



PM200 Series Inputting Type Liquid Level Transmitter User Manual (485 type)

Document version:V2.2





Catalog

1. Product instruction	3
1.1 Product overview	3
1.2 Function features	3
1.3 Main technical parameters	4
1.4 Product model	4
2. Product dimension	4
3. Equipment installation instruction	5
3.1 Inspection before installation	5
3.2 Wiring instruction	5
4. Device configuration before use	6
4.1 Software selection	6
4.2 Parameter setting	6
5. Communication protocol	7
5.1 Communication basic parameters	7
5.2 Data frame format definition	7
5.3 Register address	8
5.4 Communication protocol examples and explanations	8
6. Matters need attention	8
7. Common problems and solutions	9
8. Contact information	10
9. Document history	10



1. Product instruction

1.1 Product overview

The front-end protective cap of PM200 series inputting type liquid level can not only protect the sensor diaphragm, but also to make liquid contact with the diaphragm smoothly, what else, waterproof wire and shell be sealing connected, the snorkel in cable connect to the outside world, internal structure with anti-condensation design. Built-in miniature signal processing circuit for remote transmission. It has good stability and reliability. The product is adopted imported diffused silicon chips and low power ADI professional chips combined with microprocessor technology, PM200 series inputting type liquid level transmitter have RS485 communication function, with small size, high precision, light weight, wide range coverage. It is suitable for all industries that need precise measurement of fluid pressure places, and is widely used in industrial process control, petroleum, agriculture, irrigation, Internet of things and other industries.

It can be widely used for liquid level measurement and controlling in water plants, sewage treatment plants, urban water supply, high-rise pools, Wells, geothermal Wells, mines, industrial pools, oil pools, hydrogeology, reservoirs, rivers, oceans and other fields.

1.2 Function features

- Reverse polarity protection and instantaneous over-current and over-voltage protection, meet EMI protection requirements;
- Adopt high quality air cable, can be soaked in water all year round;
- Strong overload and anti-interference ability, economic, practical and stable;
- Adopted the core automatic correction algorithm, can effectively prevent the value fluctuation caused by water surface fluctuation;
- The slope-type liquid guide hole can effectively prevent silt impurities from entering, and can also prevent impact;
- Diffused silicon piezoresistive sensor;
- Probe inputting type measurement method, easy to install;
- Multiple protection structure design, high protection ability;
- Selection of anti-corrosion stainless steel material, suitable for a variety of occasions;
- RS485 signal output, the farthest communication distance can up to 2000 meters;
- 10~30V wide voltage input.



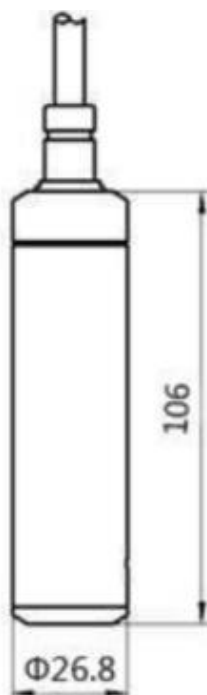
1.3 Main technical parameters

DC power supply(default)	DC 10-30V, typical 24V
Maximum power consumption	0.2W
Transmitter circuit operating temperature and humidity	-20~80°C
Overload capacity	<1.5 times of range
Protection level	IP68
OD dimension	Φ26.8mm
Measuring Media	Stainless steel non-corrosive oil, water, etc. (long time measurement should be ≤60°C)
Sampling time	≤1s
Long-term stability	±0.2%FS/year

1.4 Product model

RK-				Company code
	PM200-			Inputting type liquid level transmitter
		01~99-		Range(99 represent the customized range, other values are the meters of range)
			N01-	485 communication(ModBus-RTU protocol)
			A05	0.5 grade precision(default), can also choose 0.2 grade precision(A02) and 0.1 grade precision(A01)

2. Product dimension



3. Equipment installation instruction

3.1 Inspection before installation

Equipment list:

- 1pc general inputting type liquid level gauge
- Certificate of conformity, warranty card

3.2 Wiring instruction

Red cable: 24VDC V +

Blue cable: 24VDC V-

Yellow cable: RS485 output A

White cable: RS485 output B

Or:

Brown cable: 24VDC V+

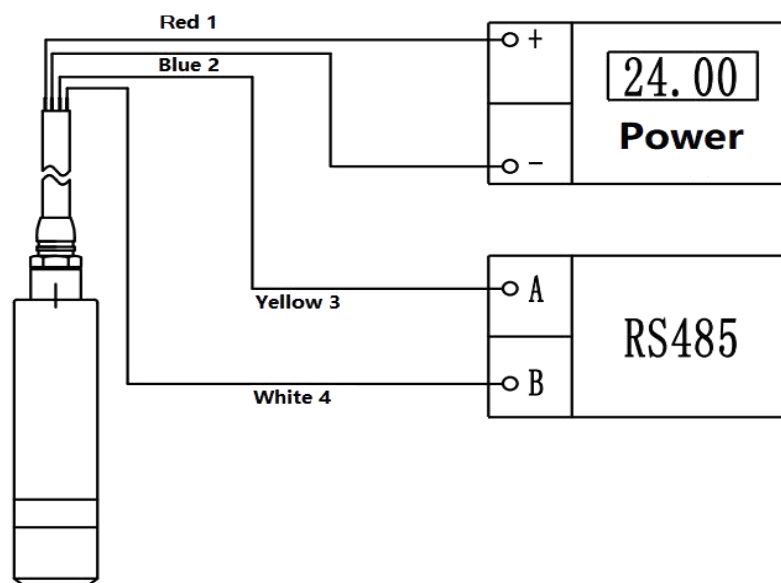
Black cable: 24VDC V-

Yellow: RS485 output A

Blue: RS485 output B

Special Instructions:

- 1) There are certain standard requirements for 485 field wiring, for details, please see the information in package <485 equipment field Wiring Manual>.
- 2) When a device is connected to the 485 bus, ensure that the addresses of multiple devices are not the same.



4. Device configuration before use

4.1 Software selection

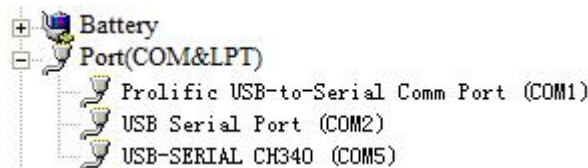
Open the document package, select "Debugging software" -- "485 parameter configuration



software", find and just open it.

4.2 Parameter setting

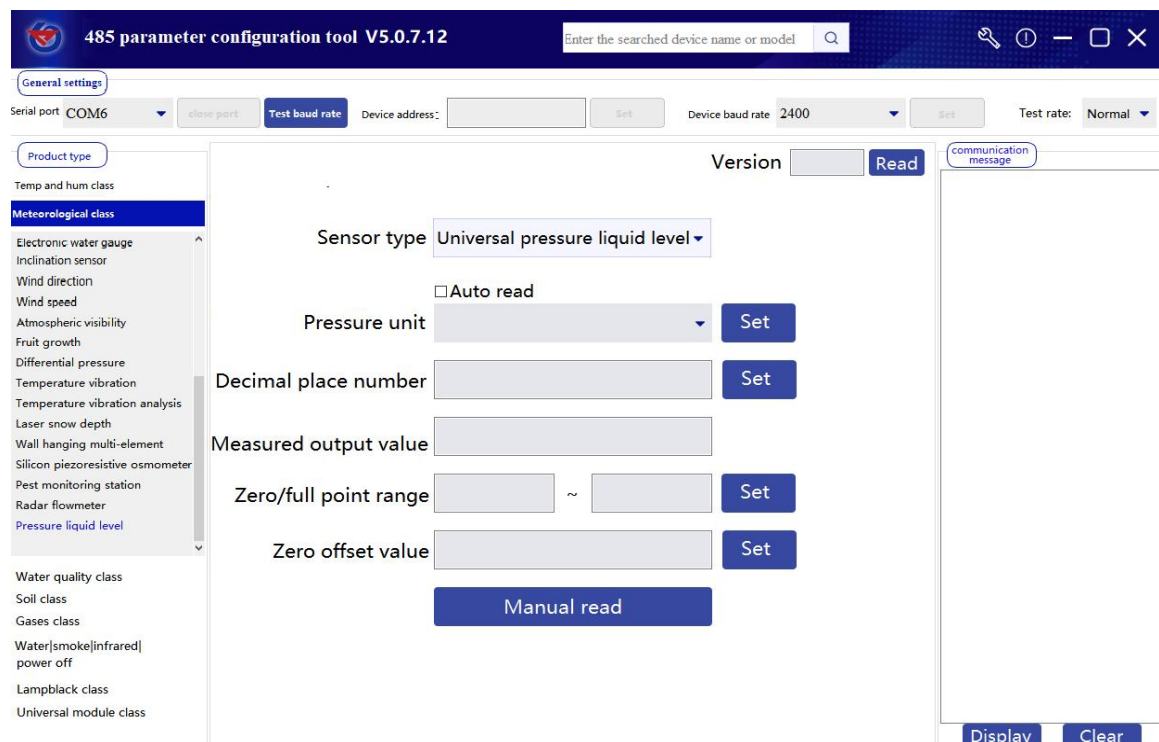
① Select the correct COM port(View COM port in “My computer-Properties-Device Manager-Ports”). Below image lists several kinds of 485 transmitter driver name.



② Connect only one device and power it on. Click the test baud rate of the software. The software will test the baud rate and address of the current device, default baud rate is 4800bit/s, default address is 0x01.

③ You can modify the address and baud rate as required, you can also query the current function status of the device at the same time.

④ If the test is not successful, recheck the device wiring and 485 driver installation status.





5. Communication protocol

5.1 Communication basic parameters

Encode	8-bit binary
Data bit	8-bit
Parity check bit	-
Stop bit	1-bit
Error checking	CRC(Redundant cyclic codes)
Baud rate	1200~115200 can be set, default is 4800

5.2 Data frame format definition

Adopt ModBus-RTU communication protocol, format are listed as below:

Time for initial structure ≥ 4 bytes

Address code=1 byte

Function code=1 byte

Data area=N bytes

Error check=16 bit CRC code

Time to end structure ≥ 4 bytes

Address code: The address of the transmitter, which is unique in the communication network (factory default 0x01).

Function code: The instruction function indication issued by the host. This transmitter uses function codes 0x03 (read register data) and 0x06 (write single register data)

Data area: The data area is specific communication data, please note that the 16bits data high byte in front!

CRC code: two byte Check digit.

Host inquiry frame structure:

Address code	Function code	Register Start Address	Register length	Check code low bit	Check code high bit
1byte	1byte	2bytes	2bytes	1byte	1byte

Slave answer frame structure:

Address code	Function code	Effective Bytes	Data area 1	Second data area	Nth data area	Check Code
1byte	1byte	1byte	2bytes	2bytes	2bytes	2bytes



5.3 Register address

Register address	PLC or configuration address	Content	Support function code
0002 H	40003	Unit type 9 represent m 10 represent cm 11 represent mm	0x03/0x04
0003H	40004	Decimal place number	0x03/0x04
0004H	40005	Measurement output value	0x03/0x04
0005H	40006	Sensor range zero point	0x03/0x04/0x06
0006H	40007	Sensor range full point	0x03/0x04/0x06
000CH	40013	Offset value	0x03/0x04/0x06

5.4 Communication protocol examples and explanations

Read the real-time value of 0x01 device address.

Inquiry frame (hexadecimal):

Address code	Function code	Start address	Data length	Check code low bit	Check code high bit
0x01	0x03	0x00 0x04	0x00 0x01	0xC5	0xCB

Response frame(hexadecimal):(Take range 0~3meters liquid level gauge for example, the decimal place number is 3, the read value is 101)

Address code	Function code	Returns valid bytes number	Real time value	Check code low bit	Check code high bit
0x01	0x03	0x02	0x00 0x65	0x78	0x6F

Actual real-time value calculation:

Real-time value:0065 H(hexadecimal)= 101 => real-time value = 0.101 meter

6. Matters need attention

- Our products are equipped with instructions and certificates, which have technical parameters among them, please check carefully, so as not to use wrong.
- The transmitter can be installed vertically, tilted or horizontally in the tank or groove, be ensured that impurities such as sediment are not buried or blocked in the transmitter probe part.
- When connecting to the power supply, the connection should be strictly in accordance with the wiring instructions of our company, wiring error will cause damage to the amplifier circuit.



- This product is a precision instrument, do not disassemble at will, strictly prevent collision, fall, do not touch the sensor diaphragm with sharp objects or other foreign bodies, which will resulting in core damage.
- When the medium fluctuates greatly, measures should be taken to fix the transmitter probe part, such as adding counterweight to the transmitter.
- The air guide cable has a key atmospheric compensation effect, when assemble it, should avoid to lock it tightly or too sharp angle bending, to prevent the airway obstruction. The air guide pipe outlet should face down, to prevent rain blockage. Need to prevent wear, punctured, scratched wire during usage, if such problems caused equipment failure, need to return the device to our company for repairing and treatment, the cost is at your own expense.
- Any problems occurs during installation process, please contact us. Do not open without authorization for maintenance, wiring errors, sensor diaphragm damage and other human factors are not within the scope of warranty.

7. Common problems and solutions

The device cannot be connected to a PLC or computer

Possible reasons:

- 1) The computer has multiple COM ports, and the selected port is incorrect.
- 2) The device address is incorrect, or there are devices with duplicate addresses (ex-factory default is all 1).
- 3) Baud rate, check mode, data bit, stop bit error.
- 4) The 485 bus is disconnected, or wires A and B are connected in reverse.
- 5) If there are too many devices or the wiring is too long, power should be supplied to the nearby area, with a 485 booster and a 120 Ω terminal resistor added.
- 6) USB to 485 driver does not installed or damaged.



8. Contact information

Shandong Renke Control Technology Co., Ltd.

10th Floor, East Block, No.8 buildings, Shuntai Plaza, High-tech Zone, Jinan City, Shandong Province, China

Post code:250101

Phone:400-085-5807

Fax:(86)0531-67805165

Website:www.renkeer.com

Cloud platform address: en.0531yun.com



Shandong Renke Control Technology Co.,Ltd

Official website



Welcome to pay attention to the WeChat public platform,enjoy convenient service

9. Document history

- | | |
|------|---|
| V1.0 | Document establishment |
| V2.0 | Revise the maximum power consumption; revise the register address content |
| V2.1 | Revise the equipment installation wiring description |
| V2.2 | Revise the register content |