“Ready for the future?”

Inductive sensors with IO-Link interface

IO-Link

www.ipf-electronic.com

Our sensors ensure your success

ipf electronic

Industry 4.0

IO-Link: Your interface to the future

The fourth industrial revolution is networked digitally and completely because Industry 4.0 links production with the latest information and communication technologies. The goal: the “Smart Factory” – an intelligent, practically self-organizing factory that is characterized by increased flexibility because of increasingly differentiating customer desires, at the same time saving available resources and incorporating customers more into the business and value-added process.

The most frequently used keywords in this context are “Internet of Things” and “integrated networking”. Integrated networking and with it gap-free communication at all levels of production, which will become increasingly more complex through Industry 4.0, can only be realized with intelligent interfaces. Interfaces such as IO-Link.

Decentralized automation intelligence

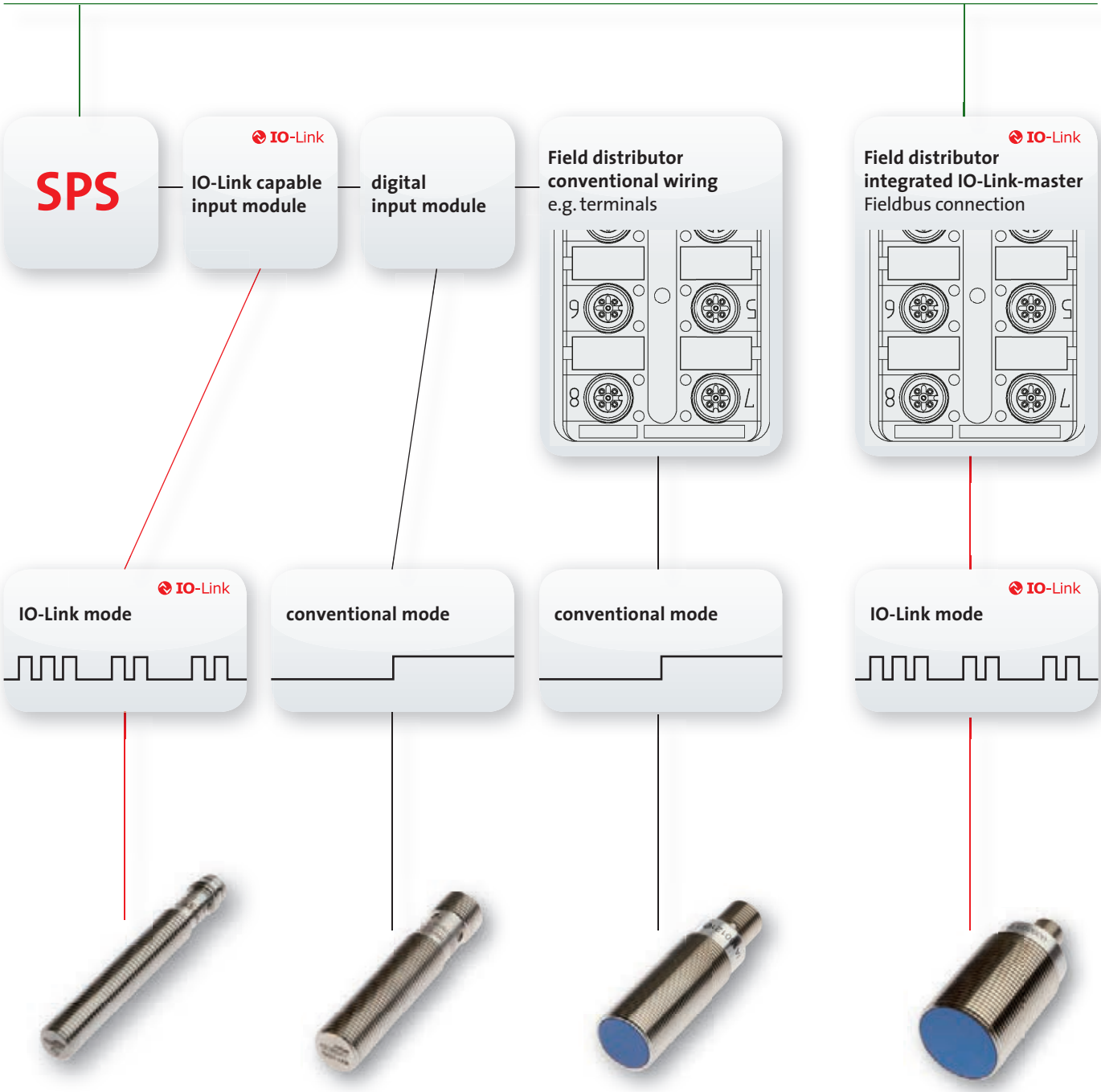
Worldwide standard for direct communication

IO-Link is **not** a bus system but a manufacturer-independent, secure point-to-point connection for sensors and actuators. Nothing about our sensors has changed apart from the IO-Link interface. Thus, they can be inserted as usual. With one particular feature: The IO-Link interface makes our devices intelligent as they can communicate with superior control units and hence can be parameterized in part during running operation or supply additionally valuable process, diagnosis and device data for manufacturing automation.

The potential is enormous: higher system availability and transparency in highly automated manufacturing processes as well as sustainable savings, inter alia through targeted process optimization and the use of status-orientated maintenance strategies to name but a few examples.

VIDEO IO-Link

Fieldbus



An IO-Link system only requires a few components:

- IO-Link master
- IO-Link device (e.g. sensor)
- Connection line (standard 3 line sensor cable)
- Configuration tool (parameterization software for IO-Link master)

Simple, efficient, results-oriented

System architecture and functionality of IO-Link

The IO-Link master has one or more ports and serves as an interface for the superior control unit (PLC). Only one IO-Link device can be connected to each port (point-to-point communication with parallel wiring – no field bus). An IO-Link device is connected to the IO-Link master via an unshielded 3-wire standard line (M8 or M12 standard sensor connection) with a maximum length of up to 20 meters. No special parameters need to be met for the routing of the line.
The IO-Link device communicates via the IO-Link master which is either integrated into a PLC (programmable logic controller) or a field bus distributor.
Therefore, there are no special requirements on the wiring or for installation to implement the IO-Link in existing automation systems.

Three types of data are exchanged between the IO-Link master and the IO-Link device:

- Cyclic process data
- Acyclic device data (IO-Link device): e.g. parameters, diagnostic information
- Acyclic data (events): e.g. errors and warnings

The IO-Link device only transmits its data at the request of the IO-Link master.

A configuration tool is required for parameterizing the IO-Link master (more about this on the following pages).

Advantages:

- Cost-efficient standardization of sensors
- Simple device change system through Plug & Play
- Efficient communication through a single manufacturer-independent system
- Intelligent sensors that supply additional diagnostic information
- Direct modification of system parameters during operation
- Problem-free wiring without requiring great effort or special requirements

IO-Link configuration tool (IO-Link protocol and IODD (software))

One software for all – parameterization the easy way

- IO-Link devices from all manufacturers need only one configuration software
- Master-software enables a convenient parameter setting of the connected devices
- Sensors' process data are retrieved and displayed by the master-software
- IO-Link protocol provides access to the sensors' process data and parameters

Manufacturer-encompassing system intelligence

IO-Link configuration tool and IODD

Software is required for parameterizing the IO-Link master and with it the connected manufacturer-encompassing IO-Link device and IO-Link capable sensors. This so-called IO-Link configuration tool makes a transparent representation (visualization) of the respective IO-Link system architecture possible.
Our IO-Link capable sensors offer access to process data and variables via the IO-Link protocol. All sensor properties are described in the IODD (IO Device Description). The structure of the IODD is the same for all IO-Link capable devices from all manufacturers. The IODD consists of one or multiple xml files that describe the IO-Link capable sensor and image files in png format.

An IODD contains:

- Information on communication properties
- Information on device parameters
- Identification, process and diagnostic data
- Picture of the sensor
- Manufacturer logo
- PDF with all relevant information for the user

The IO-Link configuration tool from the master manufacturer are in a position to read in an IODD and therefore display the characteristics of the described sensor.

- The sensors‘ features are described uniformly in the IODD
- IODD contains PDF with all important information for the user
- IODD integrates among other things a picture of the device and information on the device’s parameters for unambiguous identification and convenient configuration
- Master-software indicates if a sensor is connected that does not match to the loaded IODD-file

Sensors with IO-Link interface

Inductive sensors for standard use

IA080171
With the M8 size, the IA080171 is the smallest of this device series. The sensor in the stainless steel housing has a switching distance of 1.5mm and a repeat accuracy of 0.07mm. The sensor is connected via a 3-pin M8 connector.

IA120121
The M12 size sensor with M12-connector has a switching distance of 2mm. The device in brass housing (nickel-plated) has a repeat accuracy of 0.1mm.

IA180121
The M18 size IA180121 sensor with M12-connector. The device in housing made from nickel-plated brass has a repeat accuracy of 0.25mm.

IA300121
The M30 size IA300121 has a switching distance of 10mm and a repeat accuracy of 0.5mm. The housing is also made from nickel-plated brass.

Perfectly protected electronics
A special feature of the inductive sensors for flush mounting with an active surface made from plastic are the electronics that are compound-filled and therefore perfectly protected from vibrations. The contactless working, IO-Link capable devices in IP67 are designed for ambient temperatures of -25 to +70 °C. The sensor housing is made from metal (stainless steel or brass). Possible application areas: presence monitoring of differently sized metal parts, recording of object heights, object detection through non-metallic containers and pipe walls, and integration in machine components in automation technology.

Inductive sensors

for extreme environments

IC080172
This M8 size sensor has high pressure resistance of up to 100bar and has a switching distance of 2mm. It is connected via an M8 connector. The repeat accuracy is ≤ 0.1mm.

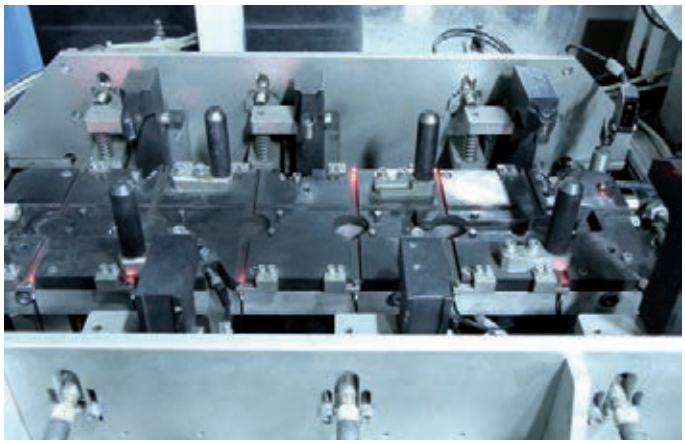
IC120122
The IC120122 resists pressures up to a maximum of 80bar. The device in size M12 has an M12-connector, a switching distance of 3mm and a repeat accuracy of ≤ 0.2mm.

IC180122
This device is designed with an M12 connector in size M18. The repeat accuracy is ≤ 0.3mm with a switching distance of up to 5mm. The device is pressure-proof up to 60bar.

IC300122
The IC300122 with the dimensions M30x1.5 with an M12 connection is pressure-proof up to a maximum of 40bar and has a switching distance of 10mm and a repeat accuracy of ≤ 0.3mm.

Ideal for extreme environments
As these inductive sensors for flush mounting have a housing made entirely out of stainless steel, they are also completely leak-proof with regard to liquids and gases on the active surface. The IO-Link capable sensors achieve the degree of protection IP96K in combination with our standard sockets. They are particularly suitable in applications where especially high demands are put on the reliability and longevity of the sensors, e.g. oil, dirt, high pressures or strong mechanical stresses. A high switching distance that can be achieved even on non-ferrous metal is a feature of this device series. Another outstanding feature of all inductive sensors is a high switching frequency of up to 5kHz.

Individual requirements Constructive solutions



Long-lasting reduction of downtimes and costs

Production losses due to maintenance work, be they planned or not, bring about considerable costs in everyday operation. “Commercial” inductive proximity switches were previously used in equipping devices for brass bushes, shown here, which were replaced at regular intervals as part of preventative maintenance. Despite these measures in which completely intact devices were replaced, production was occasionally disrupted due to defective sensors.
Because of the change to IO-Link capable inductive sensors from ipf electronic, downtimes were significantly reduced and above all over the long-term. The sensors inform the superior PLC using IO-Link as soon as they no longer have a sufficient functional reserve. The maintenance department is therefore in a position to plan an operation in good time before a device fails and therefore achieve a condition-oriented and more cost-effective service strategy.
The change to the new, IO-Link capable sensors was not problematic because the design of the device remained unchanged. Also, the present sensor lines could still be used. Only the PLC input module had to be replaced by an IO-Link capable module.

Minimized storage and higher flexibility

Who doesn‘t know about the large storage cabinets, shelves or even rooms of maintenance departments. As a spare part must be available as quickly as possible for every component that is installed and replaceable in a production system in the event of a defect or interference with a view to achieving a high degree of system availability, this cost is entirely justified but not strictly necessary. Storage and with it related costs or rather the capital commitment can be clearly reduced by changing to IO-Link capable devices. Conventional sensors were replaced by IO-ink capable devices, for example, in the tool that is seen in the picture. It is therefore no longer necessary to store separate opening and closing devices as spare parts. The storage costs decrease. Furthermore, the new, IO-Link capable sensors can also be debounced using integrated turn-on delay. Until now, this function had to be assumed by a PLC. It was possible to convert the tool at low cost because of the long range of the cables of up to 20 meters and the low demands that were made of the wiring of the IO-Link capable devices.

SEE APPLICATION REPORT

find** instead of **search

ipf ProductSelector
Faster to target

It is not always easy to find the right sensor or the suitable accessory for a specific application. With the "ProductSelector", ipf electronic presents a new feature on its website (www.ipf-electronic.com) that takes care of this with just three clicks of the mouse.

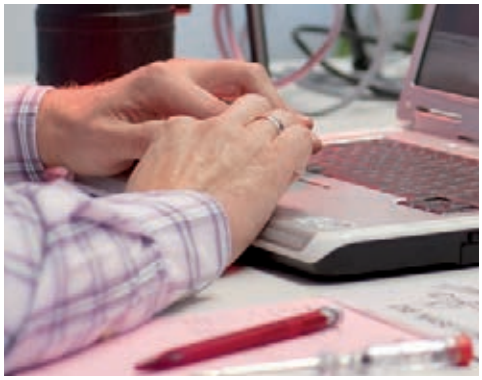
In the first step, one selects the product area in the "ProductSelector" (e.g., inductive sensors). The user can then further refine his search by specifying the design, dimensions, housing material, IP system of protection, length, sensing range,mounting, connection, output, etc.

Already in the third step, the "ProductSelector" returns a result list with products that meet the search criteria and displays, among other things, the current availability of the products.

With a click of the mouse, up to three matches can be selected for a more detailed product comparison. In the comparison that follows, color markings allow the user to immediately see the specifications in which the products of his comparison differ.

Efficient advice on all matters

Personal service and problem-solving on site



CONTACT

Every call is important! When you contact our technical hotline, you speak to experienced employees who will answer your questions competently and conscientiously. Our goal is to provide you with comprehensive and individual advice around the clock. Our expert team of in-house trained personnel is here to support you.

You can also contact your personal application consultant in our sales department. At ipf electronic, we work together very closely so that we are able to react quickly, competently and reliably to your specific query.

In almost all industrial applications, problems are becoming ever more complex and varied. Solutions to these problems often require external expertise. You will find this expertise together with a high level of specialist and problem-solving competence at ipf electronic. We are happy to discuss tasks which may seem small with you. For us, this is a matter of course!

ipf electronic is a renowned supplier of industrial sensor technology and a reliable partner. No customer query is ignored and no on-site customer appointment is missed. Our extremely broad range of products will convince you. Diversity, expertise, consultation and flexibility:

This is ipf electronic's recipe for success.

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