

YSR03 Radar Flow Meter Operation Manual



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1. Product Introduction



A radar flow meter is a product that uses radar to measure water flow velocity and level, and then calculates the flow rate using an integral model. It can measure water flow in real time, 24/7, and its non-contact measurement makes it less susceptible to environmental influences. The product includes a mounting bracket.

1.1 The main advantages of the product are as follows:

Non-contact measurement based on hybrid frequency radar; flow velocity, liquid level, and flow rate are output simultaneously without interference, requiring minimal maintenance.

Unaffected by silt or other contaminants.

IP68 waterproof design, suitable for various outdoor environments and extreme weather conditions.

Compact and stylish design, offering excellent value for money.

Integrated reverse connection protection, lightning protection, and overvoltage protection.

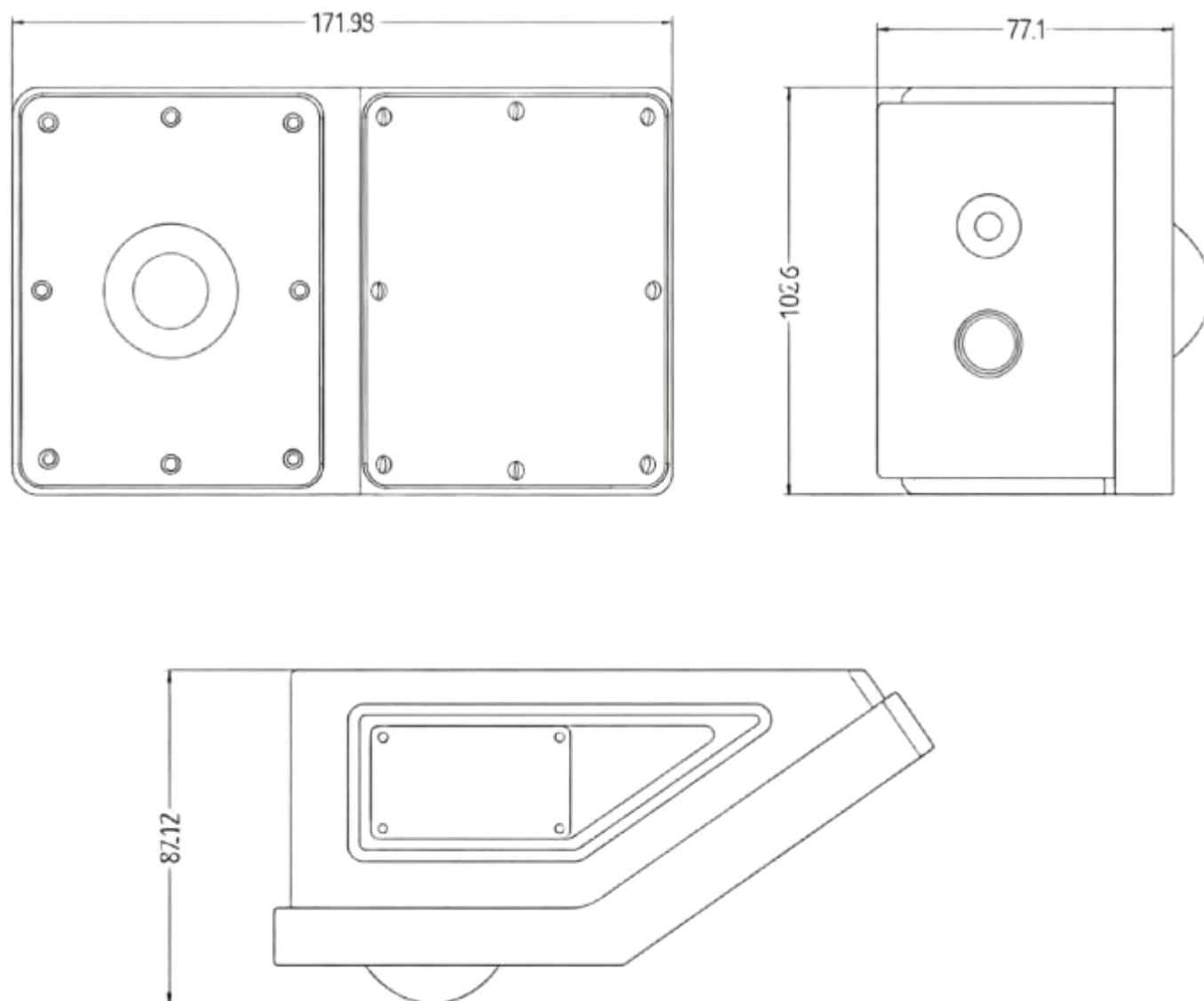
Supports Modbus-RTU protocol for easy system integration.

Supports Bluetooth debugging via mobile phone, facilitating on-site maintenance.

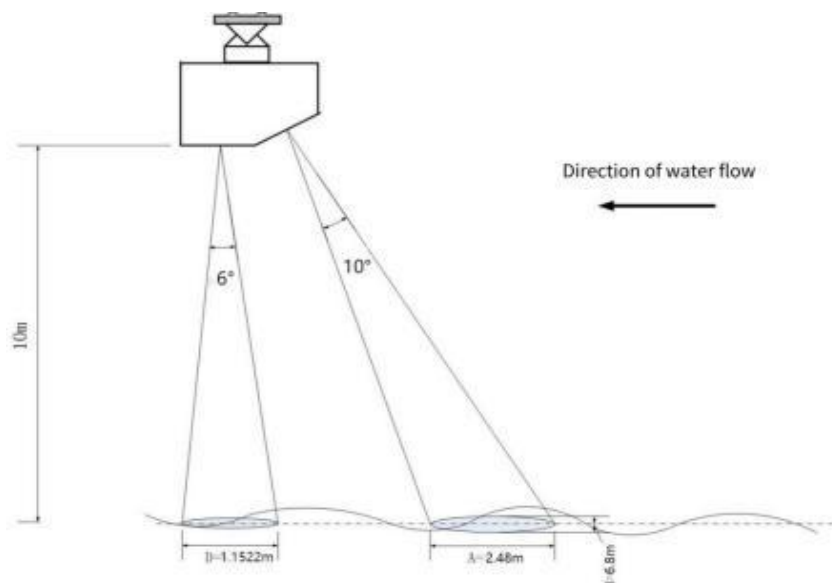
2. Technical Specifications

Speed Measurement Range	0.05 m/s ~40m/s
Speed Measurement Accuracy	± 0.01 m/s (Radar simulator calibration)
Resolution	1mm/s
Speed Measurement Pitch Angle (Automatic Compensation)	0° - 80°
Speed Measurement Antenna Beam Angle	10°*27°
Distance Measurement Blind Zone	20cm
Maximum Distance Range	65m
Distance Measurement Accuracy	± 1mm
Distance Measurement Antenna Beam Angle	6 °
Power Supply Range	7~28VDC
Measurement Time	0.5~2.5s
Start-up Time	<2s
Operating Current	The current is approximately 120mA during normal continuous operation at 12V.
Communication Interface	RS485(Baud rate) 、 Bluetooth (5.2)
Communication Protocol	Modbus (9600/115200)
Operating Temperature	-40-85 °
Housing Material	Aluminum alloy, PBT
Dimensions (mm)	171.58×77.12×87.12
Protection Rating	IP68
Installation Method	Bracket
Surge Protection	6000V

3. Dimension Drawing



4. Installation

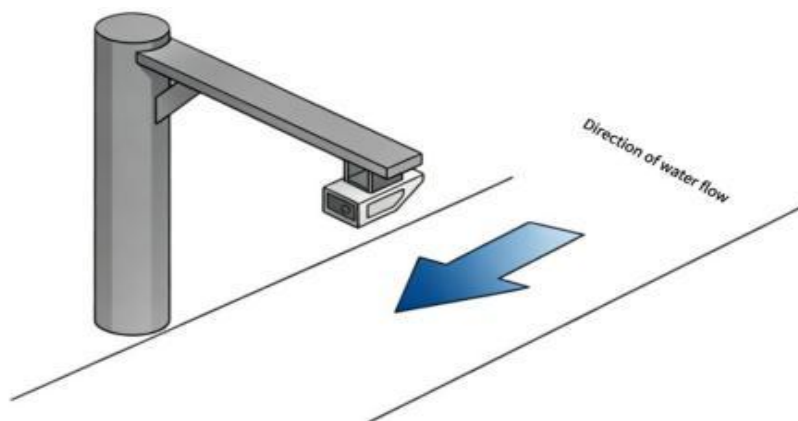


4.1 The diagram above shows the beam angles and illumination positions of the radars used to measure water level and flow velocity in the flow meter. The radar beam for measuring water level is perpendicular to the water surface with a beam angle of 6° , while the radar beam for measuring flow velocity is tilted at 45° to the water surface with a beam angle of $10^\circ \times 27^\circ$. During installation, obstructions should be avoided within the radar beam range.

Antenna beam illumination surface parameter values (1 meter)

Name	Length (m)
Flow meter A	0.248
Flow velocity gauge B	0.68
Water level gauge diameter D	0.115

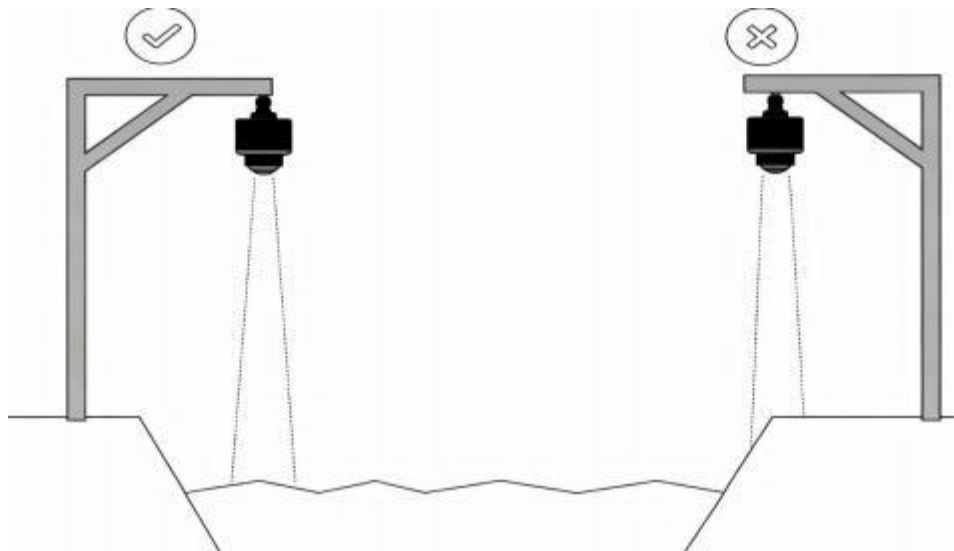
4.2 When installing the flow meter, it should be installed horizontally and preferably against the flow. The measurement signal is clearer and the measurement is more accurate when installed against the flow than with the flow. When the water flow being measured is only against the flow, set the "Measurement Liquid Flow Direction" of the flow velocity radar to "Counter the flow". Such installation and setting can not only make the measurement signal clearer and more accurate, but also minimize the interference from rain, snow and other factors.



4.3 The closer the radar installation location is to the riverbank, the more susceptible it is to interference from factors such as aquatic plants and the riverbank itself.

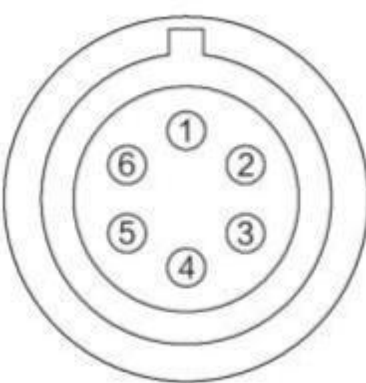
It is recommended that the radar installation location be as close to the center of the river as possible.

To ensure the reliability of water level measurement results, interference in the radar beam should be minimized, such as from the riverbank, walls, and protruding objects.



5. Wiring



	Wire sequence	sequence	Note
	Red	1	Positive pole of power supply
	Blue	2	Negative pole of power supply
	Yellow	3	RS485B
	Green	4	RS485A
Power supply voltage 7-28VDC			
The grounding mounting hole on the casing must be connected to the earth; this is crucial for lightning protection. Without this connection, the equipment will lack lightning protection.			

When connecting the connector to the female socket on the radar via the aviation connector, align the marked points on the interface and the plug, and firmly push it in with your fingers. A "click" sound indicates correct insertion. To remove the plug, hold the anti-slip groove with your hand and pull outwards to remove it.

6. Operation Method

6.1 Operating via Bluetooth Wireless Technology

Scan the QR code below with your smartphone to install (Radar Tools)

Or, for Apple phones, search for (Radar Tools) in the App Store and download it

Or, for Android phones, open the link (<http://jubo.jingyuyang.club>) to download it.

The effective Bluetooth transmission range is 12m. Transmission range depends on environmental conditions, such as fixed installations, walls, or ceilings.

To operate via the Radar Tools app, you must download the Radar Tools app to your mobile device.



Installation successful and launch the Radar Tools app.

Android devices: Enable location information (GPS) (not required for iOS devices).

Select the device to connect from the device selection list.

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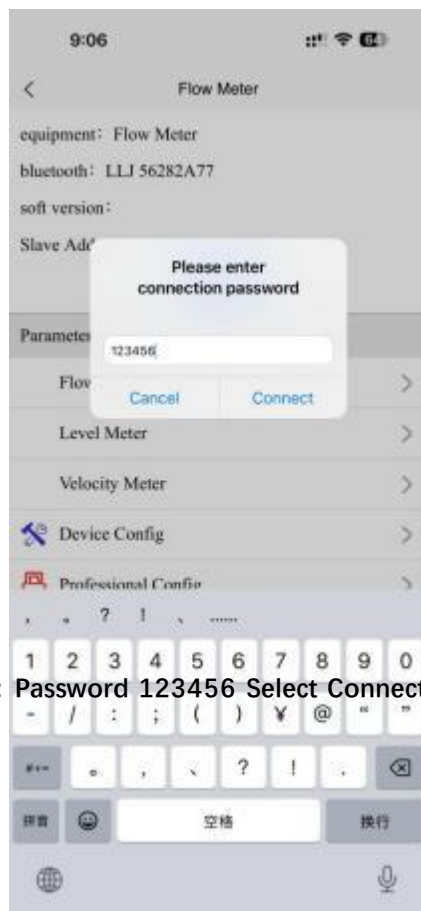
After successful connection, you can set the meter parameters.



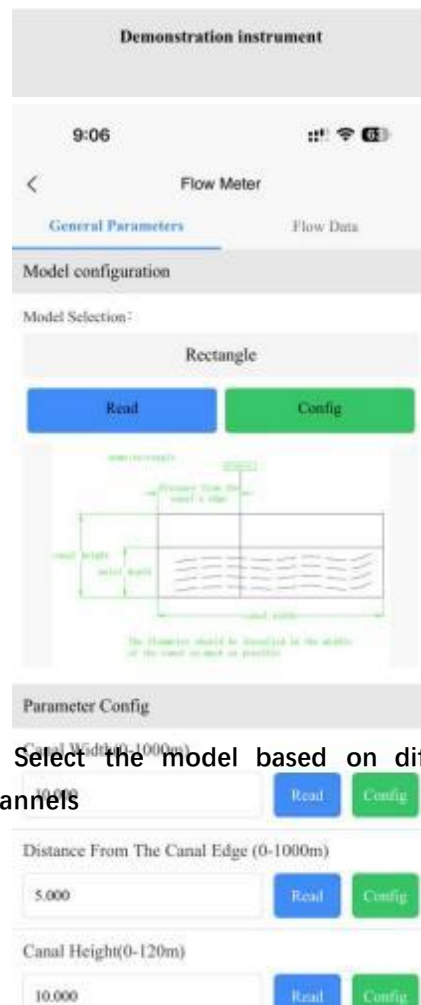
1. Select the flow meter. Android devices: Enable location information (GPS) (not required for iOS devices).



2: Click to connect via Bluetooth



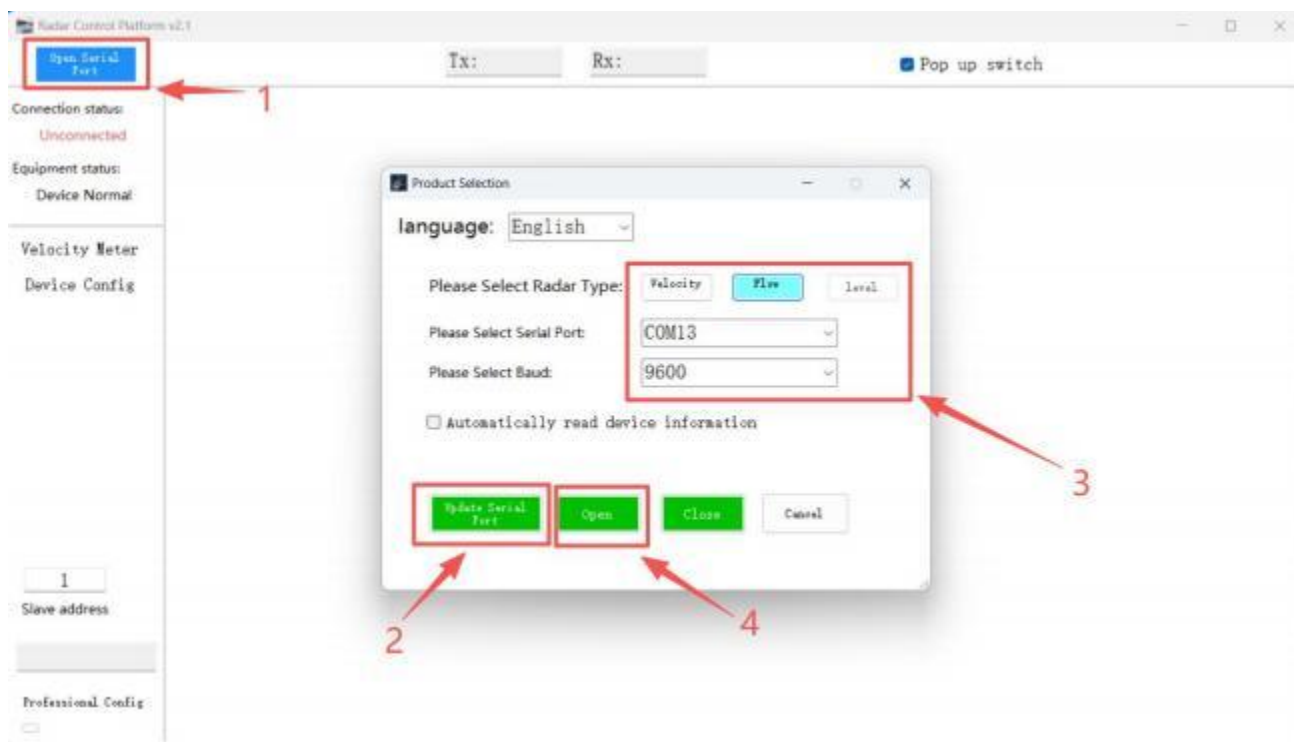
3: Password 123456 Select Connection



4: Select the model based on different channels

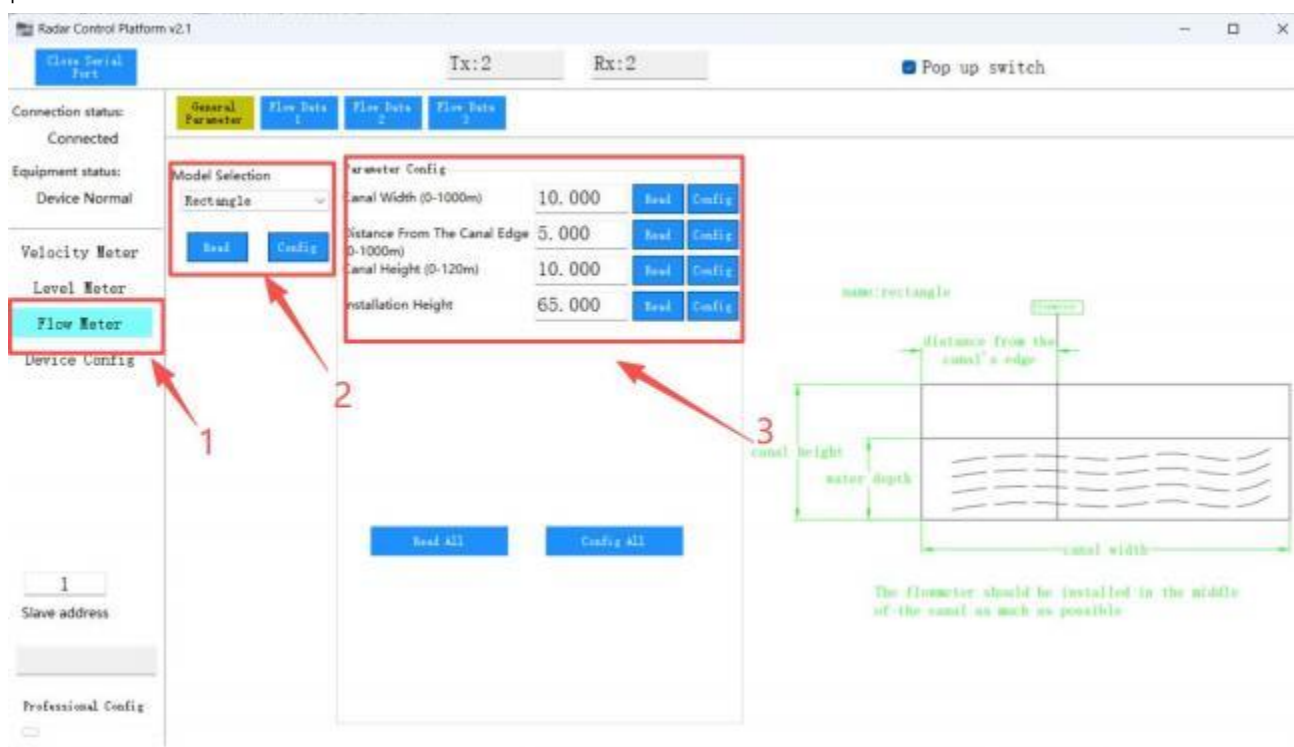
6.2 PC Host Computer User Manual

Open the host computer, select the corresponding device, and select the corresponding port baud rate to enter the host computer. See the image below for an example.

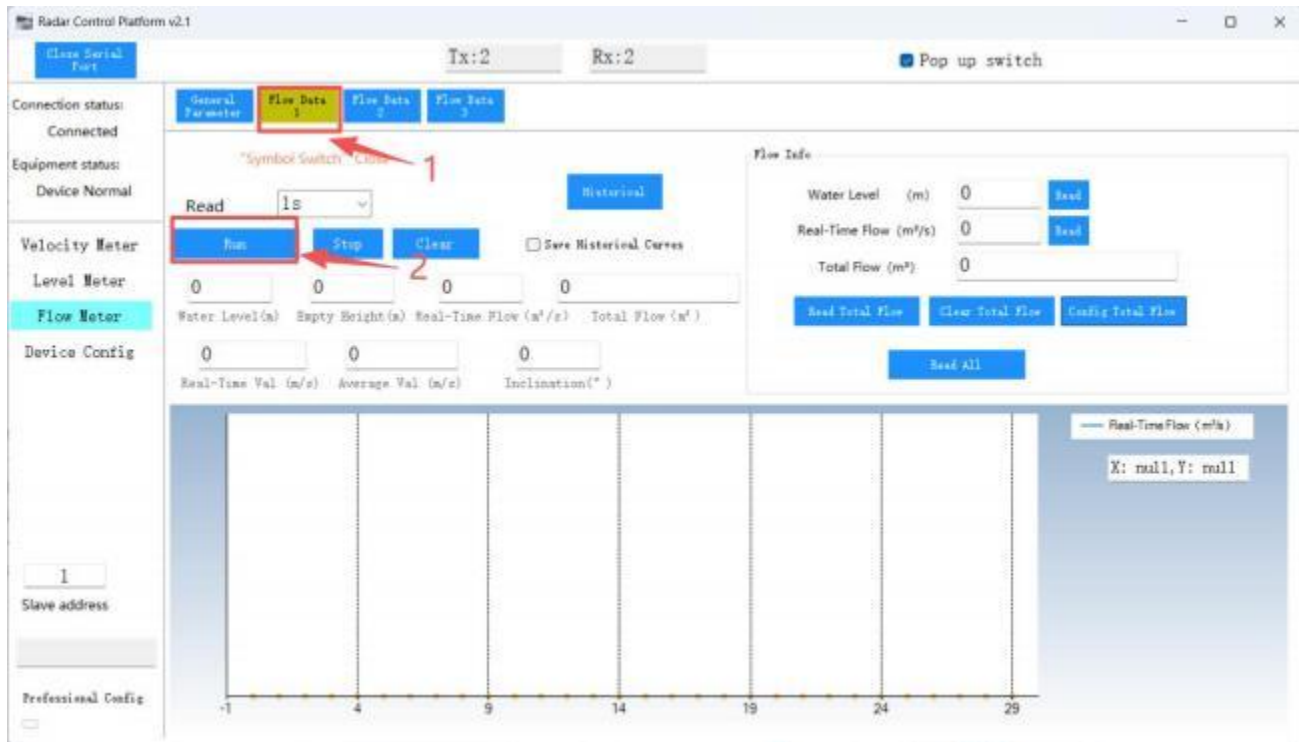


6.3 Basic Setting Parameters

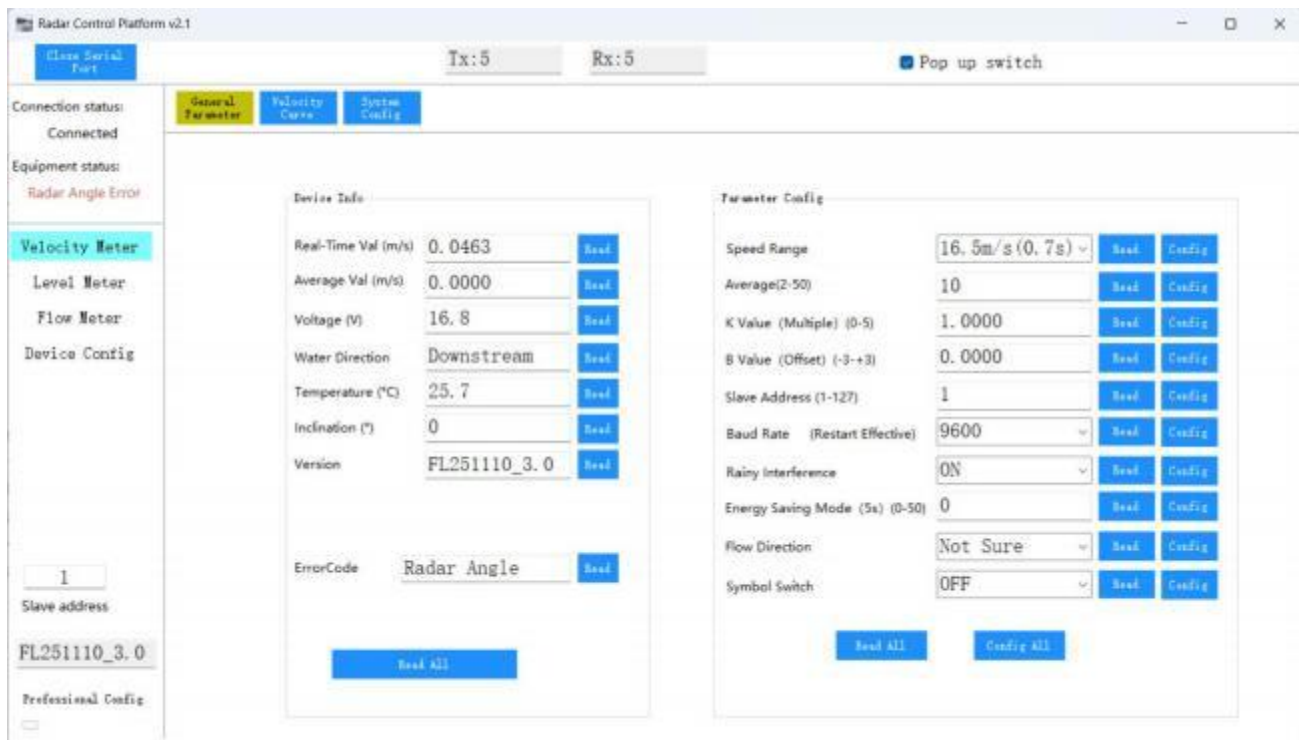
After selecting the flow meter and choosing the appropriate model for the river channel, set the cross-sectional parameters.



After setting the cross-sectional parameters, read the measured values.



Flow rate settings interface



6.3.1 Flow rate related settings

Speed range

Parameter Name	Speed range
Parameter Range (m/s)	0~66
Default Value (m/s)	16.5
Option Meaning	Choosing the appropriate speed setting helps improve measurement accuracy. When the water flow speed exceeds the optimal measurement range of the corresponding speed setting, the measurement accuracy will decrease slightly, but it will not affect the overall use. The default setting is 16.5 m/s, which has the widest applicability.
Special Notes	This parameter does not refer to the instrument's near and far measurement limits; it is only used to define the algorithm's range.

Number of average speeds

Parameter Name	Average speed times
Parameter Range	2~50
Default Value	20
Option Meaning	The moving average algorithm is used to calculate the "average measurement speed" by accumulating the number of "real-time measurement speeds". The larger this value is set, the more stable the "average measurement speed" will be. The larger this value is set, the stronger the anti-interference ability will be.
Special Notes	When there is no water flow and the test environment is noisy, the measured real-time velocity varies greatly. When this value is set to a larger value, the average measured velocity is more likely to remain at 0 when there is no water or the water is not flowing.

Offset slope K value

Parameter name	Offset slope K value
Parameter range	1~5
Default value	1
Option meaning	The compensation value used to correct for instantaneous flow velocity.
Special matters	The K value represents a multiple relationship.

Offset slope B value

Parameter Name	Offset slope B value
Parameter Range (m/s)	-3~+3
Default Value (m/s)	0
Option Meaning	The compensation value used to correct for instantaneous flow velocity.
Special Notes	The B value is an additive or subtractive relationship.

Rainy weather interference

Parameter Name	Rainy day interference
Parameter Range	on/off

Default Value	turn on
Option Meaning	Enabling the rain interference option can significantly reduce the impact of rain on downstream measurements (rain does not affect upstream measurements).
Special Notes	Enabled by default.

Energy Saving Mode

Parameter Name	Energy saving mode
Parameter Range	0~50
Default Value	0
Option Meaning	After completing a measurement, the device can shut down a portion of the circuitry to significantly reduce power consumption, and then restart the circuitry for measurement after a wait of (set value * 5 seconds).
Special Notes	The default value is 0, which means it does not save energy.

Measurement direction

Parameter Name	Measurement direction
Parameter Range	Uncertainty/With the Current/Against the Current
Default Value	Uncertain
Option Meaning	When "Uncertain" is selected, the device will automatically determine the flow direction of the liquid being measured; when "Co-current" is selected, the device will only measure objects or liquids moving in the same direction as the liquid, so that objects or liquids moving against the flow will not interfere with the measurement.
Special Notes	When installing, prioritize installation in the opposite direction of the flow.

6.3.2 Water level related settings

Range Setting

Parameter Name	Range setting
Parameter Range	0-65m
Default Value	31m
Option Meaning	Read and set the range of the water level sensor in the flow meter. When setting it, the range should be 1 meter larger than the lower adjustment range.
Special Notes	When setting it, it should be 1 meter larger than the lower adjustment.

Low-level adjustment

Parameter Name	low adjustment
Parameter Range	0-65m
Default Value	30 m
Option Meaning	Reading and setting the low-level adjustment of the water level sensor in the flow meter can be understood as the installation height.
Special Notes	The low-level adjustment of the water level gauge = water depth + empty height, where empty height is the distance between the water surface

	measured by the water level sensor and the flow meter.
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High-level adjustment

Parameter Name	High adjustment
Parameter Range	0-65 m
Default Value	0 m
Option Meaning	This function is not required and should be set up as a reserved feature.
Special Notes	This function is not required and should be set up as a reserved feature.

Blind Spot Range

Parameter Name	Blind area range
Parameter Range	0-65m
Default Value	0.2m
Option Meaning	Read and set the blind zone range of the water level sensor in the flow meter.
Special Notes	Set a range of meters below the probe where no object will be measured.

Distance offset

Parameter Name	Distance offset
Parameter Range	-10~10m
Default Value	-0.06m
Option Meaning	Set a distance offset to correct the deviation between the ideal measurement value and the actual measurement value.
Special Notes	Set a range of meters below the probe where no object will be measured.

6.3.3 Traffic-related settings

Flow meters require certain parameters of the water channel to be preset for accurate calculations. If you are using a flow meter to monitor a trapezoidal channel, the following parameters are required.

Parameter Config

Canal Top Width (0-1000m)	0.000	Read	Config
Canal Bottom Width (0-1000m)	0.000	Read	Config
Canal Height (0-120m)	0.000	Read	Config
Distance From The Canal Edge (0-1000m)	3.000	Read	Config
Installation Height	0.000	Read	Config

Read All

Config All

name:trapezium

distance from the canal's edge

canal top width

canal height

water depth

canal bottom width

canal top width/canal bottom width
The flowmeter should be installed in the middle of the canal as much as possible.

If the flow meter is used to monitor a rectangular channel, the following parameters are required.

Parameter Config

Canal Width (0-1000m)	0.000	Read	Config
Distance From The Canal Edge (0-1000m)	0.000	Read	Config
Canal Height (0-120m)	0.000	Read	Config
Installation Height	0.000	Read	Config

Read All

Config All

name:rectangle

Flowmeter

distance from the canal's edge

canal height

water depth

canal width

The flowmeter should be installed in the middle of the canal as much as possible

If the flow meter is used to monitor rectangular-trapezoidal channels, the following parameters are required.

Parameter Config

Canal Top Width (0-1000m)	0.000	Read	Config
Canal Bottom Width (0-1000m)	0.000	Read	Config
Canal Top Height (0-120m)	0.000	Read	Config
Canal Bottom Height (0-120m)	0.000	Read	Config
Distance From The Canal Edge (0-1000m)	0.000	Read	Config
Installation Height	0.000	Read	Config

Read All

Config All

name:rectangle-trapezium

Flowmeter

distance from the canal's edge

canal top width

canal top height

water depth

canal bottom height

canal bottom width

canal top width:canal bottom width
The flowmeter should be installed in the middle of the canal as much as possible

If the flow meter is used to monitor U-channel, the following parameters are required.

Parameter Config

Canal Width (0-1000m)

0.000

Read

Config

Canal Height (0-120m)

0.000

Read

Config

Installation Height

0.000

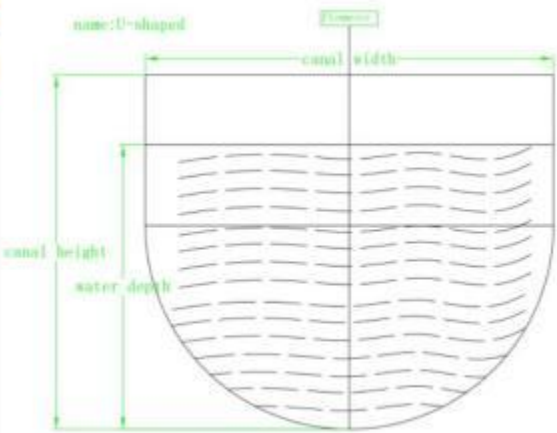
Read

Config

Read All

Config All

name:U-shaped



The flowmeter should be installed in the middle of the canal

If the flow meter is used to monitor irregularly shaped channels, the following parameters are required.

Read All

Config All

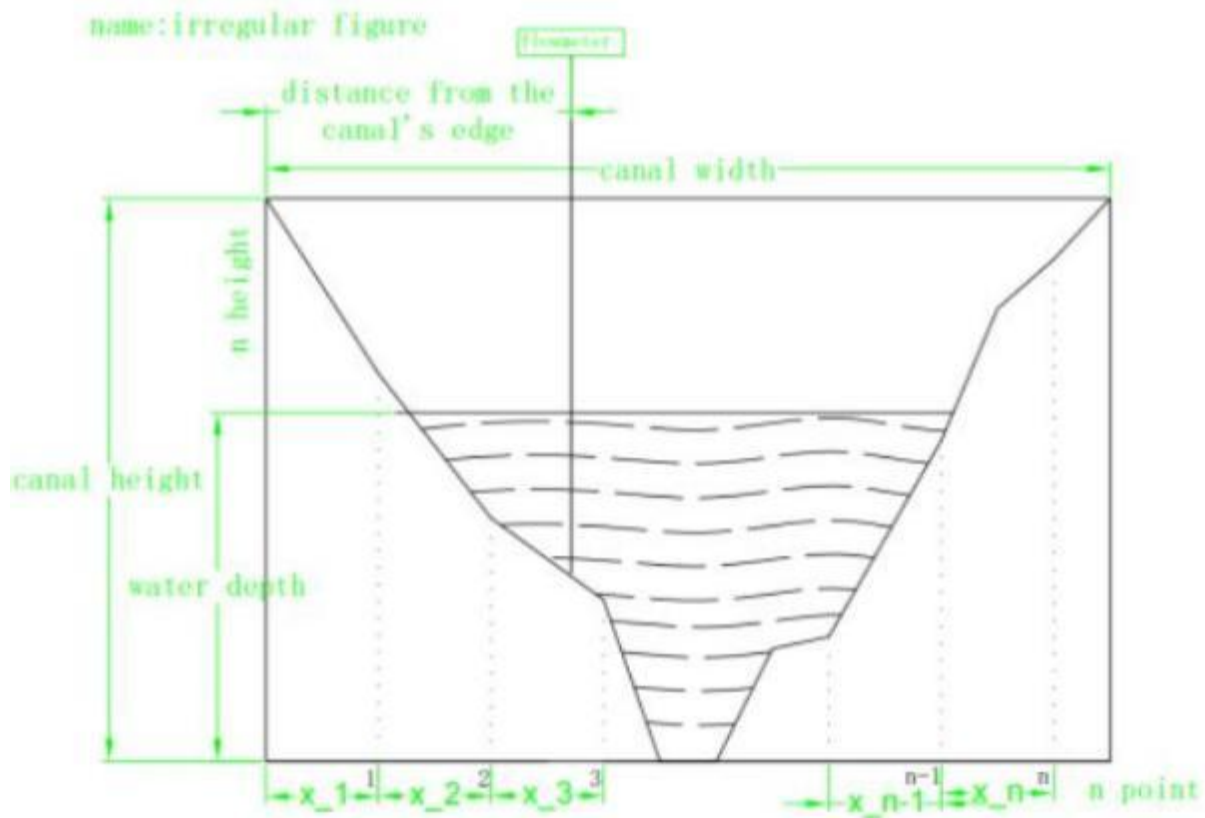
Number Of N Points (5-100) 5

High (m) Using symbols "H"

Width (m) Using symbols "X"

Range Selection 1-30

H1: 0.000	H2: 0.000	H3: 0.000	H4: 0.000	H5: 0.000	H6: 0.000	H7: 0.000	H8: 0.000
X1: 0.000	X2: 0.000	X3: 0.000	X4: 0.000	X5: 0.000	X6: 0.000	X7: 0.000	X8: 0.000
H9: 0.000	H10: 0.000	H11: 0.000	H12: 0.000	H13: 0.000	H14: 0.000	H15: 0.000	H16: 0.000
X9: 0.000	X10: 0.000	X11: 0.000	X12: 0.000	X13: 0.000	X14: 0.000	X15: 0.000	X16: 0.000
H17: 0.000	H18: 0.000	H19: 0.000	H20: 0.000	H21: 0.000	H22: 0.000	H23: 0.000	H24: 0.000
X17: 0.000	X18: 0.000	X19: 0.000	X20: 0.000	X21: 0.000	X22: 0.000	X23: 0.000	X24: 0.000
H25: 0.000	H26: 0.000	H27: 0.000	H28: 0.000	H29: 0.000	H30: 0.000		
X25: 0.000	X26: 0.000	X27: 0.000	X28: 0.000	X29: 0.000	X30: 0.000		

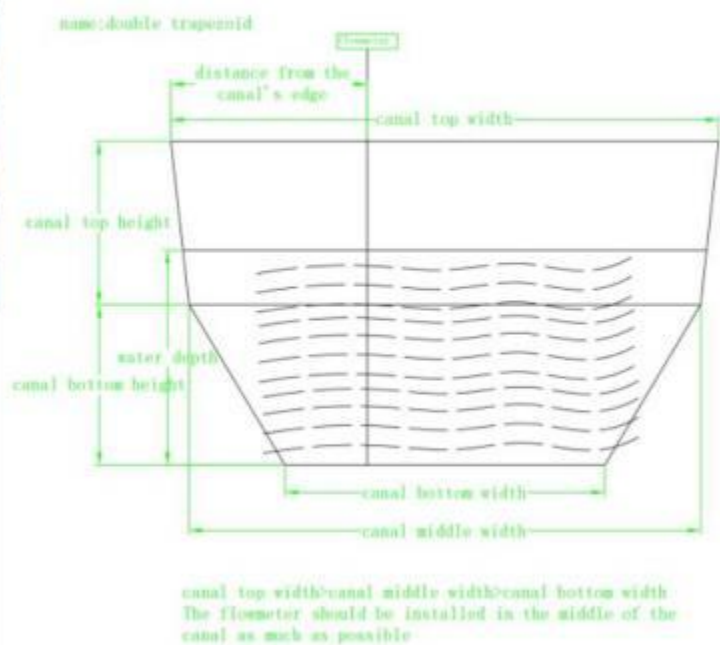


If the flow meter is used to monitor a double trapezoidal channel, the following parameters are required.

Parameter Config:

Canal Top Width (0-1000m)	0.000	Read	Config
Canal Middle Width (0-1000m)	0.000	Read	Config
Canal Bottom Width (0-1000m)	0.000	Read	Config
Canal Top Height (0-120m)	0.000	Read	Config
Canal Bottom Height (0-120m)	0.000	Read	Config
Distance From The Canal Edge (0-1000m)	0.000	Read	Config
Installation Height	0.000	Read	Config

Read All Config All



7. Historical Versions

Manual version	Release date	Update description
V1.1	2025.4.23	