CUBIC

Cubic Ultrasonic Sub-Metering Solutions

For Multi-Unit Buildings

Challenges in Multi-Unit Gas Metering

In apartment buildings, residential compounds, and mixed-use developments, gas consumption is often difficult to measure, monitor, and allocate accurately at the individual unit level. As property managers and utilities face growing demands for operational efficiency, billing transparency, and digitalization, traditional metering and management approaches are increasingly unable to meet evolving requirements.

Manual Meter Reading

On-site reading by technicians is labor-intensive, costly, and difficult to scale across large residential buildings.

Billing Disputes & Inefficiencies

Shared or estimated billing leads to inaccurate cost allocation, tenant disputes, and time-consuming reconciliation.

Lack of Consumption Visibility

Without real-time per-unit data, accurate billing, anomaly detection, and energy management become difficult to achieve.

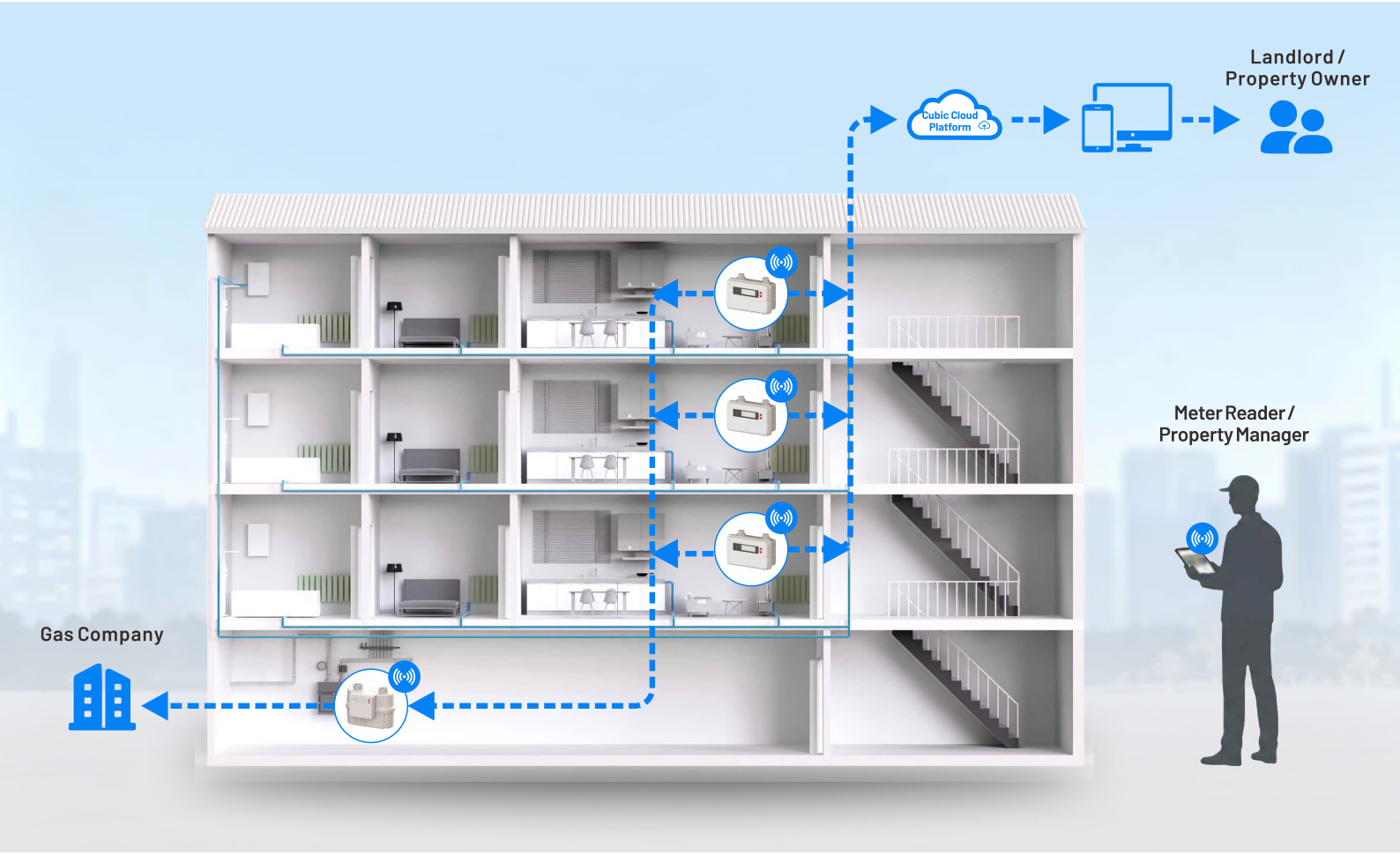
Inefficient Property Management

Disconnected metering, billing, and maintenance processes increase operational overhead and make it difficult to manage multiple units efficiently.

Cubic Sub-Metering Solution Overview

A Complete Sub-Metering Solution for Multi-Unit Buildings

Cubic's USM Series Ultrasonic Gas Sub-Metering Solution is purpose-built for apartment buildings, mixed-use developments, and multi-tenant commercial properties. It delivers individual-unit accuracy combined with building-wide data visibility, through a fully integrated hardware, communication, and software stack.



How It Works: End-to-End Architecture

Meter	Cubic USM Series ultrasonic gas meter installed at each unit. Measures consumption utilizing Time-of-Flight (TOF) technology with Class 1.5 accuracy.
Communication	Each meter transmits encrypted consumption data via NB-IoT, LTE, LoRaWAN, or RS485 wired bus, configured per building topology and operator preference.
Data Aggregation	Building-level concentrators or direct cloud gateways consolidate per-unit readings. Data is time-stamped, validated, and ready for billing export.
Management Platform	Cubic's AMR/AMI-compatible output integrates with utility billing systems, property management software (PMS), and energy dashboards, with support for remote valve control at the individual unit level.

Cubic USM Series meters are designed to integrate seamlessly into existing AMR/AMI infrastructure. Whether operating an in-house metering platform or working with a system integrator, Cubic sub-meters and gas sensor modules are ready to connect.

Cubic Ultrasonic USM Series Product Highlights

Cubic USM Series Ultrasonic Gas Flow Meter is an advanced electronic meter that utilizes the Time of Flight (TOF) principle to measure gas flow, delivering accurate and stable measurement for residential sub-metering applications.

Accurate Measurement

Ultrasonic measurement technology and Time of Flight (TOF) principle, ensuring reliable gas flow measurement for fair billing.

Maintenance-free Operation

No moving parts in the flow path, eliminating wear and drift for long-term stable performance.

Versatile Gas Compatibility

Wide gas compatibility, supporting natural gas, NG with up to 23% H_2, and LPG without field recalibration.

Seamless Digital Integration

Flexible communication options (NB-IoT, LTE, 5G, LoRa, RS485), enabling remote data transmission and seamless AMR/AMI system integration.

Safety & Protection

Abnormal usage detection and protective functions, supporting reverse installation alerts, abnormal flow monitoring, tamper detection, and valve shut-off control.

Compliance & Certifications

Compliant with international standards including MID (EN14236, EN12405-1:2021), ATEX II 2G Ex ib IIB T4 Gb, DLMS, WELMEC 7.2, and UNI/TS, supporting global market deployment.

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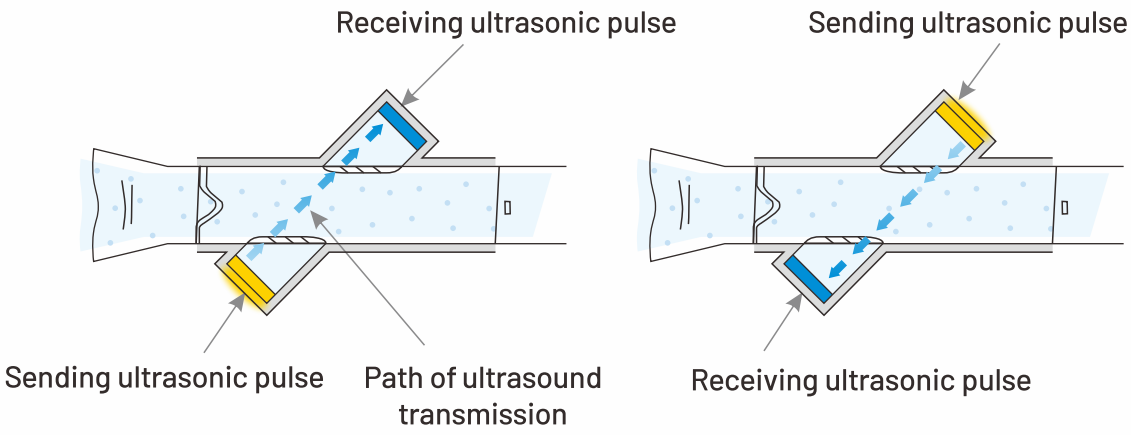
Why Ultrasonic Sub-Metering



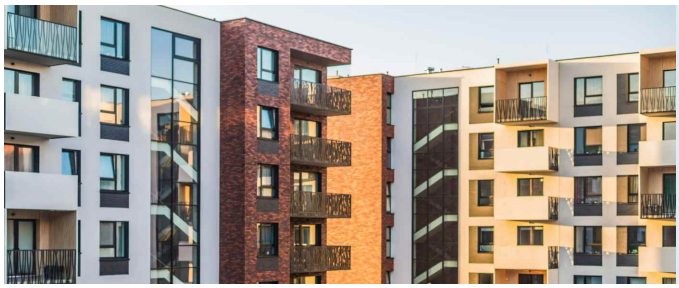
The technology inside a gas meter has a direct impact on long-term total cost of ownership, billing accuracy, and operational burden. In multi-unit buildings where hundreds of meters must perform reliably without maintenance for a decade or more, the choice of metering technology is critical.

Feature	Ultrasonic	Diaphragm	Thermal Mass
Measurement Accuracy	Class 1.5, long-term stable	Class 1.5 at installation	Affected by gas composition
Mechanical Wear	No moving parts	Diaphragm & valve wear	No moving parts
Accuracy Over Time	No degradation	Drifts with wear	Affected by humidity/temp
H2 Gas Compatibility	Up to 23% H2, no recalibration	Not suitable for high H2-blended applications	Poor, algorithm required
LPG Compatibility	Direct measurement	Yes	Cannot accurately measure
Magnetic Tamper Resistance	Immune to magnetic interference	Reed switch vulnerable	Susceptible
Remote Valve Control	Integrated shut-off valve	Requires add-on	Requires add-on
Maintenance Required	Maintenance-free	Periodic recalibration	Sensor fouling risk
Anti-Contamination	V-shape design, self-compensating	Particulates cause wear	Fouling reduces accuracy
Service Life	10–15 years	≈ 8–10 years	≈ 5–8 years in field
Size & Form Factor	Compact, retrofittable	Bulkier, larger footprint	Compact
Smart / IoT Ready	Fully electronic	Requires add-on module	Can be electronic

Specifications

Measurement Range	USM-RA/RS-G1.6: 0.016~2.5 m^3/h [0.57 ~ 88.29 ft^3/h] USM-RA/RS-G2.5: 0.025~4 m^3/h [0.88 ~ 141.26 ft^3/h] USM-RA/RS-G4: 0.04~6 m^3/h [1.41 ~ 211.88 ft^3/h]; USM-RA/RS-L-G1.6: 0.016~2.5 m^3/h [0.57 ~ 88.29 ft^3/h] USM-RA/RS-L-G2.5: 0.025~4 m^3/h [0.88 ~ 141.26 ft^3/h] USM-RA/RS-L-G4: 0.04~6 m^3/h [1.41 ~ 211.88 ft^3/h]
Accuracy	Class 1.5
Error	Qmin≤Q<0.1Qmax: ±3%; 0.1Qmax≤Q≤Qmax: ±1.5%
Gas Medium	Natural Gas, Natural Gas+23%H2, LPG
Case Housing	Aluminium Case/Steel Case
Battery	Aluminium Case: 1pc of 3.6V 19Ah Lithium battery; Steel Case: 2pcs of 3.6V 8.5Ah Lithium battery
Connector Type	Aluminium Case: Screw thread, G1-1/4; Steel Case: Screw thread, M30*2
Dimensions(mm)	Aluminium Case: 210*148*113.5 Steel Case: 230.5*156*89.6
Weight(kg)	Aluminium Case: 1.8; Steel Case: 1.6
Center Distance of Connectors (mm)	Aluminium Case: 110; Steel Case: 130
Working Pressure	0~20kPa / 0~2.90psi
Pressure Loss	200Pa / 0.029psi or less
Working Temperature	USM-RA/RS-Series: -25°C~55°C; -13°F ~ 131°F; USM-RA/RS-L-Series: -40°C~60°C; -40°F~140°F
Storage Temperature	USM-RA/RS-Series: -25°C～70°C; -13°F ~ 158°F; USM-RA/RS-L-Series: -40°C～70°C; -40°F ~ 158°F;
Protection Class	Aluminium Case: IP65; Steel Case: IP54

Typical Applications



Apartment Buildings

Multi-unit residential gas metering and billing

Student Accommodation / Dormitories

High-density shared living environments requiring fair consumption allocation

Mixed-use Developments

Residential and commercial tenants with separate billing requirements

Commercial Complexes

Offices, retail spaces and multi-tenant buildings with centralized gas supply

Centralized LPG Communities

Piped LPG distribution networks requiring individual unit metering and consumption tracking