

PROCESS INSTRUMENTATION

Battery-powered,  
**reliable and cost  
efficient.**

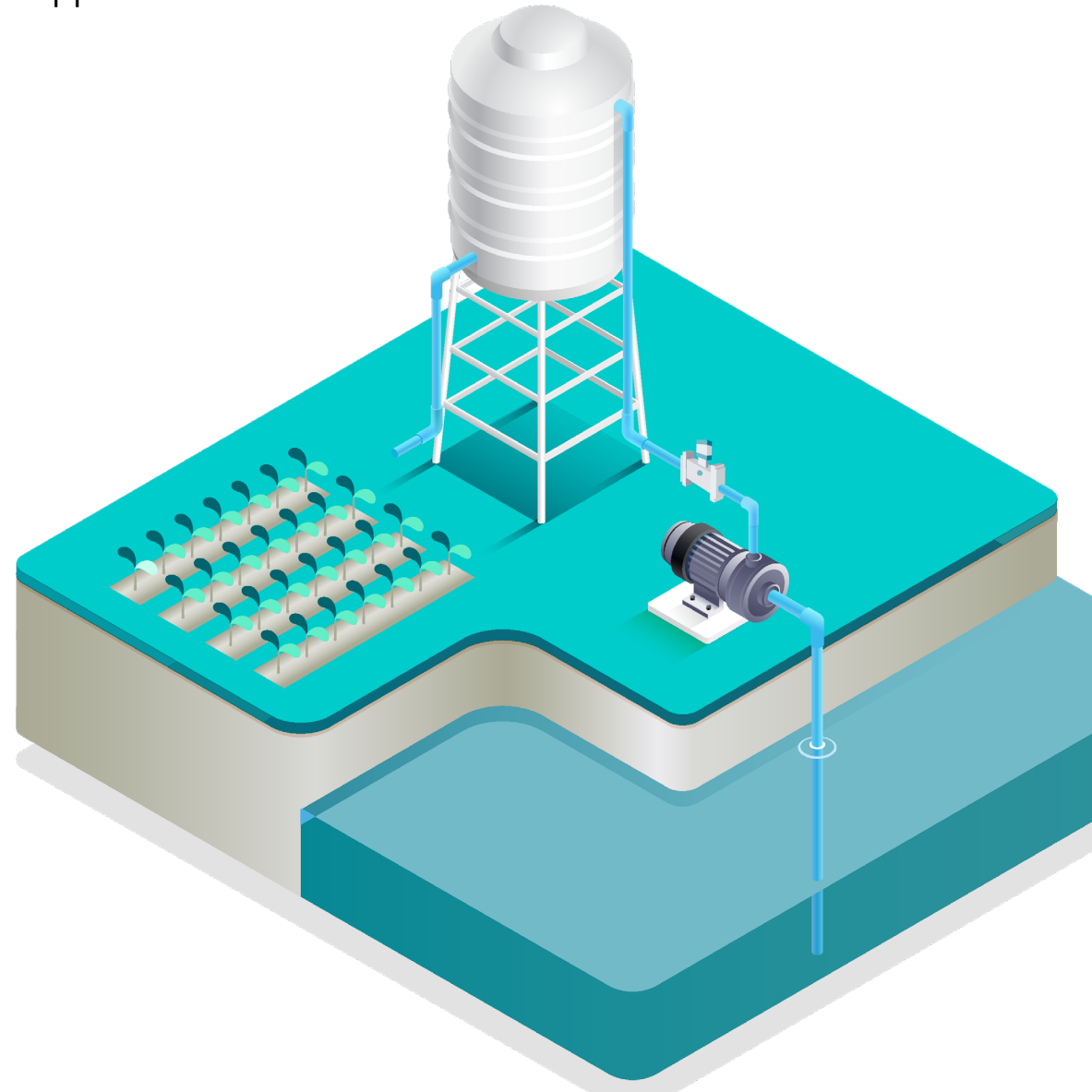


**Start now**

# The water meter of choice for distribution, billing and irrigation

The SITRANS FM MAG 8000 portfolio of battery-operated flowmeters combines world-class performance with a low cost of ownership, tailored to meet the needs of your specific water application. No mains power required.

Few resources are as vital to the human population, the environment and the global economy as water. To ensure the continuous preservation of this valuable commodity, the water industry has come to rely on the versatile SITRANS FM MAG 8000 program of battery-operated electromagnetic flowmeters from Siemens for such varied tasks as water distribution, revenue metering and crop irrigation.



The robust SITRANS FM MAG 8000 operates in even the most challenging environments with consistently high accuracy and virtually no maintenance — making it a highly cost-efficient water metering solution.

### **High-precision water metering – no compromises necessary**

Engineered for maximum flexibility without sacrificing accuracy, the SITRANS FM MAG 8000 is the ideal flow solution for a wide range of water applications, including abstraction, distribution, revenue and bulk metering, and irrigation. The MAG 8000 is available in both compact and remote versions with OD inlet/outlet requirements, making it easy to install virtually anywhere – even underground or in flood-prone locations. Its sturdy construction according to ISO 12944-2 is built to resist solids and other debris. And when powered by a highly efficient external lithium battery pack, the MAG 8000 can operate continually for up to 15 years in areas lacking mains power. An integrated power management program calculates the amount of power remaining, and a configurable “low battery” alarm alerts you when replacement is necessary.

### **Reliable and robust, it also features:**

- Remote transmitter option with factory-mounted cables and connectors
- No moving parts resulting in less wear and tear
- Bidirectional accuracy
- Unrestricted flow tube for minimal pressure loss even at high flow rates
- IP68 / NEMA 6P enclosure and cable with coating corrosivity category according to ISO 12944-2 C4 or C5, allowing for sensor burial and operation in harsh conditions

## Abstraction and distribution

To ensure that consumers receive a consistent supply of drinkable water, the MAG 8000 monitors all stages of network water flow from production plants and trunk lines to local delivery systems with:

- High accuracy - 0.2% to 0.4% of flow rate
- Bidirectional flow capability - one solution for all applications
- Network load monitoring - reduces leakage and saves energy
- Early leakage detection - achieved with reliable and repeatable measurements of low flow at night



## Bulk water and revenue

To ensure water bills are fair, and to reduce the need for verification, the MAG8 000 CT measures usage precisely and cost effectively with:

- Custody transfer approval - according to international revenue standards OIML 49 and MI-001
- No moving parts - minimal maintenance requirements optimize your cost of ownership
- OD inlet/outlet - offers greater flexibility in meter installation

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## Irrigation

Where irrigation systems are used in crop production, the MAG 8000 keeps water wastage to a minimum and ensures that farmers get a fair deal with:

- No moving parts - not prone to wear and tear in the usual way
- IP68 / NEMA 6P enclosure - allows for installation in places where flooding can occur, or even complete underground burial
- Optional conduit adaptor - provides a clean, protected pathway for device cables to secure integrity in any conditions
- Battery power and easy connection to solar panels - ensures long-term performance in locations without reliable mains power



# Intelligence at your fingertips

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With comprehensive data collection and logging options, advanced diagnostic functions and the capability for remote monitoring and configuration, the SITRANS FM MAG 8000 keeps you fully in control of your water application – whether you're on-site or on-the-go.

## Data flows better with Siemens

To enhance operational efficiency, improve billing accuracy and significantly reduce costs, SITRANS FM MAG 8000 offers flexible wireless communication options designed for modern water networks. Flow measurement data from any site can be accessed via a web application with secure password protection.

The SITRANS FM MAG 8000 features a standard IrDA interface for configuration, data collection and documentation using SIMATIC Process Device Manager or Flow Tool software. For remote monitoring of water applications, two wireless communication modules can be added: first is based on cellular technologies, which allows remote data configuration and monitoring through a dedicated web application SITRANS hub IQ. The second is based on LoRaWAN technology, which enables remote data monitoring. The SITRANS hub IQ enables further data allocation via e-mail, FTP/SFTP and RESTful API calls.



The 4G-based IIoT Wireless Communication Module collects measurement data from meters anywhere in the world covered by a LTE-M, NB-IoT or 2G network. Measurement data, parameters and alarms from the MAG 8000 are made accessible via the SITRANS hub IQ web application.

## The MAG 8000 keeps you connected

### IIoT Wireless Communication Module

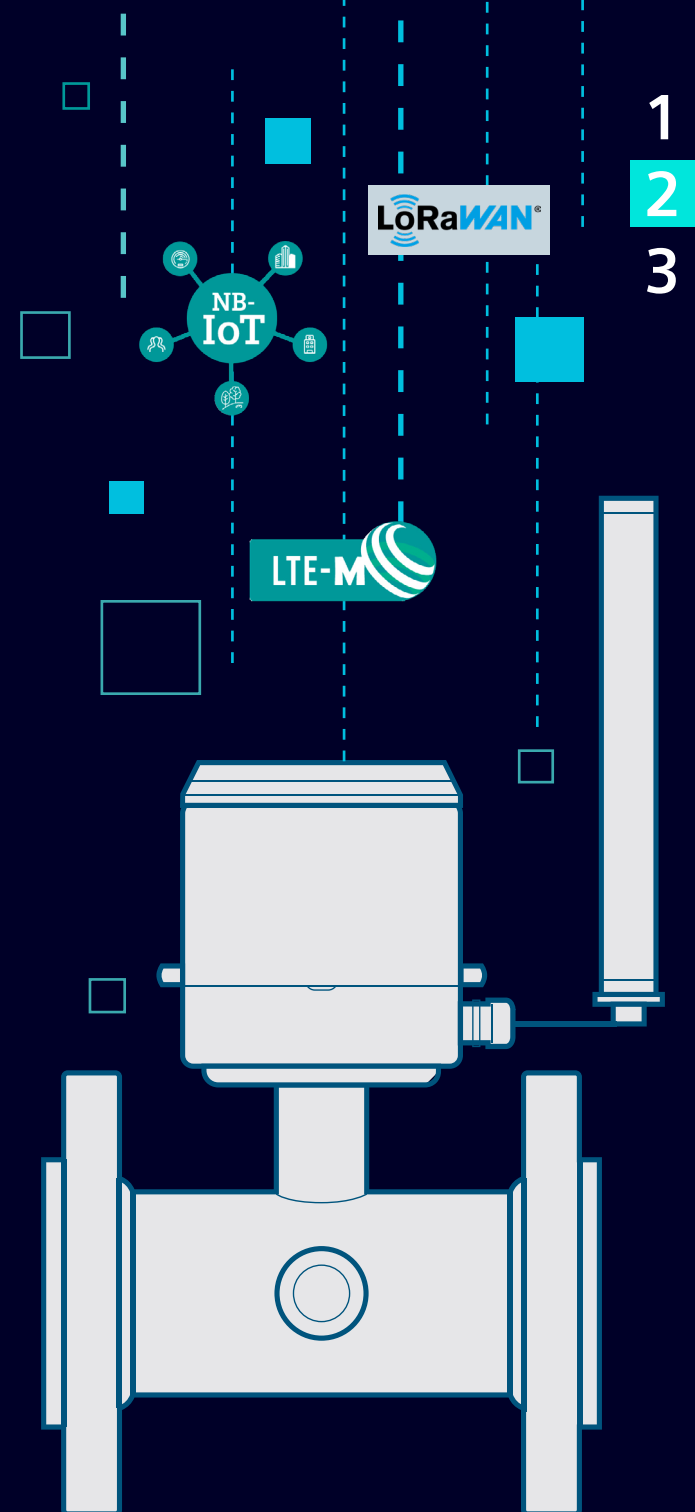
The IIoT Wireless Communication Module for SITRANS FM MAG 8000 is a communication system consisting of a hardware part combined with a web-hosted application for device management and measurement data transfer. The main features of the 4G-based module are to periodically transmit the flow readings from a MAG 8000 field device to an end user, provide near real-time notifications of alarms, enable online configuration and remote diagnosis of the field device. Having all this done via a web application significantly reduces the need for on-site presence.

The IIoT wireless communication module uses the public mobile network (LTE-M, NB-IoT, or 2G) as the channel for transferring the measurement data to the SITRANS hub IQ web application, where only authorized users have access. It also features 2-channel analog inputs that accept measurements from external ratiometric pressure transmitters alongside flow measurements (2-in-1 solution). Real-time clock synchronization with internet NTP servers ensures that every data point is accurately time-stamped.

### LW BLE Wireless Communication Module

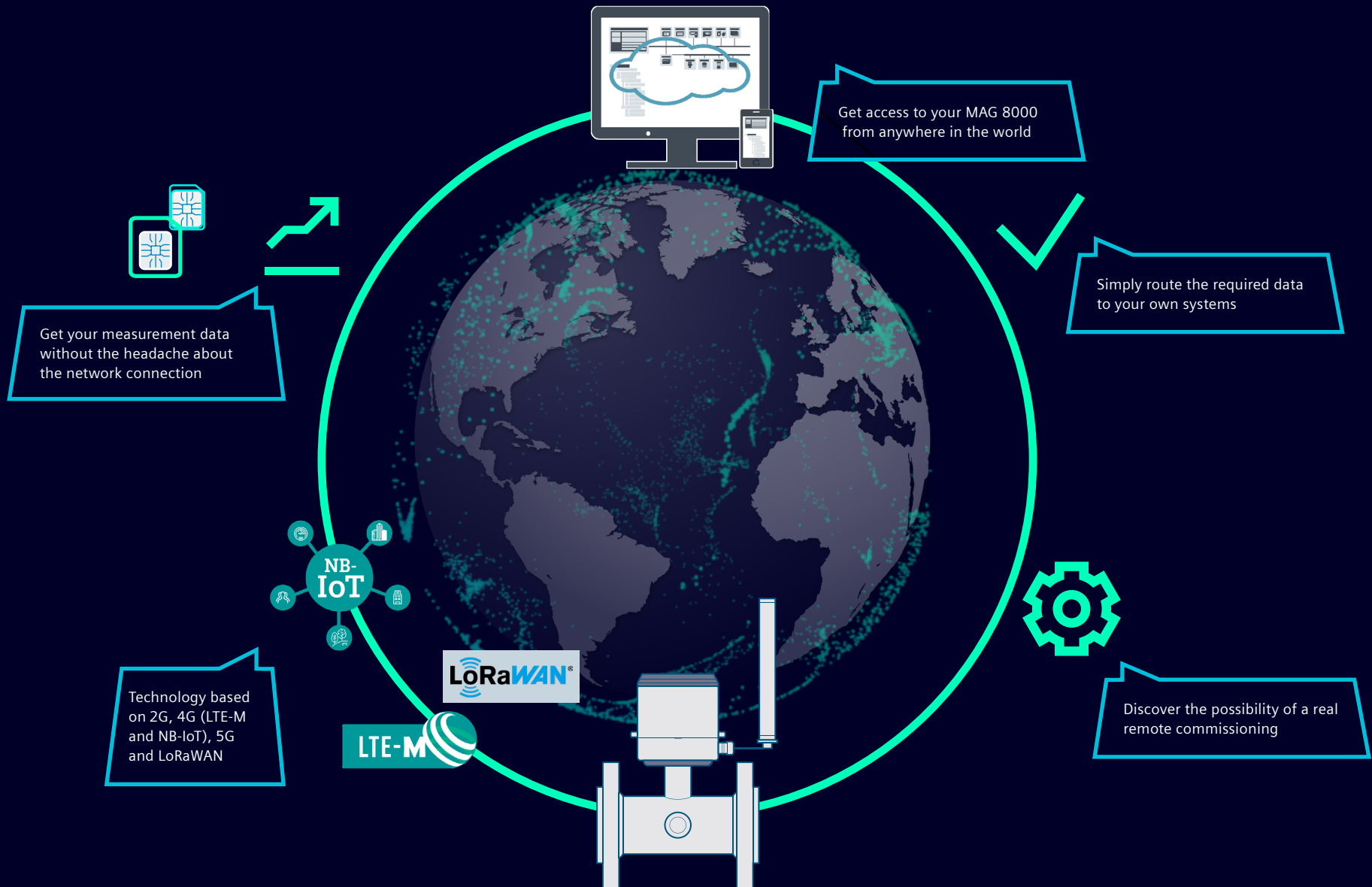
The LW BLE Wireless Communication Module is a hardware-only communication module designed for measurement data transmission from MAG 8000 field devices. Siemens supplies the communication module hardware. The customer is responsible for deploying and managing their LoRaWAN infrastructure, including the LoRaWAN Network Server (LNS) and LoRaWAN Gateways, which can be either public (operated by third-party network providers) or private (customer-owned infrastructure). The main feature of this module is to periodically transmit flow readings from the MAG 8000 field device to the customer's LoRaWAN Network Server (LNS) using the LoRaWAN protocol. Siemens provides data decoders to facilitate seamless integration with major LNS providers.

Communication between the field device and the module runs over LoRaWAN protocol 1.0.4. Local configuration is done via Bluetooth Low Energy (BLE) using the SITRANS mobile IQ app.



# SITRANS FM MAG 8000 Communication

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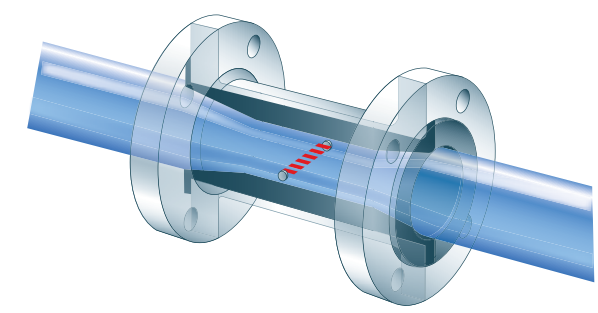
Once the MAG 8000 is installed, a wide range of smart features ensures reliable performance with minimal maintenance:

- An electrode resistance module measures the meter's contact with the media
- A product sizing program indicates whether the size of the meter selected is appropriate for the flow conditions on site
- A comprehensive data logging function records and stores consumption levels, alarms and operating conditions from the site
- Remote Qualification Certificate integrated into the IIoT Wireless Communication Module enables offsite quality audits on devices anywhere in the world

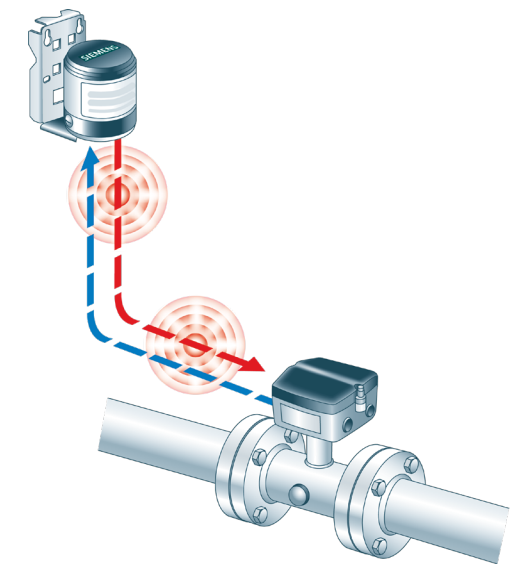


**Flow simulation**  
Integrated flow simulator verifies and adjusts the pulse output to any connected device or system, with configuration possible via the standard IrDA interface or the communication channel.

The free plug-in integrated into the SIMATIC PDM tool allows for on-site meter assessment and prints a Qualification Certificate for monitoring and auditing purposes.



**Improved low-flow performance**  
Siemens' conical flow tube design improves low-flow performance with negligible pressure drop across the meter for reduced energy loss.



**Insulation test**  
Built-in "cross-talk" test checks the entire signal chain of the system to ensure that the sensor flow signal is unaffected by external noise.

# Accredited calibration for more accurate water measurement

Every Siemens water meter is calibrated in-house at facilities that are individually accredited in accordance with ISO / IEC 17025.

Flowmeter calibration is a vital step in ensuring consistently accurate measurement. All SITRANS FM electromagnetic meters are wet calibrated at Siemens flow facilities with traceable instruments referring directly to the physical unit of measurement according to the International System of Units (SI).

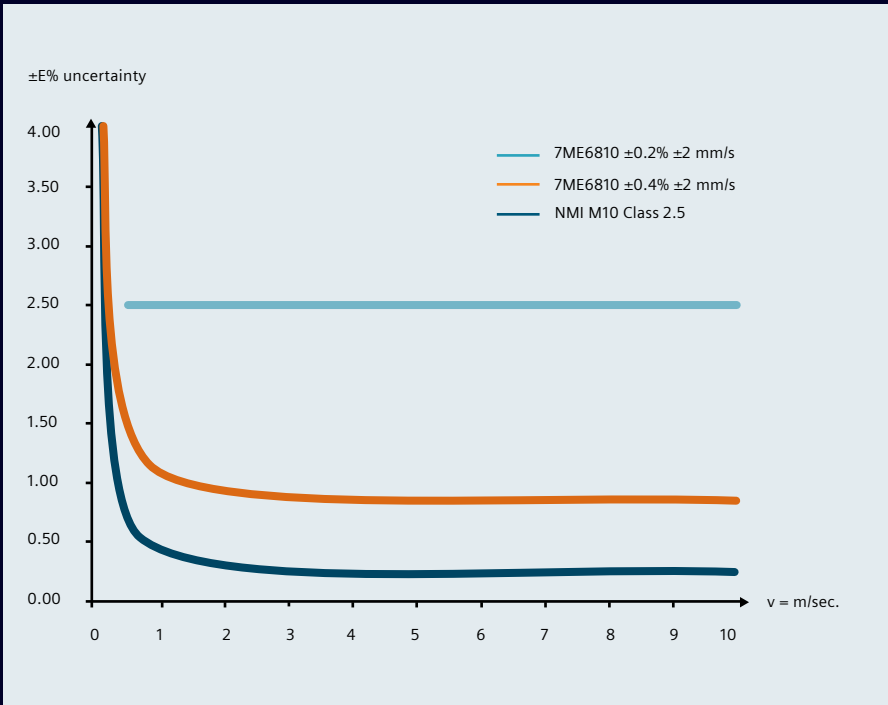
A certificate is supplied with every calibration to satisfy worldwide traceability standards, including NIST in the United States.

Siemens offers accredited calibrations assured to ISO/IEC 17025 in the flow range from 0.0001 to 10,000 m<sup>3</sup>/h.

Siemens Flow Instruments accredited laboratories are recognized by the International Laboratory Accreditation Corporation Mutual Recognition Arrangement (ILAC MRA), ensuring international acceptance of test results.



The robust SITRANS FM MAG 8000 operates in even the most challenging environments with consistently high accuracy and virtually no maintenance — making it a highly cost-efficient water metering solution.



A calibration certificate is supplied with every water meter, and all calibration data is stored in the instrument.

**SIEMENS CALIBRATION REPORT**

**SITRANS F M**

Customer  
 Converter type MAG8000 CT Serial No. 585302H045  
 Sensor type MAG8000 DN100 Serial No. 197802H065  
 Cal. Factor 0.79424317  
 System Serial No. 7ME682 585302H045

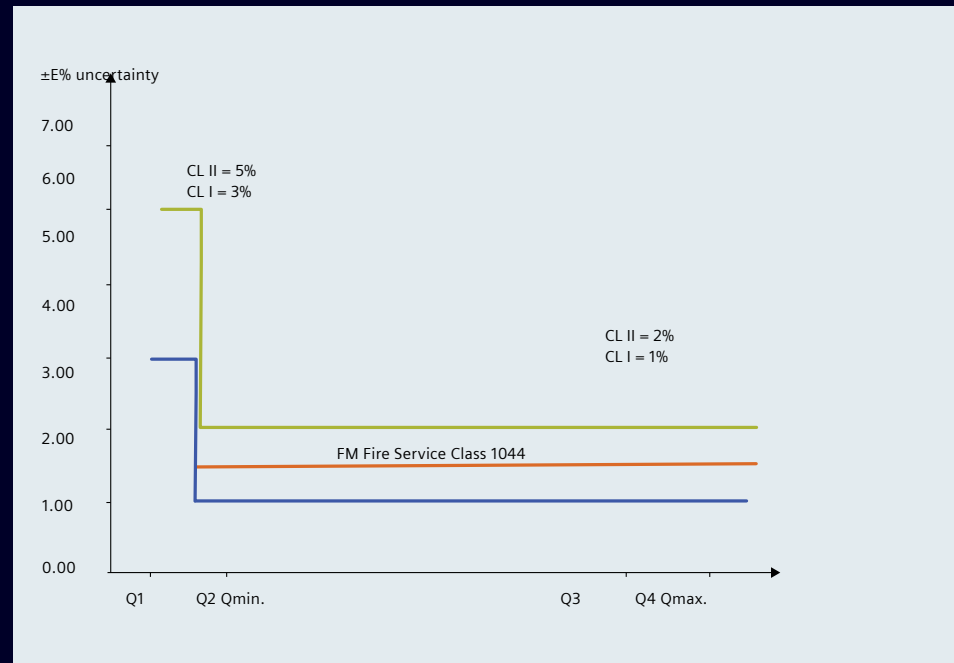
Calibration data  
 Q3 160,000 m<sup>3</sup>/h Calibration liquid Water  
 44.444 l/s Calibration rig Banc HNU 2  
 Q3/Q1 250

Calibration settings  
 Frequency output -

Calibration results

Test no.	Q3 scale flow [%]	Water temp. [°C]	True Flowrate		Flowmeter Frequency output		Error [%]	
			[l/s]	[m <sup>3</sup> /h]	[Hz]	[m <sup>3</sup> /h]		
1	94.03	23.8	41.7949	150.4616	-	41.7903	150.4451	-0.01
2	0.65	24.0	0.2877	1.0357	-	0.2862	1.0303	-0.51
3	0.43	23.7	0.1895	0.6822	-	0.1858	0.6689	-1.91

Calibrated by Grosse  
 Date Time 20:42:56  
 Approved by  
 Date



## A suitable meter for every water application.

	<b>MAG 8000 Standard</b>	<b>MAG 8000 CT</b>
Application	Irrigation, abstraction and distribution networks	Bulk water and revenue
Transmitter type	Basic version Advanced version or advanced information and functionality	
Custody transfer version		Type-approved and verified according to OIML R 49 / MI-001
Sensor size DN	25 – 1200 mm / 1" – 48" with EPDM liner	with EPDM liner
Enclosure sensor and transmitter	IP68 / NEMA 6P, compact and remote with connectors and factory-mounted cable	
Display	Display with touch keypad	
Output	2 individual pulse outputs (forward, reverse and net volume)	
Communication	Integrated standard IrDA interface, IIoT Wireless Communication Module, LW BLE Wireless Communication Module RS232 / RS485 with MODBUS RTU protocol, encoder interface module, with sensus protocol	
Power supply	Internal 2 D-cell or external 4 D-cell battery pack 12 – 24 V AC/DC and 115 – 230 V AC with battery backup	
Certifications	Approved to the international water meter standard OIML R 49/MI-001 (EU), complying with the European CEN – EN 14154, ISO 4064 specifications and FM Fire Service Class 1044	
Transmitter features	Data logger with configurable log interval up to 26 months, time and date, data protection, application identifier, alarm handling, meter status, diagnostics, battery power management, insulation test. Advanced version only (not valid for MAG 8000 I): Leakage detection, flow statistics and consumption profile, advanced diagnostics, self-check, meter utilization, tariff and settle date (revenue)	
Accuracy	±0.4% ±2 mm/s (DN 25 - 1200 / 1" – 48") ±0.2% ±2 mm/s (DN 50 - 300 / 2" – 12") NMI M 10 Class 2.5	OIML R 49 Class 1 and 2 MI-001 Class 2
Bi-directional measurement	Yes	
Process connections	ACS (France), WRc (UK), DVGW (Germany), NSF/ANSI Standard 61 (USA), Belgaqua (Belgium), KIWA and WRAS BS 6920 Cold Water (UK)	
Operating pressure	PN10/PN16/PN25/PN40	
Media temperature	0 – 70 °C / 32 – 158 °F	0.1 – 50 °C / 32 – 122 °F
Electrodes and earthing electrodes	Hastelloy C276	

Calibration type	Applications	Accuracy	Water meter type
Standard	General water	0.4%	MAG 8000 Standard
Extended	High-performance	0.2%	MAG 8000 Standard
Bulk water / revenue	Custody transfer (CT) FM fire service	OIML R49 Class 1 / Class 2 OIML R49 Class 1044	MAG 8000 CT



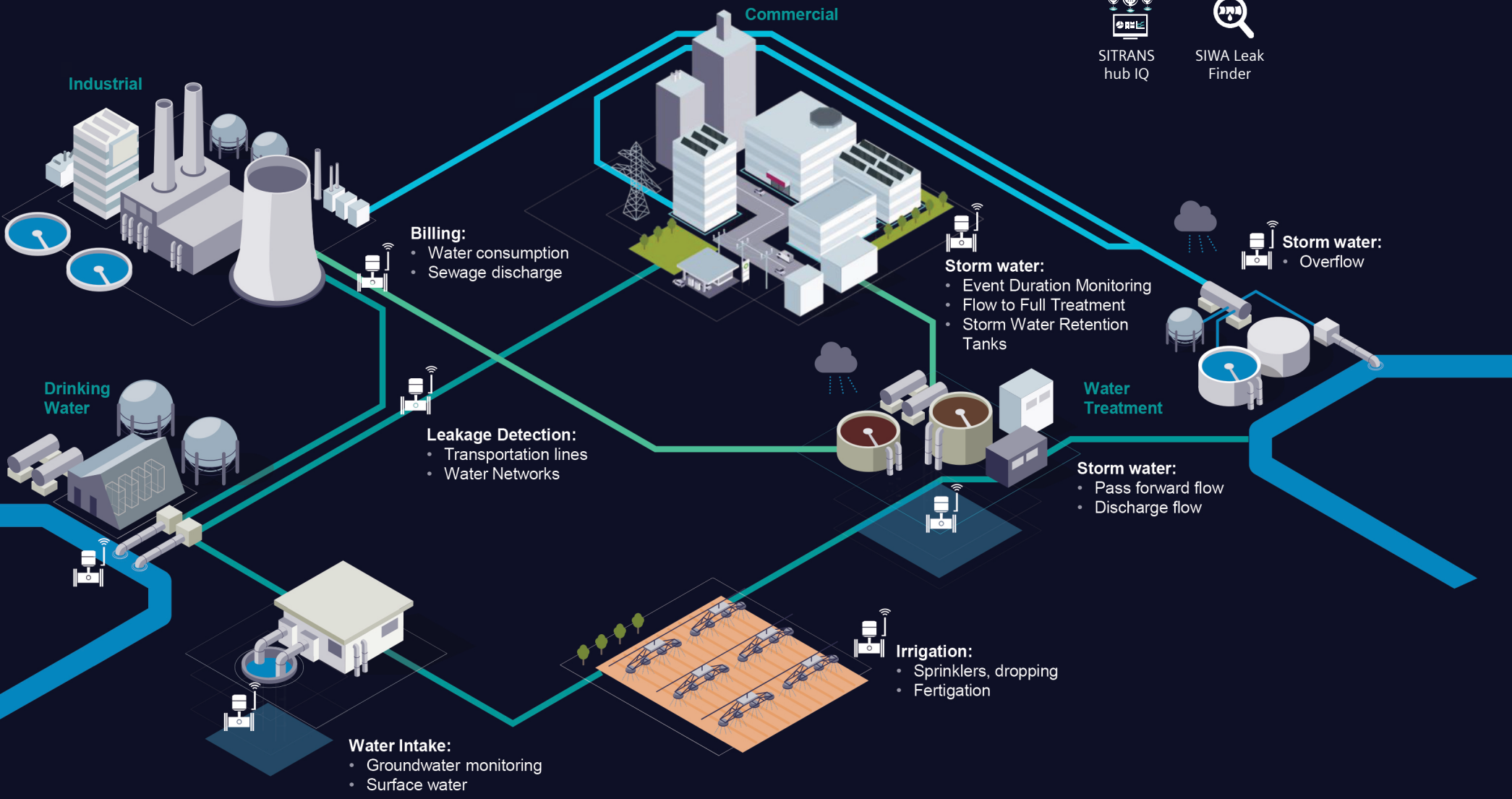
The accuracy of each meter is determined by the calibration performed. MAG 8000 water meters are available with three types of calibration, each suited to different application requirements.

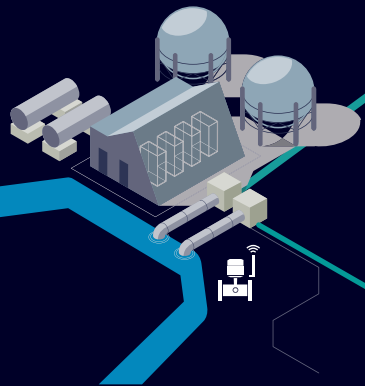
# SITRANS FM MAG 8000 IIoT

## Wireless Communication Module

### Digitalization use cases

From Asset Management to Complete solutions





## Drinking Water

Our easy-to-install Smart Water Meter allows our customers to monitor water abstraction, monitor the network and detect leaks, all without the need for an external power supply.

Remote communication improves the reporting capabilities of water utilities, no matter how far away, and provides all relevant information about water sources and network profiles that help avoid overuse of ground wells, lakes or others.

Digitalization makes this data a valuable asset through a seamless integration solution for quick reporting with SITRANS hub IQ web application. For advanced leakage detection and location in large extension areas or complex configurationsour SIWA Suit is the best choice.



## Industrial

Accurate and certified measurements meeting international Custody Transfer standards for billing purposes is one growing trend as major industries have to report their water consumption.

SITRANS FM MAG 8000 with IIoT technology simplifies the traditional data reading carried out when visiting the site.

Remote data reporting reduces transportation times contributing directly to impacting the carbon footprint for a better world.

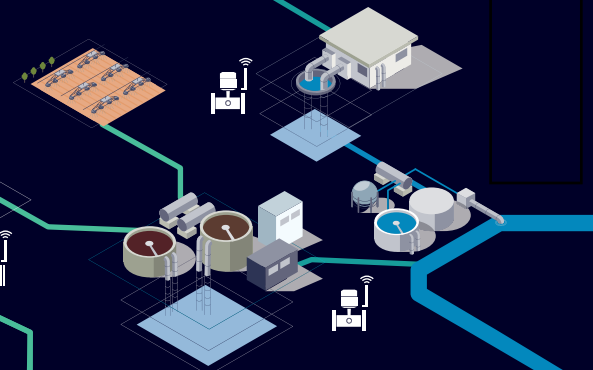
Another benefit is daily reporting with all details on consumption profiles that allow water companies to improve water supply in a smart way using the 24h trend reporting and reducing OPEX during the daily operation and enabling customers to get more detailed reports.



## Commercial

Smart water meters are also getting used more on commercial applications bringing advantages to both water supplier and users to get a clear visibility on consumption patterns and also avoid leakages in commercial centers, hospitals and government offices.

Our MAG 8000 with IIoT technology also fits in this new area, providing diverse digital ways to report information and receive in real time notifications to indicate problems. In the installation point SITRANS hub IQ web application enables an alarm to be set for high or low levels that allow water companies to react under certain conditions, saving time and millions of liters of water.



## Water Treatment

The need to report sewage water coming from industrial and commercial areas is a new way to plan the water treatment plant load, and also learn the discharge patterns that will allow water companies to improve and use in a better way the infrastructure available. For that purpose we have a large selection of digitalization solution in our SIWA Suite, such as Pump Guardian, Block Predictor and Sewer in combination with our SITRANS hub IQ web application.

Water reuse and rain water collection is a new sustainable way to help to mitigate the water needs for Irrigation or Industrial water as a reliable alternative for a better future. With our solutions we can provide all data needed to complete the water cycle and better utilize this precious resource, giving it a second chance.

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