RS-WD-HW-N01
485 infrared temperature sensor User Manual

Document version：V1.0

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1. product description

1.1product description

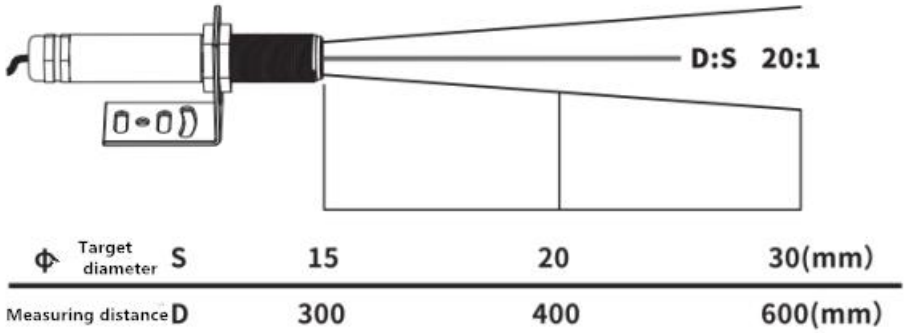
The infrared temperature sensor can calculate the surface temperature of the object by measuring the intensity of infrared radiation emitted by the target without touching the target. Non-contact temperature measurement is the biggest advantage of infrared thermometer, so that users can easily measure targets that are difficult to access or move.

The temperature sensor is an integrated integrated infrared temperature sensor. The sensor, optical system and electronic circuit are integrated in a stainless steel housing; easy to install, the standard thread on the stainless steel housing can be quickly connected to the installation site; and there are various options (Various instruments, large screen, paperless recorder purge protection cover, laser sight, adjustable mounting bracket, etc.) to meet the requirements of various working conditions.

1.2 Main Specifications

DC power supply (default)	10V-30V DC
Precision (default)	± 1% of measurement value or ± 1 ℃, whichever is greater
Repeat accuracy	± 0.5% of measurement value or ± 1 ℃, whichever is greater
Transmitter circuit working environment	Temperature: 0 ~ 60 ° C
Response time	Relative humidity: 10 - 95% (no condensation)
Optical resolution	300 ms (95%)
Spectral range	20: 1
Firing rate	8 ~ 14 μm
Measuring temperature range	0-100 ℃、0-150 ℃、0-200 ℃、0-300 ℃、0-400 ℃、0-500 ℃、0-600 ℃（Default 0-600 ℃）
output signal	RS485

1.3Light path diagram



2. Working principle and matters needing attention

2.1Infrared temperature measurement principle

Any object radiates infrared energy outward, and the intensity of radiation changes with temperature. Infrared thermometers use infrared radiation energy with a wavelength in the range of 8 μ m-14 μ m. The infrared temperature sensor is an optoelectronic sensor that receives infrared radiation and converts it into an electrical signal, which is displayed or outputted by an electronic circuit amplifier, linearization, signal processing.

2.2The maximum distance and size of the measured point

The size of the measured target and the optical characteristics of the infrared thermometer determine the maximum distance between the measured target and the measuring head. In order to avoid measurement errors, the measured target should fill the field of view of the probe as much as possible. Therefore, the measured point should always be smaller than the measured object or at least the same size as the measured target.

2.3Lens cleaning

The lens of the instrument must be kept clean to avoid measurement errors or even damage to the lens due to the adhesion of dust, smoke and other contaminants. If the lens is stuck with dust, use lens cleaning paper dipped in absolute alcohol.

2.4Electromagnetic interference

In order to prevent electromagnetic interference, please try to keep the infrared temperature sensor away from the electromagnetic field source (such as motor, motor, high-power cable, etc.), if necessary, you can add a metal sleeve.

3. device installation

3.1 Check before installation

Equipment List:

1. One infrared temperature sensor (including 2meters long cable) equipment

2. Fixing nut

3.2installation method

The infrared temperature sensor with M18 × 1 thread can be used for direct installation or can be installed by using a mounting bracket. The adjustable mounting bracket can make the adjustment of the measuring head more convenient. When adjusting the measured target and the measuring head, it is necessary to ensure that the optical path is unobstructed.

3.3 Wiring instructions

Thread color	Explanation	Remarks
Brown	Power is positive	10~30V DC
black	Power ground	GND
Yellow	485-A	485-A
Blue	485-B	485-B

4.letter of agreement

4.1Communication basic parameters

Coding	8-bit binary
Data bit	8 bit
Parity bit	no
Stop bit	1 person
Error checking	CRC (Redundant Cyclic Code)
Baud rate	Can be set, the factory default is 4800bit / s

4.2 Data frame format definition

Using Modbus-RTU communication protocol, the format is as follows:

Time of initial structure ≥ 4 bytes

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

End structure time ≥ 4 bytes

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

Function code: instruction function instruction issued by the host.

Data area: The data area is specific communication data, pay attention to the high byte of 16bits data first!

CRC code: two-byte check code.

Host inquiry frame structure:

address code	function code	Register start address	Register length	Check code low byte	Checksum high byte
1byte	1byte	2byte	2byte	1byte	1byte

Slave response frame structure:

address code	functio n code	Effective bytes	Data area	Data area two	Data N area	Check code low byte	Checksum high byte
1byte	1byte	1byte	2byte	2byte	2byte	1byte	1byte

4.3 Register address

Register address	content	type of data	operating	Definition description
0000H or 0001 H	measure temperature	Integer data	Read only	The actual value is expanded by 100 times
0002H，0003 H	Emissivity	Floating point	Read / write	Default:0.95
07D0 H	Address	-	Read/write	Default address of 1
07D1	Baud rate	-	Read/write	Default baud rate of 4800

4.4 Communication protocol example and explanation

Example: Read the temperature value of the device (address 0x01)

Inquiry frame

address code	function code	starting address	Data length	Check code low byte	Checksum high byte
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Reply frame

address code	function code	Returns the number of valid bytes	Human body temperature	Check code low byte	Checksum high byte
0x01	0x03	0x02	0x00 0xC8	0xB9	0xD2

Temperature calculation:

Temperature: 00 C8 (hexadecimal) => temperature = 20.0 ℃

5. Common problems and solutions

No output or output error

possible reason:

1) Correspondence error of the range leads to PLC calculation error. For the range, please refer to the technical specifications of the first part.

2) The wiring method is incorrect or the wiring sequence is wrong.

3) The power supply voltage is incorrect.

4) The distance between the transmitter and the collector is too long, causing signal disturbance.

5) The PLC acquisition port is damaged.

6) The equipment is damaged.

6. contact details

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7. Document history

V1.0 document creation