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SGM Family Brochure

SMART GAS METERS



SGM101

G4 DIAPHRAGM SMART MODULAR GAS METER



Efficiency, Accuracy, and Safety for Smart Gas Management

The Smart Gas Meter is an advanced IoT-enabled solution designed to enhance accuracy, efficiency, and safety in gas metering. It is ideal for residential, commercial, and industrial applications, ensuring precise consumption tracking, real-time monitoring, and seamless integration with modern utility networks. With plug and play communication modules, smart gas meters eliminate manual readings, reduce errors, and optimize gas distribution, making them a cornerstone of smart energy management.

KEY FEATURES & BENEFITS

1.

Improved Meter Reading Efficiency & Accuracy

Automatically collects daily consumption data, eliminating human errors and reducing manual meter reading costs. Shortens billing cycles and supports big data analysis for optimized utility operations

2.

Real-Time & Complex Pricing Capabilities

Enables flexible and dynamic pricing models, helping utilities manage gas demand efficiently while promoting energy conservation and optimizing revenue.

3.

Remote Monitoring of Meter Status & Gas Usage

Provides real-time gas consumption insights, supports peak demand management, and enables data-driven business decisions.

4.

Enhanced Home Gas Safety

Built-in safety monitoring features, including automatic valve control and gas leak detection, ensure reliable and secure gas usage.

5.

Gas Theft & Leakage Detection

Utilizes big data analytics to identify gas theft or leaks, ensuring precise monitoring of supplied and consumed gas

6.

Opportunities for Business Expansion

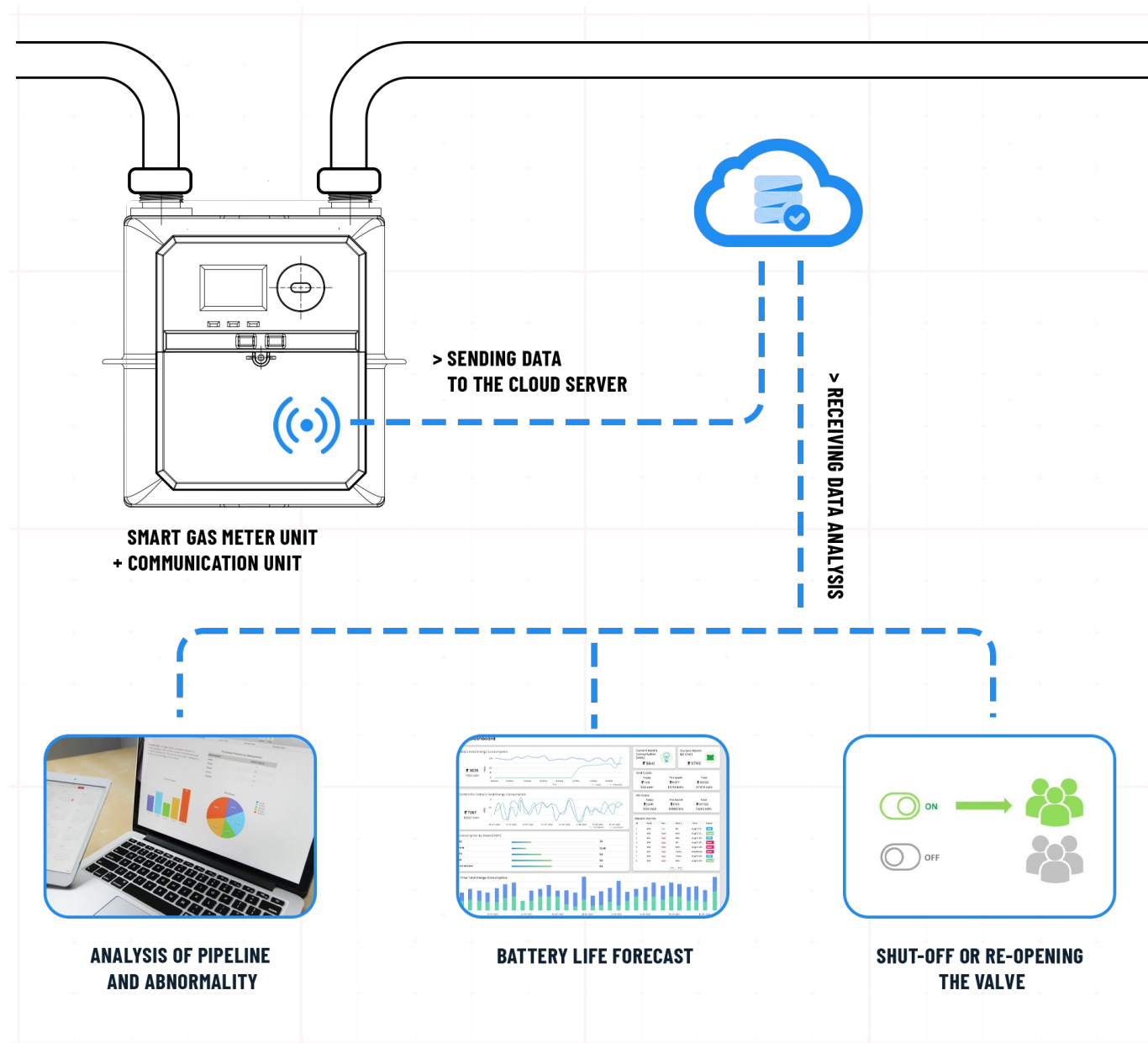
The smart gas meter ecosystem enables new business opportunities, such as gas-related smart home devices, insurance services, and ecommerce integrations.

7.

Convenient User Experience

Supports online billing and payments, offering consumers greater control over their gas usage and spending..

SMART GAS SOLUTION STRUCTURE



MODULAR SMART GAS METER

A Future-Proof, High-Performance Solution for Utility Companies

The Modular Smart Gas Meter is an advanced metering device designed to meet the rigorous smart metering standards of the European Union, Russian Federation, and other global markets. Built on a modular design philosophy, it features a fully separable communication module and smart controller, allowing on-site upgrades to accommodate evolving communication technologies. This future-ready architecture enables long-term stability, adaptability, and high-value services for gas companies. Utility providers can modernize their infrastructure cost-effectively by transitioning from traditional to smart metering without replacing the entire meter.

KEY COMPONENTS & HOW IT WORKS

BASE UNIT THE DIGITAL GAS METER

Accurate Measurement

Ensures precise gas consumption tracking, eliminating billing discrepancies

Modular Design

The core meter remains unchanged, while communication modules can be upgraded or replaced as technology evolves.

Investment Flexibility

Utility companies can begin with a basic meter and upgrade over time, spreading investment costs efficiently.

COMMUNICATION MODULES (OPTIONAL ADD-ONS)

Supported Technologies

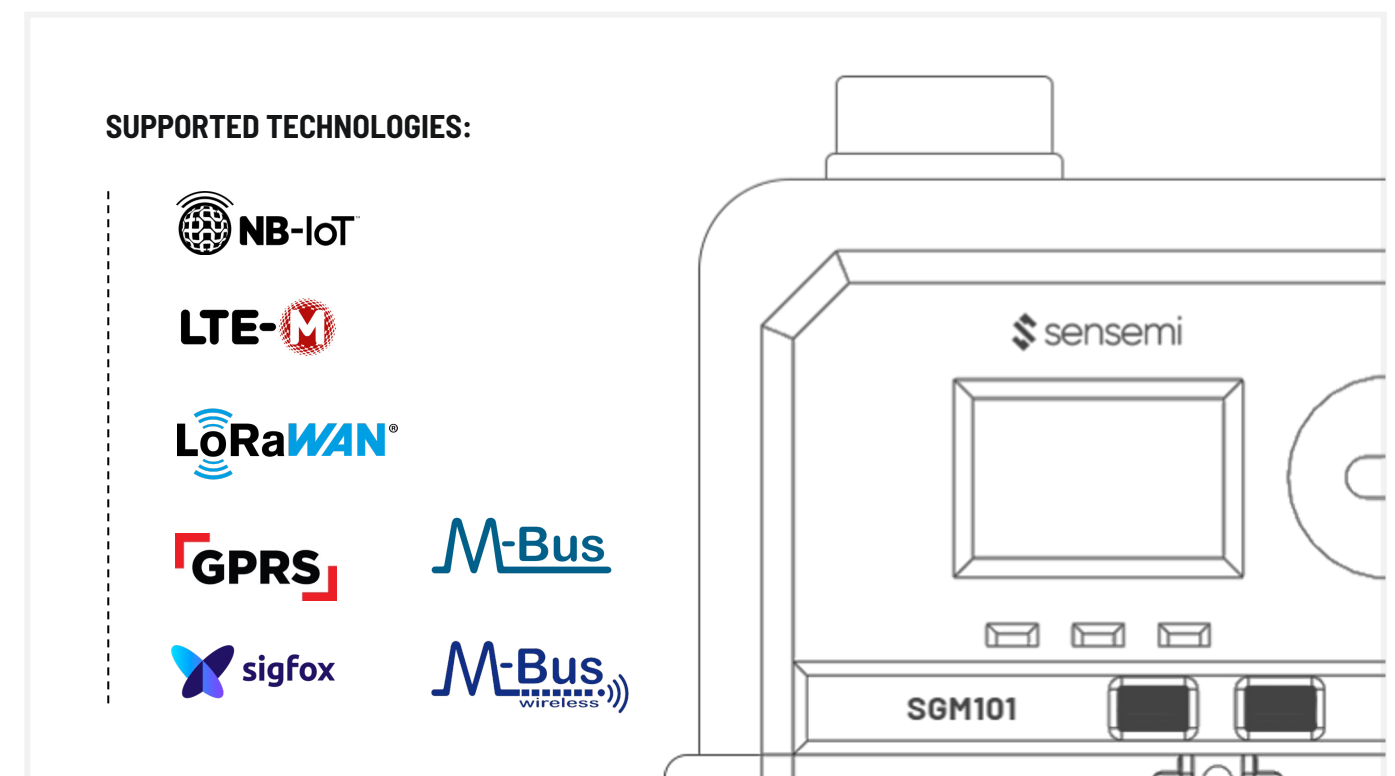
NB-IoT, LTE-M, LoRaWAN, Wireless M-Bus, Wired M-Bus, Sigfox, and GPRS.

Functionality

Enables wireless data transmission to a central system for remote monitoring and smart gas management.

Seamless Integration

Communication modules can be replaced or upgraded on-site without dismantling the meter or updating firmware.



BENEFITS

Smart Meter Conversion: Start Simple, Upgrade Later

Start with a basic digital meter and upgrade to a smart meter by adding a communication module. This modular approach minimizes costs, prevents service disruption, and allows utilities to modernize at their own pace.

Unified System Management

Seamlessly integrates gas, water, and electricity meters into a centralized Platform enabling efficient monitoring, streamlined operations, and improved resource allocation.

Cost Efficiency & Energy-Saving Operation

Gradual upgrades reduce initial investment, while automated data collection and improved billing accuracy lead to long-term cost savings. Low power consumption extends battery life, reducing maintenance costs.

Modular Communication Design & Extensive Connectivity Options

Supports NB-IoT, LTE-M, LoRaWAN, Wireless M-Bus, Wired M-Bus, LoRa Mesh, and Sigfox, ensuring low power, long-range, and secure communication. The modular design allows easy adaptation to evolving technologies without replacing the meter.

Future-Proof & Scalable Design

Modular architecture allows for easy integration of emerging technologies, ensuring long-term adaptability and effortless expansion from small-scale to nationwide deployments



Easy Installation & Seamless Integration

Standard fittings and plug-and-play communication modules simplify installation, reduce setup time, and ensure effortless integration with existing utility infrastructure.

High-Accuracy Measurement

Inductive Pulse-based high precision sensor provide precise gas pulse readings, ensuring accurate consumption tracking for billing and data analysis.

Advanced Tamper Detection & Security

Built-in tamper detection mechanisms identify unauthorized access, reverse flow, and manipulation attempts, enhancing security and regulatory compliance.

Remote Monitoring & Over-the-Air (OTA) Updates

Real-time data transmission and OTA firmware updates enable proactive diagnostics, seamless software upgrades, and enhanced service reliability with minimal manual intervention.

Wide Operating Temperature Range

Built for extreme conditions, the meter operates reliably in -25°C to +55°C (-13°F to +131°F) ambient temperature, making it ideal for harsh environments.

Features



Versatile replaceable communication modules

The single base meter supports multiple interchangeable communication modules, including GPRS, NB-IoT, LoRaWAN, Wireless M-Bus, Wired M-Bus, Sigfox, and more. Modules can be replaced on-site without dismounting the meter or updating firmware, ensuring seamless network adaptation. The meter integrates with IoT platforms, allowing efficient remote management and connectivity.



Flexible and Convenient Payment Options

Supports prepayment and post-payment methods, allowing customers to pay online, via mobile apps, or directly from their smartphones. Compatible with IC card functions for secure access and payment flexibility.



Remote Management and Upgradability

• Remote Control:

Allows operators to manage meter settings and functions remotely, minimizing on-site visits

• Remote Upgrade (FOTA):

Supports firmware updates over the air, keeping the system up to date without manual intervention.



Robust Communication and Connectivity

• High Penetration:

Strong signal penetration for stable connectivity, even in dense urban or underground environments.

• Wide Coverage:

Supports long-range communication protocols, ensuring reliable data transmission in remote areas.



Advanced safety features

Equipped with gas usage monitoring, reverse flow detection, and overflow protection, ensuring enhanced safety and operational reliability. The integrated valve control system offers multiple control logics, providing greater flexibility and security in gas distribution.



Low Power Consumption

Designed for energy efficiency, reducing battery drain and extending operational life, making it ideal for long-term installations.



Accurate And Efficient Metering

• Electronic Temperature Compensation:

Automatically adjusts gas flow measurements for temperature variations, maintaining accuracy under different conditions.

• Detailed Metering:

Provides high-precision gas usage data, supporting accurate billing and consumption analysis.

• Automatic Meter Reading:

Enables data collection without manual intervention, improving accuracy and reducing labor costs.



Intelligent Monitoring and Diagnostics

• Real-Time Self-Diagnostics:

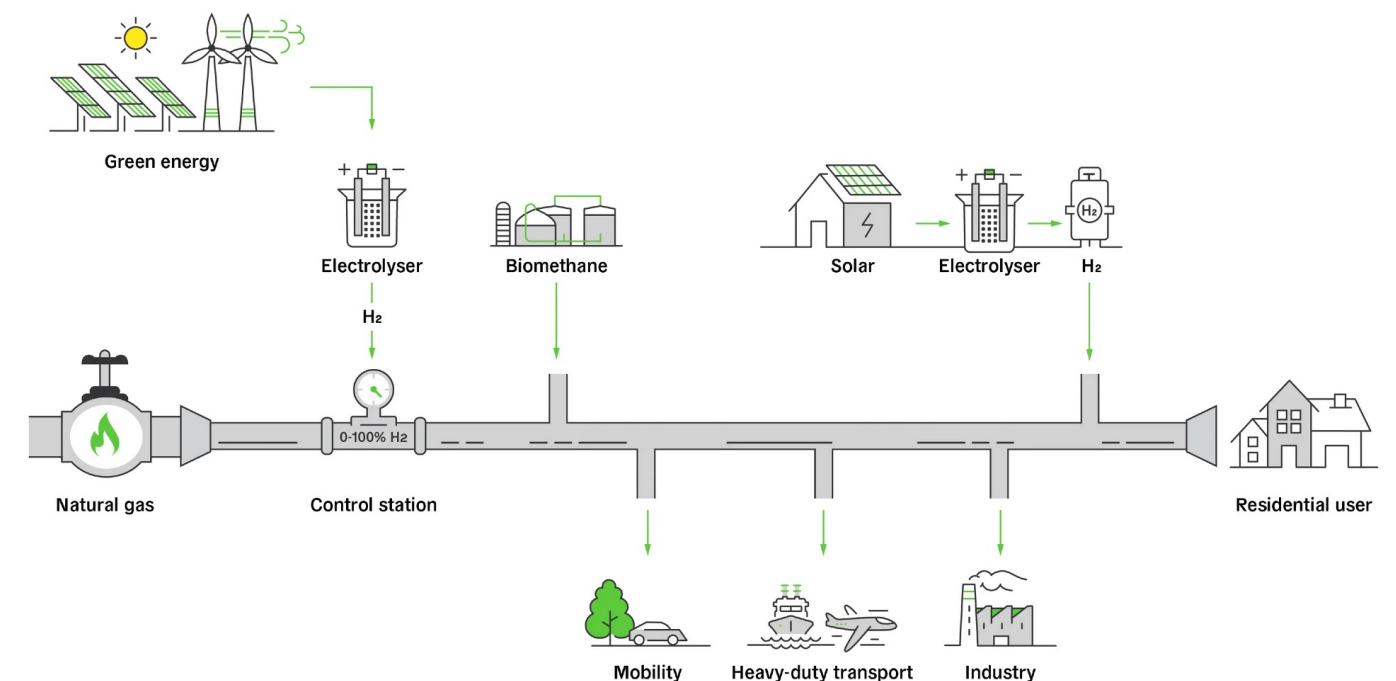
Continuously monitors system performance, detecting anomalies and potential issues for proactive maintenance.

• Remote Alarm:

Transmits configurable alarms for tampering, low battery, abnormal flow, valve events and other meter conditions to the central management system.

• Optical Port Local Communication:

Facilitates on-site maintenance and troubleshooting without network connectivity.



Why Choose the Modular Smart Gas Meter?

The Modular Smart Gas Meter from SenseMi provides unmatched adaptability, cost efficiency, and future-proof performance for utility companies. Its modular design supports seamless upgrades with evolving communication technologies like GPRS, NB-IoT, LoRaWAN, Wireless M-Bus, Wired M-Bus, and Sigfox. With its robust security features, IoT integration, and remote management capabilities, it ensures efficient gas distribution, real-time monitoring, and flexible billing options.



The diagram illustrates the NB-IoT / LoRa architecture. On the left is a line drawing of a ruggedized industrial device with a screen and buttons. This device connects via a bidirectional arrow to a radio tower icon labeled "NB IoT / LoRa". This tower connects via another bidirectional arrow to a database icon with a shield, labeled "IoT Connection management Platform". This platform then connects via a bidirectional arrow to a stack of three cloud icons. To the right of the clouds are three service icons: a headset for "Service Cloud", a briefcase for "Business Cloud", and a monitor for "Collection Cloud".

Technical Parameters								
Type	G1.6	G2.5	G4	G6	G10	G16	G25	G40
Starting Flow (m³/h)	0.003	0.005	0.005	0.008	0.013	0.013	0.020	0.032
Q _{max} (m³/h)	2.5	4	6	10	16	25	40	65
Q _{min} (m³/h)	0.016	0.025	0.04	0.06	0.1	0.16	0.25	0.4
Overload Flow (m³/h)	3.0	4.8	7.2	12.0	19.2	30.0	48.0	78.0
Accuracy Class	1.5							
Maximum Permissible Error (MPE)	$Q_{min} \leq Q < Qt = \pm 3\%$ $Qt \leq Q < Q_{max} = \pm 1.5\%$							
Max. Working Pressure (kPa)	50							
Pressure Loss (Pa)	< 200				< 300			
Working Temperature (°C)	- 25°C ~ +55°C							
Ingress Protection level	IP55							
communication mode	NB-IoT/GPRS/Sigfox/LoRaWAN/Wireless and Wired M-Bus							
Valve Lifetime (time)	>10 years							
Battery Life (year)	≥ 10 years							

ADVANCED SMART CONVERSION OF MECHANICAL METERS

Elevate Your Utility Management with Smartization!

Our cost-effective, retrofit solution modernizes mechanical gas meters, enabling real-time data management, remote monitoring, and automated billing. By integrating advanced smart modules, utility companies can enhance operational efficiency, streamline resource management, and optimize service delivery—all without replacing existing infrastructure

Transforming Mechanical Meters into Smart Meters

The Gas Meter Module converts traditional mechanical gas meters into intelligent, connected devices, eliminating the need for a full system replacement. Equipped with NB-IoT and LoRaWAN communication, it automates meter reading, improves billing accuracy, and enables remote management. Ideal for gas distribution networks, sub-metering applications, and institutions requiring precise consumption tracking, this module provides a seamless solution for hard-to-reach areas where manual readings are impractical. Its flexible installation allows for effortless retrofitting onto existing meters or integration into new deployments, ensuring a smooth transition to smart metering technology

KEY COMPONENTS & HOW GAS METER READER MODULE WORKS

1. Mechanical Meter Base

The mechanical meter base retains its primary function of measuring gas consumption while utilizing existing infrastructure. When integrated with the smart module, its readings are digitally calibrated, ensuring higher accuracy and more precise billing. This enhancement allows utility companies to modernize their metering systems without replacing the entire meter, making the transition to smart technology cost-effective and efficient

2. Smart Module (NB-IoT/LoRaWAN Communication Unit)

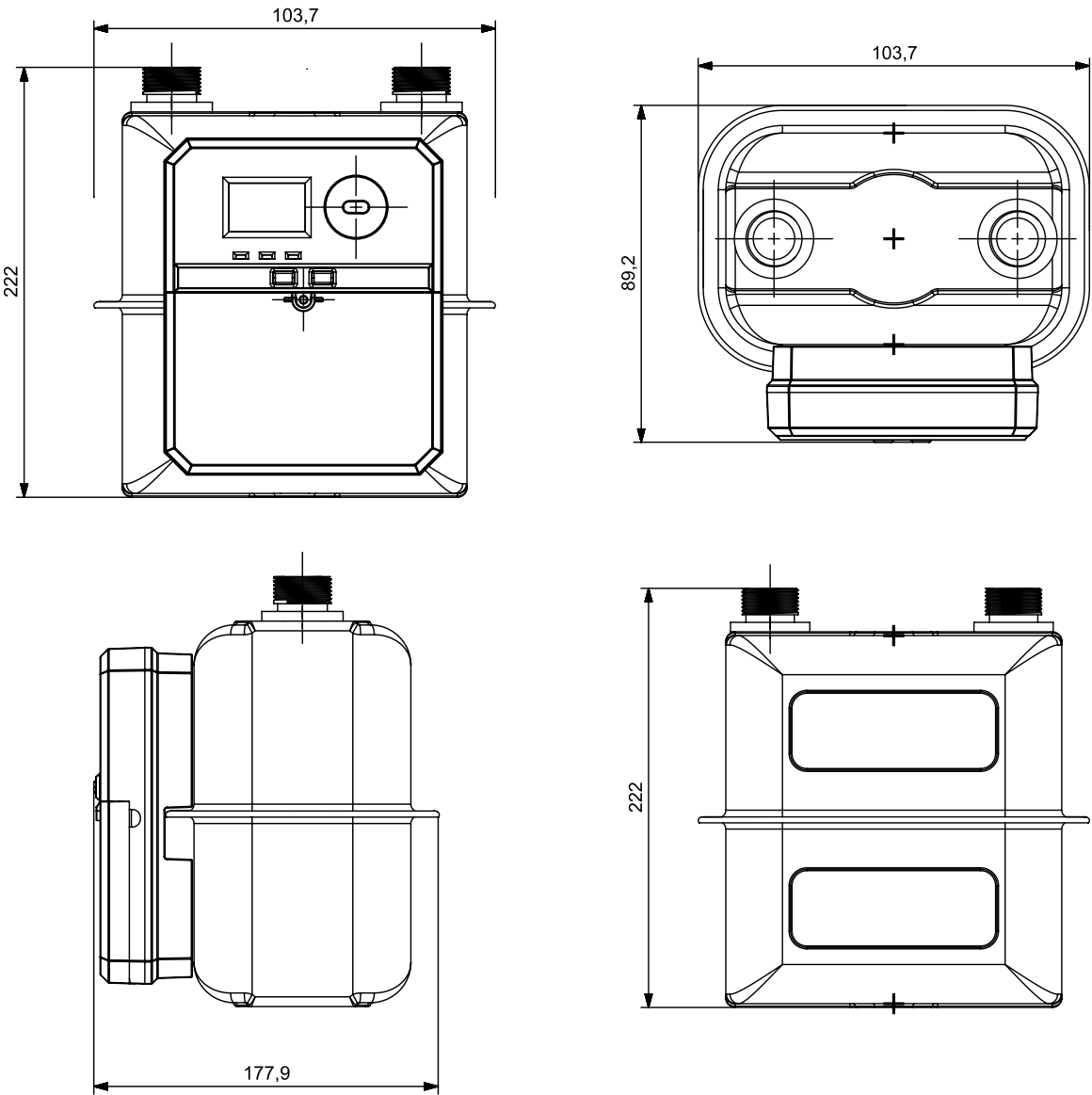
The smart module is a compact, attachable device that seamlessly upgrades mechanical meters into intelligent, connected systems. Equipped with advanced communication technologies such as NB-IoT and LoRaWAN, it enables wireless data transmission, sending real-time gas usage information to a central management system. This integration allows for remote monitoring, automated billing, and enhanced anomaly detection, significantly improving operational efficiency. The module is designed to be scalable, supporting future upgrades and new communication technologies, ensuring long-term adaptability for utility providers.

SPECIFICATIONS

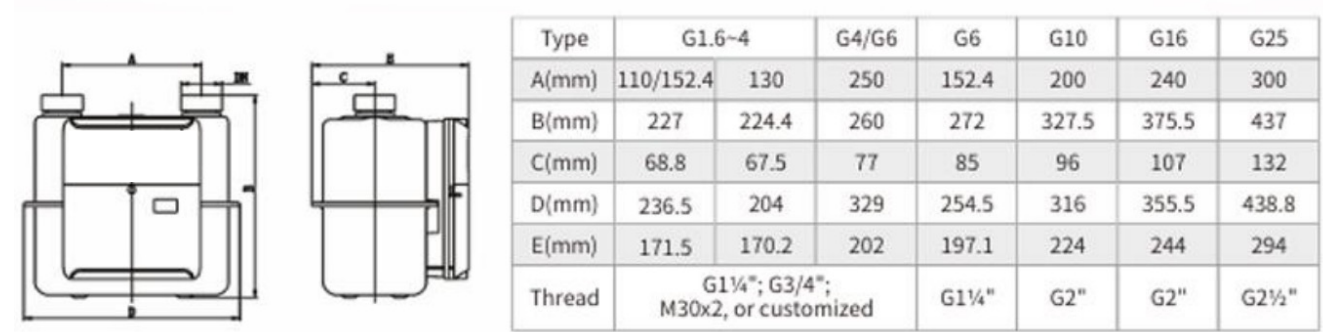
Feature	Description
Meter Sizes	Available in G1.6 to G6 sizes. For meters sized G10 and above, please contact our sales team.
Gas Pulse Reading	Inductive pulse based, tamper proof measurement sensor
Tamper Detection	Physical tampering, magnetic tampering, Jerk or tilt attempt detection
Communication Modules	Modular design supporting various communication modules
Wireless Connectivity	NB-IoT, LoRaWAN, Wired and Wireless M-Bus, SigFox, LTE-M
Power Supply	LiSoCl2 Lithium Battery, 19Ah rating, single use, customer replaceable
Operating Temperature	T _p -25°C to +55°C T _m -20°C to +40°C
Environmental Protection	IP55-rated enclosure for protection against dust and water ingress, suitable for outdoor installations. IP65 available upon request
Dimensions	G4 Meter: [182×95×136mm), G6 Meter: [200×113×160mm]
Flow Rate Capacity	Refer to Technical Parameters Table
Compliance Standards	OIML R137-1&2:2012, MID Module 'B', MID Module 'D', EN1359, EN16314, ATEX, IECEx, RED, Welmec 2.7, Data Protocol - UNI/TS 11291-12-2
Installation	Standard fittings G1 1/4 or 23mm
Display	LCD display for local readings with Backlight
Data Logging	Data Storage, Main flash 16 MB, Backup flash 2 MB, EEPROM 4 KB Event log capacity ~87,000 records Snapshot capacity ~436,000 records Snapshot content Timestamp, pulse count, valve state, tamper, temperature, battery, flow and more
Firmware Updates	Supports over-the-air (OTA) firmware updates
Battery Life	>10 years, depending on frequency of Display usage and frequency of data upload
Security	AES-128 bit encryption for highly secure communication with cloud
Diagnostic Features	Remote diagnostics and monitoring capabilities
Material Construction	Durable materials suitable for various environmental conditions
Mounting Options	Wall-mounted or pipe-mounted configurations available
Alarm Notifications	Configurable alerts for tampering, low battery, and other critical events
User Interface	Web-based and mobile applications for monitoring and management (if applicable)

DIMENSIONS

SGM101 G4 SMART GAS METER



METER BODY SIZES COMPARISON



*ALL UNITS ARE IN MM (MILIMETER)

RGM101

GAS METER READER MODULE



ACCESS PRECISE, UP-TO-DATE INFORMATION ON GAS CONSUMPTION WITH SENSEMI'S AMI GAS METER MODULE

The Gas Meter Reader Module transforms traditional mechanical gas meters into intelligent, connected devices, enabling precise remote monitoring and data-driven management. Utilizing NB-IoT and LoRaWAN communication technologies, it wirelessly transmits real-time consumption data to utility providers, forming an integral part of an Advanced Meter Infrastructure (AMI) system. This module is an ideal solution for gas distribution companies, sub-metering applications, and institutions such as hospitals, retailers, and schools, ensuring accurate consumption tracking in hard-to-read locations.

KEY FEATURES & ADVANTAGES

1.

Effortless Retrofit Capability

Easily integrates with existing gas meters, eliminating the need for costly replacements. Custom adapters can also be provided for wider network compatibility.

2.

Wireless Data Transmission & Smart Connectivity

Leverages LoRaWAN/NB-IoT to transmit gas usage data directly to the back office, ensuring secure, reliable, and real-time communication.

3.

Precision Measurement with Advanced Magnetic Sensor

The built-in magnetic sensor detects pulses directly from the meter, eliminating the need for third-party pulser boxes, ensuring accurate and seamless data capture.

4.

Long-Lasting Battery Performance

Powered by a lithium battery, providing up to 5 years of operation with daily readouts and extending to 10 years with weekly transmissions, reducing maintenance costs.

5.

Tamper Detection & Security

Detects unauthorized device removal, lid opening, or external magnetic interference, triggering instant alerts to prevent fraud and unauthorized access.

6.

Robust Data Security & Encrypted Communication

Ensures high compression and security standards, protecting metering data through a proprietary WAN protocol.

7.

Intelligent Device Health Monitoring

Includes a built-in temperature sensor to monitor ambient conditions, ensuring optimal performance and longevity.

8.

User-Friendly Display & Diagnostics

Equipped with an intuitive digital display, providing clear visibility of readings, diagnostics, and installation status, simplifying operation for field technicians.

9.

Plug-and-Play Installation

Easily attaches to mechanical gas meters without significant modifications, allowing for fast, hassle-free deployment.

BENEFITS OF THE GAS METER READER MODULE



Upgrade Existing Infrastructure Without Full Replacement

Utility companies can retrofit their current mechanical meters, eliminating the need for costly replacements while gaining smart metering capabilities.



Enhanced Data Accuracy & Centralized Management

Provides real-time gas consumption data, improving billing precision and enabling better energy distribution planning. Aggregates data from multiple meters into a single platform for streamlined reporting and analysis.



Cost Efficiency & Energy-Saving Operation

Gradual upgrades reduce initial investment, while automated data collection and improved billing accuracy lead to long-term cost savings. Low power consumption extends battery life, reducing maintenance costs.



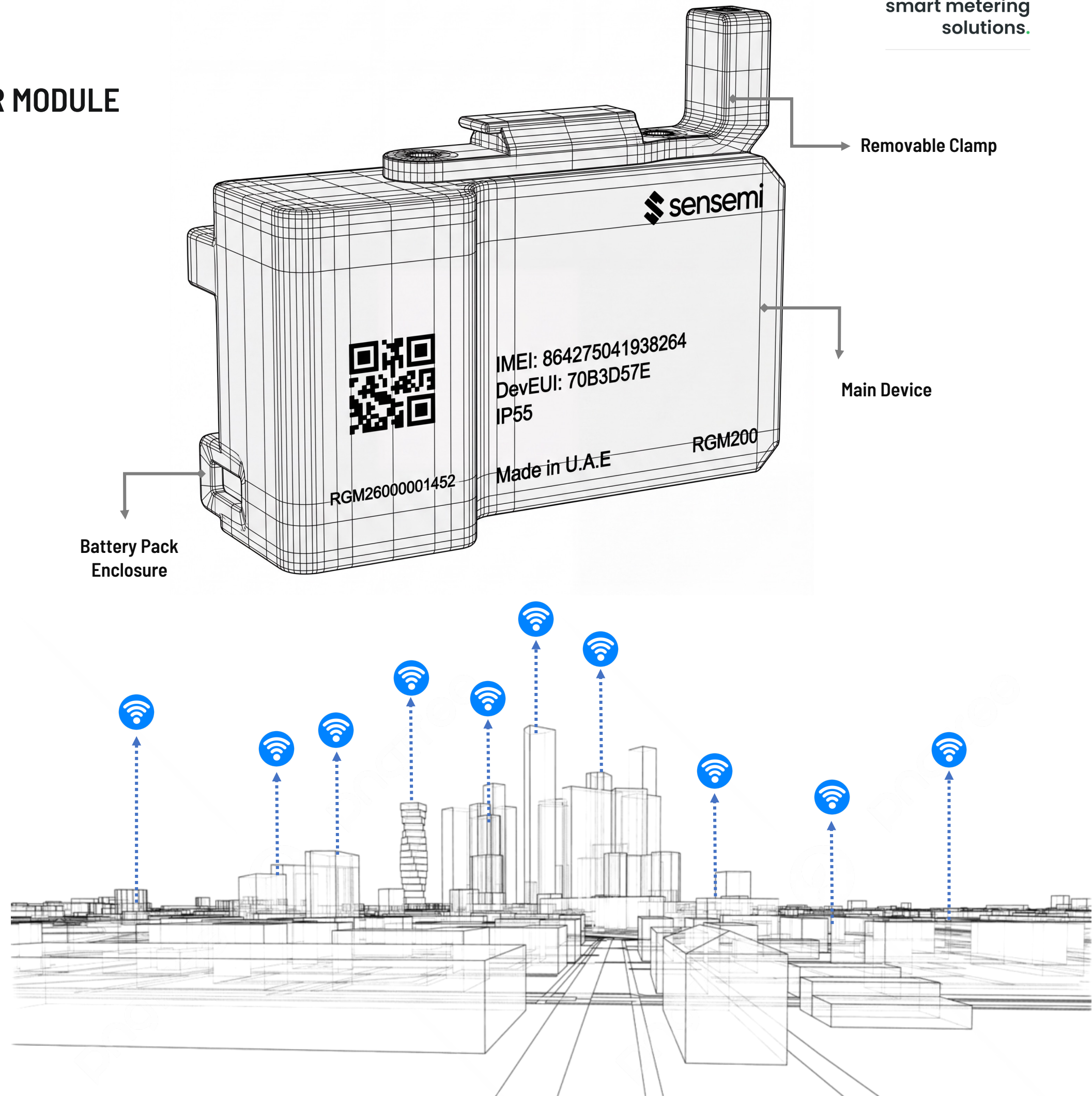
Unified Multi-Utility System Control

Integrates seamlessly with gas, water, and electricity meters, allowing utility providers to monitor and manage all meters from one central platform, enhancing operational efficiency.



Future-Proof & Scalable Design

Modular architecture allows for easy integration of emerging technologies, ensuring long-term adaptability and effortless expansion from small-scale to nationwide deployments.



USGM101

ULTRASONIC SMART GAS METER



Product Overview

The Ultrasonic Smart Gas Meter utilizes cutting-edge ultrasonic measurement technology to provide high-precision, durable, and maintenance-free metering. With no moving parts, it ensures exceptional accuracy, long-term stability, and an extended measurement range, making it a superior alternative to traditional diaphragm meters. Its compact, lightweight design enhances installation flexibility, while advanced digital capabilities support seamless integration with smart utility networks.

Working Principle

The meter determines gas flow rate by analyzing the time difference between ultrasonic waves traveling in opposite directions (T1 for U1→U2 and T2 for U2→U1). Using this data, the system precisely calculates the flow velocity and adjusts the reading based on the cross-sectional area of the flow channel, delivering accurate, real-time gas consumption measurement.

ULTRASONIC SMART GAS METER - BENEFITS

1.

Exceptional Measurement Accuracy & Sensitivity

Utilizing ultrasonic technology, this meter ensures high-precision gas flow measurement, detecting even minimal gas flow variations for accurate billing and consumption analysis.

2.

Long-Term Reliability & Maintenance-Free Operation

With no moving parts, the meter offers consistent performance over its lifespan, eliminating mechanical wear, reducing maintenance needs, and ensuring long-term stability.

3.

Compact, Lightweight & Space-Saving Design

Smaller and lighter than traditional diaphragm meters, allowing for flexible installation in space-constrained environments.

4.

Strong Anti-Interference & Secure Data Transmission

The digital signal output is immune to magnetic interference, ensuring reliable performance and tamper-resistant data accuracy.

5.

Advanced Safety Mechanisms for Leak Prevention

Equipped with overflow, reverse flow, and continuous flow detection, the meter automatically closes the valve to prevent leaks, appliance malfunctions, and pipeline damage.

6.

Built-in Fire & Hazard Detection

Integrated high-temperature sensors detect potential fire hazards, triggering automatic gas shut-off and real-time alerts to ensure safety.

7.

Tamper & Disassembly Detection

Monitors unauthorized access, water ingress, or physical tampering, reporting security threats in real-time and maintaining system integrity.

8.

Optimized Performance with Temperature & Pressure Compensation

Built-in temperature and pressure sensors adjust volume readings to Standard Temperature and Pressure (STP) conditions, ensuring consistent and precise measurement.

9.

Future-Proof with IoT Connectivity & Remote Management

Supports seamless integration with smart grids, enabling real-time monitoring, automated diagnostics, and remote control, enhancing operational efficiency.

ULTRASONIC SMART GAS METER - KEY FEATURES



Compact and Lightweight Design

Smaller and lighter than traditional diaphragm meters, allowing for easy installation and space-saving deployment.



High Reliability & No Moving Parts

The ultrasonic measurement system ensures long-term accuracy, eliminating mechanical wear and the need for frequent recalibration.



Built-in Temperature & Pressure Compensation

Integrated sensors automatically adjust readings under standard temperature (STP) conditions, delivering accurate and standardized measurements.



Ultra-High Sensitivity & Accuracy

Detects even minimal gas flow variations, ensuring precise metering across a wide range ratio (up to 1:375 for G4W and 1:4000 for G40W).



Strong Anti-Interference Technology

The digital signal output is immune to magnetic interference, ensuring secure and tamper-resistant data transmission.



Advanced Gas Safety Features

• Overflow Detection:

Closes the valve at excessive flow rates to prevent pipeline damage.

• Reverse Flow Detection:

Detects incorrect gas flow direction and automatically shuts the valve.

• Continuous Flow Detection:

Prevents accidents caused by leaks or forgotten appliances.

• High-Temperature Detection:

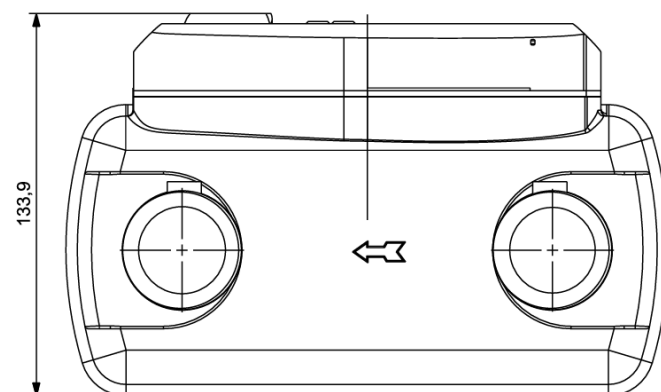
Shuts the valve and sends alerts in case of fire hazards.

• Air & Water Ingress Detection:

Detects unauthorized disassembly or water intrusion, securing the gas pipeline system.

• Tamper & Disassembly Detection:

Monitors and records battery cover removal, meter disassembly, and tampering attempts, alerting the system to potential fraud.

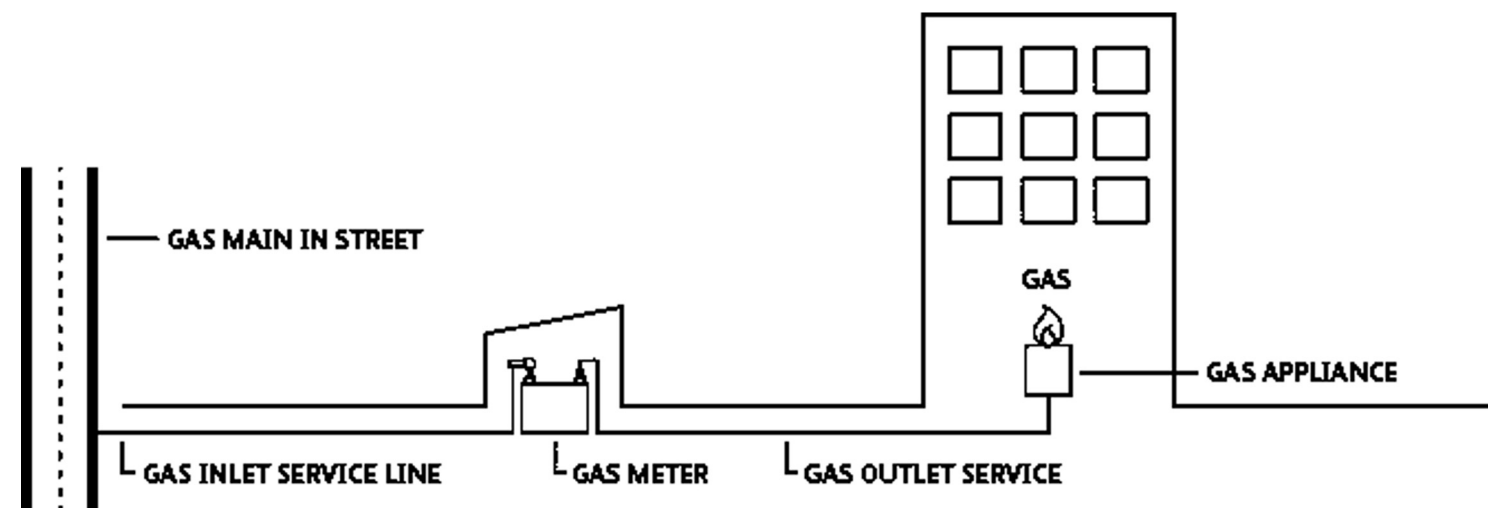


WHY CHOOSE THE ULTRASONIC SMART GAS METER?

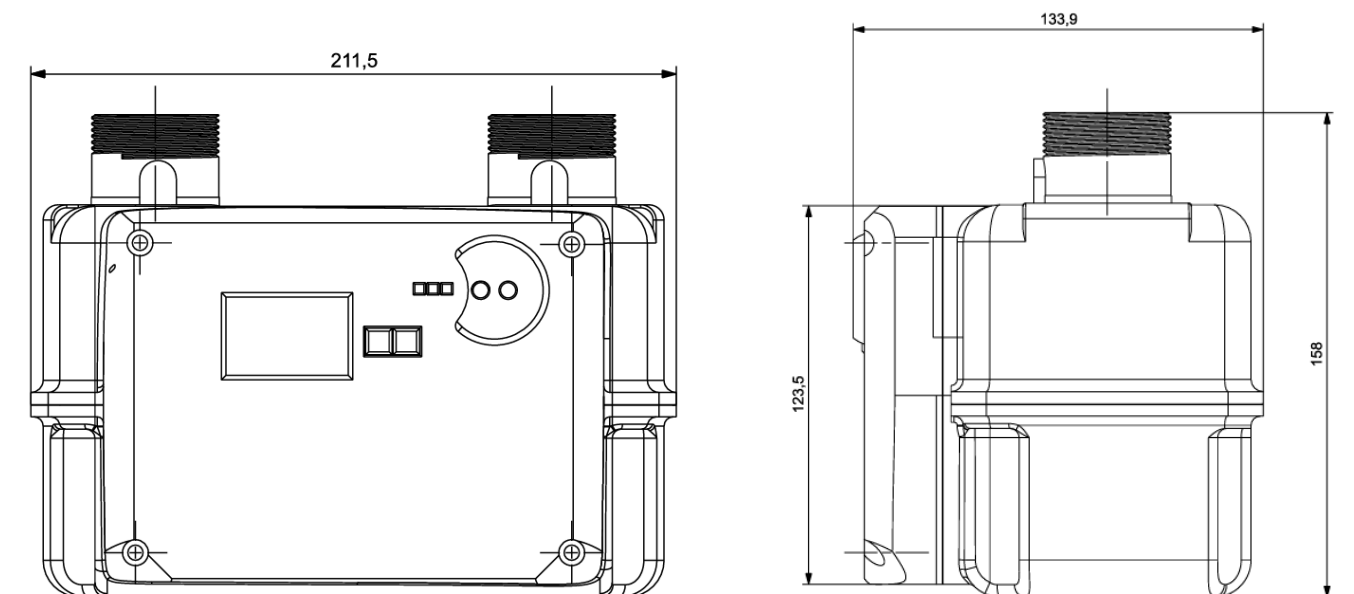
Smart. Safe. Reliable

The Ultrasonic Smart Gas Meter is an intelligent, future-ready solution for modern gas measurement and safety. Its precision, reliability, and innovative safety mechanisms deliver unmatched value for both consumers and utilities. With advanced features like digital metering, tamper detection, and environmental compensation, this meter ensures efficiency, safety, and compliance with industry standards.

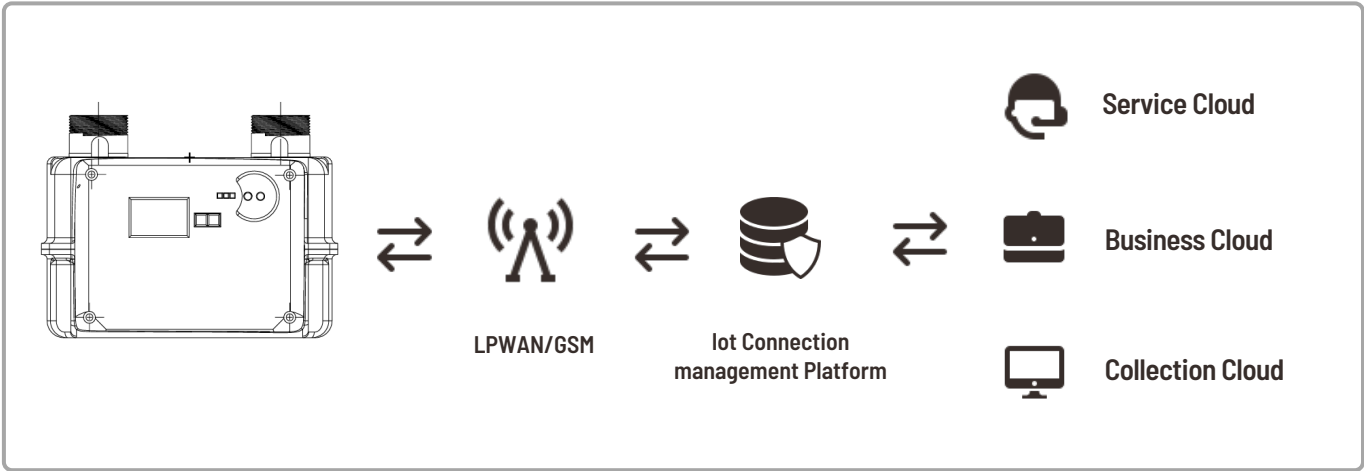
Discover the next level of gas metering with the Ultrasonic Smart Gas Meter.



DIMENSIONS



SOLUTION ARCHITECTURE



TECHNICAL PARAMETERS

Technical Parameters							
Type	G2.5	G4	G6	G10	G16	G25	G40
Starting Flow (m³/h)	0.005	0.005	0.008	0.013	0.013	0.020	0.032
Q _{max} (m³/h)	4	6	10	16	25	40	65
Q _{min} (m³/h)	0.025	0.04	0.06	0.1	0.16	0.25	0.4
Overload Flow (m³/h)	4.8	7.2	12.0	19.2	30.0	48.0	78.0
Accuracy Class	1.5						
Maximum Permissible Error (MPE)	Q _{min} ≤ Q < Q _t = ±3% Q _t ≤ Q < Q _{max} = ±1.5%						
Working Temperature (°C)	- 30°C ~ +55°C						
Ingress Protection level	IP55						
Communication mode	NB-IoT/GPRS/Sigfox/LoRaWAN/Wireless and Wired M-Bus						
Valve Lifetime (time)	>10 years						
Battery Life (year)	≥ 10 years						



SENSEMI HEAD END SYSTEM

Intelligent, Scalable, and Efficient Utility Management



Head-End System (HES)

Unified, scalable meter communication and management for smart gas, electricity, and water infrastructure.



Multi-Utility Meter Management

Manage gas, electricity, and water meters through a single centralized platform. Register devices, monitor connectivity, view meter status, and organize large-scale deployments from one unified interface.



Real-Time Monitoring & Control

Gain continuous visibility into meter communications, readings, network activity, system health, events, and alarms. Remote command capabilities allow authorized operators to interact with connected meters directly through the HES.



Modular Application Architecture

Deploy dedicated applications for different operational needs, including meter management, analytics, integrations, commands, alarms, logging, and system administration—all within a unified HES environment.

