Industrial
Industrial Weighing

21 News




# Sensors 4.0

## A Process-Technology Revolution

**Real-time diagnostics, easy network integration and verifiable measurement results will become standard for sensors in automation. What requirements must intelligent sensors fulfill to become enablers of next-generation process technologies?**

Chemical industries are under increasing pressure to comply with regulations, improve production efficiency and react quickly to customer requirements. This places higher expectations on process technologies to provide solutions, and measurement sensors play a special role in this development. They are critical in the implementation of automated production processes according to Industry 4.0 and the Industrial Internet of Things (IoT).

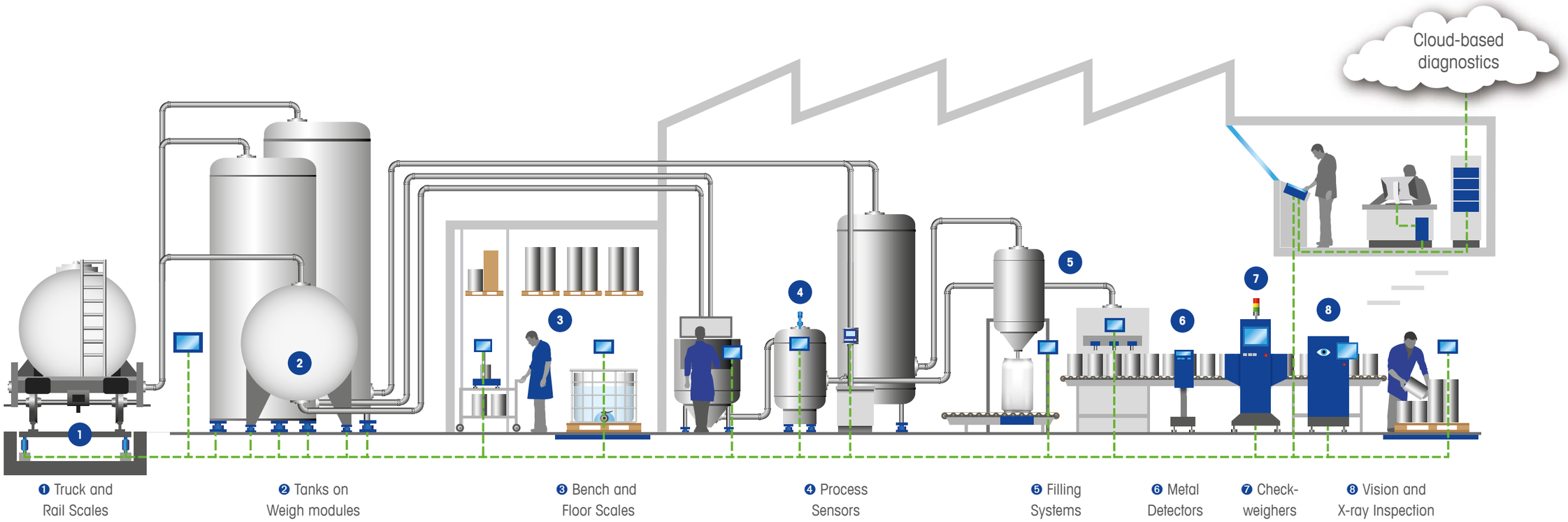
### A process revolution

In traditional manual operation, a sensor captures data about a specific part of the process – for example, a tank scale measures material inventory. An operator is present to document and evaluate the measurement and to respond appropriately if there is a problem.

In an automated process, faulty measurements may easily go unnoticed and lead to product quality issues or even safety hazards. Modern, intelligent sensors with networking capabilities provide a wealth of additional information that helps improve the efficiency, quality and safety of automated production processes.

For example, a pH sensor with integrated diagnostics can be replaced at just the right time

METTLER TOLEDO




before it fails during an expensive reaction process. A metal detector continuously monitors critical parameters to reduce testing frequency and alert operators of potential production issues.

Let's take a closer look at weighing sensors which are present in many automated processes throughout the chemical industry. For example, they are used to dose materials into reactors or verify final product weight. These applications usually have tight tolerances and require consistently accurate measurements.

Because inaccurate measurements, especially if they go unnoticed, can have a significant impact on quality and cost, continuous monitoring of sensor performance is critical. An immediate alert to the control system or the mobile phone of the production manager ensures rapid troubleshooting.

**Integrated diagnostics**

State-of-the-art weighing technology for automation is based on intelligent load cells with integrated microprocessors for signal processing directly at the actual "working point." This eliminates data transmission errors and improves the accuracy and consistency of measurement results.

The intelligence in the load cell also allows continuous analysis of the weighing process. This means a failure or even gradual loss of performance can be identified and reported. In contrast, load cells with analog value transmission provide, at best, a general fault message. A gradual decline in performance of a single load cell is not recognizable.

Capabilities for remote diagnostics via cloud-based systems allow for early recognition of potential issues and enable immediate reaction by service providers to avoid costly downtime.

Dynamic checkweighers can add further diagnostic capabilities by being able to monitor the weight of each package and instigate automatic adjustment of filling systems to ensure target weights are met and costly product give-away is minimized.

Advanced data collection software is also able to harvest live production data from product inspection equipment and make adjustments in order to optimize productivity.

**Continuous improvement**

The ability to collect such detailed measurement and diagnostics data enables a new and improved approach to process control and optimization which is a prerequisite for the Industry 4.0 age.

Reduced downtime, faster troubleshooting, less waste and scrap product: Intelligent sensors pave the way for these overall improvements in quality, compliance and productivity.

▸ **www.mt.com/ind-4-0**


## Intelligent process sensors for Industry 4.0 and IoT

The current industrial revolution demands smarter machines. We offer sensors for the food, pharmaceutical or chemical industry including weight, pH, $CO_2$ and $O_2$. Download Sensors for Process Automation to learn how we can help you design highly competitive and intelligent process equipment.

▸ **www.mt.com/ind-sensors-for-automation**

# From Standalone to Fully Networked
## Compliant, Efficient, Adaptable SQC

**FreeWeigh.Net® software solutions can fulfill all of your quality control needs, whether you work with a single station or fully networked production solution. FreeWeigh.NET Compact provides a highly capable, convenient SQC and SPC system on a single station. With production growth, it is easy to upgrade to the fully networked system.**

▸ **www.mt.com/SQC**

## Our Solutions

### Our standalone solution

FreeWeigh.Net Compact is a PC-based standalone software solution that allows you to control and fine-tune your processes. The base package contains a batch management module, as well as a multicomponent horizontal and vertical weighing functionality. Benefits include:

- Single station SQC solution that is easy to set up, operate and adapt to your process.
- Validation support and compliance with GMP, EU and FDA regulations.
- Fast and easy upgrade to full FreeWeigh.Net to grow with your process.

▸ **www.mt.com/Freeweighnet-compact**

### Our fully networked solution

FreeWeigh.Net is a powerful, networked SQC solution for factory-wide data acquisition with an MS SQL database and vast expansion capabilities. In addition to avoiding batch waste, FreeWeigh.NET allows ad hoc reporting of any asset to demonstrate compliance with legal requirements. Benefits include:

- Complete quality and process control with a flexible and scalable client-server network.
- Automated batch release and extensive reporting capabilities.
- Connectivity to third-party devices, including tablet testers, PLCs or controllers.

▸ **www.mt.com/Freeweighnet**

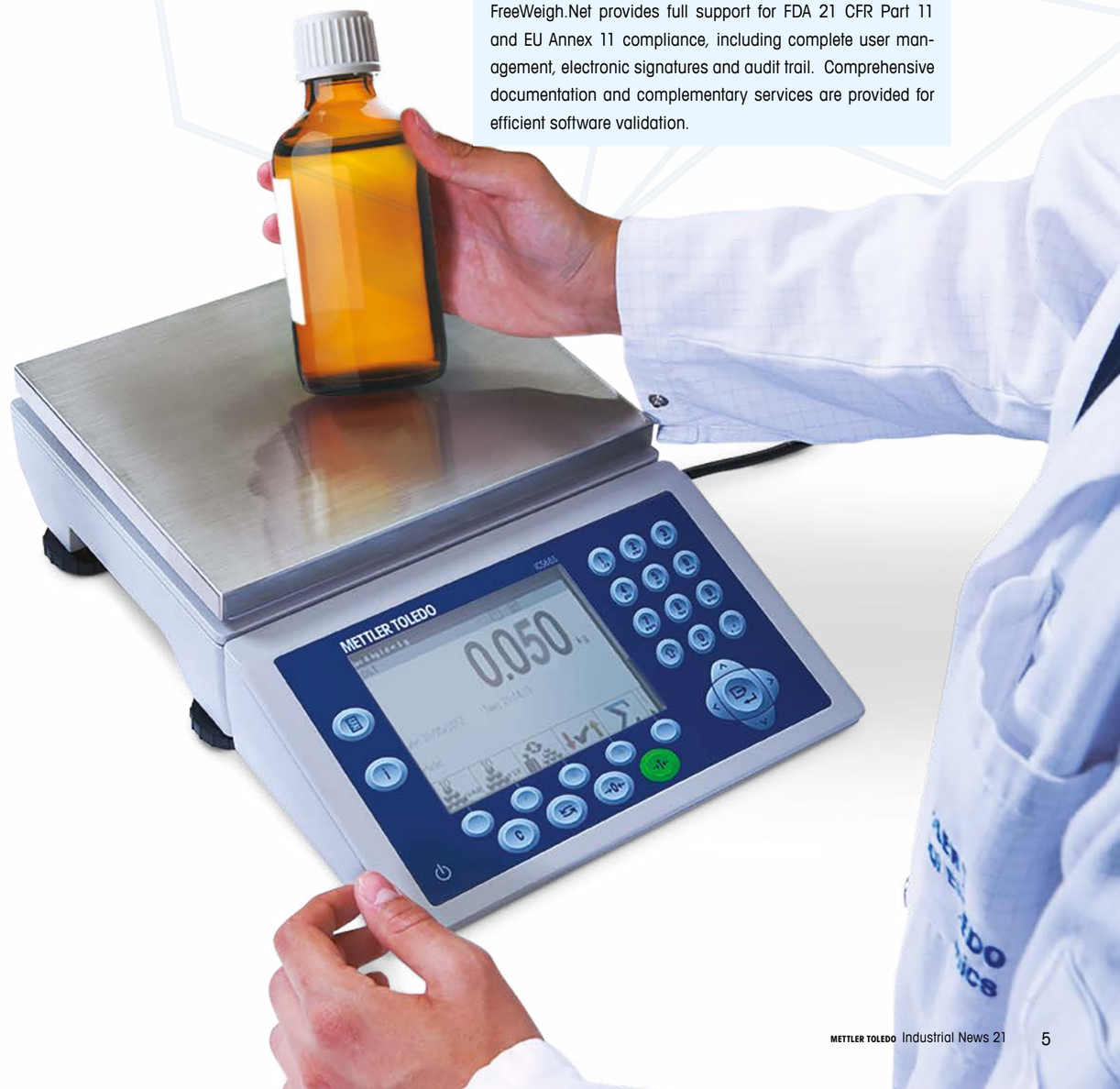
### Your benefits from both solutions

**Benefit from precise production control**

With a quick response to any deviations and immediate notifications via email or SMS, FreeWeigh.Net helps to prevent raw material waste. Additionally, content control can be amended with attribute control and data from Critical Control Points. Finally, with the trend monitoring of the optional SPC module, process interruptions can be avoided.

**Ensure compliance and data integrity**

FreeWeigh.Net provides full support for FDA 21 CFR Part 11 and EU Annex 11 compliance, including complete user management, electronic signatures and audit trail. Comprehensive documentation and complementary services are provided for efficient software validation.



# Stop Postponing Tank Calibration

## This New Method Makes it Easier than Ever

**Gone are the days of time-consuming and expensive calibration methods with unsatisfying accuracy and traceability results. The new, innovative RapidCal™ method offers economical and fast calibration without using huge amounts of test weights and liquids. This allows you to avoid extended downtime and save costs!**

**How does RapidCal tank scale calibration work?**
Instead of using test weights or material substitution, a downward force is applied with hydraulic equipment. The loading of the tank scale during RapidCal mimics that of normal operation, taking into account piping influences.

**Planning a new tank installation?**
Watch the video to see it in action:


**www.mt.com/ind-RapidCal**

**Minimum time investment**
RapidCal can be performed at any time with a minimum amount of preparation. The calibration is done quickly, thanks to equipment portability. Moreover, the whole calibration process is significantly faster than calibration with test weights. This lowers the effective downtime of your production facilities dramatically over the course of a year to a few hours per calibration. High cost savings are realized by reduced downtime.

**Higher accuracy and assured traceability**
With RapidCal, it is possible to reach up to 0.1 percent accuracy by using the force applied to hydraulic cylinders. The reference load cells used are traceable to test-weight standards and provide accuracy and traceability comparable to calibration with physical weights.

**Saves thousands of dollars**
Traditional forms of tank calibration can be very expensive, from test weights which increase in price depending on scale capacity to material substitution calibration which requires a huge amount of purified water. RapidCal helps to maintain traceability at lower costs, increase the efficiency of the calibration cycle, and improve the ecological footprint of your operation.

**Avoid contamination of tank contents**
The tedious emptying and cleaning of tanks during substitution calibration is avoided by applying this new method. For production facilities, the risk of tank contamination is eliminated and disposal costs of contaminated water avoided.

**Up to 32 ton full capacity**
RapidCal is the best method up to 32 tons, where using test weights is time-consuming and cumbersome. Regular recalibration can easily be scheduled to comply with quality systems. Furthermore, for weights in excess of 32 tons, a material substitution calibration is possible using the calibration technology offered by our service team.

## RapidCal™
Calibration by the Numbers

**60%**
**less downtime**

**0.1%**
**accuracy is attainable with RapidCal**

**$$$**
**in savings over traditional calibration methods**

**Zero**
**risk of inner tank contamination**

**32 t**
**capacity capability to handle a wide variety of tanks**

# Accurate or Safe?
## Now You Can Have Both!

**High-precision weighing in a hazardous area used to be a challenge. Today, however, ICS4_6x scales offer you the highest weighing accuracy in Zone 1/21, Division 1. When tolerances are tight, these scales deliver the precision to ensure consistently accurate results without compromising safety.**

### Simple weighing and filling
ICS426x scales are developed for easy installation and maintenance in hazardous areas. Thanks to their compact design, these scales are easy to manage. An intuitive user interface ensures quick and secure handling of even complex weighing applications.

### Versatile material dispensing
When weighing tasks require more than one scale, ICS466x is up to the challenge. Improve dispensing efficiency by easily managing two weighing platforms with one terminal. Benefit from the highest measurement accuracy for grams or tons.


### Fast, easy quality control
ICS4_6x scales can be flexibly configured for ergonomic and efficient operation in hazardous areas. The colorWeight® functionality of the ICS466x improves speed and control of weighing tasks by immediately indicating if a result is within tolerance.

### Precise automated filling and dosing
PBK9 bench and PFK9 floor scales provide the precision and ultra-fast measurement update rates required for hazardous-area filling and dosing. Combine them with the IND570xx or IND560x weighing terminals to easily configure fully automated processes.

▸ **www.mt.com/PBK9**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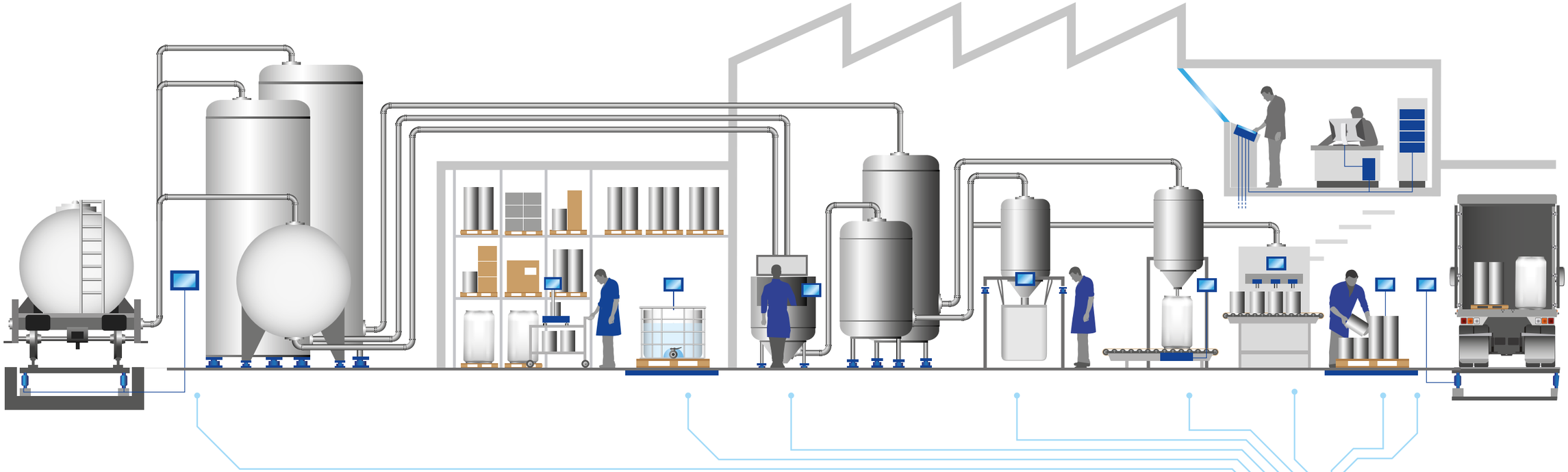
### ICS4_6x Scales: High Precision in Hazardous Areas
- Global and local approvals (including IECEx, ATEX, FM)
- Zone 1/21 and Division 1
- Intrinsically safe product design
- Up to 750,000d resolution
- Certified by OIML and NTEP
- Configurable for improved ergonomics
- Easy and efficient handling
- Large display with colored backlight

▸ **www.mt.com/ICS466x**
▸ **www.mt.com/ICS426x**

IEC IECEx Ex FM APPROVED

**Hazardous area catalog**
Select the right equipment for your hazardous area application. Our catalog shows you how!

**www.mt.com/ind-hazcat**



# Be Ready for New Business Models
## Comply with Future Data Management

**OPC UA and MQTT are the new communication standards for non-time-critical data with ERP or cloud-based services. We offer edge-computing gateways to connect new products and the installed base that also reduce data traffic on the network.**

### Adopting the technology to be ready for the future

Users of weighing technology take different routes to implement future-oriented technologies into their production processes. Early adopters are either very optimistic or they see a fast return on investment and start directly with cloud-based asset management and sophisticated predictive maintenance. Others just introduce OPC UA connectivity for in-house horizontal data exchange to be ready for services in the future. METTLER TOLEDO serves both user groups and most needs in between with reliable gateway solutions.

### Open platform communications unified architecture (OPC UA)

OPC UA is a hardware- and software-independent interoperability standard for data exchange between devices from multiple vendors. It's assumed future data communication standards inside companies for Industry 4.0 / Industrial IoT. However, it can't substitute fast, real-time technologies such as PROFINET or EtherNet/IP. The OPC Foundation manages collaboration between users, vendors and consortia to define companion specifications to facilitate integration of devices from different vendors. METTLER TOLEDO is an OPC Foundation member.

### Message queuing telemetry transport (MQTT)

This popular messaging protocol is designed for connections with remote locations. MQTT offers three different qualities of service to assure delivery without duplication. The technology is popular with many customers as it is easy to implement on simple devices and requires little memory. Most recently, this messaging protocol has been used for connecting company networks with external off-premise clouds – a simple yet powerful solution.


MQTT.ORG OPC UA

### Upgrading Installed Base to Modern Communication

The METTLER TOLEDO Edge-Computing Gateway offers OPC UA and MQTT connectivity to upgrade existing bench, portable and floor scales to these modern communication technologies. The gateway can connect one or more existing or new METTLER TOLEDO weighing devices to networks using OPC UA / MQTT technology.

▸ **www.mt.com/ind-cloud-gateways**

**Integrating weighing process data**

See how to transfer weighing process data to higher level cloud, MES or ERP systems to make processes more transparent and efficient.

**www.mt.com/ind-weight-to-cloud**

# Think Human Error is Unavoidable?
## Think Again. Think Digital!

**With repetitive daily tasks, errors natrually occur. The new PowerDeck™ Digital Floor Scale with advanced operator guidance helps you eliminate the risks that come with human error.**

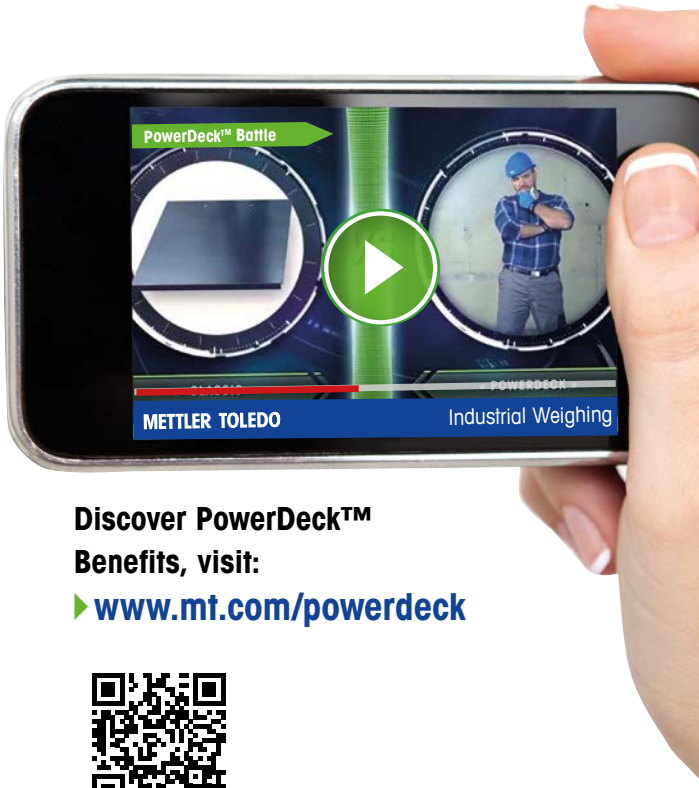
## 4 Reasons to Choose PowerDeck:

### Operator Guidance:
Prevent off-center load placement to avoid inaccurate weighing and uneven filling, with advanced operator guidance.

### Accurate and Durable:
Proven POWERCELL® technology provides increased precision and reliability to improve processes and ensure uptime.

### Reduced Maintenance:
Predictive maintenance and elimination of the junction box allows PowerDeck to reduce maintenance time and expense.

### Improved Visibility:
Proactive alerts warn operators of conditions which affect weighing accuracy, allowing them to be corrected in real time.




**Discover PowerDeck™ Benefits, visit:**
**www.mt.com/powerdeck**

**METTLER TOLEDO Group**
Industrial Division
Local contact: www.mt.com/contacts

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