

User Guide

Introduction

The rainfall sensor adopts a stainless steel housing and the data is read directly from the rainfall through the MODBUS-RS485 interface, without the need for secondary calculation, which is simple and convenient. The core component - the tipping bucket, adopts a three-dimensional streamlined design, which makes the water turning more fluent and has the characteristics of self-washing. The bucket sleeve is an integrated positioning structure, the internal structure is assembled at the factory, so there is no need to install the internal structure on site.



Use Case Scenarios

It is widely used in agricultural sheds, industry and other outdoor locations.

Features

- RS485 interface, long communication distance.
- Three-dimensional streamlined tipping bucket design, turning water more smoothly.
- Self-washing and easy to clean.
- Super stability and anti-interference ability.
- Standard audio interface design.
- Wide voltage input, DC 4.5 ~ 30V.
- Easy to install, plug and play.

Specifications

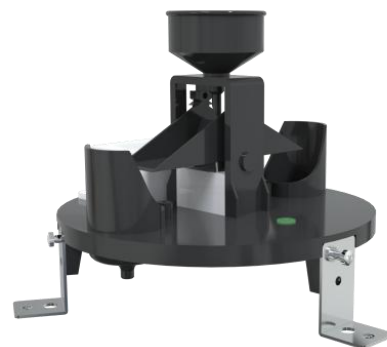
Specification	
Model	UB-RA-N1
Power Supply	DC 4.5 ~ 30V
Measuring Range	0 ~ 4mm/min (max 8mm/min)
Measuring Accuracy	±0.32mm (simulated rainfall 4mm/min)
Resolution	0.2mm
Max Current	112mA (@12V)
Rain-bearing Diameter	φ200mm
Sharp Angle of Cutting Edge	40° ~ 45°
Working Environment	0 ~ 55°C , < 95% (40°C)
Connector	Audio
Cable Length	3m
Communication Protocol	RS485 Modbus RTU Protocol
RS485 Address	0xD3
Baud Rate	1200 bit/s, 2400 bit/s, 4800 bit/s (default), 9600 bit/s, 19200 bit/s

Mounting Method

■ Preparation

(1) Check the apparatus for damage, especially to ensure that the tipping bucket is intact. Take care to place the tipping bucket properly to prevent bruising the tip of the tipping bucket shaft and the curved diversion tips at both ends of the bucket, and do not touch the inner wall of the tipping bucket with your fingers to avoid defacing the bucket and damaging the accuracy of the instrument.

(2) Unscrew the three screws at the bottom of the appliance, take the stainless steel outer barrel, cut the ties holding the tipping bucket in place, then attach the outer barrel and the preparation is complete.



■ Outdoor mounting

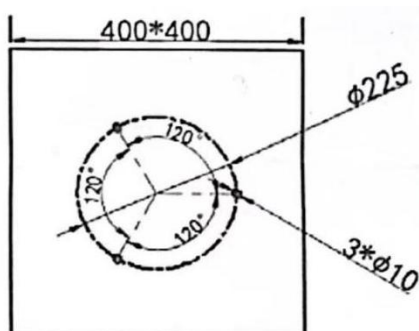
1) Making mounting base

If mounted on outdoor ground or a roof, please make a cement mounting base according to the dimensions and requirements shown in the figure below.

The surface of the cement base should be level. The size of the cement base should be at least 40cm * 40cm square base with a height of no less than 30cm, or a round base with a diameter of no less than 40cm. The height of the rain collecting port edge shall be 70cm away from the ground, and no barrier higher than the rain collecting port edge is allowed within 3 ~ 5 meters around the instrument mouth.

2) Mounting the instrument and adjusting its level

Punch three mounting holes with $\phi 10$ mm and depth 8 ~ 10cm on the cement base according to the dimensions in the figure below. Deploy the expansion bolts in the mounting holes and lock them with the nuts. Mount the instrument on the three adjusting nuts. Adjust the height of the adjusting nuts, use a levelling instrument to make sure the instrument mouth is horizontal, then fix and lock the instrument.



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 (default), 9600 bit/s, 19200 bit/s

2. Data Frame Format

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

- Initial structure ≥ 4 bytes in time.
- Address code: 1 byte, default 0xD3.
- 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 ≥ 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	Rain Fall	1	03	Unsigned integer data, divided by 10
0x07D0	Address	1	03/06	1 ~ 255
0x07D1	Baud Rate	1	03/06	0:2400, 1:4800, 2:9600, 3:19200, 4:38400, 5:57600, 6:115200, 7:1200

Maintenance

1. For long time outdoor use, please wipe the inner wall of the rain collecting port with a soft cloth and clean it to keep the waterway unblocked.
2. Over long time use, dust or oil may accumulate on the inner wall of the tipping bucket. Please clean the tipping bucket regularly. Use water to wash the inner wall of the tipping bucket or brush it gently with a degreasing brush. It is strictly prohibited to wash the inner wall of the tipping bucket with hands or other objects.