XY-MD01/XY-MD02
RS485 (modbus) sensor module from HESTORE

1.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 and ordinary UART communication protocol, users can choose communication protocols, UART communication support automatic report function (Connect the RS485 serial interface mode tool by automatically output temperature and humidity).

2.Features:

1>.Support MODBUS RTU protocol
2>.RS485 supports 1000 meters communication
3>.Standard DIN35 mounting rails
4>.High precision
5>.Industrial products, high progress SHT20 temperature and humidity sensor, the RS485 communication
6>.Standard MODBUS protocol and ordinary protocol, the user can choose communication protocol
7>.Baud rate can decide for themselves
8>.General agreement with automatic upload function, upload speed can decide for themselves

3.Parameters:

1>.Product Name:Modbus RTU RS485 SHT20 Temperature Humidity Transmitter
2>.Product Number:XY-MD02
3>.Working Voltage:DC 5V~30V
4>.Output signal:RS485 signal
5>.Communication protocol:Modbus RTU and ordinary protocol
6>.Communication address:1~247(default 1)
7>.Temperature Range:-40℃~60℃
8>.Temperature Precision:+/-0.5℃
9>.Temperature Resolution:0.1℃
10>.Humidity Range:0%RH~80%RH
11>.Humidity Precision:+/-3%RH
12>.Humidity Resolution:0.1%RH
13>.Power:<0.2W
14>.Work Temperature:-40℃~85℃
15>.Work Humidity:0%~95%RH
16>.Size:65*46*28.5mm

4.Using Steps:

1>.Connect signal receiver such as for Arduino to RS485 terminal.
2>.Input power supply at power terminal.

3>.According to the acquired data, the data is processed differently according to actual needs.

5.Note:

1>.Users need to prepare their own ModBus debugging tool and RS485 debugger.

2>.Users needs to complete write code according to the communication protocol and commands if using the controller to receive data.

6.Application:

1>.Factory Detect

2>.Equipment box Detect

3>.Environmental test

4>.Home security

Modbus Protocol	
Function Code	
Command Register	Funciotn
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	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℃	2
	0x0104	Humidity Correction -10%RH~10%RH	2

Modbus Protocol Communication Format

Master Send Format

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

Response Format from Slave

Device Address	Function Code	Bytes	Register 1 Hi	Register 1 Li	Register N Hi	Register N Li	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

Response Temperature Value from Slave

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

For example:
Temperature value=0x131, converted to a decimal 305 , so the actual temperature value = 305/10 = 30.5℃
Note: Temperature is signed hexadecimal number, temperature value = 0xFF33, converted to a decimal - 205, so 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	0x90	0x0A

Response Humidity Value from Slave

Device Address	Function Code	Bytes	Humidiyt Hi	Humidity Li	CRC Hi	CRC Li
0x01	0x04	0x02	0x02	0x22	0xD1	0xBA

For example:
Humidity Value = 0x222, converted to a decimal 546, so actual humidity value = 546/10 = 54.6%RH

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

Response Temperature and Humidity Value from Slave

Device Address	Function Code	Bytes	Temp Hi	Tmep Li	Humidiyt Hi	Humidity Li	CRC Hi	CRC Li
0x01	0x04	0x04	0x01	0x31	0x02	0x22	0x2A	0xCE

Read Keep Register(0x03)							
Read Device Address from 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	0x36
Response Data from Slave							
Device Address	Function Code	Bytes	Slave Add Hi	Slave Add Li	CRC Hi	CRC Li	
0x01	0x03	0x02	0x01	0x02	0x30	0x18	
Modify Contents of Registers(0x06)							
Modify 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	0xD8	0x30
Note:For example,this command is used to change slave address to 0x08.							
Send/Response Data from Slave							
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	Starting Address Hi	Starting Address Li	Quantity Hi	Quantity Li	Bytes	Register Address 1 Hi	Register Address 1 Li	Register Address 2 Hi	Register Address 2 Li	CRC Hi	CRC Li
0x01	0x10	0x01	0x01	0x00	0x02	0x04	0x00	0x20	0x25	0x80	0x25	0x09
For example,this command is used to change slave address to 0x20 by register 1.That is 32. Set Baud Rate to 0x2580 by register 2.That is 9600												

Response Data from Slave							
Device Address	Function Code	Starting Address Hi	Starting Address Li	Register Num Hi	Register Num Li	CRC Hi	CRC Li
0x01	0x10	0x01	0x01	0x00	0x02	0x11	0xF4

Note:

1.This product integrating MODBUS protocol and ordinary UART communication protocol, users can choose communication protocols, UART communication support automatic report function.

2. output temperature and humidity automatically after connect the RS485 serial interface mode tool.

UART Communication Protocol	
Baud Rate	9600
Bit	8
Stop Bit	1
Check Bit	No
Command	Function
READ	Read temperature and humidity
	For exampe:
	27.4℃,67.7%
	Temperature is 27.4℃
	Humidity is 67.7%RH
AUTO	Start the temperature and humidity automatically report function (Same as READ)
STOP	Stop the temperature and humidity automatically report function
BR:XXXX	Set baud rate 9600-19200 For exampe:
	BR:9600
	Set baud rate to 9600
TC:XX.X	Set the temperature calibration (-10.0~10.0)
	For exampe: TC:02.0
	Set calibration to 2℃
HC:XX.X	Set the humidity calibration (-10.0~10.0)
	For exampe: HC:-05.1
	Set calibration to -5.1%RH
HZ:XXX	Set the temperature and humidity reporting rate. Range is 0.5,1,2,5,10
	For exampe: HZ:2
	Set reporting rate to 2Hz
PARAM	Read system current Set Value
	Return:
	TC:0.0,HC:0.0,BR:9600,HZ:1
	Temperature Calibration:0.0℃
	Humidity Calibration：0.0%RH
	Baud Rate：9600
	Report Rate：1Hz
	SLAVE_ADD:1
	ModBus Slave Address is 0x01