Temperature and humidity transmitter SHT20 sensor Modbus RS485

Product Description:

Product adopts industrial-grade chip, high-precision SHT20 temperature and humidity sensors, ensure the products with good reliability, high precision and interchangeability. Adopt RS485 hardware interface (with the lightning protection design), the protocol layer compatible with standard industrial Modbus Rtu protocol.

This product integrating MODBUS protocol with ordinary, users can choose communication protocols, common agreement with automatic upload function(Connect the RS485 serial interface mode tool by automatically output temperature and humidity).

Product Highlights:

Industrial products, high progress SHT20 temperature and humidity sensor, the RS485 communication;

Standard MODBUS protocol with ordinary at an organic whole, the user can choose communication protocol;

Baud rate can decide for themselves;

General agreement with automatic upload function, upload speed can decide for themselves.

Product Parameters:

Work voltage: DC4-30 v (highest do not exceed 33 v) .

Most powerful: 0.2 W .

Work environment: Temperature 20 ℃ - 60 ℃, Humidity 0-100.

Control precision: Temperature±0.3℃, Humidity ±3%RH.

Output interface: RS485 communication (standard MODBUS protocol and custom ordinary), see note agreement device.

Device address: 1-247 can be set, the default is 1.

Baud rate: 9600(the user can set), 8bits, one stop, no check;

Shape size:60*30*18(mm)

MODBUS PROTOCAL

Modbus Function Code:

0x03:Read keep register

0x04:Read input register

0x06: Write a single keep register

0x10: Write more keep registers

Register Type	Register Address	Register contents	Number of bytes
Input Register	0x0001	Temperature	2
	0x0002	Humidity	2
Keep Register	0x0101	Device Address	2
	0x0102	Baud Rate 0:9600 1:14400 2:19200	2
	0x0103	Temperature correction(/10) -10.0~10.0	2
	0x0104	Humidity correction(/10) -10.0~10.0	2

Modbus Frame format:

Master send format:

Device Address	Function Code	Starting Address Hi	Starting Address Li	Quantity Hi	Quantity Li	CRC Hi	CRC Li

The response format of slave:

Device Address	Function Code	Num of Bytes	Register 1 Hi	Register1 Hi	Register N Hi	Register N Hi	CRC Hi	CRC Li

MODBUS COMMAND

Master read temperature command frame (0x04):

Device Address	Function Code	Starting Address Hi	Starting Address Li	Quantity Hi	Quantity Li	CRC Hi	CRC Li
0x01	0x04	0x00	0x01	0x00	0x01	0x60	0x0a

The response data from slave:

Device Address	Function Code	Num of Bytes	Temp Hi	Temp Li	CRC Hi	CRC Li
0x01	0x04	0x02	0x01	0x31	0x79	0x74

Temperature value=0x131, converted to a decimal 305, the actual temperature value = 305 / 10 = 30.5℃

Note: the temperature is signed hexadecimal number, temperature value = 0xFF33, converted to a decimal - 205, the actual temperature = -20.5 ℃;

Master read humidity command frame(0x04)

Device Address	Function Code	Starting Address Hi	Starting Address Li	Quantity Hi	Quantity Li	CRC Hi	CRC Li
0x01	0x04	0x00	0x02	0x00	0x01	0xc1	0xca

The response data from slave:

Device Address	Function Code	Num of Bytes	Humi Hi	Humi Li	CRC Hi	CRC Li
0x01	0x04	0x02	0x02	0x22	0xd1	0xba

Humidity value = 0x222, converted to a decimal 546, actual humidity value = 546/10 = 54.6 %;

Continuous read temperature and humidity command frame

(0x04):

Device Address	Function Code	Starting Address Hi	Starting Address Li	Quantity Hi	Quantity Li	CRC Hi	CRC Li
0x01	0x04	0x00	0x01	0x00	0x02	0x20	0x0b

The response data from slave:

Device Address	Function Code	Num of Bytes	Temp Hi	Temp Li	Humi Hi	Humi Li	CRC Hi	CRC Li
0x01	0x04	0x04	0x01	0x31	0x02	0x22	0x2a	0xce

Read keep register(0x03):

Read device address from the slave :

Device Address	Function Code	Starting Address Hi	Starting Address Li	Quantity Hi	Quantity Li	CRC Hi	CRC Li
0x01	0x03	0x01	0x01	0x00	0x01	0xd4	0x0f

The response data from slave:

Device Address	Function Code	Num of Bytes	Slave Add Hi	Slave Add Li	CRC Hi	CRC Li
0x01	0x03	0x02	0x01	0x02	0x30	0x18

Modify the contents of the registers (0x06):

Modify the slave address register:

Device Address	Function Code	Register Address Hi	Register Address Li	Value Hi	Value Li	CRC Hi	CRC Li
0x01	0x06	0x01	0x01	0x00	0x08	0xd4	0x0f

Modify the slave address: 0x08 = 8

The response data from slave(**And send the same**):

Device Address	Function Code	Register Address Hi	Register Address Li	Value Hi	Value Li	CRC Hi	CRC Li
0x01	0x06	0x01	0x01	0x00	0x08	0xd4	0x0f

Continuously change keep registers (0x10):

Device Address	Function Code	Start Address Hi	Start Address Li	Quantity Hi	Quantity Li	Num of Bytes	Reg1 Hi	Reg1 Li	Reg 2 Hi	Reg2 Li	CRC Hi	CRC Li
0x01	0x10	0x01	0x01	0x00	0x02	0x04	0x00	0x20	0x25	0x80	0x25	0x09

Slave address : 0x20 = 32

Baud rate : 0x2580 = 9600

The response data from slave:

Device Address	Function Code	Start Address Hi	Start Address Li	Reg Num Hi	Reg Num Li	CRC Hi	CRC Li
0x01	0x10	0x01	0x01	0x00	0x02	0x11	0xf4

General Protocal

The default baud rates 9600 (the user can set), 8 bits of data, one stop, no check

RS485

CMD	instructions
READ	Report triggered a temperature and humidity (27.4℃,67.7% 温度 27.4℃湿度 67.7%)
AUTO	Start the temperature and humidity automatically report function (Same as above)
STOP	Stop the temperature and humidity automatically report function
BR:XXXX	Set the baud rate 9600~19200 (BR:9600)
TC:XX.X	Set the temperature calibration (-10.0~10.0) (TC:02.0 温度修正值为 2.0℃)
HC:XX.X	Set the humidity ration (-10.0~10.0) (HC:-05.1 湿度修正值为 -5.1%)
HZ:XXX	Set the temperature and humidity reporting rate (0.5,1,2,5,10) (HZ:2 reporting rate 2Hz)
PARAM	Read the system current Settings

PARAM CMD:

TC:0.0,HC:0.0,BR:9600,HZ:1 ->Temp calibration 0.0, Humi calibration0.0, Baud rate 9600,report rate 1Hz

SLAVE_ADD:1 ->MODBU Slave address 1