



User Manual

TS21 GNSS Receiver

↗ TS21 for AR Staking



Version 1.0

!	Note: Please check each item according to the item list first to confirm that all the accessories are correct for the purchased kit.
	Install the radio antenna before switching the radio transceiver to transmit mode, or the radio transceiver may be damaged due to overheating. The energy to be transmitted cannot be emitted out without the antenna, which may cause the temperature rise and overheat of the radio module.

This Quick Start Guide introduces how to start using TS21 GNSS Receiver quickly, the detailed introduction and operations of TS21 refer to *User Manual for TS21 GNSS Receiver*.



Figure 0.1 TS21 GNSS Receiver

The three steps of TS21 AR staking are outlined below:

1. Rover Setup; 2. Configuration via Nuwa; 3. AR Staking

1.Rover Setup

According to the customer requirements, set up the system as per the following pictures.



Figure 1.1 TS21 as a Rover – Network Mode

Table 1.1 Devices in Figure 1.1

NO.	Device Name
1	TS21 GNSS Receiver
2	Ranging pole
3	Bracket for TC80
4	TC80 Controller



Figure 1.2 TS21 as a Rover – Internal Radio

Table 1.2 Devices in Figure 1.2

NO.	Device Name
1	TS21 GNSS Receiver
2	410-470MHz radio whip antenna
3	Ranging pole
4	Bracket for TC80
5	TC80 Controller

2. Configure via Nuwa

2.1 Connect TS21 in Nuwa App

Long press the power button to power on TS21.



Figure 2.1 Power On TS21

Start Nuwa App, click [Device]-->[Connect], select device TS21 and target WiFi, then click [Connect] to complete the device connection.

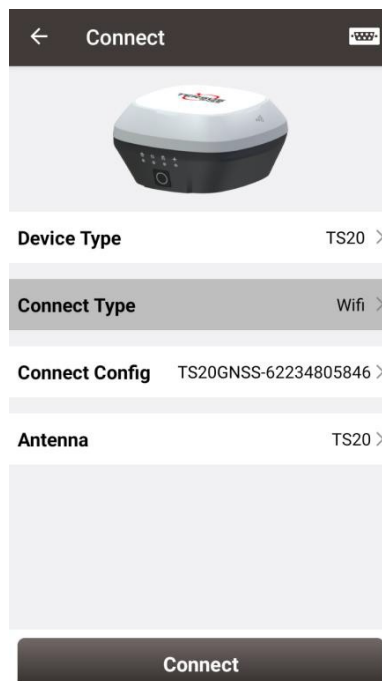
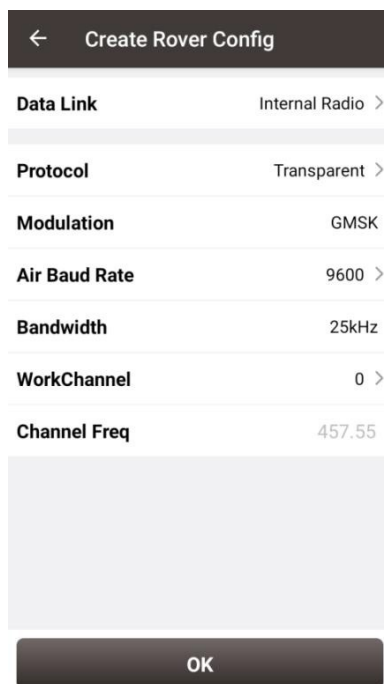


Figure 2.2 Connect TS21

2.2 Configure TS21 as a Rover

Go to the Device interface, click [Rover] to create a new Rover mode or edit an existing rover mode as shown below.



Create Rover Config	
Data Link	Internal Radio >
Protocol	Transparent >
Modulation	GMSK
Air Baud Rate	9600 >
Bandwidth	25kHz
WorkChannel	0 >
Channel Freq	457.55
OK	

Figure 2.3 Rover Config

Choose [Internal Radio], [Receiver Network] or [PDA Network] for Data Link to receive the correction data. Fill in the detailed configuration and activate rover mode to get the fixed solution.

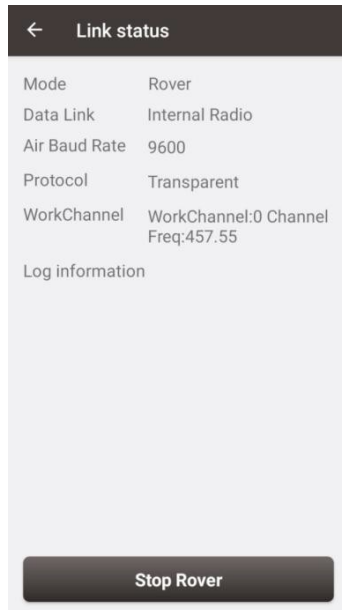


Figure 2.4 Internal Radio

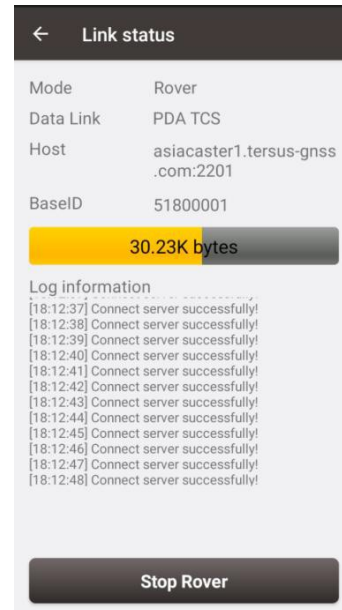


Figure 2.5 PDA Network

NOTE:

- 1) Requires radio whip antenna required in Internal Radio mode
- 2) Requires SIM card in TS21 in Receiver Network mode
- 3) Requires SIM card in controller in PDA Network mode

3.AR Staking

3.1 Open Project

Go to the Project interface, click [Project] to create new project or open a project. Make sure the coordinate system is correct.

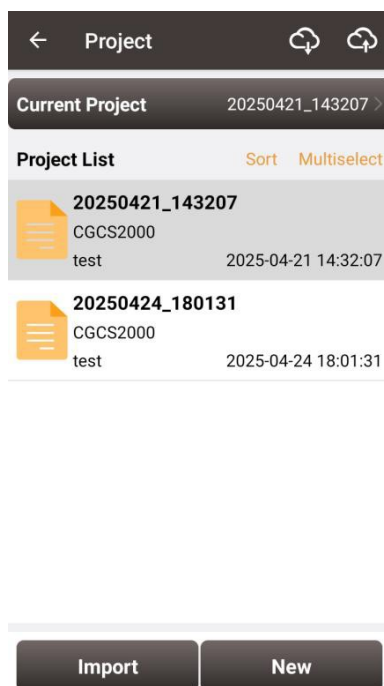
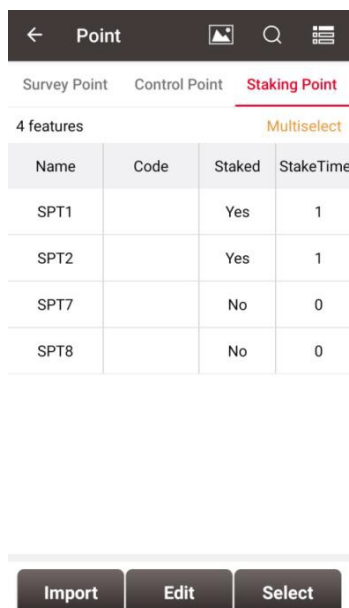


Figure 3.1 Open Project

3.2 Import Targets

Go to the Survey interface, click [Point Stakeout] to enter point stakeout interface. Click  to show the Staking Point list and click [Import] to import targets from file, from other point lists or directly manually add.



Name	Code	Staked	StakeTime
SPT1		Yes	1
SPT2		Yes	1
SPT7		No	0
SPT8		No	0

Figure 3.2 Staking Point List

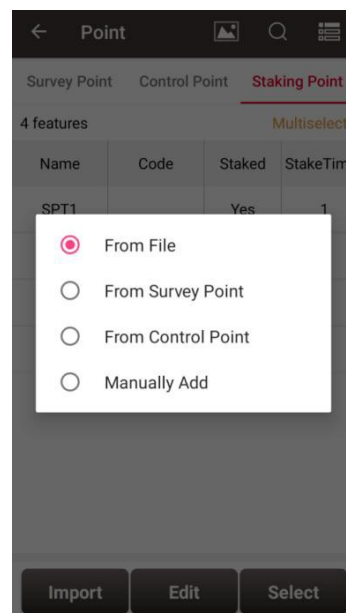


Figure 3.3 Import Targets

3.3 AR Staking

Select one of the point as the target, back to the Point Stakeout interface. Click **AR** to enter AR staking interface as shown below.



Figure 3.4 AR Staking

4. Get More

This Quick Start Guide briefly introduces the setup and operation for TS21 GNSS Receiver and the operation of Nuwa app. More details please refer to *User Manual of TS21* and *User Manual of Nuwa app* which can be downloaded from Tersus official website: <https://www.tersus-gnss.com/document>.

5. Exemption of Liability

Before using this product, please be sure to read the product manual carefully, which helps you to better use the product. Tersus is not liable for damages caused by failure to follow the instructions in the manual.

Tersus is committed to continually improving product features and performance, and the contents of subsequent product manuals are subject to change without notice. If the pictures and icons in the manual are different with actual product, please refer to the actual product.

6. Technical Support

Thank you for using Tersus products.

If you have any technical questions for the products, please contact us at support@tersus-gnss.com or log a ticket in our tracking system: <https://tersus.supportsystem.com/> and we will serve you promptly.

FCC Statement

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

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.

FCC Radiation Exposure Statement:

This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

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.

RF exposure environment warning:

This equipment complies with FCC radiation exposure limits set forth for an Occupational/Controlled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

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