MESURA®

METERING

Ultrasonic Smart Meter



PRODIGI4

Ultrasonic Smart Meter G1.6-G2.5-G4

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Ultrasonic Smart Meter





The Ultrasonic Gas Meter uses an innovative and high performance ultrasonic sensor (manufactured by Panasonic) and is designed to measure the volume of Natural Gas and LPG, with a maximum working pressure of 7.3 PSI - 0.5 bar and a maximum flow rate of 212 CFH - 6m3/h, according to EN14236.

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Main Features

- Ultrasonic Flow Sensor
- Step-Motor valve for remote control and gas shut-off
- Different technologies of communication
- Simple User Interface
- Stainless Steel Body
- Replaceable Communication Battery from front cover

OIML R137 Compliant

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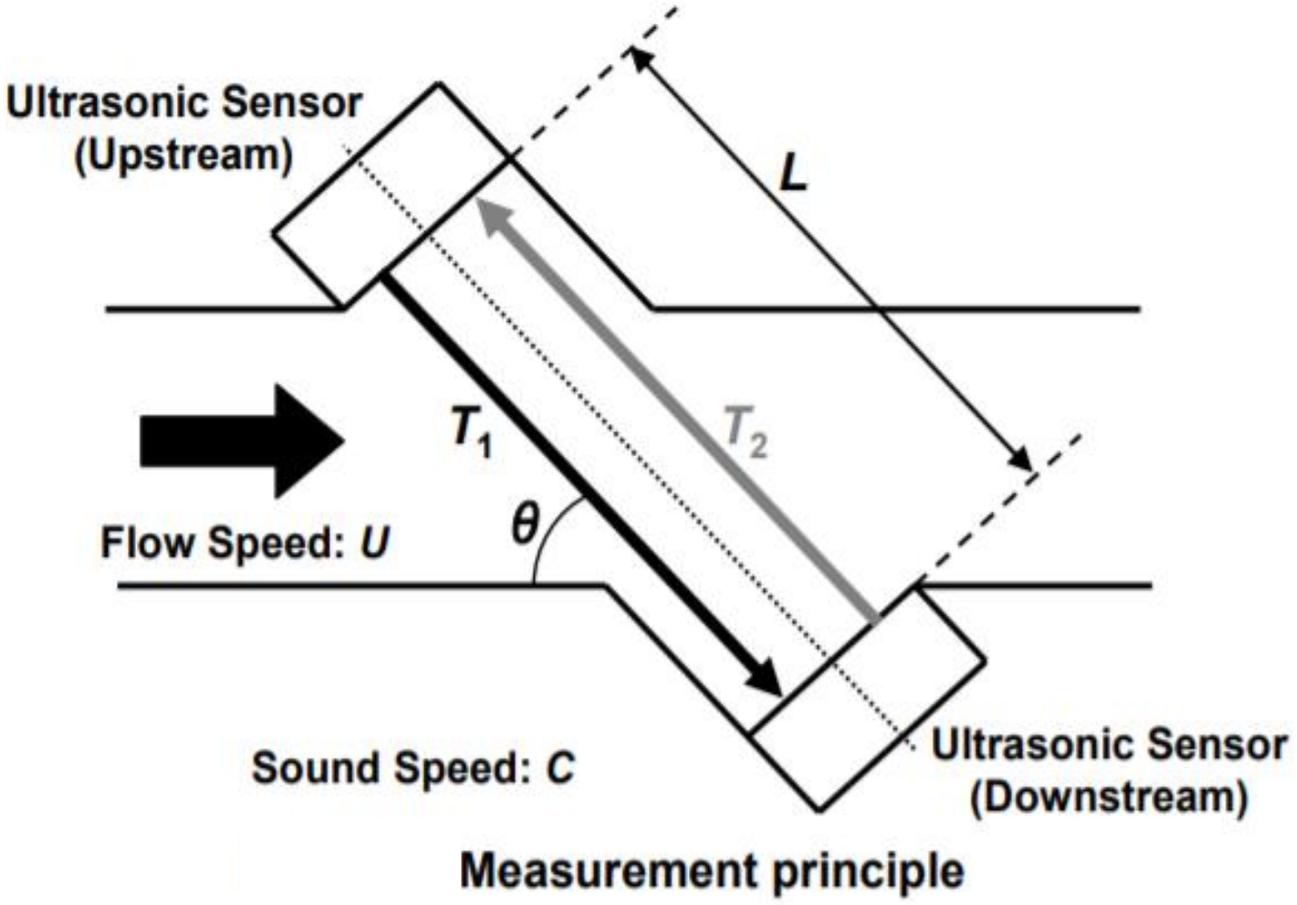
Ultrasonic Measurement Principle: Time of flight method



Measurement principle

Ultrasonic pulses are transmitted through the tube in which the gas flows, both in the direction of the gas flow and in the opposite direction, determining the difference in the transit time of the ultrasound signal in the two directions.
This difference constitutes an indirect measure of the gas flow rate, regardless of the thermodynamic state of the fluid.

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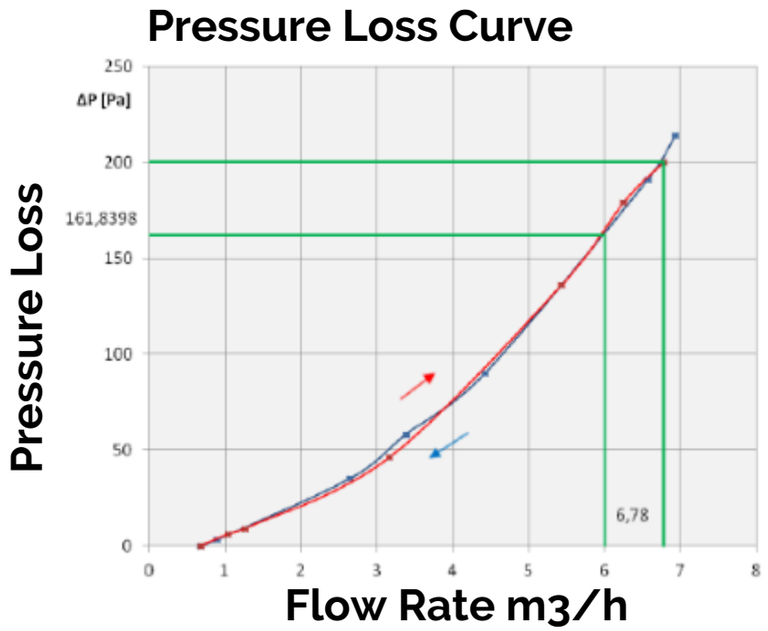
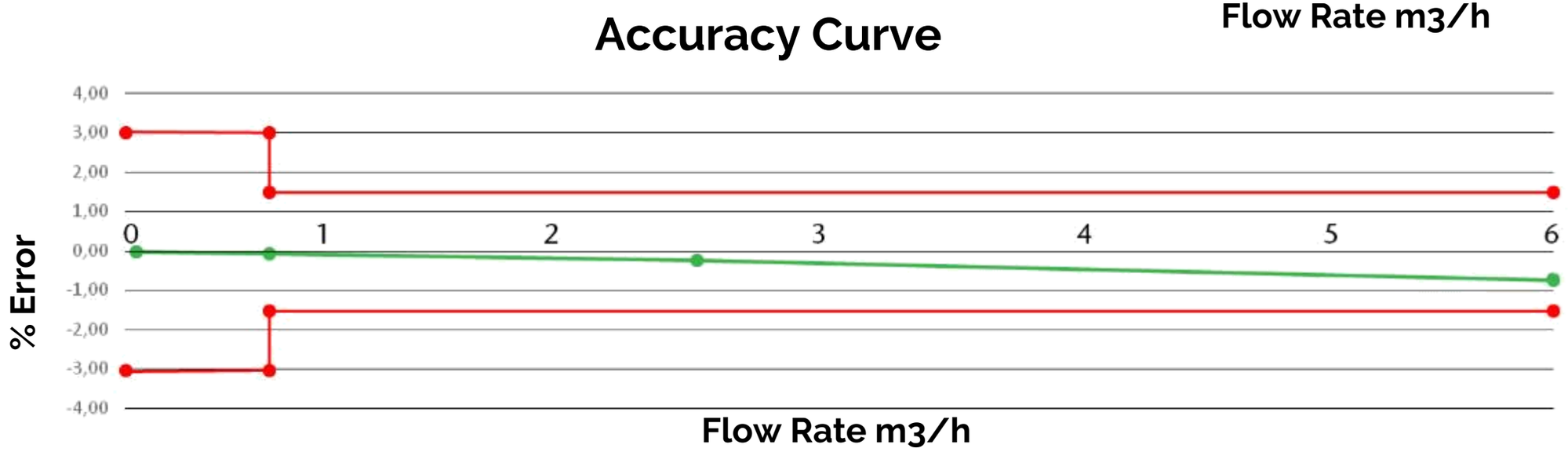
Ultrasonic Flow Sensor

The Ultrasonic Gas Meter uses a **static measurement technology** thanks to an innovative ultrasonic sensor that guarantees more precise measurement over time.
The Ultrasonic Gas Meter does not include any mechanical components.





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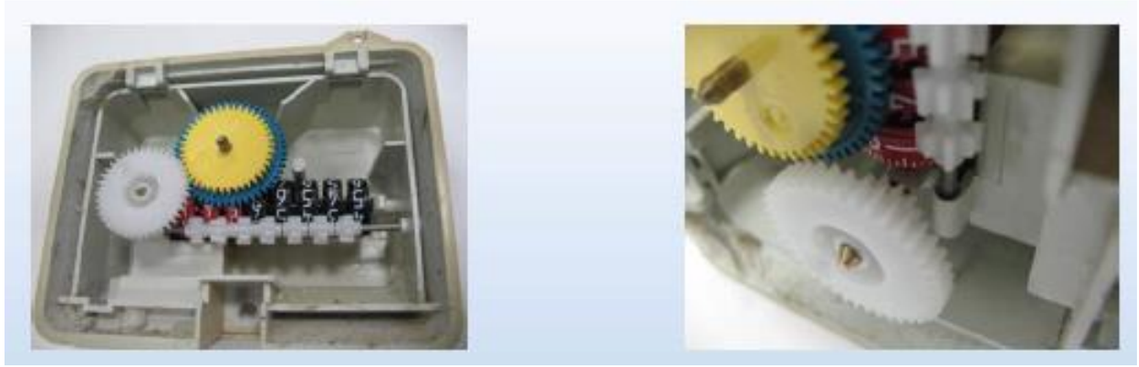
Dynamic versus Static

Gas meters can be classified into two categories according to the physical measurement principle:

1. **Mechanical or Dynamic Meters:** they are based on the movement of some components of the measurement group and on the consequent counting of a parameter linked to the measurement dynamics.
   - **Diaphragm Meters**
   - **Hybrid meters:** they are based on the use of a traditional mechanical measuring sensor (counter),mthe pulse is then transmitted to the subsequent electronic processing units of the meter. The mechanical, dynamic (moving parts) gas meters are subject to wear, and to the deterioration / aging of some particularly stressed components. It follows that the effects produced by time (in operation) can potentially affect the temporal maintenance of measurement services ("performance degradation").



2. **Electronic or Static Meters:** absence of moving parts in the measuring chamber (reduced interference between the fluid and the measurement group).
   - **Ultrasonic Meters**

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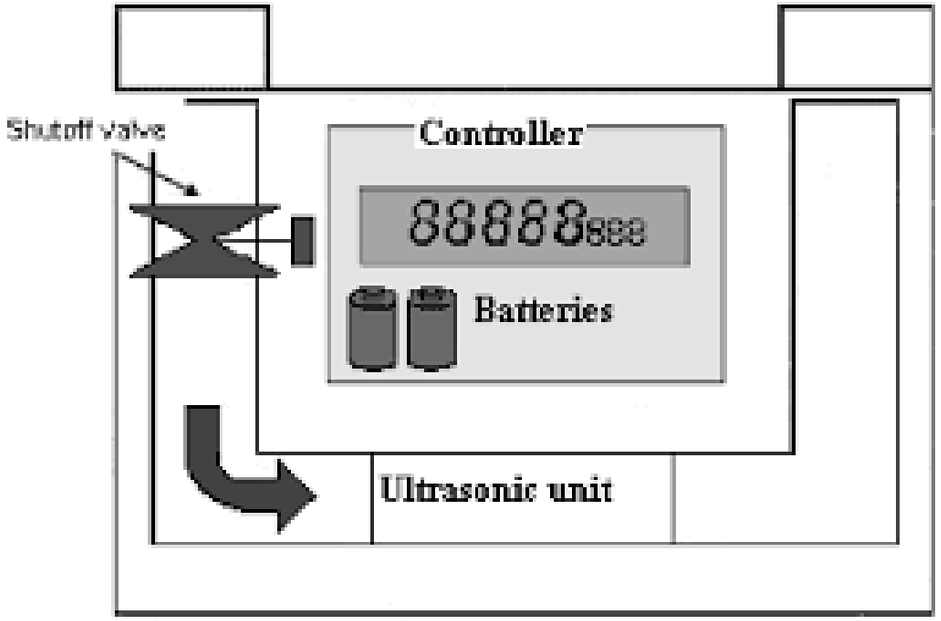
Shut-off valve

The Ultrasonic Gas Meter includes a step-motor valve that allows the remote control of gas flow.
The step-motor valve is used to shut-off the gas flow and it is located in the gas inlet path.
This feature is useful in the case of non-paying customers, eliminating the need to phisically send a person to close the gas flow manually.
Thanks to this valve, the gas company can close the gas flow without the need to send a person to the location of the specific meter and to avoid entering the property of the final user.





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Detecting low flow rate consumption



The Ultrasonic Gas Meter allows to measure smaller flow rate in comparison to a diaphragm meter and allows also to understand if there are consumption above or below a pilot flame, when the user is not at home.



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User Interface



LCD Display with volume displayed in cubic meters with 3 decimals.

2 capacitive buttons for navigation through recorded values.
Right Button: passing through screens
Left Button: to activate specific functions

Optical ZVEI interface according to Standard

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Battery Life

2 batteries working in parallel:

Metrologic Battery:
Not replaceable, more than 15 years at standard conditions.

Transmission Battery:
Replaceable through the cover - 10-15 anni at standard conditions and depending on the type of communication protocol.



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Communication Technologies: GSM 2G - GPRS













Smart Meters
Data Centre

- Sim card required
- Suitable for single houses application
- Suitable for all those applications in which you need to reach users far apart

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Communication Technologies: RF 169Mhz











M-bus protocol



Concentrator



Smart Meters
Data Centre

- Sim card NOT required in smart meter
- Concentrator required
- Suitable for buildings with many apartments
- Free use; no license fee for private networks
- Long life of smart meter battery

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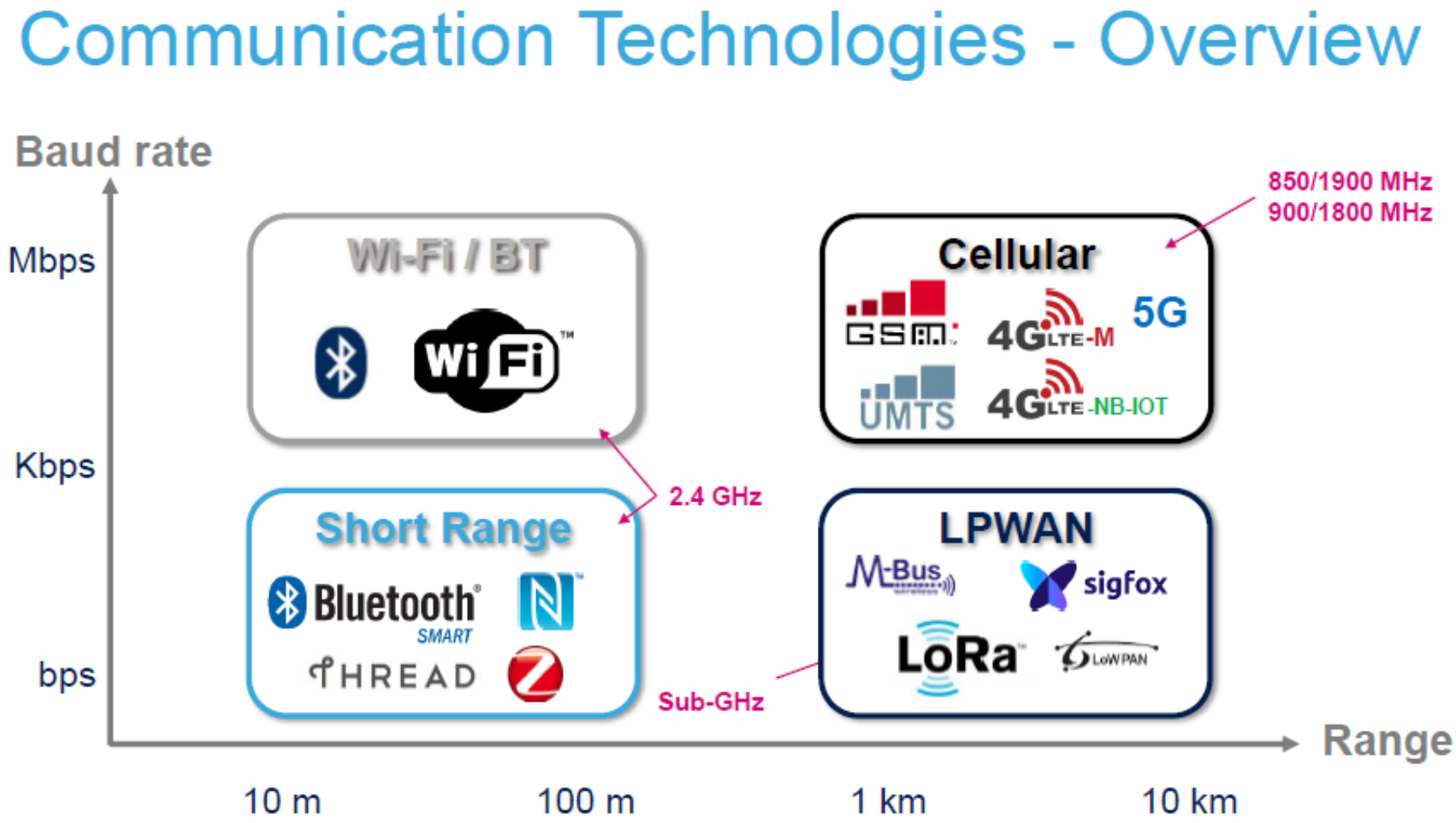
Communication Technologies: Overview



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Communication Technologies: LoRa













LoRa protocol



Gateway

LAN

4G/5G network



Smart Meters
Data Centre

- Sim card NOT required in smart meter
- Gateway required
- Also suitable for buildings with many apartments
- LP-Wan applications (Low Power Wide Area Network)
- Best solution for IoT devices and for Multiutilities Companies

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What is LoRa

1. A Sub-GHz wireless technology enabling low data rate communication over long distances
2. Targeting M2M and Internet of Things, IoT applications
3. LoRa® technology provides a WAN capability, using a MAC protocol named LoRaWAN



Long range

- Greater than cellular
- Deep indoor coverage
- Star topology



Max lifetime

- Low power optimized
- 10- to 20-year lifetime
- >10x vs cellular M2M



Multi-usage

- High capacity
- Multi-tenant
- Public network



Low cost

- Minimal infrastructure
- Low-cost end-node
- Open software



True location

- Indoor and outdoor
- Accurate



Bidirectional

- Bidirectional
- Scalable capacity
- Broadcast



Global mobility

- True mobility
- Seamless
- Roaming



Security

- Unique ID
- Application
- Network

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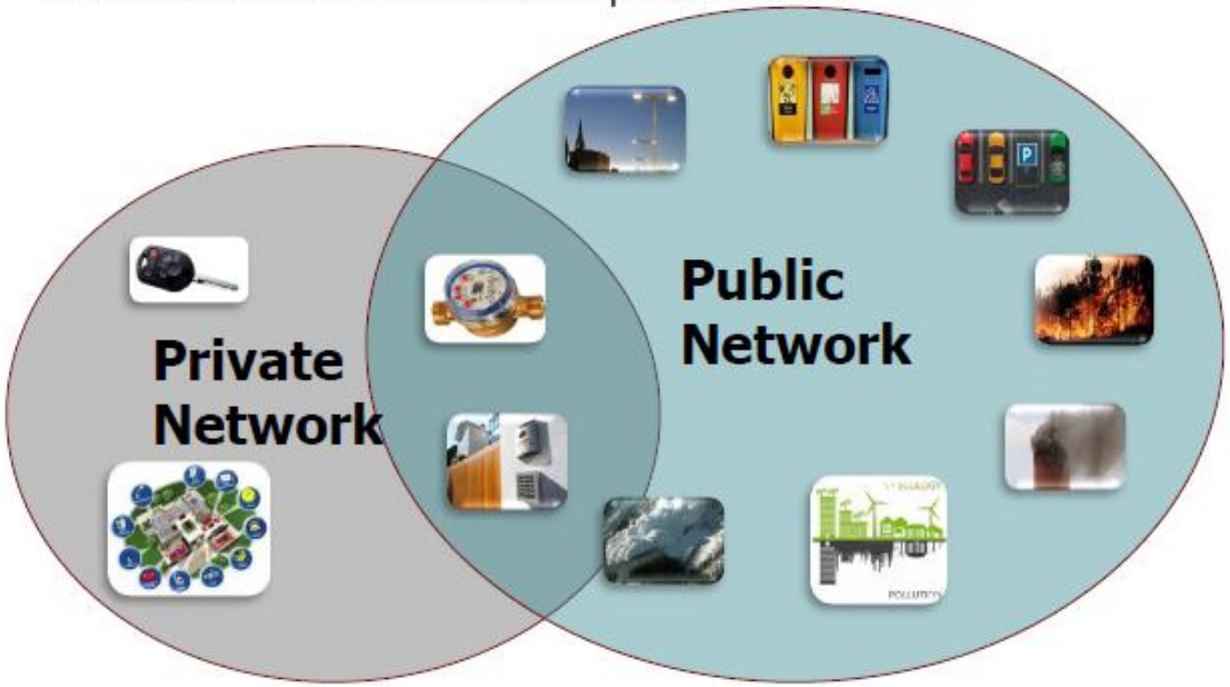
What is LoRa

- **Private network – individually managed networks**
  - Our traditional business – Metering, security, home automation, industrial control
- **Public network – Telecom/operator managed networks**
  - Includes our traditional business, permits numerous new applications, infinitely more scale able than the traditional private network



A totally free and open system means maximum flexibility for customers and therefore cost containment

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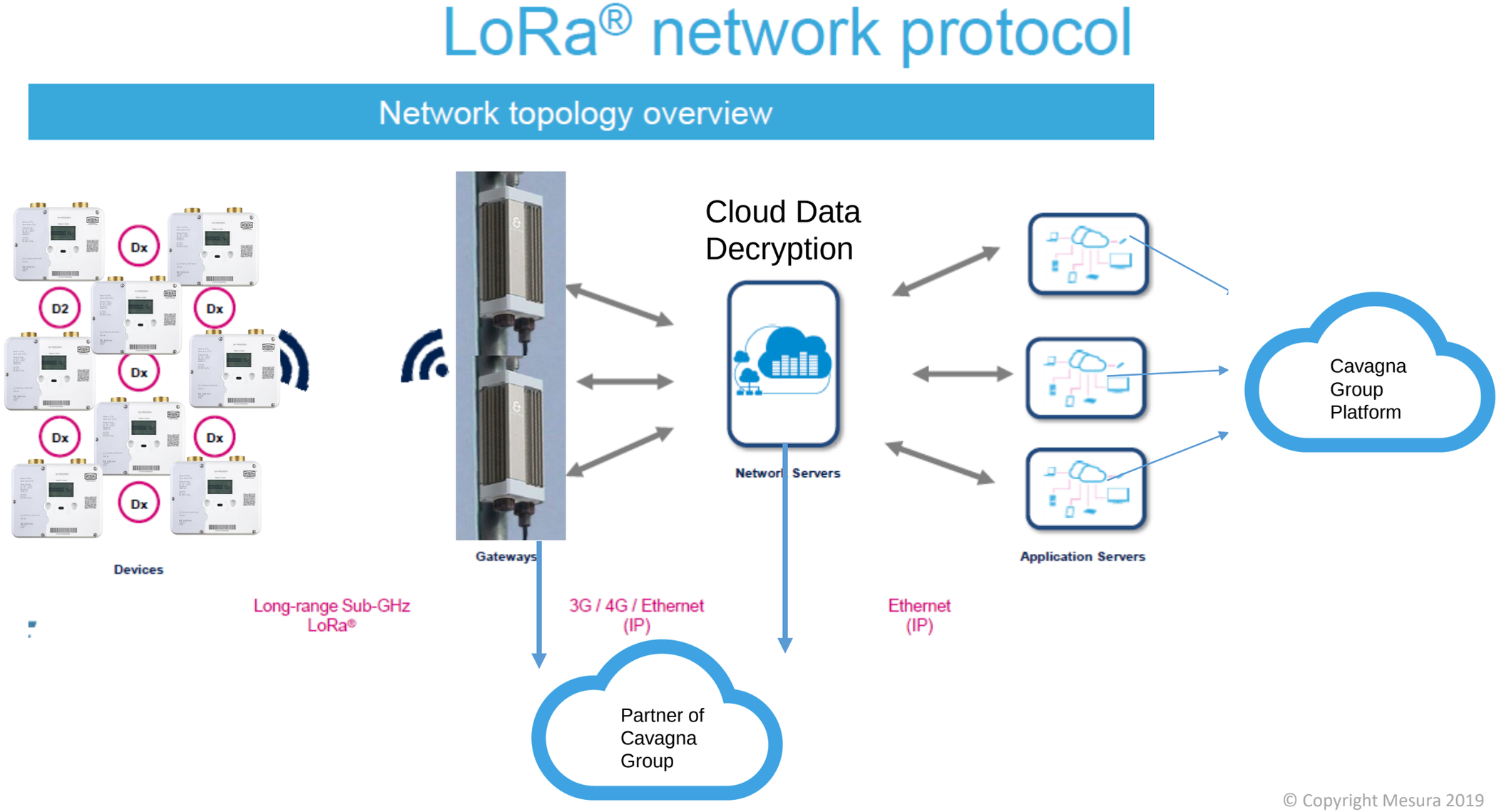
Cavagna Group Global Solution



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Cavagna Group Platform

Cavagna Group provides its customers with a cloud based platform to which the customers can access to monitor the smart meters



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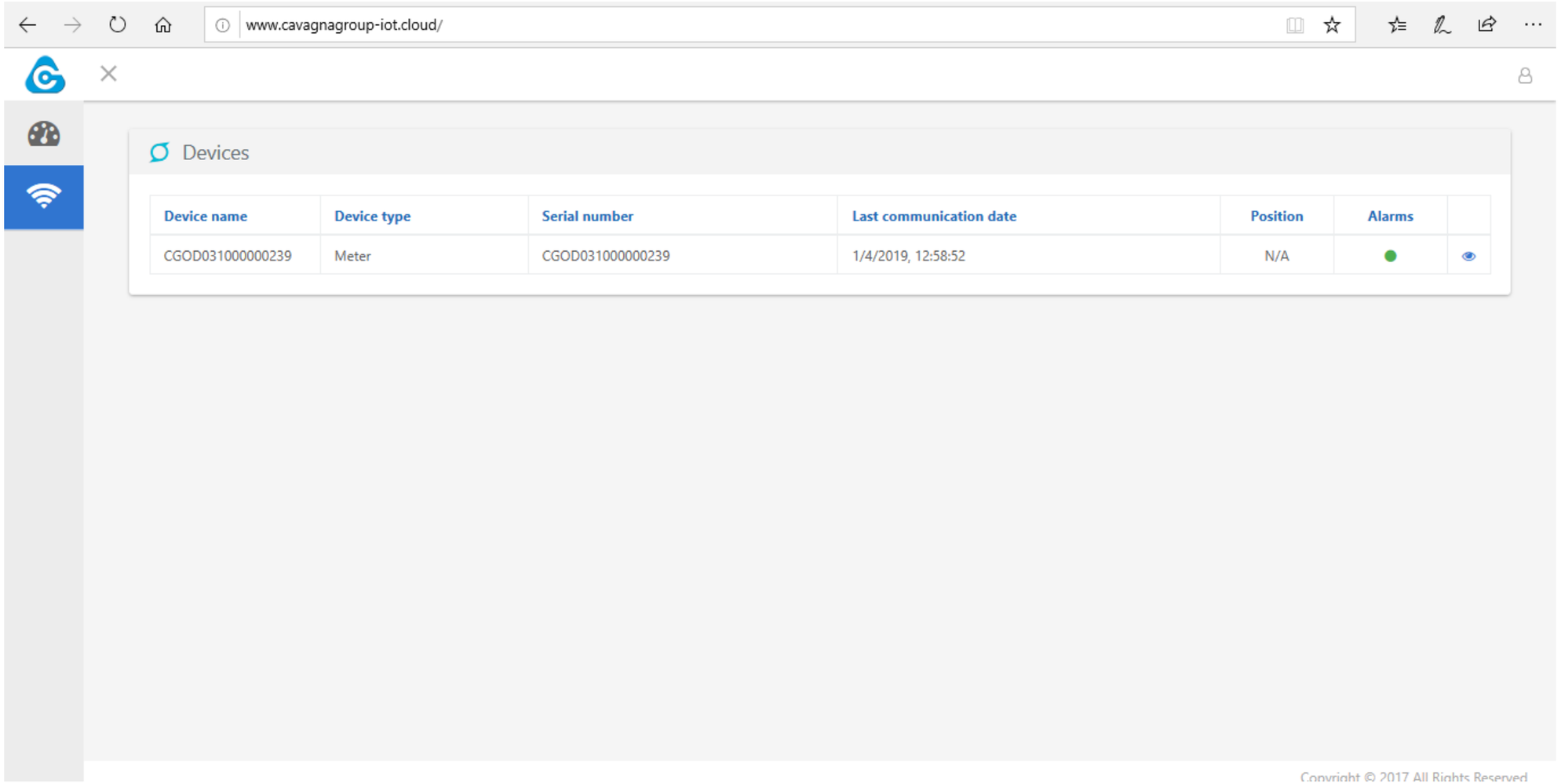
Cavagna Group provides its customers with a cloud based platform to which the customers can access to monitor the smart meters



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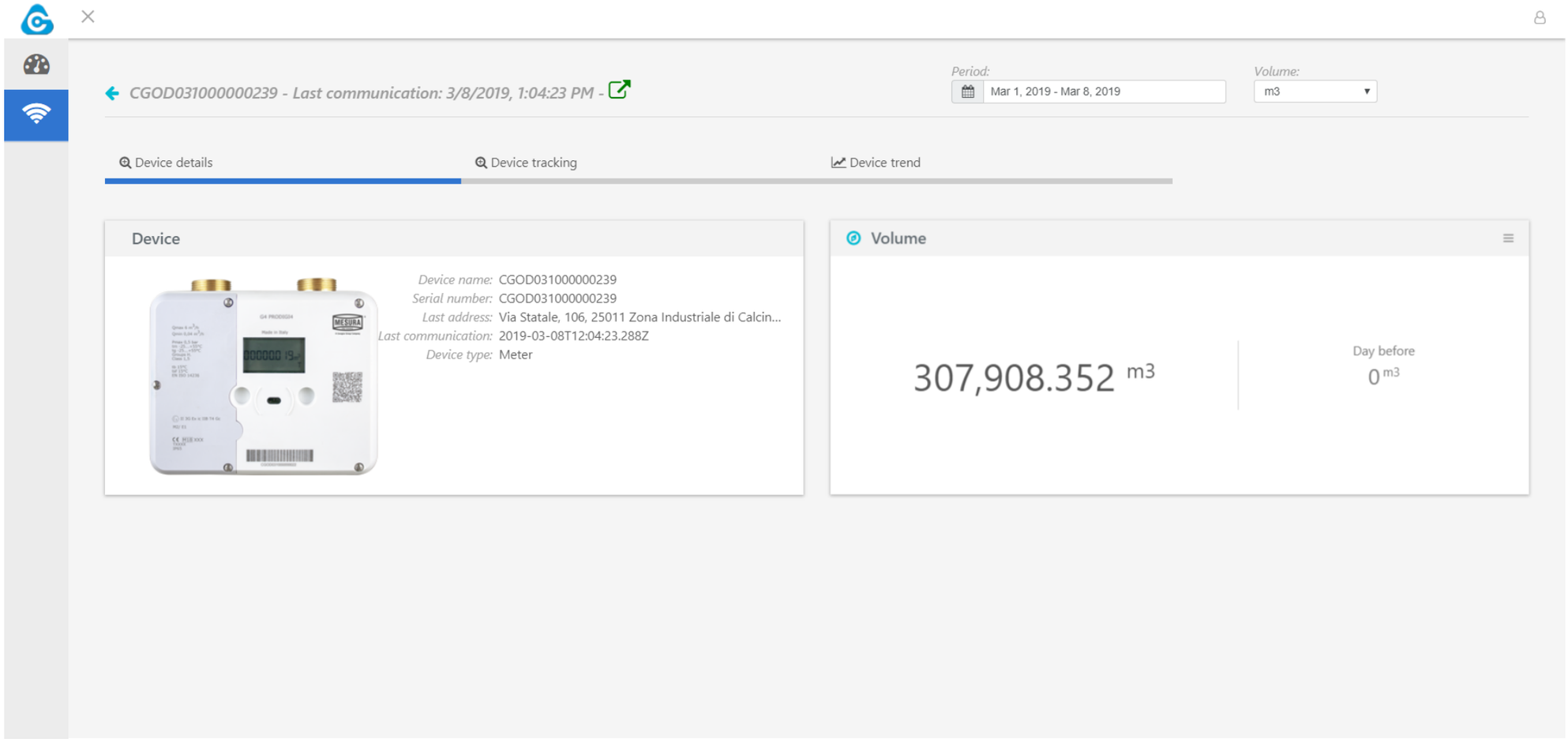
Cavagna Group Platform

Cavagna Group provides its customers with a cloud based platform to which the customers can access to monitor the smart meters



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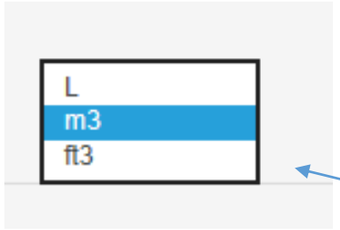
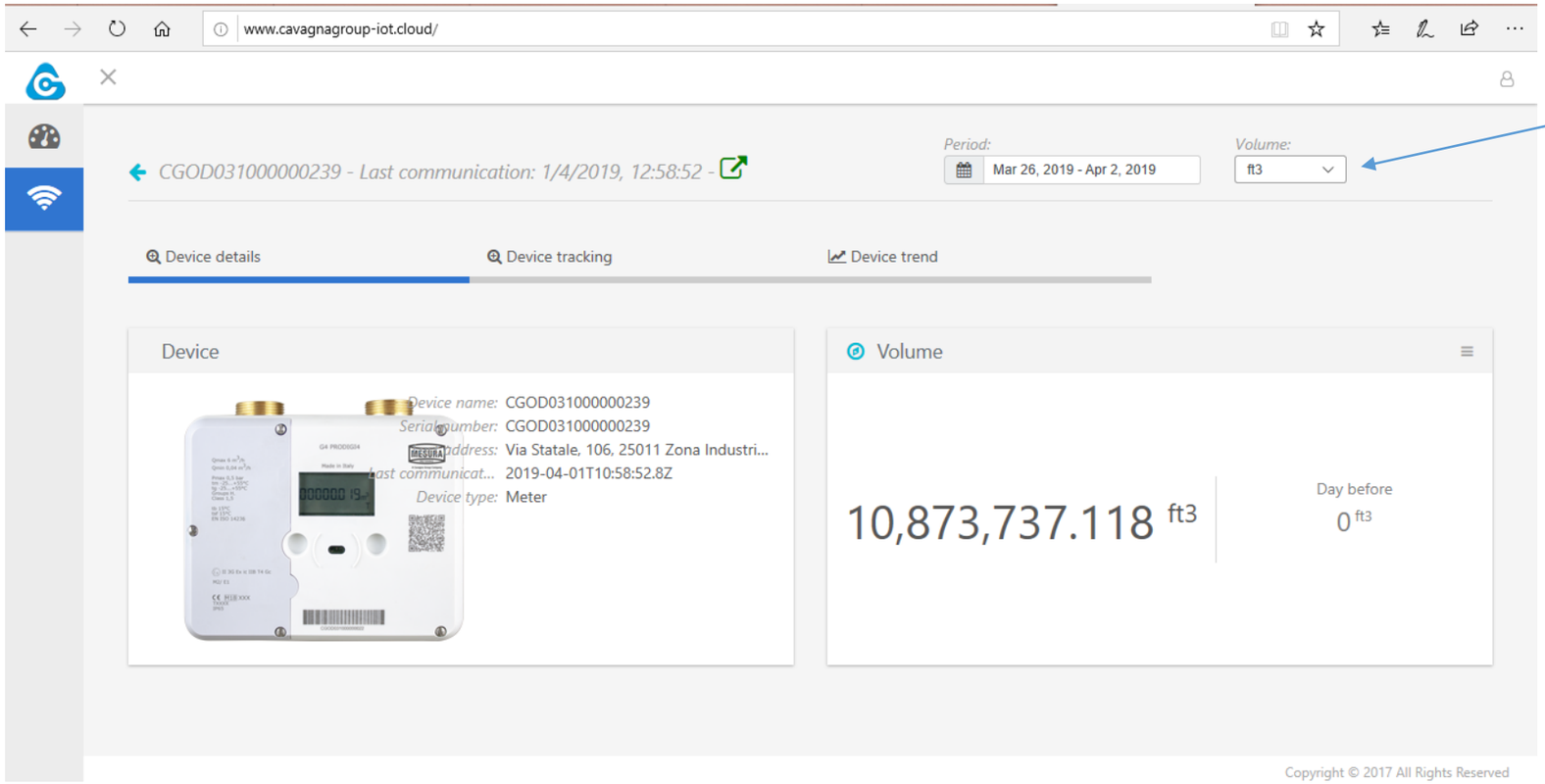
Cavagna Group Platform



You can change unit of measurement



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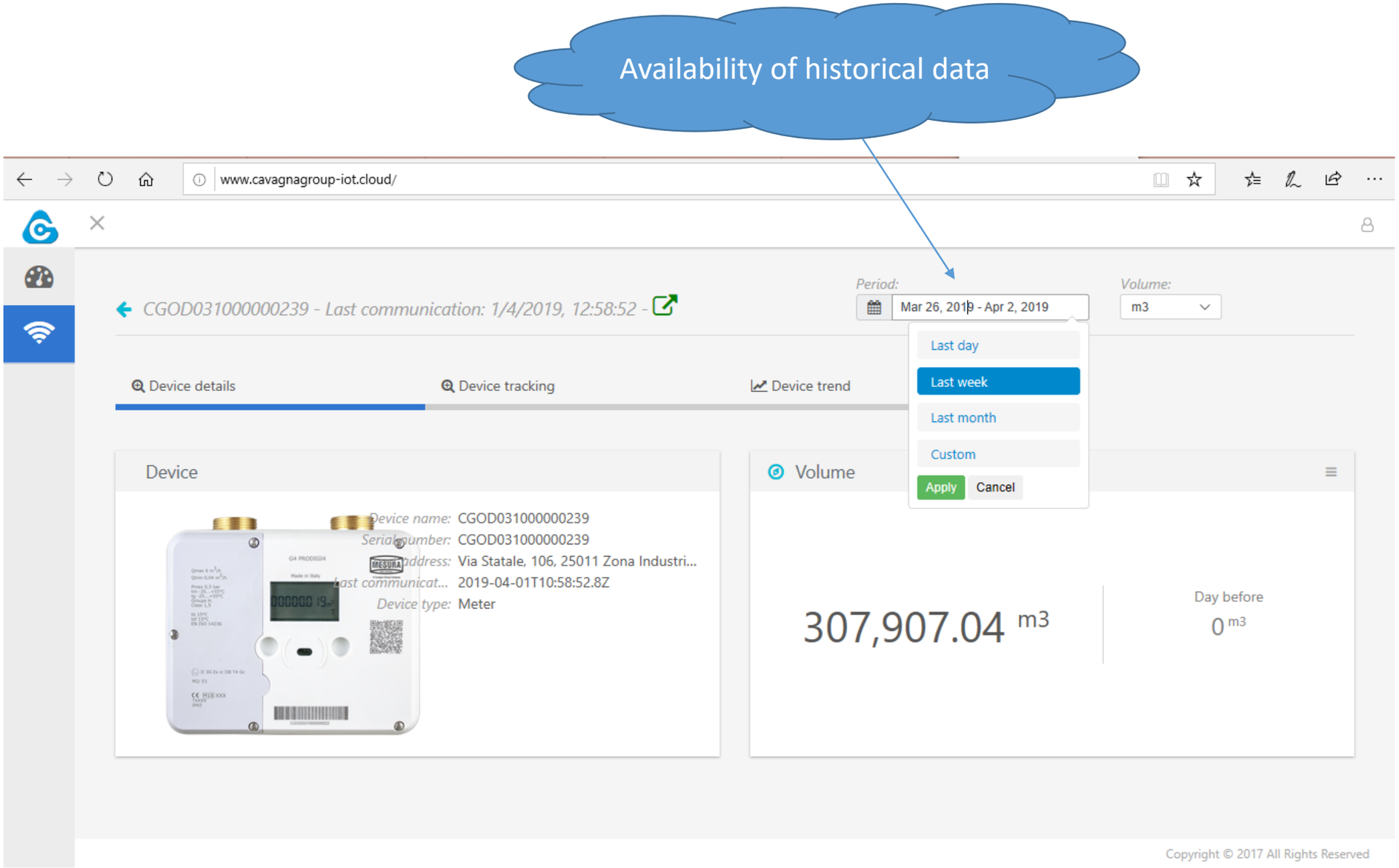
Cavagna Group Platform



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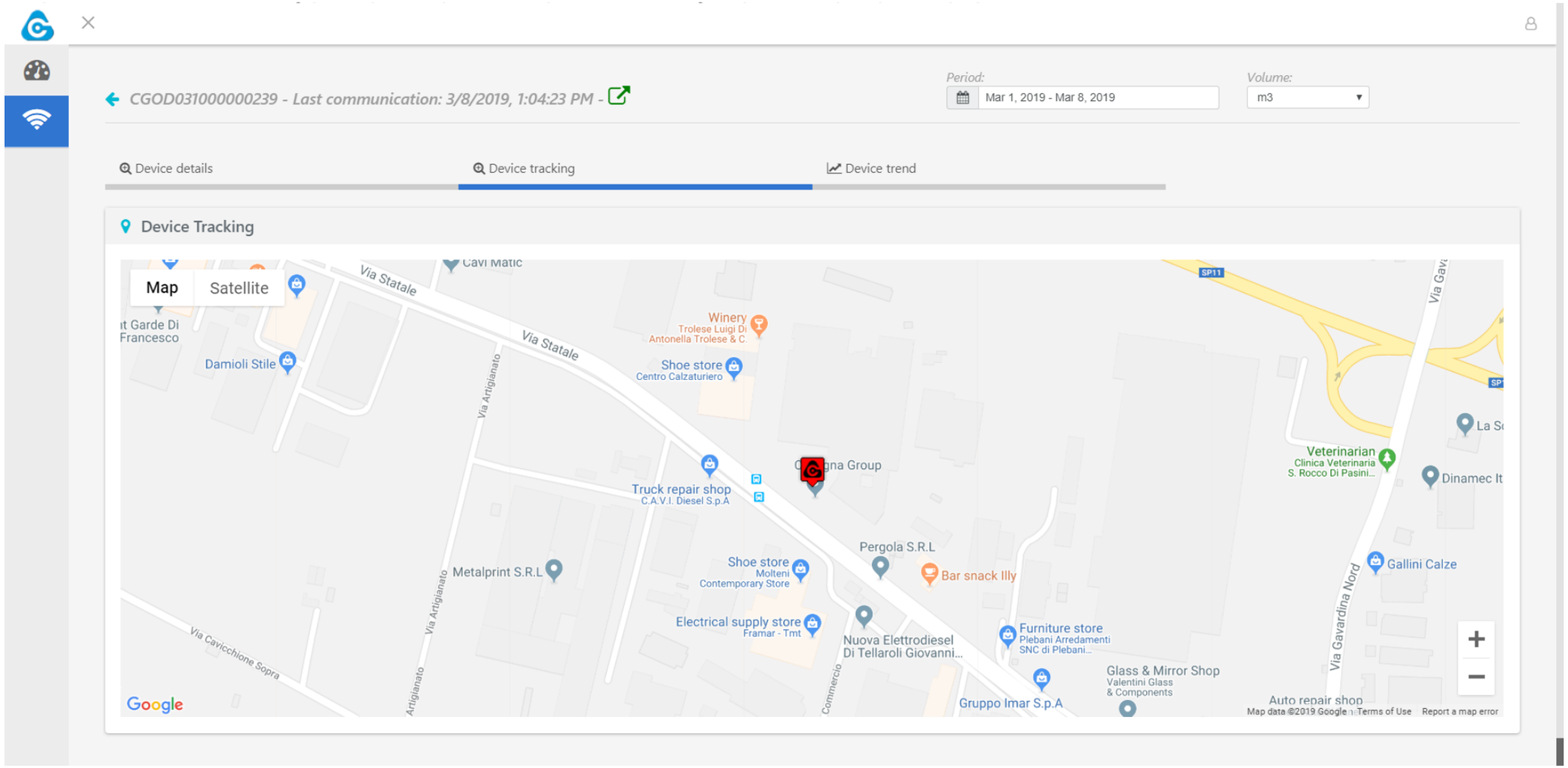
Cavagna Platform

The platform not only manages the smart meters, but all the control devices such as telemetry.
NO initial purchase license fees. Pay based on utilities.



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Easy start up



FIRMWARE UPDATE

Firmware Update

Since the Smart Meter allows two-way communication between the Smart Meter and the central system, the firmware installed in the instrument can be updated remotely, which means that new functions can be implemented in the instrument without the need to be physically next to the Smart Meter.

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Added value in using the complete smart meter solution

Functionality available	Benefit
Alleged billing elimination	Eliminitation of billing uncertainties between gas company and customers
Data availability of real consumption (not estimated) on the individual customer and constantly updated	Better capacity in forecast consumptions
Possibility of having a measurement at standard conditions	Availability of a measure independent of operating temperature. Absence of estimated correction coefficients.
Introduction of multi-hourly rates	Greater alignment between cost of procurement and revenues with reduction of risk
Consumption awareness and on the time of use	Availability of information relating to actual consumption and actual time
Opening to safety devices (shut-off valve or seismic sensor)	Greater quality of service

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Casing Material

The stainless steel body of the Smart Meter is welded to ensure strength, external seal, resistance at corrosion (internal and external) and at low and high temperatures.





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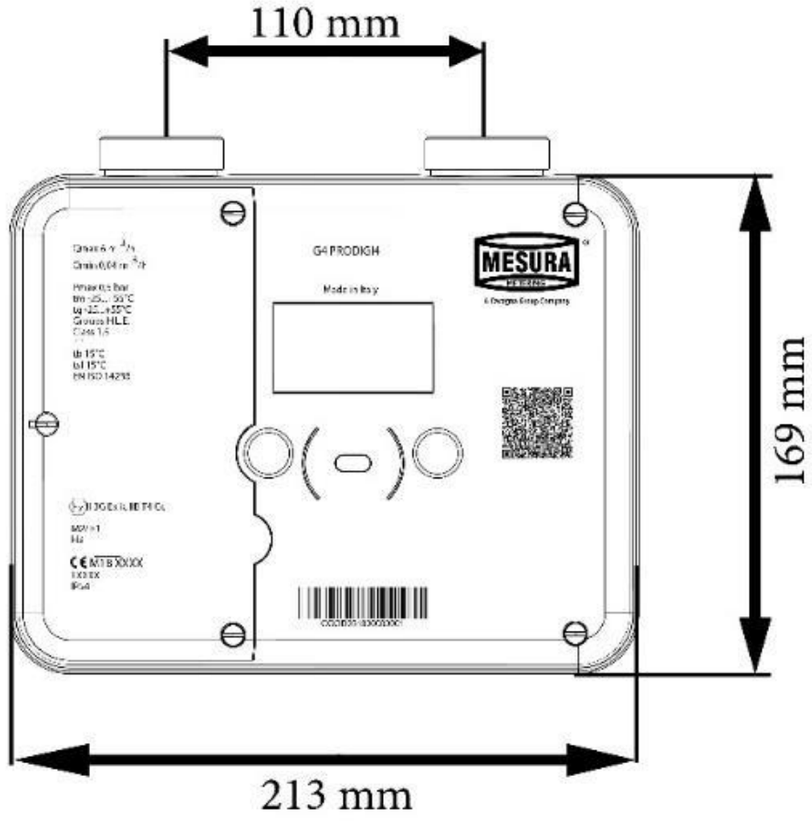
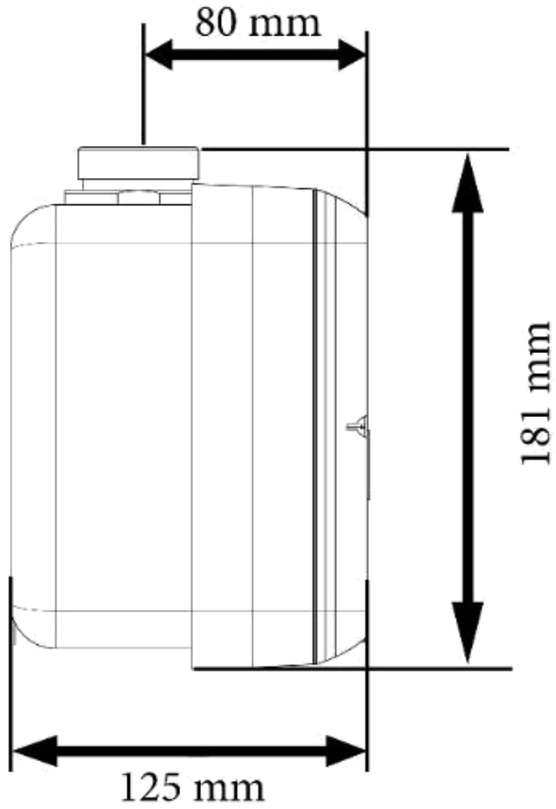
Overall Dimensions

CONNECTION: 1'' ¼ ISO 228

WEIGHT: 2.4 Kg







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Conformities

- 2014/32/UE MID
- UNI/TS 11291
- EN14236
- OIML R137 1&2:2012
- WELMEC 7.2
- DLMS/COSEM Communication protocol
- EN 62056-21
- Directive ATEX Zone 2 - EN 60079

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Technical Features

Accuracy Class	1.5
Measuring Range	0.025-6 m^3/h (G2.5-G4)
Measuring Gas	Natural Gas – LPG
Maximum Working Pressure	0,5 bar
Sealing Pressure	over 1,5 bar
Working Temperature	-25˚C ÷ + 55˚C
Humidity	95% at environment temperature
Load Loss	≤2 mbar

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