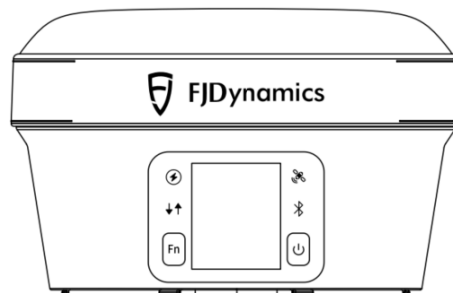




# FJD Trion GNSS Receiver User Manual



■ September 18, 2023 | No.SM0001 Rev. 1.1en-US  
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## Disclaimer

- The purchased products, services, and features are stipulated by the contract. All or part of the products, services, and features described in this manual may not be within the scope of your purchase or usage. Unless otherwise specified in the contract, all the content in this manual is provided "AS IS" without warranties of any kind, express or implied.
- The content of this manual is subject to change due to product upgrades and other reasons. FJDynamics reserves the right to modify the content of this manual without notice.
- This manual only provides guidance for use of this product. Every effort has been made in the preparation of this manual to ensure accuracy of the content, but no information in this manual constitutes a warranty of any kind, express or implied.

## Safety Instructions

Before using this product, make sure that you have read and understood the safety instructions and all the operation instructions and notes in the *FJD Trion GNSS Receiver User Manual*. Follow the safety instructions and all applicable local regulations.

### Operation Environment:

1. Keep away from people, animals, electrical wires, tall buildings, airports, signal towers, and other obstacles, to avoid interference to GNSS signals and ensure the positioning accuracy.
2. Avoid working in extreme weather such as heavy rain, strong wind, thick fog, snow, and lightning.

### Others:

1. Do not disassemble the product without authorization, which may invalidate the

warranty.

2. Damage caused by force majeure events, such as lightning strikes, high voltage, and collision, is not covered by the warranty.

3. Use the device in strict accordance with the manual. When connecting cables such as data cables, hold the end of the plug and gently plug or unplug it. Do not pull the plug by force or twist the plug, which may break the pins.

4. Use the regulated power supplies accepted by FJDynamics, and strictly follow the rated voltages, to prevent damaging the radio, the field controller, and the receiver.

5. During charging, keep away from fire sources such as flammables and explosives, to avoid fire and other serious consequences.

6. During operation, do not power the receiver via the Type-C interface and the aviation connector at the same time.

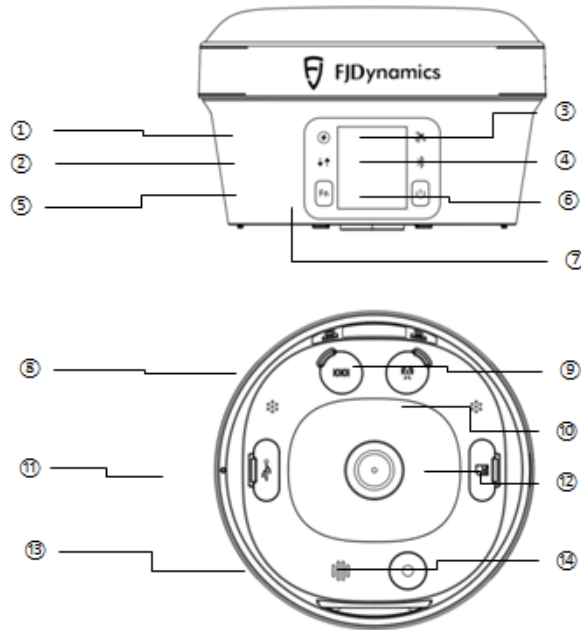
7. Do not plug or unplug cables when the receiver is powered on, and replace the damaged cables in time to avoid personal injury.

# 1 About This Document

## 1.1 Introduction

The V10i GNSS Receiver developed by FJDynamics has a built-in high-precision IMU (Inertial Measurement Unit) module. With the integration of GNSS and IMU, it supports surveying at any angle, and ensures a positioning accuracy of 3 cm within a tilt angle of 60°.

## 1.2 GNSSReceiver



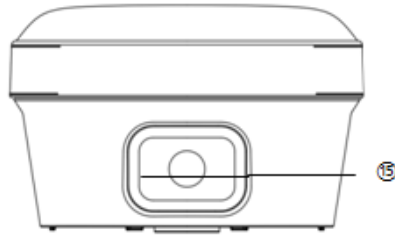


Figure 1.2 Interfaces and indicators

No.	Name	Description
1	Power (red, blue, and green)	Green: battery level of 60%-100%; Blue: battery level of 30%-60%; Red: low battery(<30%); Charging: flashes red during charging, and turns solid green after charging is complete.
2	Data (blue and green)	Off: The base station does not transmit differential data, or does not start static collection. Solid green: The data link is established after settings. Flashes green: The differential data is transmitted, and the indicator flashes at the transmission frequency. Flashes blue: In the static mode, the indicator flashes at the collection interval when the interval is $\geq 1s$ , and flashes at 1s when the interval is $< 1s$ .
3	Satellite (red and green)	Off: no satellite tracking; Solid green: fixed solution; Flashes green: positioning but not in the fixed solution status; Flashes red: satellite tracking but not positioning; Flashes green and red alternatively: GNSS board exception.
4	Bluetooth (blue)	Off: no Bluetooth connection. Solid on: Bluetooth connection established.
5	Function button	For choose icon
6	Power button	Press and hold for 1 to 3 seconds until the indicator turns solid green, and release the button to turn on the receiver. Press and hold for 3 seconds to turn off the receiver. Press and hold for over 8 seconds to enter the upgrade mode. In this case,

		the four indicators flash green, blue, green, and blue respectively from left to right.
7	OLED screen	For display the key information of device
8	Aviation connector interface	For data transmission, and connection to an external power supply or an external radio(Reserved port,function not open).
9	Radio antenna interface	For connection to the radio antenna.
10	Microphone	For voice input
11	Type-C interface	For data transmission and charging.
12	SIM Card interface	For SIM card insert
13	Speaker	For play sound
14	AR Camera	For AR function
15	Visual measure Camera	For visual measure function



### Note

- Use the charger provided.
- Do not plug or unplug the charger repeatedly during charging.
- Charge the receiver at an ambient temperature between 0°C and 35°C.
- Charge the receiver at a well-ventilated place, away from direct sunlight.
- Do not disassemble the receiver without authorization. In case of a fault, contact the maintenance staff or your dealer.
- Repair or replace the pole immediately if it is damaged.



#### CAUTION

##### Burn Hazard

Coverings on the receiver or the external radio may affect heat dissipation.

- ☞ Reduce or remove such coverings.
- ☞ Maintain good ventilation.



#### WARNING

##### Sharp Tips

Sharp tips of the pole may cause personal injury.

- ☞ Use the pole with caution.

**▲ DANGER**

**Lightning Strikes**

Use of the antenna and the pole during thunderstorms.

☞ Do not use the antenna and the pole during thunderstorms.

## 2 Operation Instructions

This manual describes the main workflow for the first time use of the product.

### 2.1 Setup

#### 2.1.1 Setting up the External Radio

Set up the tripod over a known point or an unknown point, and install the base station receiver on the extension pole of the tripod, or on the base of the tripod.

**!** **Note:** When setting up a base station over a known point, use a base purchased separately for centering and levelling.

The external radio of the base station is set up as below.

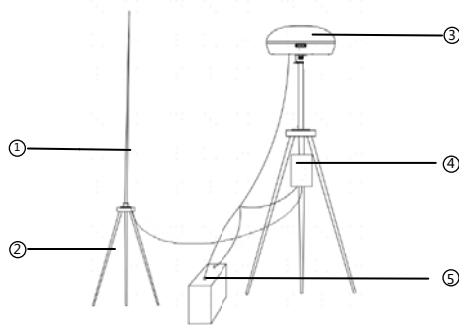


Figure 2.1.1-1 External radio of base station

No.	Name	Purpose
1	Radio antenna	External radio antenna.
2	Tripod	Mount the radio antenna on it.
3	Receiver	Receive satellite signals.
4	Radio	External radio.
5	Battery	Power the receiver and the external radio. You are recommended to

		purchase it separately due to transportation restrictions.
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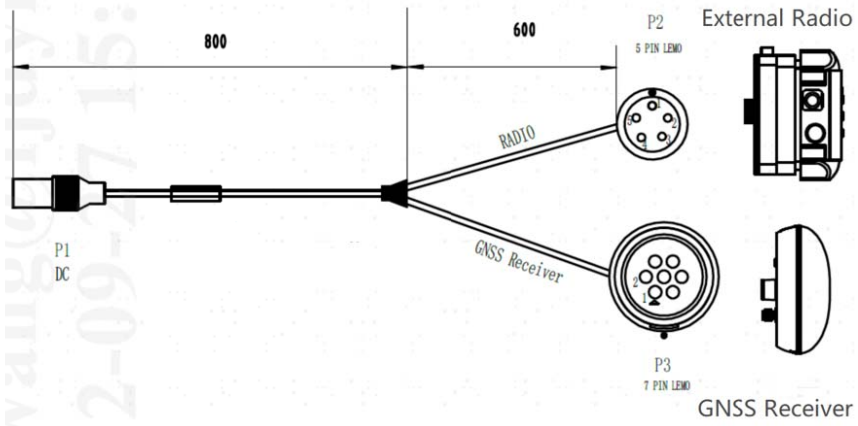


Figure 2.1.1-2 Connection of external radio of base station and receiver

## 2.1.2 Setting up the Inner Radio

Mount the receiver on the tripod and fix the tripod on the ground.

- |   |  |
|---|--|
| ■ | Note: The inner radio covers a range of 5–10 km and has strict requirements for the operation environment. |
|---|--|





Figure 2.1.2 Inner radio

### 2.1.3 Setting up the Rover

Fix the field controller bracket on the telescopic pole, install the field controller on the bracket, and mount the receiver on the pole.

■	Note: Connection to the radio antenna is required in the radio mode, but not in the network mode.
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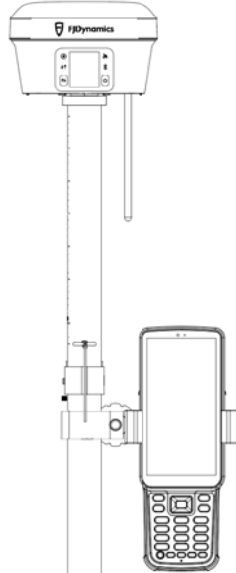


Figure 2.1.3 Rover

### 3 Specifications

FJD Trion RTK Rover V10i		
GNSS Signal	GPS:	L1, L1C/A, L2C, L2P, L5
	BDS-2:	B1I, B2I, B3I
	BDS-3:	B1I, B3I, B1C, B2a, B2b
	GLONASS:	G1, G2, G3*
	Galileo:	E1, E5a, E5b, E6C*, AltBOC*
	QZSS:	L1, L2C, L5, L1C*, L1-SALF
	SBAS:	L1C/A, L5*
	IRNSS:	L5*
	L-band*	
	Items marked with * will be available upon the firmware update.	
Positioning Performance	Time to first fix	< 45s (cold start)
		< 15s (hot start)
	Signal reacquisition	< 1s
	Pseudo-range accuracy	≤ 10 cm
	Carrier phase accuracy	≤ 1mm
	RTK initialization time	< 5s (baseline length < 10 km)
	Initialization reliability	> 99.9%
	Channels	965
	Single-point positioning (RMS)	Horizontal: 1.5 m
		Vertical: 3 m
	Static accuracy	Horizontal: 2.5mm+1ppm, RMS
		Vertical: 5mm+1ppm, RMS
RTK accuracy	Horizontal: ±(8mm+1ppm), RMS	
	Vertical: ±(15mm+1ppm), RMS	

	AR	±2.5cm
	Visual measure	±3cm ( 2~15m )
	Timing accuracy	20 ns
	Update rate	Raw observation data: 1, 2, 5, 10 , 20 Hz
		Real-time positioning data: 1, 2, 5, 10, 20 Hz
	Tilt measurement accuracy	30°/2.5cm (horizontal), max. angle 60°
Data format	RTCM3.X(input & output), NMEA-0183 (input & output), CMR (input), RTCM2.X (input)	
Wi-Fi	Protocol	2.4&5 GHz, 802.11a/b/g/n/ac
Bluetooth	Protocol	2.1 EDR/3.0 HS/4.2 LE/5.0 LE
4G	Protocol	TDD-LTE、FDD-LTE、WCDMA、GSM、EDGE
Internal Radio	Power consumption	1 W
	Modulation type	FSK
	Protocol	TRIMATLK, TRIMMARK III, TT450S, TRANSEOT, Satel 3AS 4FSK
	Frequency	902-928MHz
I/O Ports	7-pin LEMO	For 9 V to 32 V DC power input and connection to the external radio
	Type-C	For 12 V DC fast charge
	UHF antenna port	For connection to the UHF antenna
Battery	Battery capacity	7000 mAh
	Battery life	Base: 10 h Rover: 15 h
Power Supply	Voltage	USB PD fast charging 30W Aviation connector: 9-32 V DC
Indicator	Type	Power, data, satellite, and Bluetooth
Physical Property	Size	∅130*83 mm

	Weight	970 g
	IP rating	IP67
	Memory	16 GB
Ambient Environment	Operating temperature	-30°C to +60°C
	Storage temperature	-40°C to +70°C
	Humidity	100%, condensing

Field Controller E600		
System	OS	Android 11
	CPU	Octa-core 2.0 GHz processor
	ROM expandable	Up to 256 GB
	SIM card	Dual card single pass
	RAM	3 GB
	ROM	32 GB
GNSS Performance	Signals received	GPS/BDS/GLONASS
	Update rate	1 Hz–10 Hz
Data Communication	Bluetooth	BT5.0 BLE
	Wi-Fi	IEEE 802.11 a/b/g/n/ac 2.4G/5G dual-frequency
	Network	4G
Screen and Keyboard	Screen size	5.5-inch sunlight readable touchscreen
	Resolution	720 × 1440
	Keyboard	30-key keyboard + 2 volume buttons + 1 power button
Battery	Battery capacity	7,000 mAh
	Charging voltage	7.27 V

	Battery life	≥ 10 h
	Max. charging current	1.1 A
Physical Property	Size	221*77.7*16mm
	Weight	340g
	IP rating	IP67

**FCC Compliance Notice**

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.

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

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.

**FCC Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.