

C10 Cube Instruction Manual

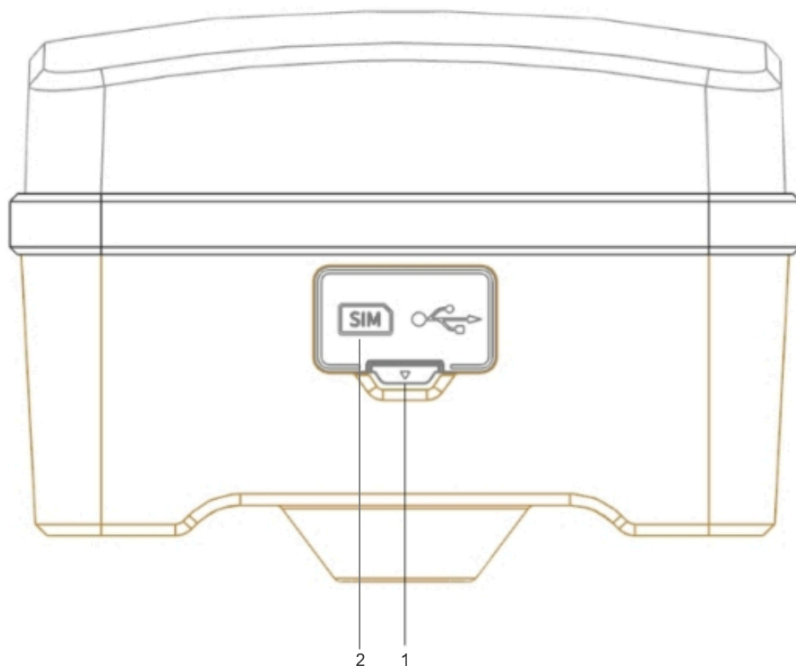
1. Overview

The C10 Cube RTK is a high-precision satellite positioning device, featuring a built-in full-system, full-frequency satellite positioning module, high-precision measurement antenna, tilt measurement module, WIFI module, Bluetooth module, and large-capacity battery. It uses a magnesium-aluminum alloy housing, with small size, light weight, high precision, and comprehensive functions, making it a great assistant for high-precision measurements.

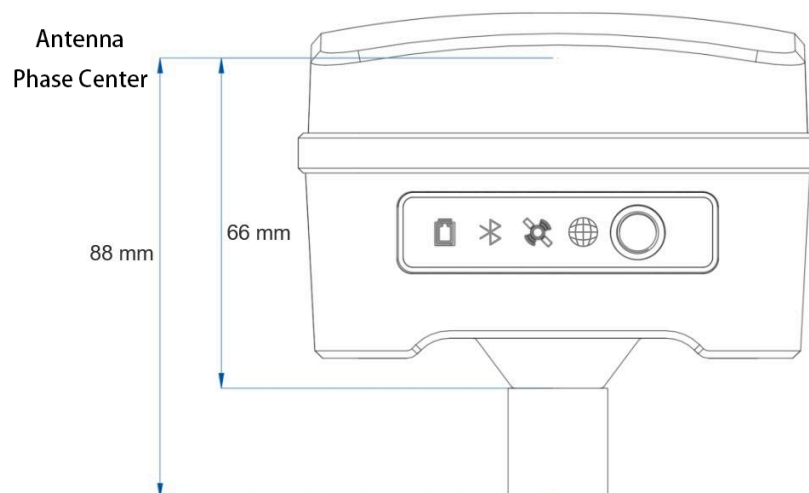
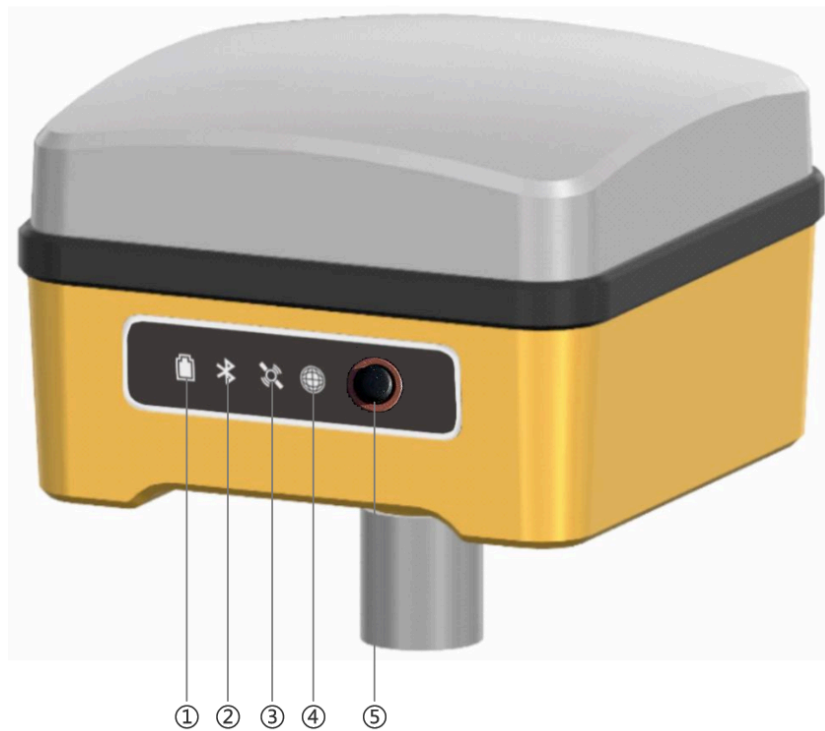
2. Product Introduction

1. External Interface

- a. Type-C interface, used for charging, data transfer, firmware upgrade, etc.
- b. TF card can be replaced here



2. Appearance, Buttons, Indicator Lights



- ① Power indicator light: Red solid on indicates the battery level is below 20% (forced shutdown when below 10%), yellow solid on indicates the battery level is 20%-50%, green solid on indicates the battery level is above 50%;
- ② Bluetooth Indicator Light: It does not light up when Bluetooth is not connected, and after connecting to Bluetooth, it stays green constantly;
- ③ Position indicator light:
 - Measurement Station Mode:
 - Enable tilt measurement: not lit indicates not positioned, red constantly lit indicates single point positioning, yellow constantly lit indicates float or pseudorange differential positioning, red green flashing indicates differential fixed + IMU needs calibration, green constantly lit indicates tilt measurement is available;

- Tilt measurement not enabled: Off indicates not positioned, **red** solid indicates single point positioning, **yellow** solid indicates floating or pseudorange positioning, **green** solid indicates differential fixed;
- Base Station Mode: **Red** steady light indicates not positioned, **Green** steady light indicates positioned;
- ④ Network Indicator Light:
 - WIFI Mode:
 - Does not light up when not connected to Wi-Fi, and after connecting to Wi-Fi **green light** stays on constantly;

III. Operating Instructions

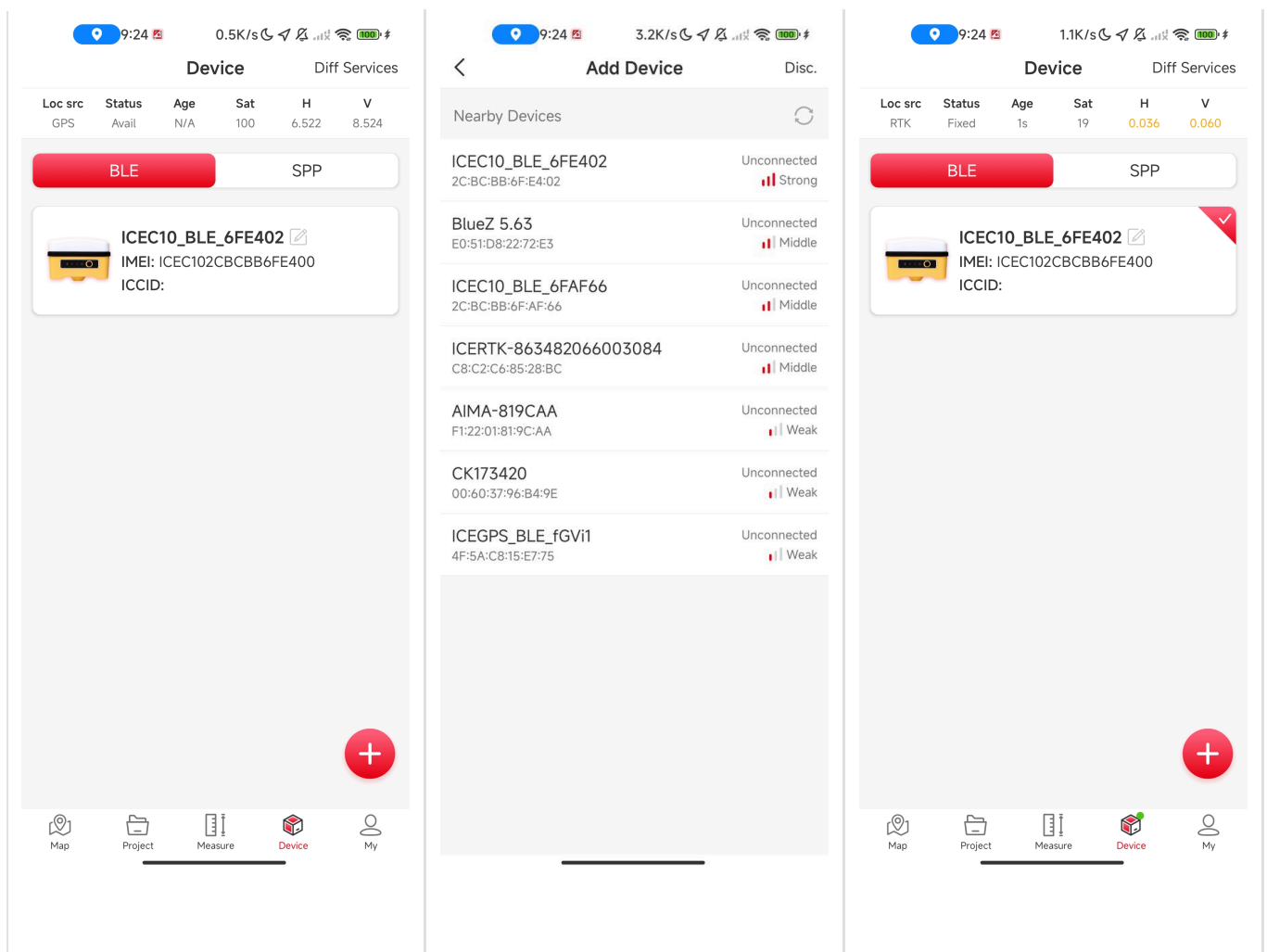
1. Connected Device:

- a. Method 1: Download the "Binghe Measurement" APP by scanning the QR code to download and install (only compatible with Android phones)

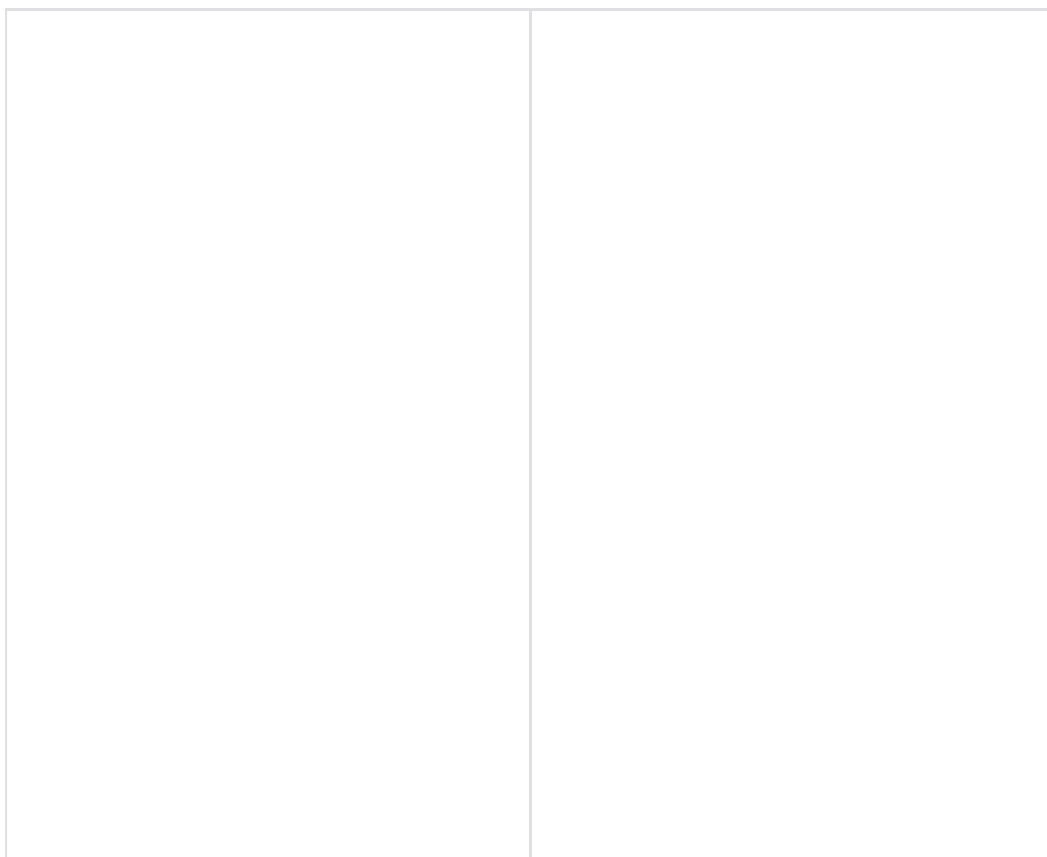


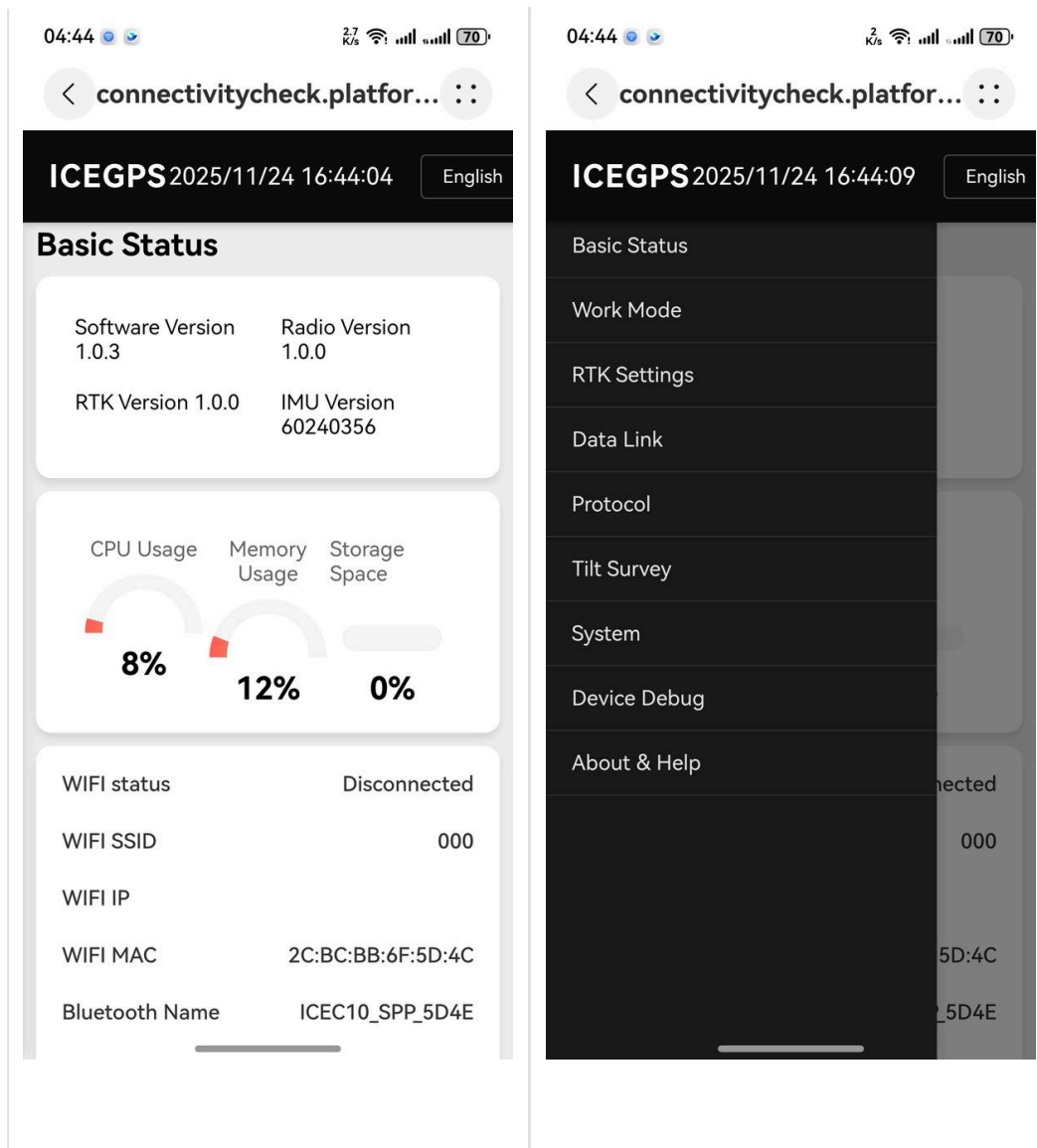
Open the "Glacier Measurement" APP, click "Device", select 'SPP', click the [+] button, and select the correct device name from the list to connect the device (the name of the C10 device starts with ICEC10);

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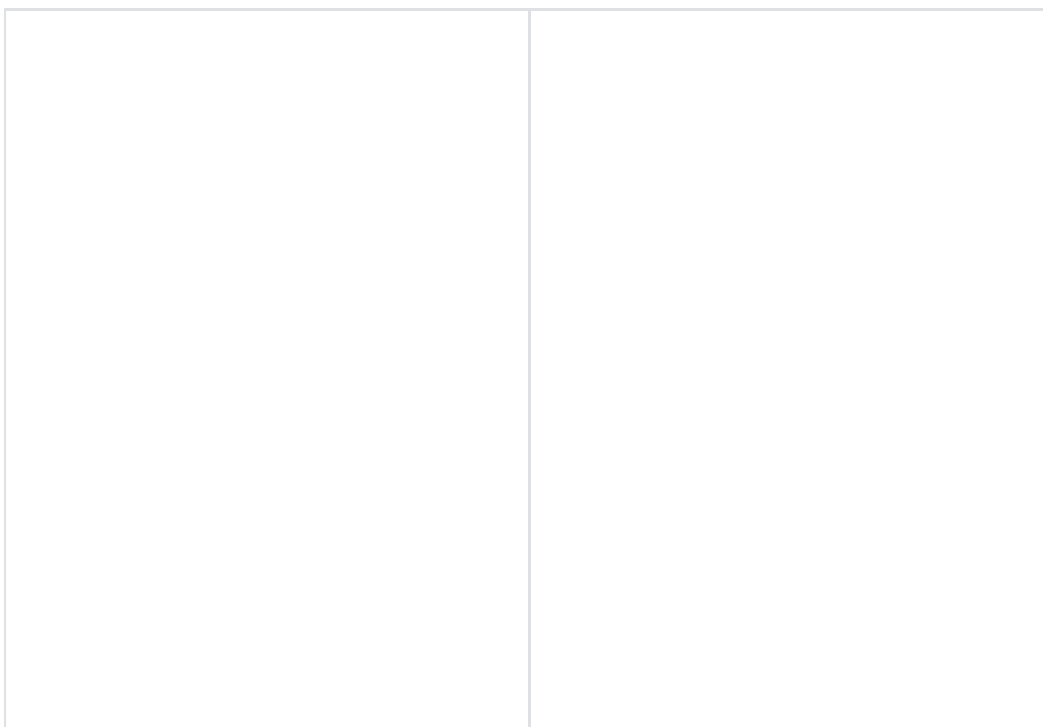


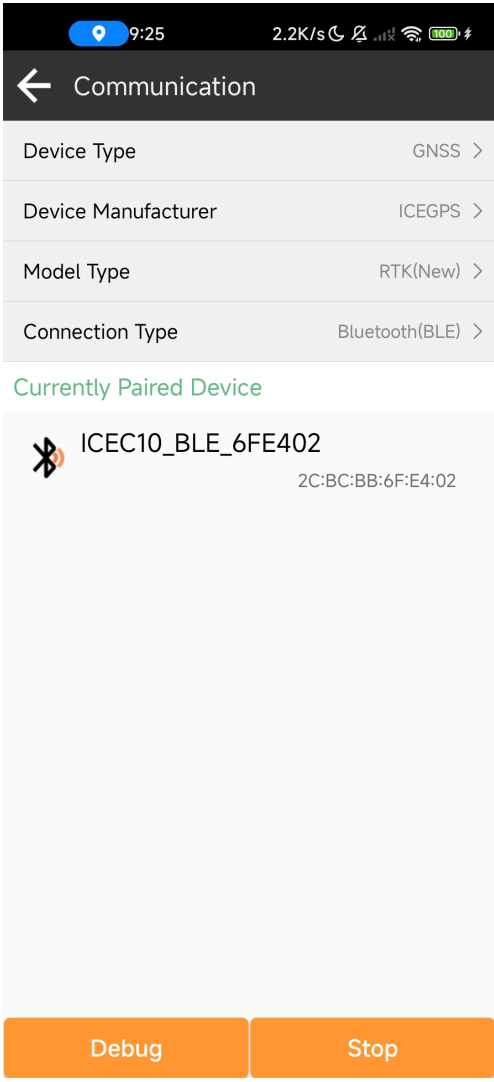
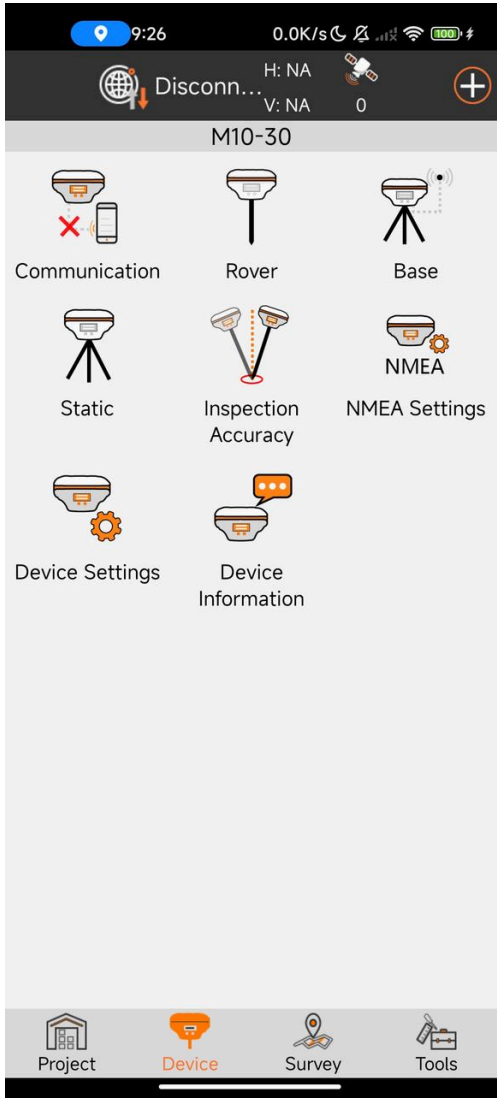
- b. Method 2: Connect to the device's WiFi, click "Authentication/Login" on the WiFi interface to enter the configuration interface.





- c. Method 3: Use xsurvey for Bluetooth connection. There is a communication setting on the instrument interface. Click into it and select BLE Bluetooth for the Bluetooth method;

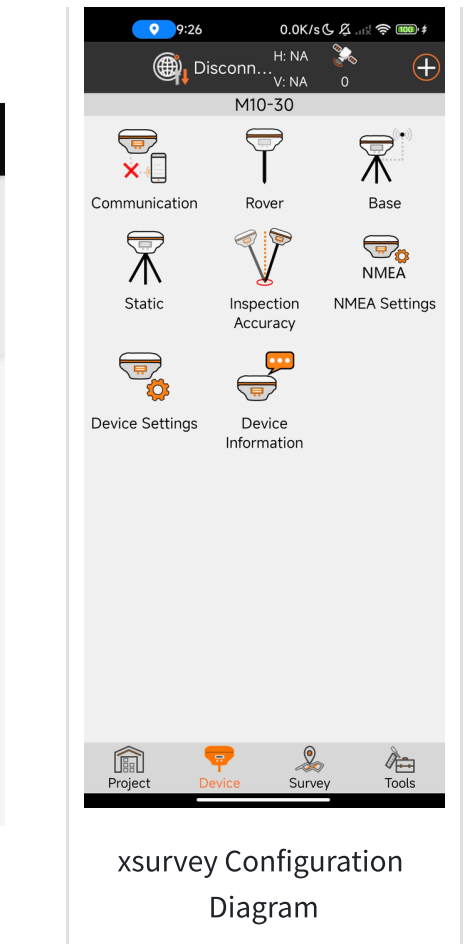
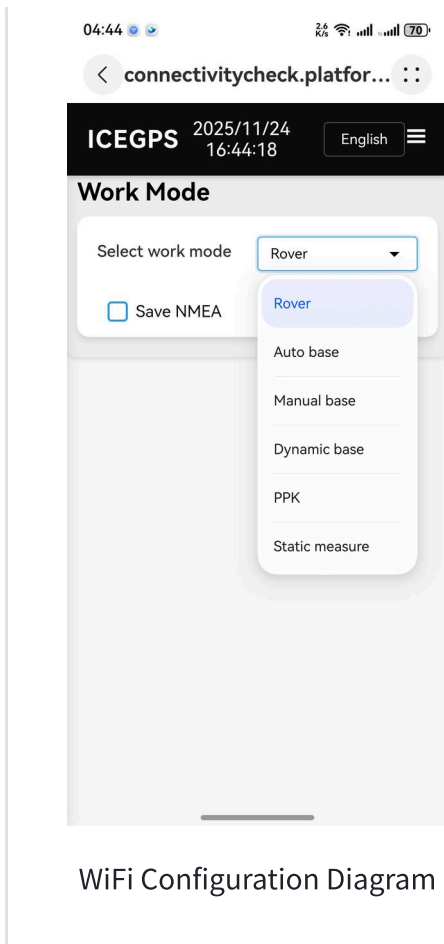
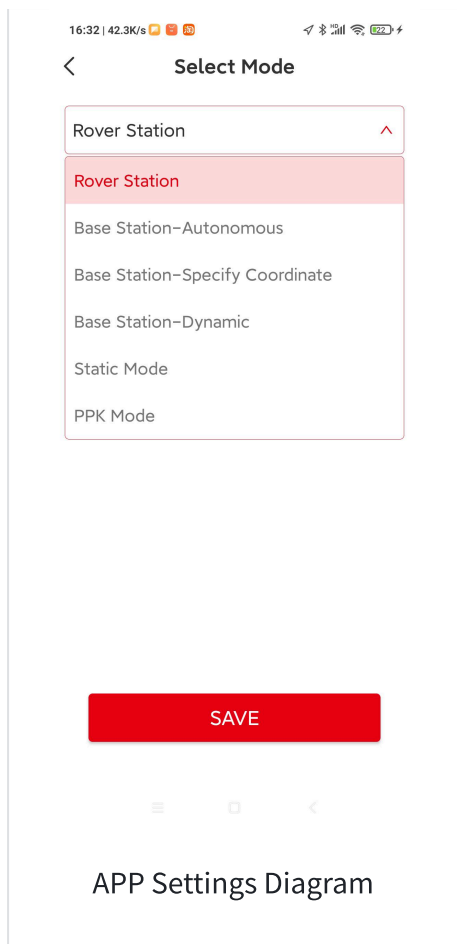




2. Select the working mode

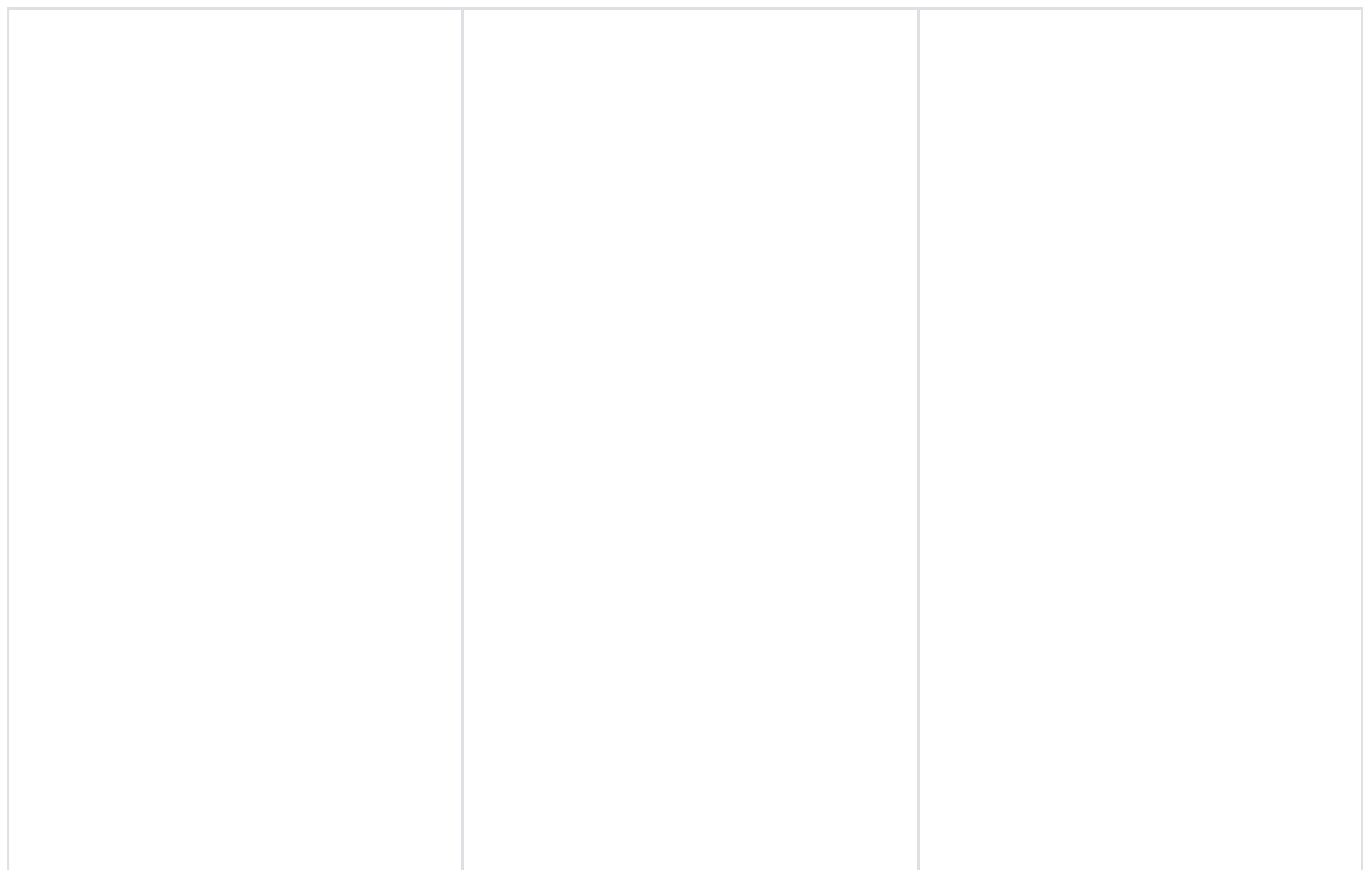
Select the working mode as needed, including base station mode (multiple types), measurement station mode, etc.

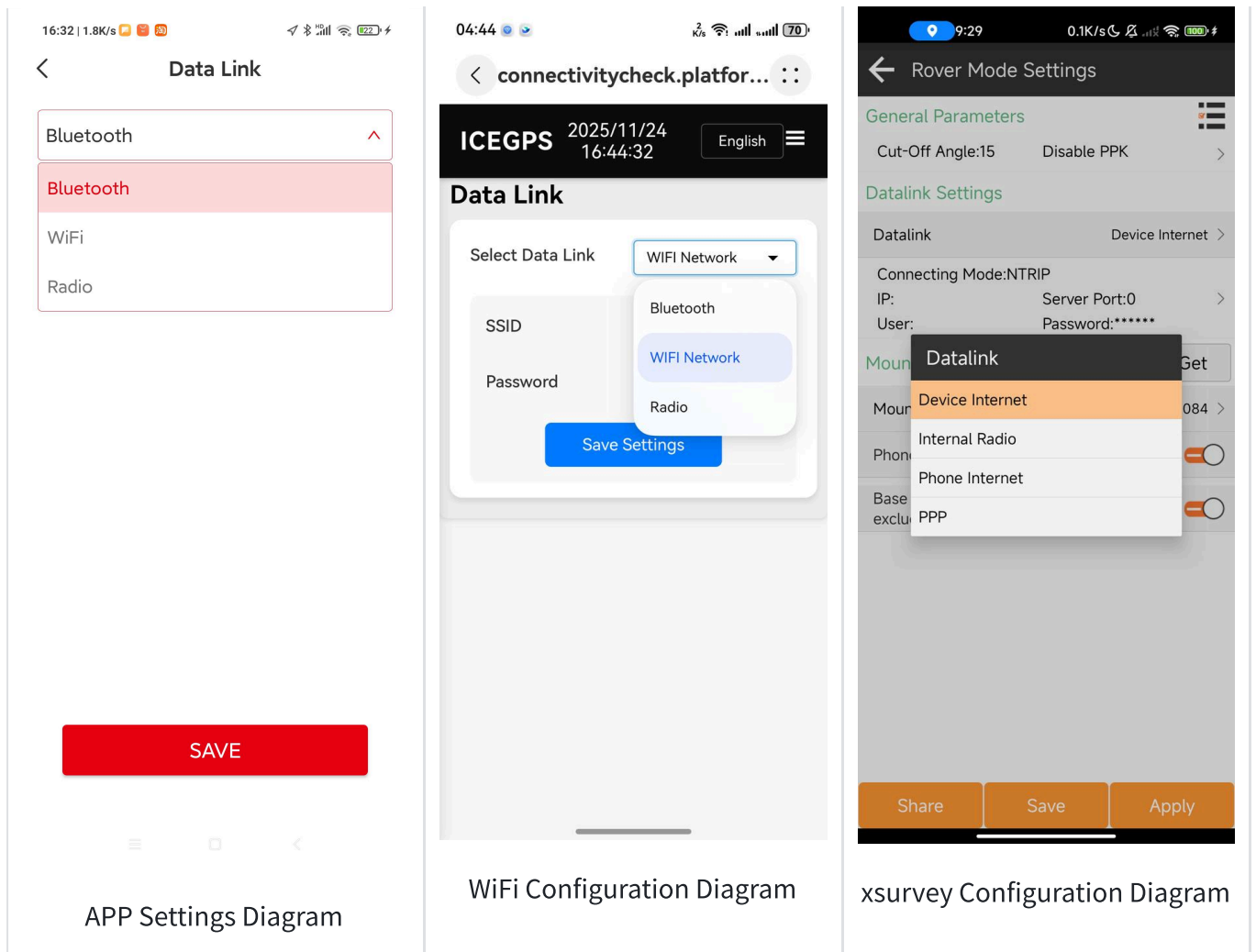
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3. Select Data Link

Select the data link as needed, including WIFI, Bluetooth, and data radio. (The configuration method for xsurvey is slightly different)

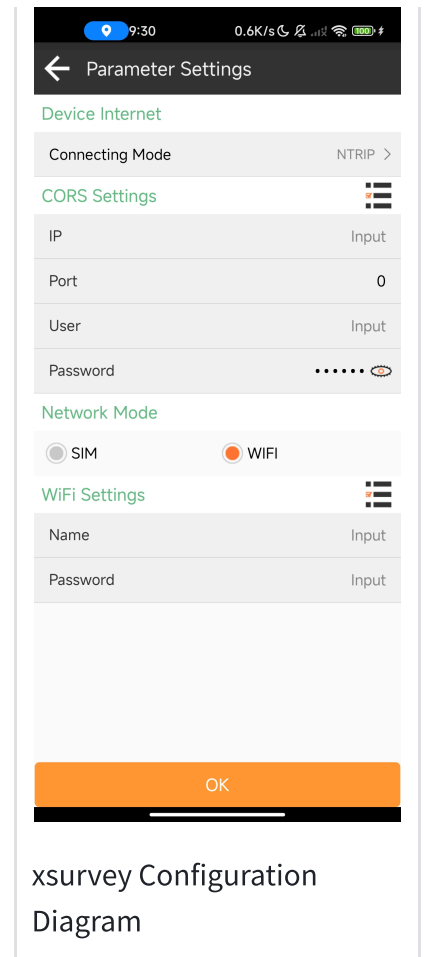
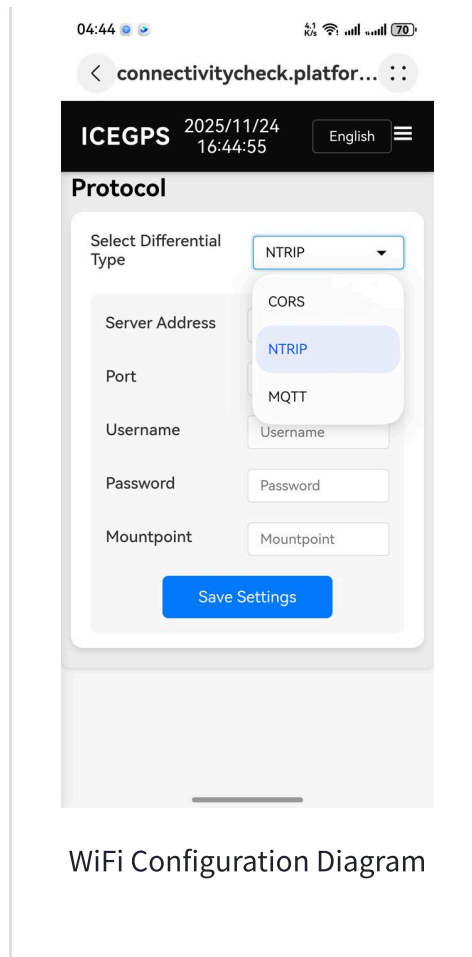
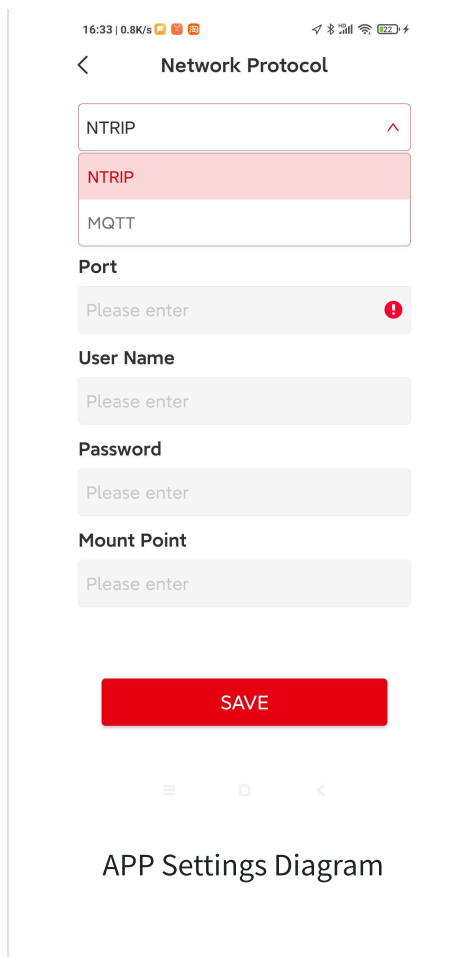




4. Select Network Protocol

Select the network protocol as needed, supporting CORS differential, NTRIP differential, and MQTT differential. (xsurvey configuration can only configure NTRIP differential)

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5. Base Station Setup Instructions

- To ensure the RTK differential effect, the reference station should be set up in an open sky environment, avoiding large buildings that may block the signal, staying away from strong signal reflectors, and keeping a distance from high-power electrical equipment (such as high-voltage lines, signal towers, radio stations, transformers, etc.).
- On the RTK Setup APP, set the data link to Bluetooth, radio data transceiver, or Wi-Fi. In base mode, only NTRIP, MQTT, or radio data can be selected as the network protocol. Enter the information of the selected protocol. When the base station is working normally, the positioning light remains constantly green.

6. Instructions for Using the Measuring Station

- In the measurement station mode, the data link has added Bluetooth and data transmission.
- When the Cube RTK is used as a measurement station, it is fixed on the centering rod via an adapter (**note to set the correct length of the centering rod**) .
- Bluetooth differential only requires selecting Bluetooth in the data link, and then using the measurement APP to forward differential data to the Cube RTK for differential processing.

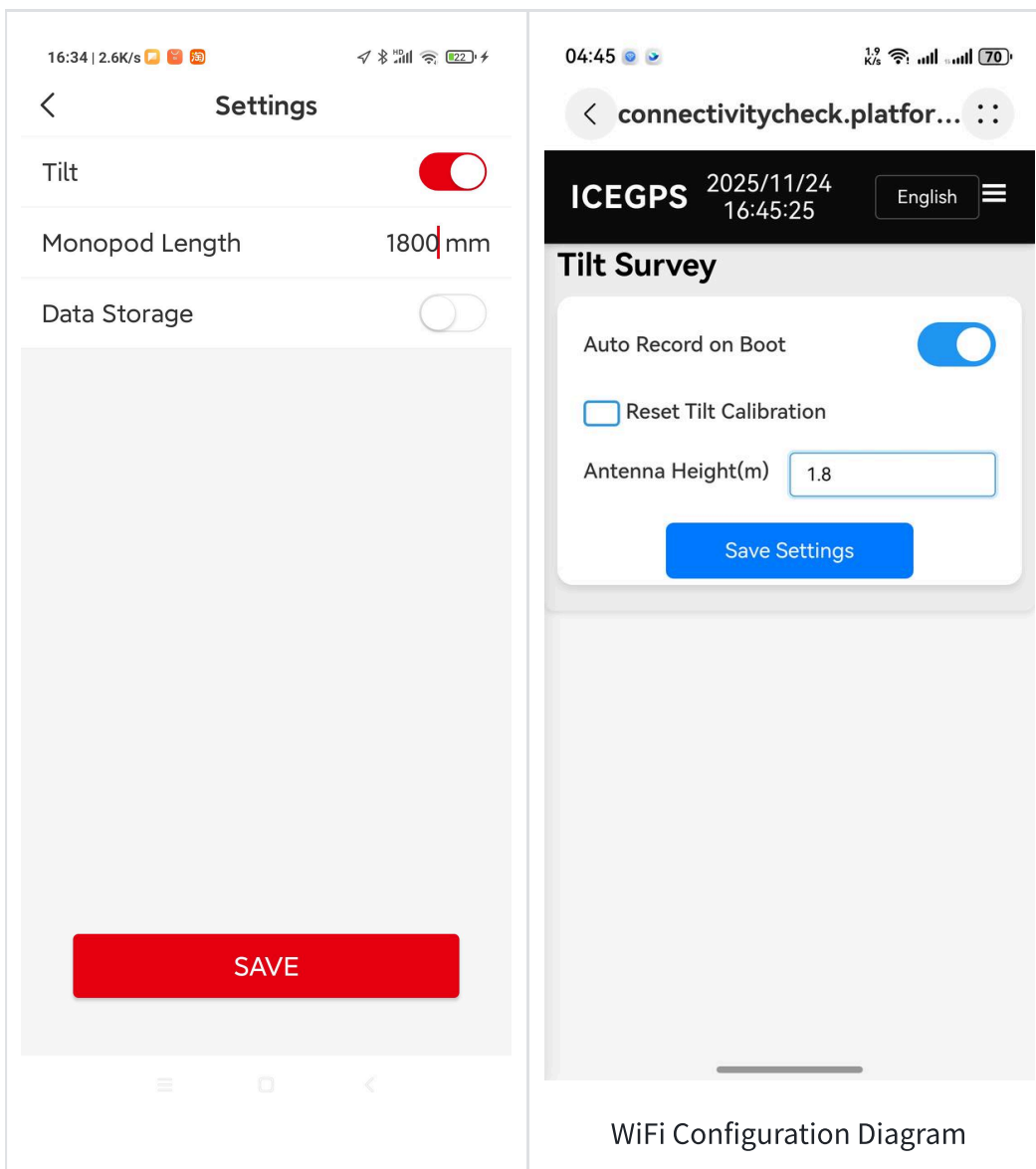
- For radio data differential, you only need to select the radio data in the data link, and then configure the radio data connection information (**radio data can only be configured using WiFi**).

7. Static Measurement and PPK Measurement

Set it to Static Measurement Mode or PPK Measurement Mode, then start Data Acquisition. After Data Acquisition is completed, the user needs to transfer the data files to a computer (remove the TF card or connect to the computer using a USB cable depending on the model), and then process the data using post-processing software;

8. Tilt Measurement

- Start tilt measurement, enter the length of the centering rod, then shake the Cube RTK for calibration according to the status of the indicator light. During calibration, the amplitude and speed of shaking should neither be too large nor too small. You can refer to the calibration video on the company's official website.
- During use, it is necessary to always pay attention to whether the status of the positioning light requires recalibration.



WiFi Configuration Diagram

4. Packing List

1. Cube RTK
2. Data Cable (Standard Configuration)
3. Adapter (standard configuration)
4. Pairing with the center pole (optional)
5. Android Handheld Terminal (Optional)
6. Android Measurement APP (Optional)



Cube RTK



Data Cable

Centering Rod



Android Handheld
Data Collector



Adapter

5. Technical Parameters

	GNSS Performance
RTK	

	Full system, all frequency points, optionally equipped with RTK module supporting satellite-based differential
Satellite Frequency	BDS B1I, B2I, B3I, B1C, B2a, B2b GPS L1C/A, L1C, L2C, L2P(Y), L5 GLONASS G1, G2, G3 Galileo E1, E5a, E5b, E6 QZSS L1C/A, L1C, L2C, L5 NavIC L5 SBAS L1C/A L-Band*
RTK accuracy	Plane: 0.8 cm + 1 ppm Elevation: 1.5 cm + 1 ppm
BeiDou PPP Accuracy	Plane: 5 cm Elevation: 10 cm
Tilt Measurement	10 mm + 0.7 mm/° tilt (accuracy < 2.5 cm within 30°)
RTK initialization time	< 5 s (typical value)
Initialization reliability	> 99.9%
Working Mode	Measurement Station Mode, Autonomous Positioning Reference Station Mode, Specified Coordinate Reference Station Mode, Static Measurement Mode, PPK Measurement Mode
Tilt Measurement	Advanced tilt measurement, seamless calibration
WIFI	2.4G
BT	Classic Bluetooth
Data Transmission	410-470 MHz
Battery and Endurance	6000mAh lithium battery, >12 hours

Type-C interface	Charging, USB Flash Drive, Virtual Serial Port
Operating System	freertos
TF Card	Supports FAT32 File System
Waterproof ability	IP65
Align the threaded interface of the center rod	The tripod has a standard 3/8-16 interface, including a 3/8-18 to 5/8-11 adapter
shell	The bottom shell is made of aluminum-magnesium alloy
Dimensions and Weight	104*104*75mm, 515g