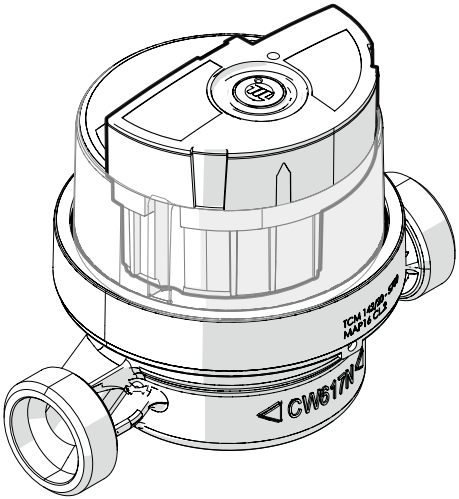
maddalena®
METERING EXPERTISE

RadioEVO

wM-Bus radio module



INSTRUCTIONS FOR INSTALLATION, USE AND MAINTENANCE

Translation of the original instructions.

Before installing and using the device, carefully read this manual and store it together with the product.

EN

Code 5000031C - 04/2022 - R7

Symbols used in this manual and relative meaning

WARNING!
Indicates particularly important information.

DANGER!
Identifies actions that may lead to injury or damage to the device if not performed correctly.

PROHIBITED
Indicates actions that MUST NOT be performed.

Compliance

Maddalena S.p.A. declares that **RadioEVO** is compliant with the mandatory requirements of the following directives and standards:
- Directive 2014/53/EU (RED - Radio Equipment Directive)
- Directive 2011/65/EU (RoHS)

CE

The full declaration of EU compliance is available from the following website: **www.maddalena.it**.

Warranty

Conditions of sale and warranty
The conditions of sale and warranty are available on the website **www.maddalena.it**.

Warranty limitations
Maddalena S.p.A. declines all responsibility, with immediate invalidation of the warranty in relation to:
- Damage or defects caused by transport or loading/unloading
- Incorrect installation caused by a failure to observe the instructions provided
- Use for purposes other than those indicated in this manual
- Use by unqualified or untrained personnel

Contents

1 General information

1.1 Warnings and safety rules

WARNINGS

- This manual is the property of **Maddalena S.p.A.** and reproduction or transfer to third parties of the contents of this document is prohibited. All rights reserved. This document represents an integral part of the product; ensure that it is always together with the product, even in case of sale/transfer to another owner, allowing its consultation by the user or authorised maintenance or repair personnel.
- Carefully read this manual before using the device to ensure safe operation.
- The device must be used as defined by **Maddalena S.p.A.**, that holds no responsibility for damage to persons, animals or property due to installation, adjustment or maintenance errors or improper use of the device.
- Once the packaging has been removed, check that the product is intact and complete. If the contents do not correspond to the order, consult the local distributor that sold the device.
- The device should not be installed and used in contexts where it will be exposed to atmospheric agents.
- The device must always be protected from extreme humidity and heat. Penetration of humidity and intense heat may damage the battery and the device.
- If there are any doubts regarding conditions/functions of the device and related parts, please contact the local distributor for further information.
- Once the device is in use, report any anomalies or faults encountered to the product supplier.
- In case of complete destruction of the device with leakage of the electrolyte, avoid contact with the eyes and skin, do not inhale fumes produced, and sufficiently ventilate the room.
- The device emits radio signals that may interfere with un-shielded electronic devices or those improperly shielded, such as pacemakers, hearing aids, medical devices and other electronic devices. To resolve any interference problems, consult the manufacturers of the relative electronic devices.
- This device is not for use by persons with reduced physical or mental capabilities, or those without appropriate experience and knowledge (including children), unless supervised by a person responsible for their safety and following adequate training in how to use the product.

1.2 Restrictions

PROHIBITED

- Modify and/or attempt to repair the product. All repairs must be performed exclusively by authorised personnel.
- Leave the device exposed to atmospheric agents.
- Place the device near to heat sources or expose it to direct sunlight.
- Install the device near other electrical equipment as this may lead to signal disturbance.
- Open and/or replace the battery.
- Use solvents to clean the device.
- Incorrectly dispose of packaging material and keep it out of children's reach as it may represent a hazard. Disposal must be performed in line with applicable laws.
- Dispose of the device as domestic waste.

1.3 Device description

RadioEVO is a compact radio module for **Maddalena** MecTo SJ EVO and VTZ water meters (cold or hot), that enables measurement, transmission and remote reading of consumption values and alarms using wireless technology.

The following alarms are managed: maximum flow exceeded (limit can be activated and configured), backflow (limit set and configurable), leak, meter block or disuse (daily limit set and configurable), electronic fraud and mechanical fraud (removal).

RadioEVO is compliant with the wM-Bus data communication protocol defined at European level by Standard EN 13757. This guarantees a high level of interoperability with various reading systems on the market, including third-party systems.
RadioEVO is also OMS certified (www.oms-group.org).

The factory set-up can be modified via radio signal at a later point using the special configuration kit (USB transceiver and relative software), supplied separately.

The main technical specifications of the **RadioEVO** design are:

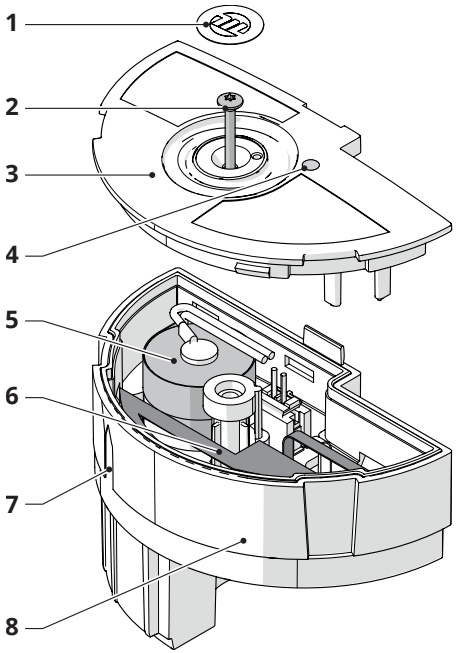
- **internal sensor** that identifies rotation of the pointer on the meter using the principle of induction (immune to magnetic interference), calculates the volume (in both directions), manages alarms and stores data in a non-volatile memory;
- M-Bus (EN 13757) 868 MHz **radio wireless communication interface** that allows remote reading in both **mobile** (walk-by) and **fixed** (AMR) scenarios, using the same factory set-up (transmission interval);
- **lithium battery** that guarantees long-term power supply (11 years + 1)

1.4 Usage limits

The product may be used exclusively with compatible meters and in line with the corresponding usage limits (see paragraph " **Technical specifications**").

***N.B.**: by default the maximum sampling frequency of the **RadioEVO** inductive sensor is 2Hz, corresponding to a maximum nominal diameter (DN) of 20mm.*
For use on meters with DN>20mm, a special variant is necessary.

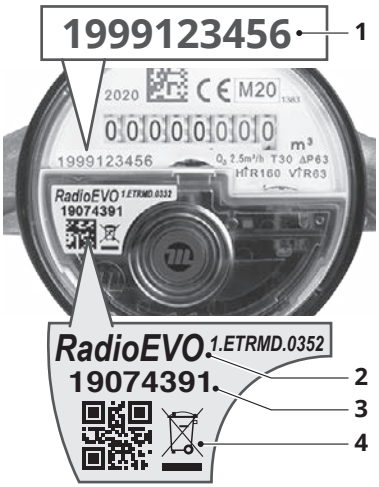
1.5 Structure



1 *Seal*
2 *Fixing screw*
3 *Cover*
4 *LED indicators*
5 *Battery*
6 *Antenna*
7 *Magnetic key reference position*
8 *Casing*

1.6 Identification

The **RadioEVO** module, identified by the label (A), is strictly associated with a single meter. Two elements are required for this association, performed during installation: the serial number of the mechanical meter and the serial number of module **RadioEVO**.



1 *Serial number of the meter*
2 *Model*
3 *Eight-digit serial number of module **RadioEVO***
4 *WEEE compliance mark*

The serial number can be read via radio signal or on the label of the module itself. If necessary, during programming it is possible to store the serial number of the mechanical meter within the radio module, so that this is available within the data transmitted.

1.7 Technical specifications

Features		Description
Sensor		Inductive dual coil (two-way)
Compatible meters		MecTo SJ EVO, VTZ and other suitable meters
Sensor resolution		1 litre
Alarms		Tampering, electronic fraud, backflow, presumed leak, blocked meter, maximum flow, inverted meter
Configuration		Via radio using configuration kit
Power supply		Lithium-ion battery (replaceable)
Battery lifespan		11 years + 1 in storage
Certifications/Approvals		CE in compliance with European standards.
		RED 2014/53/EU, RoHS2 (EU) 2017/2102
		ISO 4064 Ancillary device 6.3 (with MecTo SJ EVO)
		OMS: Registration Number OG-4467CU0203
Radio	Standard	Wireless M-Bus, OMS
	Modes	T1 (Default), C1 (Optional)
	Operating frequency range	868.0 - 868.6 / 868.7 - 869.2 MHz
	Radiated power	14dBm max
	Range	500 m in line of sight
	Reference standards	EN 13757
	Radio equipment class	class 1
	Data sent	Short frame: current volume, volume on billing dates, meter serial number, alarms.
		Long frame: same as short frame with addition of values for the previous 12 months
Environmental conditions		Storage temperature: -20°C – +60°C
		Operating temperature: -10 °C – +55 °C
Protection rating		IP67

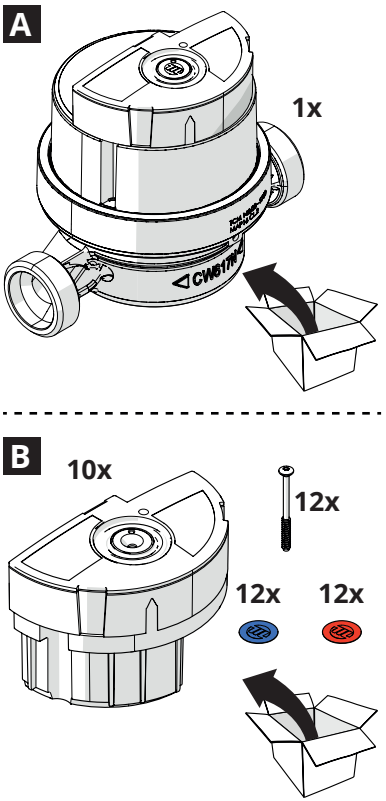
2 Installation

2.1 Receipt of the product

RadioEVO modules are supplied in two different formats:

A Single package, already fitted on meter

B Package with 10 pieces with ~12 fixing screws and 12 red/blue seals



WARNING!
The instruction manual is an integral part of the device and should be carefully read and stored.

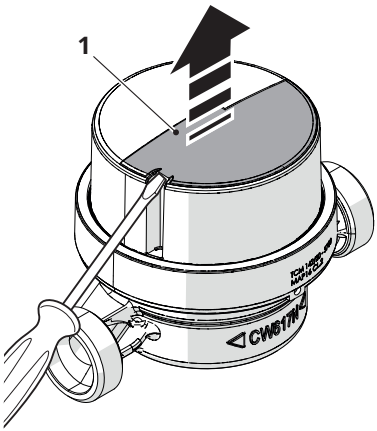
PROHIBITED
Packaging material must be properly disposed of and kept out of children's reach as it may represent a hazard. Disposal must be performed in line with applicable laws.

2.2 Fitting on meter

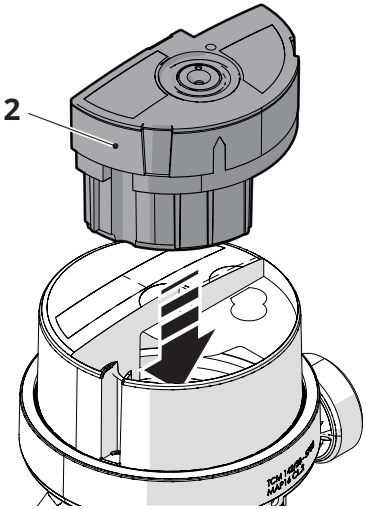
WARNING!
Installation and management of the device is permitted solely by authorised and appropriately trained personnel equipped with sufficient technical experience.

Authorised personnel: specialised installer or plumber, assigned by the metering operator.
For further information on the installation procedure, see the video tutorial at: **https://bit.ly/VideoTutorialRadioEVO**

– If present, remove the transparent cover (1) of the meter and clean the surface in correspondence with the pointer.



– Insert the **RadioEVO** module (2) in the relative space. Note the radio ID on the label (module) and the meter serial number.



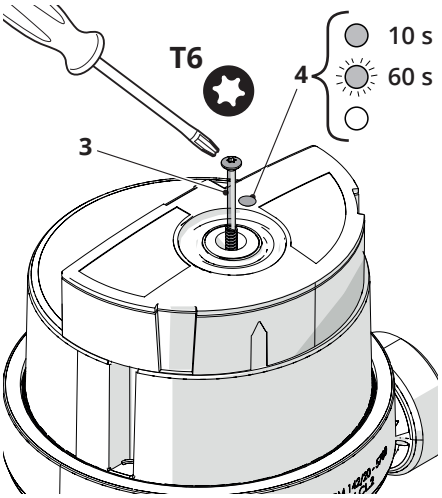
– The **RadioEVO** module is fitted using the TORX (3) screw.

PROHIBITED
IT IS PROHIBITED to use an electric screwdriver to tighten the screw.

DANGER!
Observe the following instructions to avoid breaking the module cover.

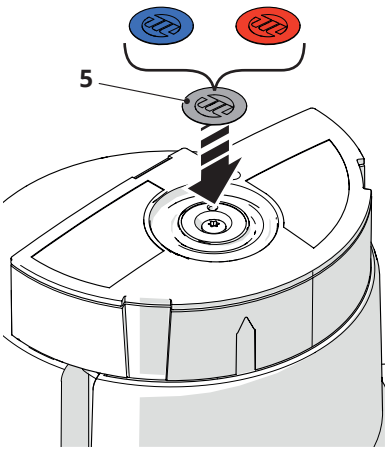
Using a torque screwdriver:
– tighten until activation of limit (0,30÷0,40 Nm)

Using a normal screwdriver:
– tighten until the red LED lights up
– tighten the screw carefully another 1/4 turn



– To indicate correct screw tightening, the red LED (4) will be constantly lit for ten seconds, and then flash for one minute before switching off. The **RadioEVO** module is active (radio ON/function activated). Start-up of metering will begin after a few turns of the litre pointer (auto-calibration procedure).

– Apply the tamper-evident seal supplied (5). Check correspondence of the RED/BLUE colour of the seal with the HOT/COLD water line where the meter is installed.



3 Use

Standard operation involves remote meter reading via the radio modules. Each radio module transmits the reading with a settable frequency (default: reading transmitted every two minutes). Simply approach the meter with a suitable receiver or in the case of a fixed reading system, data is gathered automatically.

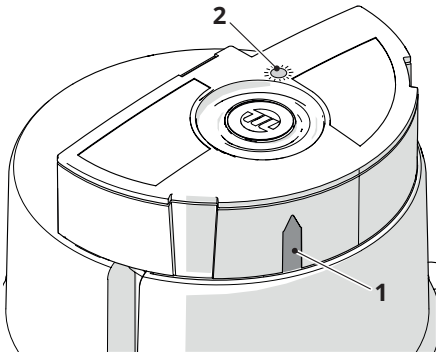
WARNING!
Reading of data can be performed using various software. Please consult the metering operator for more information on the specific use of reading software.

3.1 Synchronisation of mechanical reading

The radio module stores the volume recorded via an inductive sensor. The module is set-up in the factory with initial volume at zero.
If the meter on which the radio module is installed has a reading other than zero, synchronisation of the mechanical meter reading and radio module is recommended using the programming kit. Simply read the value in litres on the meter and set the reading using the programming software.

3.2 Programming the radio module

The operator places a special magnetic key (supplied separately) near the space (1) on the **RadioEVO** module case to activate the programming mode. The red LED (2) flashes and the device can be programmed via radio signal. To exit radio programming mode, simply return the key to the same position or wait two minutes without performing other operations.



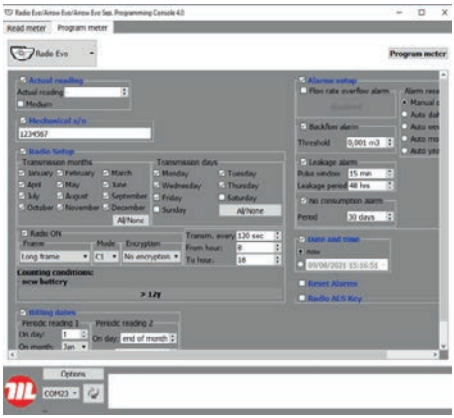
WARNING!
For a complete list of programming parameters and relative settings, refer to the specific manual.

PROHIBITED
Programming of the **RadioEVO** module without approval of the metering operator is not permitted.

3.3 Programming on initial installation of the module

The **RadioEVO** module is supplied with a series of set-up data already set to the default values.
On first installation, after activating the module, you can change the settings if necessary using:

– Evo Console PC (MS Windows) – download from **www.maddalena.it** in the software section



– Evo app (Android OS) – download from Google Play Store at: **https://bit.ly/AppMaddalenaEVO**

These two programs can be used to change the radio's default settings.

3.4 Troubleshooting

FAULT	CAUSE	SOLUTION
The radio module is not transmitting	Electrical or electronic devices interfere with the signal	Move devices to a sufficient distance away
		Move the receiver closer
	Battery empty	Replace the battery (contact the metering operator)
	Mechanical fraud alarm active	Contact the metering operator
The LED of the radio module does not light up during installation	Fixing screw stripped	Contact the metering operator
	Faulty module	Contact the metering operator
	Mechanical fraud alarm active	Contact the metering operator

WARNING!
For a complete list of alarms, please refer to the specific manual.

4 Maintenance

4.1 Battery

The radio module is equipped with a 3.0 V lithium manganese battery that is not rechargeable but can be replaced.
The typical lifespan of the battery is 11 years, calculated using factory set-up (mode T1, short frame: one message every two minutes) and with the following operating conditions:

- between -10°C and +0°C for 10% of lifespan
- between 0°C and +30°C for 80% of lifespan
- between +31 °C and +55 °C for 10% of lifespan

WARNING!
Humidity and intense heat may damage the battery and reduce its lifespan.

The radio module calculates the residual lifespan of the battery on the basis of stored parameters, such as estimated consumption of the electronic board in stand-by mode, transmitter consumption and number of transmissions performed.
Battery life depends largely on the frequency of data transmission set.

DANGER!
If the battery is empty, it is necessary to contact the metering operator for the correct replacement procedure.
The battery must be disposed of in compliance with applicable laws on waste disposal in the country of installation.

4.2 Cleaning

No particular cleaning procedures are required. However, the installation area should be kept clean and periodic checks should be performed to ensure the required environmental conditions are met.

PROHIBITED
Use of abrasive products, petrol or trichloroethylene is not permitted.

4.3 Disposal

The device is composed of materials of various nature including metal, plastic and electrical and electronic components. It must be disposed of in compliance with applicable local laws regarding special and industrial waste. The device cannot be disposed of as domestic waste.

At the end of the product's life, ensure safe removal and responsible disposal of components, including recycling of batteries, in compliance with applicable environmental laws in the country of installation.

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