FLOW MEASUREMENT / DATA SHEET

SS403-02
Ultrasonic Radar Integrated Flow Meter

Multi-mode flow, water-level and pipe-state measurement for complex pipeline applications.

Overview

- SS403-02 is an integrated ultrasonic radar flow meter combining radar, ultrasonic, pressure and water-immersion measurement technologies.
- A water-immersion sensor identifies full and partially full pipe states in real time and switches the active measurement mode automatically.
- Dual-wavelength radar and ultrasonic flow measurement support complex media, harsh environments and both full and partial pipes.
- Intelligent channel and pipe-network parameters support real-time flow calculation from measured velocity and water level.
- The one-piece ABS housing provides a waterproof seal for top-mounted field installation.



Ultrasonic velocity **-10 to +10 m/s**	**Radar velocity** **-20 to +20 m/s**	**Radar level** **0.1 to 20 m**	**Interface** **RS485**
Supply **12 to 24 VDC**	**Flow accuracy** **±2%**	**Protection** **IP68**	**Housing** **ABS**

Key Advantages

- Dual-wavelength radar and ultrasonic flow measurement for full and partially full pipes.
- Automatic mode switching based on real-time full-pipe or partial-pipe state detection.
- Intelligent flow algorithm supports channels and pipe-network configurations.
- Fully electronic design with wide-voltage supply, low power consumption and no mechanical parts.
- Top-mounted installation and configurable brackets help reduce silt and debris impact.

Application Scenarios

- Underground drainage networks and urban water supply systems.
- Urban drainage networks, river outlets and sea outlets.
- Petroleum, chemical and other liquid pipelines.
- Full and partially full pipe flow monitoring in complex media.

Measurement Principle

SS403-02 combines liquid-level sensing, water-immersion state detection, radar liquid-level measurement, Doppler ultrasonic flow measurement and Doppler radar flow measurement. The immersion sensor identifies whether the pipe is full or partially full. In a partial-pipe state, the system switches to radar flow and radar level measurement; in a full-pipe state, it switches to ultrasonic flow and pressure-based liquid-level measurement. This intelligent switching supports flow velocity, flow rate and water-level measurement across changing pipeline conditions.

Technical Specifications

Parameter	Specification	Parameter	Specification
Ultrasonic flow velocity / Measurement range	-10 to +10 m/s	**Ultrasonic flow velocity / Measurement accuracy**	±1.0% FS
Ultrasonic flow velocity / Resolution	0.001 m/s	**Radar flow velocity / Measurement range**	-20 to +20 m/s
Radar flow velocity / Measurement accuracy	±0.01 m/s	**Radar flow velocity / Resolution**	0.01 m/s
Pressure water level / Measurement range	0.02 to 10 m	**Pressure water level / Measurement accuracy**	0.5% FS
Pressure water level / Resolution	0.001 m	**Radar water level / Measurement range**	0.1 to 20 m
Radar water level / Measurement accuracy	±0.005 m	**Radar water level / Resolution**	0.001 m
Flow parameters / Instantaneous flow rate	0.001 to 999.99 m^3/s	**Flow parameters / Measurement accuracy**	±2%
Flow parameters / Resolution	0.001 m^3/s	**Flow parameters / Accumulated flow volume**	0.01 m^3 to 99,999,999 m^3
Other / Temperature range	0 to 60 °C	**Other / Storage temperature**	-20 to 80 °C
Other / Supply voltage	12 to 24 VDC	**Other / Protection class**	IP68
Other / Total power consumption	≤165 mA / 12 V	**Other / Housing material**	ABS
Other / Interface type	RS485 (Modbus-RTU)	**Other / Mounting method**	Base-mounted
Other / Dimensions	210 × 110 × 110 mm; mounting-hole spacing 70 × 70 mm (M5)		

Output and Communication

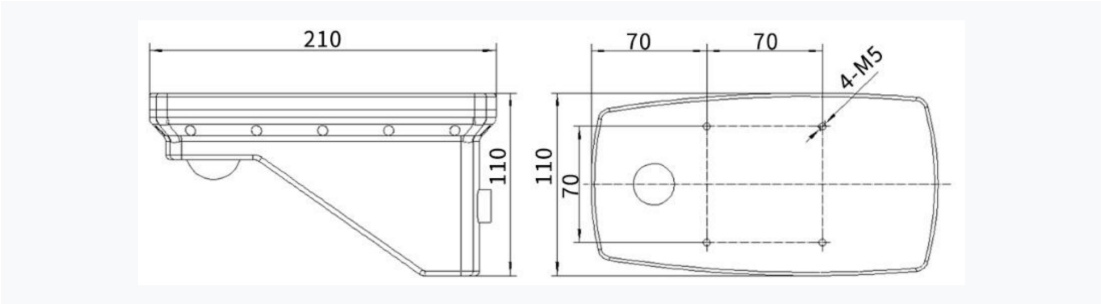
Interface / Output	Definition
RS485 (Modbus-RTU)	Serial communication interface
Measurement mode	Automatic switching between full-pipe and partial-pipe measurement
Flow calculation	Real-time flow based on measured velocity, water level and channel parameters

The source material specifies RS485 communication using the Modbus-RTU protocol. The integrated flow algorithm calculates real-time flow from measured velocity, water level and configured channel or pipe-network parameters.

Electrical Connection

Cable color	Signal / Definition
Red	Positive power supply terminal
Black	Negative power supply terminal
Blue (Green)	RS485-A
Yellow (White)	RS485-B

Mechanical Dimensions / Installation



Source dimension drawing for the sensor housing. Dimensions are shown in millimetres: 210 mm length, 110 mm width, 110 mm height and 70 × 70 mm mounting-hole spacing with M5 holes.

CONTACT / SUPPORT

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