Brewery

Perspectives in Liquid Process Analytics

22 News

INGOLD

Leading Process Analytics

Streamline Your Processes
with the New iSense Software

Intelligent Sensor Management (ISM®) technology is helping breweries the world over to increase process reliability, reduce sensor lifecycle costs, and simplify sensor handling. With the new iSense software for ISM sensors, realizing the benefits of digital sensor technology is easier than ever.

Significant benefits

Analytical measurements are going digital. The advantages offered by the latest, cutting-edge in-line sensors and transmitters, such as greater process quality and yield, reduced sensor maintenance, and simplified sensor handling, are hard to ignore.

ISM, METTLER TOLEDO's digital sensor technology, has transformed the way analytical sensors are handled and maintained from first installation to end of life. ISM offers a level of performance and convenience that is not available with other systems.

Convenience is the key

Whether in production or in the lab, the greater the convenience provided by analytical equipment the more efficient will be your processes.

iSense, the accompanying software for ISM, streamlines all your sensor activities. It provides highly valuable features such as sensor calibration away from the process, electronic documentation, instant evaluation of a sensor's "health", and predictive information on when maintenance will be required. The latest version of iSense enables seamless management of ISM sensors and delivers exceptional usability.

It is easier with iSense

Spending hours learning new software is a costly use of operator time, so we have made iSense extremely intuitive to operate.

METTLER TOLEDO

For a new sensor, just connect the Bluetooth® communicator supplied with the software. iSense automatically recognizes the probe and displays a registration page where you can add any important information. The next time that particular sensor is connected, the iMonitor screen will provide an easy-to-read overview of the sensor's condition and, if maintenance is required, tell you what steps to follow.

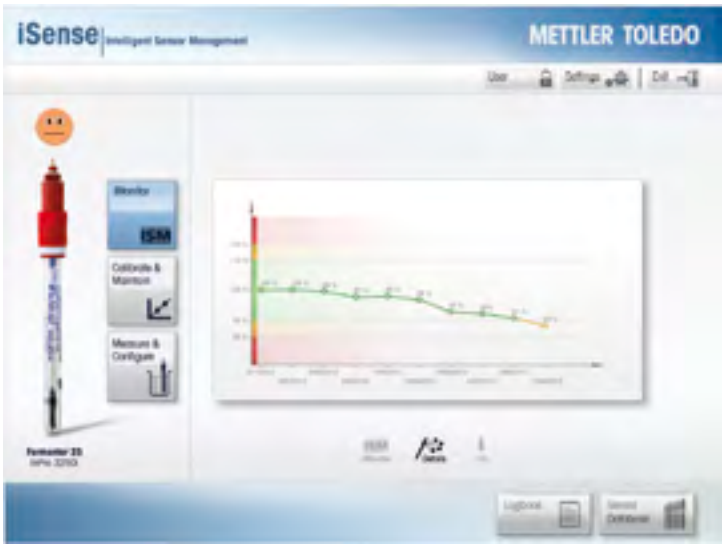
Whether you want to calibrate a pH sensor, check how a sensor's performance has been affected by a process, or print sensor maintenance documentation iSense guides you through the steps.

For today's processes and tomorrow's

ISM and iSense have been designed to be adaptable to your current needs and your future ones. Planned developments, such as a mobile app that provides a quick sensor check on the go, mean that ISM will remain in the forefront of analytical measurement technologies.

Discover more at:
► **www.mt.com/iSense**

The smiley provides at-a-glance notification of sensor "health". Diagnostics show that this sensor needs calibrated.



The Sensor History feature allows you to see how a sensor has been affected by process exposure over time, assisting with maintenance planning.

On-screen animations guide you through maintenance procedures, helping to ensure proper handling.

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Flexible, Intuitive, and Intelligent
New Transmitter for All Parameters

Our M800 transmitter series has now been extended. The new M800 1-Channel is a multi-parameter, single-channel device which combines a state-of-the-art user interface and advanced Intelligent Sensor Management (ISM®) technology with the broadest parameter coverage that has ever been available on a METTLER TOLEDO transmitter.

Full parameter coverage

The M800 1-Channel extends METTLER TOLEDO's portfolio of high-performance transmitters with a single-channel instrument that covers all major measurement parameters. pH / ORP, dissolved and gas phase oxygen (amperometric and optical), conductivity, and turbidity measurement are all possible in conjunction with either ISM or analog sensors. The M800 1-Channel's multi-parameter ability means that most applications in process analytic applications, covered until now by different transmitters, can be equipped with just one instrument platform.

Cutting-edge user interface

Transmitters, as the interface between process analytical sensors and the user or control system, are central to successful and efficient production. With its 5.7" full-color, high-resolution touchscreen, simply structured menus, and user management functions, the M800 1-Channel sets a high standard in the market for convenient transmitter operation.

The freely-configurable display provides information on measurement values plus diagnostics data on a single screen. Logbook and user management features offer excellent traceability and operating security. Wizard set-up allows the user to reach any menu in only three touches, reducing training efforts and configuration failures to an absolute minimum.

At-a-glance diagnostics

Thanks to the iMonitor display the condition of each sensor is determined in an instant, allowing preventive action to be taken before processes are affected. The ISM predictive diagnostics tools shown on the iMonitor, such as the Dynamic Lifetime Indicator (DLI), Adaptive Calibration Timer (ACT), and Time to Maintenance (TTM) indicator are color coded and shown in a distinctive way. The sensitivity of the DLI can even be altered to match process conditions.

With the introduction of the M800 1-Channel METTLER TOLEDO offers an outstanding measurement solution for applications across all process industries at a very competitive price.

Find out more at:
► **www.mt.com/M800**

ROI in Only a Few Weeks
Automatic Beer/Yeast Determination

Deciding when to switch valves on conditioning tanks as they empty can either impact filter presses, or lead to lost beer. For Molson Coors, transferring from manual to automatic operation is saving time, product, and waste disposal costs.

Major brewer

The Molson Coors Brewing Company is currently the world's seventh largest brewer by volume. As well as the Molson and Coors ranges of beverages, the company produces or distributes many other famous lagers and beers. In the UK, the company operates three main sites where they brew a wide portfolio of products including Carling, which has been the UK's best-selling lager for three decades.

Operator determination of separation can be wasteful

At Molson Coors' Alton Brewery, technicians were looking for a way to improve beer/yeast separation after the conditioning tanks. This was a manual operation and relied on operator skill to determine when to divert the flow prior to the filter press. If the flow was diverted too late, the filter press became blocked resulting in lost production time while the blockage was cleared. To prevent this, operators would throw the switch early, however this led to increased re-processing plus increased waste disposal costs.

Mark Dobner, Brewing Operations Manager at the brewery wanted a reliable solution that would automatically switch the valve at the ideal moment, thereby minimizing production downtime and waste, and improving production efficiency.

In-line turbidity monitor saves beer

METTLER TOLEDO's InPro 8300 Reflection Absorption Multi-Switch (RAMS) was designed for solving exactly this type of problem. The RAMS series of products use back-scattered or transmitted light to precisely determine liquid turbidity and/or color in real time, depending on the process concerned. For Molson Coors' application four turbidity measurement models were installed in the positions where sight glasses had been. The output of the units (4–20 mA) was then set to trigger the appropriate valve when the turbidity measurement exceeded that of the beer.

The InPro 8300 monitors require almost no maintenance and can be left to control valve switching without any operator involvement, thereby freeing technicians to work on other tasks. Something that is much appreciated by Mr Dobner, "A key part of our drive for greater efficiency is to remove unnecessary tasks from our technicians' lives. One such opportunity was to increase the automation and control of beer supply from our conditioning vessels to our filter stream by installing InPro 8300 units to detect beer/yeast interfaces in our four filter stream feeds. The output from these monitors was integrated into our control systems seamlessly and

within the week of commissioning we forgot they were there, such was their performance and reliability."

Dependable, automatic system

Use of the InPro 8300s has given Molson Coors the reliable and automated solution they were looking for. As well as reducing lost product and effluent, the InPro 8300s are helping to ensure the brewery maximizes filter lifetime through avoiding blockages. "Since installation we have not lost any filters due to blinding from tank bottoms which saves on un-planned down-time and waste disposal costs. In addition, we know we are getting every last drop of good beer out of the vessels and this has had the additional benefit of minimizing our reprocessing stream," says Mr Dobner.

So efficient are the systems that Molson Coors calculate the ROI on the monitors to be only a few weeks.

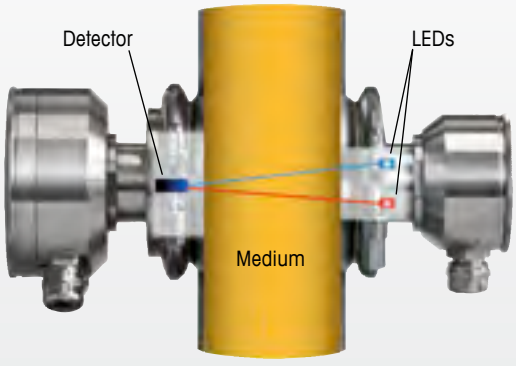
Molson Coors has since installed InPro 8300 units at a second UK facility for control of beer/water separation in canning and kegging operations.

If you want to reduce beer loss at your brewery, go to:

▶ **www.mt.com/InPro8300RAMS**

InPro 8300 RAMS

The InPro 8300 RAMS measures light absorption and reflection from LEDs to determine color and/or turbidity. This technique is sensitive to even slight changes in the color or optical density of a liquid and responds almost instantaneously. A choice of optical parameters provides the option to monitor product transitions based on optical turbidity or color measurement, similar to an in-line photometer. For turbidity measurement a near infrared (NIR) LED (880 Nm) light source is used to measure forward scattering through the liquid. By using NIR light the turbidity measurement is mostly independent of color influence. For product transitions based on color measurement a blue LED (430 Nm) is used.



Process integration is achieved by implementing the 4 … 20 mA signal transmitting the turbidity or color measurement to a suitable PLC – no transmitter is required. The measurement signal is repeated more than five times per second providing a response time of less than 200 ms.

Intelligent Sensor Management (ISM®) for Brewing Processes

ISM is METTLER TOLEDO's digital technology platform for process analytical measurement systems. With ISM solutions, maintenance becomes predictable, sensor handling is easy, and process uptime is increased.

The benefits of ISM translate into substantial gains for breweries in relation to process reliability, sensor lifecycle management, and cost of ownership.

Unlike analog probes, ISM sensors output a robust digital signal and retain their own calibration as well as process data. Thanks to diagnostics tailored to brewery applications, ISM sensors even predict when they will need maintained or replaced.

In dissolved and gas O_2, dissolved CO_2, turbidity, pH, and conductivity measurement systems ISM gives you much more than just a measurement.

Greater process reliability

Increased operational uptime
ISM provides real-time information on sensor condition, helping to increase production uptime.

Read the white paper on achieving greater process integrity:
► **www.mt.com/ISM-brewery-wp**

Easy sensor handling

Convenient lifecycle management
With ISM you can pre-calibrate sensors for error-free exchange at the process.

Discover the new iSense software for ISM sensors:
► **www.mt.com/iSense**

Reduced maintenance

Low cost of ownership
ISM reduces sensor lifecycle costs and enables higher sensor use.

Get our free guide to in-line analytical measurements for breweries:
► **www.mt.com/pro-beer-guide**

Systems for your processes …
From the brew house to the filling line to effluent monitoring, your entire brewery benefits from the unsurpassed reliability, simplified sensor handling, and low maintenance requirement of ISM solutions.

… adaptable to your requirements
Our ISM transmitter portfolio covers single-parameter, single-channel units for maximum process safety, to multi-parameter, multi-channel devices for greater convenience and flexibility.

Incorporating ISM solutions into your asset management or plant control system via transmitters or converters allows seamless integration of sensor diagnostics information for remote monitoring.

Discover how ISM can help you at:
► **www.mt.com/ISM-brewery**

M800 transmitter showing iMonitor sensor diagnostics utility.

Improve Productivity and Quality
with Turbidity Measurement at the Lauter Tun

In-line turbidity measurement provides a reliable way of verifying the performance of the separation of the wort/solids. For one of our customer's that has used our InPro 8400 turbidity sensor in the lauter tun for many years, the advanced InPro 8600 sensor has surpassed their expectations in providing reliable measurement values as well as being simple to install and maintain.

Brazilian brewer

Our customer, one of Brazil's biggest players in the brewery market, produces a beer known the world over and must meet the brand's owner's international quality standards. The brewery has always acknowledged METTLER TOLEDO as a supplier of state-of-the-art technology and has successfully used the InPro 8400 turbidity sensor for many years. Due to that sensor's performance and our post-selling services, METTLER TOLEDO was contacted to supply another turbidity system for another lauter tun in which the same beer would be produced. We were able to offer the InPro 8600 with ISM technology, a sensor with improved performance and enhanced features to meet the customer's demanding needs.

Lauter tun turbidity

Turbidity and dissolved oxygen are the two most important analytical variables to be measured in a beer plant. Among turbidity applications the most commonly known are after the lauter tun and after final beer filtration. In both positions our customer has installed InPro 8600 sensors. While in the first case a one-angle turbidity sensor is employed, in the second a two-angle sensor is required for monitoring the particle size trend.

In the lauter tun, starch and proteins present in the malt go through several steps of conversion and dissolution, resulting in the wort, and undissolved substances consisting of spent grains. During the lautering these undissolved substances are separated from the wort by filtration and sparging in three stages: recirculation of turbid wort, drawing off the first wort, and sparging.

The first outflow of the wort is always very turbid, but as the process continues it becomes clearer and eventually can proceed to the next stage. During lautering the turbidity measurement is used to control the cutting knives inside the lauter tun which have a direct influence on the turbidity value. Finally, a sparging step is necessary to extract as much wort as possible.

The turbidity signal is the perfect way of deciding when the wort is at the stage where it can progress through the process, i.e., when wort turbidity is sufficiently low. If solids are carried forward, yeast metabolism is affected resulting in low productivity. Moreover, solids can also carry unwanted components which may adversely affect the final taste of the beer. In this specific case a 4 to 20 mA output is used to control the lautering where the 4 mA signal corresponds to 0 EBC and the 20 mA corresponds to 50 EBC.

Intelligent solution

The InPro 8600 with its digital signal surpassed the customer's expectations, specifically because of the system's Intelligent Sensor Management (ISM®) technology. ISM greatly improves sensor handling, reduces maintenance costs and increases process safety. The Plug and Measure feature means that the sensor is ready to use as soon as it is connected to the transmitter. The InPro 8600 is shipped from METTLER TOLEDO already calibrated and this data is automatically uploaded to the transmitter upon connection.

As the InPro 8600 has no O-rings or light bulbs that need replaced and the windows are made of scratch-resistant sapphire glass, almost no maintenance is required.

Clearly better wort

In-line turbidity control guarantees uniform wort quality relative to low turbidity. If not controlled, beer taste can be damaged and shelf-life decreased due to the drag of solid components. Now, for our customer, wort of the best clarity possible is obtained.

Discover more about the InPro 8600 at:
► **www.mt.com/InPro8600**

Top Quality
and Guaranteed Safe

Malaysia's leading bottler of brand-name cola products sought a vision-inspection solution to ensure bottle quality at high speeds. When evaluating three different providers, only one vision system could fulfill all their requirements.

Top brand demands top quality

Leaders of this major manufacturer and bottler knew they had to do something different to maintain the brand's competitive advantage. As the supplier to a major cola company with numerous household brands in its portfolio, and sales of well over $ 1 billion, product quality was a top priority.

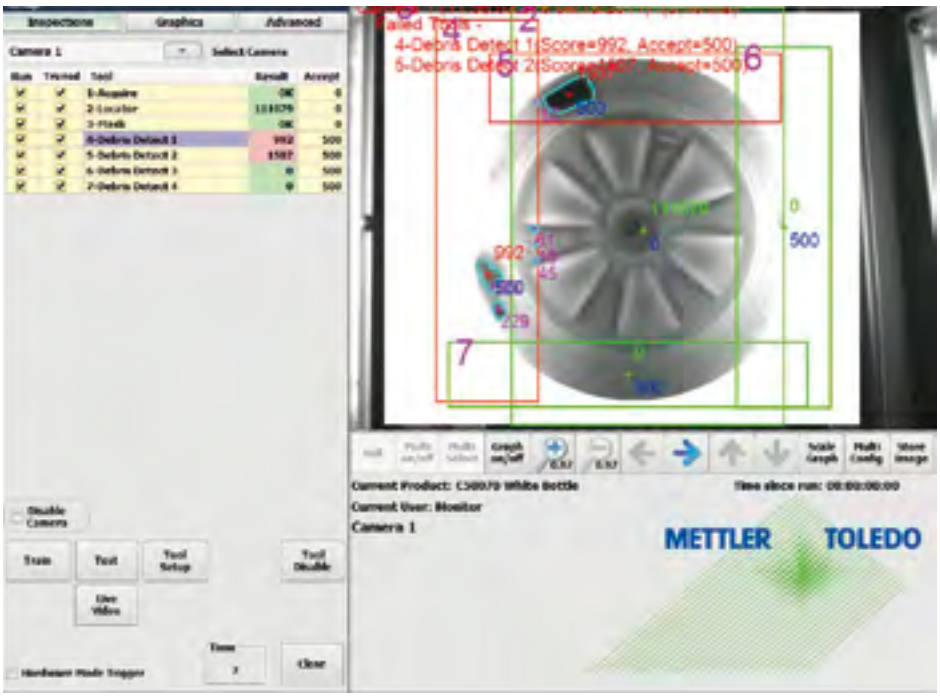
Voted as the most efficiently operated bottling plant in the world two years in a row, this bottler knew vision inspection could offer them the competitive advantage they needed in order to stay on top. With a production schedule made up of 16 different brands, reliability and ease of use at every operating level was of high importance. Once they decided to implement vision inspection, they wanted to choose the best-suited solution for their needs.

Factory-floor testing

A METTLER TOLEDO representative provided a trial system to be tested on its factory floor. The vision equipment was assessed on a number of factors.

Beating the competition

After seeing how intuitive the equipment was to navigate and operate, METTLER TOLEDO became the clear choice. The management team determined that the METTLER TOLEDO CI-Vision's system was easiest to operate, set-up, perform change-overs and maintain compared to its competitors. Within a few days into the trial, the bottler placed an order for a standard three-camera Full Bottle Inspection (FBI) system.



Vision Inspection system checking bottle integrity

High-speed performance capabilities

The specifications required inspection speeds of 600 bpm, with accurate performance for applications including printed-code verification, cap quality and foreign debris detection. Installed directly after the ink-jet printer, one camera inspects for presence and accuracy of printed ink-jet codes. Without accurately printed codes, beverage manufacturers lack the ability to support product tracking throughout the supply chain. This can potentially violate compliance regulations. This solution ensures any bottle with missing or misprinted codes is rejected from the production line before reaching retailer shelves.

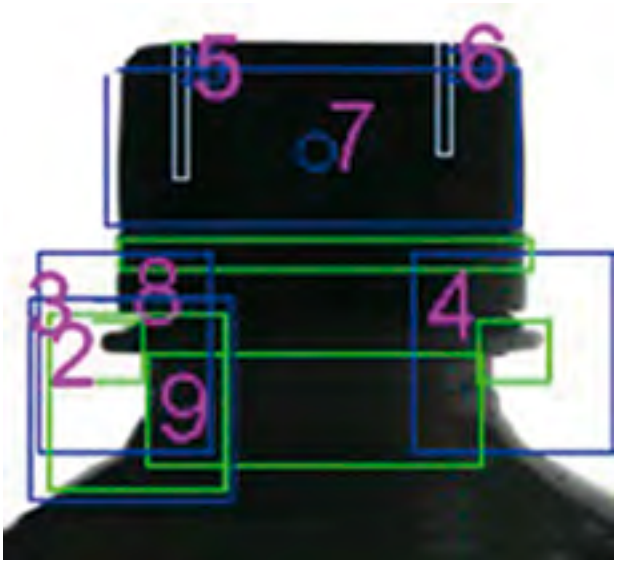
Further down the line, two cameras inside an IP 54-rated vision enclosure perform bottle-cap quality assurance. These two cameras are mounted approximately 120 degrees apart and use two backlights on the opposite side to illuminate bottles and caps to check for cap height, cap skew, tamper-band integrity and also to detect any clear PET bottle with low fill.

Flexible design

An additional inspection station of one camera was added to the main system to detect foreign particles, such as rubber or metal fragments that might have dropped in during the filling process. To perform an inspection of the bottom of the bottle, a side-grip-conveyor was implemented to suspend the bottle in the air. One camera, protected within a stainless-steel box located directly below the bottle, will detect any foreign particulates that might have collected in the bottom.

Using a METTLER TOLEDO vision solution, the manufacturer's bottled products meet quality specifications, from proper fill level to correctly printed codes, significantly reducing any risk of packaging defects ever reaching the retailer shelf.

For further details visit:
► **www.mt.com/civision**



Checking for bottle irregularities and cap quality.

Get in-line with METTLER TOLEDO

Don't leave it to chance!

Heads – I use the sensor again, tails – I don't.

ISM – True Predictive Diagnostics

No more guessing if a sensor will survive through the next production run. Intelligent Sensor Management's predictive diagnostics analyze process conditions and sensor health to provide you with accurate information on when sensor replacement will be needed.

ISM Intelligent Sensor Management from METTLER TOLEDO

► **www.mt.com/ISM**

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf
Switzerland

www.mt.com/pro
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