1. Presentation

✓ *Typical application:*

The **Data Logger automatically collects the counting and flow values and measures drinking water network pressure**; it sends these data **by SMS** or **GPRS** once a day, to a **centralized system**.

Powered by a Lithium battery, this product **possesses a power autonomy of several years**.

Completely watertight, it conforms to the requirements of the environment in which it is placed: in particular when fitted underground, or in a wet or flood-prone counting manhole.
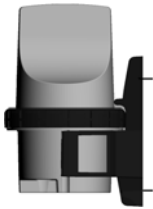
✓ *Network mimic diagram:*

SCADA Central Station

SMS communications or GPRS via GSM network

2. User interfaces

2
SOFTOOLS:
configuration, diagnostics

✓ *Configuration read / write,*
✓ *Diagnostics.*

3
SCADA Central Stations:
SMS or GPRS communication

✓ *Network data centralization.*

1
Key:
local wake-up on key

✓ *Local wake-up for indexing, communication diagnostics, etc.*

4
Mobile phone:
SMS communication

✓ *Sending command SMSs from the user's mobile phone (data status read request, meter indexing, etc.),*

✓ *Receipt of warning messages on the user's mobile phone.*

Legend:

Bluetooth communication

SMS communication

GPRS communication

3. Hardware properties

Case

Dimensions in mm: H = 261 x W = 155 x D = 176
(the case can be wall-mounted using 2 screws)

Input cable connector: watertight bayonet connector (military grade)

Watertightness

With its IP68 protection rating, the Data Logger can be fitted in a wet or flood-prone manhole.

The case is protected against the effects of **prolonged submersion**, up to 100 days in 1 meter of water.

Autonomy

The "934" battery (or standard battery) **is optimized** to provide the Data Logger with an operating autonomy of several years.

The "933" battery (or high capacity battery) can be used to significantly increase the Data Logger's autonomy.

Aerial

The built-in GSM aerial has been specifically designed to improve communication quality over GSM networks in difficult environments (particularly in buried manholes).

An optional external aerial can be connected to the case.

Key

The key enables a user to wake the Data Logger to write the configuration and to run operating diagnostics (communication tests, meter indexing, GSM reception level check, etc.).

These operating tests can be performed either using the indicator lights, using either SOFTOOLS in Bluetooth communication mode, or with a mobile phone via SMS.

Tool

This specific tool is required to correctly open and close the case; it matches the locking system and maintains the product's seal.

Electrical safety

EN 60950 standard:

In accordance with current European regulations, this device is intended for use in an industrial environment. It presents no hazardous voltage, in accordance with the low voltage directive (for further details, see § "Environmental standards and conditions").

4. Functional characteristics

Configuration

Configuration read/write via SOFTOOLS via Bluetooth and SMS communication.

Diagnostics

Operating checks and communication tests:
- using the indicator lights,
- using SOFTOOLS in Bluetooth communication mode,
- using a mobile phone in SMS communication mode.

Data acquisition

4 DIs can be configured to manage **meters** and **signaling**.

Characteristics of meter inputs:
- minimum pulse duration: 2 ms (max. frequency: 250 Hz).
- for meters with an open collector transistor type output (capacity < 220 pF).

These characteristics apply to products bearing a serial number greater than or equal to 04xxxxxxxx; for earlier versions, the maximum pulse duration is 20 ms (max. frequency: 25 Hz).

2 optional AIs for acquiring two "4-20 mA" measurements converted to 10 bits for remotely powered sensors.

Data calculations

Periodical data calculation:
- for **daily reports** (volumes),
- **average flows** (values expressed in m^3/h),
- **nighttime flow** to monitor flow over a user-definable time period.
- for **thresholds** on **AI measurements** and/or **average meter flow rates**.

Archiving

Large storage capacity: up to 50,000 values archived.

Periodical archiving of meter indices, average flows and AI measurements (e.g.: every 15 mn).

Daily report archiving (current index, daily volume, min., max. and night flow).

Communication with SCADA Central Stations

The Data Logger communicates with a centralization system whose type can be configured: SCADA central stations via SMS or GPRS, or with a WEB server via GPRS.

- **By SMS:** the Data Logger sends archived SMS messages to 1 or 2 SCADA Central Stations. On a change of state, the Data Logger can instantly send an SMS message of current states and all the archived SMS messages to the SCADA Central Stations.
- **By GPRS:** the unit initiates communications with the central system; it can be used on a GPRS network with a private (or dedicated) APN or a public (standard) one. On each GPRS communication, the Data Logger sends the central system the archived values of its data, the daily reports and diagnostic data.

By default, the unit communicates once daily with the centralization system, though in certain cases, for specific needs, multiple daily transmissions can be programmed (based on configurable times, or periodically).

Communication with a mobile phone

The Data Logger can send **warning messages** to the user's mobile phone.

The user can issue **Diagnostic commands** via SMS messages.

1. Watertightness

This unit has an **IP68** protection rating; it is **fully protected** against the effects of **immersion** and can be fitted in a **manhole in a wet or flood-prone environment**. The product's "IP68 watertightness" guarantee implies that the SIM card must be inserted into the case by the supplier at the time of delivery.
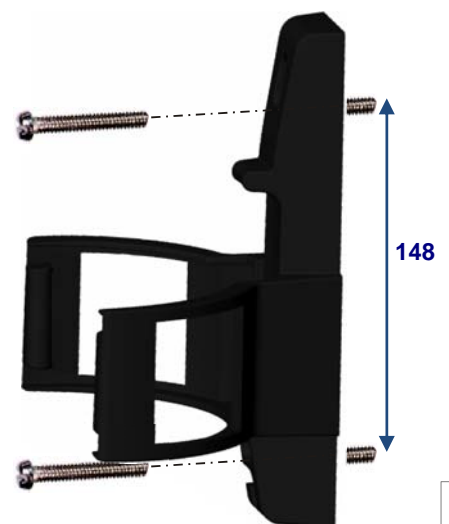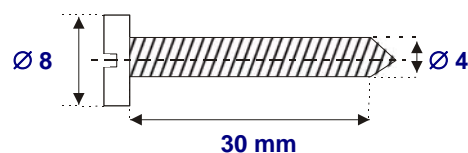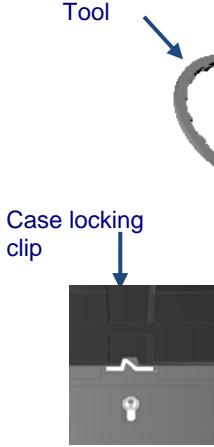
2. Case characteristics

2.1. Dimensions
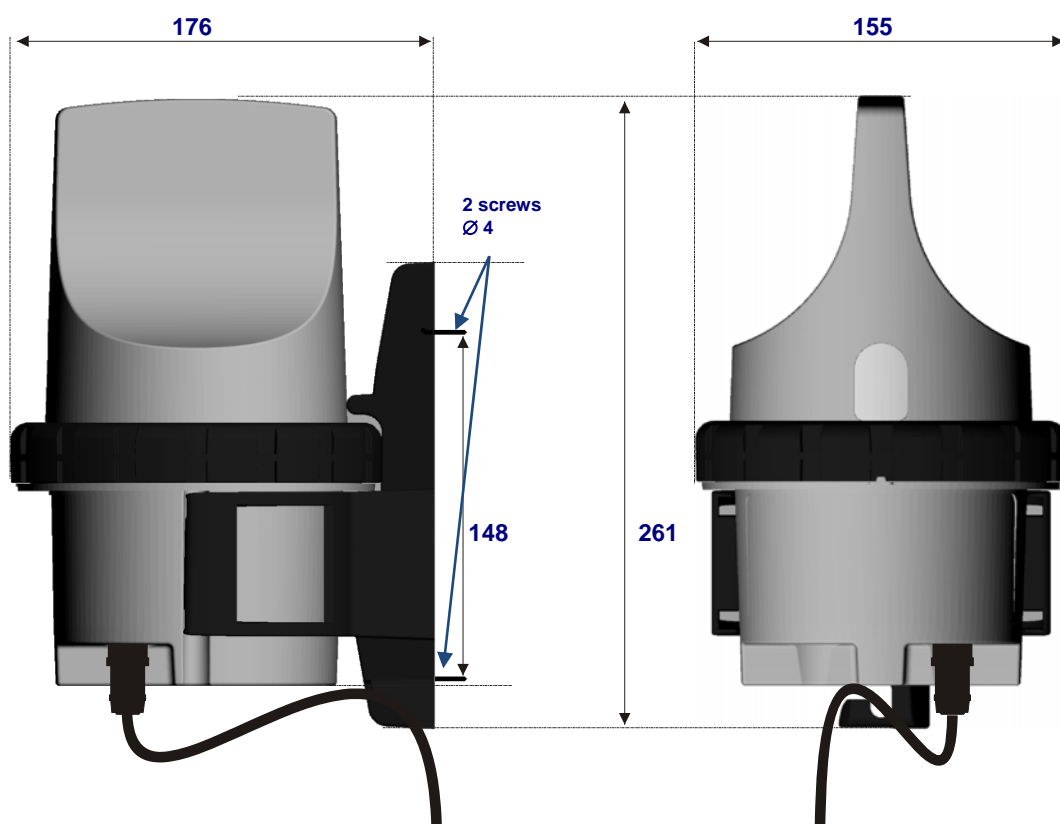
2.2. Mounting bracket

The bracket must be securely mounted with 2 screws and 2 plugs (not supplied) with the following characteristics:

3. Precautions for use

3.1. Opening the case

Tool

Case locking clip

The case can be kept watertight by screwing the case ring tightly. The case must not be opened except for inserting the SIM card or replacing the battery.

To open the case, we recommend:

- **locking the case in the "upside down" position**, *either between your knees, or in a vise (though care must be taken to avoid damaging the plastic)*

- **inserting the tool into the notches provided for this purpose** *and rotating it clockwise (in this position, the tightening and loosening directions are reversed).*

Proceed similarly to close the case; **use the tool to tighten the ring until the clip locks**.

⚠️ Do not tighten beyond the clip.

3.2. Battery power

⚠️ The Lithium battery may be potentially hazardous; the following recommendations for use must therefore be followed:

- Do not recharge, short-circuit, crush or dismantle; do not heat beyond 100°C or incinerate.
- Risk of fire, explosion and burns.

♻️ To protect the environment, return spent batteries to your supplier for recycling.

⚠️ When transporting, please conform to the UN standards described in the "Standards and conditions of use" document for **category UN 3091 - Class 9** instruments.

3.3. Optimizing the case position

To improve GSM communications, the unit's position in the manhole must be carefully considered; it should generally be **kept away from the manhole cover**. **Mount** the case **vertically** on its bracket, in accordance with the case's **Top and Bottom**.

⚠️The tests should be conducted **in a real situation**, with the **manhole cover closed**.

1) The **indicator lights** on the Remote Terminal Unit provide an initial diagnostic level.

2) SOFTOOLS, in Diagnostics mode, can be used to **search for the best operator**.

3) The user must **find the best position for the case** in the manhole using the "**Reception level test**" function, via SOFTOOLS in Diagnostics mode, or using a mobile phone to send a command no. 7 SMS (see § "Configuration and Diagnostics").

4. Connecting DI / AI inputs

The DI / AI inputs cable can be disconnected from the case to facilitate the connection of the various devices.

DI 1 to DI 4

- **"Standard" meter:**
  DI 1: counting pulses (LF signal)

- **"In / out" meter:**
  DI 1: counting pulses (HF signal)
  DI 2: water flow direction   outward = 0
                                 inward = 1

- **Logical datum** (signaling)

AI 1 and AI 2

- **4-20 mA measurement**
  (**sensor powered** by the Unit)

or

- **4-20 mA measurement** (**autonomous sensor**)

DI 1
- White / Blanc
- Brown / Marron or Black / Noir

DI 2
- Green / Vert
- Brown / Marron or Black / Noir

DI 3
- Yellow / Jaune
- Brown / Marron or Black / Noir

DI 4
- Red / Rouge
- Brown / Marron or Black / Noir

AI 1
- + Purple / Violet
- Pink / Rose
- −

AI 2
- + Blue / Bleu
- Grey / Gris
- −

AI 1
- − Brown / Marron or Black / Noir
- Pink / Rose
- +

AI 2
- − Brown / Marron or Black / Noir
- Grey / Gris
- +

NC Purple / Violet

NC Blue / Bleu

All inputs are protected up to a maximum voltage of 12 volts.

Standards and conditions of use

General precautions

UN Recommendations:	This product is powered by a lithium battery; only those batteries specified by the product manufacturer are suitable to guarantee its safety and performance. **The use of batteries of any other type is at the user's own risk.** The presence of a lithium battery positions this device in "**category UN3091 – Class 9**" of the UN list of hazardous materials. As such, the transport of this device must conform to prevailing rules that are specific to the means of transport used, both in terms of packaging, identification and accompanying documents. In all cases, the carrier must be informed of the specific contents of the package. The warning label opposite (Hazard label for Class 9 - Miscellaneous Hazardous Goods) must be affixed onto the packaging and remain visible on the outside of the package. This type of label is available from carriers or from packaging suppliers.

Electrical safety : *Directive 73/23/EEC modified 93/68/EEC "Low Voltage"*

EN 60950: Data processing hardware safety	Electric shock, Energy transfer hazard, Fire, Mechanical and thermal hazards.

Electromagnetic compatibility: *Directive 89/336/EEC "Electromagnetic compatibility"*

Standard	Access	Type	Reference	Level
EN 55022: Data processing instrument (class B) emissions	Case	Radiation disturbances		
EN 55024: Industrial environment immunity	Case	Electrostatic discharges	EN 61000-4-2	4 kV by contact 8 kV through air
		Electromagnetic field	EN 61000-4-3	10 V/m
	Inputs-outputs	Transient bursts	EN 61000-4-4	Level 4
		Shock waves	EN 61000-4-5	
		Conducted disturbances	EN 61000-4-6	10 V

Telecommunications: *Directive 1999/5/EC "Telecommunication Terminals"*

ETSI EN 301 511	GSM 900 and DCS1800 access

Federal Communications Commission (FCC)

FCC Recommendations:	*This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.* *This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.* *These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.* *However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:* - *Increase the separation between the equipment and receiver.* - *Consult the dealer* *This portable equipment with its antenna complies with FCC's radiation exposure limits set forth for an uncontrolled environment. To maintain compliance, follow the instructions below :* 1. *This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.* 2. *Avoid direct contact to the antenna, or keep contact to a minimum while using this equipment.* *Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

Temperature

	Use		-20°C to +55°C
	Storage		-25°C to + 70°C

Humidity

EN 60529 (June 2000)	Usage and Storage	IP68	100 days in 1 meter of water

Environmental protection

	WEEE directives	2002/96/EC and 2003/108/EC	Collection and sorting of Waste Electrical and Electronic Equipment (WEEE), processing, recycling and non-polluting disposal

For reasons of environmental protection, spent products should be returned to their respective suppliers for waste recycling.