TQ06
Weather monitoring
Host
User manual

Document convention:

TQ06 weather monitoring host: referred to as "monitoring host" and "host" in the following documents.

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Table of Contents

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1. System Overview

The TQ06 weather monitoring host is a dedicated control station for the weather station. The device has 1 ModBus-RTU master station interface (this interface can be connected to our 485 transmitter: 1 road wind speed, 1 road wind direction, 4 road soil temperature + moisture, 4 road soil conductivity + PH, 1 channel air Temperature and humidity, 1 channel noise, 1 channel carbon dioxide, 1 channel atmospheric pressure, 1 channel illumination, 1 channel rain and snow state, 1 channel UV, 1 channel total radiation, 1 channel carbon monoxide, 1 channel ozone, 1 channel nitrogen dioxide, 1 Road sulfur dioxide, 1 channel hydrogen sulfide, 1 channel oxygen, 1 channel air quality), 1 channel rainfall collection (total rainfall + instantaneous rainfall + daily rainfall + current rainfall), 2 relay output (optional); the device can pass GPRS The data upload value monitoring software platform, and the monitoring host also has a ModBus-RTU slave interface, which can also upload data to the customer's monitoring software or PLC configuration screen through 485 communication; the host can also An external LED display is displayed (the number of dots is 96*48).

1.1 Features

1. With 1 channel ModBus-RTU main station interface can be connected to our 485 transmitter:wind speed, wind direction, soil temperature moisture, soil conductivity PH, air temperature and humidity, noise, air quality, atmospheric pressure, light, rain and snow , UV, total radiation, CO, O3, NO2, SO2, H2S, O2, CO2 evaporation and other transmitters.

2. An external tipping bucket rain gauge can collect total rainfall, instantaneous rainfall, daily rainfall, and current rainfall.

3. Optional 2-way relay output for remote manual control.

4. multi-function GPRS communication interface, just insert a mobile phone card to upload data to the remote monitoring software platform.

5. It has a 1-way ModBus-RTU slave interface, which can be connected to the user's own monitoring host, PLC, configuration screen or configuration software. It can also be used as an external 192*96 outdoor screen (optional).

6. Can be connected to an outdoor LED monochrome display with a dot matrix of 96*48.

7. A variety of measurement elements can be freely matched.

8. Without LED screen display, it can be used with solar panels and batteries for field measurement to solve power supply problems.

9. The device is uniquely 8-bit address, easy to manage and identify, and can be used with a variety of software platforms provided by our company.

1.2 Technical Parameters

parameter name	Range or interface	Description
powered by	External power supply	220VACAC
	Solar power	Supporting our solar panels and batteries (Solar panel 35W, battery life time is about 7 days)
Data upload interface	GPRS wireless	Upload data via GPRS
	ModBus-RTU slave interface	Support external devices to monitor data in the host through the ModBus-RTU protocol.
Data acquisition communication interface	Main RS485 interface	Capable of collecting data from the 485 interface transmitter, the longest communication distance ≥1500 meters
Dot matrix LED display interface	LED screen display interface	Default with 96*48 dot matrix outdoor screen
2-way relay output (optional)	Relay dry contact output	Relay capacity: 250VAC/30VDC 5A Can be used as a remote control
1-way tipping bucket rain gauge pulse signal input	Collect magnetic switch pulse signal for rain measurement	Default pulse equivalent: 0.5mm Instantaneous rainfall, daily rainfall, current rainfall, and accumulated rainfall values can be uploaded. (The second switch is used as the rain gauge input by default)
Data upload interval	2S~10000S	Data upload interval 2S~10000S can be set

1.3 product model

RS-QXZN-M is the basic model of the weather host. Users of specific monitoring elements can choose their own.

TQ06-			Weather monitoring host
	M-		M series
		LED	With LED display
		DC-12	External solar panel + battery
		Y	External power supply

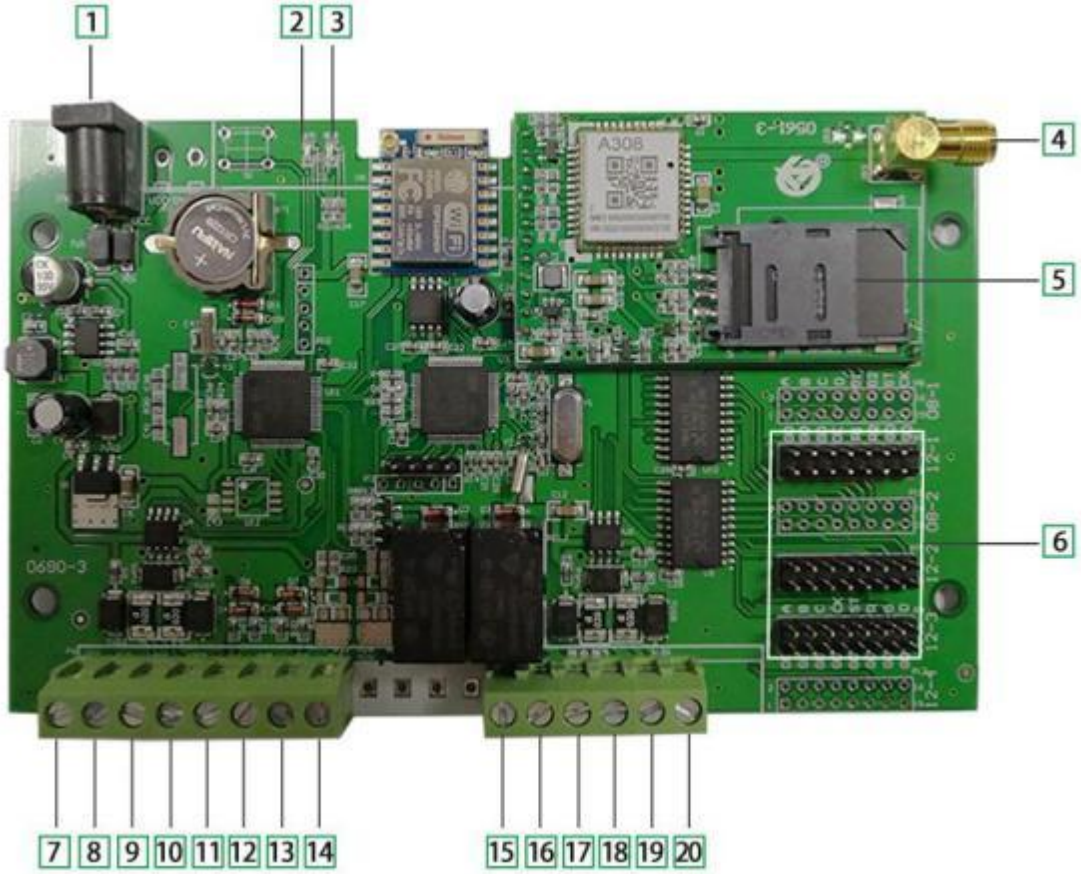
1.4Monitoring factor matching

For our meteorological monitoring host equipment, users of various monitoring elements can be freely matched. The environment variables that can be monitored are listed in detail in the following table. It should be noted that when using an external LED screen display, due to the power consumption of the LED screen, it is not possible to use the solar panel and the battery at this time.

Serial number	Description
1	Wind speed (including wind and wind speed)
2	wind direction
3	Soil temperature and moisture (up to 4 channels can be monitored simultaneously)
4	Soil conductivity + PH (up to 4 channels can be monitored simultaneously)
5	Air temperature and humidity
6	noise
7	Atmospheric pressure
8	Illuminance (range 0-200000lux)
9	Rain and snow
10	Ultraviolet light
11	Total radiation
12	Rainfall (total rainfall, instantaneous rainfall, daily rainfall, current rainfall)
13	Air quality (PM2.5, PM10)

14	Carbon monoxide concentration
15	Ozone concentration
16	Nitrogen dioxide concentration
17	Sulfur dioxide concentration
18	Hydrogen sulfide concentration
19	Oxygen concentration
20	Evaporation
21	Carbon dioxide concentration

2. Device interface description



Label	name	Description
1	Host power supply port (DC5mm socket)	
2	Equipment running indicator	Normal operation is 0.5S lighting, 0.5S is extinguished
3	Device with indicator	Always on when establishing a connection with the server; Blinks when disconnected from the server.
4	GSM antenna base	GSM antenna equipped with our company
5	SIM card holder	Put a large card into mobile or Unicom
6	LED cable holder	Connect the LED screen to 3 cables
7	VCC	ModBus main station interface, connected to our 485 type transmitter, can directly plug 1 to 3 plug line
8	GND	
9	485A	
10	485B	
11	YX1	Rain gauge interface, connected to our pulse type rain gauge
12	GND	
13	Reserved	
14	Reserved	
15	Relay 1	First relay output (optional)
16		
17	Relay 2	Second relay output (optional)
18		
19	Upstream 485A	ModBus slave interface, which can be used by users to connect their own PLC or other PC software
20	Upstream 485B	

3. device installation

3.1Equipment inspection before installation

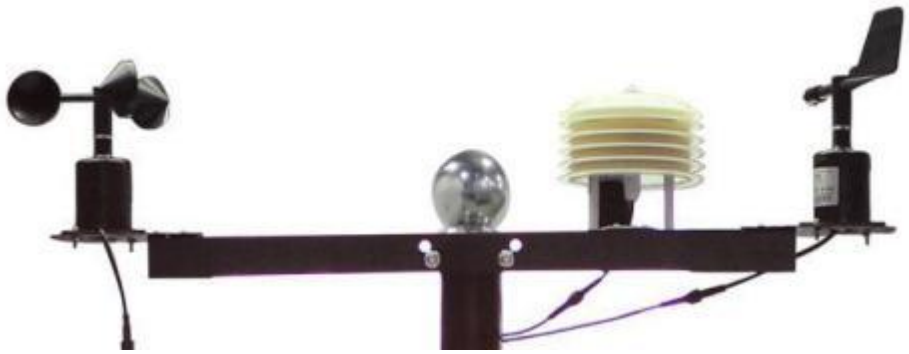
Equipment list: (The selection is different, the number of equipment is different, which is subject to the actual situation)

1. One-piece transmitter for louver box
2. 1 wind speed sensor
3. Wind direction sensor 1
4. 1 pole (2m length is 1 and 3m length is composed of 2 1.5m)
5. Beam (1 U-bolt, 2 M8 nuts)
6. Weather monitoring and integration machine (including 1 key)
7. 3 sets of support and 12 sets of M4*10 screws
8. 2 hoops, 8 M10*16 screws
9. 1 drag 3 pairs of plug wires 1 (If the 485 transmitter used in the field is more than 3, our company will be equipped with more than 1 drag 3 pairs ofplug wires)

3.2 Collection terminal installation

Pay attention to the bearing problem when installing the wind direction

The installation completion effect diagram is as follows:



3.3Weather monitoring machine installation

Required accessories: 2 hoops, 8 screws

3.4Waterproof box installation

Required accessories: 1 distribution box, 2 hoops, 8 screws

Installation completed front view:

Installation completed rear view

3.5Wiring and powering up

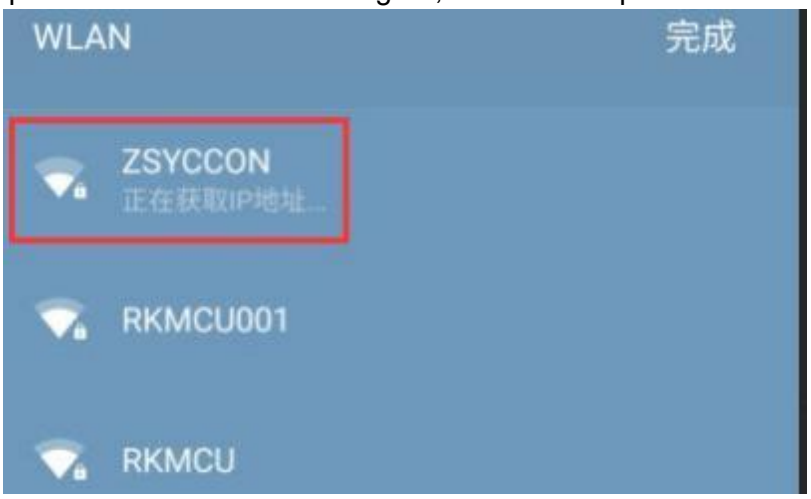
After all the parts are installed, the effect is as follows:

Wiring: In turn, the lines of the three sensors are fixed along the support poles, and then the ones
that are equipped with our ones are inserted. If the site uses multiple 485 sensors, our company will be equipped with multiple ones and three For the plug-in line, you can insert it in turn, and there is no difference between the three lines.
The GPRS antenna is pulled out from the bottom of the LED, and is adsorbed on the outside of the LED box or adsorbed on the outside of the waterproof box to prevent transmission of the shielded
network model. Refer to the following figure for specific wiring and outlet methods:

4. Parameter configuration

1) Download the configuration tool, use QQ to scan the QR code (Android mobile phone only),
click the normal download, you can install (or you can contact our staff directly)

2)When the host is powered on, search for the wireless network ZSYCCON near
the waterproof box as shown in the figure, connect the password 76543210



3) Click on the downloaded software to log in directly. No account and password required

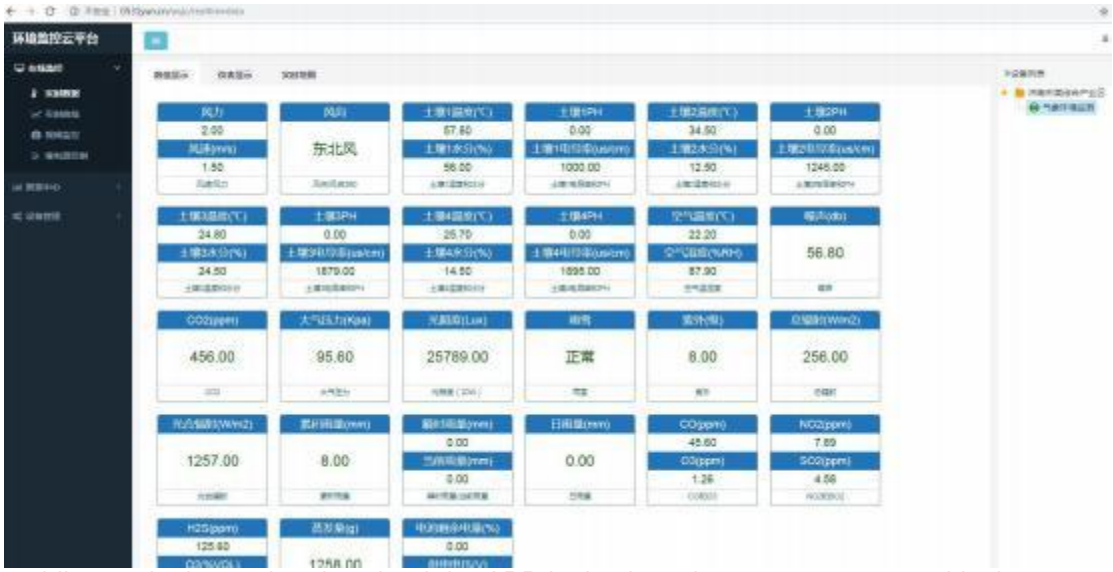
4) Log in, select the header name to be set. If you are uploading your own software monitoring platform, you need to change the target server address to the server port, upload our general cloud platform, and the target address. 0531yun.cn, target server port 8020, click
on the download parameters after changing.

5)

5. Connected software platform

5.1Connect to the cloud platform

Open the APP settings interface, fill in the target server address 0531yun.cn, fill the target server port 8020; log in to the cloud platform to connect to www.0531yun.cn, enter the assigned account password to log in;



The mobile terminal can also download the APP login view, the account password is the same as

the cloud platform, the Android APP downloads the QQ scan below the QR code, and the Apple user can directly apply the store search "Cloud Control" to download and install;

安卓版

5.2Connect local monitoring software

For the node settings of the related platform, refer to the instructions for using the software platform and the final appendix.

6. ModBus-RTU slave port communication description

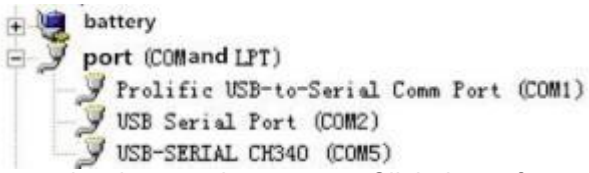
6.1 Wiring instructions

Refer to the second part of the device interface description, connect to the upstream 485A/B. You can go to our official website to download, or you can contact our staff to get it.

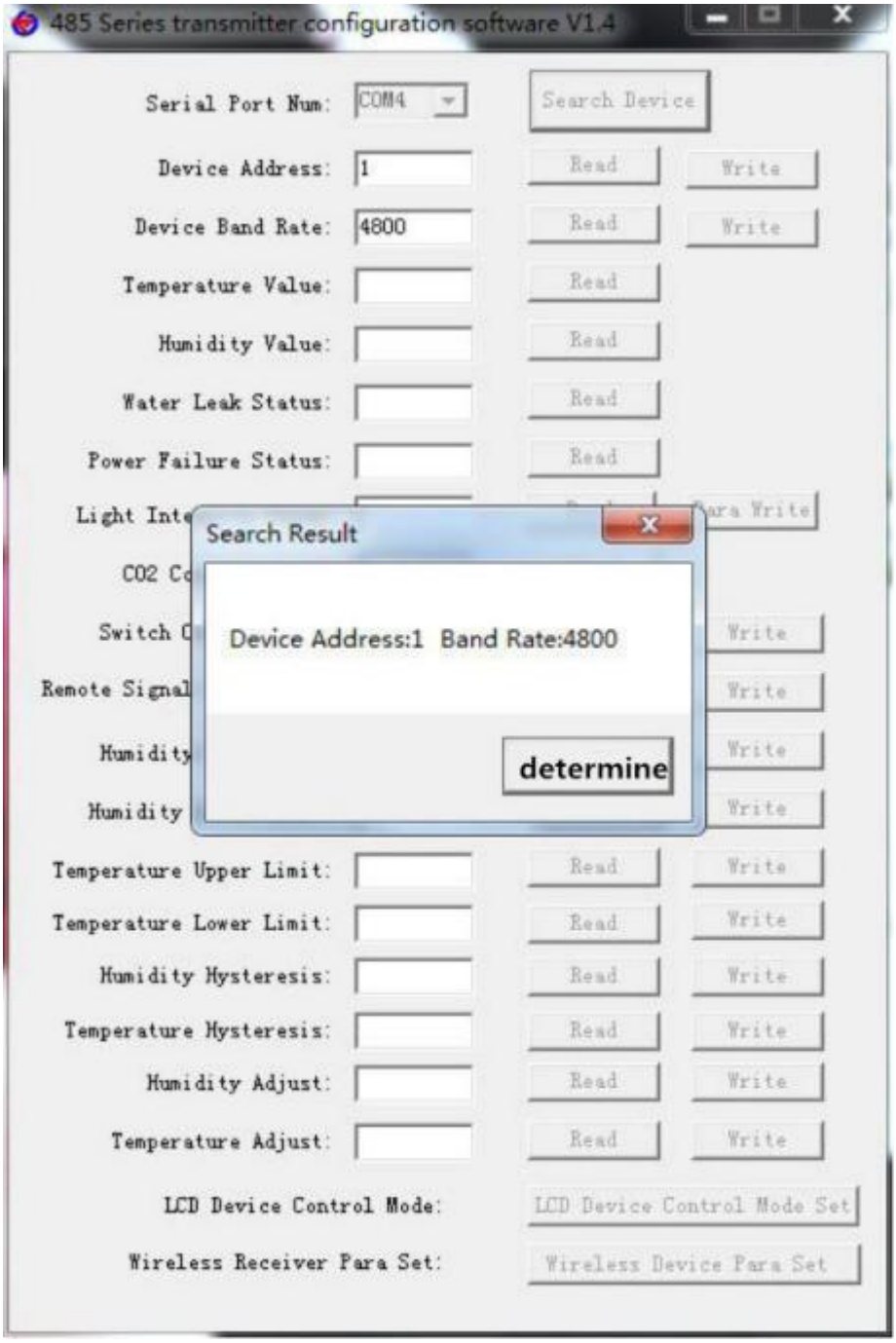
6.2 parameter settings

We provide the corresponding 485 parameter configuration tool to modify the address and baud rate of the slave.

1. Select the correct COM port ("My Computer - Properties - Device Manager - Port" to view the
COM port). The following figure lists the drive names of several different 485 converters.



2.Connect only one weather host and power on. Click the software test baud rate. The software will test the baud rate and address of the current device. The default baud rate is 4800bit/s and the default address is 0x01. The address and baud rate can be modified according to your needs.



6.3 Basic communication parameters

Code	8-bit binary
Data bit	8 digits
Parity bit	no
Stop bit	1 person
Error check	CRC (redundant cyclic code)
Baud rate	2400bit/s, 4800bit/s, 9600 bit/s can be set, the factory default is 4800bit/ s

6.4 Data frame format definition

Adopt Modbus-RTU communication protocol, the format is as follows: Initial structure ≥ 4 bytes of time

Address code = 1 byte Function code = 1 byte Data area = N bytes

Error check = 16-bit CRC code End structure ≥ 4 bytes of time

Address code: is the address of the transmitter, which is unique in the communication network (factory default 0x01).

Function code: The instruction function of the command sent by the host. This transmitter only uses function code 0x03 (read register data).

Data area: The data area is the specific communication data. Note that the 16-bit data high byte is in front!

CRC code: Two-byte check code. Host inquiry frame structure:

address code	function code	Register start address	Register length	Check code low	Check code high
1 byte	1 byte	2 byte	2 byte	1 byte	1 byte

Slave response frame structure：

address code	function code	Effective number of bytes	Data area	Second data area	Nth data area	Check code
1 byte	1 byte	1 byte	2 byte	2 byte	2 byte	2 byte

6.5Register description

MODBUS register (decimal)	Types of	coefficient	Description
500	Wind speed	Coefficient 0.1	1000 stands for 100.0m/s
501	Wind power	Coefficient 1	1 represents level 1
502	wind direction	Coefficient 1	Range 0-7 represents north wind ~ northwest wind

503	Wind direction	Coefficient 1	0-360 degrees
504	Soil 1 humidity	Coefficient 0.1	unit%
505	Soil 1 temperature	Coefficient 0.1	Unit 。C
506	Soil 1 conductivity	Coefficient 1	Unit us/cm
507	Soil 1PH	Coefficient 1	1-12
508	Soil 2 humidity	Coefficient 0.1	unit%
509	Soil 2 temperature	Coefficient 0.1	Unit 。C
510	Soil 2 conductivity	Coefficient 1	Unit us/cm
511	Soil 2PH	Coefficient 1	1-12
512	Soil 3 humidity	Coefficient 0.1	unit%
513	Soil 3 temperature	Coefficient 0.1	Unit 。C
514	Soil 3 conductivity	Coefficient 1	Unit us/cm
515	Soil 3PH	Coefficient 1	1-12
516	Soil 4 humidity	Coefficient 0.1	unit%
517	Soil 4 temperature	Coefficient 0.1	Unit 。C
518	Soil 4 conductivity	Coefficient 1	Unit us/cm
519	Soil 4PH	Coefficient 1	1-12
520	Air humidity	Coefficient 0.1	Unit %RH
521	Air temperature	Coefficient 0.1	Unit 。C
522	noise	Coefficient 0.1	Unit db
523	CO2 concentration	Coefficient 1	Unit ppm
524	Atmospheric pressure	Coefficient 0.1	Unit Kpa
525	High illuminance 16 bits	Coefficient 1	Unit Lux
526	Low light level 16 bits		
527	Rain and snow	Coefficient 1	Upload 0 means normal Upload 1 means there is rain and snow
528	UV intensity	Coefficient 1	Unit level
529	Total radiation	Coefficient 1	Unit W/m2
530	Total radiation	Coefficient 1	Unit W/m2
531	Cumulative rainfall, high 16	Coefficient 0.5	Uploading a value of 3 means the rainfall is 1.5mm
532	Cumulative rainfall, low 16		
533	Current rainfall	Coefficient 0.5	Represents the rainfall value from 0 to the current time. The upload value of 3 represents a rainfall of 1.5 mm.
534	Instantaneous rainfall	Coefficient 0.5	Current 1 minute rainfall Upload a value of 3 means the rainfall is

			1.5mm
535	Daily rainfall	Coefficien t 0.5	Last day's rainfall uploading a value of 3 means the rainfall is 1.5mm
536	O3 concentration	Coefficien t 0.01	Unit ppm
537	CO concentration	Coefficien t 0.01	Unit ppm
538	SO2 concentration	Coefficien t 0.01	Unit ppm
539	NO2 concentration	Coefficien t 0.01	Unit ppm
540	O2 concentration	Coefficien t 0.1	Unit %VOL
541	H2S concentration	Coefficien t 0.1	Unit ppm
542	Evaporation	Coefficient 1	Unit g
543	PM2.5	Coefficient 1	Unit ug/m3
544	PM10	Coefficient 1	

6.6 Communication protocol example and explanation

Communication protocol example and explanation

Inquiry frame:

address code	function code	starting address	Data length	Check code low	Check code high
0x01	0x03	0x01 0xF4	0x00 0x02	0x84	0x05

Response frame: (for example, read wind speed is 2.6m/s, wind power is level 3)

address code	function code	Returns the number of valid bytes	Wind speed value	Wind value	Check code low	Check code high
0x01	0x03	0x04	0x00 0x1A	0x00 0x02	0x5A	0x35

Wind speed calculation:
Wind speed: 001A H (hexadecimal) = 26 => wind speed = 2.m/s
Wind calculation:
Wind: 0002H (hex) = 2 => wind = 2 wind

Appendix: Platform Upload Node Description

Node number	the data shows	type of data
1	Wind speed + wind	Wind speed: analog 2 coefficient 0.1 unit m/s Wind: Analog 1 Coefficient 1 Unit No
2	Wind direction + wind direction 360	Wind Direction 360: Analog 2 Coefficient 1 Unit Degree Wind direction: analog quantity 1 coefficient 1 unit no
3	Soil 1 temperature and moisture	Temperature: analog 1 coefficient 0.1 unit℃ Moisture: analog 2 coefficient 0.1 unit%
4	Soil 1 conductivity and pH	PH: analog 1 coefficient 1 unit no Conductivity: Analog 2 Coefficient 1 Unit us/cm
5	Soil 2 temperature and moisture	Temperature: analog 1 coefficient 0.1 unit ℃ Moisture: analog 2 coefficient 0.1 unit%
6	Soil 2 conductivity and pH	PH: analog 1 coefficient 1 unit no Conductivity: Analog 2 Coefficient 1 Unit us/cm
7	Soil 3 temperature and moisture	Temperature: analog 1 coefficient 0.1 unit ℃ Moisture: analog 2 coefficient 0.1 unit%
8	Soil 3 conductivity and pH	PH: analog 1 coefficient 1 unit no Conductivity: Analog 2 Coefficient 1 Unit us/cm
9	Soil 4 temperature and moisture	Temperature: analog 1 coefficient 0.1 unit ℃ Moisture: analog 2 coefficient 0.1 unit%
10	Soil 4 conductivity and pH	PH: analog 1 coefficient 1 unit no Conductivity: Analog 2 Coefficient 1 Unit us/cm
11	Air temperature and humidity	Temperature: analog 1 coefficient 0.1 unit ℃ Humidity: Analog 2 Coefficient 0.1 Unit % RH
12	noise	Noise: Analog 2 coefficient 0.1 unit db
13	air quality	PM10: Analog 1 coefficient 1 unit ug/m3 PM2.5: Analog 2 Coefficient 1 Unit ug/m3
14	Atmospheric pressure	Atmospheric pressure: analog 2 coefficient 0.1 unit Kpa
15	Illuminance (20W)	Illuminance: 32-bit unsigned integer Coefficient 1 Unit Lux
16	Rain and snow	Switch type: normal alarm unit no
17	Ultraviolet	Analog 2: coefficient 1 unit level
18	Total radiation	Analog 2: coefficient 1 unit W/m2
19	Photosynthetic radiation	Analog 2: coefficient 1 unit W/m2
20	Cumulative rainfall	32-bit unsigned integer coefficient 0.5 unit mm
21	Instantaneous rainfall (temperature) + current rainfall (humidity)	Instantaneous rainfall: analog 1 coefficient 0.5 unit mm Current rainfall: analog 2 coefficient 0.5 unit mm
22	Daily rainfall	Daily rainfall: analog 2 coefficient 0.5 unit mm
23	CO (temperature) and O3 (humidity)	CO: Analog 1 coefficient 0.1 unit ppm O3: Analog 2 coefficient 0.01 unit ppm
24	NO2 (temperature) and SO2 (humidity)	NO2: Analog 1 coefficient 0.01 unit ppm SO2: analog 2 coefficient 0.01 unit ppm
25	H2S (temperature) and O2 (humidity)	H2S: Analog 1 coefficient 0.1 unit ppm O2: Analog 2 coefficient 0.1 unit % VOL
26	Evaporation capacity (humidity)	Evaporation: Analog 2 Coefficient 1 Unit g
27	carbon dioxide	Analog 2 coefficient 1 unit ppm