

SENSORS FOR FOOD AND LIFE SCIENCES.












HYGIENIC BY DESIGN

**ANDERSON-NEGELE**



## Instrumentation with IO-Link / Flex-Hybrid

-  TEMPERATURE
-  PRESSURE
-  LEVEL
-  POINT
-  FLOW
-  CONDUCTIVITY
-  TURBIDITY
-  WEIGHING SYSTEMS
-  PROCESS ADAPTERS

How can IO-Link make my processes easier, faster and safer?

Can I operate a complete production plant with IO-Link interface only?

What advantages does IO-Link offer in the planning, construction and commissioning of plants?

What is needed for the use of IO-Link and where can I find it?

How can I connect devices that do not offer IO-Link?

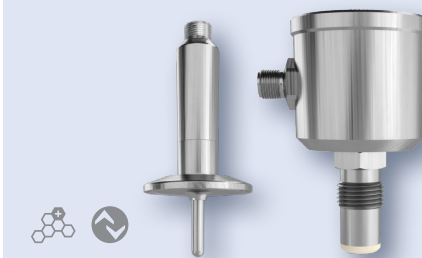
[ANDERSON-NEGELE.COM](http://ANDERSON-NEGELE.COM)



## How can IO-Link make my processes easier, faster and safer?

### Temperature

They are indispensable in almost every step of beverage production and for CIP control. That's why we offer them in 2 standards (Big and Mini), with a comprehensive performance range and an almost infinite variety of configurations, process connections, and options.



TSMA / TSBA

- ✓ For vessels and pipes from DN25
- ✓ Flush design available
- ✓ Accuracy  $< \pm 0,1 \text{ K}$
- ✓ Extremely robust and permanently precise
- ✓ Optional programming display

## The digital (R)evolution in hygienic process instrumentation

IO-Link is a universal communication protocol that's digital and not limited to a specific fieldbus. It adheres to the IEC 61131-9 standard, and many manufacturers of pumps, sensors, valves, and other components offer IO-Link compatible devices. This allows for easy connection of entire process plants or skids to the PLC by simply plugging in the devices.

Its bidirectional data transmission system ensures an interference-free connection and provides real-time status updates to avoid production disruptions. It's easy to install and commission thanks to plug-and-play technology, and replacing sensors is a breeze with the „Smart Replace Design“ that automatically detects, configures, and parameterizes the new sensor.

**FLEX-HYBRID** is a technology by Anderson-Negele that allows for digital IO-Link, analog 4...20 mA, and even parallel communication in one sensor.

### Pressure

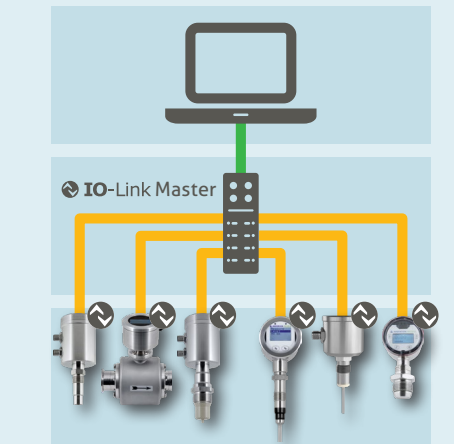
Keep optimum control of process or vessel pressure at all times. Many sensor options provide the most suitable solution for every application, every requirement and every desired pressure measuring range.



L3

- ✓ Always precise due to significantly reduced temperature effect
- ✓ Direct output of volume, level or pressure
- ✓ Integrated tank linearization and density compensation

**Our tip:** Opt for a Flex-Hybrid sensor when purchasing or replacing sensors. It lets you leverage the benefits of the digital age already today, such as simplified programming or plug-and-play sensor replacement. And if you upgrade to IO-Link control at some point, the sensors switch over just by plugging them in.



P42

- ✓ Extremely robust, even with pressure shocks
- ✓ Absolute, Relative or Compound measurement
- ✓ Temperature compensated

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### Level

Different temperatures, different vessel shapes, sometimes pressurized, different densities, differently foaming media, different turbidity and solids contents - highly different requirements and dynamic changes influence the control of the filling level of your various vessels and containers. However, at all times you need to know exactly how much product is in the vessel or ensure that a vessel does not overflow or run dry. That's why we offer different measuring techniques in different designs and options, so that you get the best solution for every purpose and application.



Hydrostatic:  
L3

- ✓ Always precise due to significantly reduced temperature effect
- ✓ Direct output of volume, level or pressure
- ✓ Integrated tank linearization and density compensation



Potentiometric:  
NSL-F

- ✓ Highly accurate even with foam, pasty or adhering media
- ✓ Installation from the top, below, or side, rod can be adapted to vessel shape
- ✓ Also for pressure vessels and up to 3 m



## Can I operate a complete production plant with IO-Link interface only?

**Short and sweet: Absolutely!** The IO-Link consortium is widespread and active worldwide, making an IO-Link version available for almost every sensor and actuator type.

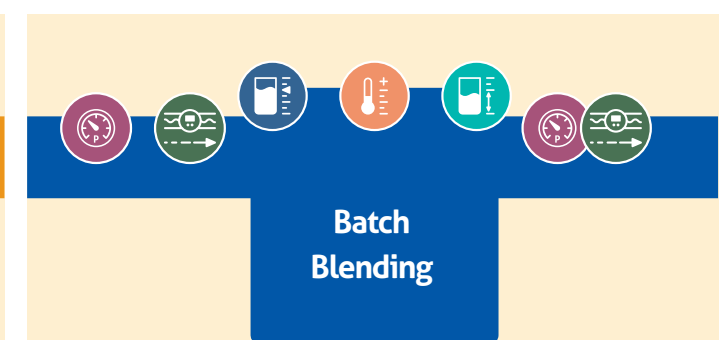
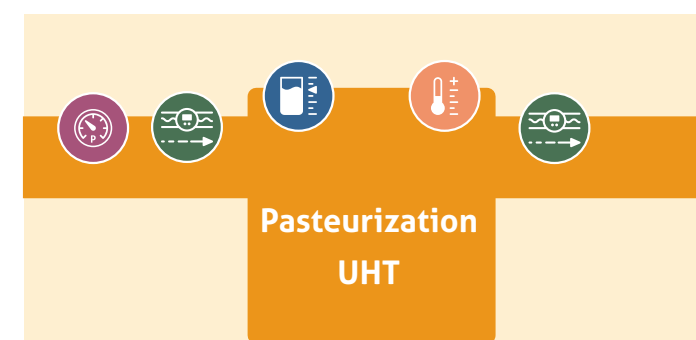
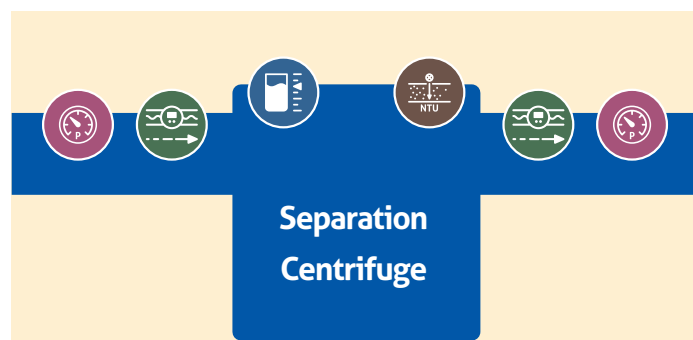
Anderson-Negele alone provides sensors for various measuring ranges such as flow, level, pressure, turbidity, conductivity, and temperature from a single source.

Additionally, our flow monitors and point level detectors with their on/off output can be processed directly as digital signals by the IO-Link master.

And those sensor types which are not yet available as IO-Link devices can be integrated with a converter that screws onto the M12 connection and converts an analog 4...20 mA signal into a digital signal.

**Our Tip:** Compile the list of sensors and actuators you plan to use in your plant. You will see: For most processes in the food and beverage industry, you can already today operate everything with IO-Link!

Examples of applications that can be executed completely with IO-Link sensors







# What advantages does IO-Link offer in the planning and construction of plants?

The main benefit is up to **50 % savings on cabling**, both for the installation time and cost as well as for the material itself. Typically, each cable must be laid in parallel wiring continuously from the sensor to the PLC or control unit. Usually this has to be a shielded special cable.

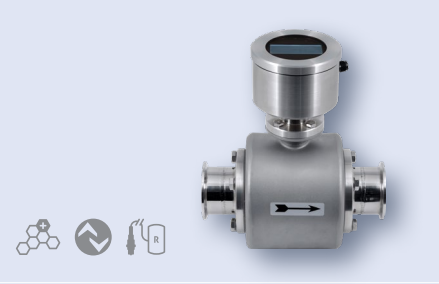
This means enormous costs for the often very expensive special cables, which also have to be laid over a long distance. In addition, this leads to a high installation effort for the cable ducts and brackets, as well as for connection of the entire cables by specialized plant electricians.

IO-Link simplifies all this by **connecting each device to a local IO-Link master with just one cable**. From the master, only one cable is needed to connect to the PLC. As digital data transmission is resistant to interference, **standard M12 cables are sufficient** for this purpose.

**Our Tip:** Our customers have reported both a 50 % reduction in labor costs and material costs for cable installation with new plant setups. Imagine cutting your cabling expenses in half - that's exactly what users have experienced. Calculate your own costs for cables and labor and see how much you could save with IO-Link.

## Flow Meter

Here's how to **keep control** of your beverage recipes, monitor your blending, and ensure the **reliable operation** of your plant: **Precise flow control** with electromagnetic flow meters.



### FMQ

- ✓ Compact, robust, low-cost all-rounder
- ✓ Measuring range 30 l/h to 280,000 l/h (8 gal/hr to 72,000 gal/hr)
- ✓ Measuring accuracy  $\pm 0.5\%$   $\pm 2$  mm/s
- ✓ For process temperature up to 165 °C / 325 °F (Remote), CIP up to 130 °C / 30 min.
- ✓ Many current process connection

## Conductivity Sensors

For active, automated phase transition, control of the CIP return of acid / caustic / water and concentration control of the CIP cleaners: ILM-4, your **safeguard for process reliability**.



### ILM-4

- ✓ Measuring range:  $\leq 1... \leq 999$  mS/cm
- ✓ Sensor response time only 1.2 sec.
- ✓ Configurable from basic to high-end model
- ✓ Extremely robust and durable: 5 years warranty

Examples of applications that can be executed completely with IO-Link sensors



# What advantages does IO-Link offer in the comissioning of plants?

## Turbidity

The **clarity of a beverage** or its **natural turbidity** are often used as **quality characteristics**. Do you want to safeguard your product quality by precisely monitoring the turbidity? Control your separator optimally? Supervise the function of your filter systems? Reuse CIP media and thus save costs? Minimize wastewater costs through contamination monitoring? Then our turbidity sensors are **your perfect solution**.



### ITM-51

- ✓ Front-flush design with backscatter light technology
- ✓ Easy installation due to screw or clamp connection
- ✓ Measuring range: 50...75,000 EBC
- ✓ High safety and durability due to glass-free sapphire optics

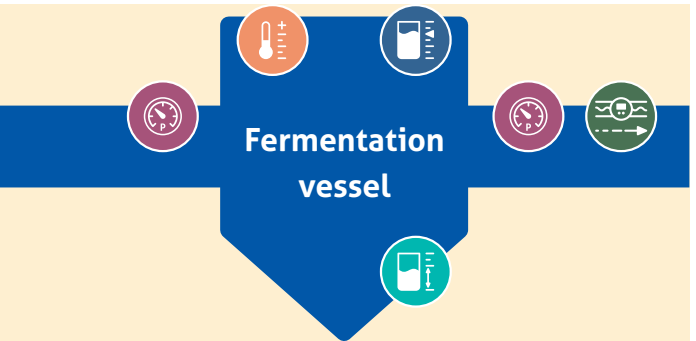
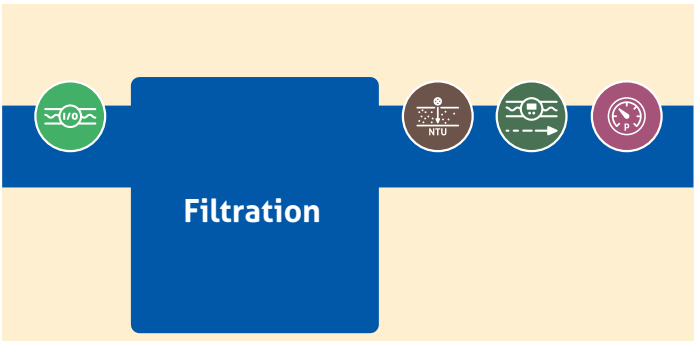
IO-Link devices are **configured by connecting a computer** to the IO-Link master.

You just have to download sensor specific data, the IODD (IO Device Description) from a central database. Then you can enter the configuration of all the parameters, such as the measuring range for turbidity or the temperature display in either °C or °F, for the process. This programming is **saved in the IO-Link master** and can be copied directly to **other sensors using copy-paste** if multiple sensors need to be configured in the same way.

This allows for **faster set-up and fewer sources of error**. You only have to use one interface to configure all devices and sensors, eliminating the need for product-specific programming adapters, special hardware and software, or programming directly on the sensor display.

**Our Tip:** Thanks to Flex-Hybrid technology, for existing analog systems you can also take advantage of these special benefits:

- Easy programming and configuration: all parameters can be set for all sensors easily on a laptop using only one software, even by someone outside of production or a plant engineer.
- Copy-paste for multiple sensors: the settings only need to be made once and can then be saved in the IO-Link master, allowing for simple configuration of additional sensors with a few clicks using copy-paste.
- Automatic programming when replacing sensors: the programming saved in the IO-Link Master can be automatically transferred to the replacement sensor by plugging in the M12 cable.





## What do I need for the use of IO-Link and where can I find it?

Thanks to the standardized communication protocol used across all sensors, actuators, and control components, setup and commissioning with IO-Link is **simple and fast, even for those without expertise** in the field. With just a few hardware and software components, you can get started with IO-Link:

- **IO-Link master:** This data hub, which is attached to the plant near the sensors, allows up to eight sensors or actuators to be plugged in via M12 cable. If more than eight devices are needed, several IO-Link masters can be connected to a central master with one cable each. Each IO-Link master model has its own software for configuration and operation of the connected devices.
- **Cables:** Thanks to the digital transmission's interference immunity, pre-made 3-pin M12 standard cables are sufficient.
- **IODD:** The „IO-Link Device Description“ is device-specific software necessary for operation via the IO-Link master. It can be downloaded from the IO-Link website or from any Anderson-Negele product page.

• **AOI:** The „Add-On Instruction“ is required only by few PLC types. The AOIs for all Anderson-Negele sensors can be found at [www.anderson-negele.com/aoi](http://www.anderson-negele.com/aoi).

👉 **Our Tip:** To configure all sensors, simply connect the IO-Link master to your computer via USB cable or wireless function. With just one software, you can configure, save, and transfer all configurations to other sensors, retrieve status reports of sensors, and even change settings remotely via protected access while the process is running. This provides you with complete control over your processes and all devices involved at all times.

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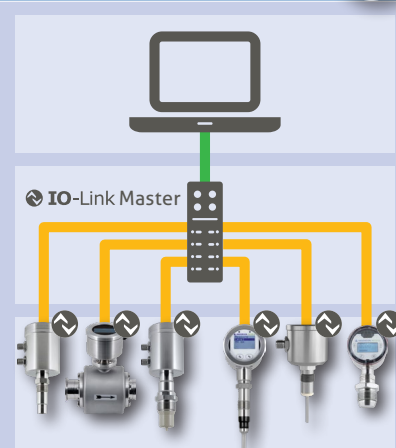
### IO-Link in a nutshell

Your key to greater efficiency: sensors with IO-Link in Flex-Hybrid technology. These make **planning, commissioning and operating** your plants **easier, faster and more flexible**. For **existing analog plants**, Flex-Hybrid means easier programming, sensor changes with “plug-and-play”, and if you upgrade to IO-Link interface at some point, the sensors are changed over just by plugging them in.

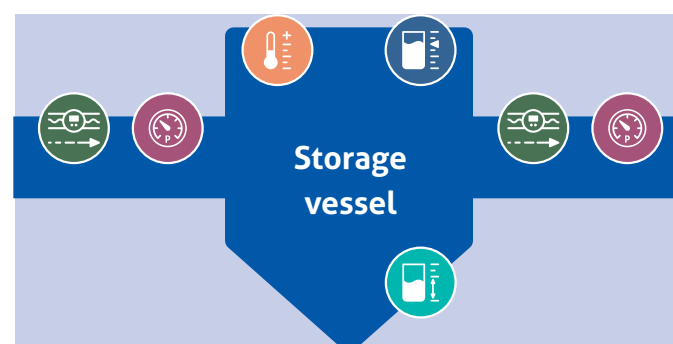
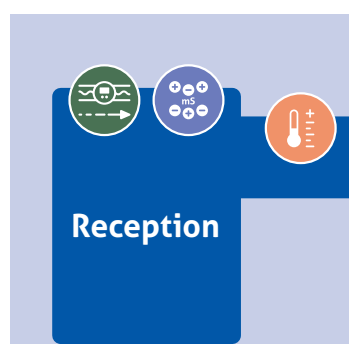
- ✓ Extensive sensor program for almost all measuring categories
- ✓ Up to 50 % savings possible due to lower material costs for cables and less time and effort for installation
- ✓ Suitable for all IO-Link masters

- ✓ Only one software for programming and configuration
- ✓ Automatic programming transfer when replacing a sensor

More info at [www.io-link.com](http://www.io-link.com)



Examples of applications that can be executed completely with IO-Link sensors



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## How can I connect devices that do not offer IO-Link?

👉 = IO-Link

🔗 = Flex-Hybrid

📶 = Remote-Version

Not all devices are already available with IO-Link. You can still integrate such components into the IO-Link system. **By means of converters, you can use other signals from the sensors.** Additional functions such as the status reports on the sensors themselves are not possible in this case, but the correct operation of the system is not a problem.

### Flow Switches

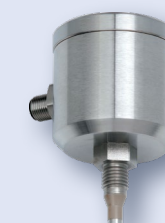


Calorimetric: FTS

- ✓ Measuring range 0.1...3 m/s
- ✓ Very short response time
- ✓ Temperature compensated

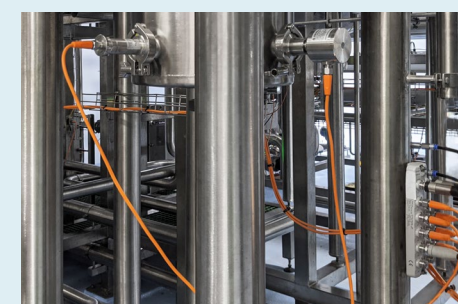
👉 **Our Tip:** I/O devices with PNP signal for On/Off can be connected directly to the IO-Link master. These are e.g. our flow monitors and point level sensors. For all 4...20 mA devices, special converters can be used to transform the analog current signals into digital data.

### Point Level



Capacitive: NCS / Conductive: NVS

- ✓ Reliable point level control even with foamy or viscous media
- ✓ Hygienic installation on top, below, or side
- ✓ Very fast reaction time
- ✓ Also for double-walled vessels



## And does all this really work in practice?

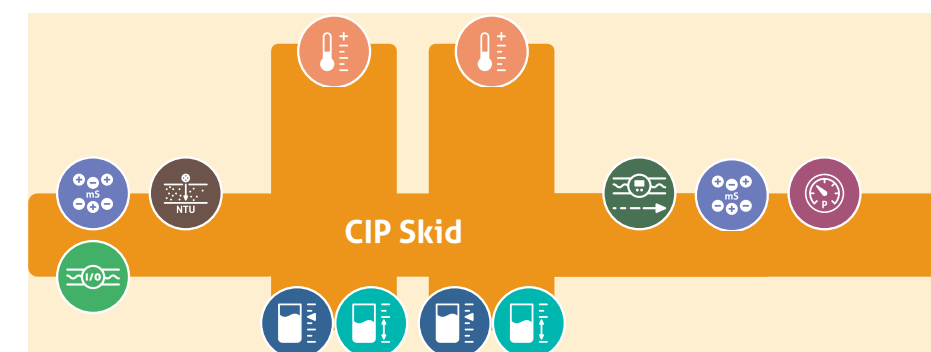
Many customers use our sensors under a wide **variety of everyday requirements**. Discover how other beverage producers are successfully overcoming their challenges with Anderson-Negele sensors. Our **case studies show examples** where we have been able to help our customers achieve their goals through application consulting, product testing or technical



support. You can **find our case studies** and application reports online here: <https://www.anderson-negele.com/us/food-beverage/>

👉 **Our Tip:** The Bellarine Foods dairy was fully implemented using IO-Link. This case study provides a detailed look at the many benefits of digital communication.

If you're also seeking solutions for process optimization, quality improvement, or cost reduction in your company, we'd be happy to visit your site and help you find answers to your questions. Please feel free to contact us!



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