SYSOLUTION

Temperature and humidity integrated sensor RTH2

Specification

Version ： Ver.1.0

Update Record

No.	Version	Update	Revise
1	Ver.1.0	Initial	2023.11.02

The document is subject to change without prior notice.

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Functions

1. The sensor adopts the latest high-precision digital temperature and humidity sensor (SHT30) from Sensirion, Switzerland, with high sensitivity, good stability, and full range automatic temperature compensation.
2. MCU adopts ST company's professional and leading high-quality low-power chips, with high reliability and strong anti-interference ability.
3. RS485 communication, standard Modbus RTU protocols.
4. Wide temperature measurement range：-40℃~+120℃.
5. Wide humidity measurement range：0~100%.
6. Supports modifying addresses (1-255), baud rates (4800bps -115200bps), and verification methods, as well as saving after power failure.
7. Power and communication indicator lights, parameter reset button.
8. Dual watchdog for hardware and software, never downtime.
9. Provide supporting PC testing software for easy testing and parameter modification.

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Specifications

1. High speed, high precision, high reliability, industrial grade.
2. STMicroelectronics imported MCU (main control chip).
3. Swiss imported high-precision temperature and humidity acquisition chip SHT30.
4. Built in switch power supply circuit, wide power supply voltage range, high conversion efficiency.
5. Both power supply and communication have anti reverse connection protection and overcurrent protection.
6. Both the power supply and communication have anti-static and lightning surge protection functions, with strong anti-interference ability.
7. All key chips are imported with brand new original packaging.
8. Industrial grade products that meet the usage needs of different fields.
9. Easy to install, standard C45 (35mm) U-shaped universal guide rail installation or screw installation.

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Parameters

Parameters	
power supply	5V DC/5~36V DC
power consumption	<100mW
communication type	RS485
collection lines	1line temperatature+1line humidity
temperatture range	-40℃~+125℃
temperature resolution	0.1℃
Temperature Accuracy	±0.3℃
Humidity range	0~100%RH
humidity resolution	0.1%RH
humidity accuracy	±2%RH
long term stability	temperature：<0.03℃/yr humidity：<0.25%RH/yr
Data update rate	30Hz/channel
communication protocols	Modbus RTU
support commands	1. Read holding register 03H 2. READ INPUT REGISTER 04H 3. Write a single holding register 06H 4. Write multiple holding registers 10H
Data interpretation method	1 decimal point

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communication address	1~255 can setup, Power down storage
baud rate	4800/9600/14400/19200/38400/56000/57600/115200bps can setup, Power down storage
communication distance	0-1200 meters, extendable through repeaters
Parameter reset	Reset button/software reset
indicators	power/communication
watchdog	Hardware and software dual watchdog never shuts down
protection function	Overcurrent/overvoltage/reverse connection/lightning surge prevention
working temperature	-40℃~+85℃
working humidity	0%~95%RH(No condensation)
dimension	LxW：78mmx14mm
install method	standard C45（35mm）Universal guide rail installation or screw hole installation

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Wire Connection

Wiring Table	
sign	**function**
+ (red wire)	positive
- (black wire)	negative
A (yellow wire)	RS485+
B (green wire)	RS485-

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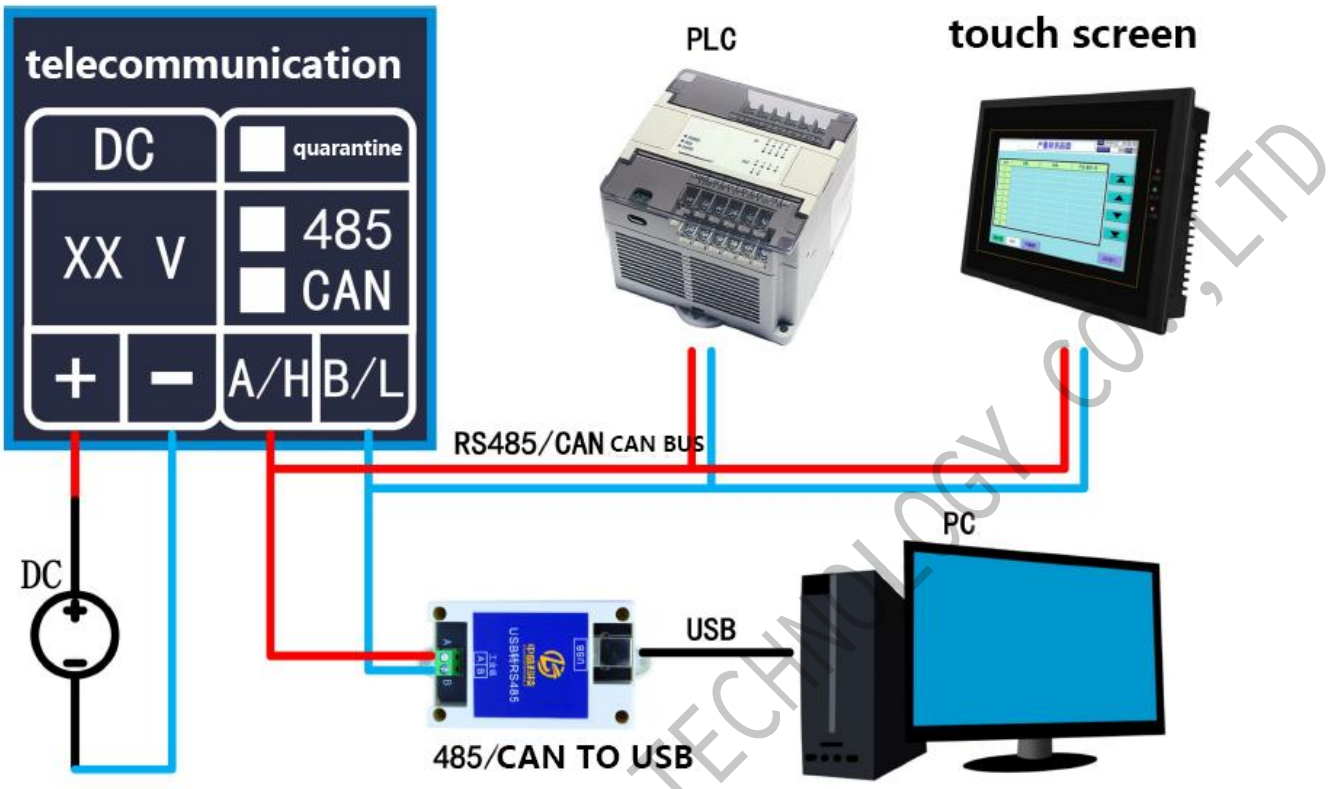
wire connection of power and communication



RS485 BUS wire

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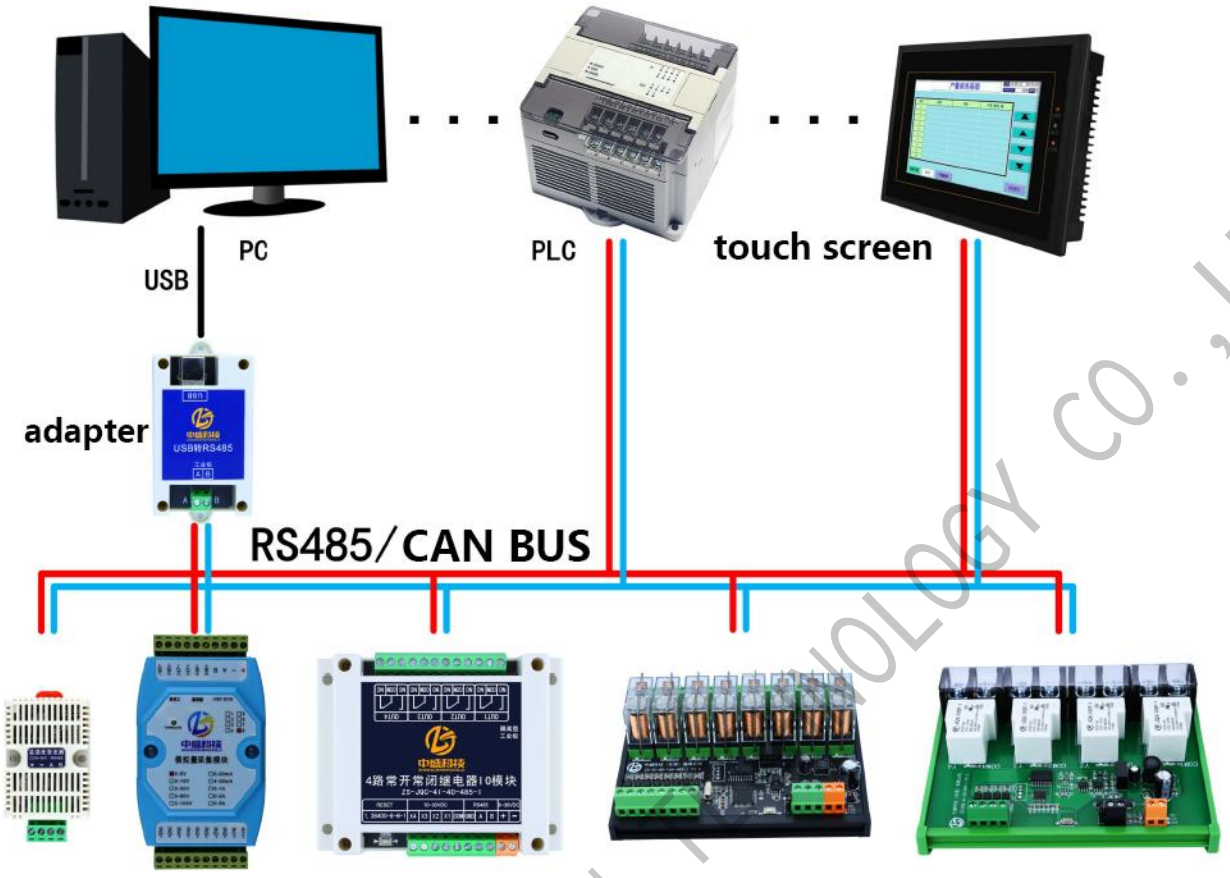

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Communication protocols

The product adopts the standard Modbus RTU protocol, and the default communication parameters are as follows:

- address：1
- baud rate：9600
- data bite：8
- stop bit：1
- Parity check：no

Input Register Function Definition

The temperature and humidity values are represented by one input register each. The input register is a read-only register, and the values in each register are 16 unsigned integers with a fixed 1 decimal point representing the actual collected temperature and humidity values.

protocols address	**PLC address**	**description**
0000H	30001	temperature value unit：℃ Analysis method: Fixed 1 decimal point (1) Positive temperature: register data＜10000 Example: Register value is 250, actual humidity value is 250 × 0.1=25 (℃)

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		(2) Negative temperature: Register data>=10000 Example: Register value is 10250 Actual humidity value: -1 × (10250-10000) × 0.1=-25 (℃)
0001H	30002	Humidity value unit：%RH Analysis method: Fixed 1 decimal point 500×0.1=50（%RH） Example: Register value is 500, actual humidity value is 500 × 0.1=50 (% RH)
0002H	30003	temperature value unit：℃ Analysis method: 32-bit floating point number, large end mode
0003H	30004	
0004H	30005	Humidity value unit：%RH Analysis method: 32-bit floating point number, large end mode
0005H	30006	

Definition of Holding Register Function

This series uses the holding register in Modbus RTU to set module parameters, and the register content is saved after power failure. Keep registers as readable and writable registers, with values in each register being 16 bit unsigned integers.

	PLC	**reset value**	**description**

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protocols address	**address**		
0000H	30001	temperature value	temperature value unit：℃ Analysis method: Fixed 1 decimal point (1) Positive temperature: register data<10000 Example: Register value is 250, actual humidity value is 250 × 0.1=25 (℃) (3) Negative temperature: Register data>=10000 Example: Register value is 10250 Actual humidity value: -1 × (10250-10000) × 0.1=-25 (℃)
0001H	30002	Humidity value	Humidity value unit：%RH Analysis method: Fixed 1 decimal point Example: Register value is 500, actual humidity value is 500 × 0.1=50 (% RH)
0002H	30003	temperature value	temperature value unit：℃ Analysis method: 32-bit floating point number, large end mode
0003H	30004		

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0004H	30005	Humidity value	Humidity value unit：%RH Analysis method: 32-bit floating point number, large end mode
0005H	30006		
000AH	40011	1	RS485 bus address/station number (1-255). Factory default: 1 Note: This parameter is saved after power down, and can take effect after being modified and re powered on
000BH	40012	1	setup baud rate 0: 4800 1：9600（factory default） 2：14400 3：19200 4：38400 5：56000 6：57600 7：115200 Note: This parameter is saved after power down, and can take effect after being modified and re powered on

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