

Barometric Pressure Sensor

Product Manual

(V1.2)



● Important statement

Thank you very much for purchasing Firstrate products, we will serve you sincerely forever. Firstrate pursues excellent quality and pays more attention to excellent after-sales service. If necessary, please call: **+86-731-86171990**.

Operation errors will shorten the life of the product, reduce its performance, and may cause accidents in severe cases. Please hand over this manual to the end user, and be sure to read it carefully before using the product. And please keep it in a safe place for reference when needed. This manual is for reference only, the actual product shall prevail.

● Product overview

The sensor can be widely used in environmental detection, installed in a standard installation shell, the device adopts (4~20) mA, (0~5) V, (0~10) V, RS485 (standard MODBUS-RTU communication protocol) signal output . The transmitter is widely used in occasions that need to measure indoors, greenhouses, etc.

● Features

- ◇ (10-30) V wide DC voltage power supply;
- ◇ ((4~20) mA, (0~5) V, (0~10) V, RS485;
- ◇ (Wide air pressure range, applicable to various altitudes.

● Technical indicators

Supply voltage	(10~30) VDC, (0~10) output limited to 24VDC
Precision	±0.15kPa (30kPa~120kPa)
Measuring range	Air pressure: 30~120kPa
Maximum power consumption	Analog signal: 1.2W Digital signal: 0.4W
Output signal	(4~20) mA, (0~5) V, (0~10) V, RS485
Long-term stability	Air pressure: -0.1kPa/year
Response time	Less than or equal to 1S
Operating temperature	-20~60°C

● Precautions

1. After opening the product package, please check whether the appearance of the product is intact, check whether the relevant content of the product instruction manual is consistent with the product, and keep the product instruction manual for more than one year;
2. Wiring strictly according to the wiring diagram of the product, and work under the permissible excitation voltage of the product, and do not use it with overvoltage;
3. Do not knock the product, so as not to damage the appearance and internal structure of the ring;
4. The product has no customer-repairable parts, please contact our company in case of failure;
5. If the company's products fail under normal conditions, the warranty period is one year (13 months from the date of delivery by our company to the date of return). as the basis. For maintenance beyond the time limit, the company will charge a basic fee, and all products of the company will be maintained for life;
6. Please refer to our company website or call us for details.

(RS485) MODBUS communication protocol

● Basic settings of communication protocol

Transmission mode: MODBUS-RTU mode.

Communication parameters: default baud rate 9600bps (optional 2400bps, 4800bps, 9600bps, 19200bps, 38400bps, 57600bps, 115200bps, can be configured according to user requirements), 1 start bit, 8 data bits, no parity (optional odd parity, even parity), 1 stop bit, after changing the communication parameters, it is recommended to power on the sensor again.

Slave address: The factory default is 1, which can be configured according to user requirements.

● Holding register list

Parameter	MODBUS holding register address (16 bits)
Atmospheric pressure	Address: 0000H The read value is the measured value of atmospheric pressure. For example, the read value is 0x03ED, converted to decimal 1005, and the measured value of atmospheric pressure is 1005hPa or 100.5kPa.
Baud rate	Address: 0014H The setting value is 24, 48, 96, 192, 384, 576, 1152, corresponding to the baud rate respectively, 2400, 4800, 9600, 19200, 38400, 57600, 115200, for example, the default baud rate is 9600, the setting value is 0x0060
Check Digit	Address: 0015H 0x0000 means no parity, 0x0001 means odd parity, 0x0002 means even parity
Slave address	Address: 0017H Default: 0x0001

Note: Access to other addresses is prohibited.

● Modbus RTU command

Supported MODBUS function codes: 0x03, 0x06

03H function code example: read the atmospheric pressure measurement data of the sensor whose slave address is No. 1.

★Host query command:

Slave Address	01H	Slave address
Function	03H	Function code
Starting Address Hi	00H	The high 8 bits of the start register address
Starting Address Lo	00H	The lower 8 bits of the start register address
No. of Registers Hi	00H	The upper 8 bits of the number of registers
No. of Registers Lo	01H	The lower 8 bits of the number of registers
CRC Check Lo	84H	CRC check code lower 8 bits
CRC Check Hi	0AH	CRC check code high 8 bits

★Slave response:

Slave Address	01H	Slave address
Function	03H	Function code
Byte Count	02H	Length is 2 bytes
Data Hi	03H	Atmospheric pressure: 100.5kPa
Data Lo	EDH	Atmospheric pressure: 100.5kPa
CRC Check Lo	78H	CRC check code lower 8 bits
CRC Check Hi	F9H	CRC check code high 8 bits

06H function code example: modify the baud rate (in this case, modify it to 57600bps)

★Host query command:

Slave Address	01H	Save address
Function	06H	Function code
Starting Address Hi	00H	The baud rate holding register address is 0014H
Starting Address Lo	14H	The baud rate holding register address is 0014H
Data Hi	02H	When the baud rate is 57600bps, the value of the register is 576, which is 0x0240
Data Lo	40H	When the baud rate is 57600bps, the value of the register is 576, which is 0x0240
CRC Check Lo	C9H	CRC check code lower 8 bits
CRC Check Hi	5EH	CRC check code high 8 bits

★Slave response:

Slave Address	01H	Slave address
Function	06H	Function code
Starting Address Hi	00H	The baud rate holding register address is 0014H
Starting Address Lo	14H	The baud rate holding register address is 0014H
Data Hi	02H	When the baud rate is 57600bps, the value of the register is 576, which is 0x0240
Data Lo	40H	When the baud rate is 57600bps, the value of the register is 576, which is 0x0240
CRC Check Lo	C9H	CRC check code lower 8 bits
CRC Check Hi	5EH	CRC check code high 8 bits