FLOW MEASUREMENT / DATA SHEET

SS403-01
Doppler Ultrasonic Flow Meter

Integrated velocity, water-level and flow-rate measurement for open-channel applications.

Overview

- SS403-01 is a Doppler ultrasonic flow meter for velocity, water-level and flow-rate measurement.
- Suspended air bubbles or particles in the fluid create a Doppler frequency shift used to determine flow velocity.
- Built-in pressure and temperature sensors support water-level measurement and temperature correction.
- Channel parameters enable calculation of cross-sectional area and instantaneous flow rate.
- The ABS housing, base mounting and RS485 interface support field deployment in open-channel applications.



Velocity **0.021-10.00 m/s**	**Water level** **0.02-10 m**	**Flow rate** **0.001-999.99 m^3/s**	**Interface** **RS485**
Power **7.5-15 VDC**	**Accuracy** **±1.0%FS**	**Protection** **IP68**	**Housing** **ABS**

Key Advantages

- Doppler measurement for fluids containing air bubbles or particles.
- Integrated velocity, water-level and flow-rate calculation.
- Fully electronic design with no mechanical parts and low power consumption.
- Strong anti-interference performance and waterproof ABS housing.

Application Scenarios

- Non-full pipes and open channels.
- Sewage outlets, culverts and box culverts.
- Manholes and water-conservancy monitoring.
- Flow metering where water level exceeds 5 cm.

Measurement Principle

The flow meter emits ultrasonic waves at an upward angle through fluid containing air bubbles or particles. The reflected signal produces a Doppler frequency shift Δf proportional to the flow velocity V. A built-in pressure sensor measures the distance to the water surface, while the temperature sensor provides water-temperature correction. After channel parameters are entered, the cross-sectional area S is calculated and the instantaneous flow rate is determined as Q = V × S; cumulative flow is accumulated over time.

Technical Specifications

Parameter	Specification	Parameter	Specification
Flow velocity / Speed measurement range	0.021-10.00 m/s	**Flow velocity / Measurement accuracy**	±1.0%FS
Flow velocity / Resolution	0.001 m/s	**Water level / Measurement range**	0.02-10 m

Parameter	Specification	Parameter	Specification
Water level / Measurement accuracy	0.5%FS	**Water level / Resolution**	0.001 m
Flow rate / Instantaneous flow rate	0.001-999.99 m^3/s	**Flow rate / Measurement accuracy**	±2%
Flow rate / Resolution	0.001 m^3/s	**Flow rate / Cumulative flow rate**	0.01 m^3 to 99999999999999999 m^3
Other / Temperature range	0-60 °C	**Other / Power supply voltage**	7.5-15 VDC
Other / Total power consumption	≤20 mA / 12 V	**Other / Data acquisition cycle**	Settable (factory specified)
Other / Interface type	RS485 (Modbus-RTU)	**Other / Storage temperature**	-20 to +80 °C
Other / Protection rating	IP68	**Other / Casing material**	ABS material
Other / Installation method	Base mounting	**Other / Dimensions**	179 × 50 × 30 mm; mounting-hole spacing 170 × 40 mm; 4-Φ5 holes

Output and Communication

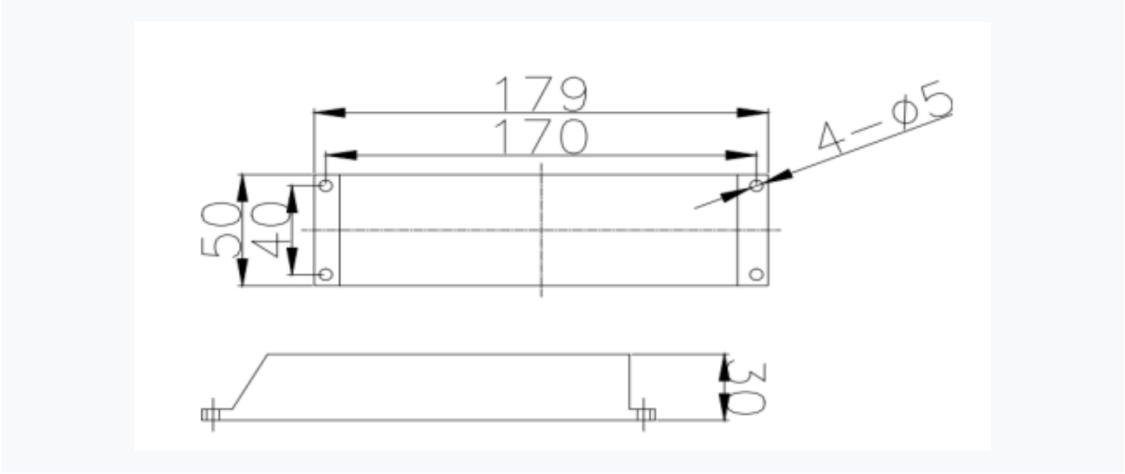
Interface / Output	Definition
RS485 (Modbus-RTU)	Serial communication interface
Instantaneous flow rate	Q = V × S
Cumulative flow rate	Accumulated flow over time

The source material specifies RS485 communication using the Modbus-RTU protocol. Flow outputs are calculated from measured velocity, water level and channel parameters.

Electrical Connection

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

Mechanical Dimensions / Installation



Source dimension drawing for the sensor housing. Dimensions are shown in millimetres: 179 mm overall length, 170 mm mounting-hole spacing, 50 mm width, 40 mm reference spacing, four Φ5 mounting holes and 30 mm height.

CONTACT / SUPPORT

SpeSense Technologies Inc.
Add: No. 9 Yuhe Road, Guitang Subdistrict, Yuhua District, Changsha City
Tel: +86-15386478166
Email: info@spesense.com
Web: www.spesense.com

WHATSAPP WECHAT
WhatsApp / WeChat