

## User Guide

### Product Introduction

The temperature sensor consists of a high-precision thermistor and a transmitter that accurately measures the temperature over the entire range. The humidity sensor is based on the dielectric constant measurement principle, which simulates the shape of the blade and the characteristics of the blade surface. Humidity can be measured accurately by the change of dielectric constant on the blade surface. With good sensitivity, it can detect trace moisture residues on the leaf surface. The leaf surface temperature and humidity transmitter adopts waterproof design, low power consumption, and can be continuously monitored for a long time.



### Use Case Scenarios

The sensor is suitable for measuring humidity on the surface of plants or objects in greenhouses, laboratories and artificial climate chambers.

### Features

1. Mimics the characteristics of leaf surfaces for fast and accurate temperature and humidity measurements.
2. Denser leaf vein pattern (15 lines/cm) allows detection of smaller droplets for more sensitive measurements.
3. Epoxy resin encapsulation, waterproof and moisture-proof, longer life.

### Product Specifications

Specifications	
Model	UB-LTH-N1
Power Supply	DC 4.5~30V
Max Current	95mA (@5V)
Measuring Range	Temperature: -40~80°C Humidity: 0~100%
Accuracy	Temperature: ±0.5°C (@25°C) Humidity: ±3% (@0~50%)
Resolution	Temperature: 0.1°C Humidity: 0.1%RH
Dimension	65*15*138.5mm
Protection level	IP67
Connector	Audio
Cable Length	3m
Communication Protocol	RS485 Modbus RTU Protocol
RS485 Address	0xCF
Baud Rate	1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s (default), 19200 bit/s

## Wiring Instruction



## Communication protocols

### 1. Communication basic parameters

Communication Basic Parameter	
Coding System	8-bit binary
Data Bit	8 bits
Parity Checking Bit	none
Stop Bit	1 bit
Error Checking	CRC Check
Baud Rate	1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s (default), 19200 bit/s

### 2. Data Frame Format

The Modbus-RTU communication protocol is used in the following format:

- Initial structure  $\geq 4$  bytes in time.
- Address code: 1 byte, default 0xCF.
- Function code: 1 byte, support function code 0x03 (read only) and 0x06 (read/write).
- Data area: N bytes, 16-bit data, high byte comes first.
- Error check: 16-bit CRC code.
- End structure  $\geq 4$  bytes of time.

Request							
Slave Address	Function Code	Register Address	No. of Registers	CRC LSB		CRC MSB	
1 byte	1 byte	2 bytes	2 bytes	1 byte		1 byte	
Response							
Slave Address	Function Code	No. of Bytes	Content 1	Content 1	...	Content n	CRC
1 byte	1 byte	1 byte	2 bytes	2 bytes	...	2 bytes	2 bytes

### 3. Register Address

Register Address				
Address	Content	Register Length	Function Code	Description of definitions
0x0000	Humidity	1	03	Unsigned integer data, divided by 10
0x0001	Temperature	1	03	Signed integer data, divided by 10
0x07D0	Address	1	03/06	1 ~ 255
0x07D1	Baud Rate	1	03/06	0:2400, 1:4800, 2:9600