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## Disclaimer

Thank you for purchasing the satellite navigation base station (hereinafter the “base station”) of FJ Dynamics (hereinafter the “Company”).

Please carefully read all contents of the *Satellite Navigation Base Station Manual* and understand the specifications and notes of this product before use. Once the base station is used, it shall automatically be deemed that all contents of this disclaimer have been recognized and accepted. This Company assumes no liability for any damage caused by installation, modification or improper use by the user or force majeure (such as lightning stroke, high voltage and collision), or damage of device and parts (including but not limited to parts not specified by this Company) caused by reasons other than product quality.

## Notes

### Operator requirements

1. The minimum operator age required is 18.
2. The operator must not operate under the influence.
3. The operator must not operate when tired.

### Working environment

1. Please use this base station in an open field away from crowds, and ensure that all antennas of the base station are uncovered.
2. Please keep away from crowds, livestock, barriers, electric wires, tall buildings, airports and signal towers, to prevent signal interference during operation.
3. Please operate in good weather conditions (no extreme weather such as heavy rain, heavy fog, snow, thunder and lightning, and strong wind).

### Operation specification

1. Do not overbend or fold wires during installation.
2. Please make sure the base station is in a horizontal position when installed.
3. To prevent the base station from moving due to accidental external force during installation and placement, please insert a tripod into the ground to enhance stability.

4. Please use the battery that comes with the base station for power supply. If the battery needs to be purchased separately, please refer to the specified models.
5. Please comply with the local radio laws and regulations when using the base station.
6. Please turn off other wireless devices of the same frequency band when using the base station.
7. Please use the accessories specified by the Company, otherwise the system may be damaged.
8. Please ensure there is no foreign matter (water, sand, etc.) within each part.
9. Do not dismantle any component of the base station by oneself.
10. The bottom of the tripod is sharp. Please handle with care.
11. To maximize battery life, please remove rechargeable batteries from the base station when not in use.
12. If any connection cable in different parts of the base station is damaged, please stop using and replace it with new cable in time to avoid accidents.

## I. Foreword

### 1.1 Manual purpose

This manual provides guidance for using the base station, with its operational process described simply and clearly, so that users can learn the different operation steps easily, quickly and accurately.

### 1.2 Technical support

Users enjoy long-term technical support and upgrade services provided for free by FJ Dynamics Technology Co., Ltd. from the date of purchase of this product.

Official website of FJ Dynamics: <https://www.fjdynamics.com/en/>

## II. Product Overview

### 2.1 Introduction

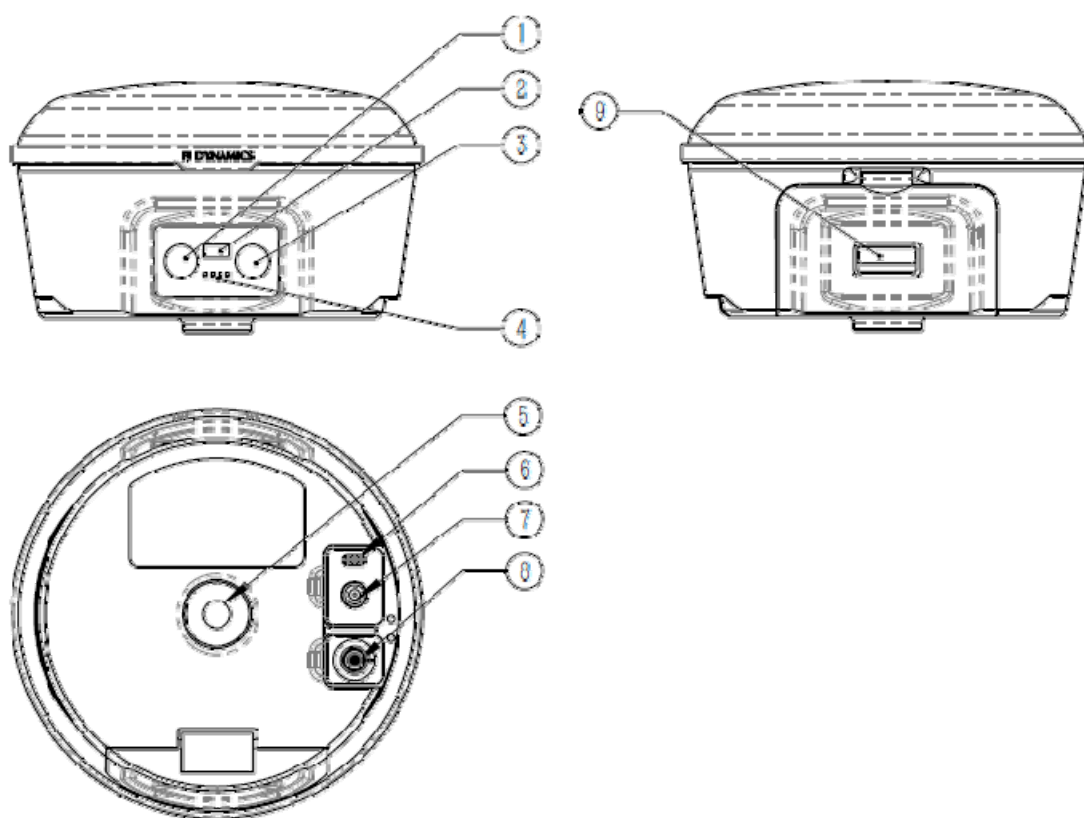
The satellite navigation base station of FJ Dynamics adopts real-time kinematic (RTK)

technology and data transmission links to provide precision positioning services.

- Analysis of accurate positioning information with intelligent data algorithm.
- Full coverage of target work area with stable data transmission capacity.

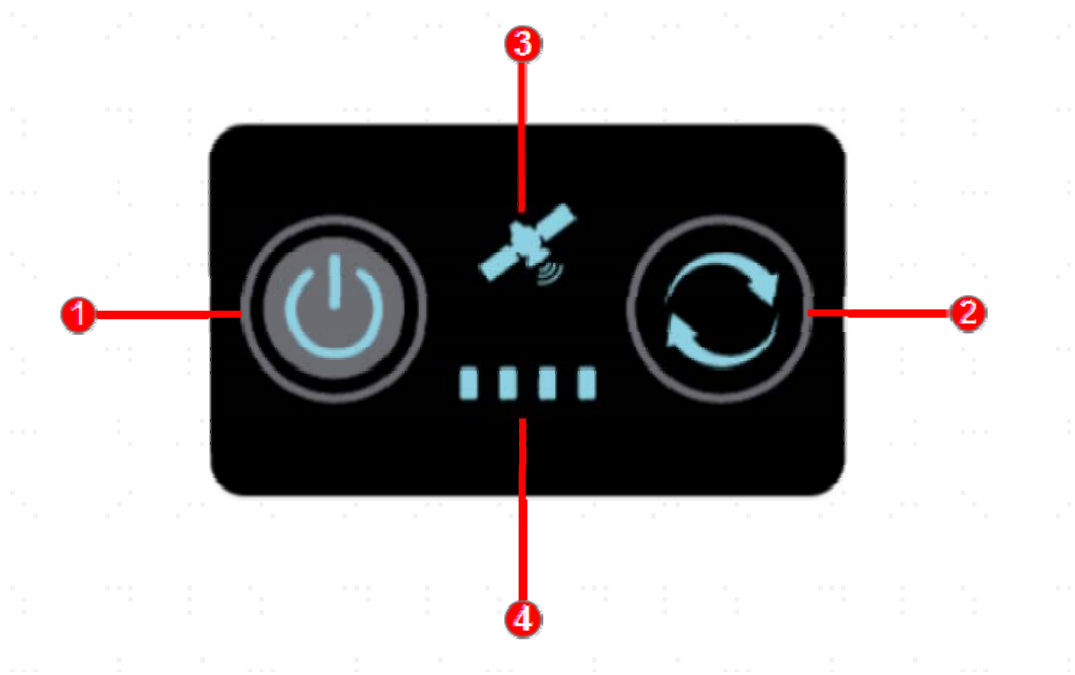
## 2.2 Main parts

### Satellite navigation base station body



1. Switch button    2. GPS indicator light    3. Standby button    4. Power indicator light  
5. Threaded hole of fixed rod    6. Type-C interface    7. External antenna interface  
8. External power interface    9. Battery cover switch

Panel indicator light:



| Indicator light                       | Meaning                                                                                                                        |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| ① Power light                         | Blue light on: base station working normally                                                                                   |
|                                       | Blue light flashing: channel detection in progress; please wait for 30s                                                        |
|                                       | Red light on: base station out of battery or low voltage of external power                                                     |
|                                       | Red light flashing: please check whether the installation site of the base station meets the requirements                      |
| ② Mode light                          | Blue light on: mobile base station function enabled                                                                            |
| ③ Satellite indicator indicator light | Blue light on: positioning                                                                                                     |
|                                       | Blue light flashing: positioning completed                                                                                     |
| ④ Battery level indicator light       | When only one of the 4 side-by-side indicator lights remains on, please replace the battery or connect to external power soon. |

**Operating instructions:**

| Operation                 | How to                                                                                                                                                                                                                                                                                                                             |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Turn on the base station  | With the base station off, press the power button until the power light is on, and the base station is turned off.                                                                                                                                                                                                                 |
| Turn off the base station | When the base station is turned on, long press the power button until the power light, satellite light and mode light are all off.                                                                                                                                                                                                 |
| Channel redetection       | Press the power button under working status, and the base station will redetect communication channels. After successful detection, the power indicator light will remain blue.                                                                                                                                                    |
| Base station upgrade      | When the power light and the satellite light are on, press the power button and the standby button at the same time, base station will start upgrading. Under upgrade mode, the red power light and the green mode light will flash simultaneously.<br>* Please maintain a full battery charge of the base station during upgrade. |

### III. Preparation before use

#### 3.1 Charging

\*Please fully charge the battery before first use.

Step 1: Connect one end of the Type-C cable to the power plug of the charger, and the other end to the Type-C interface at the bottom of the battery charger.

Step 2: Install the battery to the charging base.

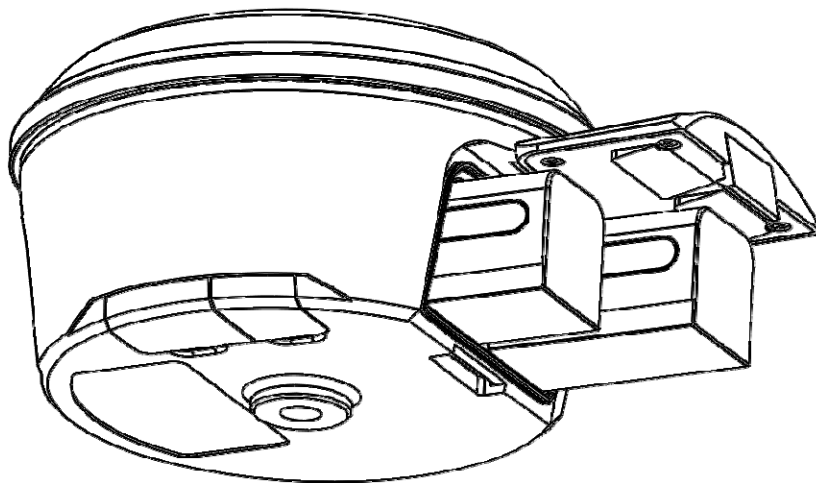
Step 3: Connect the other end of the power plug of the charger to an AC power supply (100-240V, 50/60Hz).

After successful power connection, charging will begin as the LCD screen of the charging base lights up, and the current battery level will be displayed on the screen.

#### 3.2 Battery installation and replacement

1. Battery installation: open the battery cover, and insert battery with the cell facing the inside, and the battery will be locked by the metal clips.
2. Battery replacement: this device supports battery replacement with uninterruptible power supply. This device is powered by 2 batteries. Please replace the batteries one by one, and

ensure that at least one battery remains inside to power the device. Unless the device is connected to external power supply, do not take out 2 batteries at the same time, otherwise the device will stop working due to interruption of power supply.

**Notes:**

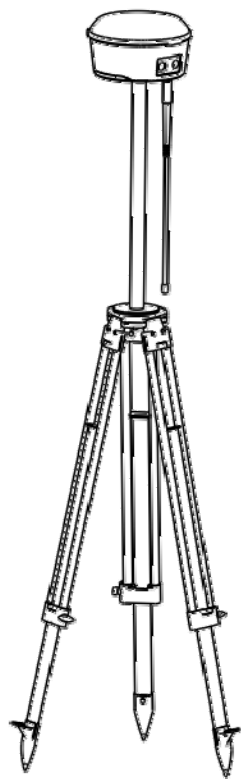
1. The base station can be fitted with 2 batteries. The estimated service time is 6 hours with one battery and 12 hours with two batteries.
2. Do not charge batteries which are not intended for use by this device, to prevent personal injury and property loss caused by battery damage, liquid leakage and even explosion.
3. Improper use of the charger may result in damage and personal risks.
4. Do not use the charger under wet conditions.
5. Do not dismantle or repair the charger by oneself, to avoid damage to the charger.
6. Stop using the charger if it is stricken heavily.
7. Minors are prohibited from using the charger.
8. Please use the charger within a temperature range of 0°C~40°C.
9. Do not use or store the charger in direct sunlight, near heating devices or in areas subject to high temperature.
10. The charger and its batteries will get slightly hot while charging, which is normal.
11. Please take out rechargeable batteries when the charger is not in use.

**3.3 Base station installation**

1. Unfold the tripod, adjust the telescopic rods to a proper length, and then tighten the knob

to keep the base level. To ensure stability of the tripod, stick the tip of the tripod into the ground when necessary.

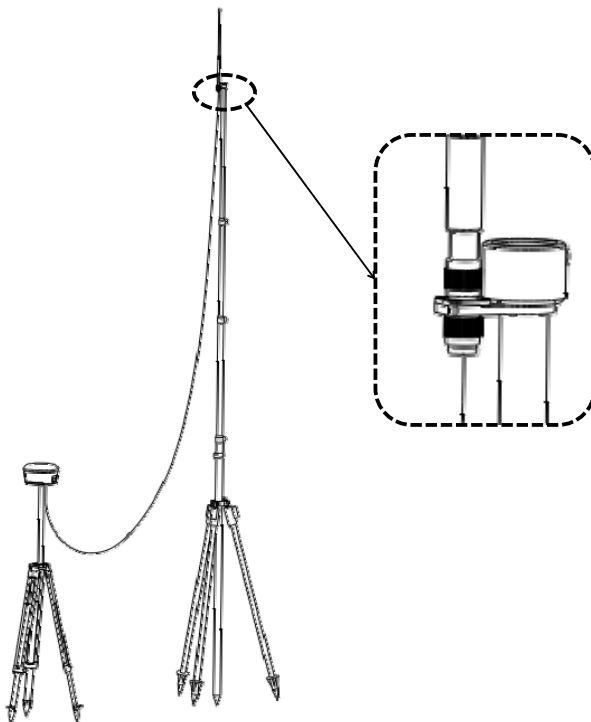
2. Install the radio antenna to the external antenna interface of the base station body, and rotate the base station to fix it on the fixed rod with screw thread.
3. Place the circular plate on the center of tripod surface, tighten the other end of the fixed rod with the bolt on the tripod, and adjust the tripod to ensure the levelness of the base station.

**Notes:**

1. If the position or angle of the tripod or the base station has to be changed, please adjust again to ensure the levelness.
2. The base station should be installed in an open field free of obstacles (such as trees, buildings, etc.) in the surroundings to prevent GNSS signals from being absorbed or blocked.
3. The base station should maintain at least 200m away from high-power radio emission sources (such as high-voltage cable, radio tower and cell tower) to prevent GNSS signals from being interfered by electromagnetic fields.

4. Keep the base station away from large bodies of water and objects which may seriously interfere with the reception of satellite signals to reduce the influence of the multi-path effect.
5. It is forbidden to move the base station during use.

### 3.4 Antenna stand installation (optional)



#### Steps:

1. Complete the base station installation following the prescribed steps, and screw off the radio antenna.
2. Unfold the tripod, and adjust the three telescopic rods to a proper length.
3. Screw off the mounting base at the top of the telescopic rods, put in the antenna adapter, screw in the mounting base, and clamp the antenna adapter.
4. Install the radio antenna to the top interface of the antenna adapter, and screw one end of the antenna extension cord into the threads at the bottom of the antenna adapter.
5. Install and fix the telescopic rods by tightening the knob through the hole of the antenna tripod, extend the centering rod and then tighten the knob.
6. Screw the other end of the antenna extension cord into the external antenna interface at the bottom of the base station body.

## IV. Use

### 4.1 Usage of base station body

1. Install batteries inside the base station body, and press the power button on the control panel of the base station.
2. When the satellite icon light on the panel flashes, it indicates that the base station is working normally.

### 4.2 Frequency pairing

1. Turn on the base station body, and wait for the satellite icon light on the panel to flash regularly, which indicates working status.
2. Click “Settings>RTK setting>Mobile station>Frequency pairing” on the control panel, enter the 8-digit service code at the bottom of the base station body, and click to confirm. It displays “Connected” upon completion of frequency pairing.



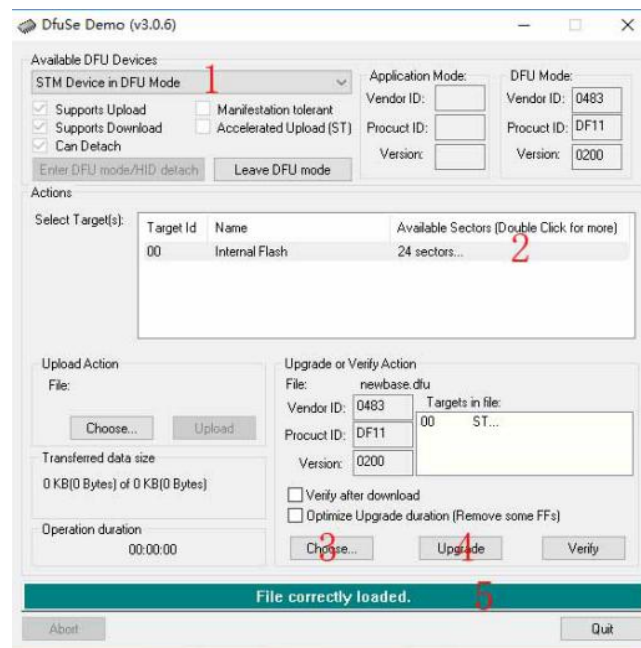
### 4.3 Firmware upgrade

Firmware upgrade can be performed through the base station software. The following are the detailed procedures for using the base station software to upgrade the mobile station:

1. Please download the latest version of base station firmware at the official website of FJ

Dynamics.

2. Turn on the base station, and use a USB Type-C cable to connect the USB Type-C interface of the mobile base station to the computer.
3. Open the base station upgrade software (provided by technical service personnel).
4. When the power indicator light and the satellite indicator light both remain blue, press the power button and the standby bottom, then the base station will start upgrading. The upgrade mode is indicated by red power light and green mode light.
5. Please follow the steps 1-5 below.



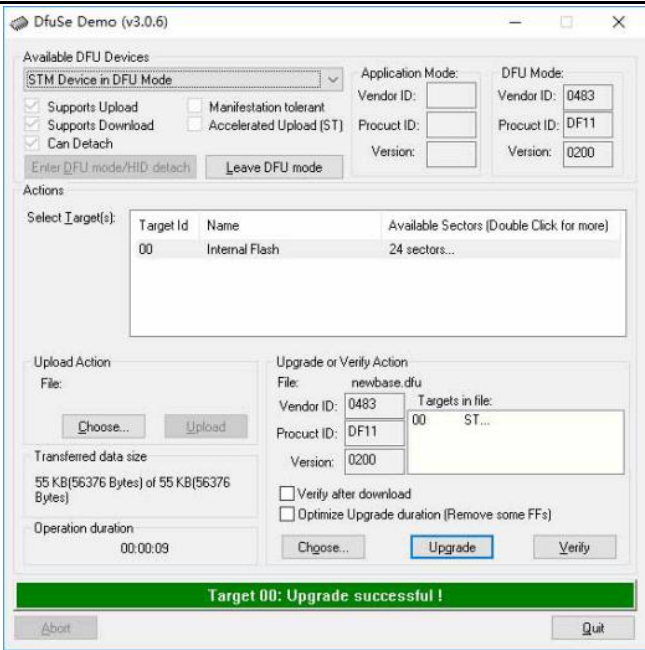
\*Step 1: Confirm successful device connection.

\*Step 2: Choose the chip for upgrading.

\*Step 3: Choose the firmware for upgrading.

\*Step 4: Press the upgrade button to begin upgrading, and wait for the status shown in the picture.

\*Step 5: As shown in the picture below, when “Upgrade successful!” is displayed, restart the base station.



V. Common faults and solutions

| No. | Fault                            | Solutions                                                                                                                           |
|-----|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Base station cannot be turned on | If it is powered by battery, please check the battery level.                                                                        |
|     |                                  | If it is powered by battery, please check battery installation.                                                                     |
|     |                                  | If it is powered by external power source, please check the connection between the charging cable and the battery terminal.         |
| 2   | Base station cannot be charged   | Please check whether the charging cable of external power source is properly connected.                                             |
|     |                                  | Please check whether the anode and cathode of the battery terminal are connected correctly.                                         |
| 3   | No reception of RTK signals      | Please confirm that the base station is installed in the working area within a reasonable range.                                    |
|     |                                  | Please confirm that there are no obstructions or signal interference within the signal coverage area of the base station.           |
| 4   | Interruption of RTK signals      | If it is powered by battery, please check the battery level.                                                                        |
|     |                                  | Please check for signal interference (such as high-voltage cable, water body, heavy truck and power plant) within the working area. |

|   |                                 |                                                                      |
|---|---------------------------------|----------------------------------------------------------------------|
| 5 | Base station cannot be upgraded | Please check whether the base station is powered on.                 |
|   |                                 | Please check whether the Type-C upgrade cable is connected properly. |
|   |                                 | Please confirm whether the base station enters upgrade mode.         |

## Appendix – Specifications

|                                   |                                    |                                |                                                                                                                                   |                                   |
|-----------------------------------|------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Satellite Navigation Base Station | Tracking Features                  |                                | GPS: L1/L2<br>BDS: B1/B2/B1I/B2I<br>QZSS: L1/L2                                                                                   | GLONASS: L1/L2<br>GALILEO: E1/E5b |
|                                   | Positioning Accuracy               | Single Point Positioning (RMS) | Plane: 1.5m                                                                                                                       | Elevation: 3.0m                   |
|                                   |                                    | DGPS (RMS)                     | Plane: 0.4m                                                                                                                       | Elevation: 0.8m                   |
|                                   |                                    | RTK (RMS)                      | Plane: 1cm+1ppm                                                                                                                   | Elevation: 1.5cm+1ppm             |
|                                   | Positioning Update Rate            |                                | 1Hz, 2Hz, 5Hz, 10Hz and 20Hz                                                                                                      |                                   |
|                                   | Cold Boot                          |                                | <30s                                                                                                                              |                                   |
|                                   | Warm Boot                          |                                | <10s                                                                                                                              |                                   |
|                                   | Recapture                          |                                | <1s                                                                                                                               |                                   |
|                                   | Initialization Reliability         |                                | >99.9%                                                                                                                            |                                   |
|                                   | Differential Data Transport Format |                                | RTCM v3.0/3.2                                                                                                                     |                                   |
|                                   | Power Consumption                  |                                | ≤24W                                                                                                                              |                                   |
| Electrical Characteristics        | Battery                            |                                | Double battery compartments, 10400mAh 7.4V (single battery 5200 mAh)<br>Mobile station lasts up to 12 hours, support hot plugging |                                   |
|                                   | Power Supply                       |                                | Input: AC 100–240V 50/60Hz Output: 12V 5A                                                                                         |                                   |
|                                   | Battery Charger                    |                                | 1000mA*1 700mA*2(±50mA) 5V input;<br>1500mA*1 1000mA*2(±100mA) QC9V input;                                                        |                                   |
|                                   |                                    |                                |                                                                                                                                   |                                   |
| Wireless Data Radio               | Frequency Range                    |                                | 902~928MHz                                                                                                                        |                                   |
|                                   | Power                              |                                | 1W                                                                                                                                |                                   |

|                     |                          |           |
|---------------------|--------------------------|-----------|
| Physical            | Dimensions               | Φ 178*110 |
| Properties          | Waterproof and Dustproof | IP65      |
| Working Temperature | -40℃-65℃                 |           |

## Warranty services of repair, replacement and refund

As China' s leading intelligent agricultural machinery manufacturer with a strong sense of responsibility, FJ Dynamics Technology Co., Ltd. (hereinafter “FJ Dynamics” ) provides users of its satellite base station with warranty services of repair, replacement and refund.

I. Warranty period of the satellite navigation base station: The warranty period shall be counted from the date of purchase (invoice issuance) until the expiration date of the warranty services of repair, replacement and refund provided herein.

II. Within the warranty period of the body and parts of the satellite navigation base station, any damaged part shall be repaired and replaced by the dealer free of charge; if the warranty period of the damaged part has expired, the user shall purchase the part with repair made by the dealer.

III. In case of damage to the satellite navigation base station within the warranty period due to improper use, maintenance and adjustment by the user or other non-quality issues, the user shall purchase the part, and the dealer or FJ Dynamics shall provide free repair service.

IV. Details of the warranty period of FJ Dynamics satellite navigation base station:

| No. | Part                | Warranty | No. | Part                   | Warranty |
|-----|---------------------|----------|-----|------------------------|----------|
| 1   | Base station body   | 2 years  | 9   | Antenna extension cord | 2 year   |
| 2   | Base station tripod | 1 year   | 10  | Antenna adapter        | 1 year   |
| 3   | Fixed rod           | 1 year   | 11  | Type-C cable           | 1 year   |
| 4   | Radio antenna       | 2 year   | 12  | Charging plug          | 1 year   |
| 5   | External power cord | 2 year   | 13  | AC power cord          | 1 year   |
| 6   | Battery charger     | 1 year   | 14  | Rechargeable battery   | N/A      |

|   |                |        |    |                              |        |
|---|----------------|--------|----|------------------------------|--------|
| 7 | Power adapter  | 1 year | 15 | Antenna tripod<br>(optional) | 1 year |
| 8 | Circular plate | 1 year | 16 | Telescopic rod<br>(optional) | 1 year |

V. FJ Dynamics reserves all rights for the explanation of this warranty.

#### **FCC statements:**

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes 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 A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

#### **Federal Communication Commission (FCC) Radiation Exposure Statement**

When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

FCC ID:2A2LL-FJ-RTKP9000A