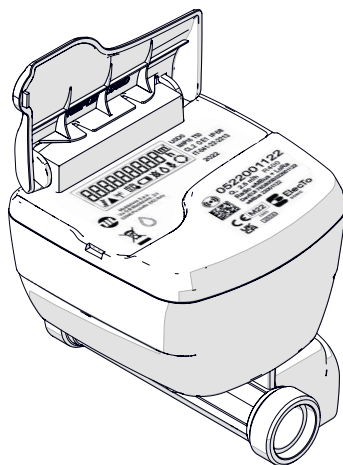


ElecTo SONIC

Ultrasonic meter



INSTALLATION, USE AND MAINTENANCE INSTRUCTIONS

Translation of the original instructions

Read this manual carefully before installing or using the device, and keep it for future reference.

Symbols used in the manual and their meanings



WARNING

Indicates particularly important information.



DANGER!

Identifies actions that may lead to injury or damage to the device if not carried out correctly.



PROHIBITED ACTIONS

Indicates actions that must not be carried out.



NOTE

Images for illustration only. The actual parts may vary.

Conformity

Maddalena S.p.A. declares that ElecTo SONIC complies with the essential requirements of the following directives and standards:

- Directive 2014/32/EU (MID - Measuring Instruments Directive)
- Directive 2014/53/EU (RED - Radio Equipment Directive)
- Directive 2011/65/EU as amended (RoHS - Restriction of Hazardous Substances)

The full text of the declaration of conformity is available in the "Declaration of Conformity" section and on the product web page.

Warranty

The terms of sale and warranty are available on the website www.maddalena.it.

Warranty limitations

Maddalena S.p.A. declines all liability, and the warranty will become immediately void, in the event of:

- Damage or defects caused by transportation or loading and unloading
- Incorrect installation due to failure to comply with the supplied instructions
- Use for purposes other than those indicated in this manual
- Use by unqualified or unauthorised personnel

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1 General information

1.1 Warnings and safety rules



WARNING

- This manual is the property of Maddalena S.p.A. and any reproduction or transfer of its contents to third parties is prohibited. All rights reserved. It is an integral part of the product. Ensure that it always accompanies the device, including when sold or transferred to a new owner, so it can be referred to by the user or authorised personnel for maintenance and repairs.
- Read this manual carefully before using the device to ensure safe operation.
- The device must be used as intended by Maddalena S.p.A.. **Maddalena S.p.A.** declines all responsibility for damages to people, animals, or property caused by installation errors, incorrect adjustments, poor maintenance, or improper use of the device.
- After unpacking, ensure the integrity and completeness of the supply. If the delivery does not match the order, contact the local distributor who sold the device.
- The device must be installed and used in an environment not liable to freezing.
- The device must be protected from extreme humidity and heat: moisture and intense heat can damage the battery and the device. The maximum permissible operating temperature is 55 °C.
- If you have any questions about the conditions and/or functionality of the device or its accessories, please contact your local distributor.
- After commissioning the device, report any faults or malfunctions detected to the product supplier.
- If the device is completely destroyed and electrolyte leaks out, avoid contact with your eyes or skin. Do not inhale the vapours produced and make sure that the room is well ventilated.
- This device is not intended for use by individuals with reduced mental or physical capabilities, or those lacking experience and knowledge (including children), unless they are supervised by someone responsible for their safety and have been adequately instructed on how to use the device.
- Any inappropriate behaviour not described in this document may cause damage to the instrument. This device contains no replaceable internal parts.
- The meter must be installed at a safe distance from any other devices that emit heat or electromagnetic fields exceeding the specified limit for its electromagnetic compatibility class.
- To prevent mechanical stress on the pipework, the spacing between the meter's connection points at the place of installation must correspond to the meter's total length, including gasket thickness.
- It is advisable to install the meter as far away as possible from any potential sources of vibration, such as pumps.
- If the meter is installed on pipework where no water flow is expected during sub-zero temperatures, the line must be drained to prevent frost damage.

1.2 Prohibitions



PROHIBITED

- Tamper with or attempt to repair the product. All repairs must be carried out exclusively by authorised personnel.
- Leave the device exposed to weather conditions.
- Place the device near sources of heat or expose it to direct sunlight.
- Place the device near sources of electromagnetic interference.
- Open the device and/or replace the battery.
- Use solvents to clean the device.
- Dispose of the packaging material in the environment or leave it within reach of children, as it may pose a hazard. It must therefore be disposed of in accordance with the regulations in force.
- Dispose of the device with household waste.

1.3 Description of the device

ElecTo SONIC is a static cold water meter. It measures flow volume, flow rate and other parameters using ultrasonic technology. The meter monitors its operating and installation parameters continuously. In the event of anomalies, the meter triggers and transmits the corresponding alarms.

The **Multiprotocol** version of **ElecTo SONIC** features an integrated radio module operating on Wireless M-Bus and LoRaWAN, providing long-range data transmission capabilities. The data can be received using a dedicated mobile reading kit or via concentrators and a fixed network.

The **NB-IoT** version of **ElecTo SONIC** features an integrated radio module for data transmission over the NB-IoT fixed network. The data can be viewed through a meter-management portal, once properly configured.

- The main technical features of **ElecTo SONIC** are:
- Liquid crystal display
 - NFC interface for device configuration
 - IP68 protection rating
 - Accuracy class up to R800
 - Anomaly reporting. Reports abnormal water consumption and detects errors (see the Alarms section).
 - No moving parts. Wear-resistant with consistent long-term performance.
 - Datalogging functions. Historical values available for: current volume, backflow volume, minimum and maximum flow rate, water temperature.
 - Power supply Long-life lithium battery (battery life may vary depending on configuration).
 - Available with integrated wM-Bus and/or LoRaWAN 868 MHz radio communication for the Multiprotocol version, or NB-IoT.

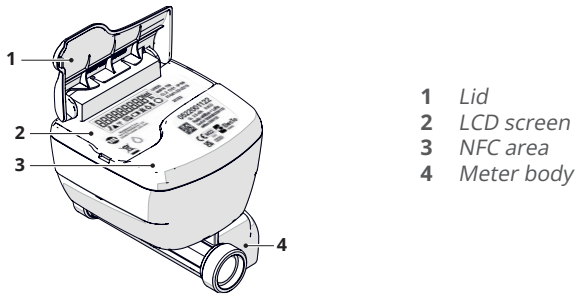
1.4 Operating limits

The product may only be used within its specified operating limits (see "**Technical data**").

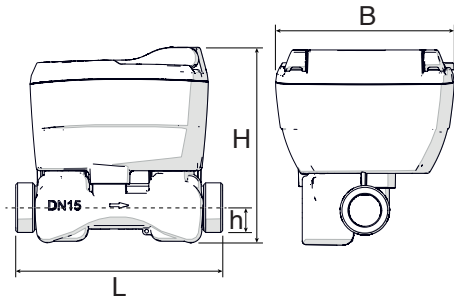
1.4.1 Operating conditions

- Ambient temperature: -10 °C to +55 °C
 - Recommended water hardness: 15 °F to 30 °F
 - Maximum permissible humidity: 93%;
 - Atmospheric pressure: 86±1 kPa to 106±1 kPa
 - pH min 6.5 max 9.5
 - Sodium min. 0 max. 200 mg/l
 - Calcium min. 20 max. 150 mg/l
 - Installation: Indoors or outdoors
- The maximum permitted chlorine content in the pipe is 5 ppm free chlorine and 10 ppm dissolved oxygen.

1.5 Structure



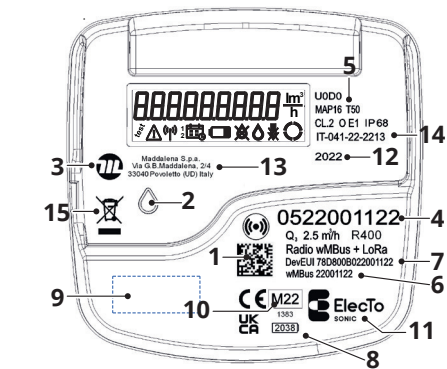
1.5.1 Dimensions



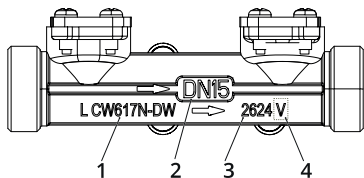
DN (mm)	15			20			25				32		40		50	
(")	1/2"			3/4"			1"				1 1/4"		1 1/2"		2"	
Thread (")	G ¾ B / G 1 B			G 1 B			G 1 ¼ B				G 1 ½ B		G 2 B		G 2 ½ B	
L (mm)	110	145	165	105 (R500 only)	130	165	190	150	160	175	260	160	260	200	300	300
H (mm)	104			105			119						126		143	
h (mm)	19			21.5			25				29		34		38.5	
B (mm)	95															98

1.6 Identification

ElecTo SONIC can be identified by the information marked on it:



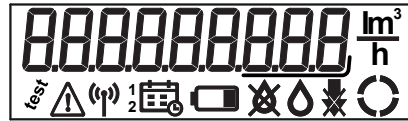
- 1 QR code
- 2 LEDs
- 3 Manufacturer
- 4 Serial number of meter
- 5 Metrological data
- 6 wMBus radio serial number
- 7 LoRaWAN™ DevEUI radio
- 8 Battery expiry date
- 9 Customer logo space (optional)
- 10 MID approval
- 11 Product name
- 12 Year of manufacture
- 13 Manufacturer address
- 14 Approval number
- 15 WEEE label



- 1 Body material
- 2 Body size
- 3 Body M/Y
- 4 NRV* installation option

* A Non-Return Valve may be installed only if the "V" marking is present.

1.7 Display



The display is a 9-characters LCD showing in cyclical sequence volume, flow rate and any error codes.

The display includes a horizontal segment that highlights the three decimal digits (hectolitres, decalitres and litres) for clearer volume reading.

Icon	Description
	Test Displayed during test mode
	Error Displayed when an error is shown
	Broadcast antenna Indicates radio transmission or radio enabled
	Calendar Displayed when billing dates are shown
	Battery Displayed towards the end of the calculated battery life, or when the voltage drops below the minimum value (in this case the error icon is also displayed).
	No-flow indicator Displayed when the instrument is not detecting a flow
	Leak Displayed when the leak alarm occurs
	Backflow Displayed when the backflow alarm occurs
	Star indicator This indicator, consisting of two arc segments, follows the movement of the flow by rotating clockwise in the case of direct flow and counterclockwise in the case of reverse flow.

By default, the display is preset to the following automatic display cycle:

- 60 seconds on the Main view
- 12 seconds on the Periodic readings
- 12 seconds on the Display test and firmware version.

1.7.1 Main view (default)

- The measured volume is displayed for 12 seconds;
- The flow rate is displayed for 3 seconds;
- The display cycle is automatically repeated 4 times, for a total of 60 seconds (12+3 = 15x4 = 60).

1.7.2 Periodic reading

Following an automatic sequence, the billing dates references are shown:

- Reading date 1 displayed for 3 seconds;
 - Periodic reading 1 displayed for 3 seconds;
 - Reading date 2 displayed for 3 seconds;
 - Periodic reading 2 displayed for 3 seconds;
- The calendar icon is displayed during the display.



NOTE

Periodic reading dates are set by default to year-end and month-end. If the periodic reading date has not yet occurred, the display will show: 01.01.2000.

1.7.3 Display test and firmware version

The display is as follows:

- all segments On for 3 seconds;
- all segments Off for 3 seconds;
- installed firmware version for 3 seconds. The displayed format is MM.mmF, where MM indicates the main version number (2 digits), mm the secondary version number (2 digits), and F indicates that the value refers to the firmware.
- firmware's CRC for 3 seconds. This is displayed using all the digits of the display as a 32-bit hexadecimal value using both digits and letters (0-9/A-F);
- any error codes for 3 seconds (E.g.: Err XXXX, where XXXX is the hexadecimal error code). See table "Error codes".

1.7.4 Display operation

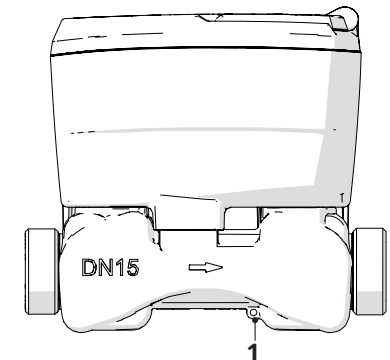
The digital display behaves in the same way as a mechanical meter. In the event of reverse flow, the volume will therefore decrement, and once it reaches the value closest to zero, it will roll over and display 999999.999.

Likewise, once the maximum value 999999.999 is reached, the meter will return to displaying values starting from 0.

The flow direction is shown by the rotation of the indicator star in the bottom-right corner of the display.

1.8 Seals

The meter features a slot (1) on the side of its body that can be used for inserting a wire with a tamper prevention lead seal at the time of installation in the field.



1.9 Alarms

ElecTo SONIC is able to detect, store and transmit via radio the following alarms:

Alarm:	Description	Permitted status options	Default
Possible leak	Continuous flow detection	ON/OFF	ON
Backflow	Reverse flow rate above a preset threshold	ON/OFF	ON
Overconsumption	The flow rate exceeds a set threshold for a preset period	ON/OFF	OFF
No consumption	The meter does not detect consumption for a preset period	ON/OFF	ON
Inverted meter	Constant negative consumption for more than 10 days	ON/OFF	ON
Suspected ice	The meter does not receive the ultrasonic signal and the temperature is below the minimum threshold	Always ON	ON
Empty line/Air	The measuring chamber is empty or the transducers are not receiving the ultrasonic signal (suspected transducer fault)	Always ON	ON
High/Low water temperature	The meter is operating outside the permitted temperature range	Always ON	ON
Expiry of the verification period	The meter has exceeded the verification period	ON/OFF	OFF
Low battery voltage	The battery voltage is too low	Always ON	ON
Low battery charge	The battery is exhausted	ON/OFF	ON
Metrological checksum error	The firmware (flash memory) is corrupt	Always ON	ON



NOTE

If the “suspected ice” alarm appears without the “empty line” alarm, it is very unlikely that the water is actually frozen.
If the “empty line” alarm appears after the “suspected ice” alarm, it is likely that the water in the line is frozen.

1.9.1 Alarm transmission

LoRaWAN mode

- if an alarm condition occurs and the frame has not yet been sent in the current time window, the frame is sent earlier;
- if an alarm condition occurs and the frame has already been sent in the current time window, then an event frame is sent.

NB-IoT mode

- It follows the wMBus protocol logic, with alarms transmitted only within the message payload.

1.10 Technical data

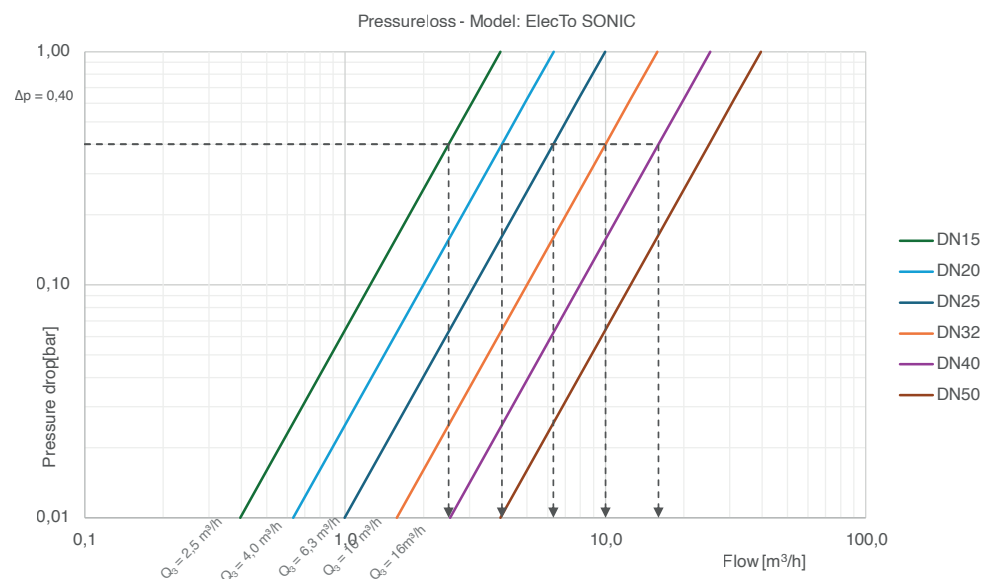
Description	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	Unit
Accuracy class	2						
Q3/Q1 ratio (MID certificate)	800						
Q3/Q1 ratio (Production standard)	500						
Maximum reading	999999.999						m³
Maximum operating pressure	16						MPa
Temperature class	T50: +0.1 to +50						°C
Sensitivity class to installation conditions	U0 - D0						
Protection rating	IP68 *						
Power supply	LiSoCl2 3.6 V						
Battery life	16 (default)						years
Environmental and mechanical conditions	Class O						
	Storage temperature: -20 °C to +60 °C Operating temperature: -10 °C to +55 °C						
Mechanical class	M1						
Electromagnetic class	E1 - E2						
Liquid	Water						
Installation position	Any position provided for by the MID						
Indicative starting flow rate **	2.5	4.0	6.3	10.0	16.0	25.0	l/h
Pressure loss	40						KPa
Approvals available	DM174, ACS, NSF WRAS						

* 1440h under 1 m³ of water at 20 °C.

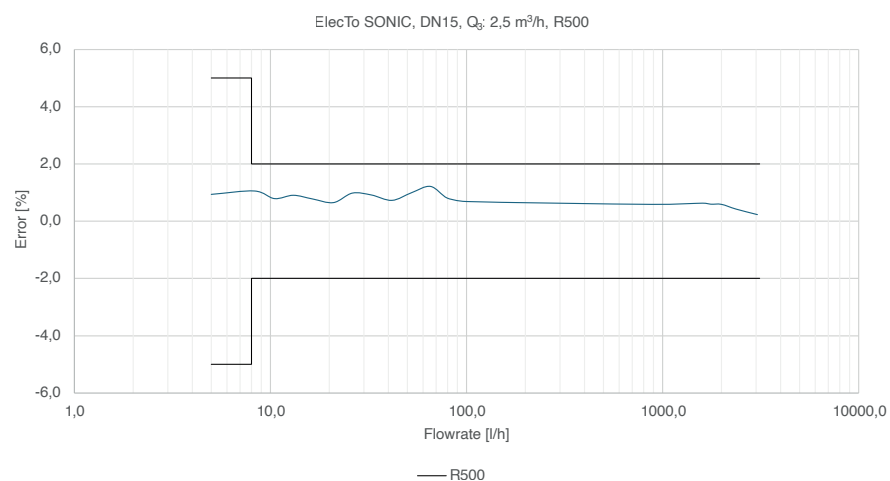
** Other values available upon request.

1.11 Additional technical specifications

1.11.1 Pressure losses



1.11.2 Typical error curve



1.12 Radio technical data - Multiprotocol version

Characteristics	Description
Radio status	Activation upon water flow (10 L)
Configuration	Using Android APP via NFC interface (ISO 15693)
Standard	Wireless M-Bus, OMS
	LoRaWAN™ v. 1.03 class A
Modes	wMBus T1, C1
	LoRa SF7-12, BW125-500, CR=4/5
Operation frequency band	863 to 870 MHz
Radiated power	14dBm max
Transmission range*	Up to 15 Km in LoRaWAN™ mode
	Up to 500 m in wM-Bus mode
Equipment class	Class 1 Radio
Data transmitted	LoRaWAN (OTAA) Transmission of measurement data (alarms, hourly or daily consumption) twice a day Transmission of supervision data (alarms, device status) once a week
	wM-Bus - Tiny frame (default): Current volume, date and time, volume at billing date, billing date, alarms - Short frame: Current volume, volumes at billing dates, meter serial, alarms - Long frame (C1 mode only): same as short frame plus the values from the last 12 months

In open air, line-of-sight

Factory radio configuration	Single mode	Dual mode	
	wM-Bus	wM-Bus	LoRaWAN
Data transmitted	Tiny frame C1: Current volume, date and time, volume at billing date, billing date, alarms	Tiny frame C1: Current volume, date and time, volume at billing date, billing date, alarms	Date and time, daily consumption for up to the previous 7 days, alarms
Transmission time	08:00 - 18:00	08:00 - 18:00	00:00 - 24:00
Transmission interval	30 sec	30 sec	twice a day
Cryptography	active	active	native
Alarms (default)	Backflow (100 L), possible leak (15-min observation interval / 48-hour observation period), maximum flow (disabled)		
Battery life	18 years	16 years	

1.13 Radio technical data - NB-IoT version

The meter features an integrated **MFF2 SIM card (SIM-on-chip)**, together with an antenna and modem for NB-IoT communication.
The data are transmitted directly from the meter to the *Head-End System (HES)* via cellular connectivity, enabling communication even in remote areas.

The power consumption associated with this technology is strongly influenced by environmental and/or installation conditions.

In the absence of NB-IoT coverage, or where coverage is weak, the following may occur:

- increased energy consumption
- possible failure to receive the message.

These situations are a direct consequence of the network signal conditions.

The coverage information is an integral part of the frame transmitted by the meter.

Characteristics	Description
Radio status	Activation upon water flow (10 L)
Configuration	Using Android APP via NFC interface (ISO 15693)
Standard	NB-IoT, NB2
3GPP	Rel. 15
Operation frequency bands	B3, B8, B20
Radiated power	23dBm max.
Battery life	13 years (1 communication every 3 days - default)
Transport layer network protocol	UDP
Application protocol	wMBus (EN 13757-8:2023)
Device class	Radio class 1

1 Day data frame	3 Day data frame	15 Day data frame
Meter info (alarms, date and time, ...)		
Volume (total and negative), Alarms, periodic billing data, Maximum flow rate, signal quality		
24 data points (hourly consumption)	12 data points (6-hour consumption)	15 data points (daily consumption)
ECL0 required to ensure 13 years of life		Suitable for areas with low network coverage (ECL2)

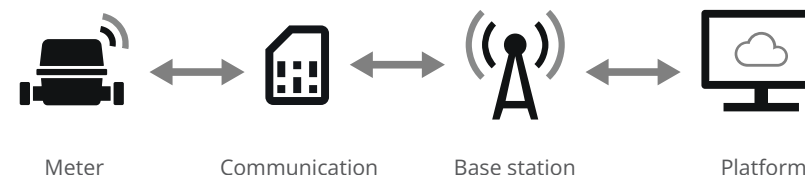


NOTE

NB-IoT devices are factory-configured to automatically connect to the network and to the designated portal.

1.13.1 Mandatory information

The **ElecTo SONIC NB-IoT** meter can operate correctly only if all product, connectivity, and platform-related information has been provided in advance to **Maddalena S.p.A.**



Before an NB-IoT-enabled meter can be supplied, the customer must provide the following information:

Meter information

- Physical specifications of the meter (DN, length, logo, serial number, layout, ...)
- Alarms
- Type of frame (1-3-15 day data frame)

Connectivity information

- Country of installation of the meter
- Operating band used
- APN (Access Point Name)
- If the SIM is provided by the customer rather than by **Maddalena**, information on the eSIM chipset will be required (ICCID – Integrated Circuit Card Identifier, or IMSI – International Mobile Subscriber Identity).

Platform details (if other than the MGRID platform)

- UDP port and IPv4 address (Internet Protocol version 4).
Alternatively, the device can be connected using a DNS (Domain Name System) address (e.g. data.platform.com)

If any of the above information is missing, correct device communication cannot be guaranteed.



NOTE

If a backend address in **FQDN(Fully Qualified Domain Name)** format is to be used, the following rules must be observed. Failure to do so may prevent the device from transmitting data correctly.

- The **FQDN** address must resolve to a limited pool or to a predefined sub-range of **IPv4 addresses** provided in advance.
- **DNS resolution** of the address occurs at a frequency of **no less than once per week**.
- The **resolution mechanism** must not use round-robin logic (the **IP address must not change** at each resolution).

1.13.2 Fallback & Backoff

The fallback function on the 868 MHz wM-Bus network is available on certain specific product variants only.

In such variants, if the meter loses the NB-IoT connection, it switches to fallback mode and uses the wM-Bus communication protocol.

To restore the NB-IoT connection, the following logic is applied:

- A transmission attempt over NB-IoT is performed every X days (where X is initially preset to 2 days).
- At the first successful NB-IoT transmission, the fallback mode is deactivated and the meter returns to NB-IoT operation.
- If the radio remains registered on the NB-IoT network for 7 consecutive days, X is reset to its initial value.
- If a transmission fails, X is doubled (up to a maximum of 60 days) and the success counter is reset.

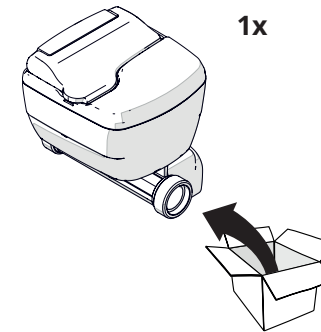


NOTE

A “successful transmission” means that the meter has successfully registered with the mobile network cell and that the infrastructure has accepted the frame for forwarding to the backend/HES. The presence of filters or firewalls within the network infrastructure, if not properly configured, may prevent the data frame from reaching the backend/HES.

2 Installation

2.1 Receipt of the product



Optional accessories:

- Fitting kit
- Gasket kit
- Gasket
- Non-return valve



NOTE

The Instruction manual is an integral part of the product. It must be read and kept with care.



PROHIBITED ACTIONS

Do not dispose of the packaging material in the environment or leave it within the reach of children, as it may pose a hazard. It must therefore be disposed of in accordance with the regulations in force.

2.2 Installation

Authorised personnel: a qualified installer or plumber appointed by the metering operator.



NOTE

Only authorised personnel who have received the necessary training and have the required technical expertise are permitted to install and operate the device.

Before installing the device, ensure that the two pipe sections are aligned to avoid mechanical stress; clean them thoroughly (especially if the pipes are empty) and let water flow for some time using a short piece of pipe in place of the meter.

If there is no water in the pipe, open the upstream valve before installing the device. This precaution is necessary because opening the valve after installation may cause air suction that could damage the device.

Before putting the meter into service, completely vent the air from the pipe and from the meter itself. During this operation, all shut-off/control components must be fully open. Start by opening the upstream valve, followed by the downstream valve.

When replacing the meter, it is recommended to replace the coupling gasket as well. Recommended gasket seal hardness: minimum 80 ShA.

Tighten the nut with a torque wrench and use a holding wrench to keep the meter steady. Maximum tightening torque: 40 Nm.

Install the meter:

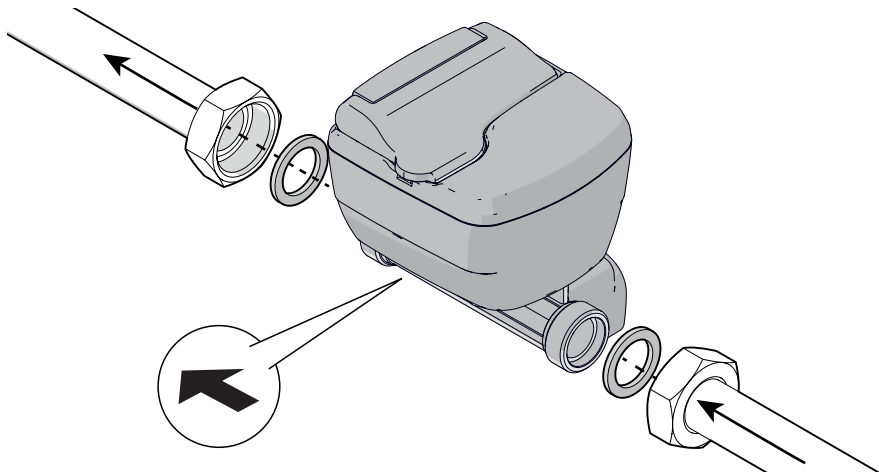
- In a frost-free location (insulate if necessary) and at the lowest point of the system to avoid air pockets.
 - Protected from impacts or tampering, in a position where reading is easy.
 - Ensuring that the direction of the arrow on the meter matches the direction of flow.
- Install suitable upstream and downstream shut-off devices to allow maintenance and inspection of the meter as well as control of the system.

It is also advisable to install a non-return valve, either internal or external to the meter (see the specific technical datasheet).



NOTE

Before fitting the gasket seal, ensure that it is not damaged. Take care not to damage the gasket seal during installation. Ensure that the centre line of the gasket seal aligns with that of the pipe. Ensure that the gasket seal does not protrude from the pipe. Make sure that the flange surfaces are clean and undamaged. Check that the meter is installed in the correct orientation and that no air is present in the system.



NOTE

Check the gaskets for leaks.

Installation position

Observe the indications on the dial (letters H and V):

- H – the meter must be installed with the dial in a horizontal position.
- V – the meter must be installed with the dial in a vertical position.
- H and V, the meter may be installed with the dial in either position.
- If the symbols are not present, installations in a vertical position with downward flow or with the dial facing downward must still be avoided.

Straight pipe sections and flow straighteners

If straight sections are used upstream and/or downstream of the meter, refer to letters U and D on the dial. If the letters U and/or D are followed by the letter S, install a flow straightener.

Maximum allowable pressure (ISO 4064-1)

The maximum allowable pressure (MAP) is 16 bar and is indicated on the meter dial. If not specified on the dial, it must be 10 bar. These values must never be exceeded.

The minimum allowable pressure (MAP) downstream of the meter must be ≥ 0.03 MPa (0.3 bar).

Commissioning

Before putting the meter into service, fully vent the air from the pipework and from the meter itself (rotating it if necessary). During this operation, all shut-off/control components must be fully open. Start by opening the upstream valve, followed by the downstream valve.



NOTE

Keep the valves closed when the premises are unoccupied. For safety reasons, if the installation is not yet complete or if no water consumption is expected for an extended period (for example, when the building will remain unoccupied for a long time), make sure that the upstream and downstream valves of the meter are fully closed.

2.3 Datalogging

Historical data is available for:

- current forward water volume
- current reverse water volume
- minimum flow rate with timestamp
- maximum flow rate with timestamp
- error codes (status)
- total operating time
- operating time without errors
- average operating temperature.

These values are available for four time buffers:

Data period	Retention period
15 minutes	9 days
Time	37 days
Daily	896 days
Monthly	21 years

3 Use

ElecTo SONIC is ideal for both domestic and industrial utility environments and, with no moving parts, offers excellent wear resistance and stable performance over time. The readings acquired by the meter are cyclically shown on the display and are also accessible via other communication interfaces.

This water meter is not intended for use in systems with water containing high levels of particulate, sand, algae, sludge, debris, or significant air content.

Stray currents originating from poorly insulated electrical systems can cause rapid corrosion of metallic components, especially in humid environments. To prevent this problem, proper earthing must be ensured and stray currents must be prevented from flowing through metallic structures.

During normal operation, the meter is read via its radio modules. In fixed AMR mode, each radio module (wMBus-OMS, LoRaWAN and NB-IoT) transmits the reading at a user-defined interval. In mobile mode (Walk-By/Drive-By, wMBus only), the radio module broadcasts a data frame containing the measurements. Reception requires approaching the meter with an appropriate receiver. Where a fixed AMR system is present, data are acquired automatically.



NOTE

It is recommended to keep the cover closed once the installation has been completed.



NOTE

For the NB-IoT version, when the SIMs are not provided by **Maddalena**, verify their correct activation before proceeding with the field installation of the meter.



NOTE

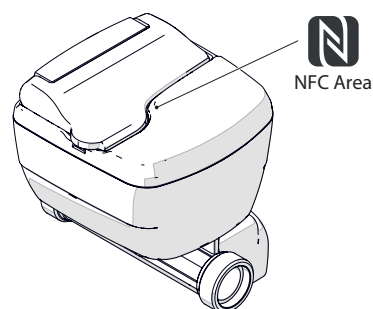
Data can be read using various software tools. For specific instructions on the reading software, please refer to your metering service provider.

4 Configuration

ElecTo SONIC is supplied with a factory-preset configuration.

The radio is activated after 10 litres of water have passed through the meter.

The NFC interface for programming and reading is always available by placing the configuration kit over the designated area. The total cumulative programming time available is 18 hours.



Radio parameters such as the radio frame type and the data-transmission interval are preset to factory values. If necessary, after enabling the device for programming, they can be modified using the specific configuration kit:

- ElecTo SONIC App for the Multiprotocol version and ElecTo SONIC NB-IoT App for the NB-IoT version (Android platform, downloadable from the Google Play Store)
- Smartphone with NFC interface or UniCo Tool and Android device.

Contact the manufacturer for more information.

The App allows you to read and program the following parameters:

- Radio settings
- Radio AES key
- Periodic reading
- Alarm configuration;
- Alarm reset;
- Date/time synchronization
- Delivery point

4.1 Static memory

The meter includes an NFC tag capable of storing multiple values, even if the battery is fully discharged or the device has been tampered with.

The data is stored on the NFC tag every day at 23:59:59.

The information present can be grouped into the following categories:

- Identification (serial, manufacturer, generation and type)
- Operation (Recorded volumes, flow rate, temperature, operating hours and service life)
- Alarms (Alarm configuration, and any alarms present before the device was powered down)
- Data transmission (Settings configured on the built-in radio)
- Battery status (energy budget, battery capacity, and any remaining energy)
- Other data (CRC, FW version, 7 alarms and errors).

All this information can be retrieved directly using the Android configuration App or via UniCo, by placing the NFC reader over the tag. The "static memory data" are also available from the "Reading" menu, in the "Nominal" tab.

5 Test mode

ElecTo SONIC can be temporarily set to high resolution for metrological testing. Contact the manufacturer for more information.

6 Error Codes

The error code is displayed in hexadecimal format:

The instrument identifies 6 errors that can occur concurrently.

Hexadecimal format	Description
0080	Temperature out of range
0100	ICE
0400	Low battery voltage
1000	Metrological verification period expired
4000	Incorrect metrological checksum
8000	General Fault

Example of combined errors

Low battery voltage + Metrological verification period expired: Err 1400

7 Maintenance

7.1 Battery (default)



NOTE

Should the installed product be removed from the installation for shipment by air transport, the radio function must be disabled using its dedicated interface.

The meter is fitted with a non-rechargeable, non-replaceable 3.6V lithium battery.

The estimated service life of the battery has been calculated based on the factory configuration profile and the following operating conditions:

- betw. -10°C and 0°C for 10% of the service life
- betw. 1°C and +30°C for 80% of the service life
- betw. +31°C and 55°C for 10% of the service life

In order to calculate the battery's remaining service life, the device uses stored parameters, such as the estimated power consumption of the electronic board in standby mode and during transmission, as well as the number of transmissions made.

The battery life depends on the data transmission frequency you choose to set. Should the battery become fully discharged, all integral readings and archive data will be preserved and may be accessed at the manufacturer's facility.

7.2 Cleaning

No special cleaning procedures are required. However, it is recommended to keep the installation area clean and periodically check that the required environmental conditions are met.



PROHIBITED ACTIONS

The use of abrasive products, methyl alcohol, hydrochloric acid (35%), sodium bicarbonate (10%), tricresyl phosphate, benzene, concentrated ethanol, toluene, industrial gasoline, white spirit, methyl isobutyl ketone, acrylonitrile, cosmetic solvents, sodium hydroxide (10%), ammonium hydroxide (10%), nitric acid (40%), potassium dichromate, acetone, diesel naphtha, and petrol is strictly forbidden.

7.3 Disposal

The device is made using various materials, including metals, plastics, and electrical and electronic components. It must be disposed of in accordance with local regulations on industrial and special waste. It may not be disposed of with household waste.

Based on current investigations and knowledge, and on information from our suppliers regarding REACH Article 33, our company has identified the SVHC listed below in concentrations above the 0.1% w/w threshold, which may be present in products with brass components.

SUBSTANCE	CAS No.	EC No.
Lead	7439-92-1	231-100-4

Note that not all products with brass components exceed the threshold level of 0.1% w/w

Our Company is not subject to the registration requirement, as the SVHCs present are not intended to be released under normal or reasonably foreseeable conditions of use, as per Article 7, paragraph 1(b).

At the end of its lifecycle, ensure the safe removal and responsible disposal of the components, including recycling the batteries, in compliance with the environmental regulations applicable in the country of installation.



8 Declaration of conformity

8.1 Multiprotocol version



DICHIARAZIONE DI CONFORMITÀ UE EU DECLARATION OF CONFORMITY

Modello	ELECTO SONIC (DN 15+50 mm) Multiprotocol
Model	
Nome e indirizzo del fabbricante	Maddalena S.p.A.
Name and address of the manufacturer	Via G.B. Maddalena 2/4 – 33040 Povoletto (UD), Italy

La presente dichiarazione di conformità è emessa sotto la responsabilità esclusiva del fabbricante.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Oggetto	Contatore per acqua ultrasonico
Object	Ultrasonic water meter

L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione: Direttiva 2014/32/UE, Allegato MI-001.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation: Directive 2014/32/EU, Annex MI-001.

Direttiva concernente l'armonizzazione delle legislazioni degli Stati membri relative alla messa a disposizione sul mercato di strumenti di misura

2014/32/EU

Directive on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments

Direttiva apparecchiature radio (RED)
Radio equipment directive (RED)

2014/53/EU

Restrizione dell'uso di determinate sostanze pericolose (RoHS) e successivi aggiornamenti
Restriction of the use of certain hazardous substances (RoHS) and subsequent updates

2011/65/EU

La conformità è stata verificata in accordo alle seguenti norme armonizzate e specifiche tecniche:

The conformity was checked in according to the following harmonized standards and technical specification:

EN ISO 4064 :2017	EN 62479:2010
EN 301 489-3 V2.1.1	EN61000-6-3:2007+A1:2011
EN 301 489-1 V2.2.3	EN61000-6-2:2005+AC:2005
EN 300 220-1 V3.1.1	EN 62368-1:2014 + A11:2017 + AC:2017
EN 300 220-2 V3.2.1	EN IEC 63000
	EN IEC 62311 :2020

8.2 NB-IoT version



Nome e numero dell'organismo notificato <i>Name and number of the notified body</i>	Attività <i>Activity</i>	Certificato nr. <i>Certificate no.</i>
Pa.L.Mer. , NB 2213 Via Casilina 246 03013 Ferentino (FR) Italy	Certificato di esame UE del tipo in accordo al Modulo B della Direttiva 2014/32/UE <i>EU-type certification in accordance with Module B of Directive 2014/32/EU</i>	IT-041-22-2213
Czech Metrology Institute, NB 1383 Okružní 31 638 00 Brno Czech Republic	Certificazione di prodotti, collaudo e controlli finali in accordo al Modulo D della Direttiva 2014/32/UE <i>Certification of production, final product inspection and testing in accordance with Module D of Directive 2014/32/EU</i>	0119-SJ-A010-08

Povoletto, 18/06/2025

Maddalena S.p.A.

MADDALENA S.p.A.
IL PRESIDENTE
.....
Dott. Ing. Franco Maddalena
Amministratore Delegato
Chief Executive Officer



DICHIARAZIONE DI CONFORMITÀ UE *EU DECLARATION OF CONFORMITY*

Modello **ELECTO SONIC (DN 15+50 mm) NB-IoT**
Model
Nome e indirizzo del fabbricante **Maddalena S.p.A.**
Name and address of the manufacturer **Via G.B. Maddalena 2/4 – 33040 Povoletto (UD), Italy**
La presente dichiarazione di conformità è emessa sotto la responsabilità esclusiva del fabbricante.
This declaration of conformity is issued under the sole responsibility of the manufacturer.
Oggetto **Contatore per acqua ultrasonico**
Object **Ultrasonic water meter**

L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione:
Direttiva 2014/32/UE, Allegato MI-001.

*The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
Directive 2014/32/EU, Annex MI-001.*

Direttiva concernente l'armonizzazione delle
legislazioni degli Stati membri relative alla messa a
disposizione sul mercato di strumenti di misura

2014/32/EU

*Directive on the harmonisation of the laws of the
Member States relating to the making available on
the market of measuring instruments*

Direttiva apparecchiature radio (RED)

Radio equipment directive (RED)

2014/53/EU

Restrizione dell'uso di determinate sostanze
pericolose (RoHS) e successivi aggiornamenti

*Restriction of the use of certain hazardous
substances (RoHS) and subsequent updates*

2011/65/EU

La conformità è stata verificata in accordo alle seguenti norme armonizzate e specifiche tecniche:

The conformity was checked in according to the following harmonized standards and technical specification:

EN ISO 4064 :2017	EN 62479:2010
EN 301 489-1 V2.2.3	EN 18031 :2024
EN 301 489-52 V1.2.1	EN 61326-1:2013
EN 301 489-3 V2.3.2	EN IEC 62311: 2020
EN 301 908-13 V.13.1.1 par. 4.2.4 and 4.2.10	EN 61010-1:2010+A1: 2019



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N. REA UD128629 | Registro Export UD007790 | Registro AEE N. IT24010000015659 | PEC: amministrazione@maddalena.legalmail.it



Nome e numero dell'organismo notificato <i>Name and number of the notified body</i>	Attività <i>Activity</i>	Certificato nr. <i>Certificate no.</i>
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Povoletto, 01-08-2025

Maddalena S.p.A.



Dott. Filippo Fontanelli
Amministratore Delegato
Chief Executive/Technical Officer



MADDALENA S.p.A.

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