Future Is Now.

IO-Link

Sensors and Systems
with IO-Link

Data exchange from sensor
to PLC and beyond—standardized
and transparent.

Your automation, our passion.

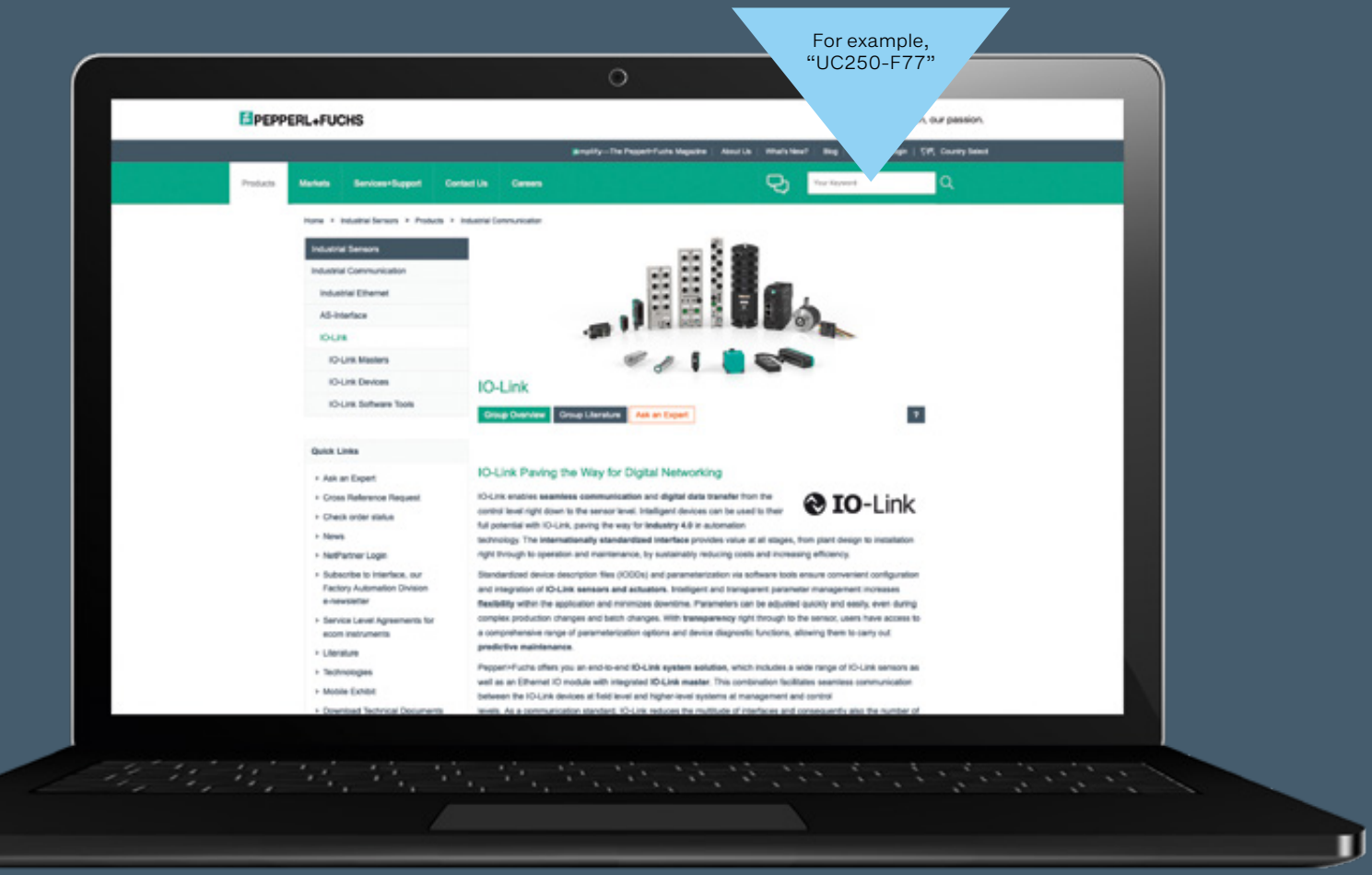
PEPPERL+FUCHS

Find Your IO-Link Device in Just a Few Clicks

Go online. Specify your requirements. Select your device. You can find the right solution for your application in just a few clicks. If you have any questions, our experts are available to take your call.

Online Search on the Pepperl+Fuchs Website

Enter the model number in the search field on the Pepperl+Fuchs website and get to your product selection immediately. Model numbers can be found in this brochure in the technical data summaries. Or you can navigate through our range of product families and groups. Product selectors help you select the optimal IO-Link device.



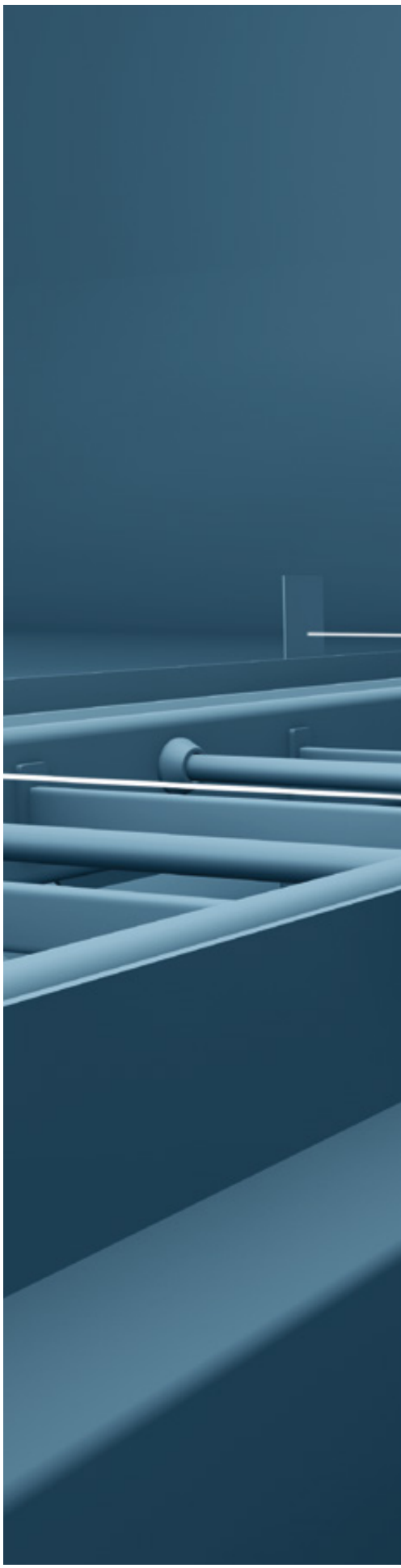
For more information, visit
pepperl-fuchs.com/tf-io-devices

Contents

Technology

The Standard for Future-Proof Technology

IO-Link enables comprehensive diagnostics down to the sensor/actuator level, reduces costs, and provides a secure investment. Pepperl+Fuchs' IO-Link portfolio offers a complete solution from a single source for flexible solutions.

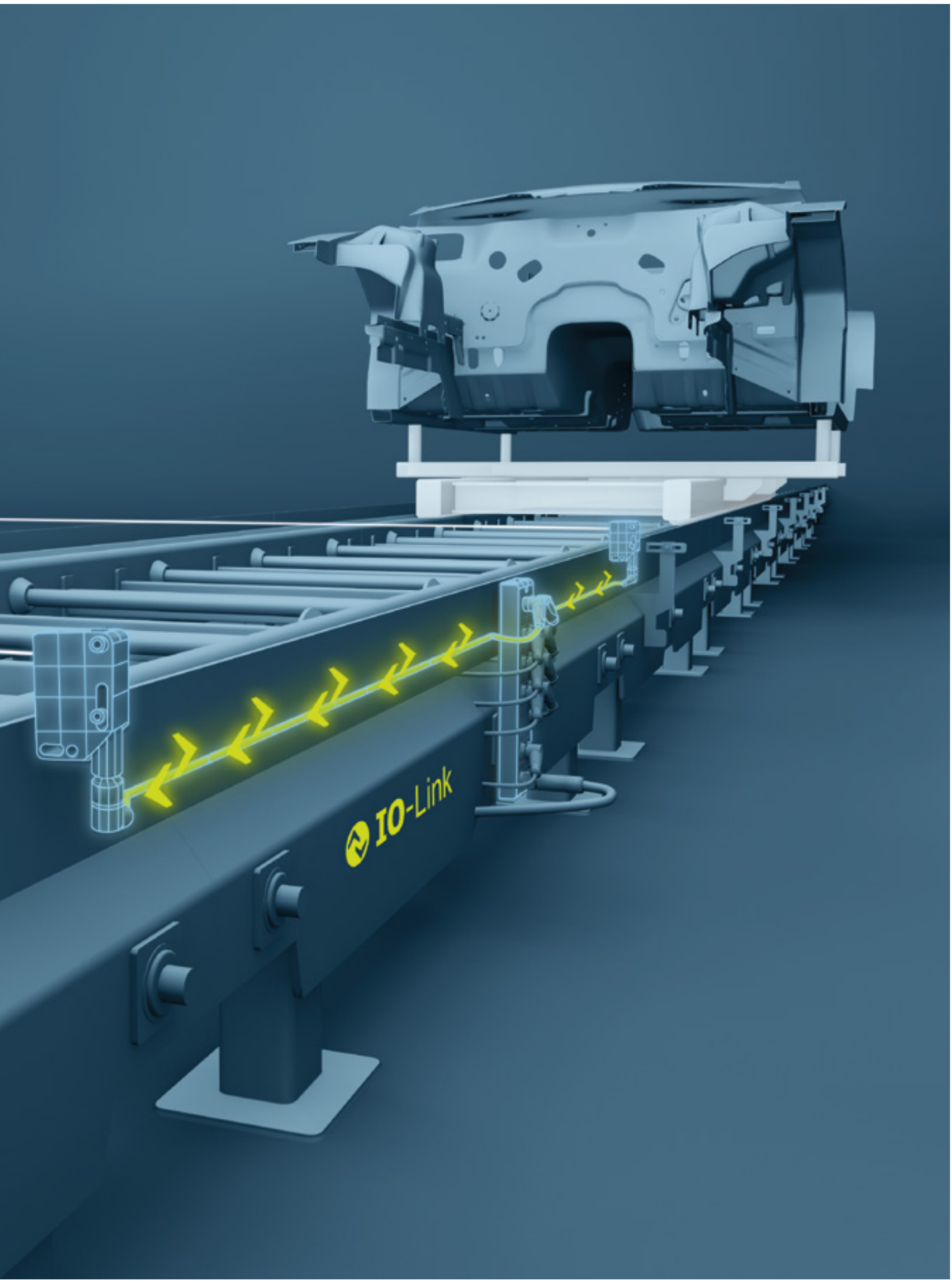


Standardization for Industry 4.0

IO-Link is an internationally standardized, cross-vendor IO technology that enables bidirectional communication from the control system to the sensor/actuator level. The fieldbus-independent open standard can be integrated into any system landscape using standard unshielded cables and point-to-point connectivity. Bidirectional communication enables comprehensive diagnostics and data transfer is interference-free.

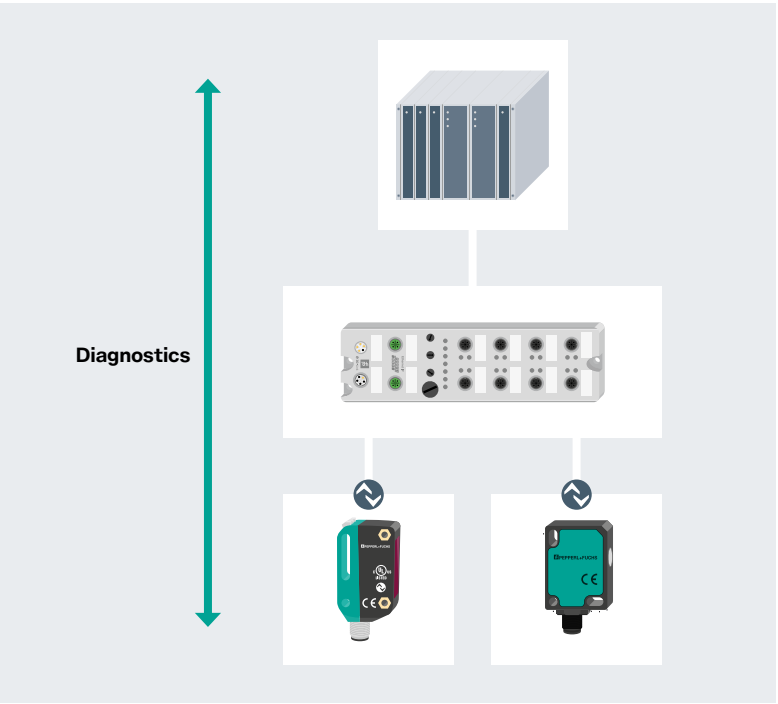
Complete Solution from a Single Source

Pepperl+Fuchs' IO-Link portfolio allows users to choose from a wide range of sensor technologies, including photoelectric sensors, ultrasonic sensors, inductive proximity sensors, positioning systems, and RFID. In addition to IO-Link sensors, I/O hubs with IO-Link offer another economical solution for connecting standard digital sensors. The complete solution is rounded off by IO-Link masters, connectivity, and software.


IO-Link

Reducing Costs with IO-Link

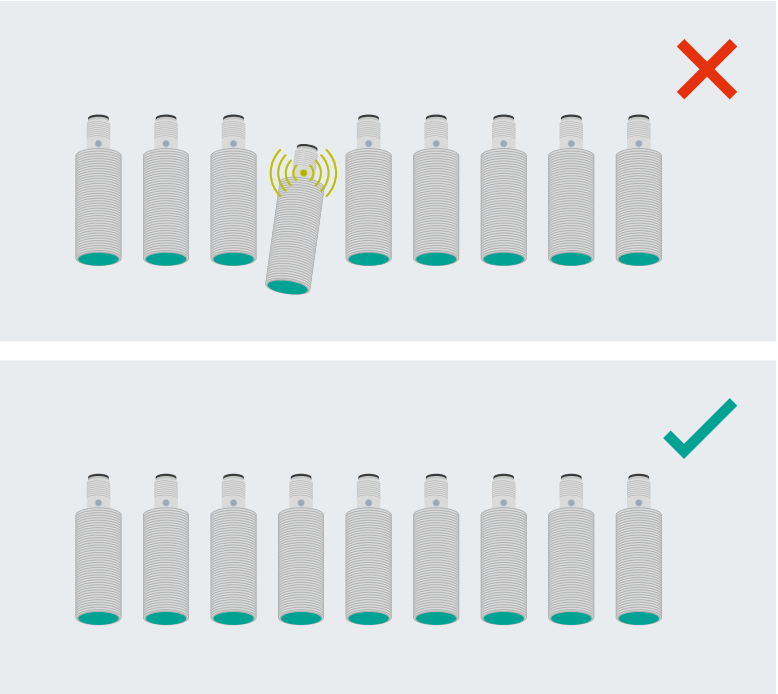
IO-Link offers countless new possibilities and creates added value for users. It reduces complexity, provides needs-based maintenance with comprehensive diagnostics, and enables individualized production with central data storage and automatic configuration.



Acyclical data for comprehensive diagnostics

Comprehensive Diagnostics Down to the Sensor/Actuator Level

Bidirectional communication from the control system to the field level enables comprehensive diagnostics of sensors and actuators. In addition to cyclical process data, a wealth of additional data is transferred acyclically, allowing device identification to be performed at any time. The control system simply accesses the manufacturer, part number, and serial number information saved in every IO-Link device. Diagnostic information about the general device condition, specific data from operation, temperature, and signal quality are also available.



Sensor and target misalignment can be identified early via stability alarm

Easy and Efficient Maintenance

With diagnostic data from the IO-Link device, maintenance can be scheduled and carried out based on the needs of plants and machines.

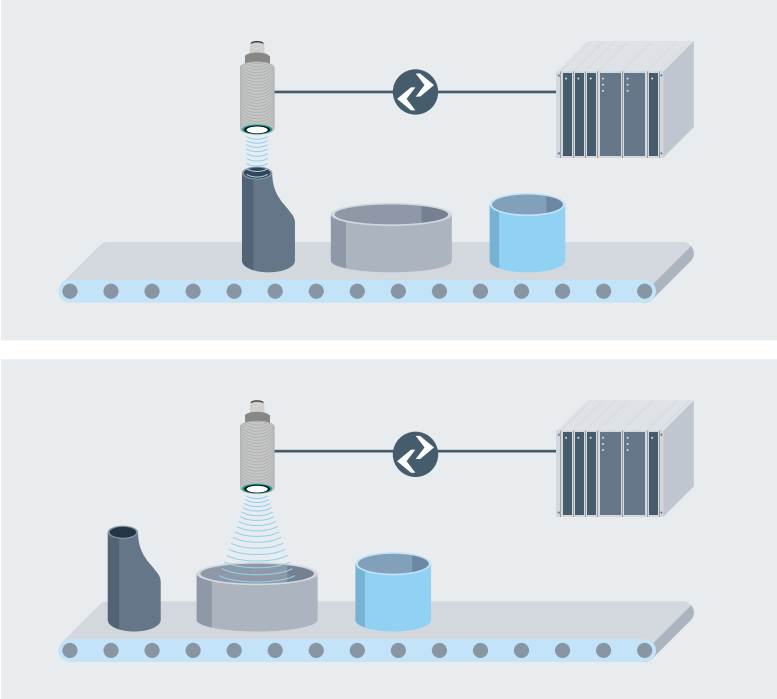
If an inductive proximity sensor with IO-Link falls out of alignment and the target is no longer in range, a stability alarm can be triggered. During the next maintenance cycle, the sensor can be readjusted by maintenance personnel.

If a sensor needs to be replaced, simply replace it with a new one and let IO-Link import the existing settings. This avoids downtime and unnecessary costs.

Batch Size 1 Production

IO-Link sensors can be configured via the control system. This simplifies commissioning and makes quick recipe changes possible without extended downtime. Even complete individualization—batch size 1 production—is possible.

For example, the beam width on an ultrasonic sensor can be adjusted to accommodate different container shapes in a level-measurement application.



Automatic beam width adjustment on an ultrasonic sensor

IO-Link at a Glance

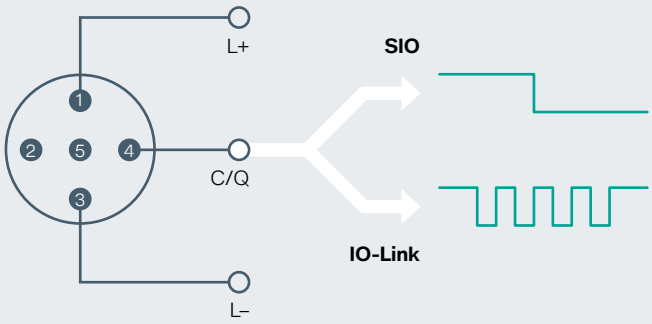
- Bidirectional, serial point-to-point connectivity for signal and power
- Operating modes: Standard IO mode (SIO), IO-Link mode
- Three transfer rates: 4.8 kBaud (COM 1), 38.4 kBaud (COM 2), 230.4 Kbaud (COM 3)
- Unshielded standard industry cable for all connections
- Pin assignment: Pin 1: 24 V, Pin 3: 0, Pin 4: Switching and communication line (C/Q)
- Cable length: 20 m maximum

IO-Link

For more information, visit
pepperl-fuchs.com/tf-io-link

Future-Proof with IO-Link

Smart Sensor Profiles for simple integration and a reliable investment—Pepperl+Fuchs is pioneering integration of the new standard and paving the way toward Industry 4.0.



Standardized pin assignment of IO-Link devices

Uniform Structures Ensure Efficiency

Every IO-Link device that incorporates Smart Sensor Profiles is developed to follow a general specification and structure. The same device information is always stored and available anytime, and the pin layout and available operating modes are also identical in every device. This standardization ensures efficient machine design—and compatibility with Industry 4.0.

Sensorik 4.0

Sensorik4.0®—Paving the Way for the Smart Factory

IO-Link sensors pave the way for the Fourth Industrial Revolution. In the Industry 4.0 future of fully networked production systems, communication-ready sensors play a vital role: they send and receive sensor data within production processes and to higher-level local or cloud-based information systems.

To pave the way for Industry 4.0, Pepperl+Fuchs is providing innovative sensor technologies with Sensorik4.0®. They use the standard IO-Link interface to support the digitization of industrial applications.

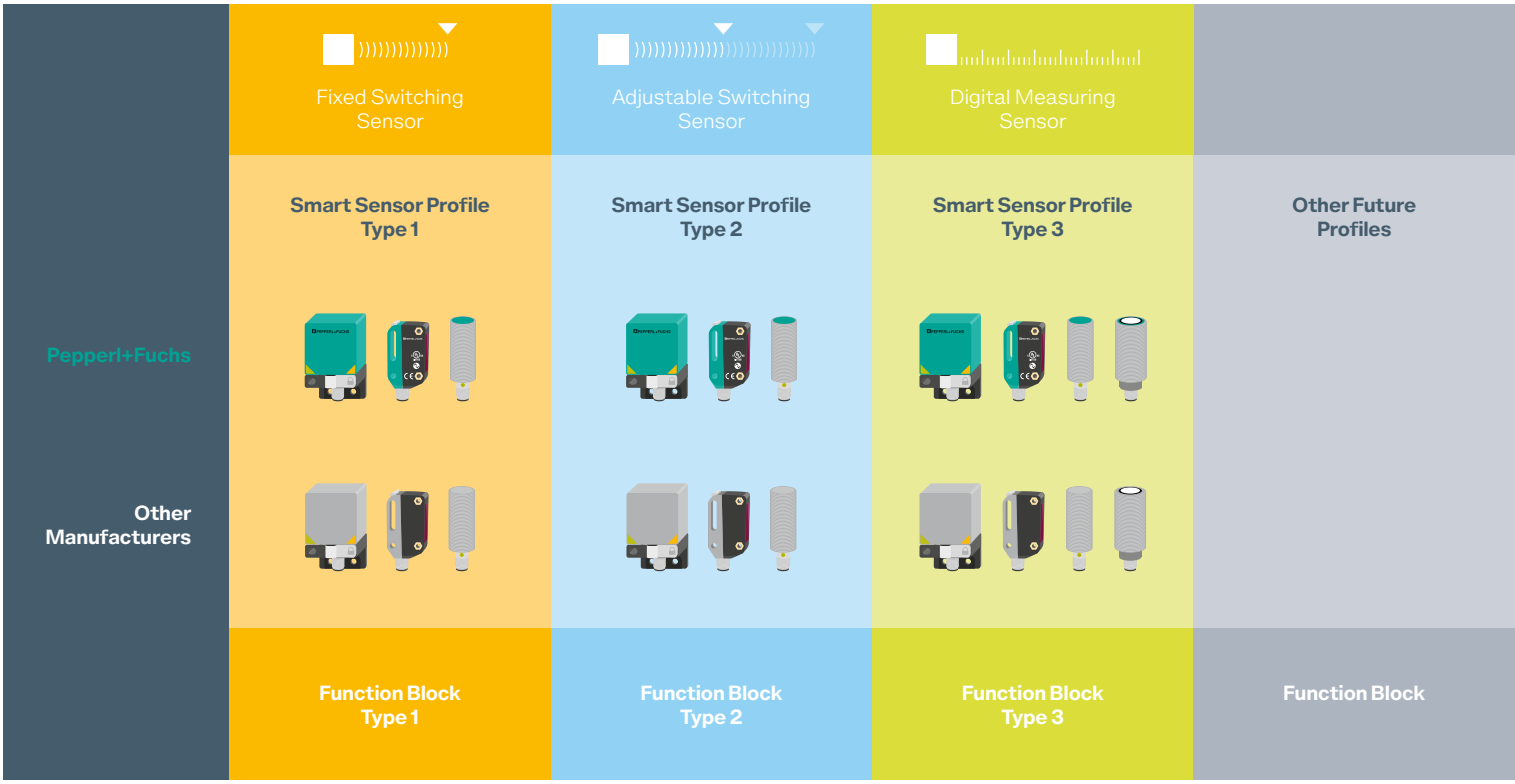
Smart Sensor Profiles: Finding a Common Denominator

To achieve true standardization, data transfer, data structures, and data content must be clearly defined for all manufacturers. Smart Sensor Profiles have been developed for this purpose. They divide all sensors into types that are not determined by manufacturer or sensing mode but by the signal that a sensor transmits.

Profile-specific function blocks exist for each profile class to make integration quick and easy for users. Once a device from a specific profile class is initially integrated into a control system, the integration of additional devices from the same profile is simple.

This makes it possible to quickly replace a photoelectric distance sensor with a sensor from another manufacturer or with a measurement sensor that uses another sensing technology, such as an ultrasonic sensor.

Pepperl+Fuchs is pioneering the integration of Smart Sensor Profiles in current and future product development projects, paving the way for international standardization and Industry 4.0.



Principles of Smart Sensor Profiles

Complete Solution from a Single Source

A comprehensive portfolio of IO-Link devices, IO-Link infrastructure, software, and connectivity—this is the complete solution of intelligent IO-Link systems from Pepperl+Fuchs.

Flexible Applications

Pepperl+Fuchs' IO-Link portfolio offers flexible solutions for a range of applications—photoelectric sensors, ultrasonic sensors, rotary encoders, inductive proximity sensors, positioning systems, vibration sensors, and RFID. In addition to sensors, IO-Link masters, connectivity, I/O hubs, and software are also available.

IO-Link Devices: Broad Portfolio for Any Requirement

Every application poses unique challenges. Pepperl+Fuchs' broad product portfolio includes a range of sensing technologies and housing styles that can be seamlessly integrated into all applications.

IO-Link Infrastructure: Optimized for Every Application

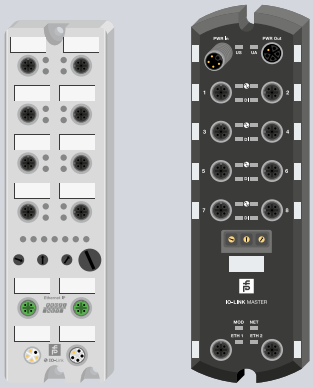
Take full advantage of IO-Link. Pepperl+Fuchs offers a range of IO-Link infrastructure: an IO-Link USB master for offline configuration, various IO-Link masters for connection to higher-level fieldbuses as well as IO-Link masters with OPC UA and MQTT for applications even without classic control. The portfolio is completed by matching software and perfectly coordinated connectivity.

For an overview of the IO-Link portfolio, visit
pepperl-fuchs.com/tf-io-portfolio

PLC control

IO-Link Infrastructure

IO-Link USB master



IO-Link master

IO-Link Devices

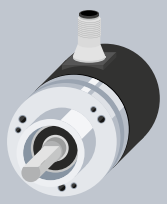
Inductive proximity sensors

Inductive positioning systems

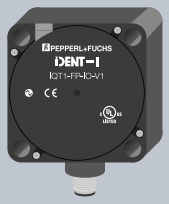
Photoelectric sensors

Ultrasonic sensors

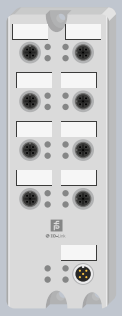
Vibration sensors



Rotary encoders

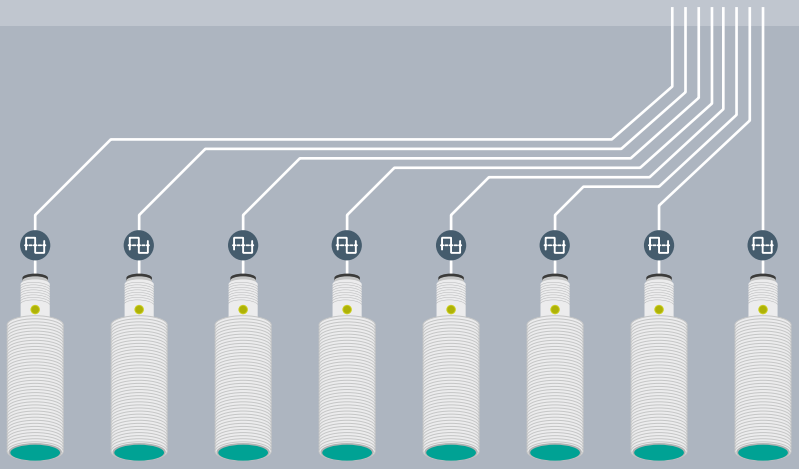


Identification systems



I/O hub with IO-Link

Standard Devices



Digital sensors

Software Tools for Every Application

Pepperl+Fuchs offers a comprehensive set of tools for sensor configuration and diagnostics. Convenient, standardized user interfaces make sensors even easier to use.

IODD: Standardized Device Description for Easy Commissioning

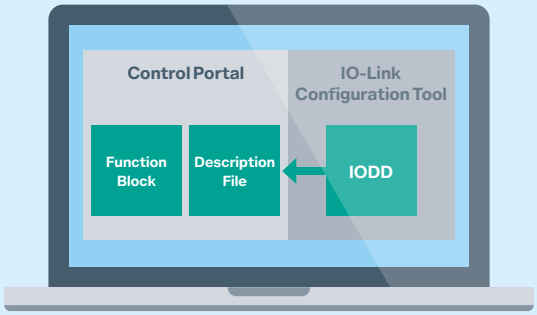
Every IO-Link device has an IO device description (IODD) file that contains a range of information for integration into different systems. This information includes communication characteristics, available parameters and functions, and the user interface, among other things.

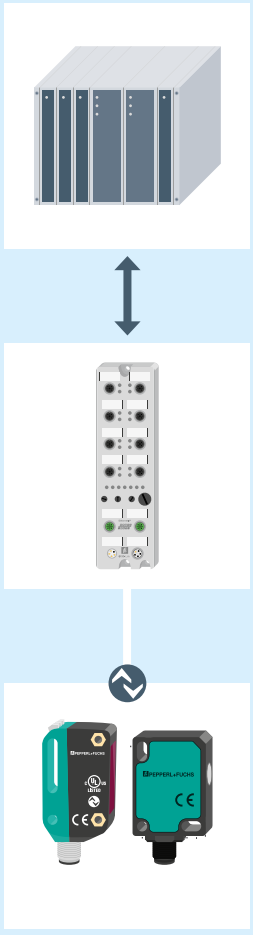
Because the IODD structure has been standardized for all devices, it can always be read the same way—regardless of the IO-Link master being used, the manufacturer, or the automation system.

The Right Software for Every Need

In addition to the IODD, several software tools are available for configuring IO-Link devices. From device DTMs for configuring a device via PACTware to function blocks for user programs in the control system, Pepperl+Fuchs offers software for every situation.

For more information, visit
pepperl-fuchs.com/tf-io-link



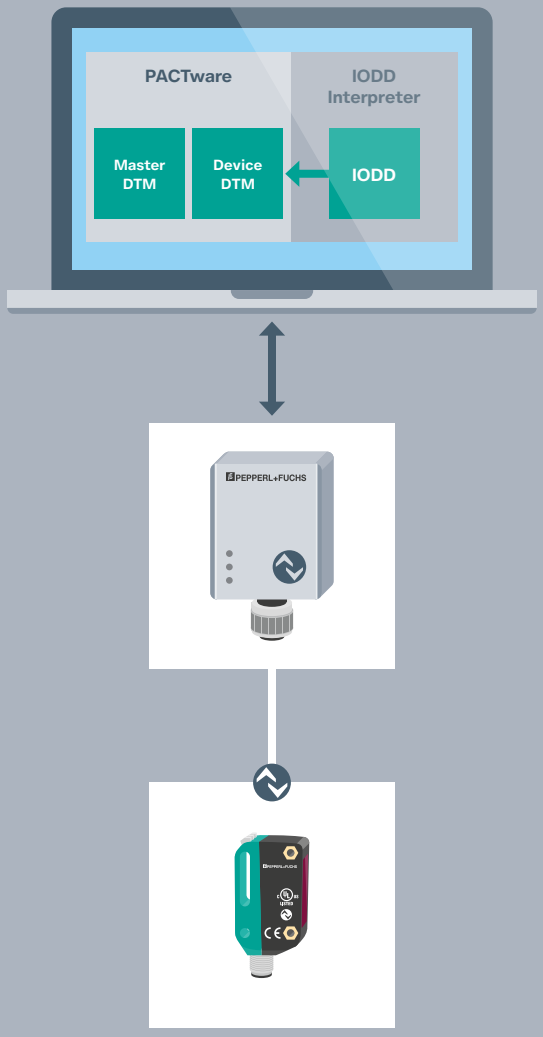


Offline Configuration

With offline configuration, IO-Link devices are configured before they are mounted. Pepperl+Fuchs' IO-Link USB master can be used for this.

In addition to the master, a program such as PACTware, USB Master DTM, or IODD interpreter is required to display an IO-Link device's IODD.

Device DTMs simplify operation of more complex devices with a graphical interface.



Online Configuration

To commission machines and plants, the IO-Link master and devices must be integrated into the appropriate automation system, which requires different software.

Then, the IO-Link configuration tool can be used to configure devices. During operation, IO-Link device parameters can be set, and diagnostic data can be monitored. The integration of IO-Link data into an application program takes place via function blocks.

IO-Link Masters

Efficient, Innovative, and Durable

Enabling Process Reliability and Standardization

Designed for traditional PLC-based applications, the ICE1* modules offer greater process reliability. The integrated web server can be activated or deactivated as needed. This means the module is only accessible via the PLC—external access is blocked. With a multiprotocol capability, the IO-Link masters offer a great deal of efficiency for standardizing machines and plants. The innovative, high-performance connection technology optimizes installation.

Highlights

- All standard Ethernet communication protocols are supported in one single module for optimal machine standardization
- Innovative M12 power connector for reduced installation costs thanks to higher current capability of 2× 16 A for sensors and actuators
- Integrated IO-Link master for continuous diagnostics and parameterization from the control system to the sensor level

Technical Data	ICE1-8IOL-G60L-V1D	ICE1-8IOL-G30L-V1D	ICE11-8IOL-G60L-V1D
Inputs/outputs	8-port IO-Link master		
Housing	Die-cast zinc—nickel-plated surface		
Rated current	2× 16 A		
Operating temperature	–20 °C ... +70 °C		–40 °C ... +70 °C
Degree of protection	IP69		IP65/IP67/IP69K
Dimensions	200 × 59.6 × 30.7 mm	225 × 30 × 43 mm	200 × 59.6 × 30.7 mm

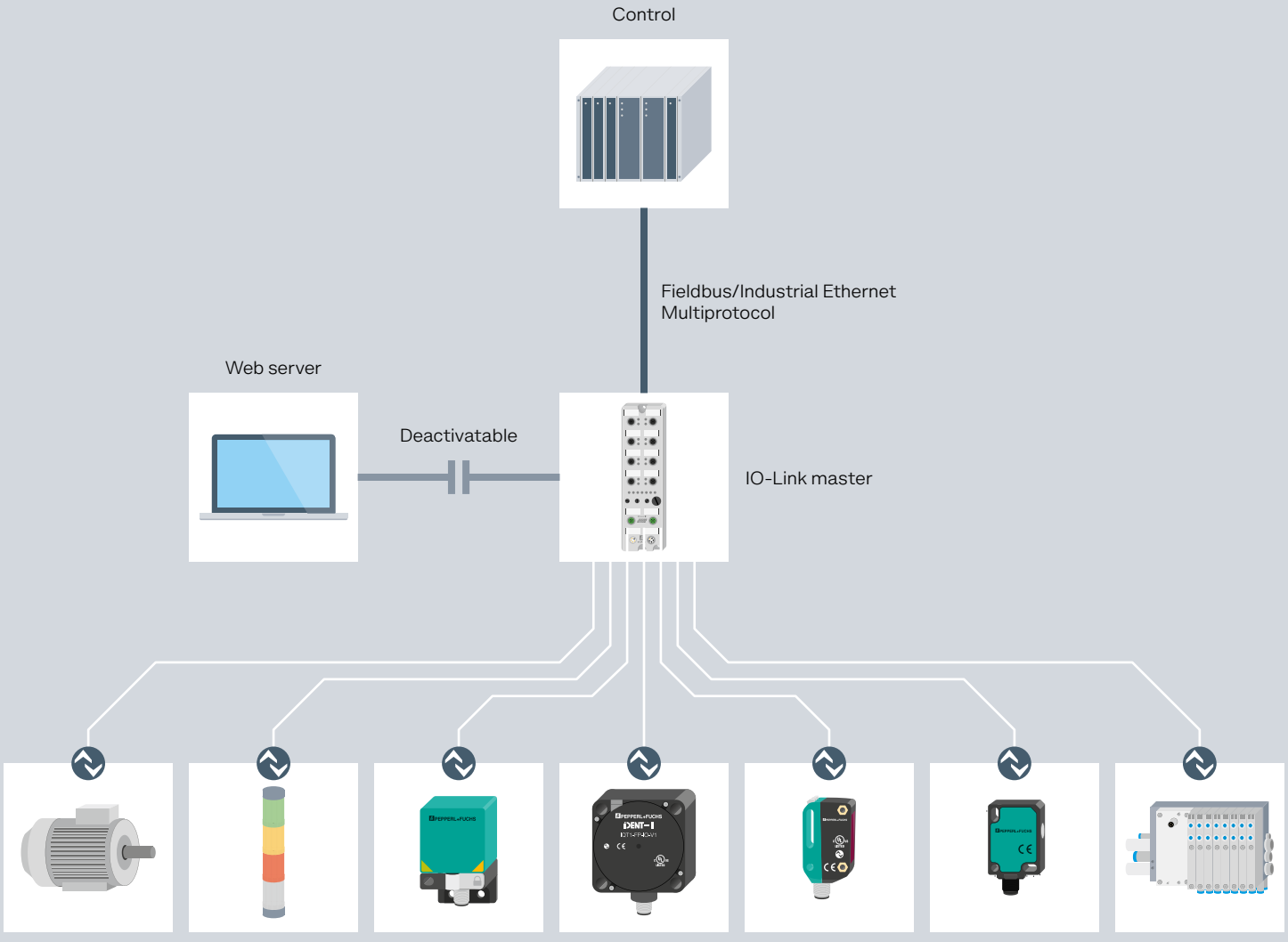
PROFINET EtherNet/IP EtherCAT CC-Link Modbus

Selected products from the portfolio.
For more IO-Link masters, visit
pepperl-fuchs.com/tf-io-master

Rugged Design, Extreme Durability

The rugged design of these modules ensures durability in harsh, industrial environments. The fully encapsulated metal housing is extremely resistant to mechanical damage and environmental factors. It is dust-tight and withstands at least water during high-pressure/steam jet cleaning in accordance with IP69 standards. The modules also operate in a wide range of temperatures, from up to –40 °C to +70 °C, and they are resistant to mechanical vibration (15 g) and shock (50 g).

Optimized for PLC-Based Applications



IO-Link Masters

From the Sensor to the Cloud

Flexibility for the Future

IoT-optimized ICE2* and ICE3* modules offer everything that flexible cloud applications need. With MultiLink™, multiple sources can access the device in parallel and make the right data available wherever it is needed. Whether with a traditional PLC and an industrial PC or as a purely cloud-based application, IO-Link masters from Pepperl+Fuchs offer the most flexibility and planning reliability.

Highlights

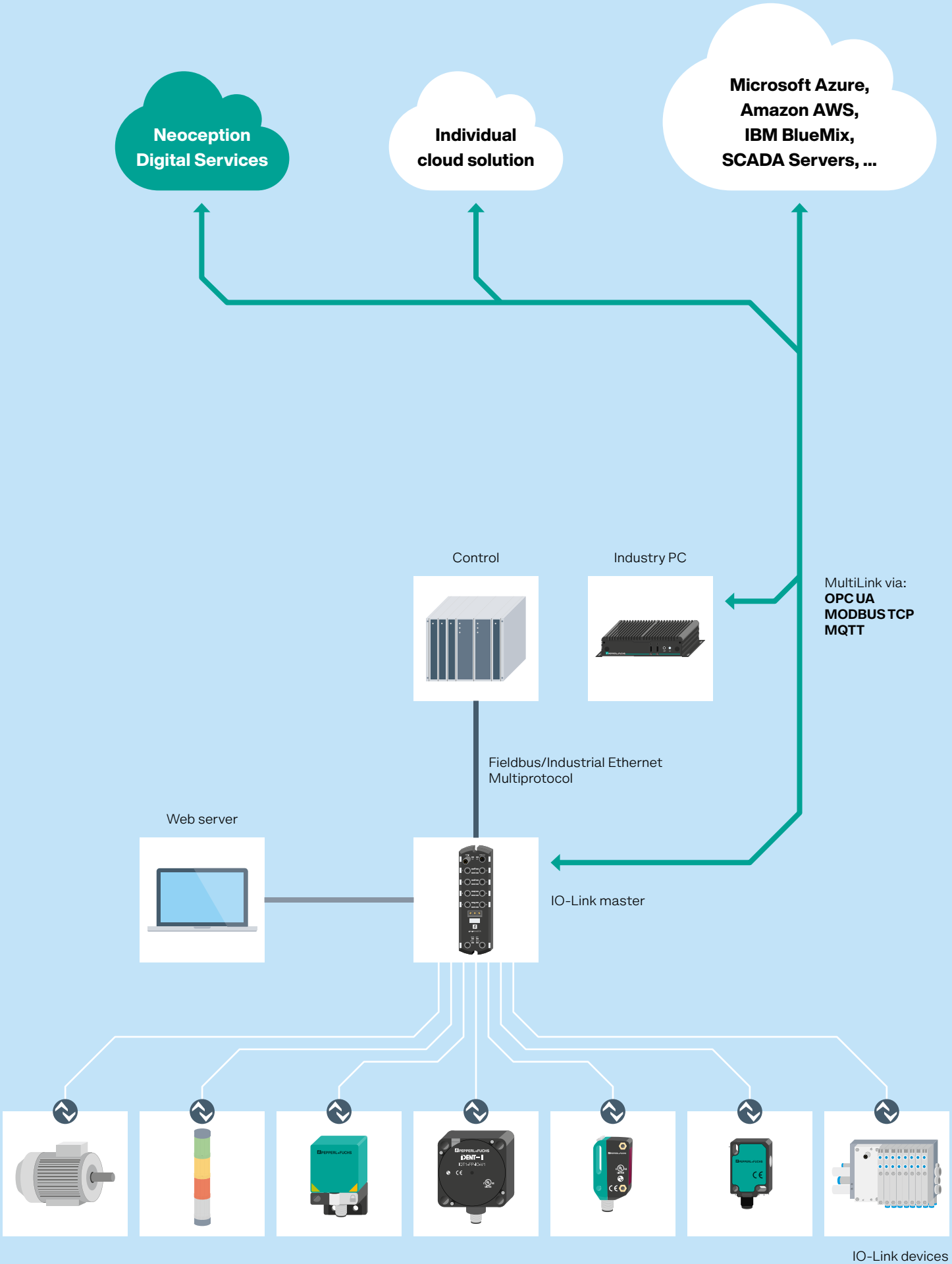
- OPC UA and MQTT interface for cloud-based applications that pave the way for future Industry 4.0 scenarios
- MultiLink—simultaneous communication with PLCs and cloud/SCADA systems offers outstanding flexibility in automation systems
- Integrated web server and IODD interpreter enable simple configuration via a web browser
- PortVision® DX software offers network configuration, device management, and settings cloning/backup in one application

Technical Data	ICE2-8IOL-G65L-V1D ICE3-8IOL-G65L-V1D	ICE2-8IOL-K45S-RJ45 ICE3-8IOL-K45S-RJ45	ICE2-8IOL-K45P-RJ45 ICE3-8IOL-K45P-RJ45
Inputs/outputs	8-port IO-Link master	8-port IO-Link master	8-port IO-Link master
Housing	Polyamide (encapsulated)	Polyamide	Polyamide
Rated current	16 A	3.7 A	3.7 A
Operating temperature	–25 °C ... +60 °C	–40 °C ... +70 °C	–40 °C ... +70 °C
Degree of protection	IP67	IP20	IP20
Dimensions	212 × 65 × 30 mm	118 × 45 × 114 mm	118 × 45 × 114 mm

IP20 IP67 | PROFINET | EtherNet/IP | OPC UA

Selected products from the portfolio.
For more IO-Link masters, visit
pepperl-fuchs.com/tf-io-master

Optimized for IoT Applications



IO-Link USB Master

Offline Configuration—Easy and Universal

Flexible Configuration for All IO-Link Devices

Get an IO-Link sensor up and running quickly and easily—and do it all from your desk. The IO-Link USB master acts as a link between a standard office infrastructure with Windows® PCs and an industrial IO-Link device.

The computer's USB port is used for both communication and power, allowing sensors to operate immediately without complex wiring. For devices with higher current consumption, an additional power supply is included with delivery.

Highlights

- Offline operation for a variety of applications via standardized interfaces and tools
- Plug-and-play with power supply from the USB port
- Standard M12 connector for quick connectivity with conventional cables

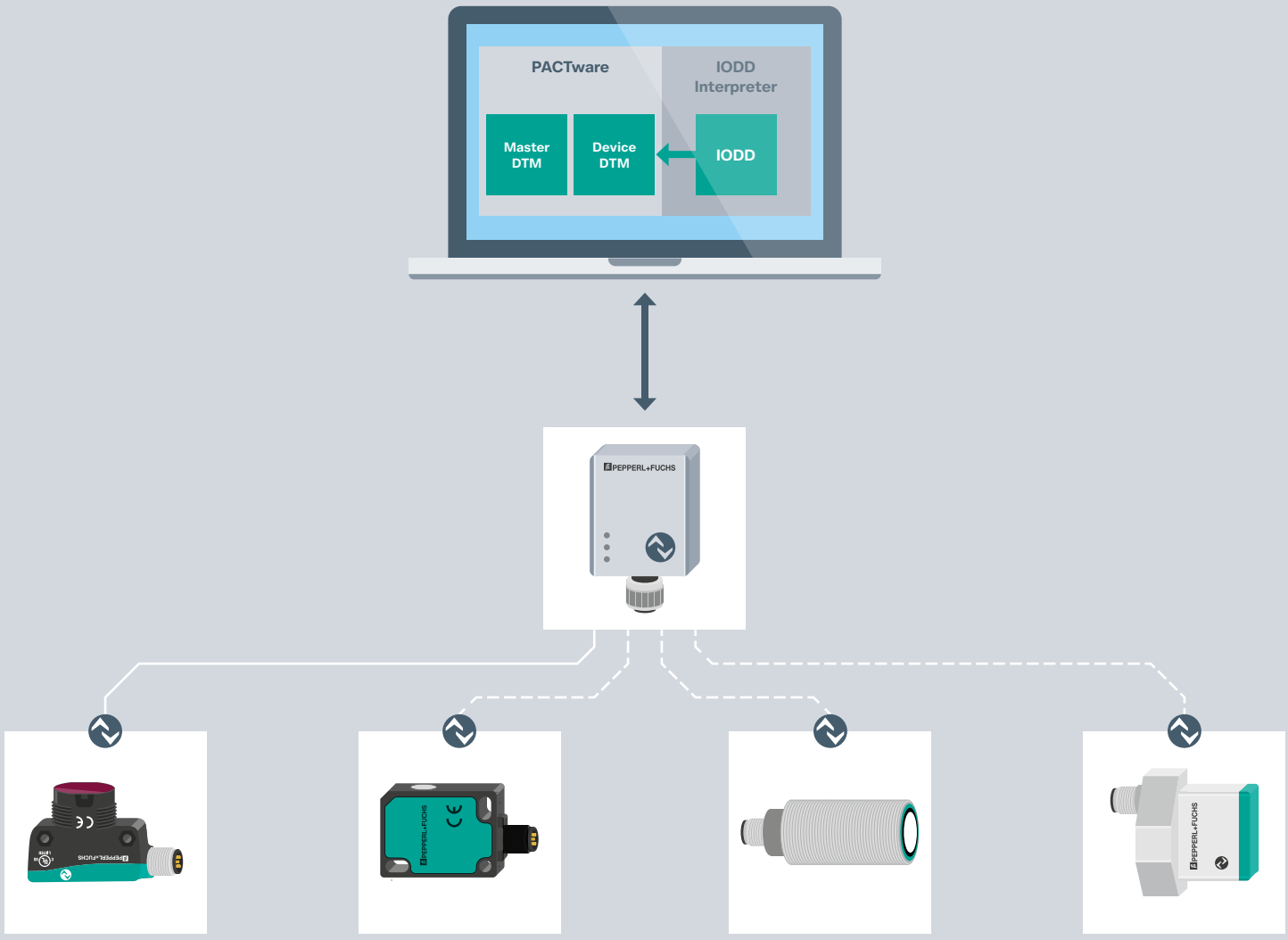
Technical Data	IO-Link-Master02-USB
Dimensions	70 × 41 × 24 mm (L × W × H)
Mass	100 g
Connection	IO-Link port: 1x M12, 5-pin, A-coded Operating voltage: DC-9, 2.1 mm USB 2.0: USB connector type MiniB
Interfaces	IO-Link, USB
Functional principle	Master mode
Standards	IEC 61131-9 (IO-Link Version 1.0 and 1.1)
Power supply	24 V DC/USB 5 V DC

For more information, visit
www.pepperl-fuchs.com/tf-io-master

Small but Mighty

The IO-Link USB master enables any IO-Link device to be preconfigured and tested via the IODD interpreter included in the software package from Pepperl+Fuchs.

Read parameter data from an IO-Link device, record changes and save data externally, duplicate and compare device settings—these are only a few of many possibilities. Previous knowledge of control system programming is not necessary.



IO-Link USB master for offline parameterization before assembly

Identical Switching for All Metals

Adaptability—Even in Applications with Multiple Target Types

Starting with steel, the switching distances of conventional inductive sensors are reduced, metal to metal, by a defined reduction factor. This is not the case with reduction factor 1 sensors, which offer identical switching distances for all metals with a single sensor. This allows much more flexibility in machine design and use in applications with multiple target metals. By using only one sensor instead of several, procurement, storage, and administration costs are reduced. In addition, reduction factor 1 sensors offer high magnetic field immunity for use in weld cell environments.

Highlights

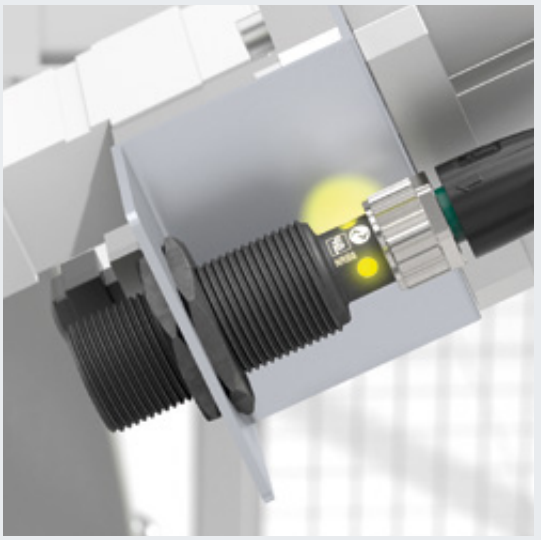
- Flexible—a broad portfolio of sensors with identical switching distance, regardless of a target's material
- Smart maintenance via stability alarm and temperature indicator
- Rugged, weld-immune sensors with IP68/IP69K protection for harsh industrial environments

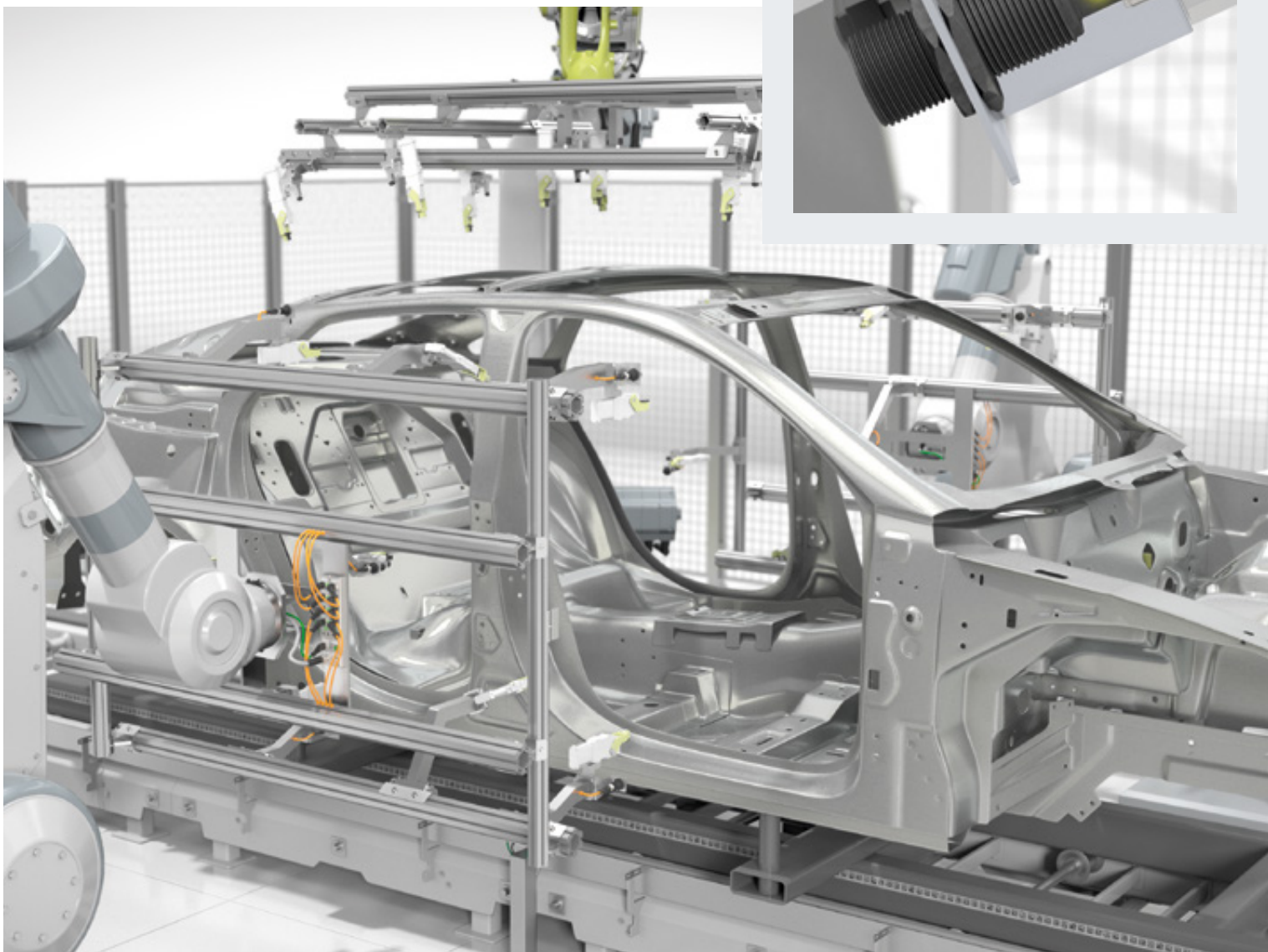
IO-Link 1.1

Weld-immune versions available

Selected products from the portfolio.
For more proximity sensors, visit
pepperl-fuchs.com/tf-io-inductive

Technical Data	M12	M18	M30	Varikont L
IO-Link standard	NR*-12GS40-E2-IO-*-V1	NR*-18GS40-E2-IO-*-V1	NR*-30GS50-E2-IO-*-V1	NR*-L3-E2-IO-*-V1
IO-Link weld-immune	NR*-12GS40-E2-IO-C-V1	NR*-18GS40-E2-IO-C-V1	NR*-30GS50-E2-IO-C-V1	NR*-L3-E2-IO-C-V1
Switching distance Flush Non-flush	 4 mm 10 mm	 8 mm 15 mm	 15 mm 30 mm	 20 mm 40 mm
Output	3-wire, PNP, NO/NC programmable			
Housing	Threaded sleeve M12 × 1	Threaded sleeve M18 × 1	Threaded sleeve M30 × 1.5	40 × 40 × 40 mm (Varikont L) 40 × 40 × 120 mm (Varikont)





Patented Technology for Precise Position Detection

Maximum Precision and Efficiency

A patented configuration and wiring of multiple coils within a single sensor and intelligent evaluation enable maximum precision and efficiency. This allows simple steel actuators to be used. Whether the actuator is the customer's design, from Pepperl+Fuchs' accessory portfolio, or part of the machine module being monitored—PMI inductive positioning systems always detect the exact position.

F90 Series

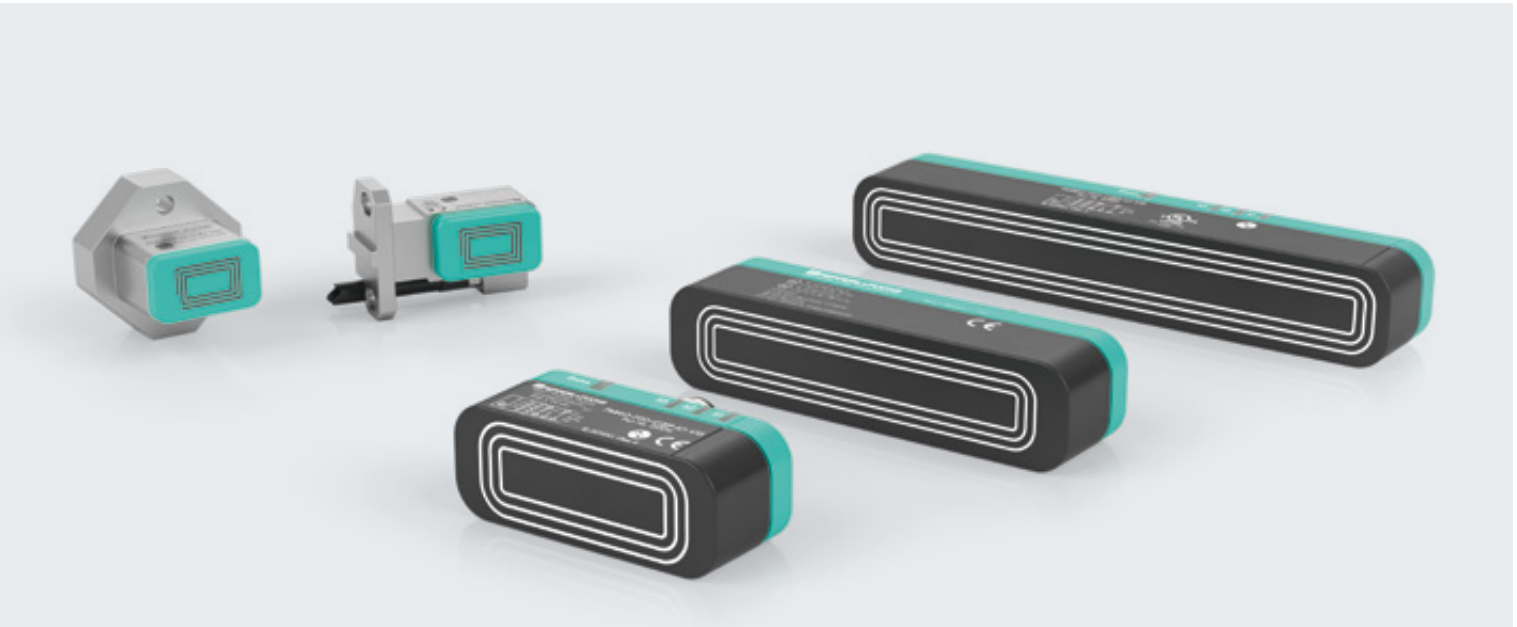
IO-Link, simultaneous detection of two damping elements, as well as measuring and switching functions in one device—the F90 series offers an unprecedented range of features for your application. Available in three measurement lengths (40 mm, 80 mm, and 120 mm), the best solution is always available. Certified versions are also available for applications in ATEX Zone 2/22 (3G ec, 3D tc) hazardous locations.

F112 Series

With a measurement length of 14 mm, the F112 series provides high-precision position data or switch points/windows. Fully encapsulated in a rugged metal housing with IP67 protection, the sensor withstands tough conditions and, with IO-Link, offers new possibilities in space-restricted applications.

F166 Series

Its compact design, rugged metal housing and IO-Link interface make the F166 series perfect for basic applications in tight spaces. Tool spindles are a typical application where these benefits are put to use.



IO-Link 1.1

Zone 2/22
(3G ec, 3D tc)

Measuring and switching in one device

Selected products from the portfolio.
For more identification systems, visit
pepperl-fuchs.com/tf-io-positioning

Technical Data	PMI*F90-IU-IO	PMI*F90-3EP-IO	PMI*F90-IU2EP-IO-V15	PMI*F112-U-IO	PMI*F112-2EP-IO	PMI*F112-2EPE2-IO	PMI*F166-EP-IO
Measurement length	40, 80, 120 mm	40, 80, 120 mm	40, 80, 120 mm	14 mm	14 mm	14 mm	15 mm
Output type	1 analog output (current or voltage)	3 switching outputs (push-pull)	1 analog output 2 switching outputs (push-pull)	1 analog output (voltage)	2 switching outputs (push-pull)	2 switching outputs (push-pull) 1 switching output (PNP)	1 switching output (push-pull)

Highlights

- Maximum durability with noncontact, maintenance-free technology and high environmental protection
- Simple steel actuator opens up a variety of possible applications
- Flexibility due to a wide range of functions and programmable measuring and switching range

Standard Housings—All Sensing Modes

Forward-Thinking Product Design—Endless Application Possibilities

A complete family of sensing modes in five standard housing styles with one user interface and IO-Link in every model. The forward-thinking design of Pepperl+Fuchs' R100, R101, R103, R200, and R201 series simplifies installation and reduces costs.

Highlights

- All photoelectric sensing modes in standard housing styles for maximum flexibility and more integration possibilities
- Simple installation and setup with one user interface for all housing styles and sensing modes
- IO-Link and Smart Sensor Profile in every sensor: standardized communication down to the sensor level as the basis for Sensorik4.0®
- Precise and reliable MPT distance measurement in a standard small housing

IO-Link 1.1

Up to IP69K

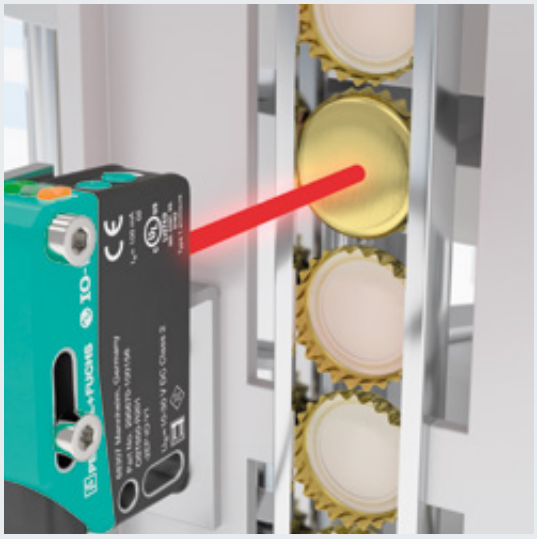
Smart Sensor Profile

Selected products from the portfolio.
For more photoelectric sensors, visit
pepperl-fuchs.com/tf-io-opto

Smart Sensor Profile: Pioneering the Standardization of IO-Link

Pepperl+Fuchs is among the first manufacturers to implement Edition 2 of the Smart Sensor Profile—including in the R200 and R201 series. This standard will also be implemented in future Pepperl+Fuchs products, and additional Smart Sensor Profiles with new function classes will be integrated into future developments.

Sensing Mode	Red Light LED (Power-Beam)	DuraBeam Laser	Infrared LED (R100, 101)
Thru-beam sensor	■	■	■
Retroreflective sensor with polarization filter	■	■	
Retroreflective sensor without polarization filter			■
Retroreflective sensor with clear object detection	■		
Diffuse mode sensor	■		■
Diffuse mode sensor with background suppression	■	■	■
Diffuse mode sensor with background evaluation	■	■	■
Measuring sensor with multiple switch points	■	■	■
Distance sensor	■	■	



Ultrasonic Sensors: UC-F77 Series

Extreme Performance in Reduced Space

Impressive Functionality

With IO-Link, sound beam adjustment, synchronization, long detection ranges of up to 800 mm, and minimal dead bands, F77 series ultrasonic sensors offer an unparalleled range of features and adjustment options. The series is available in a standard or side-looker version with integrated M18 thread. The minimized dead bands and long detection range mean objects close to the sensor and farther away are detected reliably. The sound beam width is easy to switch depending on requirements.

Highlights

- Highly adaptable: a single sensor can be adjusted to fit a wide range of applications
- Precise and reliable: high noise immunity and multiplex capability for maximum reliability
- Simple integration: compact, space-saving housing design with thru-hole and surface-mount options

IO-Link 1.1

IP67

Adjustable sound beam

SYNC

Synchronization

Selected products from the portfolio.
For more ultrasonic sensors, visit
pepperl-fuchs.com/tf-io-ultra

Simple Configuration for Batch Size 1 Production

With IO-Link, UC-F77 series sensors can be adapted to the demands of the application. Filter settings, sound beam width, switch points, and other parameters can be easily adjusted via the control system—even during production. This enables quick automatic recipe changes and individualized production down to batch size 1.

Technical Data	UC250-F77	UC400-F77	UC800-F77S
Sensing mode	Diffuse	Diffuse	Diffuse
Sensing range	20 ... 250 mm	30 ... 400 mm	60 ... 800 mm
Operating voltage	10 ... 30 V DC (18 ... 30 V DC analog output versions)		
Output type	1 switching output (push-pull output) 1 analog output (current or voltage)		

Rotary Encoder

Simplified Condition Monitoring for Increased Plant Availability

Flexible and Cost-Effective

The IO-Link encoder from Pepperl+Fuchs offers a wide range of mechanical interfaces and settings. Multiple software configuration options are available, which means a single device can be used to solve a wide variety of applications. This maximizes flexibility and warehouse efficiency.

The Pepperl+Fuchs IO-Link encoder has a total resolution of 31 bit and a transfer rate of 230.4 kBit/s (COM3). Its measured values provide information on absolute position (single and multiturn) and direction of rotation. The IO-Link encoder also delivers information about current ambient temperature and critical machine states. This provides status information on (cyclical) process data and enables a quick response if critical changes are needed. The configuration allows the output data to be easily interpreted—for easy monitoring and better plant performance.

IP67

COM 3

IO-Link 1.1

Selected products from the portfolio.
For more encoders, visit:
pepperl-fuchs.com/tf-io-encoder

Highlights

- System reliability feedback from intelligent diagnostic functions
- Condition monitoring with critical detection warnings
- Flexible, configurable rotary encoder enables standardized machine design
- Variety of shaft and flange configuration options available
- Optionally also available with preset parameters

Excerpt of Technical Data	ENA**TL – IO-Link
Accuracy	0.1°
Resolution	16 bit (single turn), 15 bit (multiturn)
Direction of rotation	Clockwise or counterclockwise
Shaft type	Solid or recess hollow
Flange	Servo, clamping, or spring-plate mounting
Housing dimensions	36 mm, 58 mm
Degree of protection	IP65, IP67

The Flexible Solution, Customized for Any Application

Comprehensive Machine Condition Data, Reliable Analysis

The IO-Link vibration sensor VIM3*IO* from Pepperl+Fuchs provides a wide range of measurement values and output data. Values are transmitted cyclically to the controller via the process data, providing in-depth analysis of the machine's current condition on a continuous basis. Predictive maintenance is therefore guaranteed, allowing the plant operator to take the appropriate maintenance actions in a timely manner. The wide range of information issued via the sensor includes temperature data, vibration measurements, operating-hours counter, and measurement scaling, enabling data to be interpreted remotely. In addition, the following measured values are transmitted:

- Vibration speed (RMS in mm/s) up to 128 mm/s
- Vibration acceleration (RMS in g) up to 48 g
- Max. vibration acceleration (peak in g) up to 48 g
- Temperature
- Crest factor scaled according to DIN ISO 13373-3
- Planned maintenance necessary

IP67

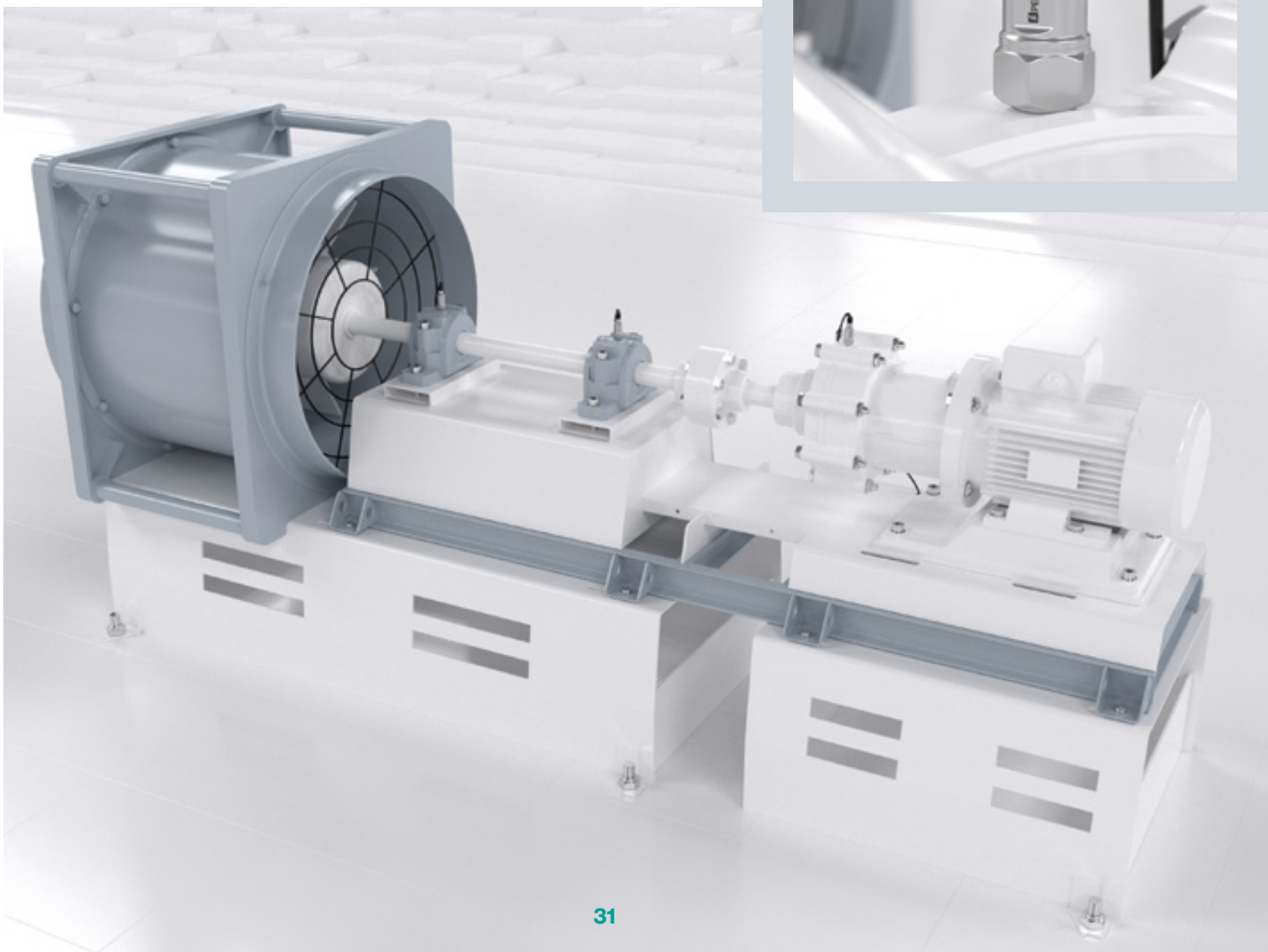
IO-Link 1.1

For more information, visit
pepperl-fuchs.com/tf-io-vim

Highlights

- Optimized system reliability: vibration velocity, acceleration, and crest factor provide the most reliable information about the machine condition
- Long service life: V2A/V4A and duplex steel variants with extremely robust housing and encapsulated electronics
- Use in demanding environments: extended temperature range from –40 °C to +125 °C as well as protection for use up to IP67

Technical Data	VIM3
Interface	IO-Link/Analog 4 ... 20 mA
Temperature range	–40 °C ... +85 °C
Output values	Speed/acceleration/temperature/crest
Switches	Switching output



RFID Read/Write Devices— Industry 4.0 Identification with IO-Link

Flexible Identification Solution Simplifies Integration

RFID read/write devices with IO-Link offer simplicity and flexibility. With autostart functionality, they simplify integration dramatically. Combining our Ethernet IO module with IO-Link master with the RFID read/write devices, Pepperl+Fuchs offers a complete, flexible identification solution.

RFID IO-Link read/write devices operate in the HF range according to ISO 15693 or in the UHF range according to ISO 18000-63 and EPC Class-1 Gen-2 and offer a read/write range of up to 30 centimeters and up to one meter, respectively. The housing designs are rugged and compact, ideal for use in harsh industrial environments.

Flexible System Integration

Users can choose between two operating modes that are designed for easy and complex applications. **Easy mode** enables simple plug-and-play commissioning with minimal programming. With **Expert mode**, Pepperl+Fuchs also offers a solution for high-performance data access via a handshake procedure.

The standardized IO-Link interface on the read/write devices enables flexible connectivity to most common bus systems and controls.

IP67 | COM 3 | EASY MODE

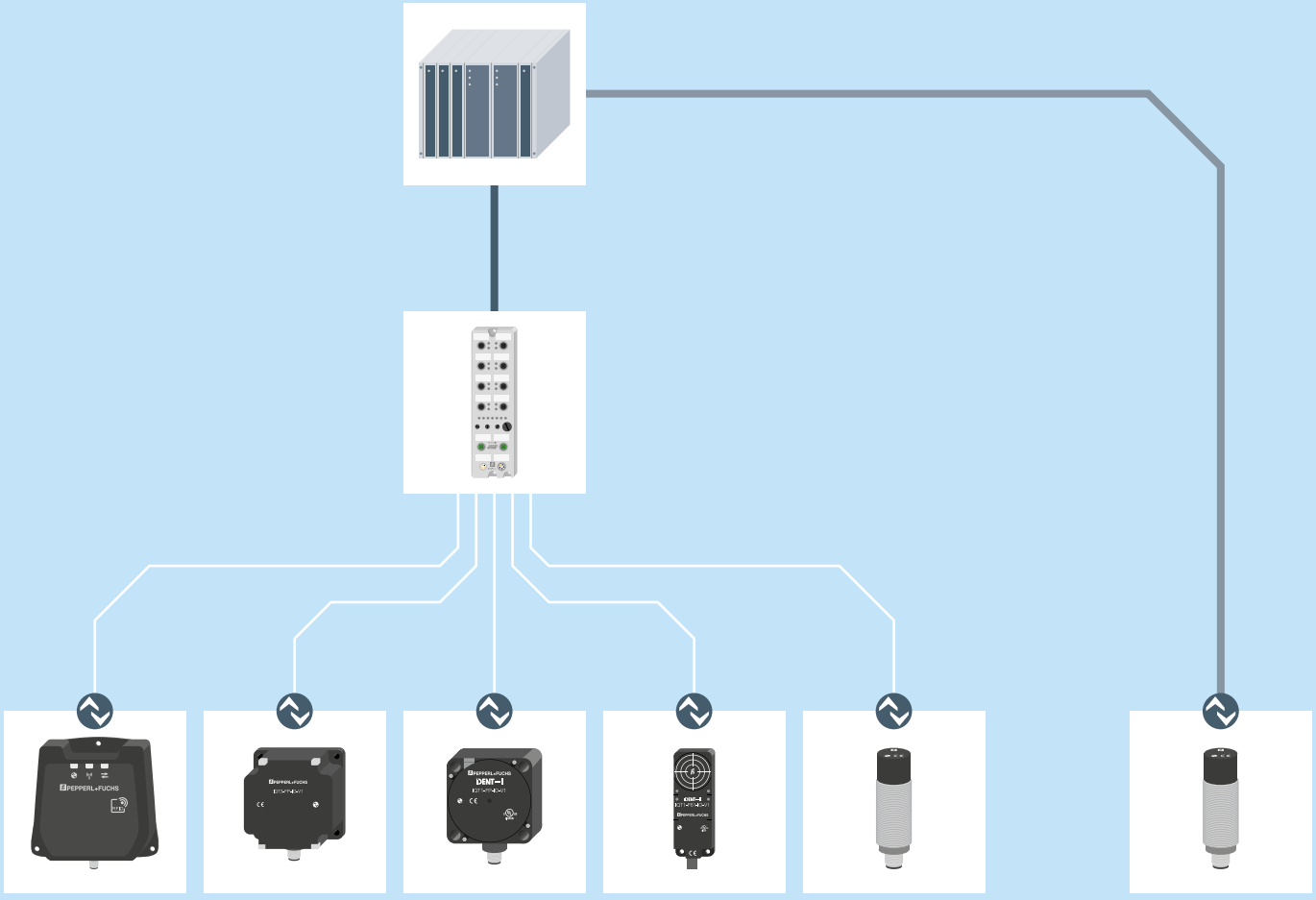
IO-Link 1.1

Selected products from the portfolio.
For more identification systems, visit
pepperl-fuchs.com/tf-io-ident

Highlights

- Easy Mode based on plug-and-play principle reduces complexity
- System standardization with multiprotocol support via IO-Link master for most common bus systems
- Standardized IO-Link interface unlocks the potential of Industry 4.0
- Flexible and efficient solution enables IO-Link read/write devices to be combined with other devices on any IO-Link master

Technical Data	IQT1-18GM-IO-V1	IQT1-F61-IO-V1	IQT1-FP-IO-V1	IQT3-FP-IO-V1	IUT-F191-IO-V1
Operating frequency	13.56 MHz				865–928 MHz
Read/write distance	0 ... 50 mm	0 ... 55 mm	0 ... 130 mm	0 ... 300 mm	Up to 1 m
Electrical interface	IO-Link (V1.1)				
Mechanical interface	M12 × 1				
Conformity	According to ISO 15693				According to ISO 18000-63 and EPC Class-1 Gen-2
Dimensions	ø 18 mm, length 63.5 mm	80 × 28 × 12 mm (L × W × H)	80 × 80 × 40 mm (L × W × H)	80 × 80 × 40 mm (L × W × H)	165 × 165 × 47 mm (L × W × H)
Temperature range	–25 °C ... +70 °C			–25 °C ... +70 °C (operation with nontransmission periods) –25 °C ... +55 °C (continuous transmission mode)	–25 °C ... +70 °C (operation with nontransmission periods) –25 °C ... +60 °C (continuous transmission mode)
Degree of protection	IP67				



Connection to the Ethernet IO module with IO-Link master

Direct connection to a control panel with IP20 IO-Link master

Push Button Box with IO-Link

Simple Connection, Multiple Configurations

Perfect Integration

The push button box can be easily connected to an IO-Link network via an M12 connector. There is no need for complex and error-prone wiring. The particularly compact housing is mounted directly on the machine via a mounting clip. In addition, the push button box impresses with its modern design and perfect visibility of the push buttons, even from a greater distance.

Depending on the requirements of the application, numerous configurations can be carried out on the software side:

- Five selectable standard colors or free RGB color configuration
- Four different flashing modes
- Night mode with several brightness levels

IP65

IO-Link 1.1

For more information, visit:
pepperl-fuchs.com/pf-io-link-box

Highlights

- Simple and error-free connection to an IO-Link network via M12 connector
- Highly flexible: numerous colors as well as flashing and night mode can be set
- Compact housing for particularly easy integration directly on the machine
- Modern design with perfect visibility of the buttons

Technical Data	ICA-F85E2-MC-IO-V1
Interface	IO-Link 1.1.2 (COM 2)
Illumination color of push buttons	RGB (configuration via IO-Link)
Dimensions	123.2 × 40 × 35.6 mm
Temperature range	–30 °C ... +60 °C
Degree of protection	IP65

Signal Light with IO-Link

Unmatched Flexibility and Excellent Resilience

Full-surface signaling or various illuminated images for a wide range of applications from alarming to level monitoring—this is what the signal light with IO-Link promises. It is especially robust and can be used in virtually any application environment.

The signal light is easily connected to an IO-Link network via an M12 connector. Each of the nine segments can be configured and controlled individually. All colors in the RGB space can be set. In addition, continuous illumination, flashing, or rotation mode can be selected. The brightness can also be easily adjusted to the application requirements on the software side.

For additional personal and system protection, the 105 dB siren alarms acoustically in ten configurable tones and four volume levels.

IO-Link 1.1

IP66
IP69K

MULTI-
COLOR

For more information, visit
pepperl-fuchs.com/pf-io-link-light

Highlights

- Numerous modes for a wide range of applications from alarming to level monitoring
- Individual setting of the nine segments with over one million colors each
- 105 dB siren for additional acoustic warning for personal and plant protection in case of an emergency
- Uniquely robust: high degree of protection and temperature range for use in demanding environmental conditions
- Easy connection to IO-Link via M12 connector

Technical Data	ICA-SL-9MCS-70MM-IO-V1
Rated operating current	Max. 405 mA
Number of segments	9
Light type	LED multicolor (>1,000,000 colors)
Signal type	Multitone (105 dB, 10 tones)
Dimensions (W × H)	72 × 271 mm
Degree of protection	IP66/IP69K
Temperature range	–30 °C ... +60 °C

I/O Hub with IO-Link

Efficient Integration of Binary Sensors and Actuators

G60 Series

The G60 series I/O hubs with IO-Link make it possible to easily and economically integrate digital sensors into the IO-Link communication channel. The hub has eight ports with digital inputs and outputs. Combined with an Ethernet IO module with integrated IO-Link master from Pepperl+Fuchs, signal transmission of up to 128 digital I/Os to higher-level control systems is enabled.

Since only one connector is necessary for signal transmission and power, wiring complexity is significantly reduced, leading to an especially efficient solution. With a rugged housing design and extended temperature range of –25 °C to +70 °C, the I/O hub can also be used in demanding industrial environments.

CB10 Series

The I/O hubs of the CB10 series enable the connection of up to eight standard devices into IO-Link networks. Freely configurable digital inputs and outputs ensure a wide range of applications—from use in stack lights and the connection of mechanical push buttons to the connection of three-wire sensors. Due to the compact housing design of 39.5 × 36 × 10.1 mm, the modules can be integrated into the smallest of panels and customer-specific electronics.

IO-Link 1.1

IP69K

Up to IP69K

UP TO 16

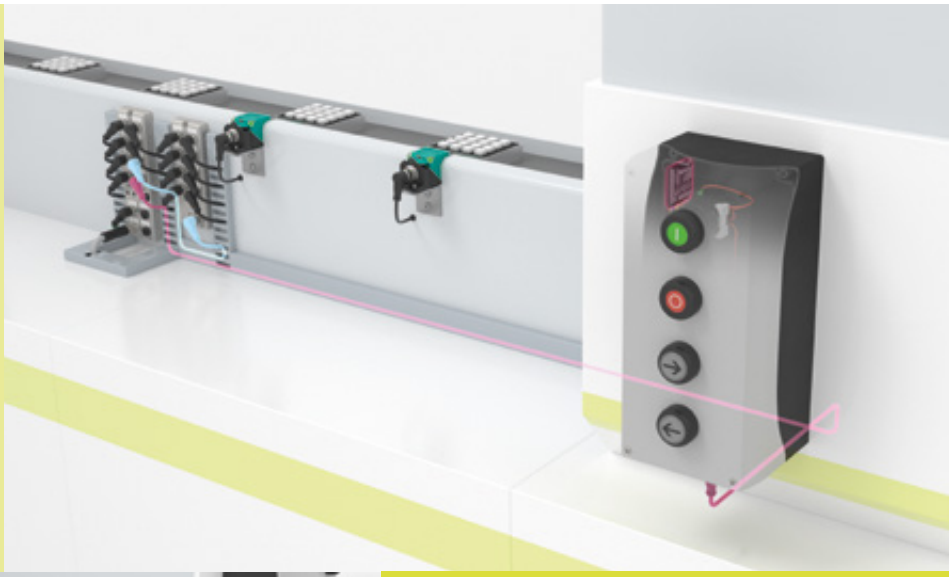
Up to 16 digital inputs/outputs

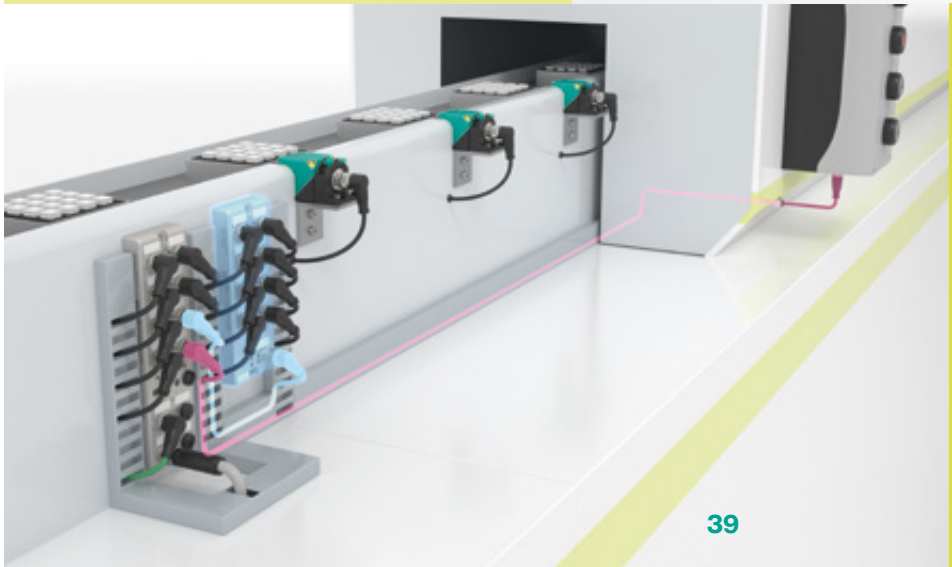
Selected products from the portfolio.
For more products, visit
pepperl-fuchs.com/tf-io-hub

Highlights

- Easy integration of binary sensors and actuators into automation systems via IO-Link
- Efficient signal transmission of up to 128 digital IOs via Pepperl+Fuchs' IO-Link master module to the control level
- Configurable digital inputs/outputs for greatest application variety

Technical Data	ICA-16DI-G60A-IO	ICA-10DI6DO-G60A-IO	ICA-16DIO-G60AL-IO	ICA-8DIO-CB10-IO
Inputs/outputs	16 digital inputs	10 digital inputs 6 digital outputs	16 digital inputs/ outputs, configurable	8 digital inputs/ outputs, configurable
IO-Link	V1.1, Class A	V1.1, Class B	V1.1, Class A	V1.1, Class A
Connection voltage	M12 A-coded	M12 A-coded	M12 L-coded	Conductor
Connection IOs	M12 A-coded			Conductor
Dimensions	160 × 60 × 31 mm (L × W × H)			39.5 × 36 × 10 mm (L × W × H)





IO-Link Analog Converters

Simple Connection of Analog Sensors and Actuators

Flexible Integration Directly into IO-Link Networks

With the help of the IO-Link analog converters from Pepperl+Fuchs, sensors and actuators with analog interfaces can be quickly and easily connected to an IO-Link master. The devices are installed between the IO-Link master and the analog device via M12 connectors. Due to the space-saving housing design, the converters can be mounted even in the smallest of spaces.

The IO-Link analog converters of the ICA-AI-* series are used to connect analog sensors. The devices of the ICA-AO-* series enable the control of analog actuators via IO-Link. Both variants can be configured for current signals as well as voltage signals—a wide variety of devices with analog interfaces can therefore be flexibly integrated.

IP67

IO-Link 1.1

For more information, visit
pepperl-fuchs.com/tf-io-ica

Highlights

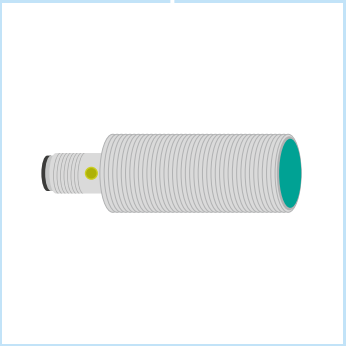
- Simple connection of sensors and actuators with analog interface to IO-Link
- Small housing enables installation in tight spaces
- High flexibility in use: configurable for current signals and voltage signals

Technical Data	ICA-AI-I/U-IO-V1	ICA-AO-I/U-IO-V1
Inputs/outputs	1 analog input	1 analog output
Electrical interface	IO-Link (V1.1)	
Mechanical interface	M12, Port Class A	
Dimensions	77.2 × 15.0 × 32.3 mm (L × W × H)	
Analog signal (configurable)	0 ... 20 mA/4 ... 20 mA 0 ... 10 V/–10 ... 10 V	
Degree of protection	IP67	

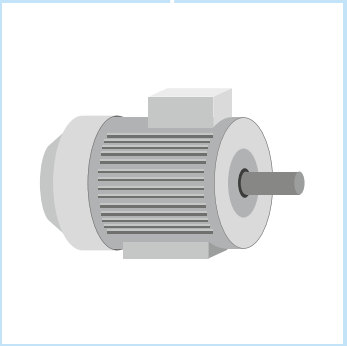
ICA-AI-*

IO-Link master

ICA-AO-*



Sensor with analog interface



Actuator with analog interface

The Perfect Complement: Connection Technology and Accessories

High-performance sensors need strong connections to match. The comprehensive accessory portfolio from Pepperl+Fuchs delivers everything you need for optimal sensor connectivity.

Connection Technology from Pepperl+Fuchs

- **Sensor-actuator cables**—Countless globally certified cables and connectors for the perfect application solution
- **Field-attachable connectors**—A wide assortment of connectors suitable for a diverse range of applications
- **Junction blocks**—M8 and M12 multiport sensor connection blocks with master cable or connector for reduced installation costs
- **Sensor-actuator splitters**—Allow easy merging of two signals in one junction block port
- **Receptacles**—Signal routing from the control cabinet directly into the field
- **Data connectors**—Enable you to establish a reliable network between the different components of your automation system

The Right Cable for Every Situation

Each installation environment has its own set of requirements. The mechanical and chemical properties of the connection technology are crucial in determining the best solution. Pepperl+Fuchs offers the right cable for every situation.

- PVC—Solid and economical
- PUR—Durable and highly flexible
- PUR-U—Highly flexible with UL approval
- PUR-A—Resistant to weld sparks for the automotive industry
- PUR-O—Rugged for harsh outdoor applications
- PUR-R—Highly flexible for challenging robotics applications
- STOOW—Used widely in the American market
- POC—Weld-bead resistant

For more information, visit
pepperl-fuchs.com/pf-connectivity

IO-Link Valve Connector

Comprehensive Diagnostic Data for Reliable Condition Monitoring

The innovative Form A valve connector can be easily connected to an IO-Link network via the pre-assembled M12 connector. In this way, numerous digital diagnostic data can be output, which allow the status of the connected valve to be determined reliably:

- Current switching status
- Switching cycle counter
- Voltage and current measurement
- DC resistance of the valve coil
- Temperature
- Valve motion detection

The alarm function in the event of limit values being exceeded for the respective values enables fast reaction times in the event of maintenance, therefore reducing downtimes to a minimum. The event-related RGB LED additionally ensures quick and easy identification of faulty valves directly in the plant.

Energy-Saving Pulse Width Modulation Mode (PWM)

In PWM mode, the average current required by the connected valve is reduced, thereby significantly limiting the temperature increase. This not only increases the valve service life, but also allows an overall energy saving of up to 70 %.

Highlights

- Increased plant availability: reliable condition monitoring due to various digital diagnostic data via IO-Link
- Individual control of the output current in PWM mode enables energy reduction of up to 70%
- Short response times in the event of maintenance due to configurable alarm function when defined limit values are exceeded
- Event-related LED for fast status display and identification of faulty valves directly in the plant
- Complete solution from a single source—extensive IO-Link portfolio for any requirement

IO-Link 1.1

For more information, visit
pepperl-fuchs.com/pf-smart-valve-connector

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