Transmitter Series

INGOLD
Leading Process Analytics

M400/M420/M300
Transmitters

Extended ISM functions

Easy handling

Intuitive user interface

Multi-parameter

ISM

Versatile Transmitter Series

For Intelligent Measurement Solutions

METTLER TOLEDO

M400: Versatile & Intelligent
For Advanced Process Control

The M400 transmitter series features advanced ISM technology and covers pH/ORP, oxygen and conductivity measurements. Thanks to the mixed-mode input functionality, the M400 accepts any conventional (analog) or ISM sensor of your choice. Combined with its multi-parameter capabilities, the M400 is the state-of-the-art transmitter for your most demanding applications.

The M400 is a single-channel, multi-parameter unit. The same unit can handle different parameters such as pH/ORP, oxygen or conductivity, depending on the type you choose.

Key benefits at a glance:
- More flexibility
- Versatility
- Higher reliability
- Minimized Maintenance Costs

Multi-parameter for more flexibility

Keep your inventory complexity low with the versatile M400:
- Each model can be used for several input parameters
- 3 types are available to suit your process needs

Versatility thanks to mixed-mode input

The benchmark in today's advanced process analytics:
- The M400 can input either any analog or innovative ISM sensor. You decide which sensor type is best suited for each application

Advanced ISM for low cost of ownership and higher reliability

Keep your process under control with real-time status information from the sensor for true predictive maintenance.
- The Dynamic Lifetime Indicator (DLI) tells you when the sensor needs to be replaced
- Only calibrate when necessary: The Adaptive Calibration Timer (ACT) monitors the time to next calibration
- Traceability support thanks to built-in CIP/SIP counter and calibration history

Minimized maintenance costs

The Plug and Measure™ feature allows the system to be ready for measurement within seconds.
- Simplified commissioning minimizes risk of installation troubles
- ISM sensors carry their own up-to-date calibration data

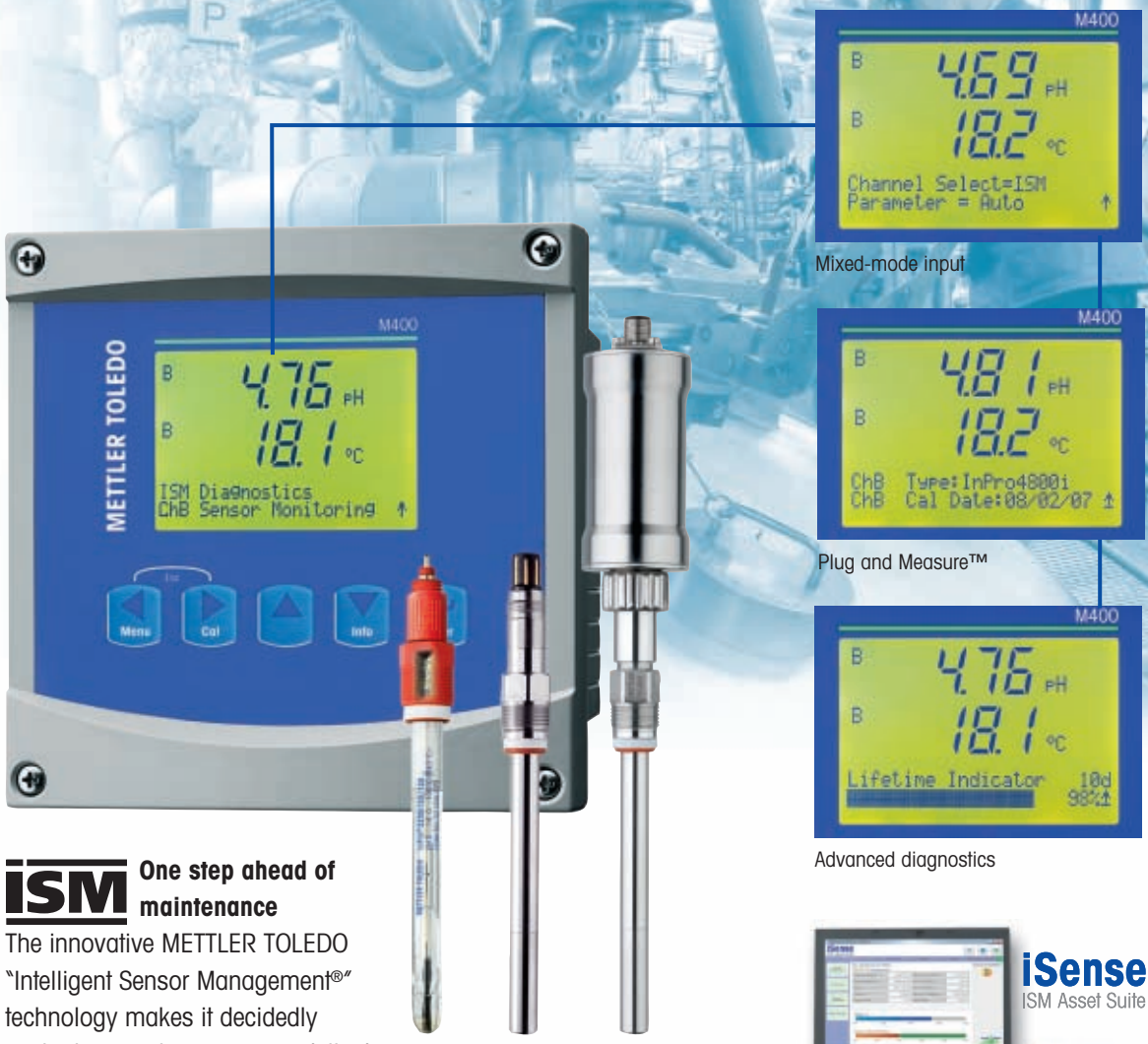
ISM

Intelligent Sensor Management

Pharmaceutical industry

Food and beverage

Chemical industry



Each unit accepts either ISM or conventional sensors

ISM One step ahead of maintenance

The innovative METTLER TOLEDO "Intelligent Sensor Management®" technology makes it decidedly easier to operate process analytical systems from initial installation to maintenance right through to sensor replacement. ISM is available on all key analytical measurement parameters.

iSense™ Asset Suite

The iSense™ Asset Suite offers you a unique means to optimize the performance of pH and DO sensors for enhanced reliability and process safety. Simply connect your ISM sensor via USB port to your PC and get access to various intuitive analysis, calibration and documentation applications.

M400 parameter guide

Parameter	Type 1		Type 2		Type 3	
	Analog	ISM	Analog	ISM	Analog	ISM
pH/ORP	•	•	•	•	•	•
Conductivity	•	•*	•	•*	•	•*
Oxygen ppm/ppb/traces	–	–	•/–/–	•/–/–	•/•/–	•/•/•
Optical DO ppm/ppb	–	–	–	•/–	–	•/•

* Available Q2/2009

Key technical data for the M400 transmitter series

ISM features	Plug and Measure™, Advanced diagnostics
Power	AC (100–240 V) or DC (20–30 V)
Enclosure	IP 65 (NEMA 4X)
Approvals	CE, ATEX Zone 2 (pending), FM cFMus, Cl. 1 Div. 2 (pending)
Relays	6
Digital input (hold)	2
Multi-level password protection	yes
User interface	2 values + 2-lines, 24 characters, backlit display
Isolated current outputs	4
Service Interface	USB port

M420: Reliable & Intelligent
For Hazardous Area Applications

The M420 transmitter series stands for reliability in loop-powered applications. When your process requires the highest safety level for pH, oxygen and conductivity measurement, the M420 brings you the best performance and the advantages of the state-of-the-art ISM technology for efficient maintenance.

The M420 series features the most advanced measurement technology for operation in hazardous area, combined with ISM for better process control.

Reliability by design
The M420 transmitter development was focused on rugged design and resistance to the most difficult operation conditions. This allows the M420 to stand out for its superior operational reliability in chemical, pharmaceutical or gas phase applications.

Versatility thanks to mixed-mode input
Available for a whole range of measurement parameters, the M420 is compatible with both conventional and ISM sensors

Additional functionality for greater flexibility
Configure your M420 to better suit your process needs. Add a second analog output or select the extended logbook, CFR21 Chapter II conformity with AuditTrail™ or trace oxygen measurement.

Key benefits at a glance:
- Mixed-mode input
- Rugged design IP 67, NEMA 4X*
- Intuitive interface with full text messages
- IrDA service interface
- Sensoface™ for easy diagnostics
- CIP / SIP counter

* pending

One step ahead of maintenance
Stay ahead of your maintenance tasks with the ground-breaking Intelligent Sensor Management (ISM) Technology from METTLER TOLEDO. ISM-equipped measurement loops are efficient to maintain without compromising on your process reliability.

Predictive maintenance thanks to ISM technology
Thanks to the ACT (Adaptive Calibration Timer), calibration intervals for each measurement loop can be optimized, based on the real-time sensor information and current process conditions.

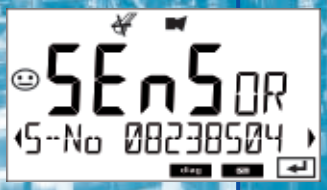
ISM
Intelligent Sensor Management


Chemical industry


Petrochemical industry


Oxygen gas phase measurement

Dynamic Lifetime Indicator



Sensor identification

Total operating hours

Key technical data for the M420 transmitter series

ISM features	Plug and Measure™, DLI, ACT
Loop power	4 – 20 mA (14 – 30 VDC)
Enclosure	IP 67, NEMA 4X*
Approvals	CE, ATEX/IECEx/FM/CSA Zone 1/Cl I Div 1*
Ambient temperature	–20 °C to 65 °C (–4 °F to 149 °F)
Digital inputs	optional: HOLD and CONTROL
User interface	LC display, 7 segment with icons, backlit (white)
Isolated current outputs	2nd passive current output optional
Service interface	IrDA

* pending

iSense
ISM Asset Suite

ISM Real-time monitoring of sensor condition

Sensors equipped with ISM technology have an own processor to anticipate in real-time early signs of sensor failure. All contributing factors, including process conditions (see chart 1, 2, 3), are then combined to estimate the DLI, or Dynamic Lifetime Indicator (4).

Calculation of the actual DLI according to real-time process conditions

M300: Reliable & Easy to Use
For Basic Process Applications

The M300 transmitter series for pH/ORP, oxygen, and conductivity measurements combines robustness with ease of use. High versatility and reliability make this instrument the ideal choice for your basic process applications. With the ISM (Intelligent Sensor Management) option, configuration and commissioning become substantially easier.

The M300 is available as a single- or dual-channel unit. The dual-channel version multi-parameter solution offering your choice of pH/ORP, oxygen, or conductivity.

Simplified operation
- A user-friendly "Quick Setup" routine guides you through the installation settings
- Intuitive user interface for easy operation without extensive training

Easy navigation
- Harmonized menu structure for all parameters facilitates navigation
- Large, dual-value display with four text lines allows reading also under weak light conditions

Fast commissioning
- Simplified sensor handling and maintenance with Plug and Measure™ functionality
- Pre-calibrated ISM® sensors can be swiftly exchanged in the field

Better connectivity
- USB service interface available as standard
- Use the PC-based configuration tool for comfortable access to all settings

System fabricators

Light industrial applications

Wastewater industry

Dual-channel for Versatility
With the dual-channel option, both channels are user-definable, making the transmitter ideal for a wide range of applications for the following parameters:

pH/ORP
- Sensor monitoring through diagnostic features
- Easy calibration based on auto buffer recognition and process calibration
- ORP measurement available with simultaneous pH measurement

DO
- More accurate measurements through salinity and pressure correction
- High DO measurement range
- Units: mg/l, % saturation, ppm

Conductivity
- Wide application coverage thanks to compatibility with 2- and 4-electrode cells
- Selection of chemical curves for % concentration measurement

¼ DIN version

Key technical data for the M300 transmitter series (single- and dual-channel)

Parameters	pH/ORP, DO, Conductivity
Power	AC (100–240 V) or DC (20–30 V)
Enclosure	IP 65 (NEMA 4X)
Approvals	CE, UL (cULus)
Relays	Single-channel: 4; dual-channel: 6
Digital input (hold)	Single-channel: 1; dual-channel: 2
Multi-level password protection	Yes
User interface	2 values + 2-lines, 24 characters, backlit display
Isolated current outputs	Single-channel: 2; dual-channel: 4
Service interface	USB port
ISM technology	Plug and Measure™

Easy wiring, ½ DIN version

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