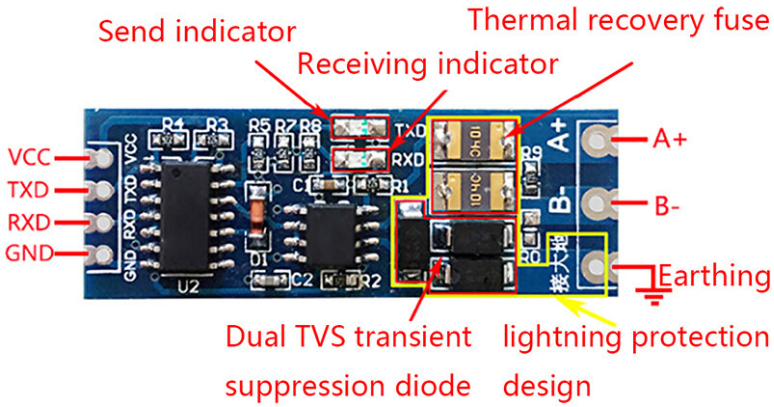
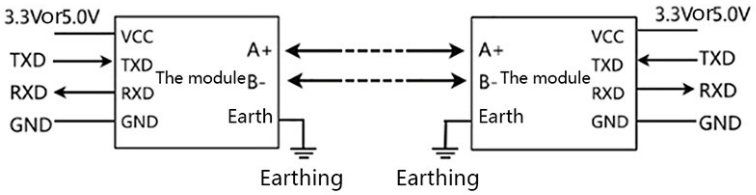
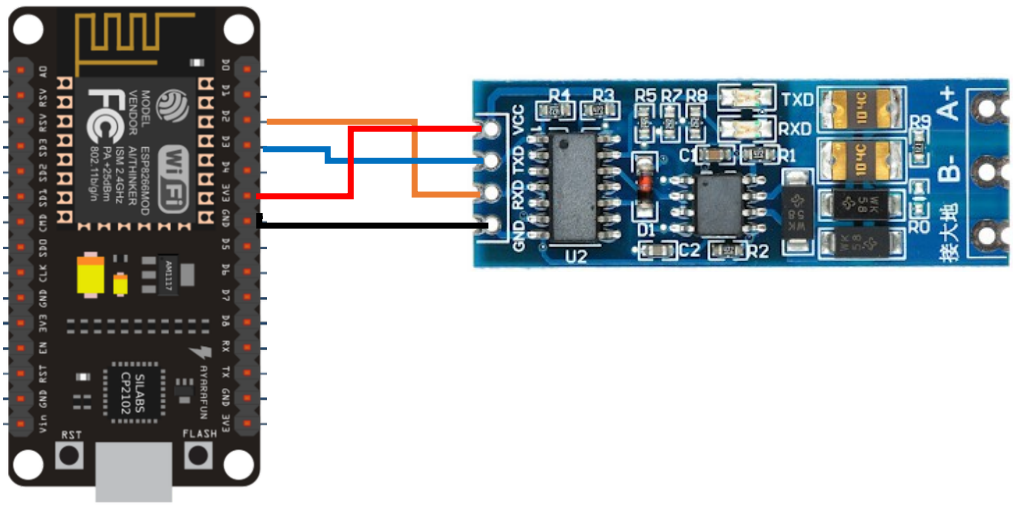
Modbus RS485







Temperature and Humidity Transmitter SHT20 RS485 Sensor Module Digital IIC I2C High Precision Industrial Modbus Rtu Protocol Monitoring

Product introduction:
The product uses industrial-grade chips and high-precision imported SHT20 temperature and humidity sensors to ensure the excellent reliability, high precision, and interchangeability of the product. Using RS485 hardware interface (with lightning protection design), the protocol layer is compatible with the standard industrial Modbus-RTU protocol. This product integrates the MODBUS protocol and the common protocol. The user can choose the communication protocol by himself. The common protocol has an automatic upload function (connecting RS485 and passing the serial port adjustment tool will automatically output temperature and humidity).

Features:
Industrial grade product, high progress SHT20 temperature, and humidity sensor, RS485 communication;
Standard MODBUS protocol and common protocol are integrated, and users can choose communication protocol by themselves;
The baud rate can be set by yourself;
The standard protocol has an automatic upload function, and the upload rate can be set by yourself.

Product parameters:

Maximum power: 0.2W
Working temperature: temperature -20 +60 , humidity 0%RH-100%RH
Control accuracy: temperature ±0.3 (25), humidity ±3%RH(25)
Output interface: RS485 communication (standard MODBUS protocol and custom common protocol), see protocol description for details
Device address: 1-247 can be set, the default is 1
Baud rate: default 9600 (users can set by themselves), 8 data, 1 stop, no parity.

register type	register Address	the data content	the number of bytes
the input register	0x0001	the temperature value	2
	0x0002	humidity value	2
the holding register	0x0101	device address (1~247 (in Chinese))	2
	0x0102	the baud rate 0:9600 1:14400 2:19200	2
	0x0103	temperature correction(/10) -10.0-10.0	2
	0x0104	humidity correction value(/10) -10.0-10.0	2

Modbus protocol

products used in the function code:
0 x03:read holding registers
0 x04:read input registers
0 x06:write a single holding register
0 x10:write multiple hold registers

Modbus communication Format:

the host sends a data frame:

the slave address	function Code	register Address the high byte	register Address the low byte	number of registers the high byte	number of registers the low byte	CRC the high byte	CRC the low byte

slave response data frame:

the slave address	in response to the function code	the number of bytes	register1data the high byte	register1data the low byte	registerNdata the high byte	registerNdata the low byte	CRC the high byte	CRC the low byte

MODBUSthe command frame

host reads temperature command frames(0 x04):

the slave	function	register	register	number	number	CRC	CRC

address	Code	Address the high byte	Address the low byte	of registers the high byte	of registers the low byte	the high byte	the low byte
0x01	0x04	0x00	0x01	0x00	0x01	0x60	0x0a

slave response data frame:

the slave address	function Code	the number of bytes	temperature the high byte	temperature the low byte	CRC the high byte	CRC the low byte
0x01	0x04	0x02	0x01	0x31	0x79	0x74

the temperature value= 0 x131,to decimal conversion305actual temperature value= 305 / 10=30.5
note: temperature is marked16decimal number, temperature value= 0 xFF33,to decimal conversion-205the actual temperature= -20.5 ;

host reads humidity command frames(0 x04):

the slave address	function Code	register Address the high byte	register Address the low byte	number of registers the high byte	number of registers the low byte	CRC the high byte	CRC the low byte
0x01	0x04	0x00	0x02	0x00	0x01	0xC1	0xCA

slave response data frame:

the slave address	function Code	the number of bytes	humidity the high byte	humidity the low byte	CRC the high byte	CRC the low byte
0x01	0x04	0x02	0x02	0x22	0xD1	0xBA

humidity value= 0 x222,to decimal conversion546actual humidity value= 546 / 10 = 54.6%;

continuously read temperature and humidity command frames(0 x04):

the slave address	function Code	register Address the high byte	register Address the low byte	number of registers the high byte	number of registers the low byte	CRC the high byte	CRC the low byte
0x01	0x04	0x00	0x01	0x00	0x02	0x20	0x0B

slave response data frame:

the slave address	function Code	the number of bytes	temperature the high byte	temperature the low byte	humidity the high byte	humidity the low byte	CRC the high byte	CRC the low byte
0x01	0x04	0x04	0x01	0x31	0x02	0x22	0x2A	0xCE

read the content of the maintenance register(0 x03):
take reading the slave address as an example:

the slave address	function Code	register Address the high byte	register Address the low byte	number of registers the high byte	number of registers the low byte	CRC the high byte	CRC the low byte
0x01	0x03	0x01	0x01	0x00	0x01	0xD4	0x0F

slave response frame:

the slave address	function Code	the number of bytes	the slave address the high byte	the slave address the low byte	CRC the high byte	CRC the low byte
0x01	0x03	0x02	0x00	0x01	0x30	0x18

modify the content of the maintenance register(0 x06):
take modifying the slave address as an example:

the slave address	function Code	register Address the high byte	register Address the low byte	the register value the high byte	the register value the low byte	CRC the high byte	CRC the low byte
0x01	0x06	0x01	0x01	0x00	0x08	0xD4	0x0F

modify the slave address: 0x08=8

the slave response frame(and send the same):

the slave address	function Code	register Address the high byte	register Address the low byte	the register value the high byte	the register value the low byte	CRC the high byte	CRC the low byte
0x01	0x06	0x01	0x01	0x00	0x08	0xD4	0x0F

continuous modify holding register(0 x10):

the slave address	function Code	the start address the high byte	the start address the low byte	number of registers the high byte	number of registers the low byte	the number of bytes	register 1the high byte	register 1the low byte	register 2the high byte	register 2the low byte	CRC the high byte	CRC the low byte
0x01	0x06	0x01	0x01	0x00	0x02	0x04	0x00	0x20	0x25	0x80	0x25	0x09

modify the slave address: 0x20=32
the baud rate: 0x2580=9600
slave response frame:

the slave address	function Code	register Address the high byte	register Address the low byte	number of registers the high byte	number of registers the low byte	CRC the high byte	CRC the low byte
0x01	0x06	0x00	0x11	0x00	0x04	0xD4	0x0F

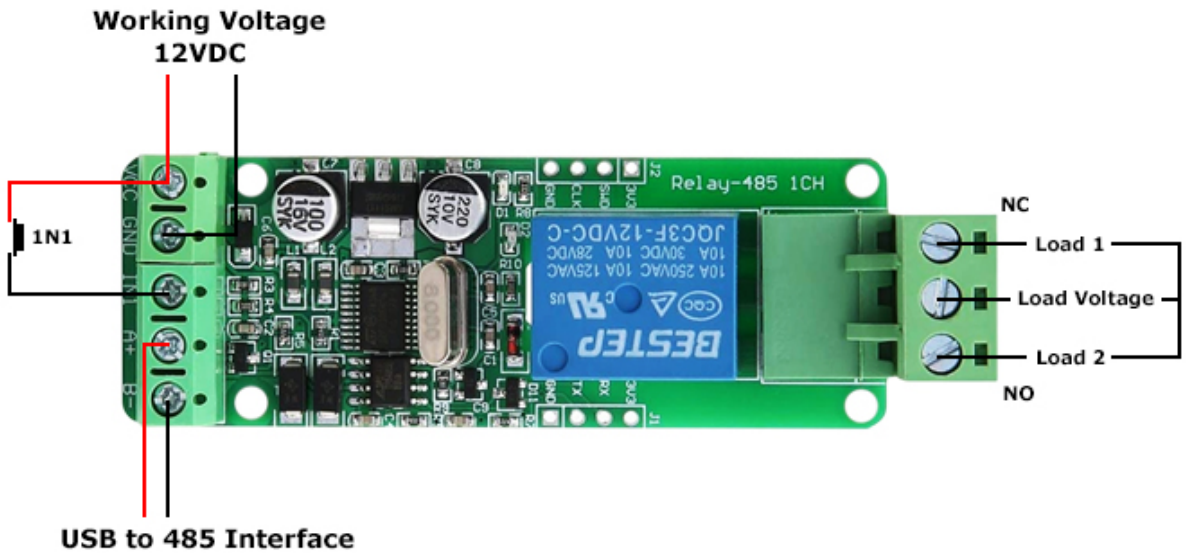
the ordinary version protocol

the baud rate of the default9600(Users can set it by themselves),8bit Data,1bit stop, no verification
RS485 communication

serial commands	description
READ	trigger a temperature and humidity report (27.4 67.7%temperature27.4 humidity67.7%)
AUTO	start the automatic report function of temperature and humidity (ditto)
STOP	stop Automatic temperature and humidity reporting function
BR:XXXX	set the baud rate from 9600 to 19200 (BR:9600the baud rate9600)
TC:XX.X	set the temperature correction

	(-10.0~10.0) (TC:02.0temperature correction2.0)
HC:XX.X	setting the humidity calibration (-10.0~10.0) (HC:-05.1humidity correction value is-5.1%)
HZ:XXX	set the temperature and humidity report rate (0.5,1,2,5,10) (HZ:2not only automatically reported rate2)
PARAM	read the current system settings

PARAMinstructions:
TC:0.0,HC:0.0,BR:9600,HZ:1->temperature correction0.0humidity correction value0.0the baud rate9600report rate1Hz
SLAVE_ADD:1->MODBUSthe slave address0x01



Arduino UNO R3 -> RS485 module

- 5V -> VCC
- GND -> GND
- 2 -> RO
- 3 -> DI
- 4 -> DE
- 5 -> RE

Arduino UNO R3 -> SHT20

- 5V -> (+)
- GND -> (-)

RS485 module -> SHT20

- VCC -> (+)
- GND -> (-)
- B -> B-
- A -> A+

This is a one channel Modbus RTU relay module equipped with stable 8-bit MCU and RS485 level communication chip, adopting standard MODBUS RTU format RS485 communication protocol. It can realize 2-bit input signal detection and provides a 2-bit relay output. It can be used for digital detection or power control occasions.

Quick Spec

- Model: GY18123
- Work Voltage: 7 ~ 24VDC
- Baud Rate: 4800/9600/19600bps (default 9600bps)
- Optocoupler Input Signal: 3.3 ~ 30VDC
- Set Address: 1 ~ 255
- Relay Contorl Mode: ON/OFF, Delay_ON, Delay_OFF mode
- Delay Time: 0 ~ 6553.5s
- Load: AC 250V 10A / DC 28V 10A
- Protocol: Modbus RTU
- Interface: RS485/TTL UART
- Control Channel: 1 channel
- Operating Temperature: -20 ~ +85°C
- Operating Humidity: 5% ~ 95%RH
- Module Size: 85 x 49 x 19mm
- Weight: 24g

N.O.	Command	Instruction	Return value	Explanation
1	Relay 0 Instantaneous trigger	01 05 02 00 07 00 CE 42 // 700MS=7*100MS=700MS	01 05 02 00 07 00 CE 42 // 700MS=7*100MS=700MS	Address 1
2	Relay 1 Instantaneous trigger	01 05 02 01 08 00 9A 72 // 800MS	01 05 02 01 08 00 9A 72 // 800MS	Address 1
3	Relay 0 Instantaneous trigger	02 05 02 00 05 00 CF 11 // 500MS	02 05 02 00 05 00 CF 11 // 500MS	Address 2
4	Relay 1 Instantaneous trigger	02 05 02 01 06 00 9E 21 // 600MS	02 05 02 01 06 00 9E 21 // 600MS	Address 2
5	Completely destroyed	01 0F 00 00 00 08 01 00 FE 95	——	
6	Full bright	01 0F 00 00 00 08 01 FF BE D5	——	

N.O.	Command	Instruction	Return value	Explanation
1	Set the address to 01	00 10 00 00 00 01 02 00 01 6A 00	None	Modified to 01
2	Set the address to 02	00 10 00 00 00 01 02 00 02 2A 01	None	Modified to 02
3	Set the address to 03	00 10 00 00 00 01 02 00 03 EB C1	None	Modified to 03
4	Read address	00 03 00 00 00 01 85 db	00 03 02 00 01 44 44	01 is the device address

N.O.	Instruction Explanation (01 05 00 01 01 00 9d 9a)	Command (Set No. 1 Relay)
1	1st Byte: 01	Device address
2	2nd Byte: 05	Function code
3	3rd,4th Byte: 00 01	Represents the register address
4	5th,6th Byte: 01 00	Register data
5	7th,8th Byte: 9d 94	CRC check

N.O.	Command	Instruction
1	Relay 0 turns ON	01 05 00 00 FF 00 8C 3A
2	Relay 0 turns OFF	01 05 00 00 00 00 CD CA

N.O.	Command	Instruction
1	Read relay status 0	01 01 00 00 00 01 FD CA
2	Read all relay status	01 01 00 00 00 08 3D CC

N.O.	Command	Instruction
1	Relay 0 flip	01 05 00 00 55 00 F2 9A
2	All flip instructions:	01 05 00 00 5A 00 F7 6A

Crc check

https://crccalc.com/

http://www.ip33.com/crc.html