GEOMATE

GEOMATE SG6L GNSS

USER GUIDE

Survey & Engineering | March 2026

High-Tech Precision. High-Touch Service

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Preface

Copyright

Copyright

Trademarks

Safety Warnings

The Global Navigation Satellite System (GNSS) comprises several distinct satellite constellations, each of which is under the jurisdiction of a specific government entity. These entities bear the sole responsibility for ensuring the accuracy of their respective systems and for maintaining the integrity of their satellite networks.

Do not rely solely on the device for critical navigation decisions. The GNSS signals may be affected by atmospheric conditions, satellite availability signal blockage, etc.

Be aware of the limitations of GNSS accuracy. It provides positioning information with a certain level of accuracy, but errors (including manual error)and deviations can occur.

Avoid prolonged exposure to strong magnetic fields, as they may interfere with the operation of the device and affect its accuracy.

Do not dismantle or modify the device. Any unauthorized modification may result in malfunction or damage and void the warranty.

Caution -Class 3R laser radiation when open avoid direct eye exposure Follow all instructions provided in the user manual for proper handling charging,and maintenance.

Caution-Use of controls or adjustments or performance of procedures other

than those specified herein may result in hazardous radiation exposure.

FCC Statement

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.

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.

The device has been evaluated to meet general RF exposure requirement.This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

CE Interference Statement

Declaration of Conformity: Hereby, GEOMATE POSITIONING PTE. LTD. declares that this SG6L is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. A copy of the Declaration

of conformity can be found at GEOMATE POSITIONING PTE. LTD.

Brazil

Este equipamento nÃao tem direito à protecao contra interferência prejudicial e nao pode causar interferência em sistemas devidamente autorizados. Para maiores informacöes, consulte o site da ANATEL-www.anatel.gov.br.

Conformity to Japanese regulations

Japanese Radio Law and Japanese Telecommunications Business Law Compliance.

- This device is granted pursuant to the Japanese Radio Law and the Japanese Telecommunications Business Law.
- This device should not be modified (otherwise the granted designation number will become invalid).

1 Introduction

The GEOMATE SG6L GNSS Receiver User Guide describes how to set up and use the GEOMATE SG6L GNSS receiver. In this manual, "the receiver" refers to the SG6L GNSS receiver unless otherwise stated. Even if you have used other Global Navigation Satellite Systems (GNSS) products before, GEOMATE recommends that you spend some time reading this manual to learn about the special features of this product.

1.1 Safety Information

An absence of specific alerts does not mean that there are no safety risks involved.

A Warning or Caution information is intended to minimize the risk of personal injury and/or damage to the equipment.

WARNING - A Warning alerts you to a potential misused or wrong setting of the equipment.

CAUTION - A Caution alerts you to a possible risk of serious injury to your person and/or damage to the equipment.

1.2 Regulations and Safety

The receivers contain a built-in wireless modem for signal communication through Bluetooth wireless technology or through external communication datalink. Regulations regarding the use of the wireless modem vary greatly from country to country. In some countries, the unit can be used without obtaining an end-user license. However, in some countries, the administrative permissions are required. For license information, consult your local dealer. Bluetooth operates in license-free bands.

Before operating a SG6L GNSS receiver, determine if authorization or a license to operate the unit is required in your country. It is the responsibility of the end-user to obtain an operator's permit or license for the receiver for the location or country of use.

Use and Care

This receiver is designed to withstand the rough environment that typically occurs in the field. However, the receiver is high-precision electronic equipment and should be treated with reasonable care.

CAUTION - Operating or storing the receiver outside the specified

temperature range will cause irreversible damage.

1.3 Technical Support

If you have a problem and cannot find the information you need in this manual or GEOMATE website (www.geomate.sg), contact your local GEOMATE dealer from which you purchased the receiver(s).

If you need support, please contact us by email (support@geomate.sg)

1.4 Disclaimer

Before using the receiver, please make sure that you have read and understood this User Guide, as well as the safety information. GEOMATE holds no responsibility for the wrong operation by users and for the losses incurred by the wrong understanding about this User Guide. However, GEOMATE reserves the rights to update and optimize the contents in this guide regularly. Please contact your local GEOMATE dealer for new information.

1.5 Your Comments

Your feedback about this user guide will help us to improve it in future revision. Please email your comments to support@geomate.sg

2 Getting Started with SG6L

2.1 About the Receiver

The new GEOMATE SG6L GNSS receiver is an ultra-compact, centimeter-grade surveying instrument engineered for harsh environments. By integrating GNSS, IMU, dual cameras and an industrial-grade green laser, it boosts stakeout productivity by 40% through CAD- and AR-driven visual guidance.

Its daylight-visible green laser captures fast, precise 3-D points in obstructed or hard-to-reach areas—even under 50,000 lux midday sunlight. AUTO-IMU eliminates manual centering, delivering instant tilt-compensated measurements and, together with a high-speed SOC and next-generation IMU, accelerating laser workflows by 50%.

An 8 MP "telescopic" camera with real-time image processing offers autofocus and zoom with ultra-low latency, keeping distant targets razor-sharp so operators can lock on and record points without a second thought.

The receiver can be used as the part of an RTK GNSS system with GEOMATE MateSurvey software. And you can download the GNSS data that recorded in the internal memory of receiver to a computer.

To configure the receiver for performing a wide variety of functions, you can use the web interface by connecting the receiver with PC or smartphone through Wi-Fi.

2.2 Parts of the Receiver

Power Button is located on the front panel. Type-C port ,SMA port and connectors are located on the bottom of the unit.

2.2.1 Front Panel

The following figure shows a front view of the receiver.

The front panel contains four indicator LEDs and two buttons.

Front

Satellite

Correction

Static

Power

Fn

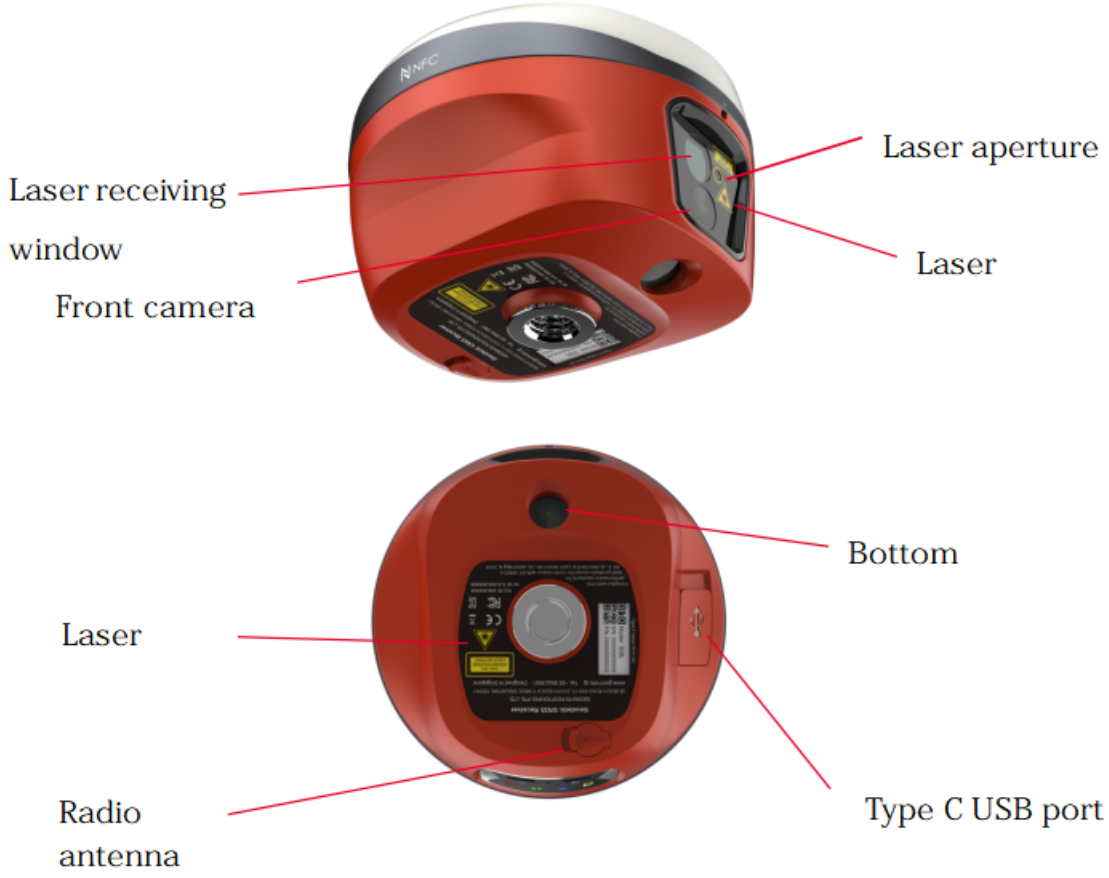
Power

Name	Description
Correction LED (Yellow/Green)	• Indicates whether the receiver is transmitting/ receiving differential data. • As a Base station: successfully transmitting differential data, flash yellow light. • As a Rover station: successfully receiving differential data from Base station will flash yellow light when it is float, flash green light when it is fixed.
Satellite LED (Blue)	• Shows the number of satellites that the receiver has tracked. • When the receiver is searching satellites, the blue LED flashes once every 5 seconds. • When the receiver has tracked N satellites, the blue LED will flash N times every 5 seconds.
Power LED(Red)	•If the internal battery is ≥20 %, the indicator stays solid green. •If the internal battery is <20 % but >10 %, the indicator stays solid red. •If the internal battery is ≤10 % but >0 %, the indicator flashes red at 1 Hz (one flash per second).
Static LED (Yellow)	• Flash means static is on.
Power button (White)	• Press and hold this button for 3 seconds to turn on or turn off the receiver.
Fn button (White)	• Press and hold this button for 3 seconds to turn on or turn off the static mode.

2.2.2 Camera

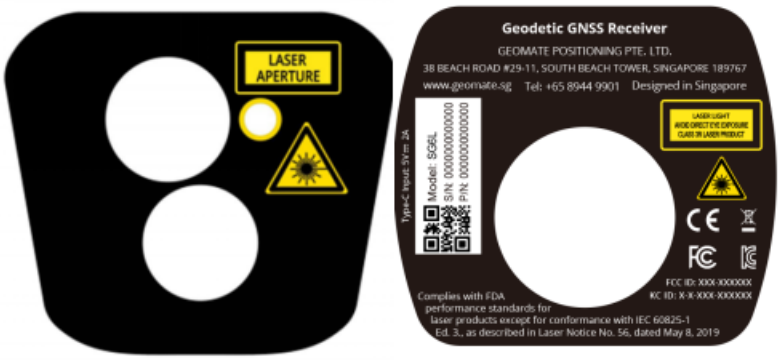
The lower housing contains one TNC radio antenna connector (SMA port), one USB type C communication port and one bottom camera.

The side contains a camera, a Laser receiving window and a laser aperture.

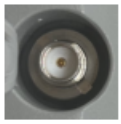


2.2.3 Laser label instructions

The product contains two laser labels, one located at the bottom of the instrument and the other on the laser emitter



2.2.4 Receiver Ports

Port	Name	Description
	USB Type-C port	This port is a USB Type-C connector that supports USB communications. Users can use USB Type-C Cable supplied with the system to download the logged data to a computer.
	SMA port	Connect a radio antenna to internal radio of the receiver. And this connector is not used if you are using an external radio.

2.3 Batteries and Power

2.3.1 Batteries

The receiver has a built-in non-removable Lithium-ion battery.

2.3.2 Charging the Battery

The rechargeable Lithium-ion battery is supplied partially charged. Charge the battery completely before using it for the first time. Charge via USB Type-C port.

⚠ WARNING – Charge and use the rechargeable Lithium-ion battery only in strict accordance with the instructions. Charging or using the battery in unauthorized equipment can cause an explosion or fire and can result in personal injury and/or equipment damage.

To prevent injury or damage:

- Do not charge or use the battery if it appears to be damaged or leaking.
- Charge the Lithium-ion battery only in a GEOMATE product that is specified to charge it. Be sure to follow all instructions that are provided with the battery charger.
- Discontinue charging a battery that gives off extreme heat or a burning odor.
- Use the battery only in GEOMATE equipment that is specified to use it.

• Use the battery only for its intended use and according to the instructions in the product documentation.

2.3.3 Battery Safe

⚠ WARNING – Do not damage the rechargeable Lithium-ion battery. A damaged battery can cause an explosion or fire and can result in personal injury and/or property damage.

To prevent injury or damage:

• Do not use or charge the battery if it appears to be damaged. Signs of damage include, but are not limited to discoloration, warping, and leaking battery fluid.

• Do not expose the battery to fire, high temperature, or direct sunlight.

• Do not immerse the battery in water.

• Do not use or store the battery inside a vehicle under hot weather condition.

• Do not drop or puncture the battery.

• Do not open the battery or short-circuit its contacts.

⚠ WARNING – Avoid contact with the rechargeable Lithium-ion battery if it appears to be leaking. Battery fluid is corrosive and contact with it can result in personal injury and/or property damage.

To prevent injury or damage:

• If the battery leaks, avoid with the battery fluid.

• If battery fluid gets into your eyes, immediately rinses your eyes with clean water and seek medical attention. Please do not rub your eyes!

• If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.

2.3.4 External Power Supply

Provide the external power to the receiver by the USB Type-C Cable + Power Adapter. The Power Adapter is connecting with AC power of 100-240V, the output port of the Power Adapter connects with the USB Type-C Cable.

2.4 Product Basic Supply Accessories

2.4.1 Base Kit Basic Supply

Item	Picture
SG6L GNSS Receiver	
SMA Whip Antenna(410-470 MHz)	
Power Adapter	
USB Type-C	
H.I. Tape	
Extension pole(30 cm)	
Tribrach with optical plummet	
Auxiliary H.I. Tool	
Transport Hard Case	
Tribrach Adaptor	

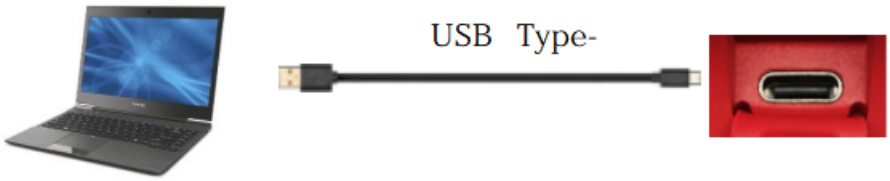
2.4.2 Rover Kit Basic Supply

Item	Picture
SG6L GNSS Receiver	
SMA Whip Antenna(410-470 MHz)	
Power Adapter	
USB Type-C	
Range Pole (AR)	
Auxiliary H.I. Tool	
Transport Hard Case	

2.5 Connecting to an Office Computer

The receiver can be connected to an office computer for serial data transfer or settings via a USB Type-C. Before you connect to the office computer, ensure that the receiver is powered on by internal battery or external power.

The following figure shows how to connect to the computer for serial data transfer or settings:

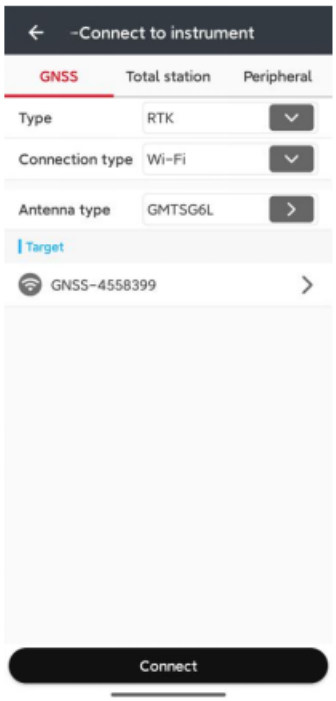


2.6 Connecting to a Controller

2.6.1 Connecting via Wi-Fi with MateSurvey Software

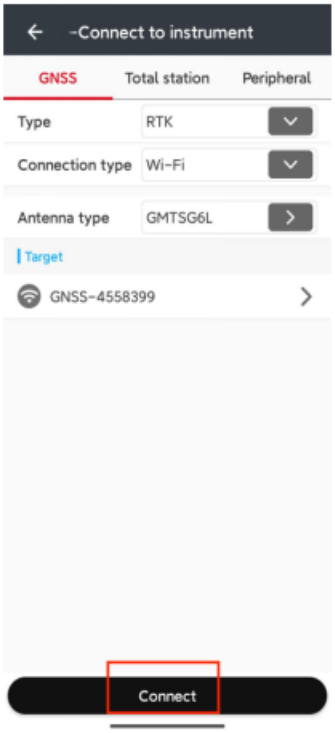
Turn on the controller → run **MateSurvey** → tap **Connect**.

In the Connect screen, select **GEOMATE** for the Manufacture field, **SG6L** for Device Type field, WIFI for **Connection** Type field.

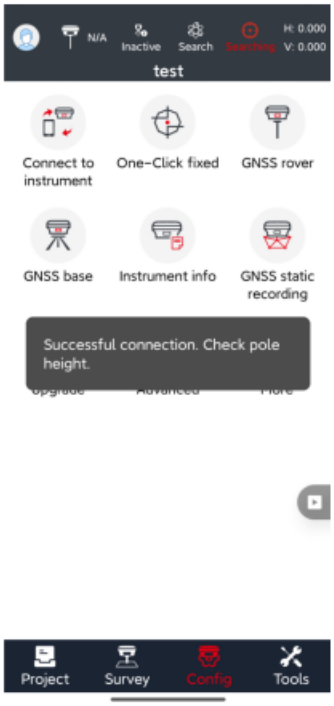


Tap the Wireless Lan icon on the right side to select the hot spot → Switch on the WiFi module by the top switch → select the target device in the list.

Tap **Connect** to link to the hot spot.



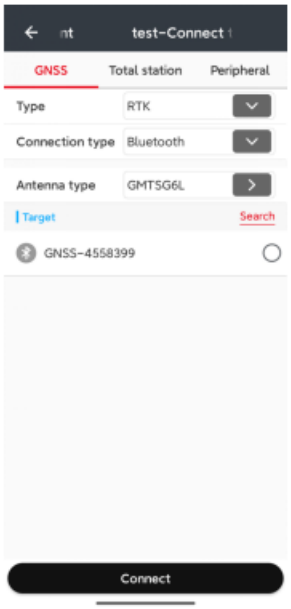
Tap the Connect button to build the connection.



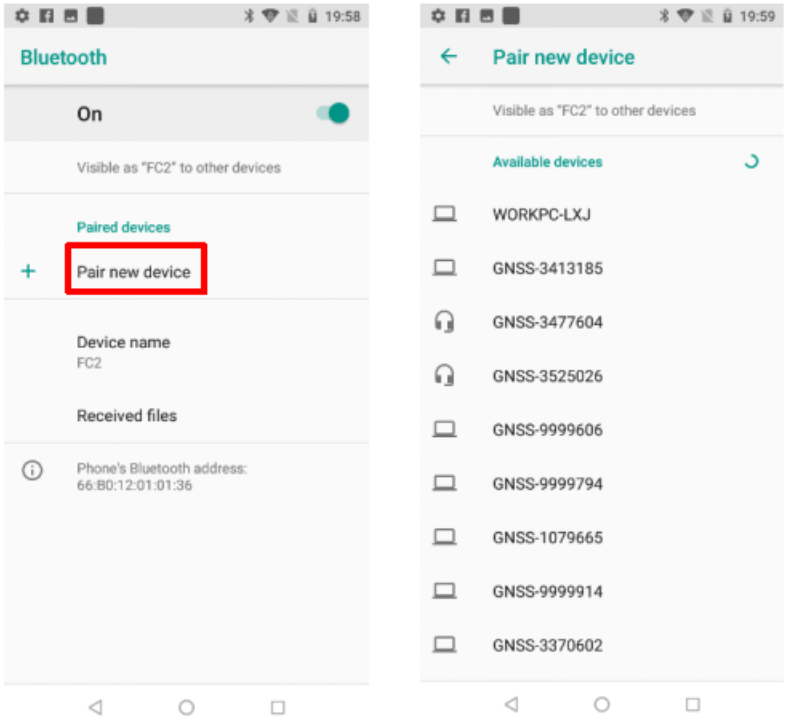
2.6.2 Connecting via Bluetooth with MateSurvey Software

Turn on the controller → run MateSurvey → tap **Connect**.

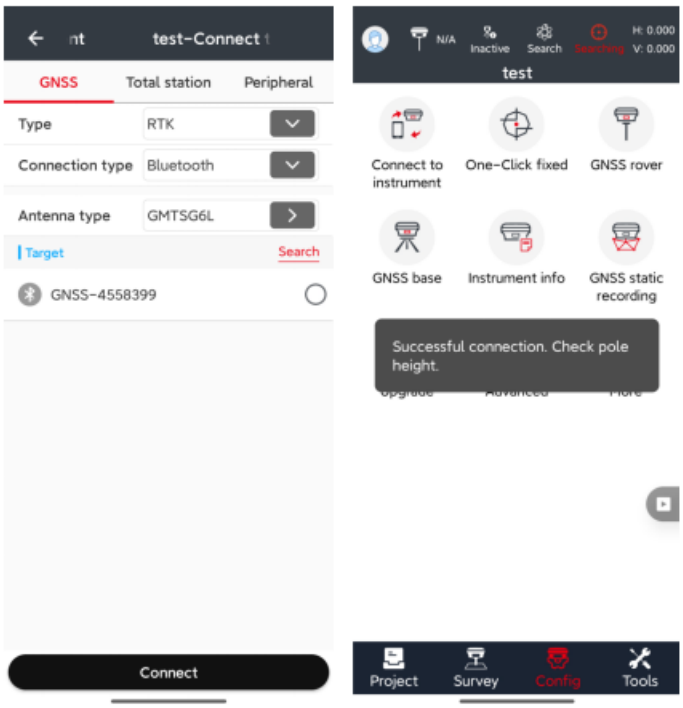
In the Connect screen, select GEOMATE for the Manufacture field, **SG6L** for Device Type field, **Bluetooth** for Connection Type field.



Tap the **Bluetooth Manager** and turn on the **Bluetooth** function to search Bluetooth device around → select the target device in the list → Tap back button → select the target device in the Bluetooth manager list.



Tap the **Connect** button to build the connection.



2.7 Downloading Logged Data

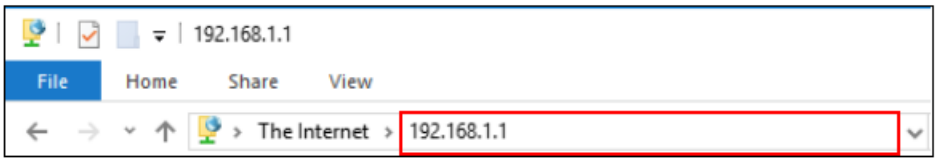
Data logging involves the collection of GNSS measurement data over a period at a static point or points, and subsequent post-processing of the information to accurately compute baseline information. Data logging using receivers requires access to suitable GNSS post-processing software such as the GEOMATE MateOffice Software.

2.7.1 FTP Download

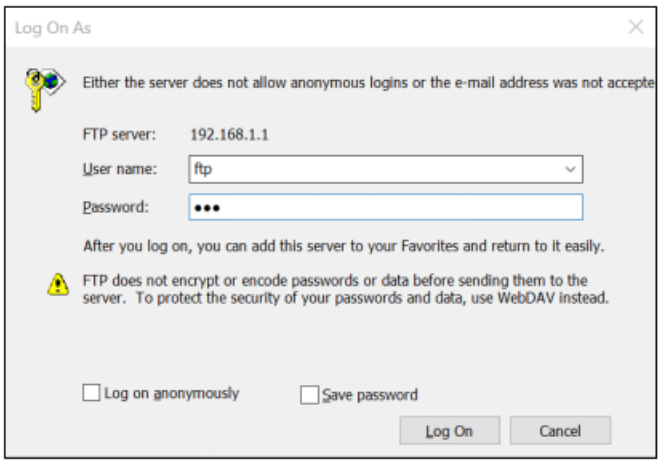
The procedures of downloading logged data through FTP are as follows:

(1)Switch on the receiver, search its Wi-Fi in the computer and connect.

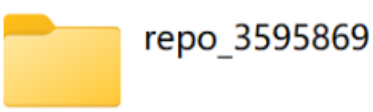
(2)After the successful connection, open the file manager in the computer and input “ftp://192.168.1.1” in the address box.



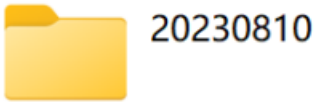
(3)Input user name and password, the default user name and password are “ftp”.



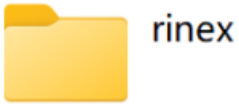
(4)Double click the folder “repo_receiver SN” (take 3225804 as example), you will see 2 folders. The “push_log” folder is used to save the log files, and the "record_1" folders are used for store static data.



(5)Double click the folder that you have configured to store the static data, you will see the folder(s) created by the SG6L system automatically and named by the date which is decide by GPS time when you start to log data.



(6)Select the destination folder and double click it, and then the folder named as data format will be displayed.



(7)Select the data format that you configured to save the static data, you will find the static raw data.

Notes: For rinex files, the name of the file is represented as XX XXXXDD D NN, where XXXXX X is the SN of the receiver, D DD is day of year, and NN is the recording session.

⚠ WARNING – The static data will be saved in the first logging session, the "record_1" folder, by default. Old files will be deleted if the storage space is full. If you configure not to auto delete old files when the memory is low, the receiver will stop data logging.

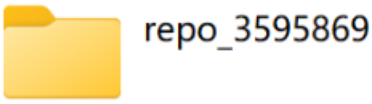
2.7.2 USB Download

The procedures of downloading logged data in the receiver are as follows:

(1)Switch on the receiver and connect it with a computer by Type-C. After the successful connection, a removable disk named as the Serial Number (SN) of the receiver will appear on the computer.

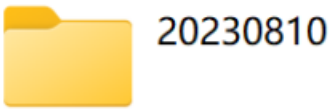
(2)Double click the removable disk and you will see the folder named as

"repo".

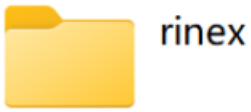


(3)Double click this folder, you will see 2 folders. The "push_log" folder is used to save the log files, and the other 2 folders represent different logging session and are used for store static data.

(4)Double click the folder that you have configured to store the static data, you will see the folder(s) created by the SG6L system automatically and named by the date which is decided by GPS time when you start to log data.



(5)Select the destination folder and double click it, and then two folders named as different data format (rinex) will be displayed.



(6)Select the data format that you have configured to save the static data, you will find the static raw data.

Tip – For rinex files, the name of the file is represented as XXX XXXD DD NN, where XXX XXX is the SN of the receiver, DDD is day of year, and NN is the recording session.

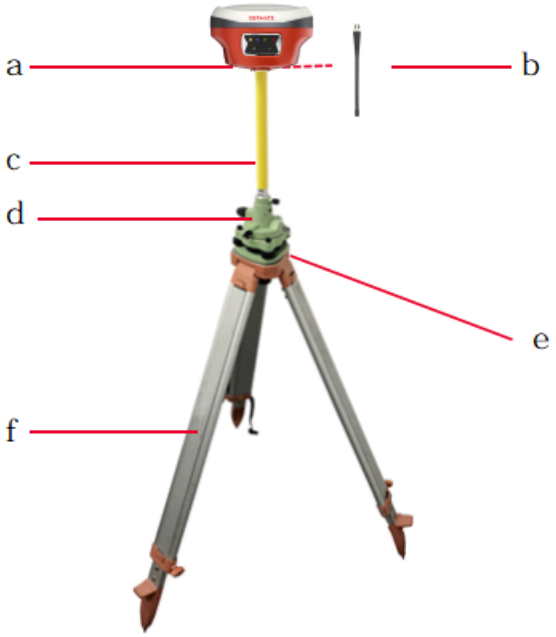
WARNING – The static data will be saved in the first logging session, the "record_1" folder, by default. Old files will be deleted if the storage space is full. If you configure not to auto delete old files when the memory is low, the receiver will stop data logging.

3 Equipment Setup and Operation

3.1 Base Station Setup

Note:

For good rover operation, the following base station setup guidelines are recommended:



Components:

No.	Name
a	SG6L GNSS receiver
b	SMA Whip Antenna
c	Extension pole (30 cm)
d	Tribrach adaptor
e	Tribrach w/ Opti
f	Aluminum tripod

Steps:

(1)Put tripod in the target position, center and level it roughly.

(2)Place and lock the tribrach in the tripod.

If work as a UHF base station, the SMA Whip Antenna need to be connected to the receiver.

(3)Connect the receiver to external battery by using external power cable if necessary.

(4)Connect the receiver to external storage disk by using USB cable if necessary.

(5)Turn on the receiver by pressing the power button for 3 s.

(6)Measure the antenna height by using H.I. tape and auxiliary H.I. tool.

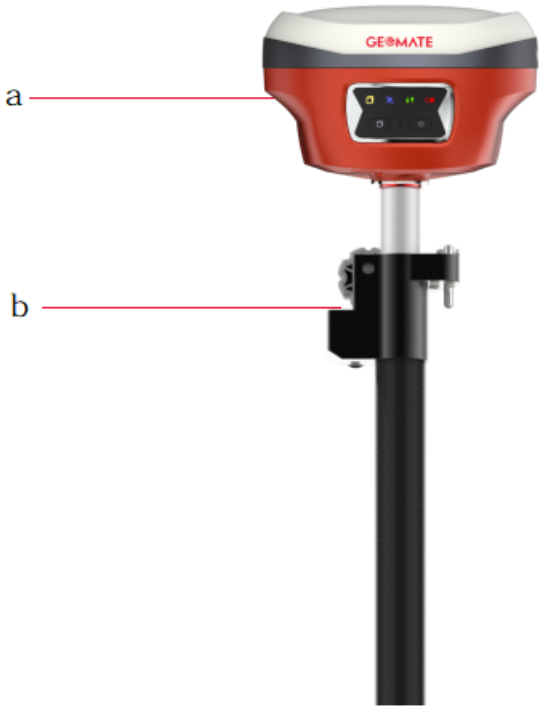
(7)Switch on the data controller and connect it to the receiver.

(8)Use software to configure the receiver as UHF base mode.

3.2 Rover Station Setup

For good performance, the following rover station setup guidelines are recommended:

Components:



No.	Name
a	SG6L GNSS receiver
b	2M range pole w/bag

Notice:

Keep the receiver fully charged.

If work as a UHF rover station, the SMA Whip Antenna need to be connected to the receiver.

Steps:

(1)Screw the receiver onto the pole.

(2)Turn on the receiver by pressing the power button for 3 s.

(3)Switch on the data controller and connect it to the receiver.

(4)Use software to configure the receiver as cellular rover or UHF rover mode.

(5)Use software to start surveying.

3.3 Working with the Tilt Compensation

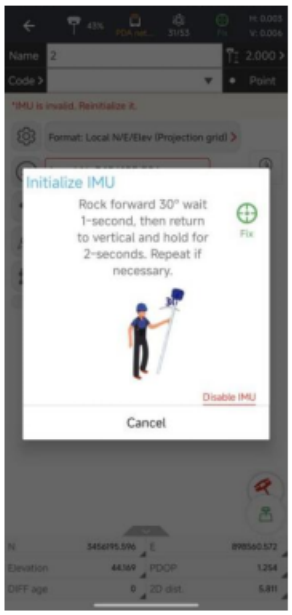
SG6L use 200 Hz AUTO-IMU, automatic pole tilt compensation for automatic inertial navigation initialization, and the user do not need to calibrate it manually any more.

After enable the tilt survey, the SG6L IMU can be ready after a few steps walk or a bit movement automatically.

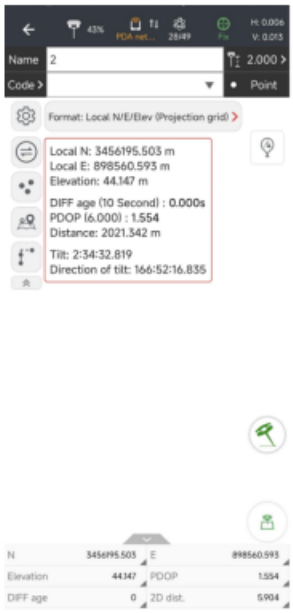
3.3.1 Operation Steps

(1)Open MateSurvey-> Tap PT Survey-> Tap  to activate tilt measurement.

(2) Shake around according to the procedures in the interface to do initialization.

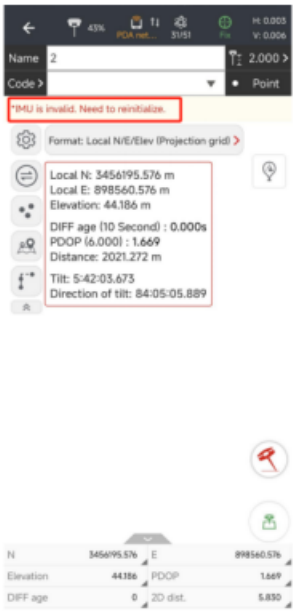


(3)This icon  will appear when the initialization is successful.



(4)Enter the Name and Antenna, then tap , point will be collected and store to Points automatically.

(5)When this icon appears, the text will show "Tilt measurement is not available, reinitialize IMU." at the top of interface.



(6)Tap to close tilt compensation.

3.3.2 Notes of using tilt measurement

(1)At the beginning of initialization, the pole height of the instrument should be the same as that antenna height in the software.

(2)In the process of tilt measurement, if the controller shows that "Tilt measurement is not available, reinitialize IMU." (red), please shake RTK slightly from left to right or back to front until the reminder disappears.

(3)The controller will prompt "Tilt is not available, please measure in alignment" when the receiver is stationary over 30 seconds, or the pole hit the ground toughly.

(4)The pole cannot be shaken when point is collected.

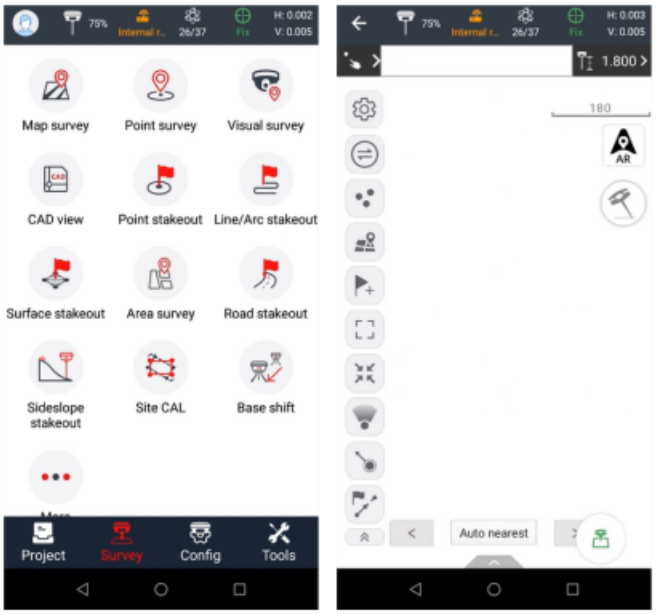
(5)Initialization is required:

- when the RTK is turned on every time.
- when IMU module is turned on every time.
- when receiver drops at working.
- when the pole is tilted more than 65 degree.
- when the receiver is stationary more than 10 minutes.
- when the RTK rotates too fast on the matching pole (2 rounds per second).
- when the pole hits the ground toughly.

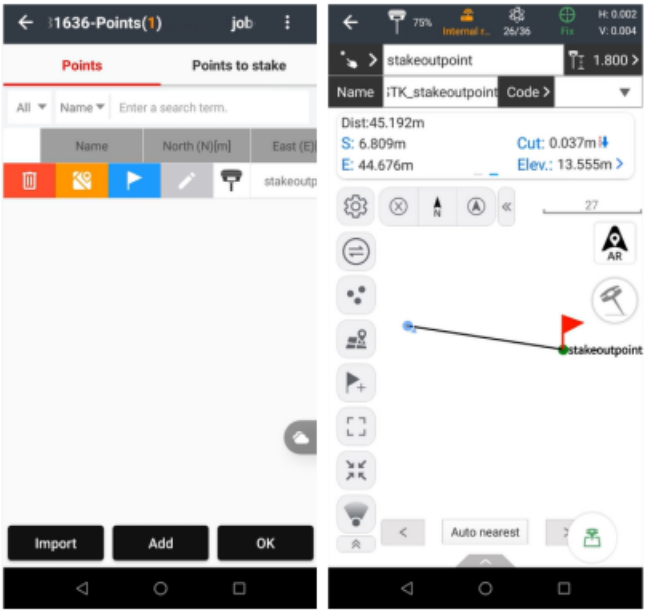
3.4 Working with the Vision Camera

3.4.1 Vision Stakeout Operation Steps

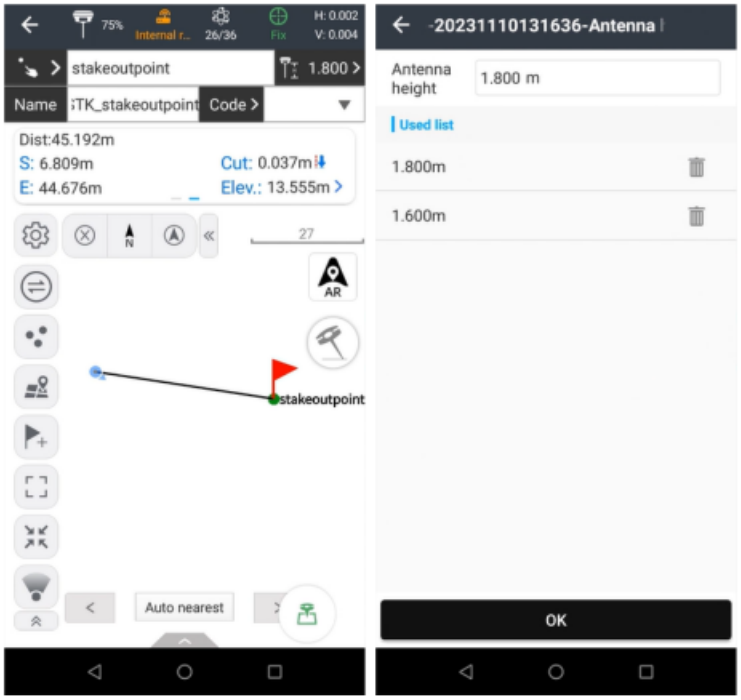
(1)Open MateSurvey-> Tap Stakeout-> Tap Point stakeout (Here take point stakeout as an example, currently also supports Line stakeout, CAD stakeout)



(2)Tap points, select a stakeout point, slide right and tap stakeout



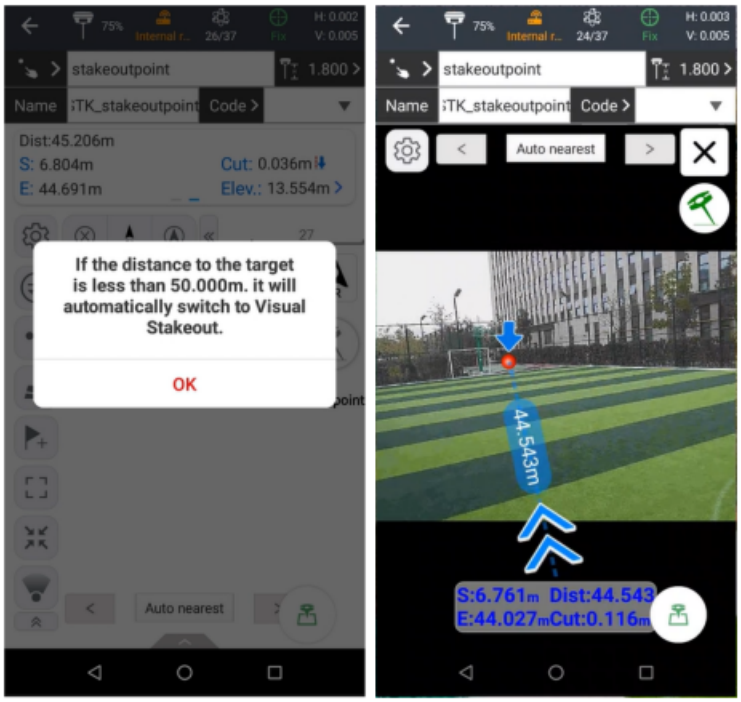
(3)Check whether the height of the antenna is consistent with the height of the 2 M Range Pole w/ Bag



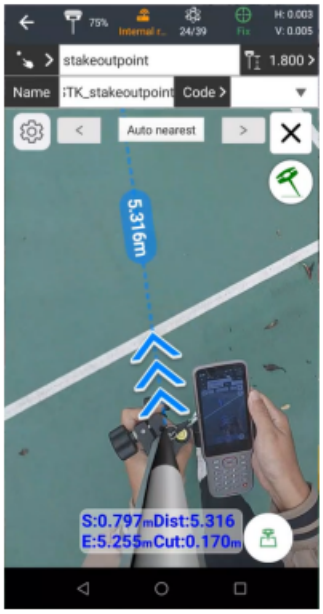
(4)Tap AR, the software will prompt you to activate tilt measurement

(5)This icon will appear when the initialization is successful.

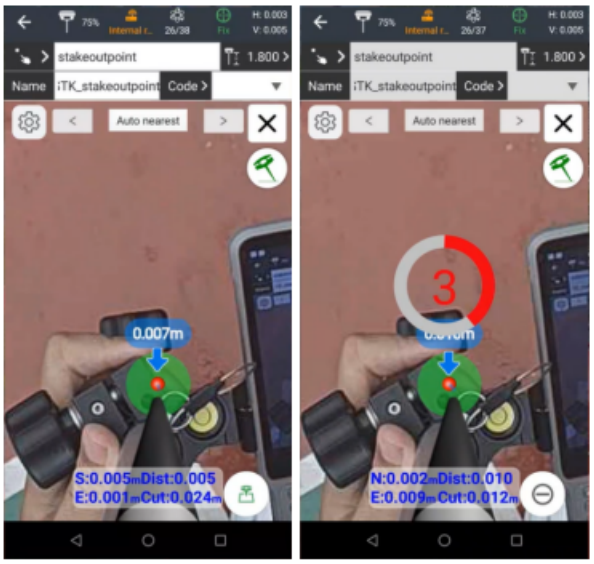
(6)If the distance to the target is less than 50.0 m meters, it will automatically switch to Vision Stakeout. (with Front Camera)



(7)If the distance to the target is less than 3.0 m meters, it will automatically switch to Vision Stakeout. (with Bottom Camera)



(8)After we are within 1 cm from the target point, we can click the measurement icon to collect



Note:

When the stakeout target point has a height, it is necessary to input the height of the target point as 0 or the actual height.

PDA and receiver camera should face the same direction.

3.4.2 Notes of using Vision Camera

(1)At the beginning of initialization, the pole height of the instrument should be the same as that antenna height in the software.

(2)In the process of tilt measurement, if the controller shows that "Tilt is not available, please measure in alignment" (red), please shake RTK slightly from left to right or back to front until the reminder disappears.

(3)The controller will prompt "Tilt is not available, please measure in alignment" when the receiver is stationary over 30 seconds or the pole hit the ground toughly.

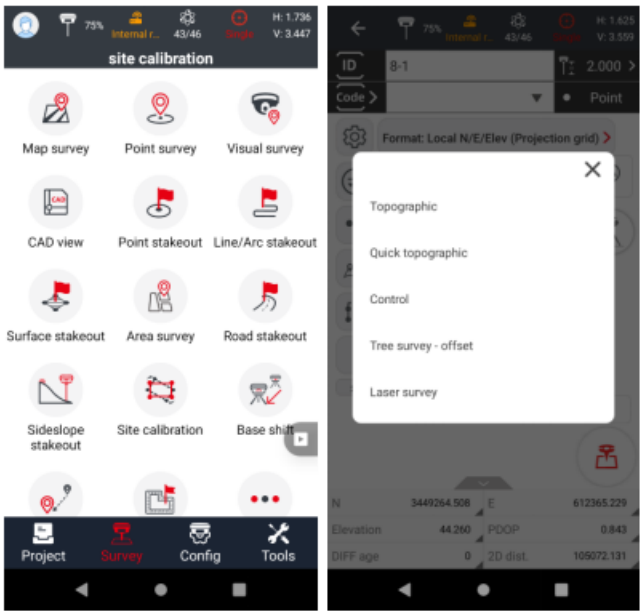
(4)The pole cannot be shaken when point is collected.

(5)Initialization is required:

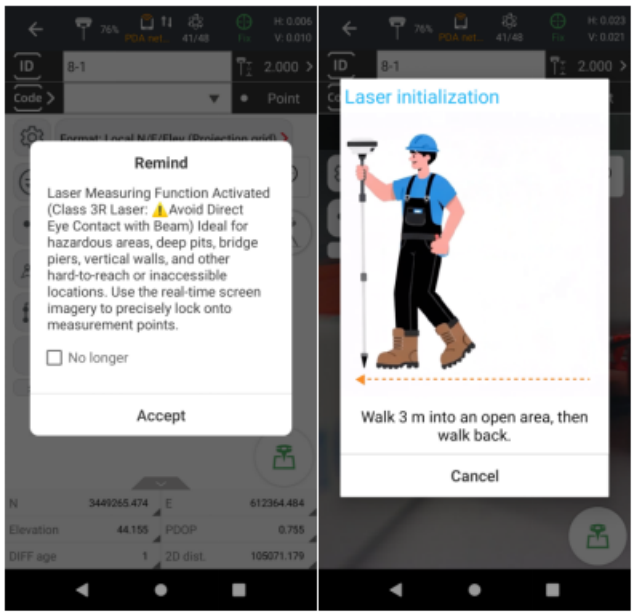
- when the RTK is turned on every time;
- when IMU module is turned on every time;
- when receiver drops at working;
- when the pole is tilted more than 65 degree;
- when the receiver is stationary more than 10 minutes;
- when the RTK rotates too fast on the matching pole (2 rounds per second);
- when the pole hit the ground toughly.

3.5 Laser Survey function

(1) To use this function, tap **[Point survey]** in the Survey interface and select **Laser survey**.

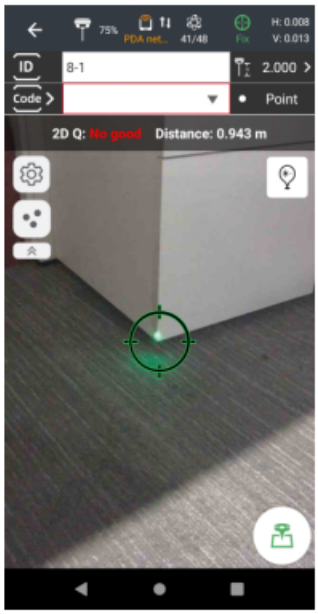


(2) After tapping Laser survey, you'll receive a safety-use notice and a laser initialization prompt. Follow the on-screen instructions to complete the laser initialization.



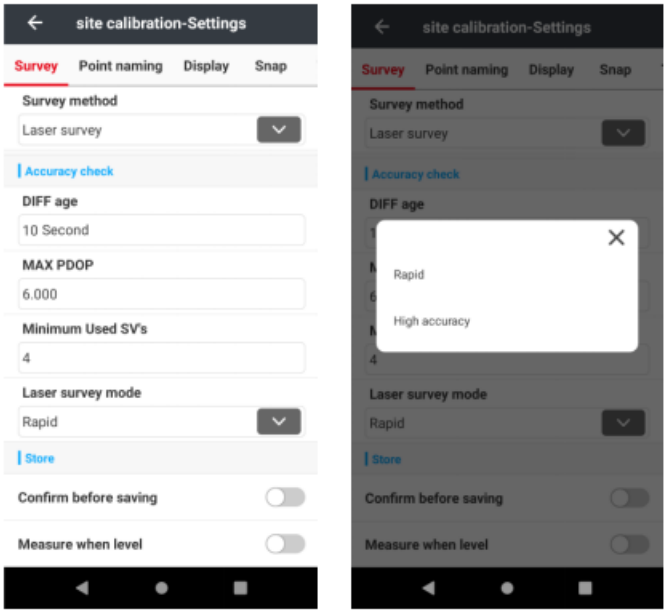
Caution - Class 3R laser radiation when open avoid direct eye exposure.

(3) Once initialization is complete, a laser-aiming crosshair appears. Center it on the point to be measured and tap Measure to finish a laser measurement.

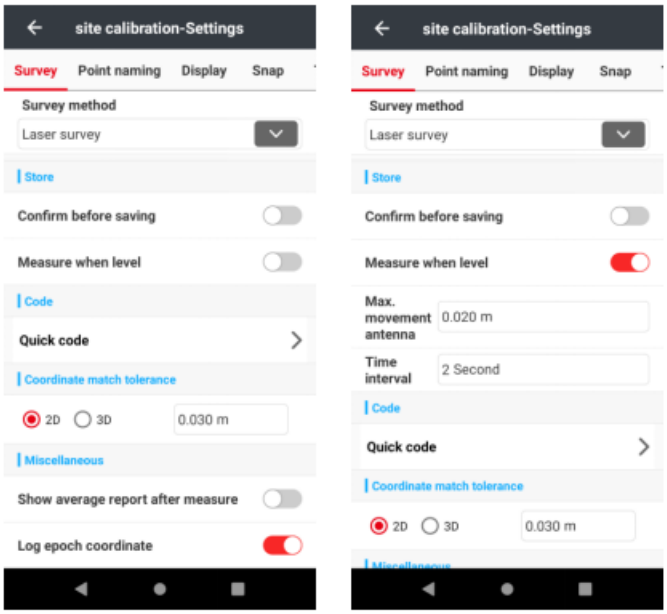


(4) Our camera supports two modes: automatic zoom and manual zooming in and out.When aiming at a distance, the camera will automatically zoom in, it can also be continued manually.

(5) The software supports two laser survey mode---Rapid and High accuracy.Different modes have different requirements for laser initialization.



(6) Our software also supports automatic store.When the laser remains stationary for a certain period of time, the collection can be automatically completed. Users can customize the Max movement distance and time interval.



3.5.1 Notes of using laser survey

1. When using laser survey, the instrument connection type must be selected as wifi.

2.When conducting laser survey, it is recommended that the measurement distance be less than 20 meters, with 10 meters being the best and 50 meters the farthest.

3. It is recommended that the altitude of the measurement scene be less than 1500 meters and the light intensity be less than 50 klux.

4. It is recommended that the temperature of the measurement scene sea be between -10 °C and 60 °C. If it exceeds or falls below the critical value, the laser will enter a dormant mode

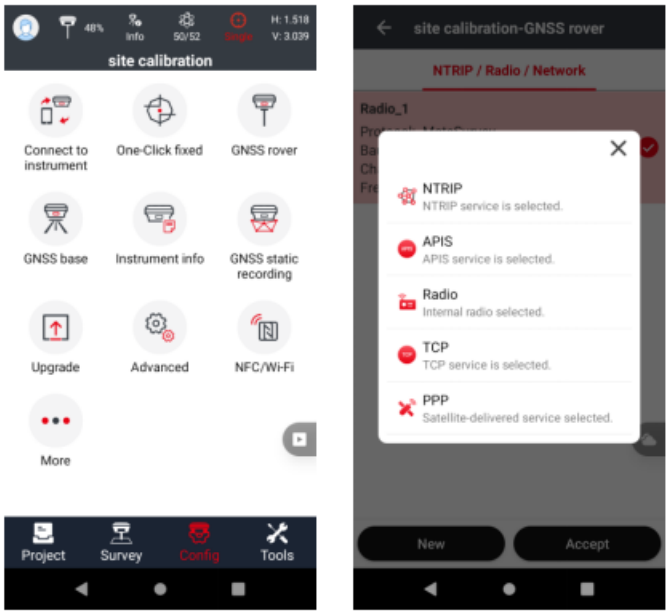
5. After aiming at the target point, the pole should be avoided from shaking.

6. During the measurement process, it is recommended that the tilt Angle of the pole should not be too large.

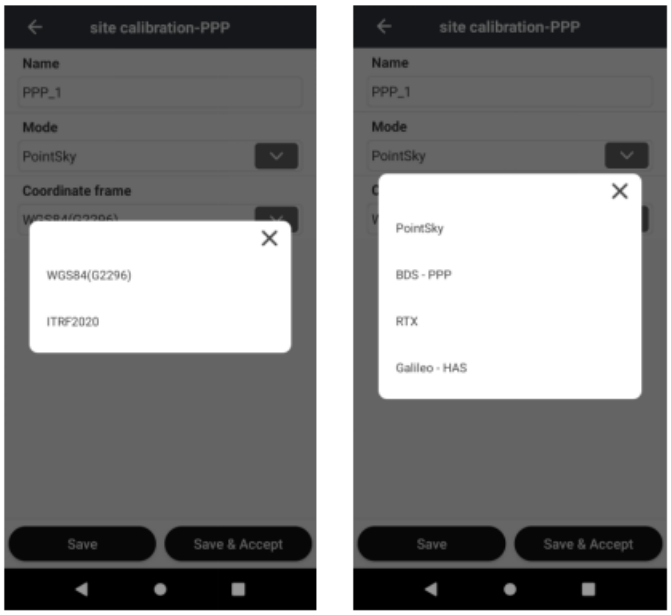
3.6 Point sky service

Point Sky service provides real-time centimeter-level positioning corrections to your device via a global satellite network. Wherever you are, you can obtain stable and accurate absolute coordinates without setting up a local base station, significantly simplifying field operations.

(1)Open the GNSS rover setting,find the PPP mode.

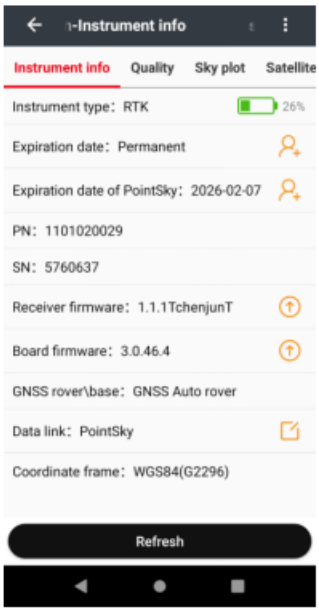


(2)Choose the **PointSky**, then, choose the Coordinate frame,we support **WGS84(G2296)** and **ITRF2020**.



(3) After successful setup, the main interface of the software will indicate that the current operating mode is Point Sky. Within the instrument information,

we can check the Point Sky Service expiration date and related configuration for the current device.



Notes:

(1) Convergence time varies depending on the level of signal obstruction in the environment and should be assessed based on actual conditions.

(2) It is highly recommended to use this service in an open, unobstructed area.

4 Configuring Through a Web Browser

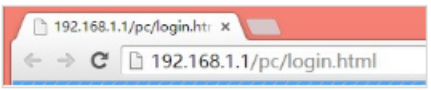
Supported browsers:

- Google Chrome
- Microsoft Internet Explorer version 10, or higher
- To connect to the receiver through a web browser:

1.Turn on the Wi-Fi of the receiver.

2.Search the wireless network named as GNSS-XXXXXXX (the SN of your receiver) on your computer, and then establish the connection.

3.After the successful connection between your computer and the receiver, enter the IP address (192.168.1.1) of the receiver into the address bar of the web browser on your computer:



4. The web browser prompts you to enter a login account and password:

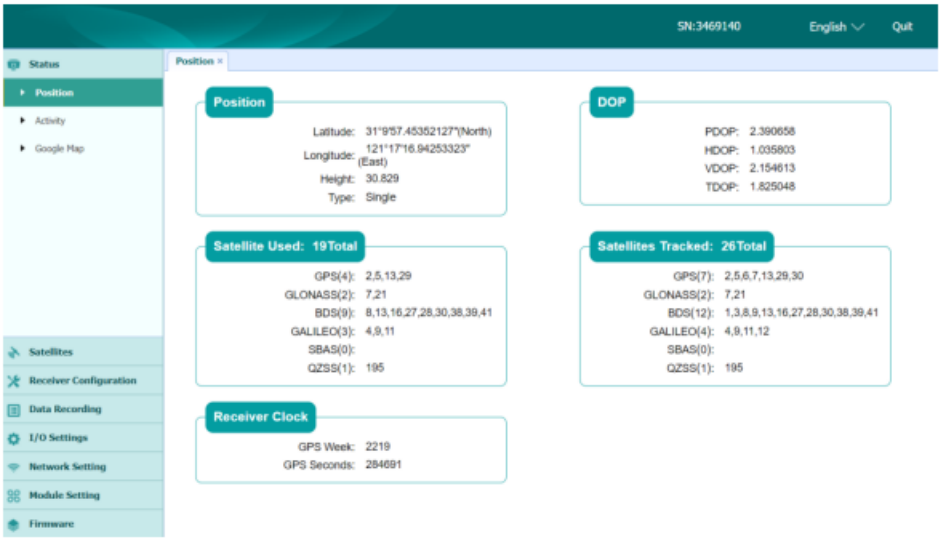
The default login account for the receiver is:

➢Login Account: admin

➢Password: password

Note – Tick **remember me** option, and then the browser will remember the Login Account and Password you entered.

5.Once you log in, the web page appears as follows:

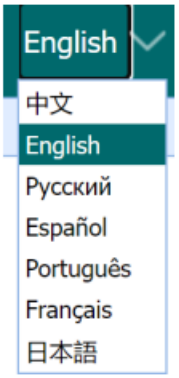


This web page shows the configuration menus on the left of the browser window, and the setting on the right. Each configuration menu contains the related submenus to configure the receiver and monitor receiver performance.

This chapter describes each configuration menu.

To view the web page in another language, select the corresponding language name from the dropdown list on the upper right corner of the web page.

Currently, these languages are available:

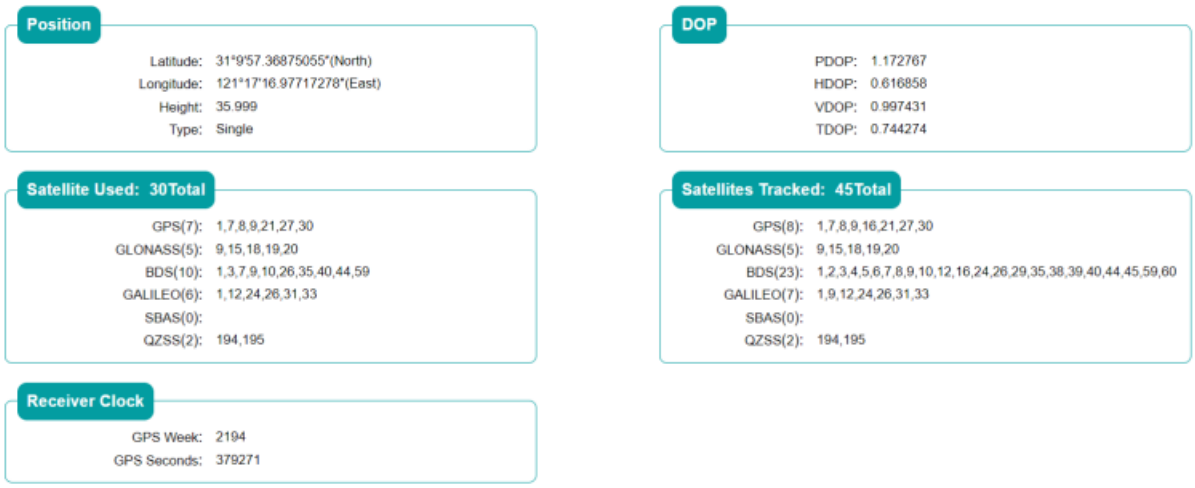


4.1 Status Menu

This menu provides a quick link to review the receiver's position information, satellites tracked, runtime, current data log status, current outputs, available memory, and more.

4.1.1 Position Submenu

This page shows the relevant position information about the receiver's position solution which including the position, DOP values, satellites used and tracked, and the receiver clock information.



4.1.2 Activity Submenu

Lists several important items to help you understand how the receiver is being used and its current operating condition. Items include the identities of currently tracked satellites, internal and external storage usage rate, how long the receiver has been operational, state of the internal battery, power source state, files being logged, and data streams being output. With this information, it is easy to tell exactly what functions the receiver is performing.