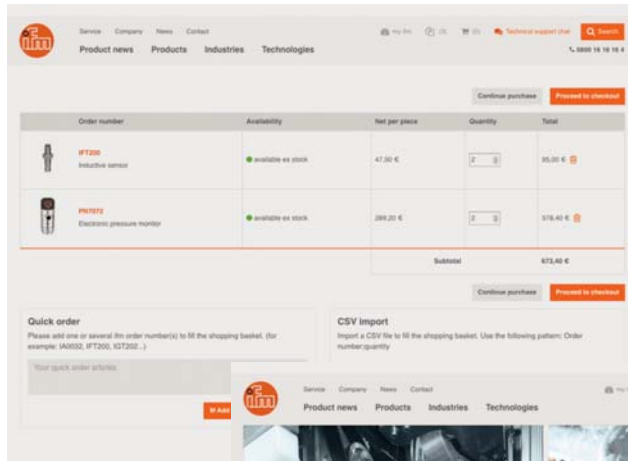


### Compare products with each other

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



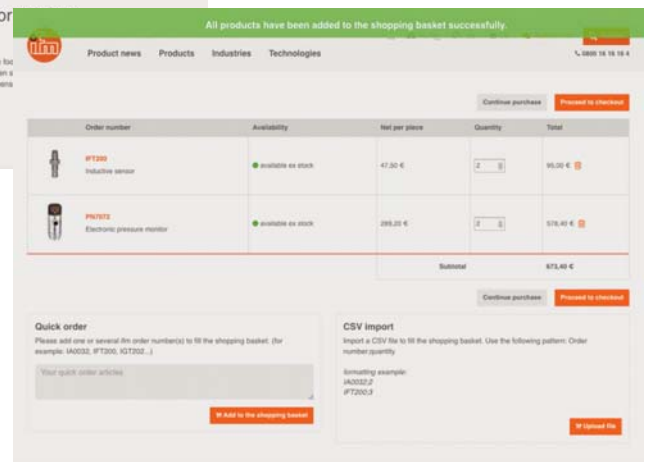
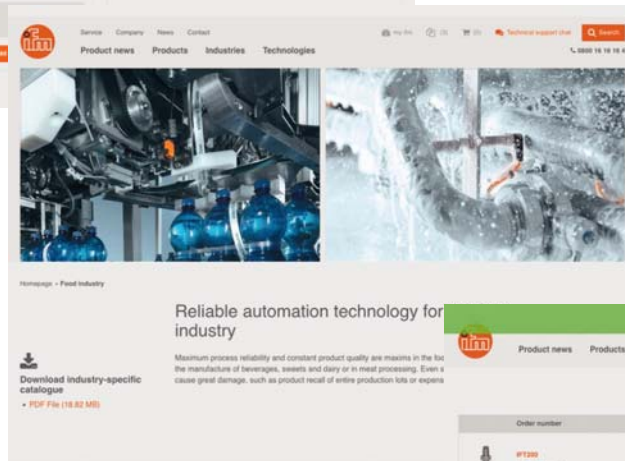
# Technology for Mining Industry



## Easy purchasing

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

Customers relying on long-standing tried-and-tested articles can quickly order by entering the article number in the shopping basket. This saves time, in particular when a product has to be quickly reordered. Navigation in the menu structure is no longer necessary.



## For all types of display

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





# Conveyor control solution

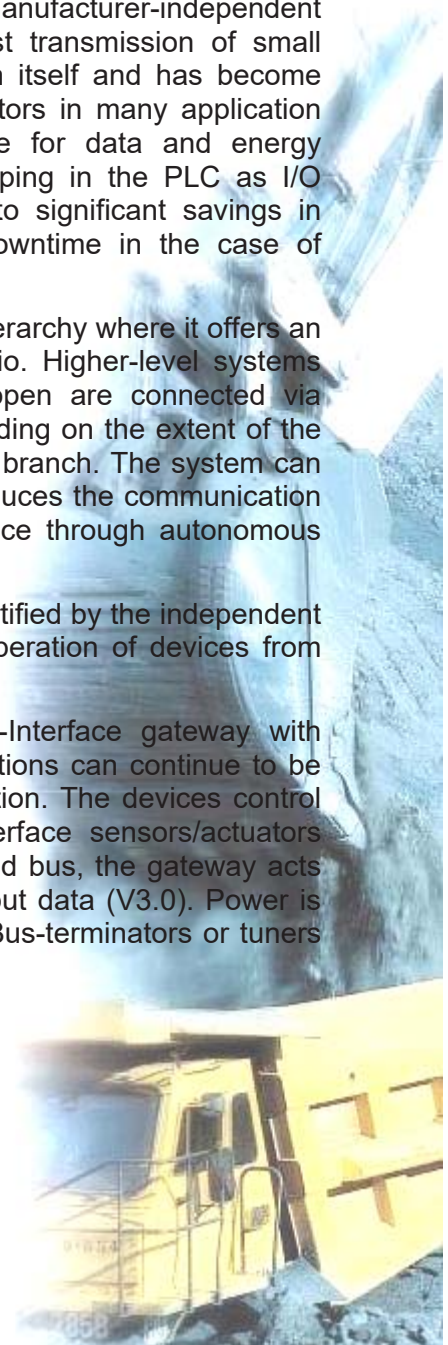
In the mining industry there are lots of raw material conveyors to transport the raw material from underground facilities to the processing plant. The mineral bearing rock has to be moved over a long distance via robust conveyor systems. These conveyors can be longer than 2 km and have to be very flexible due to changing's in the locations of the mining fields. Ifm electronic developed a conveyor control system which allows connection of all the stations of a conveyor system e.g. rope switches, emergency stop switches, belt alignment switches, rip and tear detection, temperature sensors, speed sensors, start-up alarms etc. The conveyor control system is called AS-i (Actuator Sensor Interface).

The Actuator Sensor Interface is a hot-pluggable alternative to conventional wiring technologies that is easy to use and easy to extend. Speed, reduction of installation, plant and maintenance costs, and high availability are features of this manufacturer-independent interface system. The AS-Interface is ideally suited for the robust transmission of small quantities of data under rugged industrial conditions. It has proven itself and has become accepted as the standard for the networking of sensors and actuators in many application areas for economic amongst other reasons. The two-core cable for data and energy transmission, the connection in the clamping technology, the mapping in the PLC as I/O component assembly, and extensive diagnostic possibilities lead to significant savings in project planning, installation, documentation, maintenance, and downtime in the case of failures.

The AS-Interface is designed for the lowest level of the automation hierarchy where it offers an easy, reliable, and fast transfer with optimal price-performance ratio. Higher-level systems such as Profibus DP, EtherNet IP, Profinet, DeviceNet or CANopen are connected via gateways. Decentralised solutions relieve the control system. Depending on the extent of the setup, this permits cycle times of typically 5 ms for one AS-Interface branch. The system can be flexibly extended, may be commissioned in partial areas only, reduces the communication on higher-level field buses and offers an increased failure resistance through autonomous subareas.

The AS-Interface shadow logo designates devices that have been certified by the independent AS-Interface test centre. This permits simultaneous problem-free operation of devices from different manufacturers on one AS-Interface branch.

The heart of the system is the AS-Interface master or the AS-Interface gateway with respective diagnostic possibilities. Current PLC or PC software solutions can continue to be used as the AS-Interface acts like an I/O card in a downward direction. The devices control and monitor the data exchange with the modules and/or AS-Interface sensors/actuators according to the master-slave principle. Viewed from the primary field bus, the gateway acts as slave participant with up to 248 bits of input and 248 bits of output data (V3.0). Power is supplied via AS-Interface power supply units with data decoupling. Bus-terminators or tuners and repeaters permit line extension beyond 100 m.





For this purpose, the repeater separates the primary and secondary side electrically to achieve increased safety in case of a short circuit. An unlimited amount of repeaters may be operated in star configuration but no more than two in sequence. Together with the repeater, a further AS-interface power supply unit must be used to provide power to the additional AS-Interface circuit.

Slaves are available in many designs, binary or analogue, for use in the field, either in a switch cabinet or in the terminal box. For the dust / gas areas, solutions with ATEX approval are also available.

With a manual address-programming device, individual modules can be addressed/configured easily at the desk or directly on site. However, it is also possible to address an entire AS-Interface branch via the AS-Interface master.

Based on the same technology and the same protocol, safety-oriented components such as rope switches, emergency-stop devices, opto-electronic protective devices and safety guard interlocking devices can also be integrated. This only requires the installation of one safety monitor and some safe slaves on the branch.

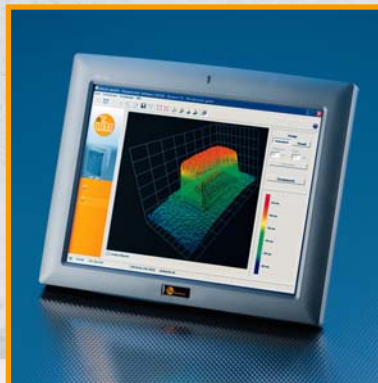
A mixed operation of both safe and nonsafe AS-interface slaves is possible without problems. The safety monitor monitors the data communication on the AS-Interface line. For the safe slaves, dynamic code sequences (8x4-bit data sequence) that are stored in each slave are transmitted. These are "learned" by the safety monitor during commissioning. During operation, the safety monitor compares the expected with the actual sequence in each cycle and carries out a safe shut-down within 40 ms if there are any deviations, e.g., as a result of device failure, communication problems or the like. The time for re-activation is 100 ms. Safe field and switch cabinet modules are available as slaves, including intelligent safety sensors and safety command devices with AS-Interface chip. The system can be used up to Performance Level e according to ISO 13849 or up to SIL 3 according to IEC 61508 and may be used for stop category 0 and 1 according to EN 60204-1.

The conveyor control system consists of the AS-i master, AS-i power supply, the safety monitor/relay device, AS-i cable and various I/O modules (safe and non-safe). The main benefits and features of ifm Electronics conveyor control system is a safe control system that is cost effective, which allows for fast and flexible expansion and status of Rope Pull Switches and Emergency Stop switches are displayed locally by the AS-i master display and also remotely in the PLC and on SCADA.





**Online Vibration  
Diagnostics**



**E2D400 Panel PC**



**AS-i gateways with ultra  
short transfer times**



**The central control  
components of the AS-i  
network**



**Pt100  
Bolt-on sensors**



**ClassicLine: Quickly and  
reliably ready for  
operation due to quick  
mounting technology**



**Safety rope switches and  
belt misalignment solutions  
for conveying automation**



**Belt Speed Monitoring**



**Tilt sensor and  
belt rip & tear detection**





# Keep track even in harsh environments!



- 12.1" touch-screen display with a resolution of 1024 x 768 pixels.
- Windows® 7 Embedded operating system, ifm software pre-installed.
- Wlan and USB 2.0, Gbit LAN, RS-232, RS-422, RS-485 interfaces.
- Robust and industrially-compatible housing with protection rating IP 64 (on the front face).



### Technical data

The industrially compatible small computer is equipped with a 12.1" touch-screen with a resolution of 1024 x 768 pixels. The required performance is achieved by using a fan-less Intel® Atom™ N270 processor with a clock frequency of 1.6 GHz, 2 GB RAM and a 32 GB compact flash card as a robust hard disc substitute.





Windows® 7 Embedded has been installed as operating system, besides the ifm user software, for the vision sensors.

### Industrially-compatible design

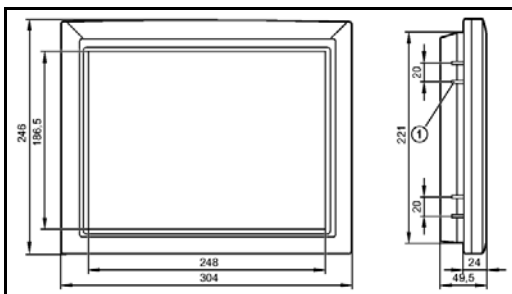
A power consumption of only 32 watts combined with a fan-less design form a sound basis for a continuous use of the display. When installed in the control panel the front face of the plastic housing has a protection rating of IP 64.



## Monitor for object recognition and identification sensors

Type	Description	Order no.
	Touch Panel PC • 12.1" colour display • Intel Atom CPU 1.6 GHz • 2 GByte RAM • 32 GByte Compact flash card • Windows® 7 Embedded • Ambient temperature: -10...50 °C • Weight 1,8 kg • Protection IP 64	<b>E2D400</b>
	Mounting accessories for wall mounting	<b>E2D401</b>
	Mounting accessories for control cabinet mounting	<b>E2D402</b>
	Parameter setting cable • cross-over • 2 m PUR • M12 D-coded / RJ45	<b>E11898</b>

## Dimensions



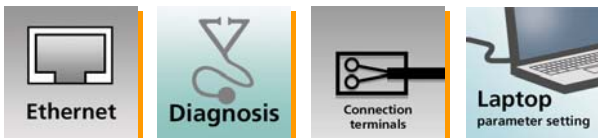
1: Insertion slots for control cabinet mounting



# Diagnostic systems for vibration monitoring of rolling element bearings



- Low-cost permanent vibration monitoring
- Reliable measuring principle by acoustic emission detection
- Condition-based maintenance increases machine uptime
- Easy parameter setting and set-up
- Direct local reading of the bearing condition, progr. switching outputs



## Introduction

The rolling element bearing is a standard element for the construction of machinery and equipment. The correct function of this force-transmitting and moving component is critical for uptime of machinery and equipment. Due to the high dynamic and static loads during operation as well as design limitations the rolling element bearing is often the Achilles' heel with regard to lifetime. Thus unforeseen damage to the bearing often leads to production or quality loss.

State-of-the-art for industrial monitoring of rolling element bearings is presently restricted to the intermittent measurement with handheld measuring instruments and to expensive central measuring systems which due to their enormous acquisition costs only make sense economically for monitoring expensive machines like turbines or large gears.





## Innovative technology

With the ifm efector octavis brings the first vibration sensor with integrated rolling element bearing diagnosis based on frequency analysis on the market. Due to the implementation of a proprietary diagnostic algorithm several different rolling element bearings can be monitored separately and their condition can be displayed via a "green-yellow-red" logic. Monitoring and diagnosis are performed in real time. Thus vibration measurement technology is integrated into automation technology so that expensive expert know-how for a reliable bearing diagnosis is not required. Therefore permanent monitoring of small machines and components is possible for the first time without losing the diagnostic quality of expensive systems.

## Easy parameter setting

For the easy parameter setting of the rolling element bearing monitor, it is only necessary to take the relevant bearing data from the rolling element bearing database. For variable speed drives information on speed must be provided. The speed can either be provided by an analogue signal or a pulse generator connected to the sensor.

## VSE diagnostic electronics







The VSE is a 6-channel diagnostic system designed to evaluate 4 dynamic signals (e.g. rotational acceleration) and 2 analogue inputs. The new VSE15x family provides different fieldbus interfaces to exchange data with a PLC. This makes it possible to display the measuring values directly on the control system and optimally adapt the monitoring functions to the operating states and processes of the machine. In addition to the fieldbus, 2 fast digital switching outputs (response time  $\leq 1$  ms) are provided for time-critical alarms.

## Reduced network complexity saves time and money

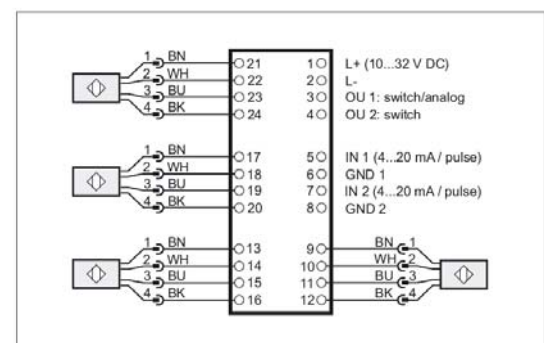
The direct PLC connection via fieldbus allows auxiliary parameters (e.g. rotational speed and triggers for operating states) as well as non-time-critical alarms from condition monitoring to be exchanged over the bus.

This not only reduces wiring complexity but also saves the cost of providing the corresponding inputs/outputs on the PLC.

## The products

Type	Description	Order no.
	Frequency-selective machine monitoring of up to 4 measurement points and 2 other process quantities • Ethernet interface TCP/IP • PC-software required • RMS, a-peak, a-RMS • integrated history function with real-time clock • 2 switching outputs or 1 switching and 1 analogue output • 12 freely configurable counters (operating hours, events, load)	VSE002
	Frequency-selective machine monitoring of up to 4 measurement points and 2 other process quantities • Ethernet interface TCP/IP • PC-software required • RMS, a-peak, a-RMS • integrated history function with real-time clock • 2 switching outputs or 1 switching and 1 analogue output • up to 8 freely configurable I/O • 12 freely configurable counters (operating hours, events, load)	VSE100
	Diagnostic electronics for vibration sensors • total number of inputs and outputs 8 (configurable) • Communication interface Ethernet • Profinet IO	VSE150
	Diagnostic electronics for vibration sensors • total number of inputs and outputs 8 (configurable) • Communication interface Ethernet • Ethernet/IP	VSE151
	Diagnostic electronics for vibration sensors • total number of inputs and outputs 8 (configurable) • Communication interface Ethernet • EtherCAT	VSE152
	Diagnostic electronics for vibration sensors • total number of inputs and outputs 8 (configurable) • Communication interface Ethernet • Modbus TCP	VSE153
	Parameter setting software for VSExxx	VES004
	Jumper • straight / straight • Ethernet • Cross-over patch cable • 2 m • Housing materials: PUR	EC2080
	Jumper • straight / straight • Ethernet • Cross-over patch cable • 5 m • Housing materials: PUR	E30112

Wiring diagram VSE002





# Vibration sensor for diagnostic electronics



- The right enclosure for harsh environmental conditions
- Compact and robust stainless steel housing
- Temperature range -30 to 125 °C
- Integrated self-test







## Sensor type VSA001

The acceleration sensor is used to log measured data especially for the VSE002 octavis diagnostic electronics. The special analogue output ensures the correct transmission of high-frequency vibration signals even over distances of up to 30 m.

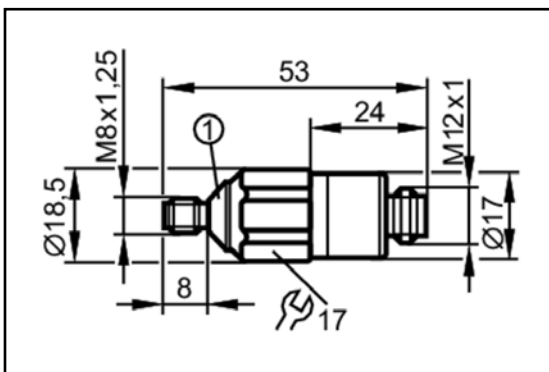
The compact and highly robust design provides good long-term stability even under adverse environmental conditions. Due to the use of modern silicon technology the sensitivity of the sensor is both long-term stable and temperature independent.



## Vibration sensors for connection to external diagnostic electronics VSE

Type	Description	Order no.
	Vibration sensors based on MEMs technology • measuring range +/- 25g • IP 67 / IP 68 / IP 69k • frequency range 0...6000 Hz • linearity 0.2% • overload protection 500g • ambient temperature -30...125°C • M12 connector • recommended cable length 30m	<b>VSA001</b>
	conical washer • Ø 8.4 / 15 mm • stainless steel 316Ti / 1.4571	<b>E30115</b>
	Vibration sensors based on PIEZO technology • measuring range of vibration -50...50 g • frequency range 2...10000 Hz • accuracy ± 5 % • ambient temperature -55...125 °C • IP 67 • M12 connector • set screws included	<b>VSP001</b>
	Cable socket • M12 connector • angled • free from silicone • free from halogen • gold-plated contacts • screened cable • drag chain suitability • IP65 / IP67 / IP 68 / IP 69k • ambient temperature: -25...90 °C • 20 m PUR cable • 4 x 0.34 mm <sup>2</sup>	<b>EVC597</b>

## Dimensions



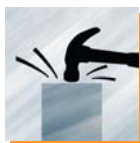




# Continuous vibration monitoring



- Vibration transmitter in stainless steel housing
- 2-wire loop powered
- 4...20 mA signal output
- Robust metal housing provides high protection rating



## The sensor

The vibration transmitter type VT monitors machinery and equipment according to ISO 10816. The sensor measures the true rms velocity of non-rotating component surfaces. The values are then transmitted as an analogue signal (4...20 mA) directly to the PLC.

## The applications





Due to its robust design, high IP Rating as well as the maximum ambient temperature of 105 °C the sensor is suitable for use in harsh environments.

## The installation

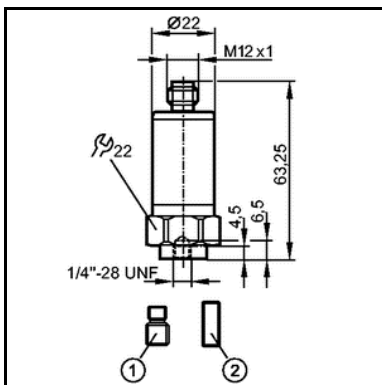
The unit is quick and easy to install. No extra parameter software is required.



## Vibration transmitters for vibration monitoring of machines and plants to ISO 10816

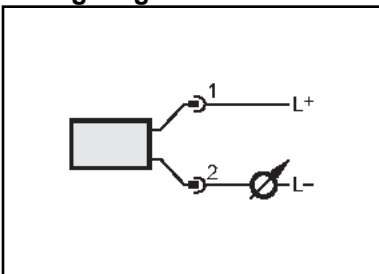
Type	Description	Order no.
	Vibration transmitter • Connection via M12 connector • Vibration transmitter to ISO 10816 • Measuring range veff: 0...25 mm/s • Analogue output 4...20 mA • stainless steel 316L / 1.4404 • Frequency range 10...1000 Hz • Ambient temperature -30...125 °C • IP 67 / IP 68 / IP 69K	<b>VTV122</b>
	Cable socket • M12 connector • angled • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69k • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 0.34 mm <sup>2</sup>	<b>EVC005</b>
	Vibration sensor • analogue 4...20 mA • Total number of inputs and outputs 3 (configurable) • Measuring range of vibration 0...25 g • Frequency range 0...6000 Hz • Ambient temperature -30...60 °C • IP 67 • housing: diecast zinc nickel-plated • connector • 9,6...30 V DC operating voltage	<b>VNB211</b>
	Cable socket • M12 connector • angled • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69k • Ambient temperature: -25...90 °C • 5 m PUR cable • 5 x 0.34 mm <sup>2</sup>	<b>EVC074</b>

### Dimensions VTV122



1), 2) customer specific connection configuration

### Wiring diagram VTV122





# Pt100 bolt-on sensors



- Flexible mounting
- Bolt-on sensors for M6 screws
- Temperature measurement of -25...115 °C
- Precise temperature measurement on machine surfaces using an integrated Pt100 sensor element



## For complex applications with different requirements

Every application has its own requirements as regards the temperature sensors to be used. Criteria such as housing material or mechanical design are as important as the connection to control monitors, plcs or AS-i modules. The housings and materials of the new bolt-on sensors of ifm electronic have been designed for a wide range of applications.






## TS522A for ATEX applications

In addition, the bolt-on sensor TS522A has the ATEX approval to group II, category 3D / 3G.

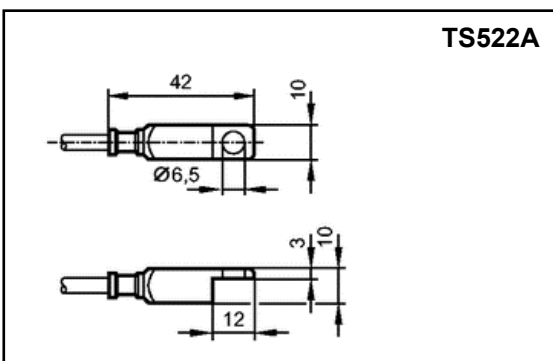
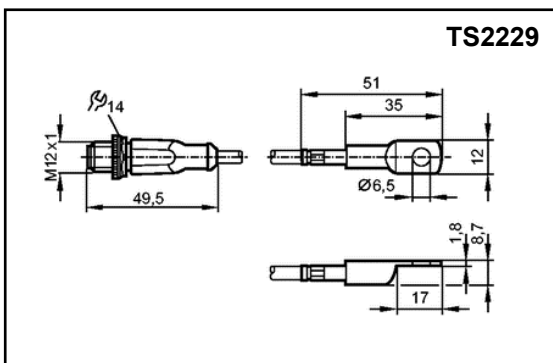




## Pt100 bolt-on sensors

Type	Description	Order no.
	Bolt-on sensor 12 x 8,7 x 51 mm • 2 m PUR cable with connector • halogen-free • free from silicone • gold-plated contacts • Measuring range: -25...90 °C / -13...194 °F • Measuring element: 1 x Pt 100, to DIN EN 60751, class B	<b>TS2229</b>
	Bolt-on sensor 10 x 10 x 42 mm • 5 m silicone cable • ATEX approval Group II, category 3D / 3G • Measuring range for ATEX applications: -20...115 °C / -4...239 °F • Measuring range for standard applications: -20...150 °C / -4...302 °F • Measuring element: 1 x Pt 100, to DIN EN 60751, class A	<b>TS522A</b>
	Measured signal converter for temperature sensors, Pt100 and Pt1000 measuring elements • Analogue output 4...20 mA • IP 67 • Ambient temperature -25...70 °C • Measuring range: -50...150 °C • M12 connector	<b>TP3231</b>
	Wireable plug • M12 connector • straight • free from silicone • gold-plated contacts • IP65 / IP67 / IP 68 / IP69K • Ambient temperature: -25...90 °C	<b>EVC812</b>
	Wireable plug • M12 connector • angled • free from silicone • gold-plated contacts • IP65 / IP67 / IP 68 / IP69K • Ambient temperature: -25...90 °C	<b>EVC813</b>

## Dimensions





# Speed monitor



- Compact speed monitor M18
- Switching output and pulse output
- Sensing range 12 mm [nf]
- non-flush mountable
- 10...36 V operating voltage









## Introduction

The compact speed monitor M18 is suitable for simple speed monitoring for underspeed or blockage on conveyors, elevators and ventilation systems, as overspeed monitors in wind power systems or load monitoring on hoists.

The unit detects without contact if a set rotational speed is exceeded or not reached and signals this by means of a switched output. The pulse output enables the external evaluation of the damping pulses.



## Speed monitor

Type	Description	Order no.
	Compact speed monitor M18 • Switching output and pulse output • Sensing range 12 mm [nf] • IP 67 • Housing materials: stainless steel 316Ti / 1.4571; PBT • setting range: 3...6000 [pulses/min.]	<b>DI6001</b>
	Target wheel • Plastic disk with 8 screws as "target" • Centered drill holes	<b>E89010</b>
	Angle bracket • 2 lock washers (Steel galvanised) • Ø 18 mm (for M18 sensor)	<b>E10736</b>
	Speed monitor • Housing for DIN rail mounting • single pulse evaluation system with µprocessor for frequency • rotational speed • speed and machine cycles • 2 relay outputs • 2 transistor outputs • analogue output, 0/4...20 mA • programmable • Test function without external frequency • Key function • IP 50 • Ambient temperature -40...60 °C • dual-chamber terminals 2 x 2.5 mm <sup>2</sup> (2 x AWG 14) • 24 V DC or 110...240 V AC input voltage	<b>DD2503</b>
	Inductive sensor • M18x1 • Increased sensing range • Electromagnetic-field immune • Correction factor = 1 • DC PNP • Sensing range 8 mm • flush mountable • IP 65 / IP 66 / IP 67 / IP 68 / IP 69K • Ambient temperature -40...85 °C • M12 connector • Gold-plated contacts • 10...30 V DC operating voltage	<b>IGS290</b>
	Cable socket • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 0.34 mm <sup>2</sup>	<b>EVC002</b>

### Applications:

**Conveyor technology in all industries**  
**Mining, machine construction, machine tools,**  
**mills and animal feed plants**

### Unit with integrated sensor

- **Compact speed monitor M18**  
with switching output transistor  
and additional pulse output  
10...36 V DC  
M12 connector  
12 mm sensing range [nf]  
setting range: 3...6000 [pulses/min.]

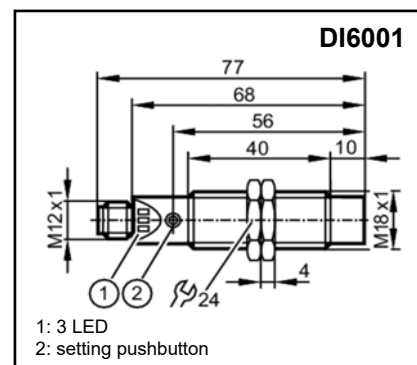
You can adjust:

switch point  
start-up delay  
output function

### Operation

The parameters of the compact speed monitor can be set via an integrated pushbutton. To do so, the rotational speed to be monitored is measured and the switch point is automatically calculated.

### Dimensions





## Compact ultrasonic sensors



- Robust high-grade stainless steel housing for demanding applications
- Sensing range up to 3.5 m in M30 design
- The vibrating sound transducer reduces the deposit of dirt
- Retro-reflective operation for orientation independent object detection
- Easy setting via teach button, wire teach or IO-Link



### The alternative for difficult surfaces

Ultrasonic sensors transmit and receive sound waves in the ultrasonic range. The object to be detected reflects the sound waves and the distance information is determined via time of flight measurement. As opposed to photoelectric sensors colour, transparency or the object's surface shine do not play a role. Blister packages in packaging technology or transparent plastic bowls in the food industry, for example, can be reliably detected.






### High performance

The ifm ultrasonic sensors in M30 design provide a particularly small blind zone and long sensing ranges which are usually only achieved by sensors of a considerably larger design.

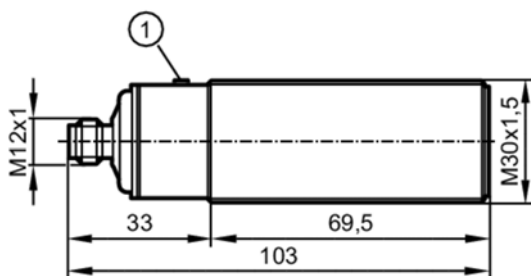
The sensors operate reliably with heavy soiling so that they can be used in applications in which photoelectric sensors meet their limits.



## Ultrasonic diffuse-reflection sensors

Type	Description	Order no.
	Ultrasonic diffuse reflection sensor • M30 x 1.5 / L = 103 mm • Teach function • DC PNP • Output function: 2 x normally open / closed programmable • Sensing range 250...3500 mm • IP 67 • Ambient temperature -20...70 °C • M12 connector • 4-wire • 10...30 V DC operating voltage • IO-Link	<b>UIT500</b>
	Ultrasonic diffuse reflection sensor • M30 x 1.5 / L = 103 mm • Teach function • DC PNP • Output function: 1 x NO / NC programmable + 1 x current output (4...20 mA) • Sensing range 250...3500 mm • IP 67 • Ambient temperature -20...70 °C • M12 connector • 4-wire • 10...30 V DC operating voltage • IO-Link	<b>UIT501</b>
	Ultrasonic diffuse reflection sensor • M30 x 1.5 / L = 103 mm • Teach function • DC PNP • Output function: 1 x NO / NC programmable + 1 x voltage output (0...10 V) • Sensing range 250...3500 mm • IP 67 • Ambient temperature -20...70 °C • M12 connector • 4-wire • 10...30 V DC operating voltage • IO-Link	<b>UIT502</b>
	Cable socket • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69k • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 0.34 mm <sup>2</sup>	<b>EVC002</b>
	Cable socket • M12 connector • angled • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69k • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 0.34 mm <sup>2</sup>	<b>EVC005</b>
	Angle bracket • 2 lock washers (stainless steel) • Ø 31 mm (for M30 sensor)	<b>E10737</b>
	Sound tube for all ultrasonic sensors with M30 thread • material: POM	<b>E23XXX</b>

## Dimensions



1: teach button



# Rope switch for field applications



- Integrated E-stop with blue reset button
- 4 NC safety contacts and 2 NO auxiliary contacts
- Rope tension indicator
- Long rope spans up to 125 m each side possible
- LED function display:  
Operation - LED permanently green  
Error - LED flashing red



## Introduction

The new rope switch is a heavy duty safety rope emergency stop switch designed to protect long conveyor belts. The die-cast housing is robust to survive indoor or outdoor use.

A bi-colour LED ensures switch status can be seen easily from a distance. They have 4 NC and 2 NO contacts to guarantee flexibility with all modern control applications e.g. AS-Interface Safety at Work system.



## Rope switch for field applications

### Application

The safety rope emergency stop switch is used to provide safety-related switching statuses where large danger areas have to be secured and housings or covers are not possible.

Typical applications are conveyor systems and rotating machines and large danger areas.

The safety rope emergency stop switch meets the requirements of EN ISO 13850, IEC / EN 60947-5-1 and IEC / EN 60947-5-5.

The safety rope emergency stop switch can be used in applications up to performance level e according to EN ISO 13849-1.

### Function

Pulling the tensioned rope, rope breakage or impact on the E-stop cause activation of the switching function of the safety rope emergency stop switch.

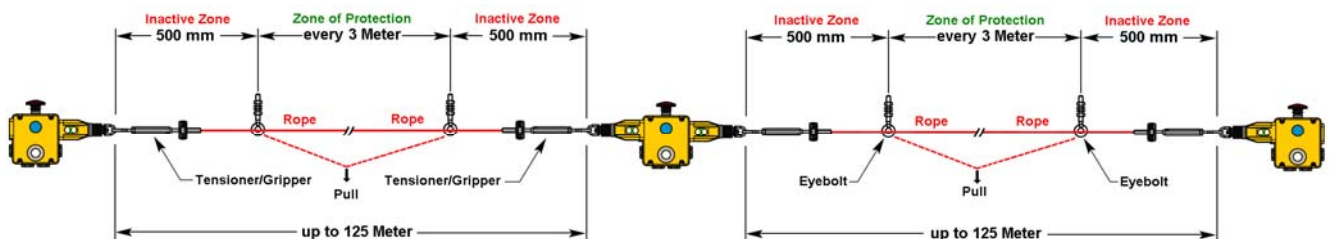
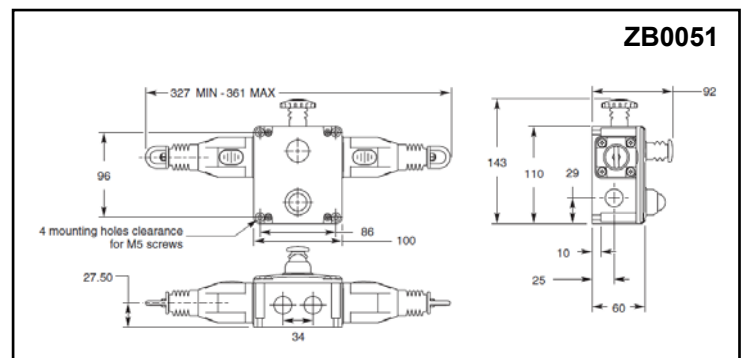
There is a window on the switch via which the correct rope tension can be monitored during setting and maintenance. Setting, troubleshooting and maintenance are made much easier.

After activation of the E-stop function a latching mechanism maintains the E-stop command until it is unlocked manually by pressing the blue reset button. Before resetting the E-stop signal the cause of the activation has to be determined. Reset is only possible with correct rope tension (position indication in middle position).

### Technical data

Safety contacts	4 NC
Auxiliary contacts	2 NO
Termination clamp up to	2.5 mm <sup>2</sup>
max. switching voltage	240 V
max. rope span	125 m
Operating temperature [°C]	-25 ... +80
Cover	yellow
Protecting rating	IP 67




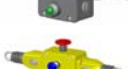






### Dimensions



### Installation of the components









## Rope switch for field applications

Type	Description	Order no.
	Safe rope pull emergency stop switch • dual hand type • 4 NC / 2 NO • no LED • yellow cover • die-cast aluminium	<b>ZB0050</b>
	Safe rope pull emergency stop switch • dual hand type • 4 NC / 2 NO • bi-colour LED 24 V DC • yellow cover • die-cast aluminium	<b>ZB0051</b>
	Safe rope pull emergency stop switch • left hand type • 4 NC / 2 NO • bi-colour LED 24 V DC • yellow cover • die-cast aluminium	<b>ZB0052</b>
	Safe rope pull emergency stop switch • right hand type • 4 NC / 2 NO • bi-colour LED 24 V DC • yellow cover • die-cast aluminium	<b>ZB0053</b>
	Safe rope pull emergency stop switch • dual hand type • 4 NC / 2 NO • bi-colour LED 24 V DC • silver cover • stainless steel 316	<b>ZB0075</b>
	Safe rope pull emergency stop switch • dual hand type • 4 NC / 2 NO • bi-colour LED 110 V AC • silver cover • stainless steel 316	<b>ZB0070</b>
	Safe rope pull emergency stop switch • dual hand type • 4 NC / 2 NO • bi-colour LED 110 V AC • yellow cover • die-cast aluminium	<b>ZB0071</b>
	Safe rope pull emergency stop switch • left hand type • 4 NC / 2 NO • bi-colour LED 110 V AC • yellow cover • die-cast aluminium	<b>ZB0072</b>
	Safe rope pull emergency stop switch • right hand type • 4 NC / 2 NO • bi-colour LED 110 V AC • yellow cover • die-cast aluminium	<b>ZB0073</b>
	Safe rope pull emergency stop switch • dual hand type • 2 NC / 2 NO • no LED • silver cover • stainless steel 316 • ATEX - can be used in Zone 21 + 22 (gas + dust) • [Exd IIC T6 (-20°C ≤ Ta ≤ +60°C) Gb] • [Ex tb IIIC T85°C (-20°C ≤ Ta ≤ +60°C) Db]	<b>ZB0074</b>





## Accessories rope switch

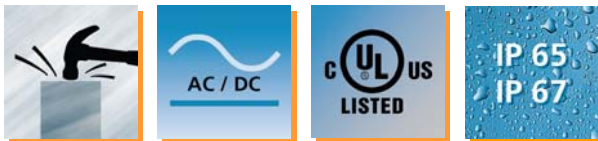
Type	Description	Order no.
	Rope Tension Kit • Stainless Steel, 5m • 1 Tensioner • 1 Allan Key • 3 Eyebolts	ZB0054
	Rope Tension Kit • Stainless Steel, 10m • 1 Tensioner • 1 Allan Key • 5 Eyebolts	ZB0055
	Rope Tension Kit • Stainless Steel, 20m • 1 Tensioner • 1 Allan Key • 9 Eyebolts	ZB0056
	Rope Tension Kit • Stainless Steel, 50m • 1 Tensioner • 1 Allan Key • 20 Eyebolts	ZB0057
	Rope Tension Kit • Stainless Steel, 80m • 2 Tensioner • 1 Allan Key • 30 Eyebolts	ZB0058
	Rope Tension Kit • Stainless Steel, 100m • 2 Tensioner • 1 Allan Key • 37 Eyebolts	ZB0059
	Rope Tension Kit • Stainless Steel, 126m • 2 Tensioner • 1 Allan Key • 45 Eyebolts	ZB0060
	Safety Spring • Stainless Steel	ZB0061
	Universal Pulley • Stainless Steel • reversing the direction of the rope	ZB0062
	Tensioner / Gripper • Stainless Steel	ZB0063
	Replacement LED 24V DC for rope switch • permanently green / red flashing	ZB0064
	Replacement LED 110V AC for rope switch • permanently green / red flashing	ZB0065
	Replacement LED 220V AC for rope switch • permanently green / red flashing	ZB0066
	Replacement mushroom button for rope switch • red • powder coat paint	ZB0068
	Rubber cover for red mushroom button • add. UV protection option	ZB0069
	AS-i safety PCB • connection of mechanical contact and LED components • complies with the requirements: ISO 13849-1 PL e and SIL 3 to EN 62061 / IEC 61508	E7015S
	Adapter plug • straight, M20 to M12 connector	E11295
	Cable gland M20 x 1.5 • black • Material: PA • Sealing: CR	E21010



# Belt drift switch for field applications



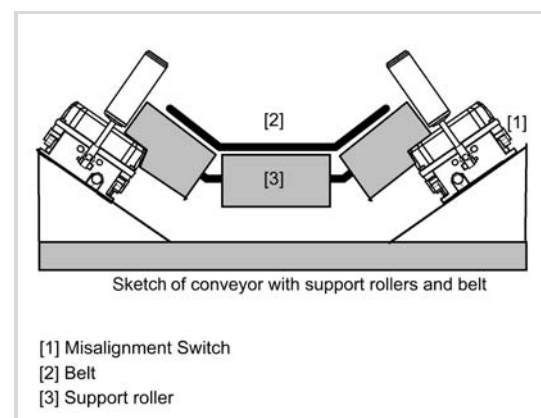
- 2 changeover contacts
- Belt speeds up to 5 m/s
- Cylindrical roller stainless steel, Ø 50 mm
- 2 adjustable switching points: 5° ... 15°, 15° ... 35°
- also available in stainless steel housing



## Introduction

The new belt drift switch is designed for heavy duty application and used for drift monitoring of conveyor belt installations. The belt drift switches are used to protect the installations from damage or destruction in the event of belt drift and are positioned in pairs on both sides of the conveyor belt. The ball bearing stainless steel actuating roller is resistant to wear and is used for belt speeds up to approx. 5 m/s.

The device features a robust aluminum housing and is equipped with 2 force-actuated changeover contacts with snap-action function with two adjustable switching points.





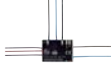

## Belt drift switch for field applications

### Function

Inadmissible belt drift occurs when the belt edge approaches the end of the supporting rollers through lateral movement and surpasses it. Then the actuator (roller lever) is operated and displaced. In case of displacement of the actuator, the cam operating switches are activated.

The switching angle can be set via an adjustable camshaft. In this way, a pre-warning can be implemented in addition to the safety shutdown. As soon as the belt moves correctly, the roller lever will automatically return to its home position.

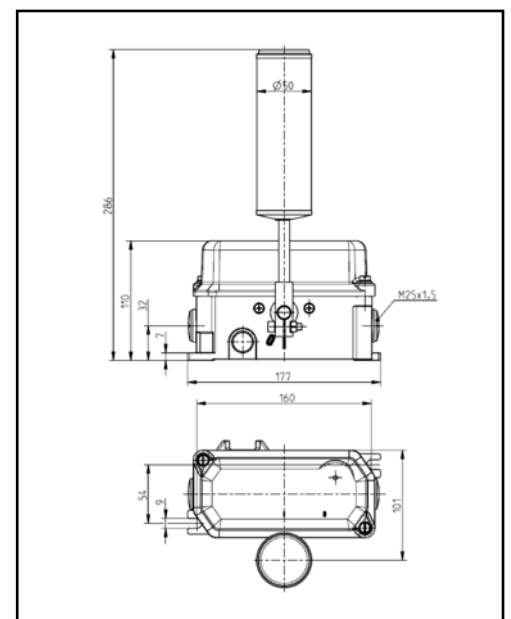
## The products

Type	Description	Order no.
	Belt drift switch • 2 changeover contacts • cylindrical roller stainless steel, Ø 50 mm • yellow cover • housing materials: Aluminium • switching points: default setting: 2 x 10° • conduit entries: M25 x 1,5 • one included • IP65 / IP67	<b>ZB0090</b>
	Replacement actuating roller for belt drift switch, Ø 50 mm • stainless steel	<b>ZB0091</b>
	AS-i pcb • connection of mechanical contacts and LED components	<b>E70529</b>
	Belt drift switch • 2 NC / NO contacts • cylindrical roller stainless steel, Ø 50 mm • silver cover • housing materials: Stainless steel 316 • 2 switching points: default setting: 14° and 25° • conduit entries: M25 x 1,5 • heavy duty • IP67	<b>ZB0093</b>

### Technical data ZB0090

Contacts	2 SPDT
Termination clamp up to	2.5 mm <sup>2</sup>
max. switching voltage	230 V
Thermal current	6 A
Suited fo belt speed up to	5 m/s
Operating temperature [°C]	-25 ... +70
Cover	yellow

## Dimensions



# Belt rip and tear detection for conveyors



- 1 Normally open contact
- 20...30 V DC or 110 / 220 V AC
- Connector cable 2 m
- Push-on sleeve stainless steel, Ø 22,5 mm
- Chain length 2,5 m



## Introduction

Conveyor belts are used where materials need to be transported from A to B, e.g. in the mining, cement, sand and gravel industries. A conveyor belt may get damaged (e.g. by sharp-edged stones / materials) or become worn out during operation. Such damage must be detected and the conveyor belt deactivated.

The new belt rip and tear detection system from ifm electronic is used to detect belt damage.








## Belt rip and tear detection for conveyors

### Function

If only drooping rubber shreds and ropes are to be detected, the monitor is to be installed under the top run. In this case, a tripping chain is tightened across the conveyor belt with one chain end fixed to the conveyor belt structure. The other chain end is inserted into the push-on sleeve with the push-fit fitting. The push-fit fitting is connected to an inductive proximity sensor via a pull-off device. When the tensioned tripping chain is touched by a rubber shred, the push-fit fitting separates from the sensor and an electrical switching operation is triggered.

Pulling the tensioned chain activates the switching function of the belt rip and tear detection system.

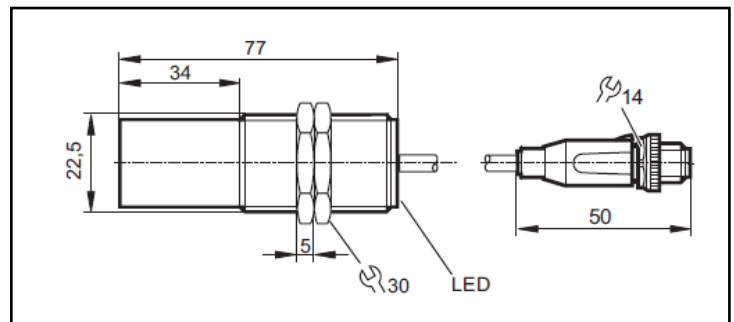
### The products

Type	Description	Order no.
	Belt rip and tear detection • 1 NO • 24 V DC • cylindrical design stainless steel, Ø 22,5 mm • silver cover • M12 cable plug • connector cable PUR • 2 meter	<b>ZB0095</b>
	Belt rip and tear detection • 1 NO • 20 ... 250 V AC / DC • cylindrical design stainless steel, Ø 22,5 mm • silver cover • connector cable PPU • 2 meter • 2 x 0,5 mm²	<b>ZB0096</b>
	Active AS-i ClassicLine module • 2 digital outputs / 2 digital inputs • Version 2.11 and 3.0 with extended addressing mode • Addressing socket • Three orientations of the flat cable are possible • Output supply via AS-i • Sockets M12 x 1	<b>AC5224</b>

### Technical data ZB0095

Operating voltage	10...30 V DC
Current consumption	< 10 mA
Electrical design	DC PNP
Output function	NO
Protection rating	IP 65 / IP 67
Operating temperature	-25 ... +70 °C

### Dimensions





# Tilt sensor for field applications



- 1 NO / NC; (selectable via IO-Link)
- 10...30 V DC
- Connector cable 5m
- Rope length 5 m
- Aluminium probe with Teflon cap

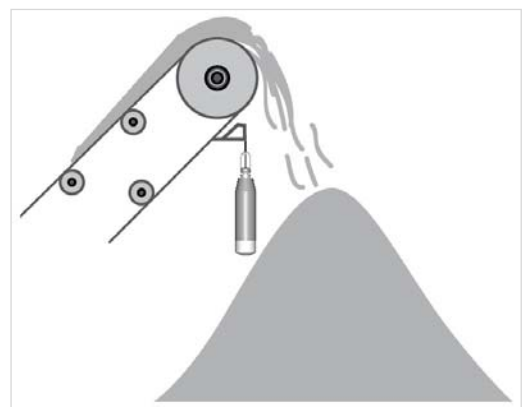


## Introduction

The new tilt sensor is designed for heavy duty application and used for level monitoring in silos (coal, ore, grain, etc.), material flow monitoring, level monitoring in transport chutes or stockpile monitoring.

The device features a robust aluminum housing with a teflon cap and is equipped with a capacitive IO-Link sensor. The adjustments for the material is very easy and can be made via IO-Link.

The aluminium housing is robust to survive indoor or outdoor use.








## Tilt sensor for field applications

### Function

The device is delivered with a 5 meter long connection cable and four connection wires with 1mm<sup>2</sup>. At the end of the cable, a junction box (e.g. E30401) should be fitted to connect the device to the electrical system. Inside is an IO-Link sensor KI6000. Adjustments / parameterizations can be made via IO-Link.

The tilt sensor can be connected to the evaluation unit for level monitoring directly. With the DL0201 you can protect your silo / chute against overspill or dry run. The other option is to connect the tilt sensor directly to a PLC input card for control.

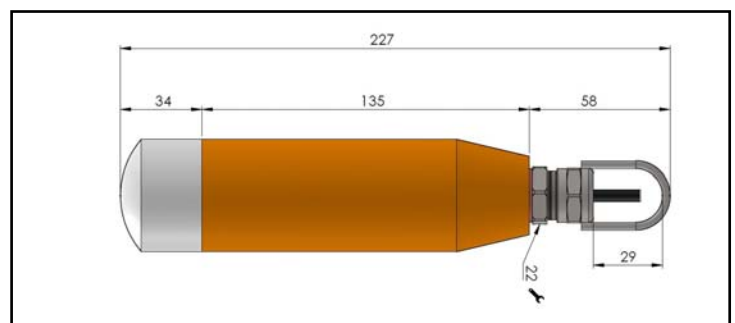
## The products

Type	Description	Order no.
	Tilt sensor • 10...30 V DC operating voltage • IP65 / IP67 • 1 NO / NC (selectable via IO-Link) • Rope length 5 m • Aluminium probe with teflon cap • connector cable PUR • 5 meter • 4 x 1mm <sup>2</sup> , Ø 6,2 mm	<b>ZZ0700</b>
	Splitter box • junction box with ventilation • IP 67 • housing material: plastics • 5 terminals	<b>E30401</b>
	Evaluation unit for level monitoring / control • housing for DIN rail mounting • adjustable switch-on and switch-off delay • clearly visible LEDs for indicating operation, input, output and release • protection of a silo against overspill or dry run • 24 V DC or 110...240 V AC input voltage • IP20	<b>DL0201</b>
	IO-Link master with USB interface • for connecting sensors with IO-Link capability to a PC • quick and easy parameter setting and set-up • reading of the current measured values, process values and parameter settings • Complete set with power supply for the sensors • Socket M12 x 1	<b>E30390</b>
	IO-Link parameter setting software LR DEVICE for IO-Link sensors • software on USB Stick	<b>QA0011</b>

### Technical data

Operating voltage	10...30 V DC
Current consumption	< 22 mA
Electrical design	DC PNP
Output function	NO
Protection rating	IP 65 / IP 67
Operating temperature	-25 ... +80 °C

## Dimensions





# AS-Interface



- **Manufacturer-independent standard**
- **Worldwide acceptance as a wiring system**
- **Communication from the sensor to the controller**
- **“Safety at Work” for safety-related applications**
- **Intelligent system solutions for special tasks**



## Bus system AS-Interface

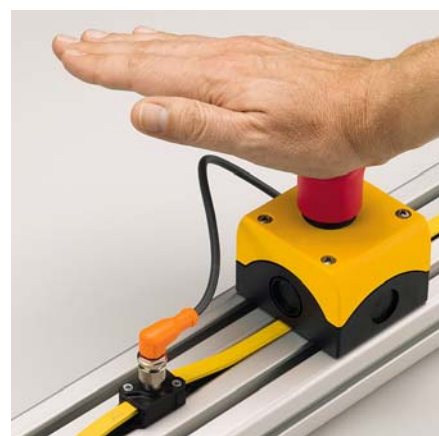
AS-Interface (AS-i = actuator sensor interface) is a manufacturer - independent standard for the connection of actuators and sensors of the first field level. It is the only wiring system accepted worldwide. With 20 million slaves installed AS-i has been tried and tested as a low-cost feeder for all common fieldbuses for many years.

The product range includes AS-i components for different areas from packaging and conveying via silo applications, machine tools, robotics and automation to the food industry and mobile vehicles.

## Safe

The sophisticated AS-i technology and the extended diagnostic possibilities provide high reliability and machine uptime.

“Safety at Work” is the extension of the AS-interface by safety-related components. Safety components up to the highest performance level e to EN ISO13849-1 and SIL 3 to IEC 61508 can be connected to AS-i.



With “Safety at Work” AS-i also solves safety related tasks



## Easy

Due to the standardised system, the low wiring complexity and the quick connection technology, AS-i enables simple “Plug & Play”. The reduction of terminals leads to reduced documentation.

Data and energy are jointly transmitted via a two-wire cable. The reverse polarity protected insulation displacement technology helps avoid errors. The modularity and the tree structure smoothly fit to the way the plant is put together.

## Cost-optimised

It's the end result that matters: Wiring complexity, documentation and set-up times are significantly reduced. The decentralisation of the AS-i participants leads to smaller and less expensive control cabinets. Simple diagnosis and a clear system design result in high machine uptime and avoid downtimes.

## Wiring Solution: AS-Interface

The actuator sensor interface (AS-i) sets new technological standards in the design and automation of installations. AS-i considerably reduces wiring complexity since conventional parallel wiring of each sensor or actuator to the controller is no longer necessary. This saves the user a great number of terminals, splitter boxes, input / output cards and cable lines.

Via its field connections AS-i allows low-cost connection of conventional devices. Up to 248 binary sensors and 248 actuators (V3.0) can be connected per AS-i network.

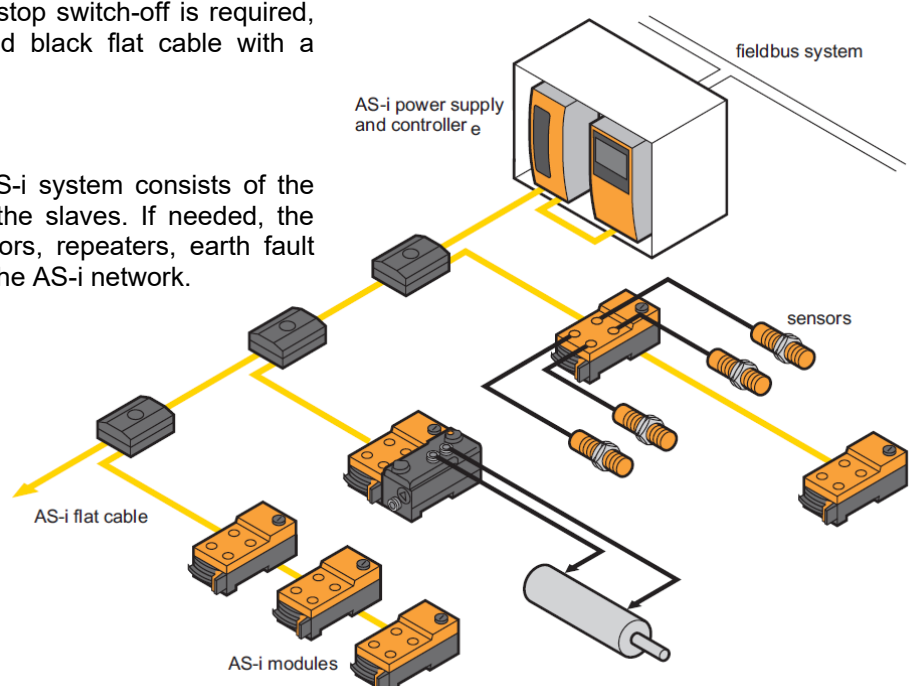
## Voltage supply and data via one cable

Voltage supply and data communication of all sensors are normally performed via a (yellow) AS-i cable. For some modules actuators can also be supplied via this cable. If a higher output current or emergency stop switch-off is required, actuators are supplied via a second black flat cable with a separate 24 V auxiliary voltage.

## Basic system structure





The minimum configuration of an AS-i system consists of the master, an AS-i power supply and the slaves. If needed, the user can also connect safety monitors, repeaters, earth fault monitors or other diagnostic tools to the AS-i network.

Reduced cost:  
reduced wiring complexity  
for faster  
installation and fewer  
error sources









## AS-Interface Gateways

Type	Description	Order no.
	AS-Interface / Profinet gateway • 1 AS-i master with M4 profile • full master functions • Reliable and fast data exchange with the sensor actuator level • colour display for indicating the status of all AS-i nodes • user-friendly and simple configuration, set-up and diagnosis • Ethernet configuration interface • housing for DIN rail mounting • IP20	AC1401
	AS-Interface / Profinet gateway • 2 AS-i master with M4 profile • full master functions • Reliable and fast data exchange with the sensor actuator level • colour display for indicating the status of all AS-i nodes • user-friendly and simple configuration, set-up and diagnosis • Ethernet configuration interface • housing for DIN rail mounting • IP20	AC1402
	AS-Interface / Profibus gateway • 1 AS-i master with M4 profile • full master functions • Reliable and fast data exchange with the sensor actuator level • colour display for indicating the status of all AS-i nodes • user-friendly and simple configuration, set-up and diagnosis • Ethernet configuration interface • housing for DIN rail mounting • IP20	AC1411
	AS-Interface / Profibus gateway • 2 AS-i master with M4 profile • full master functions • Reliable and fast data exchange with the sensor actuator level • colour display for indicating the status of all AS-i nodes • user-friendly and simple configuration, set-up and diagnosis • Ethernet configuration interface • housing for DIN rail mounting • IP20	AC1412
	AS-Interface / Ethernet/IP gateway • 1 AS-i master with M4 profile • full master functions • Reliable and fast data exchange with the sensor actuator level • colour display for indicating the status of all AS-i nodes • user-friendly and simple configuration, set-up and diagnosis • Ethernet configuration interface • housing for DIN rail mounting • IP20	AC1421
	AS-Interface / Ethernet/IP gateway • 2 AS-i master with M4 profile • full master functions • Reliable and fast data exchange with the sensor actuator level • colour display for indicating the status of all AS-i nodes • user-friendly and simple configuration, set-up and diagnosis • Ethernet configuration interface • housing for DIN rail mounting • IP20	AC1422
	AS-i data decoupling • can be mounted on AS-i gateway • supply of several gateways from a single power supply	AC1250

## Power supplies

Type	Description	Order no.
	2,8A AS-i power supplies • Output voltage: 29.5...31.6 V DC • single phase • Nominal voltage: 100...120 AC / 200...240 AC , $\pm 10\%$ , automatic range selection • Efficiency typ. 88 %	AC1256
	8A AS-i power supplies • Output voltage: 29.5...31.6 V DC • single phase • Nominal voltage: 100...120 AC / 200...240 AC , $\pm 10\%$ , automatic range selection • Efficiency typ. 89,4 %	AC1258
	24 V DC / 5A power supplies • Output voltage: 24...28 DC, adjustable, output voltage to SELV/PELV • single phase • Nominal voltage: 100...120 AC / 200...240 AC , $\pm 10\%$ , automatic range selection • Efficiency typ. 89,4 %	DN4012
	24 V DC / 10A power supplies • Output voltage: 24...28 DC, adjustable, output voltage to SELV/PELV • single phase • Nominal voltage: 100...120 AC / 200...240 AC , $\pm 10\%$ , automatic range selection • Efficiency typ. 91 %	DN4013





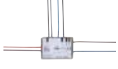





## AS-Interface Components


Type	Description	Order no.
	AS-i flat cable • reverse polarity protection due to special shape • material: TPE • for use in isolation displacement connector technology for FC lower parts and compact modules • 100 m	<b>E74200</b>
	AS-i flat cable • reverse polarity protection due to special shape • material: TPE • for use in isolation displacement connector technology for FC lower parts and compact modules • 500 m	<b>E74203</b>
	FC insulation displacement connector • Socket M12 - AS-i flat cable • 2 connection directions possible in case of angled connectors • sealing: EPDM; housing: PA; O-ring: EPDM; screws: stainless steel (303S22); nut: stainless steel (303S22); contact pins: bronze gold-plated	<b>E70471</b>
	FC splitter • AS-i flat cable yellow / yellow • Housing materials: Metal parts: stainless steel 316L / 1.4404 / Blanks: FPM / O-ring: EPDM	<b>E70377</b>
	AS-i repeater • extension of the AS-i network by another 100 m • Integrated passive bus termination • one additional AS-i power supply necessary • combicon connection included • Housing materials: PC GF20 • IP20	<b>AC3226</b>
	Passive AS-i bus termination • extension of the cable to a maximum of 200 m without additional repeater • improvement of the signal quality • Monitoring of the supply voltage by means of LEDs	<b>AC1147</b>
	Passive AS-i bus termination • extension of the cable to a maximum of 200 m without additional repeater • improvement of the signal quality • Quick and easy to mount using flat cable insulation displacement connector • Monitoring of the supply voltage by means of LEDs	<b>E70580</b>
	Active AS-i switching cabinet module • 4 digital inputs / 4 digital outputs • String mounting possible • Addressing socket • Version 2.11 • combicon connection • Housing materials: PA	<b>AC2251</b>
	Active AS-i ClassicLine module • 4 digital inputs • Version 2.11 and 3.0 with extended addressing mode • Addressing socket • Three orientations of the flat cable are possible • Sockets M12 x 1 • Housing materials: PA • IP67	<b>AC5205</b>
	Active AS-i ClassicLine module • 2 digital outputs / 2 digital inputs • Version 2.11 and 3.0 with extended addressing mode • Addressing socket • Three orientations of the flat cable are possible • Output supply via AS-i • Sockets M12 x 1 • Housing materials: PA	<b>AC5224</b>
	Active AS-i ClassicLine module • 2 analogue inputs 4...20 mA • For the connection of 2-wire and 3-wire sensors • Version 2.11 and 3.0 • Addressing socket • Three orientations of the flat cable are possible • Sockets M12 x 1 • Housing materials: PA	<b>AC5222</b>








## AS-Interface Safety at Work

Type	Description	Order no.
	AS-i safety monitor • 4 safe inputs / 2 safe semi-conductor outputs • SIL 3 to EN 62061, IEC 61508 / SIL 3 and EN ISO 13849-1 / PL e • Chip card to save the configuration data • configuration and setup by configuration software ASIMON V3 G2 • USB 2.0 interface • chip card and combicon screw terminals supplied with the device • monitoring of up to 31 safe AS-i nodes • IP20	<b>AC041S</b>
	Safe contact expander without delay • Screw terminal • 2 independent channels • 4 contact blocks (NO) per channel • 1 feedback circuit (NC) per channel • Mounting on DIN rail • IP20	<b>E7053S</b>
	AS-Interface safe input / 2 non-safe LED outputs module • AS-i version 2.11 and 3.0 • for connection of mechanical / electrical contacts • sockets M12 x 1 • housing materials: PA • complies with the requirements: ISO 13849-1 PL e and SIL 3 to EN62061 / IEC 61508 • IP67	<b>AC505S</b>
	AS-Interface 2 x 2 safe inputs / 2 non-safe LED outputs / 2 non-safe outputs module • AS-i version 2.11 and 3.0 • for connection of mechanical / electrical contacts • sockets M12 x 1 • housing materials: PA • complies with the requirements: ISO 13849-1 PL d and SIL 2 to EN62061 / IEC 61508 • IP67	<b>AC509S</b>
	AS-i safety PCB • connection of mechanical contact and LED components • AS-i version 2.11 and 3.0 • complies with the requirements: ISO 13849-1 PL e and SIL 3 to EN62061 / IEC 61508 • IP20	<b>E7015S</b>
	Safe illuminated E-STOP operating unit with integrated AS-i connection • AS-i version 2.11 and 3.0 • Connector M12 x 1 • AS-i interface via AS-i flat cable • fool-proof E-STOP to EN ISO 13850 • pull to reset • interchangeable button inserts • IP 67	<b>AC012S</b>
	Software ASIMON V3 G2 • configuration, set-up and diagnostics of the AS-i safety monitor	<b>E7050S</b>
	USB interface cable for the connection of the safety monitor AC041S to the PC • for quick and easy parameter setting and set-up • cable length 1.8 m	<b>E7051S</b>

## AS-Interface IO-Link

Type	Description	Order no.
	Active AS-Interface - IO-Link master module • 4 digital inputs / 2 digital outputs • AS-i version 2.11 and 3.0 • for connection of up to two IO-Link devices (IO-Link Port Class A) • reliable transmission of machine data, process parameters and diagnostic data to the AS-Interface controller • simple replacement of units due to integrated parameter memory • robust housing for use in harsh industrial environments • IP65 / IP66 / IP 67 • sockets M12 x 1 • Housing materials: PA • power supply via AS-i only	<b>AC6002</b>

## AS-Interface accessories

Type	Description	Order no.
	AS-i addressing unit • for easy addressing and programming of AS-i nodes • indication of all nodes on the bus • reading and writing node data and node parameters • LCD display for indicating operating mode and node address • 1 x 230 V AC charging unit included • AS-i version 2.11 and 3.0 • IP20	<b>AC1154</b>
	Addressing cable for AS-i nodes • cable with connector M12 x 1 and with cinch socket • for a reliable signal transmission of the addressing unit • cable length: 1.6 m	<b>E70213</b>
	COMBICON connector • Combicon plug / quantity: 6 • user-friendly connection of control cabinet modules • simple and fast wiring by means of screw terminals	<b>E70230</b>
	wall passage stainless steel • operating voltage < 60 V AC • current load: 4A • connector plug and socket M12 x 1: straight • housing materials stainless steel (1.4305 / 303) • sealing: EPDM • IP 65 / IP 67 / IP 69K	<b>E73008</b>
	Assembly tool for plug and socket connections M12 • materials: stainless steel (1.4301 / 304) • tightening torque: < 2 Nm	<b>E12078</b>

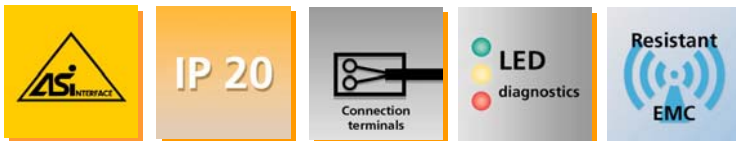




# AS-i signal transmission via fibre optic



- AS-Interface signal transmission over a distance of up to 3.2 km
- Possibility of mixed operation (AS-i flat cable and fibre optic)
- Lightning protection, radiated EM interference immunity
- High operational reliability
- Electrical separation
- Plug-in connection terminals



## Introduction

ifm's new AS-i fibre optic repeater enables AS-Interface signal transmission via an optical medium and vice versa. This allows for considerable cable length extension in the AS-i network.

Every AS-i fibre optic repeater has two independent channels that consist of a transmitting and a receiving element which are supplied via the AS-Interface system. Various LEDs indicate the current operating status. This innovation is integrated into the new SmartLine housing.



## AS-i signal transmission via fibre optic




### Function

Optical transmission means there is no interfering radiation, nor are there any ground problems. Fibre optic transmission systems exclude any EMC risk, as a matter of principle. As to distance related losses due to inductances, capacities and resistances (as is the case with copper cables for example), they do not occur either.

Consequently, the new AS-i fibre optic repeater contributes decisively to life time extension and cost reduction.

Using the new AS-i fibre optic repeater allows for additional fibre optic network topologies (line topology, star topology).

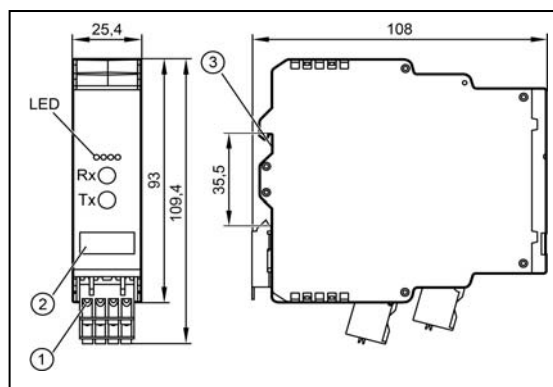
## The products

Type	Description	Order no.
	Cable length in the AS-i network of up to 3.2 km • integrated passive bus termination • protection rating IP20 • COMBICON connectors included	<b>AC3227</b>
	Fibre optic cable • ST / ST • IP 20 • 50 µm • 20 m • PUR	<b>E74800</b>
	Fibre optic cable • ST / ST • IP 20 • 50 µm • 50 m • PUR	<b>E74801</b>
	Fibre optic cable • ST / ST • IP 20 • 50 µm • 100 m • PUR	<b>E74802</b>
	AS-i power supply 115 / 230 V AC • single phase • output current (AS-i) 4 A	<b>AC1257</b>

### Technical data AC3227

Operating voltage [V DC]	26.5...31.6
Total current consumption [mA]	< 80
AS-i specification	2.11 + 3.0
Fibre optic connector	ST
Compatible fibre types	Multimode: 50/125 µm, 62.5/125 µm
Ambient temperature [°C]	-25 ... +70
Protection	IP 20

### Dimensions



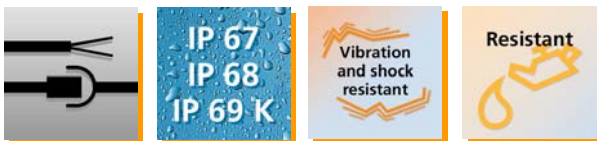
- 1) plug with cage clamp connection
- 2) panel for labelling
- 3) Din rail adapter



# Connection Technology



- Connection technology meets the M12 standard (EN 61076)
- Optimum sealing even when fastened by hand
- The mechanical end stops the O-ring being destroyed
- Nut secured against shock and vibration due to saw tooth vibration protection



### ecolink M12 for demanding applications

Most applications require special solutions. Only high-quality materials, assured production processes and faultless assembly lead to success in the long run. The integrated end stop protects the O-ring against destruction caused by overtightening the nut. No tools needed for installation and removal.

The asymmetrically acting vibration protection holds the nut tight in its position, guaranteeing optimum and permanent sealing.


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




**ecolink –**  
a new dimension in connection technology.



## Jumper cables, 3-wire

Type	Description	Order no.
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 0,3 m PUR cable • 3 x 0.34 mm <sup>2</sup>	EVC040
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • P65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 0,6 m PUR cable • 3 x 0.34 mm <sup>2</sup>	EVC041
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • P65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 1 m PUR cable • 3 x 0.34 mm <sup>2</sup>	EVC042
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • P65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 2 m PUR cable • 3 x 0.34 mm <sup>2</sup>	EVC043
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • P65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 5 m PUR cable • 3 x 0.34 mm <sup>2</sup>	EVC044

## Jumper cables, 4-wire

Type	Description	Order no.
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 0,25 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC716
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / P67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 0,5 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC717
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 1 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC718
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 2 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC719
	Jumper M12 • straight / straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC720

## Connectors

Type	Description	Order no.
	Cable plug • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 2 m PUR cable • 4 x 0.34 mm <sup>2</sup>	EVC076
	Cable plug • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 0.34 mm <sup>2</sup>	EVC077
	Cable plug • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 10 m PUR cable • 4 x 0.34 mm <sup>2</sup>	EVC078
	Cable socket • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 2 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC706
	Cable socket • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 5 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC707
	Cable socket • M12 connector • straight • free from silicone • free from halogen • gold-plated contacts • drag chain suitability • IP65 / IP67 / IP 68 / IP 69K • Ambient temperature: -25...90 °C • 10 m PUR cable • 4 x 1 mm <sup>2</sup>	EVC708



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# Technology for Mining Industry

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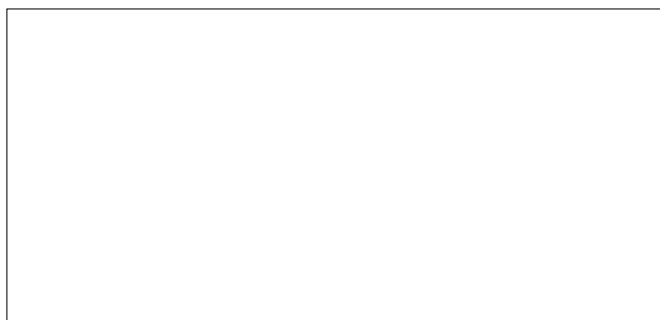
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