



# Simplify Integration and Enable Condition Monitoring

## Smart IO-Link Sensors for Automated Weighing

METTLER TOLEDO



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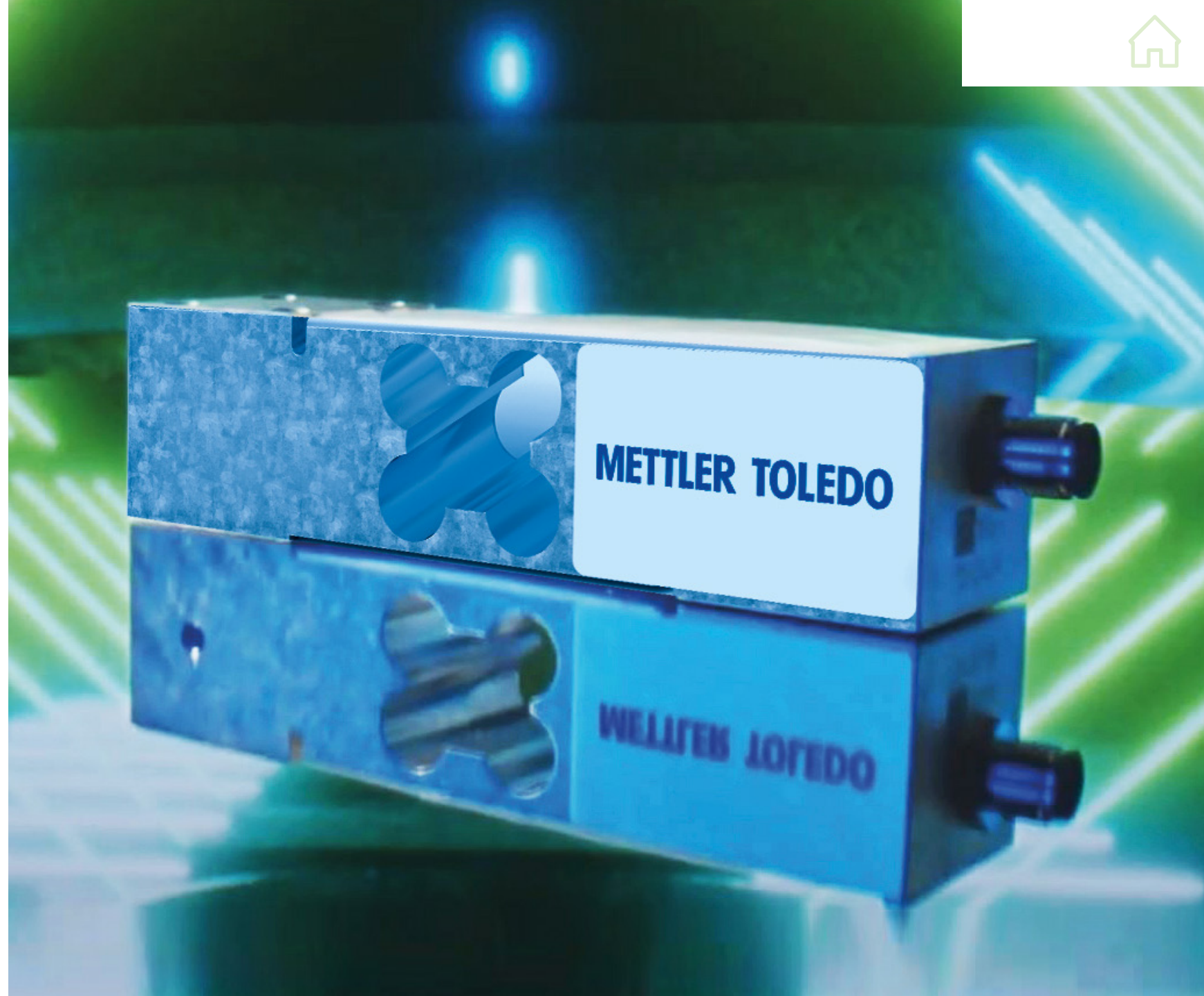
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# Smart Technology for Automated Weighing

## Flexible, Optimized Machine Design

Rising costs, growing industrial skills gaps, and the pursuit of measurable return on investment (ROI) have manufacturers leaning heavily on automation and condition monitoring to increase performance and equipment uptime. Adoption of smart sensors and related Industry 4.0 technologies is rapidly advancing across industries and factory applications, and increasingly extending to lower-level equipment.

### Smart Foundation

This trend is being facilitated by IO-Link, an open-standard industrial network-communication protocol for smart sensors introduced in 2006 that has become a world-leading sensor and actuator interface. Developed

and supported by a consortium of key user companies and leading automation suppliers including Rockwell Automation, IO-Link simplifies sensor integration and condition monitoring, allowing both easier machine building for the integrator and more robust production monitoring for the end-user.

IO-Link-capable sensors are already on the market measuring parameters such as pressure, level, flow, temperature, humidity, oxygen concentration and pH. Meanwhile, newer solutions are being designed to tackle the finer challenges of production operations, including weighing system automation.





## Why Standardize?

### Historic Automation Complexity

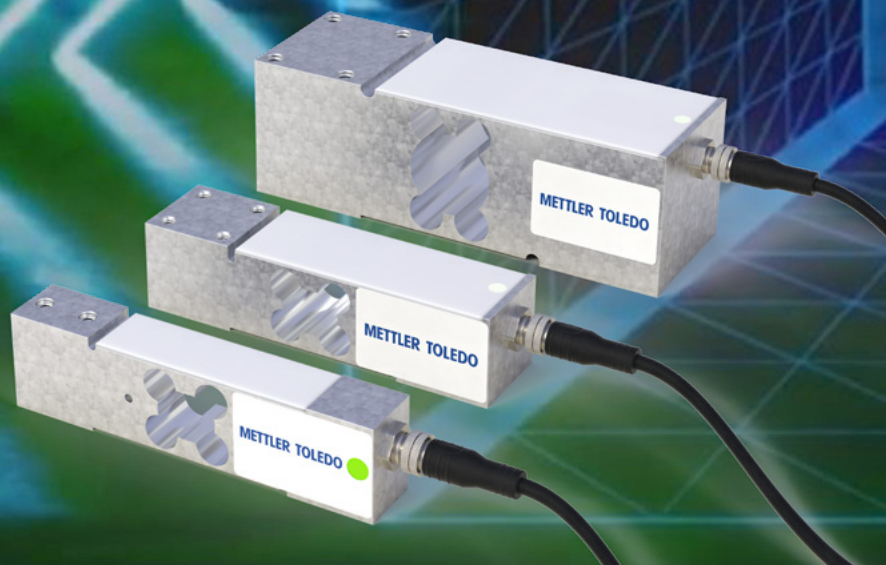
In the past, every automation technology supplier had its own proprietary network making integration difficult if not impossible across platforms from different suppliers. It often also required expensive adapters, extensive commissioning, and specialized training.

### Make it Simpler

Happily, this is not the case with IO-Link. This innovative open-source automation language works with many automation systems. This frees integrators who either do not want to be beholden to a proprietary system that requires extensive commissioning or who want to be more creative in terms of a build than a proprietary system allows.

Standardized sensor interfaces reduce complexity by providing a variety of commercially available options for quick and easy integration all on one network. They reduce the learning time for engineers and integrators responsible for design and implementation and mitigate the risk of supply-chain disruptions by eliminating dependency on any single vendor. They just plug in a sensor, and it works.

For equipment and machine builders, standardization helps bring better machines to market faster and more efficiently. It also reduces complexity so that it is easier and faster to both maintain equipment or bring it back to operational status if a component must be replaced, enhancing uptime and operational readiness.





# Limitations of Standard Weighing Technologies

## Compared to the Latest Innovations

A weighing sensor's function is to deliver fast, accurate and repeatable results to maximize throughput and yield in production. For many years, analog technology was the only option to obtain these results. However, faster, more nimble manufacturing operations have been exposing the limitations of analog weighing sensors. While Industrial Ethernet-based sensors have been improving performance of weighing operations since 2016, IO-Link is poised to further improve performance and accuracy in critical weighing processes.



### 1. Maintenance

Traditional scales and analog sensors typically require extensive and specialized labor to routinely calibrate and monitor systems for damage. Regardless of labor costs, today's skilled talent pools tend to be smaller.



### 2. Downtime

Resolving issues in operations that use conventional weighing technology is labor-intensive and can involve costly downtime. For example, a cut or crushed cable on an analog sensor requires a stoppage of an hour or more to locate the sensor, remove it, and rewire/reintegrate it.



### 3. Cabinet Space

While conditioning monitoring can be added to some analog or conventional weighing sensors, this typically requires additional wiring, hardware and switches that require additional cabinet space at a time when real estate inside factories comes at a premium.



### 4. Missing Metadata

Today, continuous improvement is required to maintain ever-thinning manufacturing margins and simple weight monitoring over time is no longer sufficient. Added context to confirm accuracy and ensure that suspect measurements are not allowed to affect downstream processing is vital.



## Better Ways to Weigh

### Advantages of Smart Sensors

Directly adding an IO-Link interface to a single-point weighing sensor provides the necessary measurement speed and accuracy required by modern manufacturing while allowing connection to almost any automation system.

These weighing solutions offer:

#### **Unparalleled out-of-the-box accuracy**

Benefit from smart cells that are factory-tuned for optimal performance

#### **Straightforward integration**

Use off-the-shelf components with an off-the-shelf device driver for fast connection

#### **Fully transparent condition monitoring**

Have confidence in your measurements with status updates and Smart5™ alarms

#### **Continuous data**

Weight and the sensor's status are cyclically transmitted at 200x per second





## Better Ways to Weigh

### Benefits and Values of Smart Sensors

These advantages, when combined, are able to help you:

#### **Lower Development Costs**

Moving the condition-monitoring technology onto the sensor itself eliminates unnecessary development costs. It also eliminates the need to add other components such as signal converters or communications adapters, which increase cost and take up valuable space inside a control cabinet.

#### **Reduce/Eliminate Troubleshooting**

Smart sensors significantly simplify troubleshooting. IO-Link offers the speed required for real-time condition monitoring and smart alarming. This gives machine builders better understand their equipment performance while assuring end-users that bad measurements will not make it into production.

#### **Maximize Yield**

Smart precision sensors mean streamlined access to rich data that helps machines optimize their operation. This improves throughput and maximizes yield.

#### **Eliminate Extra Cable**

Analog sensors come with long, fixed-length cables that cannot be cut to size. Now with IO-Link, machine builders can choose their own cable length using off-the-shelf components.








# Continuous Performance

## Smart Alarm Prioritization

Smart, IO-Link-enabled sensors also enhance data contextualization by providing industry-standard classifications for alarm priorities. Color coding means operators can quickly see and act on condition alarms based on messages describing probable remedies to these prioritized alarms.

If an alarm occurs, the operator or control system can react immediately when necessary. In the unlikely event a full production stop is required, getting the operation back up and running is a faster and easier process. Root causes can be eliminated before the product or process is comprised.

Alarm	Implication	Action
	Safety risk Equipment damage Bad product	Immediately stop your process - find and eliminate the root cause
	Imminent performance loss	Schedule service - maintenance during planned downtime
	Out of Specification Production errors	Identify problem, correct the cause, ensure workflows are being followed
	Quality at risk	Initiate routine test or calibration to ensure measurements are true
	Good production	No action required

Prioritized alarms help you take the most important actions first.

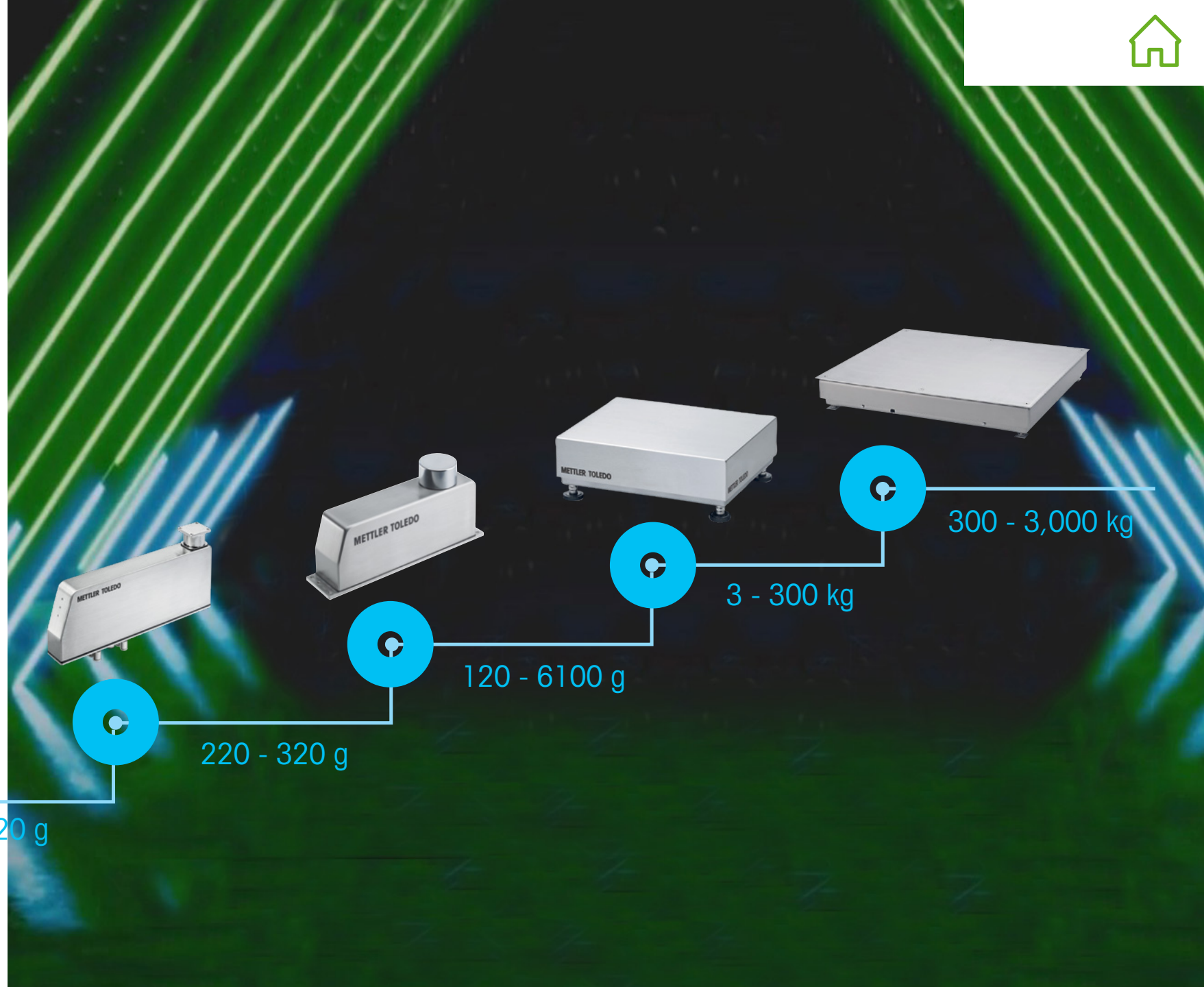
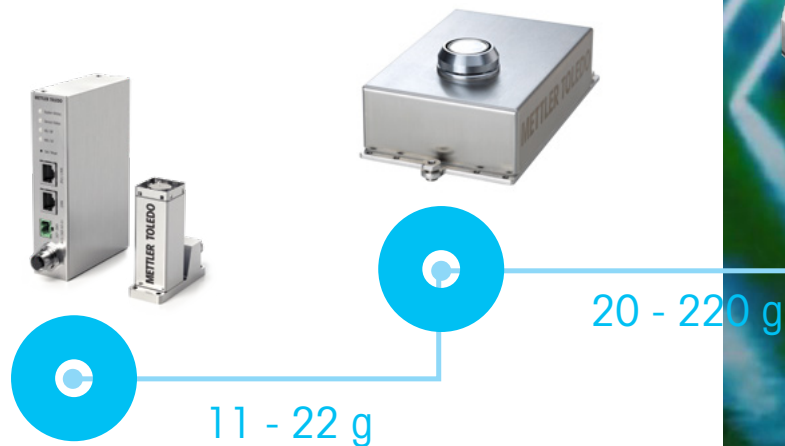


# Continuous Performance

## Full Weighing Range

### Automated Precision Weighing in the Smart Factory

METTLER TOLEDO has additional smart weighing sensor technology covering a range of 11 grams to 3,000 kilograms with readability from 1 microgram to 5 grams. These sensors and scales are intended for direct integration into machines where traditional strain gauge sensors are not precise enough to meet tolerance requirements or fast enough to provide necessary processing speed.





# Accelerate Smart Manufacturing Plug-and-Measure Technology

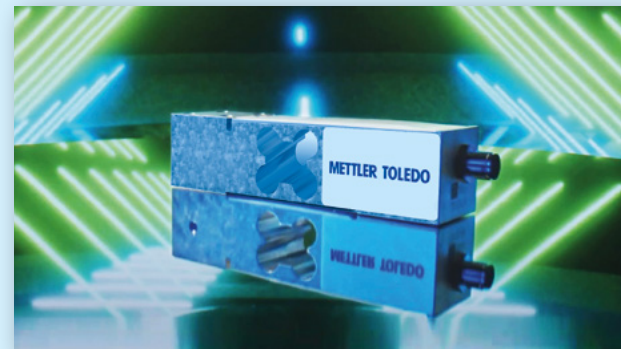
The value of sensors that meet the needs of machine builders, system integrators and manufacturers alike cannot be overstated. New weighing-system applications are poised to continue closing gaps in information technology and operations technology (IT/OT) infrastructure, supporting continuous improvement initiatives and maximizing yield.

Simple and easily integrated IO-Link compatible sensors are vital to achieving excellence across these weighing applications, as machine builders and integrators seek to deliver on fabrication promises in smaller and smaller spaces while manufacturers work to keep production timelines tight and costs low.

► [www.mt.com/ind-weighing-components](http://www.mt.com/ind-weighing-components)

## SLP33xD Introduction Video

Introducing the smart load cell with IO-Link interface from METTLER TOLEDO, the perfect companion for your automation journey. This tiny device can be easily connected to any automation system and installed in tight spaces.



[www.mt.com/ind-slp33xd-video](http://www.mt.com/ind-slp33xd-video)

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