Product handbook of DWT100-ST112 Wireless Temperature Sensor

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Part I DWT100 system parameter

1.1 DWT100-ST112 wireless temperature sensor specifications

1.1.1 Operating testing temperature:-55℃~+150℃
1.1.2 Measurement error:±1℃
1.1.3 Operating environment temperature:-40℃~+100℃
1.1.4 Modulation:GFSK
1.1.5 Frequency band:2.45GHz
1.1.6 Wireless communication distance:>300m(2.45GHz,open space)
1.1.7 Measurement interval:4s (risk), 16s (alarm) and 30s (normal)
1.1.8 Average power consumption:≤3μA(3V)
1.1.9 Battery life:≥10years
1.1.10 Battery capacity:500mAh
1.1.11 Surface material:stainless steel; thermal pad material:heat conductive copper
1.1.12 Dimension (Φ x H):31mm x 12mm
1.1.13 Weight:32g
1.1.14 Packaging:IP68
1.1.15 Installation:glue and/or clamp
1.1.16 Transmisson power:10mw

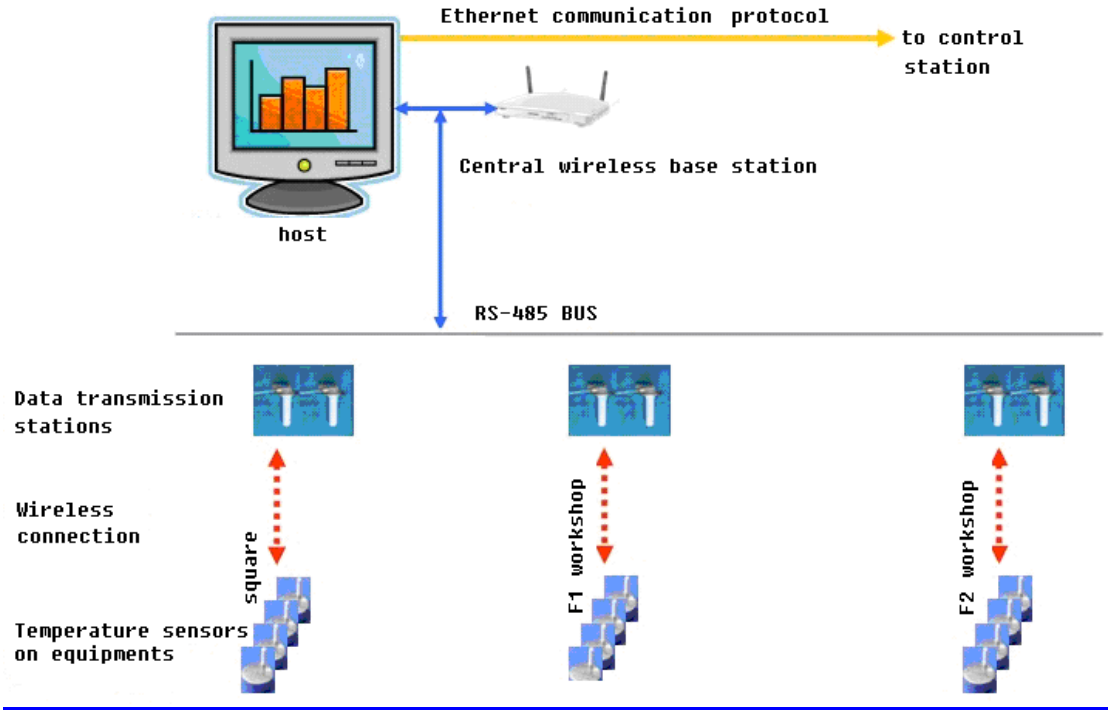
1.2 DWT100-R02WH base station specifications

1.2.1 Modulation: GFSK
1.2.2 Frequency band: 2.45GHz
1.2.3 Antenna: whip antenna, helical antenna
1.2.4 Sensitivity:-90dB
1.2.5 Power supply voltage:DC9~24V
1.2.6 Operating current: < 60mA (12V)
1.2.7 Operating environment temperature: -20℃~+65℃
1.2.8 Sensors manageable: 65536 pcs
1.2.9 Interfaces: RS485, CAN
1.2.10 Communication speed : 4K -- 115.5Kpbs, adjustable
1.2.11 Mean Time Between Failure(MTBF):>50000h
1.2.12 Mounting bracket/bottom material: stainless steel; main frame:enhanced ABS plastic; antenna shell:enhanced ASA resin
1.2.13 Dimension: 300mm x125mm x 125mm
1.2.14 Weight:0.7kg
1.2.15 Packaging:IP68
1.2.16 Installation: brackets

Part II System operation principle

2.1 System configuration

The system diagram of a temperature on-line monitoring system is as follows, it contains an administaration center(host machine), one or more DWT100-R02WH data receiving base stations and a plural of DWT100-ST112 wireless temperature sensors.



2.2 System operation

DWT100-ST112 wireless temperature sensors measure the temperature of monitoring points regularly, and one or more sensors are used to mesure the environment temperature as well. These temperature data measured by sensors are transmitted to the base stations via 2.45GHz ISM band wireless channel periodically. The base station will save and record these data.

The host machine will periodically poll the base stations in roll via wired network connections over RS-485 bus (or CAN); Upon polling each base station will transmit the temperature data to the host through the network connection. Then the host will process and save these temperature data.

By comparing the relative temperature rises between the equipment and the enviroment, between indoor air and outdoor air, the host machine can detect

possible overheat situation and produces Early Warning Signal to alert operators to handle the situation. The host can further communicate with a backend control station on Ethernet, through IEC 61850 standard protocol; and the host can also use a standard relay to send the alerting signal to public measurement/control panel.

Product

Part III Application Examples

3.1 Temperature monitoring system in the Electric Power Substation

Equipment monitoring points can be: cable connector, knife switch contact, switch contact, copper bar junction, reactor, arc suppression coil, capacitor etc..

3.2 Switch cabin and equipment in steel plants

Monitoring temperatures differences between inside and outside cabin.

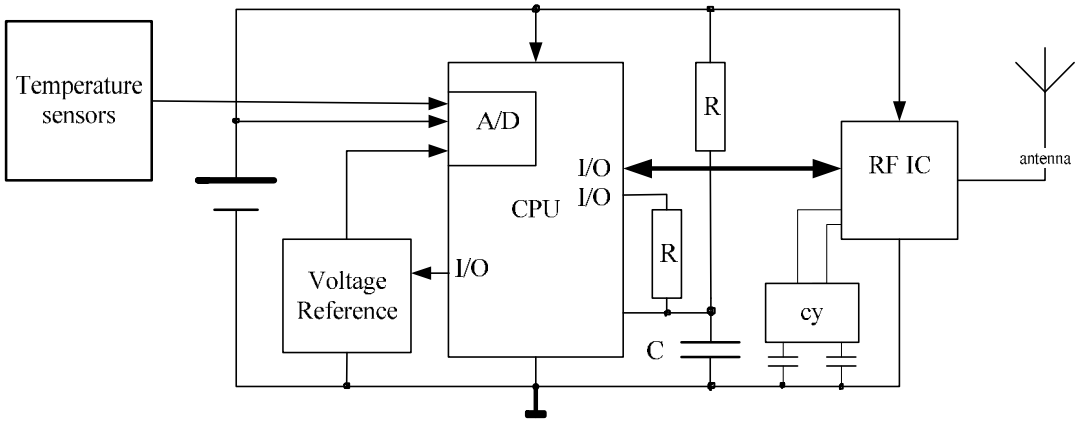
3.3 Materials management in the supermaket

Monitoring temperatures of food containers (shelves, frigs and freezers)

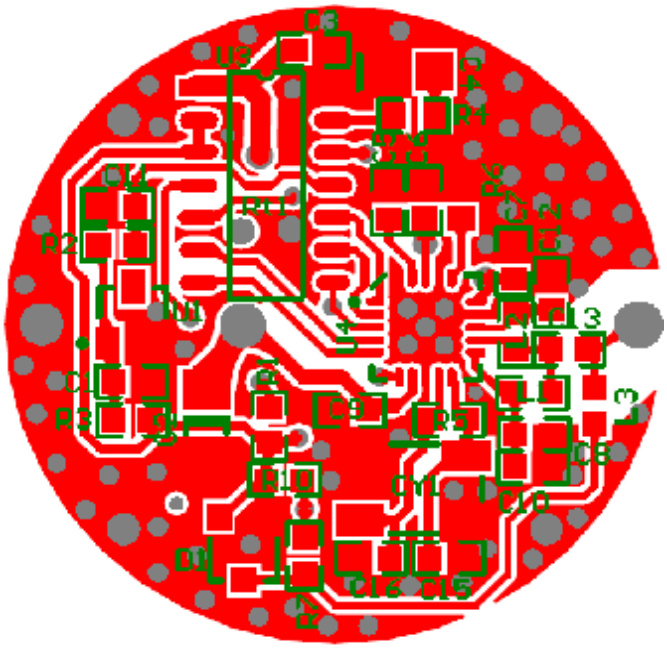
Part IV PCB drawing

4.1 Wireless temperature sensor

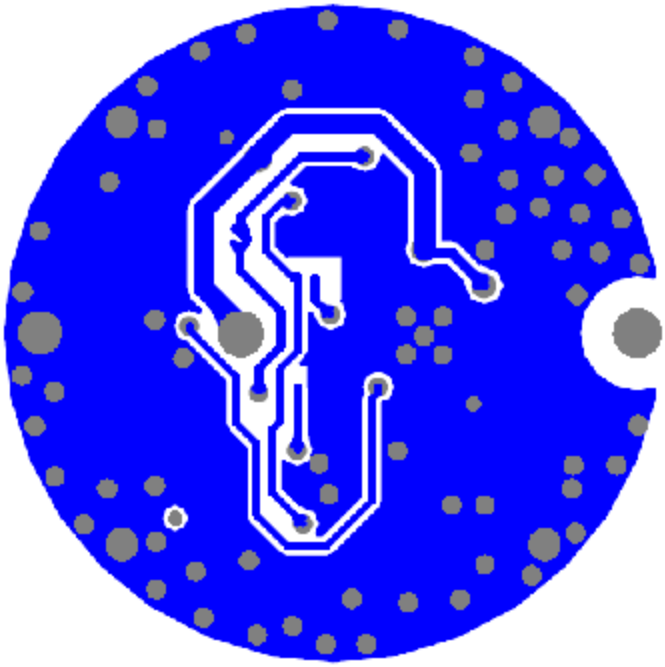
4.1.1 The schematic diagram of DWT100-ST112



4.1.2 The top layer of the PCB drawing of DWT100-ST112

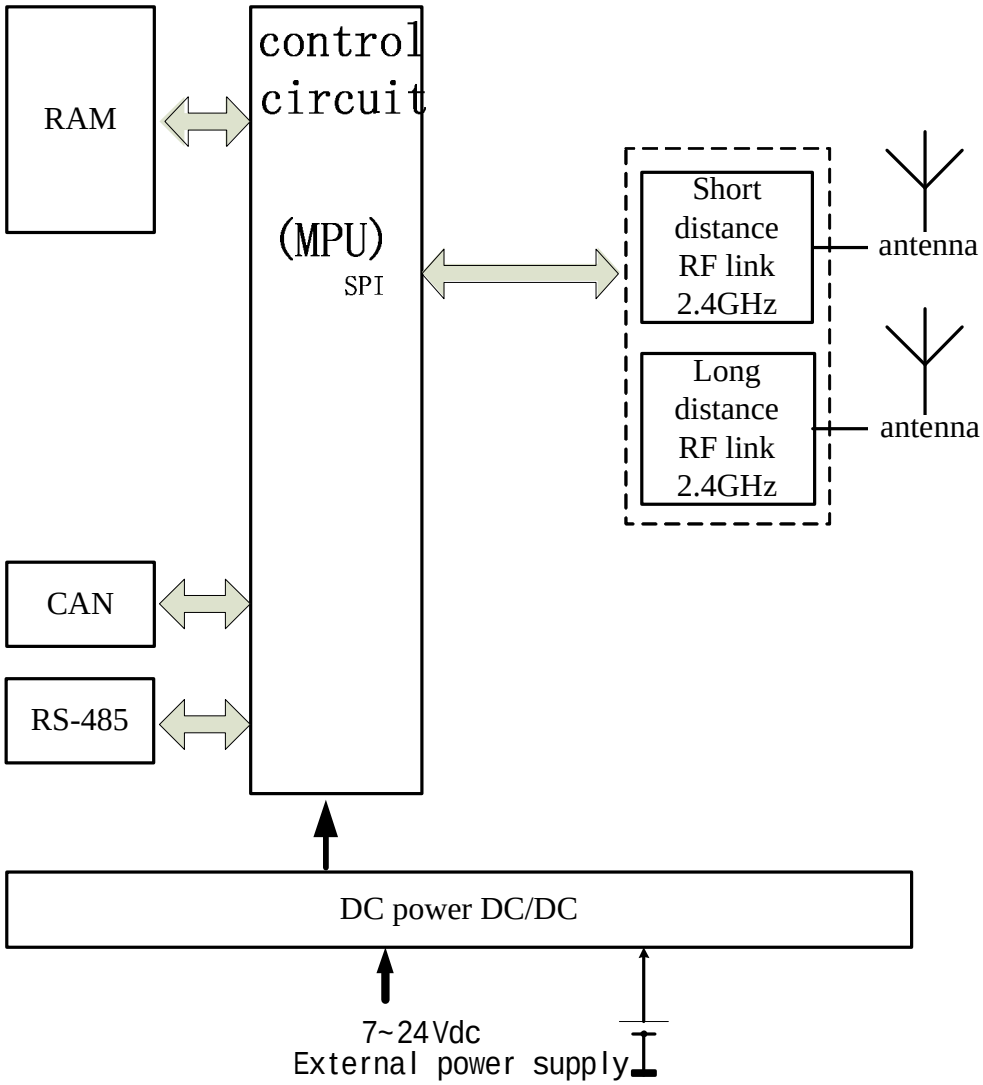


4.1.3 The bottom layer of the PCB drawing of DWT100-ST112

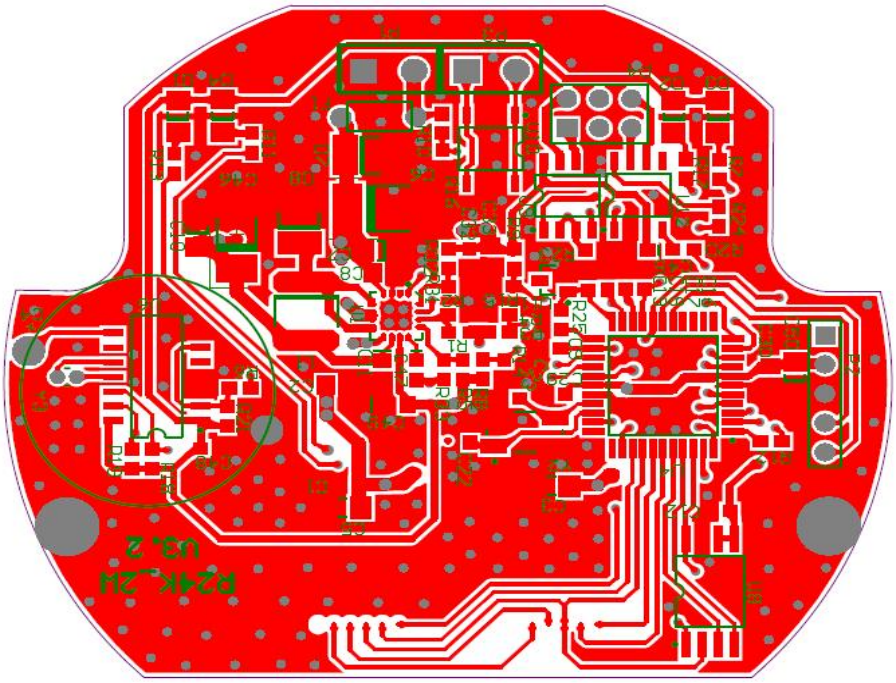


4.2 Data transmission base station

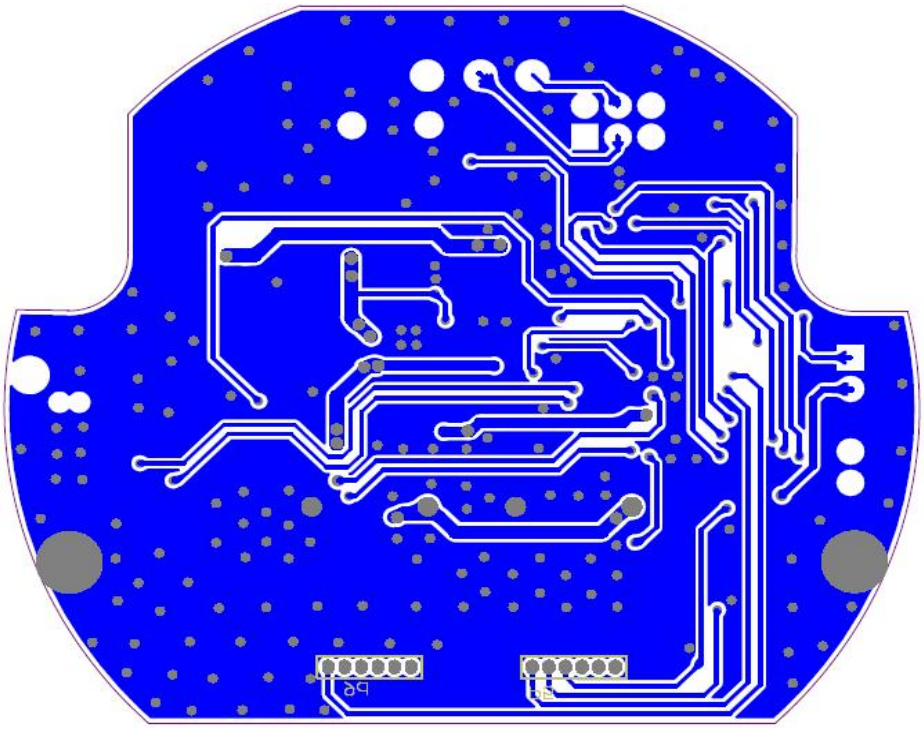
4.2.1 The schematic diagram of DWT100-R02WH



4.2.2 The top layer of the PCB drawing of DWT100-R02WH

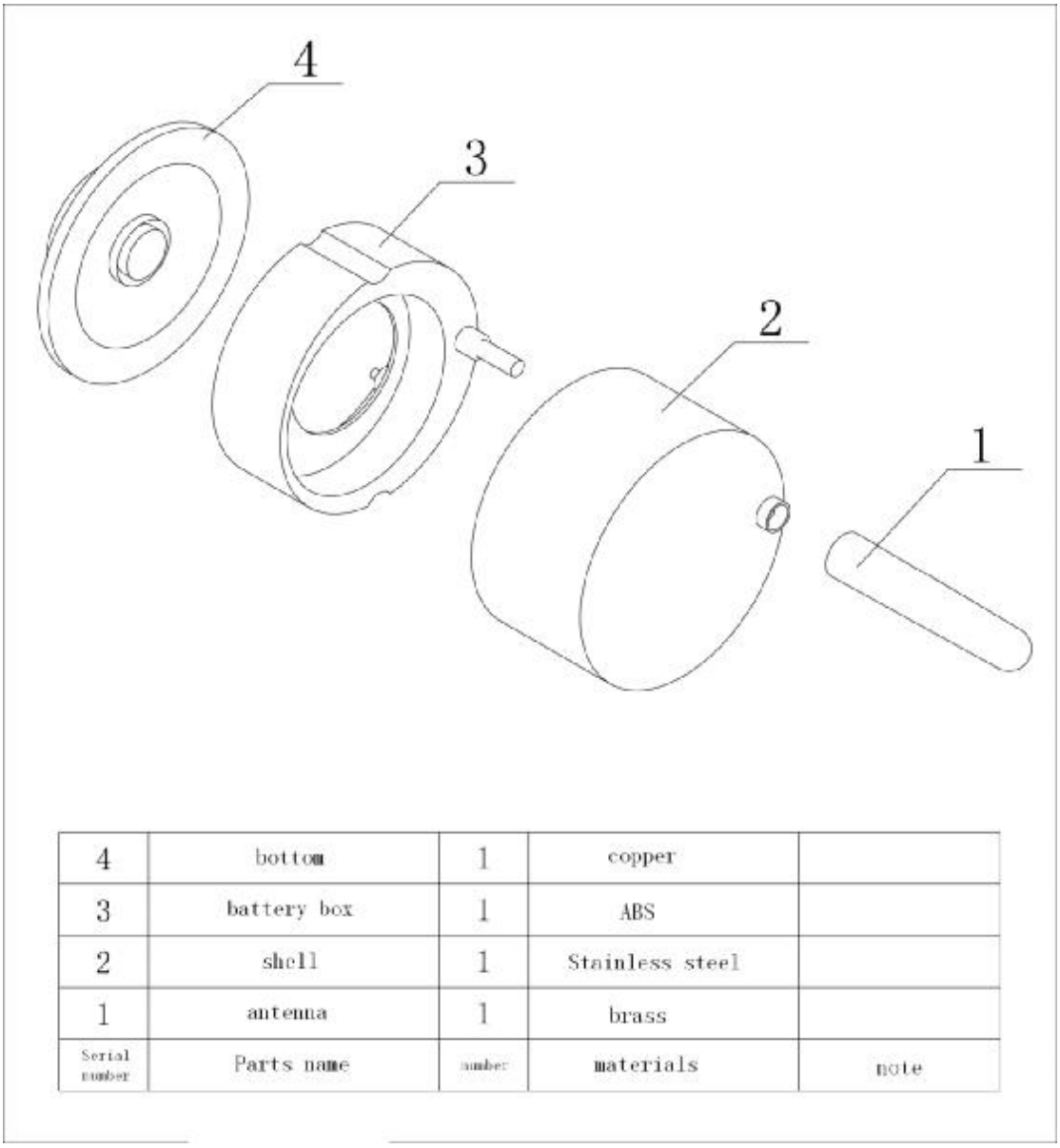


4.2.3 The bottom layer of the PCB drawing of DWT100-R02WH



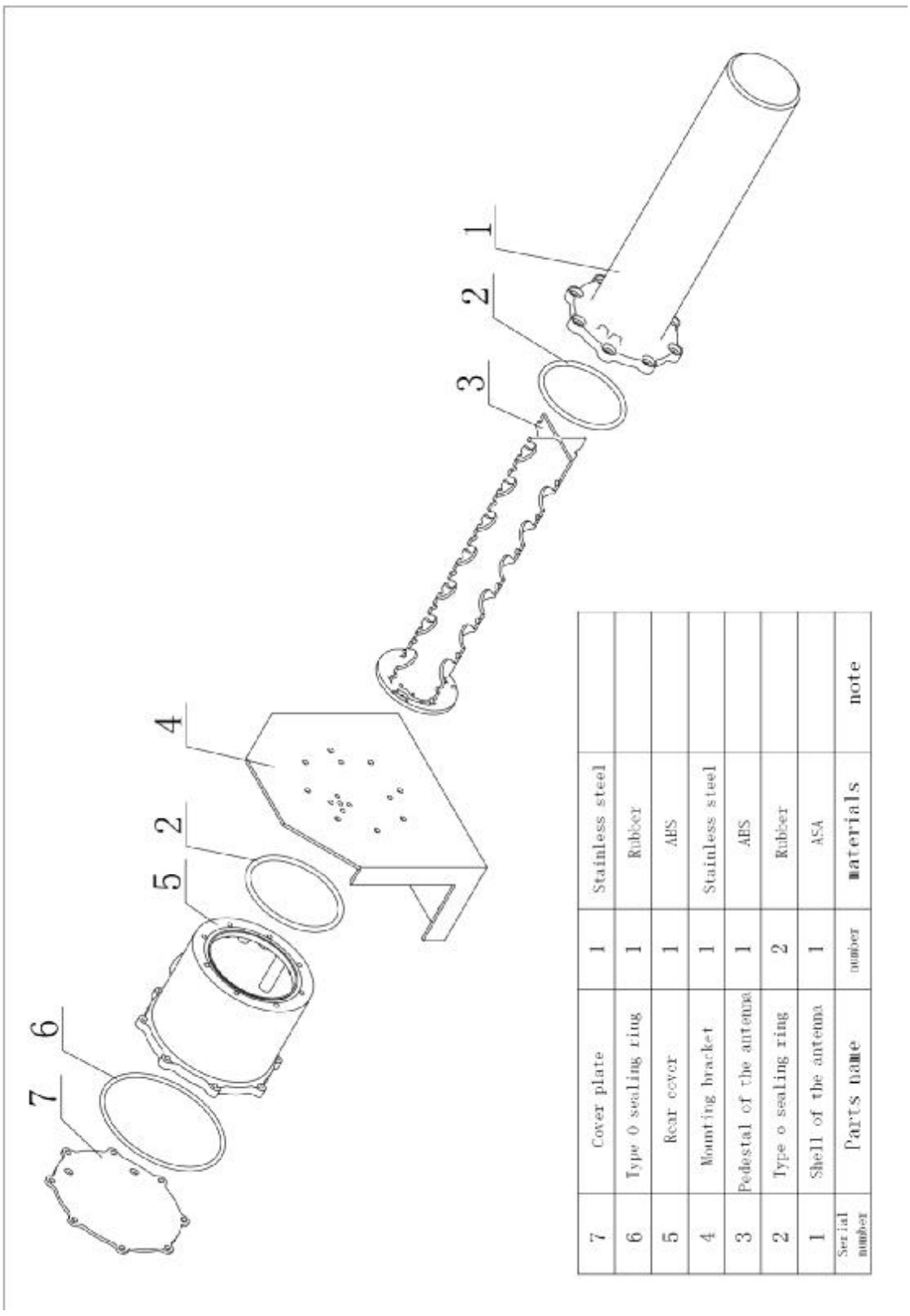
Part V Assembly drawing of system

5.1 Assembly drawing of DWT100-ST112



Serial number	Parts name	number	materials	note
4	bottom	1	copper	
3	battery box	1	ABS	
2	shell	1	Stainless steel	
1	antenna	1	brass	

5.2 Assembly drawing of DWT100-R02WH



Serial number	Parts name	number	materials	note
7	Cover plate	1	Stainless steel	
6	Type O sealing ring	1	Rubber	
5	Rear cover	1	ABS	
4	Mounting bracket	1	Stainless steel	
3	Pedestal of the antenna	1	ABS	
2	Type o sealing ring	2	Rubber	
1	Shell of the antenna	1	ASA	

FCC ID: ZJO-ST112

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.