

Flow meter instruction manual



1. Product introduction

Radar flow meters use radar to measure water velocity and level, converting the flow rate into an integral model. They provide real-time flow measurement around the clock, and their non-contact measurement is less susceptible to environmental influences. They also offer a bracket for mounting.

The product's key advantages are as follows:

Non-contact measurement based on hybrid-band radar. Simultaneous output of flow velocity, level, and flow rate without interference. Low maintenance and unaffected by sediment.

IP68 waterproof design, suitable for a variety of field environments and even extreme weather conditions.

Compact design, highly cost-effective.

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

Supports Modbus-RTU protocol for easy system integration.

Supports mobile Bluetooth debugging, facilitating on-site maintenance.

1.1 Technical Specifications

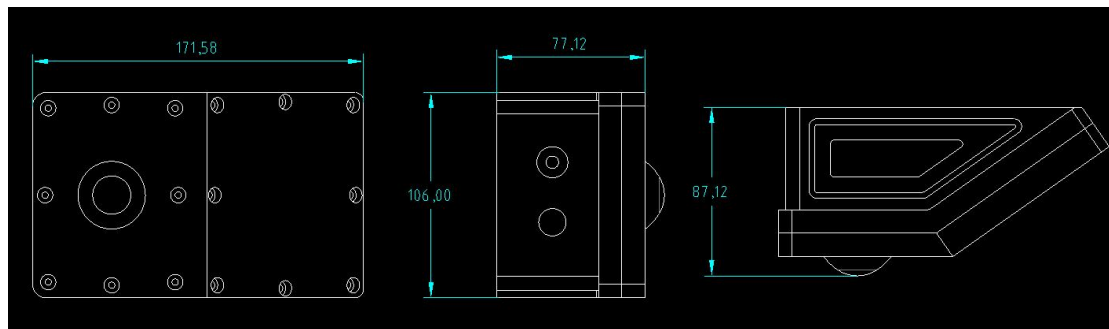
Speed range	0.05 m/s ~40m/s
Speed measurement accuracy	±0.01m/s (Radar simulator calibration)
Resolution	1mm/s
Speed measurement pitch angle (automatic compensation)	0° - 80°
Speed measurement antenna beam angle	10°*27°
Ranging blind spot	20cm
Maximum ranging range	65m
Ranging accuracy	±1mm
Ranging antenna beam angle	6°
Power supply range	7~28VDC
Measurement time	0.5~2.5s
Start time	<2s
Working current	When 12V is working normally and continuously, the current is about 120mA
Communication interface	RS485 (baud rate)、Bluetooth (5.2)
Communication protocol	Modbus (9600/115200)
working temperature	-40-85°
Shell material	Aluminum alloy,PBT
Dimensions (mm)	171.58×77.12×87.12
Protection level	IP68
Installation method	Bracket
Anti-surge	6000V

1.2 Wiring

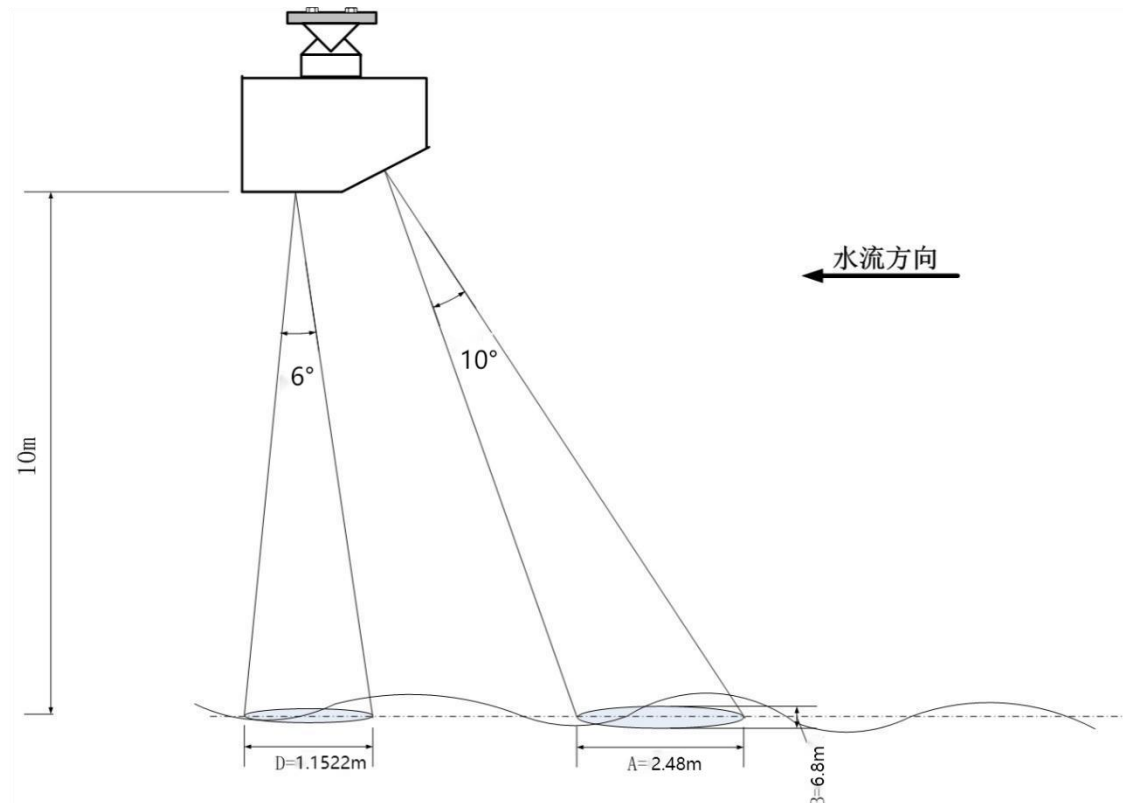


No.	Color	Definition
1	Red	Positive pole of power supply
2	Blue	Power ground wire
3	Green	RS485A(+)
4	Yellow	RS485B(-)
5	The ground wire installation hole of the shell must be connected to the ground, which is very important for lightning protection. If it is not connected, the device will have no lightning protection function.	

1.3 Flow meter dimensions



2. Precautions when installing the flow meter



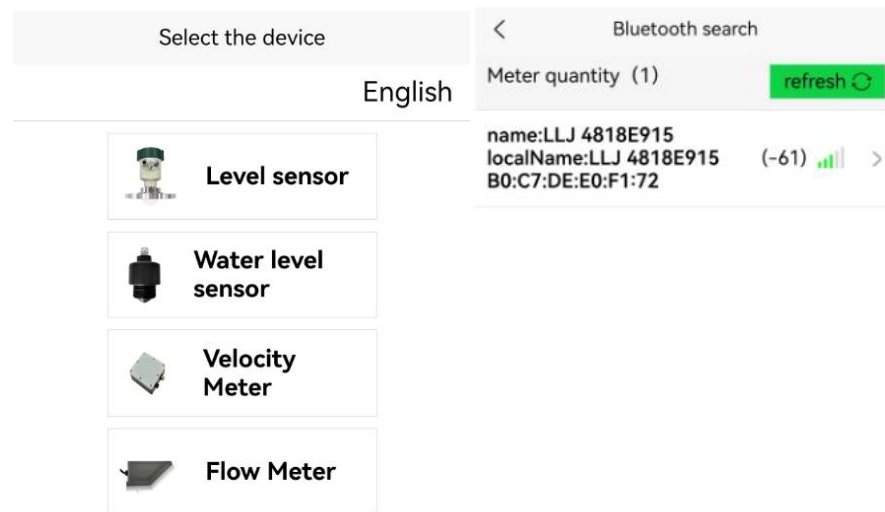
Antenna beam illumination surface parameter values (1 meter)

Name	Length (m)
Flowmeter A	0.248
Flowmeter B	0.68
Water level gauge diameter D	0.115

1. The two figures above illustrate the beam angles and locations of the flowmeter's water level and velocity radars. The water level radar beam shines perpendicularly onto the water surface at a 6° beam angle. The velocity radar beam shines at a 45° angle, with a 10° x 27° beam angle. Avoid obstructions within the radar beam during installation.
2. When installing the flowmeter, install it upstream whenever possible. This provides clearer and more accurate measurement signals than downstream installation. If the flow being measured is only upstream, set the "Measure Liquid Flow Direction" setting on the velocity radar to "Upstream." This installation and configuration not only ensures a clearer and more accurate measurement signal, but also minimizes interference from rain, snow, and other factors.

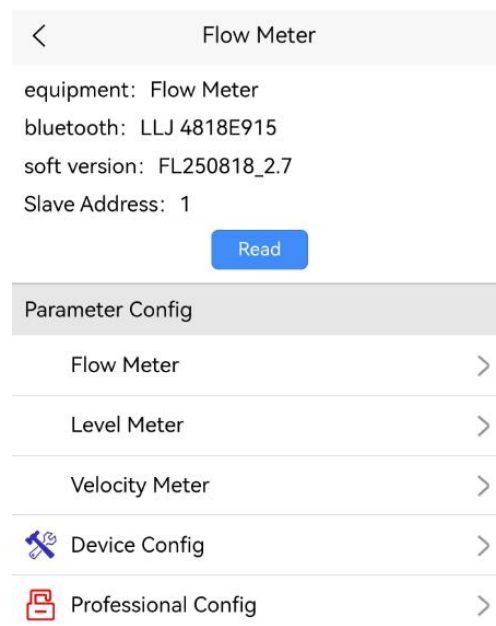
3. Bluetooth APP Instructions

After opening the APP, select the flow meter software and you will find the LLJ xxxx name, which is the flow meter. Click it and enter the password 123456



Demonstration instrument

After entering, as shown below, select flow to set parameters and view measurement data



First, set the open channel parameters. After setting, remember to reset the accumulated flow and start counting again.

<

Flow Meter

General Parameters

Flow Data

Model configuration

Model Selection:

Rectangle

Read

Config

name:rectangle

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

Parameter Config

Canal Width(0-1000m)

Please enter a value (keep 3 de

Read

Config

Distance From The Canal Edge (0-1000m)

Please enter a value (keep 3 de

Read

Config

Canal Height(0-120m)

Please enter a value (keep 3 de

Read

Config

<

Flow Meter

General Parameters

Flow Data

Flow Meter

Water Level(m)

Please enter a value (keep 3 decimal plac

Read

Real-Time Flow(m³/s)

Please enter a value (keep 3 decimal plac

Read

Total Flow(m³)

Please enter a value (keep 3 decimal plac

Read

Read All

Clear Total

Config Total

Flow curve

Read interval:

1s

Start

Stop

Clear

Water Level(m):

--

Empty Height(m):

--

Real-Time Flow(m³/s):

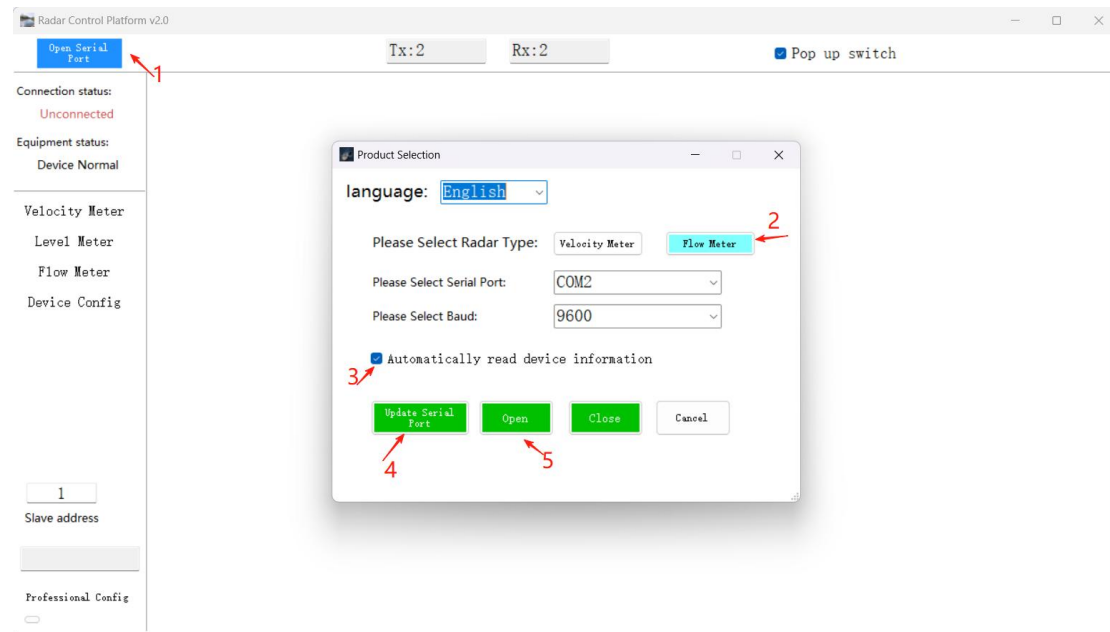
--

Real-Time Val(m/s):

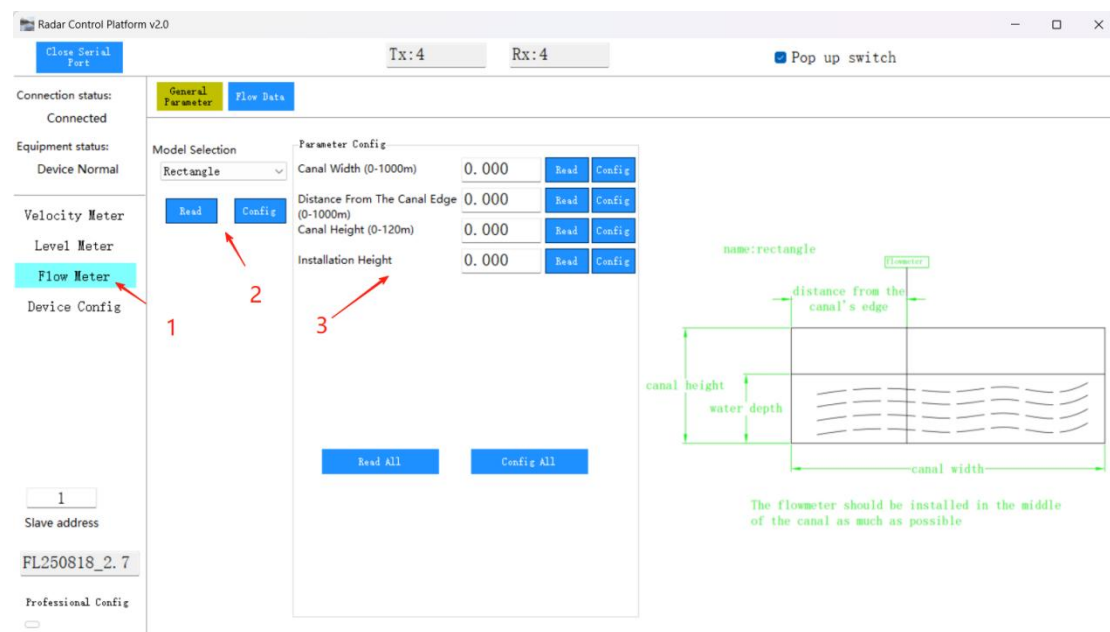
--

4. PC host computer instructions

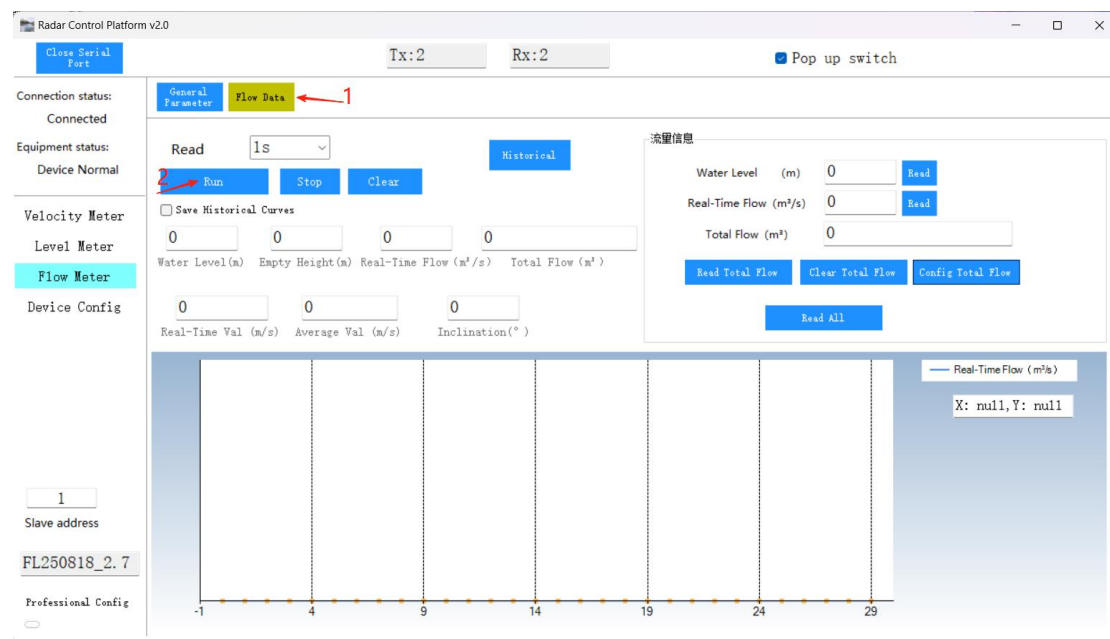
1. Open the host computer and select the corresponding device, then select the corresponding port baud rate to enter the host computer. For example, see the figure below.



2. Select the flow meter and choose different models according to the river channel and set the cross-section parameters.



3. After setting the section parameters, read the measured values.



[Speed Range] Please refer to the table below for specific meaning.

Parameter name	Speed Range
Parameter range (m/s)	0~66
default value (m/s)	16.5
Option meaning	Selecting the appropriate gear helps to improve measurement accuracy. When the water flow rate exceeds the optimal measurement range of the corresponding gear, the measurement accuracy decreases slightly, but it does not affect the overall use. The default is generally 16.5m/s, which has the widest range of application.
Special matters	This parameter does not refer to the instrument's near-far measurement limit, but is only used to limit the algorithm area.

[Average speed times] For specific meanings, please refer to the table below.

Parameter name	Average speed times
Parameter range	2~50
default value	20
Option meaning	The number of "real-time measurement speed" accumulated when calculating the "average measurement speed" using the sliding average algorithm. The larger this value is set, the smoother the "average measurement speed" is. The larger this value is set, the stronger the anti-interference ability is.
Special matters	When there is no water flow and the test environment is noisy, the measured real-time speed varies greatly. When this value is set to a larger value, the average measured speed is more likely to remain at 0 when there is no water or the water is not flowing.

[Offset slope K value] For specific meaning, please refer to the table below.

Parameter name	Offset slope K value
Parameter range	1~5
default value	1
Option meaning	Compensation value for correcting instantaneous flow rate.
Special matters	The K value is a multiple relationship.

[Offset slope B value] For specific meaning, please refer to the table below.

Parameter name	Offset slope B value
Parameter range (m/s)	-3~+3
default value (m/s)	0
Option meaning	Compensation value for correcting instantaneous flow rate.
Special matters	The B value is an addition and subtraction relationship.

[Rainy Day Interference] For specific meanings, please refer to the table below.

Parameter name	Rainy Day Interference
Parameter range	on/off
default value	On
Option meaning	When the rain interference option is turned on, the impact of rain on downstream measurements can be greatly reduced (rain has no effect on upstream measurements).
Special matters	Enabled by default.

[Energy saving mode] Please refer to the table below for specific meanings.

Parameter name	Energy saving mode
Parameter range	0~50
default value	0
Option meaning	After completing a measurement, the device can shut down part of the circuit to significantly reduce power consumption, and then turn on the circuit for measurement after waiting (set value * 5s).
Special matters	The default value is 0, which means no energy saving.

[Measurement Direction] For specific meaning, please refer to the table below.

Parameter name	Measurement direction
Parameter range	Uncertain/Upstream/Upstream
default value	uncertain
Option meaning	When "Uncertain" is selected, the device will automatically determine the flow direction of the measured liquid; when "Downstream" is selected, the device only measures objects or liquids moving in the downstream direction, so that objects or liquids moving in the countercurrent direction will not interfere with the measurement.

Special matters	When installing, it is preferred to install in the countercurrent direction.
-----------------	--

[Range Setting] Please refer to the table below for specific meanings.

Parameter name	Range Setting
Parameter range	0-65m
default value	31m
Option meaning	Read and set the measuring range of the water level gauge in the flow meter. The setting should be 1 meter larger than the low adjustment.
Special matters	The setting should be 1 meter larger than the low adjustment.

[Low-level adjustment] Please refer to the table below for specific meanings.

Parameter name	low adjustment
Parameter range	0-65m
default value	30m
Option meaning	Read and set the low adjustment of the water level gauge in the flow meter, which can be understood as the installation height.
Special matters	The low position adjustment of the water level gauge = water depth + air height, and the air height is the distance between the water surface measured by the water level gauge and the flow meter.

[High-level adjustment] Please refer to the table below for specific meanings.

Parameter name	High-level adjustment
Parameter range	0-65m
default value	0m
Option meaning	This function has no effect and does not need to be set. It is a reserved function.
Special matters	This function has no effect and does not need to be set. It is a reserved function.

[Blind area range] For specific meanings, please refer to the table below.

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 gauge in the flow meter.
Special matters	Set the number of meters below the probe so that any objects in this range will not be measured.

[Distance Offset] For specific meanings, please refer to the table below.

Parameter name	distance offset
Parameter range	-10~10m
default value	-0.06m
Option meaning	Setting the distance offset corrects the deviation between the ideal measurement value and the actual measurement value.
Special matters	Factory calibrated and no changes are required.