

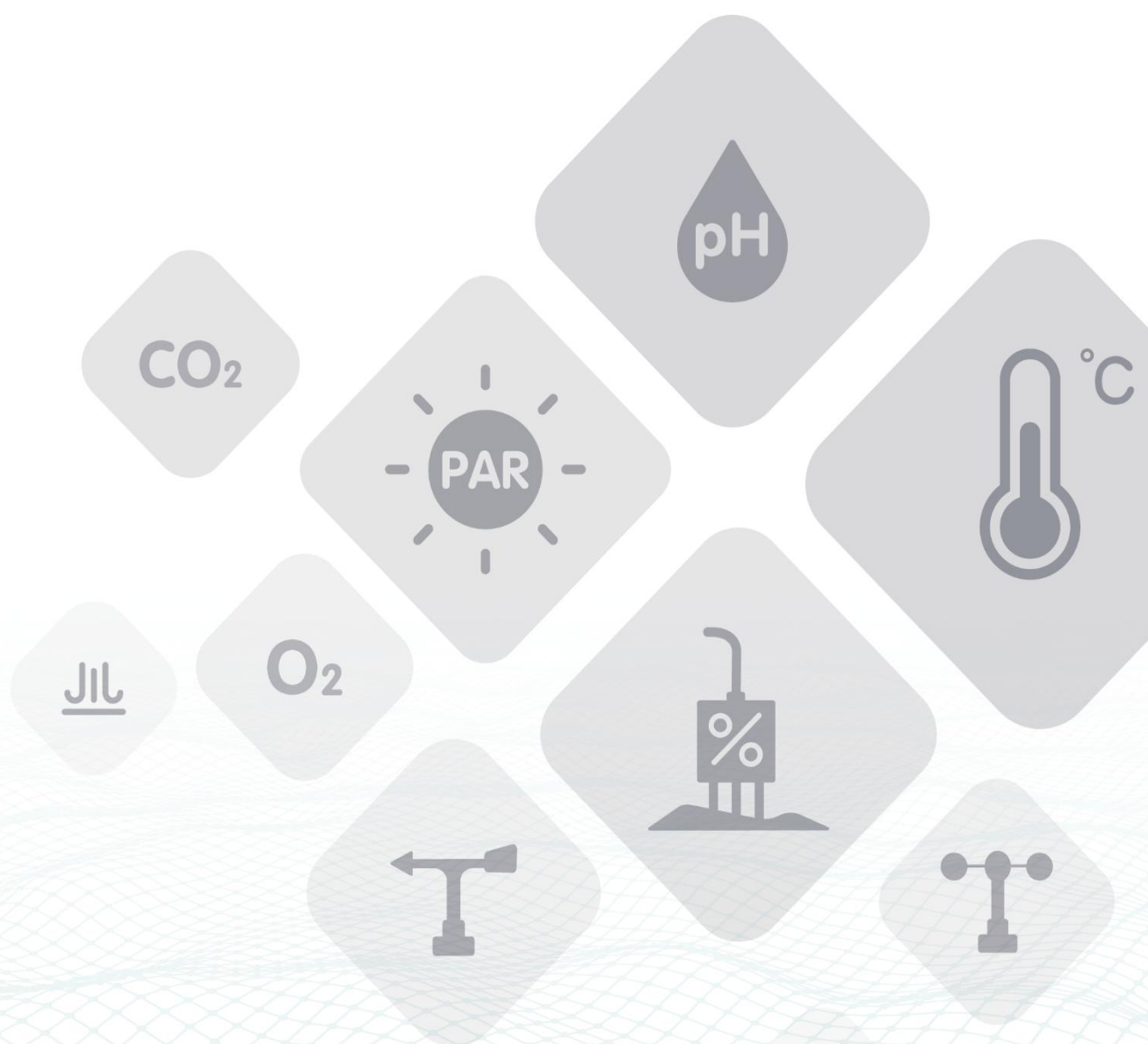


SENSECAP

Air Temperature & Humidity & Barometric Pressure Sensor User Guide

Product Model: S-THP-01A

Version: V1.0



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1 Introduction

S-THP-01A is an air humidity, temperature and barometric pressure sensor. The sensing elements are located on a PCB in the tip of the sensor. The acquisition circuit is completely over-moulded. Temperature and humidity sensor is based on a precision SENSIRION® sensor. An additional BOSCH®MEMS chip measures barometric pressure. Each sensor is individually factory-calibrated. With dimensions of only 108mm x 16mm, the sensor can easily be fitted into many standard radiation shields and field application.

The sensor supports RS485 interface (Modbus-RTU protocol), compatible with a variety of data collectors that support RS485 communication, for long-distance multi-point monitoring and recording.

Features:

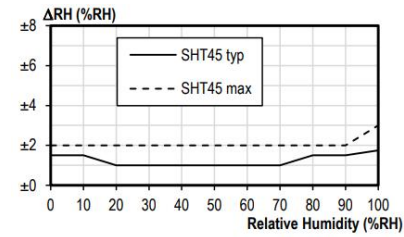
- High precision SENSIRION humidity/Temperature sensor and BOSH barometric sensor
- Secondary measurements including dew point, frost point, vapor pressure, vapor concentration, cloud base height and altitude, etc.
- Digital Output RS485 with built-in surge protection
- Small size with high accuracy with excellent stability
- Cleanable 10um Copper sintering filter cap
- Wall mounting or Pipe flange insertion installation
- Reverse power protection and Built-in TVS/ESD protection
- Excellent price-performance ratio

2 Specifications

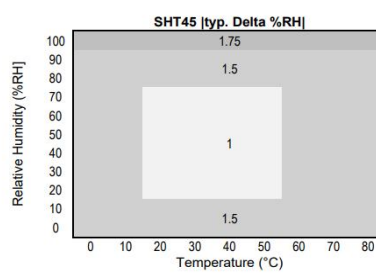
Temperature		
Range	-40 °C to +125 °C Note: The long-term operating temperature range of the sensor is -40 to 80°C.	
Accuracy	±0.1°C	
Resolution	0.01 °C	
Humidity		
Range	From completely dry to fully saturated (from 0% to 100% of saturation)	
Accuracy	±1.0%RH	
Resolution	0.01%	
Barometric		
Range	300-1100hPa	
Accuracy	±0.15hPa(Relative Accuracy) ,±0.1hPa(Absolute Accuracy)	
Resolution	0.1hPa	
General Parameters		
Product Model	S-THP-01A	
Output Interface	RS-485	
Protocol	MODBUS-RTU RS485	
Power Supply	4.5 ~ 18V DC	
Power Consumption	Quiescent Current : <300uA	Measurement current: 10mA for 50ms during measurement, then returns to static sleep current consumption
Response Time	Less than 1 second	
IP Rating	IP56	
Encapsulation	Standard (ABS+ Copper sintering filter)	
Connector	Cold pressed terminal	
Cable Length	2 meters	
Operating Temperature	-40 ~ 80°C	
Installation	Wall mounting or Pipe flange insertion	
Dimension	Sensor Body 110*16mm	

2.1 Accuracy

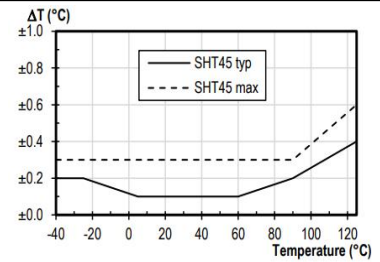
SHT45 – Temperature & Humidity accuracy



SHT45 typical and maximal relative humidity accuracy at 25 °C.



Typical RH accuracy tolerance over humidity and temperature for SHT45.



SHT45 typical and maximal temperature accuracy.

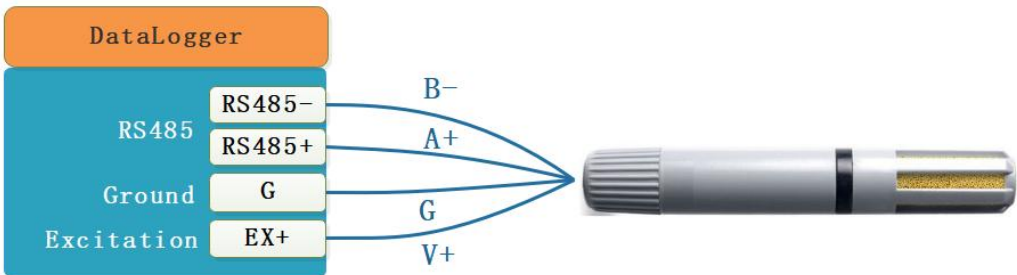
BMP280 – Barometric Sensor

Absolute Accuracy (300-1100hPa) : $\pm 1.7\text{hPa}$ ($-20\sim 0^{\circ}\text{C}$) , $\pm 1.0\text{hPa}$ ($0\sim 65^{\circ}\text{C}$)

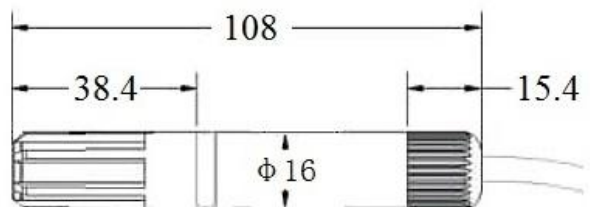
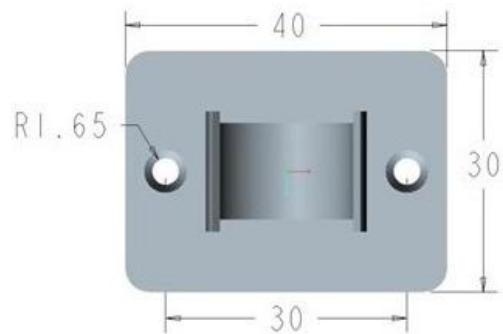
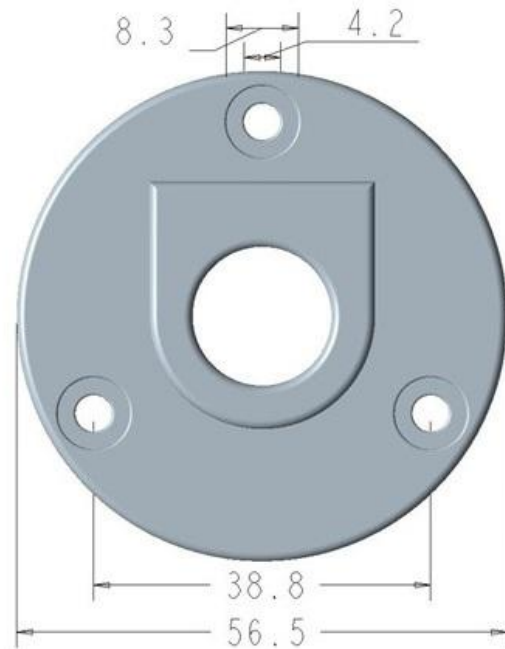
Relative Accuracy (700-900hPa) : $\pm 0.12\text{hPa}$ ($25\sim 40^{\circ}\text{C}$)

3 Wiring

3.1 RS485 Interface

Type	Wiring diagram
RS485 Interface Signal definition	Cold pressed terminal  RED (V+) : Power Supply+ BLACK (G) : Power supply- YELLOW (RS485) : A+ WHITE (RS485) : B-
RS485 Interface connection diagram	Wiring Diagram For RS485  DataLogger RS485- B- RS485+ A+ Ground G Excitation EX+ V+

4 Dimension



Unit: mm

5 RS485 Communication

Seeed Technology Co., Ltd. Authorised

5.1 Modbus Protocol

Modbus Protocol is widely used to establish master-slave communication between intelligent devices or sensors. A Modbus message sent from a master to a slave contains the address of the slave, the function code (e.g. 'read register' or 'write register'), the data, and a check sum (LRC or CRC).

The sensor is RS485 interface with Modbus protocol. The default serial communication settings is slave address 1, Modbus-RTU, 9600bps, 8 databits and 1 stop bit. All communication settings can be changed with Modbus command, and take effective after re-power up the sensor.

Following Modbus function code are supported by sensor.

Modbus Function Code 0x03 : used for reading holding register.

Modbus Function Code 0x04 : used for reading input register.

Modbus Function Code 0x06 : used for writing single holding register.

Modbus Function Code 0x10: used for writing multiple holding register.

5.2 Modbus Register

Parameters	Register Addr. (HEX/DEC)	Data Type	Modbus Function Code(DEC)	Range and Comments	Default Value
TEMPERATURE	0x0000 /0	INT16 RO	3/4	-4000-12500 for -40.00-125.00 (°C); -4000-25700 for -40.00-257.00 (°F)	N/A
HUMIDITY	0x0001 /1	INT16 RO	3/4	0-10000 for 0.00-100.00 (%)	N/A
DEWPOINT	0x0002 /2	INT16 RO	3/4	-10000-12500 for -100.00-125.00 (°C) -14800-25700 for -148.00-257.00 (°F)	N/A
Atmospheric Pressure	0x0003 /3	INT16 RO	3/4	3000-11000 for 300.0-1100.0 (hPa)	N/A
Frost Point	0x0004 /4	INT16 RO	3/4	-10000-12500 for -100.00-125.00 (°C) -14800-25700 for -148.00-257.00 (°F)	N/A
Vapor Pressure	0x0005 /5	INT16 RO	3/4	0-24000 for 0.0-2400.0 (hPa)	N/A
Vapor Concentration	0x0006 /6	INT16 RO	3/4	0-13000 for 0.0-1300.0 (g/m3)	N/A
Cloud base Estimation Ref By Station	0x0007 /7	INT16 RO	3/4	0-20500 for 0-20500 (m)	N/A
Elevation Estimation Ref By Sea Level	0x0008 /8	INT16 RO	3/4	-700-9200 for -700-9200 (m)	N/A
RESERVED	0x0009 /9	INT16 RO	3/4	Reserved	0
RESERVED	0x000A /10	INT16 RO	3/4	Reserved	0
RESERVED	0x000B /11	INT16 RO	3/4	Reserved	0
RESERVED	0x000C /12	INT16 RO	3/4	Reserved	0
RESERVED	0x000D /13	INT16	3/4	Reserved	0

		RO			
RESERVED	0x000E /14	INT16 RO	3/4	Reserved	0
RESERVED	0x000F /15	INT16 RO	3/4	Reserved	0
TEMPUNIT	0x0020 /32	UINT16 RW	3/6/16	0:°C 1:°F	0
SLAVEADDRESS	0x0200 /512	UINT16 RW	3/6/16	0-255	1
BAUDRATE	0x0201 /513	UINT16 RW	3/6/16	0-5 0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps	3:9600bps s
PROTOCOL	0x0202 /514	UINT16 RW	3/6/16	0 0:Modbus RTU	0:Modbus RTU
PARITY	0x0203 /515	UINT16 RW	3/6/16	0-2 0:NONE 1:EVEN 2:ODD	0:NONE
DATABITS	0x0204 /516	UINT16 RW	3/6/16	1 1:8 databits	1:8 databits
STOPBITS	0x0205 /517	UINT16 RW	3/6/16	0-1 0:1 stopbit 1:2 stopbits	0:1 stopbit
RESERVED	0x0206 /518	UINT16 RW	3/6/16	Reserved	0
RESERVED	0x0207 /519	UINT16 RW	3/6/16	Reserved	0
User-defined serial number (USERSN)	0x0220 /544 0x0221 /545 0x0222 /546 0x0223 /547	UINT16 RW	3/16	0x0000000000000000 000- 0xFFFFFFFFFFFFFFF FF	N/A
TEMPRATURE_FL OAT	0x1000 /4096	FLOAT RO	3/4	-40.00-125.00 (°C) -40.00-257.00 (°F)	N/A
HUMIDITY_FLOAT	0x1002 /4098	FLOAT RO	3/4	0.00-100.00 (%)	N/A

DEWPOINT_FLOAT	0x1004 /4100	FLOAT RO	3/4	-100.00-125.00 (°C) -148.00-257.00 (°F)	N/A
Atmospheric Pressure_FLOAT	0x1006 /4102	FLOAT RO	3/4	300.00-1100.00 (hPa)	N/A
Frost Point_FLOAT	0x1008 /4104	FLOAT RO	3/4	-100.00-125.00 (°C) -148.00-257.00 (°F)	N/A
Vapor Pressure_FLOAT	0x100A /4106	FLOAT RO	3/4	0.00-2400.00 (hPa)	N/A
Vapor Concentration_FLOAT	0x100C /4108	FLOAT RO	3/4	0.00-1300.00 (g/m3)	N/A
Cloud base Estimation Ref By Station_FLOAT	0x100E /4110	FLOAT RO	3/4	0.00-20500.00 (m)	N/A
Elevation Estimation Ref By Sea Level_FLOAT	0x1010 /4112	FLOAT RO	3/4	-700.00-9200.00 (m)	N/A
RESERVED_FLOAT	0x1012 /4114	FLOAT RO	3/4	Reserved	0
RESERVED_FLOAT	0x1014 /4116	FLOAT RO	3/4	Reserved	0
RESERVED_FLOAT	0x1016 /4118	FLOAT RO	3/4	Reserved	0
RESERVED_FLOAT	0x1018 /4120	FLOAT RO	3/4	Reserved	0
RESERVED_FLOAT	0x101A /4122	FLOAT RO	3/4	Reserved	0
RESERVED_FLOAT	0x101C /4124	FLOAT RO	3/4	Reserved	0
RESERVED_FLOAT	0x101E /4126	FLOAT RO	3/4	Reserved	0
TEMPERATURE_FLOAT_INVERSE	0x1100 /4352	FLOAT _INVERSE RO	3/4	-40.00-125.00 (°C) -40.00-257.00 (°F)	N/A
HUMIDITY_FLOAT_INVERSE	0x1102 /4354	FLOAT _INVERSE RO	3/4	0.00-100.00 (%)	N/A
DEWPOINT_FLOAT_INVERSE	0x1104 /4356	FLOAT _INVERSE RO	3/4	-100.00-125.00 (°C) -148.00-257.00 (°F)	N/A

Atmospheric Pressure_FLOAT_INVERSE	0x1106 /4358	FLOAT_INVERSE RO	3/4	300.00-1100.00 (hPa)	N/A
Frost Point_FLOAT_INVERSE	0x1108 /4360	FLOAT_INVERSE RO	3/4	-100.00-125.00 (°C) -148.00-257.00 (°F)	N/A
Vapor Pressure_FLOAT_INVERSE	0x110A /4362	FLOAT_INVERSE RO	3/4	0.00-2400.00 (hPa)	N/A
Vapor Concentration_FLOAT_INVERSE	0x110C /4364	FLOAT_INVERSE RO	3/4	0.00-1300.00 (g/m3)	N/A
Cloud base Estimation Ref By Station_FLOAT_INVERSE	0x110E /4366	FLOAT_INVERSE RO	3/4	0.00-20500.00 (m)	N/A
Elevation Estimation Ref By Sea Level_FLOAT_INVERSE	0x1110 /4368	FLOAT_INVERSE RO	3/4	-700.00-9200.00 (m)	N/A
RESERVED_FLOAT_INVERSE	0x1112 /4370	FLOAT_INVERSE RO	3/4	Reserved	0
RESERVED_FLOAT_INVERSE	0x1114 /4372	FLOAT_INVERSE RO	3/4	Reserved	0
RESERVED_FLOAT_INVERSE	0x1116 /4374	FLOAT_INVERSE RO	3/4	Reserved	0
RESERVED_FLOAT_INVERSE	0x1118 /4376	FLOAT_INVERSE RO	3/4	Reserved	0
RESERVED_FLOAT_INVERSE	0x111A /4378	FLOAT_INVERSE RO	3/4	Reserved	0

		RO			
RESERVED_FLOAT_INVERSE	0x111C /4380	FLOAT_INVERSE RO	3/4	Reserved	0
RESERVED_FLOAT_INVERSE	0x111E /4382	FLOAT_INVERSE RO	3/4	Reserved	0

UINT16:16 bit unsigned integer

INT16:16bit signed integer

RO: Register is Read Only

R/W: Register is Read/Write

HEX: Hexadecimal (data with 0x/0X prefix)

DEC: Decimal

FLOAT: If IEEE754 little-endian byte order is [A,B,C,D], the FLOAT format is [C,D,A,B]

FLOAT_INVERSE: If IEEE754 little-endian byte order is [A,B,C,D], the FLOAT_INVERSE format is [A,B,C,D]

The register value will be set as following when there is sensor error:

Error Value	Register Address	Error
-32768	0x0000-0x000F	-32768
-32768	0x1000-0x101E	-32768
-32768	0x1100-0x111E	-32768

5.3 Modbus Register Detail Description

TEMPERATURE --- Temperature Value (16 bit signed int)		
Range	-4000-12500 corresponds to -40.00-125.00 (The temperature Unit is set to °C); -4000-25700 for -40.00-257.00 (The temperature Unit is set to °F)	Default: N/A
Parameter Storage	N/A	

TEMPERATURE_FLOAT --- Temperature Value, FLOAT Format TEMPERATURE_FLOAT_INVERSE --- Temperature Value, FLOAT_INVERSE Format		
Range	-40.00-125.00 (The temperature Unit is set to °C); -40.00-257.00 (The temperature Unit is set to °F)	Default: N/A
Parameter Storage	N/A	

HUMIDITY --- Humidity (16 bit unsigned int)		
Range	0-10000 corresponds to 0.00-100.00 (%)	Default: N/A
Parameter Storage	N/A	

HUMIDITY_FLOAT --- Humidity, FLOAT Format HUMIDITY_FLOAT_INVERSE --- Humidity, FLOAT_INVERSE Format		
Range	0.00-100.00 (%)	Default: N/A
Parameter Storage	N/A	

DEWPOINT --- Dew Point (16 bit signed int)		
Range	-10000-12500 corresponds to -100.00-125.00 (The temp Unit is set to °C);	Default: N/A

	-14800-25700 corresponds to -148.00-257.00 (The temp Unit is set to °F)	
Parameter Storage	N/A	

DEWPOINT_FLOAT --- Dew Point, FLOAT Format
DEWPOINT_FLOAT_INVERSE --- Dew Point, FLOAT_INVERSE Format

Range	-100.00-125.00 (The temp Unit is set to °C); -148.00-257.00 (The temp Unit is set to °F)	Default: N/A
Parameter Storage	N/A	

Atmospheric Pressure--- Atmospheric Pressure (16 bit unsigned int)

Range	3000-11000 corresponds to 300.0-1100.0 (hPa)	Default: N/A
Parameter Storage	N/A	

Atmospheric Pressure_FLOAT --- Atmospheric Pressure, FLOAT Format
Atmospheric Pressure_FLOAT_INVERSE --- Atmospheric Pressure, FLOAT_INVERSE Format

Range	300.0-1100.0 (hPa)	Default: N/A
Parameter Storage	N/A	

Frost Point--- Frost Point (16 bit signed int)

Range	-10000-12500 corresponds to -100.00-125.00 (Temp Unit set to °C); -14800-25700 corresponds to -148.00-257.00 (Temp Unit set to °F);	Default: N/A
Parameter Storage	N/A	

Frost Point_FLOAT --- Frost Point, FLOAT Format

Frost Point_FLOAT_INVERSE --- Frost Point, FLOAT_INVERSE Format		
Range	-100.00-125.00 (The temp Unit is set to °C); ; -148.00-257.00 (The temp Unit is set to °F);	Default: N/A
Parameter Storage	N/A	

VaporPressure---Vapor Pressure (16 bit signed int)		
Range	0-24000 corresponds to 0.0-2400.0 (hPa)	Default: N/A
Parameter Storage	N/A	

VaporPressure_FLOAT --- Vapor Pressure, FLOAT Format VaporPressure_FLOAT_INVERSE ---Vapor Pressure, FLOAT_INVERSE Format		
Range	0.00-2400.00 (hPa)	Default: N/A
Parameter Storage	N/A	

VaporConcentration---Vapor Concentration/ Absolute Humidity (16 bit signed int)		
Range	0-13000 corresponds to 0.0-1300.0 (g/m3)	Default: N/A
Parameter Storage	N/A	

VaporConcentration_FLOAT ---Vapor Concentration/ Absolute Humidity, FLOAT Format VaporConcentration_FLOAT_INVERSE ---Vapor Concentration/ Absolute Humidity, FLOAT_INVERSE Format		
Range	0.00-1300.00 (g/m3)	Default: N/A
Parameter Storage	N/A	

CloudbaseEstimationRefByStation---Cloud base estimation (16 bit signed int)		
Range	0-20500 corresponds to 0-20500 (m)	Default: N/A
Parameter Storage	N/A	

Storage		
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Note: Cloud base estimation (Reference by station)

CloudbaseEstimationRefByStation_FLOAT ---Cloud base estimation, FLOAT Format CloudbaseEstimationRefByStation_FLOAT_INVERSE ---Cloud base estimation, FLOAT_INVERSE Format		
Range	0.00-20500.00 (m)	Default: N/A
Parameter	N/A	
Storage		

Note: Cloud base estimation (Reference by station)

ElevationEstimationRefBySeaLevel---Elevation estimation (16 bit signed int)		
Range	-700-9200 corresponds to -700-9200 (m)	Default: N/A
Parameter	N/A	
Storage		

Note: Cloud base estimation (Reference by sea level)

ElevationEstimationRefBySeaLevel_FLOAT---Elevation estimation, FLOAT Format ElevationEstimationRefBySeaLevel_FLOAT_INVERSE---Elevation estimation, FLOAT_INVERSE Format		
Range	-700.00-9200.00 (m)	Default: N/A
Parameter	N/A	
Storage		

Note: Cloud base estimation (Reference by sea level)

TEMPUNIT--- Temperature Unit (16 bit unsigned int)		
Data Range	0:°C 1:°F	Default: 0
Parameter	YES	
Storage		

Note: Temperature Unit

SLAVEADDRESS --- Modbus Slave Address (16 bit unsigned int)
--

Data Range	0-255	Default: 1
Parameter Storage	YES	

Note: Please power up the sensor to take effective after set.

BAUDRATE --- Serial Comm Baudrate (16 bit unsigned int)		
Data Range	0-5 0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps	Default: 3
Parameter Storage	YES	

Note: Please power up the sensor to take effective after set.

PROTOCOL --- Serial Comm Protocol (16 bit unsigned int)		
Data Range	0 0:Modbus RTU	Default: 0
Parameter Storage	YES	

Note: Please power up the sensor to take effective after set.

PARITY --- Serial Comm Parity (16 bit unsigned int)		
Data Range	0-2 0:NONE 1:EVEN 2:ODD	Default: 0
Parameter Storage	YES	

Note: Please power up the sensor to take effective after set.

DATABITS --- Serial Comm Databits (16 bit unsigned int)		
Data Range	1 1:8 databits	Default: 1
Parameter Storage	YES	

Note: Please power up the sensor to take effective after set.

STOPBITS --- Serial Comm Stopbits (16 bit unsigned int)		
Data Range	0-1 0:1 stopbit 1:2 stopbits	Default: 0
Parameter Storage	YES	

Note: Please power up the sensor to take effective after set.

5.4 Modbus Function Code

For description below, data started with 0X/0x means that it's in HEX format.

5.4.1 Function Code 3 Protocol Example

Master Request:AA 03 RRRR NNNN CCCC

AA	1 byte	Slave Address,0-255
0x03	1 byte	Function Code 3
RRRR	2 byte	Starting Register Addr
NNNN	2 byte	Quantity of Register to read
CCCC	2 byte	CRC CHECKSUM

Slave Response:AA 03 MM VV0 VV1 VV2 VV3... CCCC

AA	1 byte	Slave Address,0-255
0x03	1 byte	Function Code 3
MM	1 byte	Register Data Byte Count
VV0,VV1	2 byte	Register Value (High8bits first)
VV2,VV3	2 byte	Register Value (High8bits first)
...	...	Register Value (High8bits first)
CCCC	2 byte	CRC CHECKSUM

Example:Read register 0x0200-0x0201,that is slave address and baudrate.

Master Request:01 03 0200 0002 C5B3

Slave Addr.	1 byte	0x01
Function Code	1 byte	0x03
Starting Register Addr.	2 byte	0x0200
Quantity of Register to read	2 byte	0x0002
Checksum	2 byte	0xC5B3

Slave Response:01 03 04 00 01 00 03 EB F2

Slave Addr.	1 byte	0x01
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Function Code	1 byte	0x03
Register Data Byte Count	1 byte	0x04
Register Value: Address	2 byte	0x00(HIGH 8 Bits) 0x01(LOW8 Bits)
Register Value: Baudrate	2 byte	0x00(HIGH 8 Bits) 0x03(LOW8 Bits)
Checksum	2 byte	0xEBF2

5.4.2 Function Code 4 Protocol Example

Master Request:AA 04 RRRR NNNN CCCC

AA	1 byte	Slave Address,0-255
0x04	1 byte	Function Code 4
RRRR	2 byte	Starting Register Addr
NNNN	2 byte	Quantity of Register to read
CCCC	2 byte	CRC CHECKSUM

Slave Response:AA 04 MM VV0 VV1 VV2 VV3... CCCC

AA	1 byte	Slave Address,0-255
0x04	1 byte	Function Code 4
MM	1 byte	Register Data Byte Count
VV0,VV1	2 byte	Register Value (High8bits first)
VV2,VV3	2 byte	Register Value (High8bits first)
...	...	Register Value (High8bits first)
CCCC	2 byte	CRC CHECKSUM

Example:Read register 0x0000-0x0003,that is temperature, humidity, dew point, Atmospheric Pressure.

Master Request:01 04 0000 0004 F1C9

Slave Addr.	1 byte	0x01
Function Code	1 byte	0x04
Starting Register Addr.	2 byte	0x0000

Quantity of Register to read	2 byte	0x0003
Checksum	2 byte	0xF1C9

Slave Response: 01 04 08 0B 1E 12 AB 06 60 26 FE 26 63

Slave Addr.	1 byte	0x01
Function Code	1 byte	0x04
Register Data Byte Count	1 byte	0x08
Register Value: Temperature	2 byte	0x0B(HIGH 8 Bits) 0x1E(LOW8 Bits)
Register Value: Reserved	2 byte	0x12(HIGH 8 Bits) 0xAB(LOW8 Bits)
Register Value: Reserved	2 byte	0x06(HIGH 8 Bits) 0x60(LOW8 Bits)
Register Value: Reserved	2 byte	0x26(HIGH 8 Bits) 0xFE(LOW8 Bits)
Checksum	2 byte	0x2663

5.4.3 Function Code 6 Protocol Example

Master Request:AA 06 RRRR VVVV CCCC

AA	1 byte	Slave Address,0-255
0x06	1 byte	Function Code 6
RRRR	2 byte	Register Addr (High8bits first)
VVVV	2 byte	Register Value (High8bits first)
CCCC	2 byte	CRC CHECKSUM

Slave Response:AA 06 RRRR VVVV CCCC

AA	1 byte	Slave Address,0-255
0x06	1 byte	Function Code 6
RRRR	2 byte	Register Addr (High8bits first)
VVVV	2 byte	Register Value (High8bits first)
CCCC	2 byte	CRC CHECKSUM

Example: Write Register 0x0200, that is change modbus slave address to 2.

Master Request: 01 06 0200 0002 09B3

Slave Addr.	1 byte	0x01
Function Code	1 byte	0x06
Register Addr.	2 byte	0x0200
Register Value	2 byte	0x0002
Checksum	2 byte	0x09B3

Slave Response: 01 06 0200 0002 09B3

Slave Addr.	1 byte	0x01
Function Code	1 byte	0x06
Register Addr.	2 byte	0x0200
Register Value	2 byte	0x0002
Checksum	2 byte	0x09B3

5.4.4 Function Code 16 Protocol Example

Master Request: AA 10 RRRR NNNN MM VVVV1 VVVV2 ... CCCC

AA	1 byte	Slave Address, 0-255
0x10	1 byte	Function Code 0x10
RRRR	2 byte	Starting Register Addr
NNNN	2 byte	Quantity of Register to write
MM	1 byte	Register Data Byte Count
VVVV1	2 byte	Register Value (High 8 bits first)
VVVV2	2 byte	Register Value (High 8 bits first)
...	...	Register Value (High 8 bits first)
CCCC	2 byte	CRC CHECKSUM

Slave Response: AA 10 RRRR NNNN CCCC

AA	1 byte	Slave Address, 0-255
0x10	1 byte	Function Code 0x10
RRRR	2 byte	Starting Register Addr
NNNN	2 byte	Quantity of Register to write

CCCC	2 byte	CRC CHECKSUM
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Example:Write Register 0x0200-0x0201,that is set slave address to 1,and baudrate to 19200bp.

Master Request:01 10 0200 0002 04 0001 0004 BACC

0x01	1 byte	Slave Addr.
0x10(HEX)	1 byte	Function Code 0x10
0x0200	2 byte	Starting Register Addr
0x0002	2 byte	Quantity of Register to write
0x04	1 byte	Register Data Byte Count
0x0001	2 byte	Register Value: Slave Address 1
0x0004	2 byte	Register Value: Baudrate 19200bps
0xBACC	2 byte	CRC CHECKSUM

Salve Response:01 10 0200 0002 4070

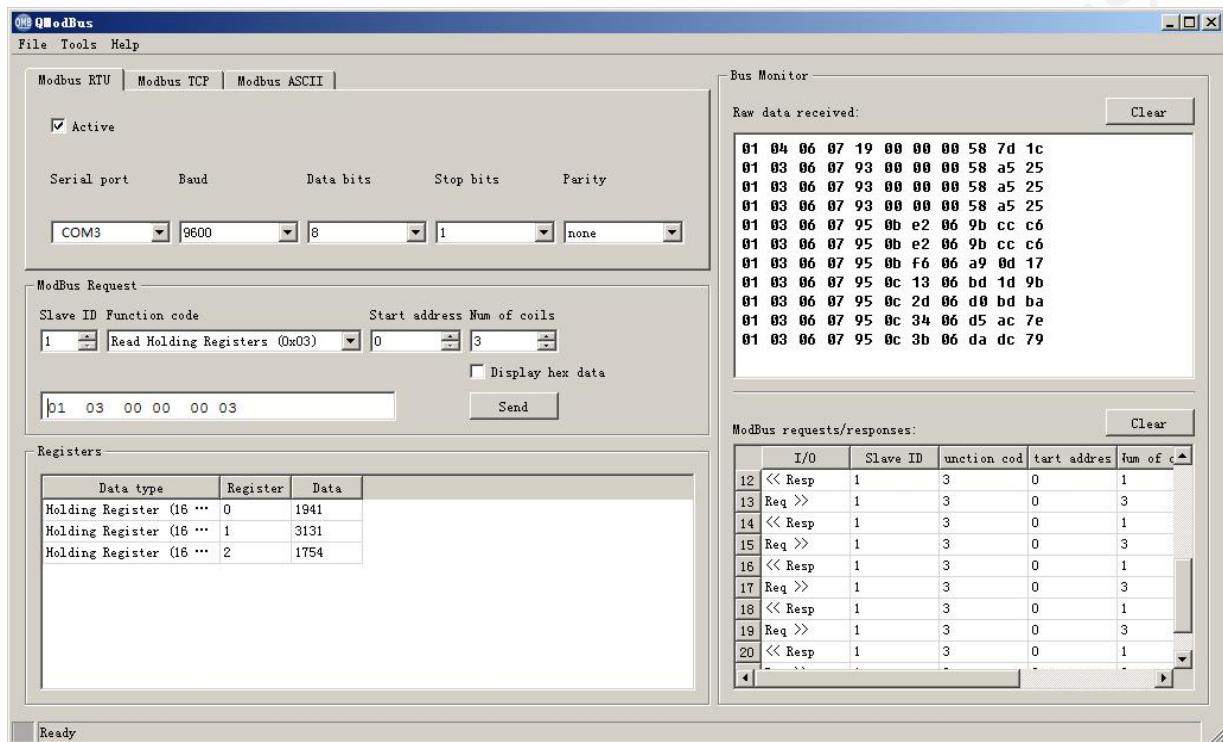
0x01	1 byte	Slave Addr.
0x10(HEX)	1 byte	Function Code 0x10
0x0200	2 byte	Starting Register Addr(High8bits first)
0x0002	2 byte	Quantity of Register to write(High8bits first)
0x4070	2 byte	CRC CHECKSUM

5.5 Software Configuration Utility

5.5.1 Universal Modbus Comm Utility

You can use software listed below to try reading/writing the register of sensor,

<https://github.com/ed-chemnitz/qmodbus/releases>



6 Document version

Version	Date	Description	Editor
V1.0		First Version	Yvonne.Meng