User Manual for SEN101-2001
Temperature and humidity sensor

●Product description

The temperature and humidity atmospheric pressure sensor can be widely used in environmental detection, integrating temperature and humidity, and the device can be customized with standard MODBUS-RTU communication protocol, RS485 signal, (0-5)V, (0-10)V, (4-20) Output such as mA. This transmitter is widely used in applications where temperature and humidity are required to be measured.

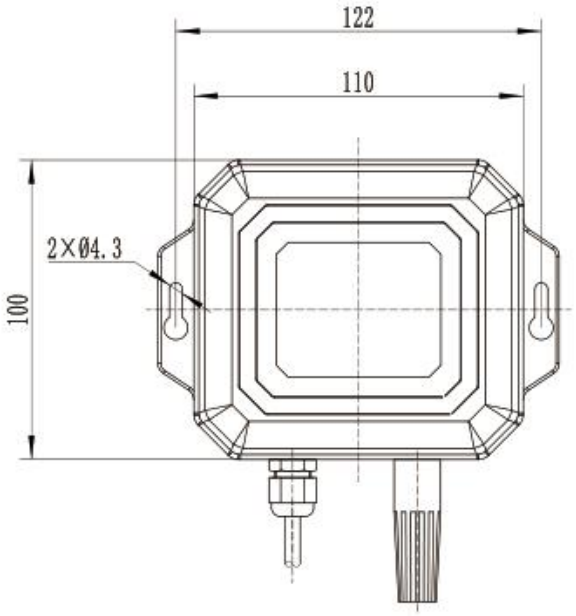
●Features

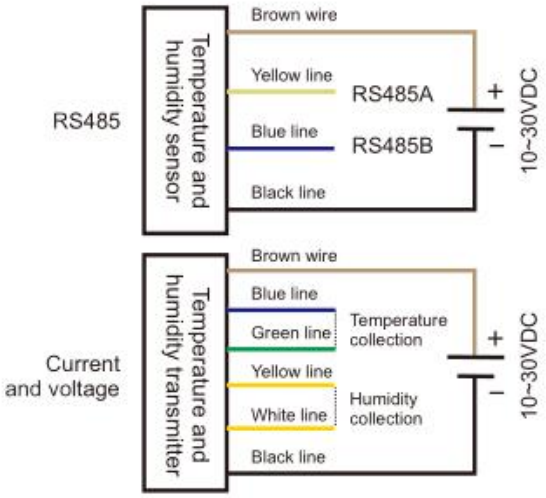
- ●10-30V wide DC voltage supply
- ●Standard MODBUS-RTU communication protocol
- ● Wide range of air pressure range, can be applied to various altitudes

●Technical indicators

Supply voltage	10~30VDC	
Precision	temperature	±0.5℃（25℃）
	Relative humidity	±3%RH（5%RH~95%RH，25℃）
Measuring range	temperature	-40℃~80℃
	Relative humidity	0%RH~100%RH
display resolution	temperature	0.1℃
	Relative humidity	0.1%RH
Long-term stability	temperature	0.1℃/y
	Relative humidity	0.1%RH/y
output signal	(0-5)V、(0-10)V、 (4-20)mA、RS485（Modbus RTU Protocol）	
Operating temperature	-20~60℃	
Storage temperature	-40~100℃	

●Electrical interface and connection method





●Notes

1 After opening the product packaging, please check whether the appearance of the product is intact, verify that the relevant content of the product manual is consistent with the product, and keep the product manual for more than one year;

2 Strictly follow the wiring diagram of the product, and work under the excitation voltage of the product, do not use over voltage;

3 Do not knock the product to avoid damage to the appearance and internal structure of the ring;

4 The product has no customer self-repair parts, please contact our company in case of failure;

5 If the company's products have a failure under normal circumstances , the warranty period is one year (from the date of shipment from the company to the 13 months after the date of return), whether it is a failure under normal circumstances, the inspection by our quality inspectors is in accordance with. After the deadline for maintenance, the company

charges a basic fee, all products of the company for lifetime maintenance;

6 If any question, please visit our website or call us.

●Common problems and solutions

Possible reasons when the device cannot be connected to a PLC or computer:

1) The computer has multiple COM ports and the selected port is incorrect.

2) The device address is incorrect, or there is a device with duplicate addresses (all factory defaults are 1).

3) Baud rate, check mode, data bit, stop bit error.

4) The host polling interval and the waiting response time are too short and need to be set to more than 200ms.

5) The 485 bus is disconnected, or the A and B lines are reversed.

6) If the number of devices is too large or the wiring is too long, the power should be supplied nearby, add 485 booster, and increase the 120Ω terminating resistor.

7) The USB to 485 driver is not installed or damaged.

8) The equipment is damaged.

●Important statement

Temperature and Humidity Sensor (RS485) MODBUS Communication Protocol

●The basic settings of the communication protocol

Transmission mode: MODBUS-RTU mode.

Communication parameters: default baud rate 9600bps (optional 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, the sensor needs to be powered on again.

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

●Keep the register list

Parameter	MODBUS Hold Register Address (16-bit)
Temperature	Address: 0000H The temperature data is uploaded in the form of a complement. The value of the reading is divided by 10 to obtain the measured value of the temperature. For example, the reading value is 0xFF9B, and the decimal value is -101, the measured value of the temperature is -10.1 °C.
Relative Humidity	Address: 0001H The measured value of the relative humidity can be obtained by dividing the value by 10. For example, if the reading value is 0x0149 and the decimal value is 329, the measured value of relative humidity is 32.9% RH.
Baud rate	Address: 0014H The setting values are 48, 96, 192, 384, 576, and 1152, corresponding to baud rates of 4800, 9600, 19200, 38400, 57600, and 115200, for example, the default baud rate is 9600, and the setting value is 0x0060.
Check digit	Address: 0015H 0x0000 means no parity, 0x0001 stands for odd parity, 0x0002 stands for even parity
Slave address	Address: 0017H Default: 0x0001

Note: Access is prohibited for other addresses.

●Modbus RTU instruction

Supported MODBUS function codes: 0x03, 0x06

Example of 03H function code: Read the temperature 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	Start register address is 8 bits high
Starting Address Lo	00H	Start register address lower 8 bits
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 low 8 digits
CRC Check Hi	0AH	CRC check code high 8 bits

★Slave response:

Slave Address	01H	Slave Address
Function	03H	function code
Byte Count	02H	is 2 bytes in length
Data Hi	00H	The temperature at this time is: 24.7 ° C
Data Lo	F7H	at this time temperature: 24.7 ° C
CRC Check Lo	F9H	CRC check code low 8 digits
CRC Check Hi	C2H	CRC check code is 8 bits high

Example of 06H function code: modify the baud rate (this example is modified to 57600bps)

★ Host query command:

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	baud rate holding register address is 0014H
Data Hi	02H	baud rate is 57600 bps, the value of the register is 576, which is 0x0240.
Data Lo	40H	baud rate is 57600 bps, the value of the register is 576, which is 0x0240.
CRC Check Lo	C9H	CRC check code low 8 digits
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	baud rate holding register address is 0014H
Data Hi	02H	baud rate is 57600 bps, the value of the register is 576, which is 0x0240.
Data Lo	40H	baud rate is 57600 bps, the value of the register is 576, which is 0x0240.
CRC Check Lo	C9H	CRC check code low 8 digits
CRC Check Hi	5EH	CRC check code high 8 bits