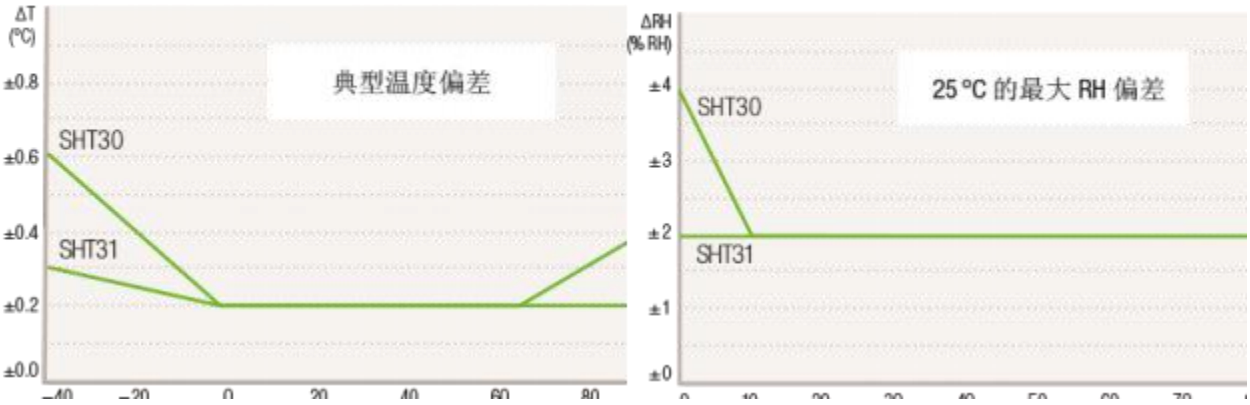
HT 3x-A Environment Sensor specification V 2.1

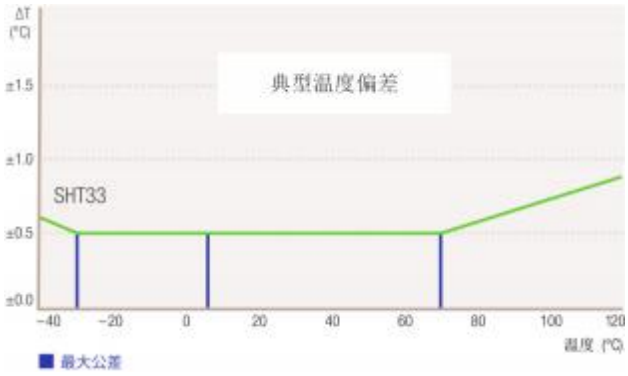
application area:

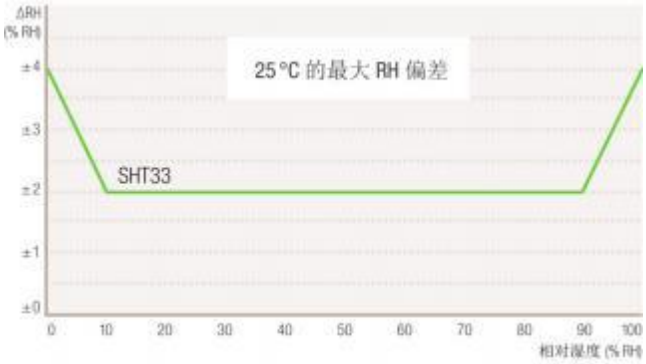
1, the need to monitor the environmental temperature and humidity, atmospheric pressure, volatile organic compounds, e CO2 air quality, etc.

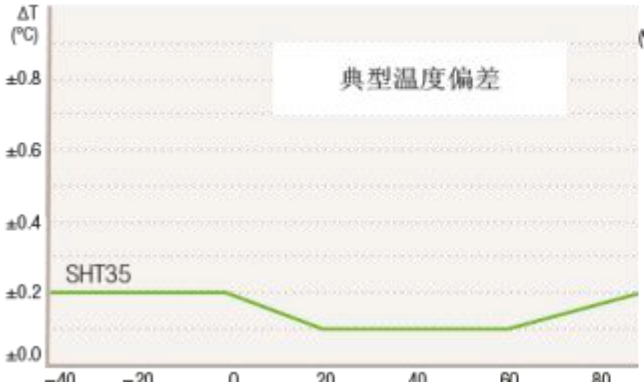
2, Cold storage, warehouse, greenhouses, granaries, etc.

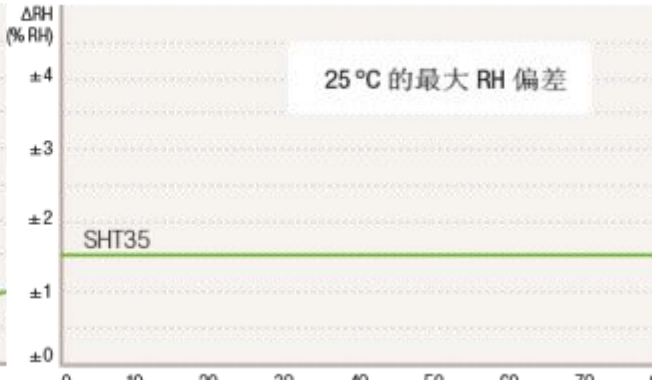
Temperature and humidity accuracy:


ΔT
(°C)
±0.8
±0.6
±0.4
±0.2
±0.0
典型温度偏差
SHT30
SHT31
−40
−20
0
20
40
60
80
ΔRH
(% RH)
±4
±3
±2
±1
±0
25 °C 的最大 RH 偏差
SHT30
SHT31









atmospheric pressure:

Key parameters

• Pressure range	300 … 1100 hPa (equiv. to +9000…-500 m above/below sea level)
• Package	8-pin LGA metal-lid Footprint : 2.0 × 2.5 mm², height: 0.95 mm
• Relative accuracy (950 … 1050hPa @25°C)	±0.12 hPa, equiv. to ±1 m
• Absolute accuracy (950 …1050 hPa, 0 …+40 °C)	typ. ±1 hPa
• Temperature coefficient offset (25 … 40°C @900hPa)	1.5 Pa/K, equiv. to 12.6 cm/K

TVOC、eCO2：

Parameter	Signal	Values		Comments
Output range	TVOC signal	0 ppb to 60000 ppb		Maximum possible output range. The gas sensing performance is specified for the measurement range as defined in **Table 1**
	CO_2eq signal	400 ppm to 60000 ppm		
		Range	Resolution	
	TVOC signal	0 ppb - 2008 ppb	1 ppb	
		2008 ppb – 11110 ppb	6 ppb	
		11110 ppb – 60000 ppb	32 ppb	
	CO_2eq signal	400 ppm – 1479 ppm	1 ppm	
		1479 ppm – 5144 ppm	3 ppm	
		5144 ppm – 17597 ppm	9 ppm	
		17597 ppm – 60000 ppm	31 ppm	
Sampling rate	TVOC signal	1 Hz		The on-chip baseline compensation algorithm has been optimized for this sampling rate. The sensor shows best performance when used with this sampling rate.
	CO_2eq signal	1 Hz		

hardware resource:

1: One road of RS485 interface.

2: Road SHT 3x series temperature and humidity sensor (SHT 30, SHT 31, SHT 33, SHT35 optional, default SHT 30)

3: One-way BMP 280 air pressure and temperature sensor (optional)

4: Road SGP 30 TVOC, eCO 2 air quality sensor (optional)

Fast interface

1: RS 485 communication (MODBUS-RTU protocol), customized custom protocol

characteristic:

1. It can be directly connected to computers, PLC, MCU, etc., and one bus can monitor the value of 254 devices at the same time

2. RS485 interface specific TVS pipe protection.

3. With the LED working status indication flicker function

4. Wide-voltage power supply

The 5.96-bit ID number can be used for system encryption

product size:

Sensor: 45 * 65 * 28MM (high)

Communication interface parameters:

Communication wave rate: adjustable, 1-stop bit, 8-bit data, no check

See the MODBUS-RTU protocol before reading the following information!

Parameter Reference Table:

project	condition	least value	standard value	crest value	unit	remarks
service voltage	-30-80℃	5		24	V	DC
Communication Porter rate		300	9600	115200	bps	
RS 485 Number of bus support		1		32	individual	No amplifier
Working style, ambient temperature		-30	25	80	℃	
Working style, surrounding humidity		0		100	%RH	
conversion rate		1	1	255	Seconds /	

					times	
Bus response time	1200bps	160		200	mS	
	115200b ps	3		5	mS	
supply current	DC5V		1.6	60	m A	Static
Address setting range		1		254		

RS485 Read the temperature and humidity instruction is

Sent: 0103000000002 C 40B

instruct	01	03	00	00	00	02	C4	0B
explain	Device address to be read	Read the finger a surname	Register from The beginning address is high	Register start address is low	Read the number High volume	Read the number Low quantity	CR CH	CR CL

Return data: 01 03 04 00 F9 00 B7 6A 74

instruct	01	03	04	00 F 9	00 B7	6A	74
explain	Return to the address of the data device	Functional code	Number of data bytes returned	Byte 1 is high	Byte 1 is low	CR CH	CR CL

● Temperature value conversion: 00 F9, first changed to 10 decimal system is 249, and then after 10 is the temperature value we want, 24.9 degrees. The negative value is the complement (that is, the temperature value is the signed number), for example, a 0XFFFF value is negative 1 (0.1 degrees)

● Humidity value conversion: 00 B7, first change into 10 decimal system is 183, and then after 10 is the relative humidity value we want, 18.3RH%.

The register address function is as follows

Register address	The PLC configuration address	content	operate
0000H	40001	Temperature (in 0.1℃)	read only
0001H	40002	Humidity (in 0.1% RH)	read only

0004H	40005	High pressure	read only
0005H	40006	Low pressure	read only
0006H	40007	And eCO2 (in ppm)	read only
0007H	40008	TVOC (unit ppb)	read only
0064H	40101	Equipment address, value range: 1-254, factory default value: 1	Read / write
0065H	40102	Paud rate, range: 0-7 ➢0：1200bps， ➢1：2400bps， ➢2：4800bps ➢3:9600bp s (factory default value) ➢4：19200bps ➢5：38400bps ➢6：57600bps ➢7：115200bp s	Read / write
0066H	40103	Check bit, value field: 0-2 ➢0: No check (factory default value)	Read / write

		➢1: Strange verification ➢2: Even check	
0067H	40104	Stop bit, value domain: 0-2 ➢0:1 stop bits (factory default value) ➢1:2 stop bits ➢2:1.5, a stop bits	Read / write
0068H	40105	Conversion time interval, value domain: 1-10, unit: seconds, factory default 1:1 conversion per second	Read / write
0069H	40106	LED indicator light operating mode, value domain: 0-4 ➢0: For runtime out ➢1: Bright for runtime ➢2: Runtime flash	Read / write
006AH	40107	For temperature result deviation correction, value domain-128~127, factory default 0, unit 0.1℃	Read / write
006BH	40108	For humidity result deviation correction, value domain-128~127, factory default 0, unit 0.1% RH	Read / write
00C8H	40201	Firmware version number	read only
00C9H~ 00CEH	40202~ 40207	The 96-bit ID number	read only

Notes for use:

The address of the sensor is set to No.1 before the factory. When multiple sensors are used in parallel, it is necessary to ensure that each sensor number (station address) on the line is different. If there is the same, the probe between the same number will cause RS485 bus conflict, so that the communication can not be normal. When multiple probes are used in one line, please start from the 1st and start in order. The installation shall ensure vertical installation and probe direction down.

To change the address, please use the software we provided for free. Before changing,

please connect the sensor to the computer through the converter. Set up the test

software usage:

Brief description of functions:

String slogan: the system automatically enumerates all the current serial ports of the computer, and select the COM port currently in use

Paud rate: 9600bps

Automatic search: This function is used without knowing the port rate and address of the current sensor. Before use, please ensure that there is only one sensor on the bus, the system broadcasts at 1200bps-115200b ps port rate, and the correct reply is considered to be found. When found, all the parameters of the current sensor are automatically read.

Address: When the value of 0 is a broadcast address, only one sensor can be connected during the parameter setting, otherwise the instruction will be received and executed by all the sensors on the bus. Other than 0 is for the specified sensor operation.

New address: the new address of the sensor preset

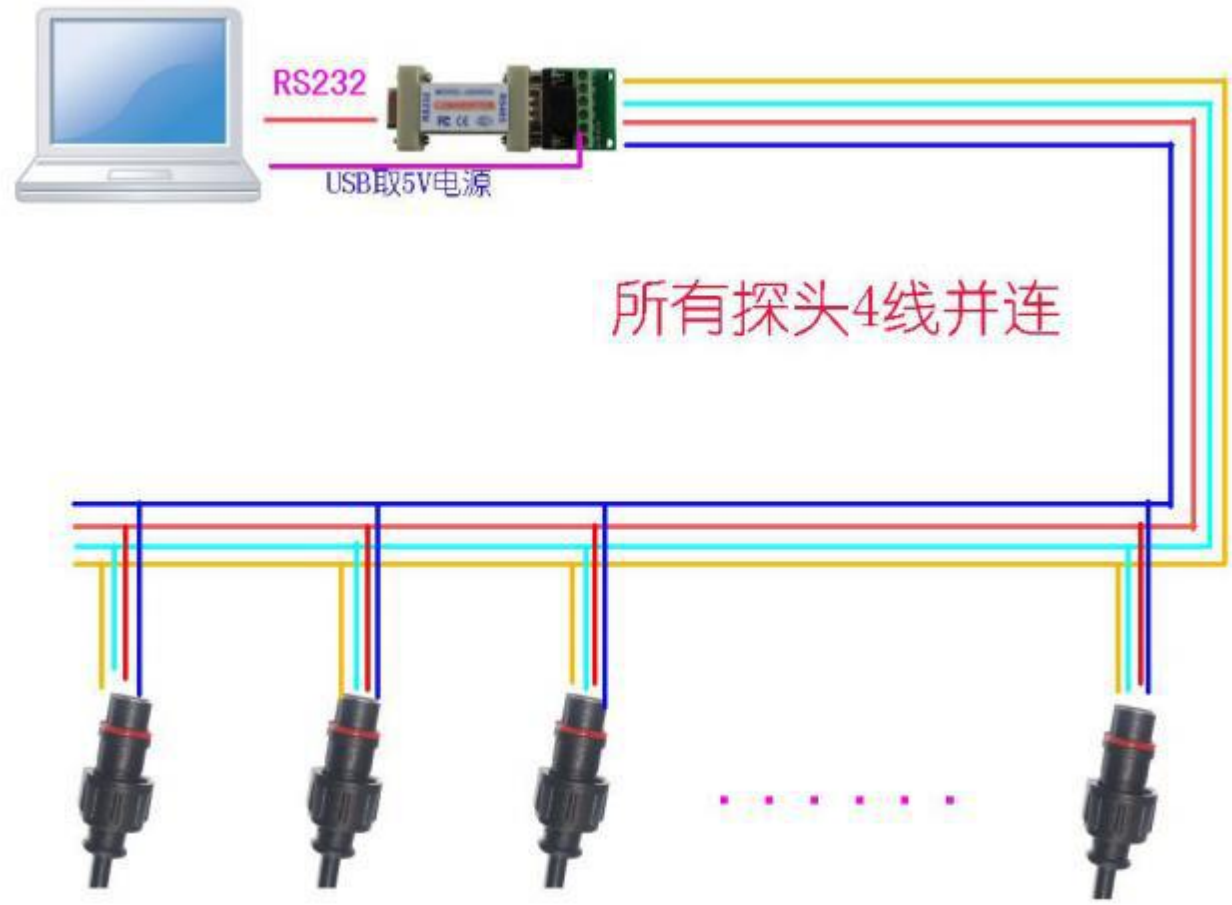
New port rate: the new port rate preset by the sensor

Conversion interval (s): The digital sensor extends the update time as far as possible according to the actual situation to reduce the power consumption, recommended for 10 seconds. Temperature offset: The sensor adds the actual temperature value with the offset value to output.

Humidity offset: The sensor adds the actual humidity value with the offset value.

LED light indicator mode: 0 operation is often out, 1 operation is often bright, 2 operation flash, 3 communication flash, 4, local communication flash global unique ID number: 96, number can be read through RS485, one machine one.

Application Schematics:



If a separate power supply is used, switch the positive and negative terminals of the power supply to a separate power supply, otherwise the USB will be burned out.

The USB output voltage is 5V, and the maximum output current is 500MA.