

PTT04R Integrated Temperature Transmitter



1. Overview

The integrated field intelligent temperature transmitter produced by our company is an ultra-small, high-performance, high-precision measuring meter. With digital display, small size, light weight, easy to use and install, it turns the temperature of the controlled object into electrical signals. It can be directly installed in the junction box to form an integrated structure with on-site sensing elements. This not only saves compensation wires and cables, but also reduces signal transmission distortion and interference, thereby obtaining high-precision measurement results.

It is usually used together with display instrument, recording instrument and electronic computer, with current output of RS485

2. Features

- ▲. RS485 output, high precision and maintenance-free.
- ▲. The data is processed by a single-chip microcomputer with high stability.
- ▲. It has the functions of anti-reverse connection, anti-surge, anti-vibration, anti-moisture, anti-heat and anti-harmful gas.
- ▲. Good stability, fast response speed, high precision, impact resistance
- ▲. Standard Hessman profile.
- ▲. Wiring reverse and overvoltage protection, current limit protection
- ▲. Small structure, easy to install

3. Application areas

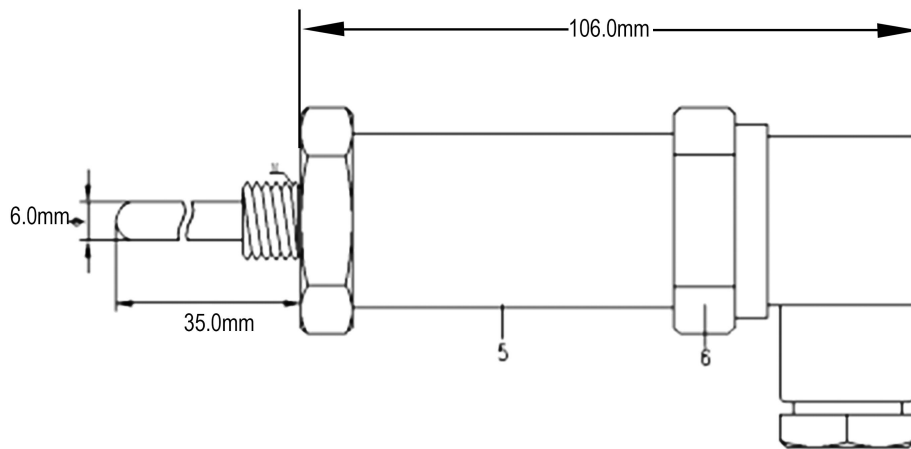
Wide range of applications, such as:

- Chemical
- Metallurgy
- Petroleum
- Electricity
- Environmental protection
- Water treatment
- Pharmaceutical
- Food

4. Technical index

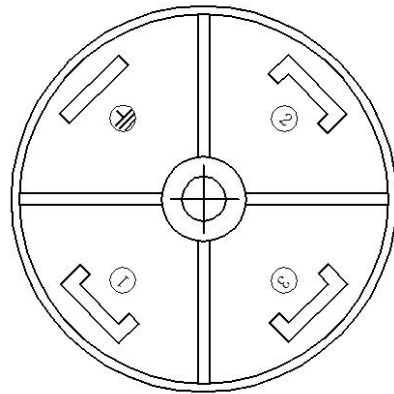
Maximum range	-200-850℃
Sensor	PT100
Supply voltage	24VDC±10% or 12VDC±10% (Recommended 24VDC)
Installation interface	M20x1.5 (Customizable)
Insertion depth	50mm、100mm、150mm、200mm (Customizable)
Output	RS485
Transfer Protocol	MODBUS Protocol
Start Time	Within 2 seconds
Probe can measure temperature range	-70-200℃
Ambient temperature	0-60℃
environment humidity	5%-95%, No condensation
Vibrate	≤10g, f≤55Hz, amplitude≤0.5mm
Ground	In areas with high electromagnetic interference, the transmitter and cable shielding layer should be well grounded
Precision	±0.2℃, ±0.5%
Linear	±0.2% , ±0.5%
Weight	170g

5. Outline dimension drawing



6. Connection mode

The actual wiring shall prevail



1: 24V+ 2: 24V- 3: A 4: B

7. Transmission protocol

This communication protocol adopts the standard Modbus protocol, and the transmission mode used is RTU mode. The Modbus protocol is a master-slave protocol.

Only one device can send on the wire at any time. The information exchange is managed by the master station, and only it can initiate it. It will poll the slaves one after another. Unless approved by the master station, no slave station can send messages. Direct communication between slave stations is not possible.

The protocol frame does not contain any message header byte or message byte terminator. It is defined as follows:

Slave address	Request code	data	CRC16
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Slave address: -The address must be between 1 and 247.

-Each address must be unique in the network device environment.

Data: Transmitted in binary code.

CRC16: Cyclic redundancy check parameter.

When the interval time is longer than or equal to 3.5 characters, it is regarded as detecting the end of the frame.

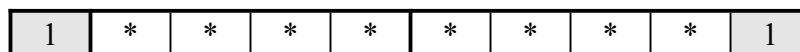
1. Communication port settings

Communication method Asynchronous serial communication interface, such as RS-485

Baud rate 2400, 4800, 9600, 19200bps (can be changed by setting instrument parameters, the default is 9600)

2. Byte data format

- . A start bit
- . Eight data bits
- . One stop bit
- . No verification



A start bit

Eight data bits

One stop bit

3. Instrument communication frame format

The following table shows the Modbus function when the digital display of our company works in slave mode, and specifies its limit.

Slave number: The instrument address of this machine must be between 1 and 247, and the address of each instrument on the same bus cannot be repeated.

When the address is 0, it is used for the broadcast function, and only the write function is valid at this time. Single byte.

Function code: The "read" and "write" functions are defined from the perspective of the master. Single byte.

Function code	Modbus	Function name	broadcast	Maximum value of N in a row
3 (0x03)	Read Holding Registers	Read N register values	NO	6
06 (0x10)	Write Single Register	Write 1 register value		

First register address: The address of the first internal register to be read. Double byte. The value data of each internal register is two bytes.

Number of registers: The number of internal registers to be read or modified. Double byte.

Number of bytes read: The total number of bytes of internal register data read. Single byte.

CRC16: Cyclic redundancy check parameters.

1) Read N output words: function 3

Note: Hi = high byte, Lo = low byte.

This function can be used to read parameters regardless of the type.

Master request:

Slave number	0x03	First register address		Number of registers		CRC16	
		Hi	Lo	Hi	Lo	Lo	Hi
1 bit	1 bit	2 bit		2 bits		2 bit	

Slave response:

Slave number	0x03	Number of bytes read	First register value		Last register value		CRC16	
			Hi	Lo		Hi	Lo	Lo	Hi
1bit	1bit	1bit	2 bits			2 bits		2bits	

Example 1: Use function 3 to read 1 word on slave 1 (address 0003H, see attached table)

Master request:

0x01	0x03	0x00	0x03	0x00	0x01	0x74	0x0A
1 bit	1 bit	2 bits		2 bits		2bits	

Slave response

0x01	0x03	0x02	0x00	0x11	0x78	0x48
1bit	1bit	1bit	2bits		2bits	

2) Abnormal response

When the slave cannot perform the request sent to it, it will return an exception response.

The format of the exception response:

Slave address	Response code	error code	CRC16	
			Lo	Hi
1bit	1bit	1bit	2bits	

Response code: The requested function code + 0x80 (the highest bit is set to 1). (Read: 0x83; write 0x90)

error code:

1 = The register address to be accessed in the request is not within the register address range.

2 = The data exceeds the maximum value. (Shaping start address + maximum value 11)

4 = The data exceeds the data range.

The corresponding address table of the internal parameters of the instrument (range: 0-27):

Numbering	Parameter symbol	parameter name	Register address	Type of data	Type	Value range	
1	spare	spare	0x0000 Decimal 0	2 bytes unsigned	Read only		
2	spare	spare	0x0001 Decimal 1	2 bytes unsigned	Read/write		
3	spare	spare	0x0002 Decimal 2	2 bytes unsigned	Read/write	1	
4	spare	spare	0x0003 Decimal 3	2 bytes unsigned	Read/write	-1999~9999	
5	spare	spare	0x0004 Decimal 4	2 bytes unsigned	Read/write	-1999~9999	

6	PS	Offset value	0x0005 Decimal 5	2 bytes unsigned	Read/write	-1999~9999	
7	K	coefficient	0x0006 Decimal 6	2 bytes signed	Read/write	-1999~9999	1000correspond 1.000
8	spare	spare	0x0007 Decimal 7	2 bytes signed	Read/write	-1999~9999	
9	spare	spare	0x0008 Decimal 8	2 bytes signed	Read/write	-1999~9999	
10	spare	spare	0x0009 Decimal 9	2 bytes signed	Read/write	10~9000	
11	spare	spare	0x000A Decimal 10	2 bytes signed	Read/write	10~9000	
12	spare	spare	0x000B Decimal 11	2 bytes signed	Read/write	10~9000	
13	ADD	address	0x000C Decimal 12	2 bytes signed	Read/write	1-240	
14	BAD	Baud rate	0x000D Decimal 13	2 bytes signed	Read/write	10~9000	2:4800 3:9600 4:19200
15	spare	spare	0x000E Decimal 14	2 bytes signed	Read/write	10~9000	
16	spare	spare	0x000F Decimal 15	2 bytes signed	Read/write		
17	spare	spare	0x0010 Decimal 16	2 bytes signed	Read/write		
33	Measurements	Measurements	0x0020 Decimal 32	2 bytes signed	Read only		PV= K*Original value +PS

Prompt: Get the measurement value command, the command code of address is 01 03 00 20 00 01 85 C0

Factory default address 1, baud rate 9600; protocol format 1, N, 8

The configuration parameters are written with the 06 command, if you are not clear, it is not recommended to modify~~to prevent the instrument from being changed~~

This agreement supports Kingview, Force Control, PLC, touch screen, etc.;
If you encounter connection problems, please consult the equipment and software manufacturers~~

Special idea:

- 1. Please read the instructions carefully before use.**
- 2. Connect to the correct power source to prevent damage to the meter.**
- 3. We leave the factory in accordance with the requirements. Please do not operate the meter if you do not understand it well.**
- 4. Please confirm the special customized parameters to prevent unnecessary trouble.**