

CDY-10A
ABS
Tipping Bucket Rainfall Sensor
Manual

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CDY-10A ABS Tipping Bucket Rainfall Sensor

- ◆ **Product Brief**

The instrument is composed of rain bearing parts and measuring parts. The bearing outlet is $\Phi 160\text{mm}$. The rainfall sensor is used to measure ground rainfall. The rainfall flows through a receiver into a bucket. When the bucket flows into a certain amount of rainwater, the bucket turns over, emptying the water in the bucket. The bucket begins to receive water again. Each flip action of the bucket is transmitted to the collection system through the dry clarinet into a pulse signal (1 pulse = 0.2mm precipitation).

- ◆ **Application**

- Meteorological Monitoring
- Micro Environmental Monitoring
- Grid Environment Monitoring
- Agricultural Meteorological Monitoring
- Meteorological Traffic Monitoring
- Photovoltaic Environment Monitoring
- Meteorological Environment Monitoring for Smart Cities

- ◆ **Features**

- Small in size
- High integration
- Easy to install
- Free testing software MODBUS - poll V1.0 (ask your salesperson for it)
- Integrated design
- Low starting threshold
- One year warranty

Technical Data

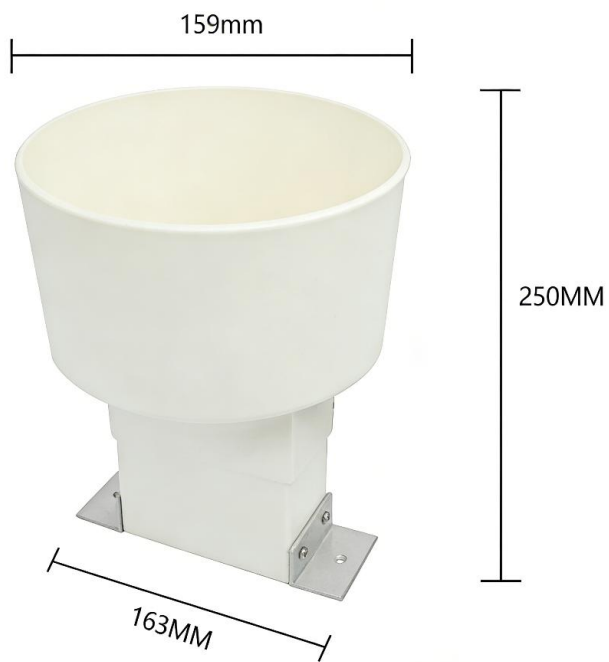
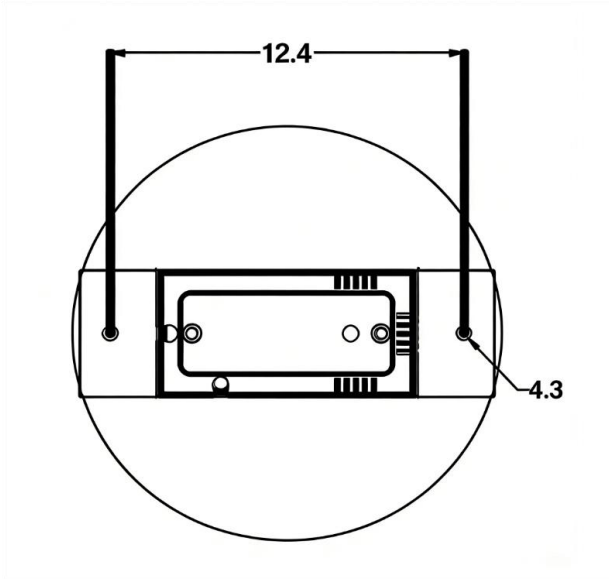
CDY-10A ABS Tipping Bucket Rainfall Sensor

◆ Technical Parameters

Parameters	Measuring Range	Accuracy	Resolution
Rainfall	0-4mm/min	±4%	0.2mm
Supply	5-24VDC		
Output Signal	Reed switch pulses,RS485(12-24VDC supply)		
Water ride diameter	Diameter :φ159.5mm		
Allow rainfall intensity	Max: 10mm/min		
Ingress Protection	IP65		
Operating temperature (no freeze)	0-+60°C		
Main material	ABS & 304SS		

★ Specifications may be updated without prior notice.

◆ **Product Size**



MODBUS RTU Communication Protocol

(Apply to CDY-10A product)

Baud Rate: 9600
Data Bits: 8
Stop Bit: 1
Check Bit: None

1.1 CRC Description:

Among all the following instructions, the two bytes of CRC16 in MODBUS RTU protocol are as follows: the low byte comes before and the high byte comes after.

In the following instructions, the assumed sensor address is 0x02 (the default sensor address is 02).

1.2 Return Error Code Rule:

When receive error instruction (including CRC16 validation error), no error codes will be returned. It is considered to be a failure, when there is no return data in 200ms after the instruction is issued. Upper computer may resend instruction.

1.3 Standard MODBUS register description

Special Notice:

The quantity or length of the register in MODBUS is two bytes with 16 bits as a unit (the high byte comes first, and the low bytes follows), instead of one byte with 8 bits as a unit.

User shall ensure that the address and quantity of register in command are confined within the range specified by the system. Otherwise, the output of the sensor will be unpredictable. Users shall ensure that the MODBUS command complies with the requirements of this manual in the software design of the upper computer and the minimum query period supported is 1s/ time.

CGDA Technical Data

CDY-10A ABS Tipping Bucket Rainfall Sensor

Input register: read with function code 03

Address	Operation	Contents	Note
0x0000	Read-only	Rainfall, a hexadecimal number magnified by 5 times. For example, 0x0025 indicates $37/5=7.4\text{mm}$	
0x0001	Read-only	Ten minutes of rain, a hexadecimal number magnified by 5 times. For example, 0x0039 indicates $57/5=11.4\text{mm}$	
0x0002	Read-only	Rainfall (zero for 2 hours after no rain), a hexadecimal number magnified by 5 times. For example, 0x0069 indicates $105/5=21\text{mm}$	
0x1000	Read /Write	Machine Address (0-255)	Default Address 02

1.4 Electrical Connections

Cable	RS485	Pulse
Red	V+	/
Black	V-	/
Yellow	RS485A	/
Green / Blue	RS485B	Output pulse
Brown	/	Output pulse

1.5 Communication Example

The following is an example of how to use MODBUS RTU commands to access system registers:

1. Read multiple input registers (real time data) command

Send: 02 03 00 00 00 01 84 39

CGDA Technical Data

CDY-10A ABS Tipping Bucket Rainfall Sensor

02	03	00 00	00 01	84 39
System Address	Function Code	Register Address	Number of Registers	CRC16 check digit automatically generated by software

Answer: 02 03 02 00 25 3D 9F

01	03	02	00 25	3D 9F
System Address	Function Code	The number of bytes in a data segment	Segment Data	CRC16 check bit

Analytical Data:

$$0x000A = 0x00 * 256 + 0x25 = 37$$

$$\text{Rainfall} = 37/5 = 7.4\text{mm}$$

2. Modify internal register (system address) command (change the address to 0x03)

Send: 00 10 10 00 00 01 02 00 03 FA 00 (00 03 new address)

00	10	10 00 00 01	02	00 03	FA 00
System Address	Function Code	Register Address	Number Of Written	New Address	CRC16 check

3. Rainfall reset command

Send: 02 06 00 00 00 00 00 89 F9

02	06	00 00	00 00 00	89 F9
System Address	Function Code	Register Address	Number of Registers	CRC16 check digit automatically generated by software

Answer: 02 06 00 00 00 00 00 89 F9 (indicates that the modification is successful)

Warranty and After-sales Service:

Warranty: The product warranty period is 12 months from the delivery date (except for the product problems caused by not operating in accordance with corresponding technical requirements or other artificial behavior).

After-sales telephone: 86-0731-86117089 www.codasensor.com Molly@codasensor.com

Other Weather Sensors

Model number	Type	Output	Special features
CDF-10A	Wind speed	Pulses(PNP) RS485 4-20MA 0-5V	Three cup plastic wind speed
CDF-11A	Wind direction	RS485 4-20MA 0-5V	Plastic wind direction sensor
CDF-12A	Pipe wind speed	RS485 4-20MA 0-5V 0-10V	Duct type wind speed sensor
CDF-13B	Wind speed display controller	LED display	Wireless output relay output
CDF-15A	Digital Anemometer	LCD display	Hand-held anemometer
CDF-20B	Combined Wind Speed & Direction	RS485 4-20MA 0-5V 0-10V	Integrated wind speed and direction
CDF-21A	Ultrasonic Wind Speed & Direction	RS232/RS485(Modbus/NMEA-0183), Voltage(0-5V),Current(4-20mA) optional	Ultrasonic principle
CDF-22A	Mini Ultrasonic Wind Speed & Direction	4-20mA,RS232/RS485(Modbus or NMEA-183), SDI-12	Ultrasonic principle
CDF-26B	Recorder station for wind	LCD display & 4G WIFI Ethernet	Wind speed & direction recorder
CDQ-T6A	Miniature Ultrasonic Automatic Weather	RS485	Wind speed & direction temp & humidity & pressure
CDW-33A	Atmospheric Temperature, Humidity & Pressure	RS485	Shelter installation
CDY-12A	Economical Tipping Bucket Rainfall	Pulses(@10kΩ&0.01uF),RS485	Diameter :φ200mm, height: 271mm
CDG-10B	Solar Radiation	0-5V,4-20mA,RS485	Spectral range:300~1100nm