



G50 Laser GNSS Receiver

User Manual

Guangzhou GEOSURV Information Technology Co.,Ltd.

2024/12/16

Menu

Chapter I: Overview - 1 -

§1.1 Introduction - 1 -

§1.2 Highlights of G50 - 2 -

Chapter II: Product Introduction - 5 -

§2.1 Introduction - 5 -

§2.2 Introduction of G50 - 7 -

§2.2.1 Structure and Interface - 7 -

§2.2.2 Buttons and Indicators - 9 -

§2.2.3 Function of Button - 11 -

§2.3 P3 Controller - 12 -

§2.3.1 Appearance - 12 -

§2.3.2 Keyboard - 13 -

§2.3.3 Bluetooth Connection - 14 -

§2.4 Introduction of Accessories - 16 -

§2.4.1 Packing List of G50+P3 - 16 -

§2.4.2 Charger - 17 -

§2.4.3 UHF Radio Antenna - 17 -

§2.4.4 TYPE - C Cable - 17 -

Chapter III: Mode Setting - 18 -

§ 3.1 RTK Mode (Internal Radio) - 18 -

§3.1.1 Base setup - 18 -

§3.1.2 Starting Base - 19 -

§3.1.3 Rover Setup - 19 -

§3.2 RTK Mode (Network Mode) - 21 -

§3.2.1 Base Setup - 21 -

§3.2.2 Starting Base - 21 -

§3.2.3 Rover Setup - 23 -

Chapter IV: WEB UI- 34 -

§4.1 WEB UI Login- 34 -

§4.2 Common Function from WEB UI- 35 -

§4.2.1 Code Registering - 35 -

§4.2.2 Time Zone Setting - 36 -

§4.2.3 Data Download - 36 -

§4.2.4 Device Firmware Update - 38 -

In this chapter, you will learn about GINTEC Team and G50 GNSS Receiver.

§1.1 Introduction

Welcome to use GNSS products of GINTEC team (Guangzhou Geosurv Information Technology Co.,Ltd). Our team has been committed to popularize the advanced GPS surveying and mapping technology and products to the hands of measurement users. If you want to know more about us, please visit the official website: <http://www.gintec.cn/>

This manual takes G50 measurement system as an example, for how to install, set up, upgrade, daily maintenance, the use of accessories and explain how to use RTK system operation. Even if you have used other models of RTK products of our company, it is recommended that you read this instruction carefully before using the instrument for better use.

§1.2 Highlights of G50

1. Higher Laser Positioning Accuracy And Stability

G50 exhibits small data variation after multiple measurements under the same conditions. It stands out itself by adopting Mileseey's leading edge EDM laser unit & unique Laser-Easy ranging algorithm, ensuring both the accuracy and stability of the data

2. Clearer & Brighter Laser Spot

Emitting Class 2 red laser, G50 targets the objects in a brighter and clearer laser point, achieving more efficient laser measurement.

3. Measure any Objects Accurately

With higher-intensity laser emission and superior reflectivity, G50 maintains stable ranging results in measuring objects, regardless of their colors and materials.

4. Valid Real-time Data Collection

Continuously collecting and transmitting laser data at up to 20Hz, coupled with supporting of CY software, G50 implements real-time measurement, greatly shorten the

acquisition time.

5. Laser Staking-out

By integrating the latest IMU, algorithms and EDM characteristics, G50 supports real-time laser staking-out for difficult measurement points, ensuring accuracy, efficiency and ease of use.

6. HD Stellar Camera

Adaptive Exposure Adjustment under Different Lighting Conditions + IR Filter, it is more suitable for dark vision usage, effectively filtering infrared light and significantly improving nighttime shooting results.

7. Up to 120°Tilt Within 2.5cm Accuracy

The use of fourth-generation measurement technology ensures the G50 can still get fixed for tilt measurement work at even 120° measurement angles.

8. G-FIX Correction outage Technology

Extending Fix solution up to 10 minutes

Reducing downtime waiting to re-establish RTK corrections

9. GALILEO HAS/BDS PPP Service Supported

HAS provides free high-precision PPP correction services on the Galileo E6-B signal to improve real-time user positioning performance

BDS PPP Provides free BDS high precision PPP correction services with its coverage area.

10. Augmented Reality (AR)

Cutting-edge dual-camera system significantly enhances accuracy and guidance during measurement and staking out processes.

Chapter II: Product Introduction

By reading this chapter, you can master the composition, installation, and functions of the G50 measurement system in detail.

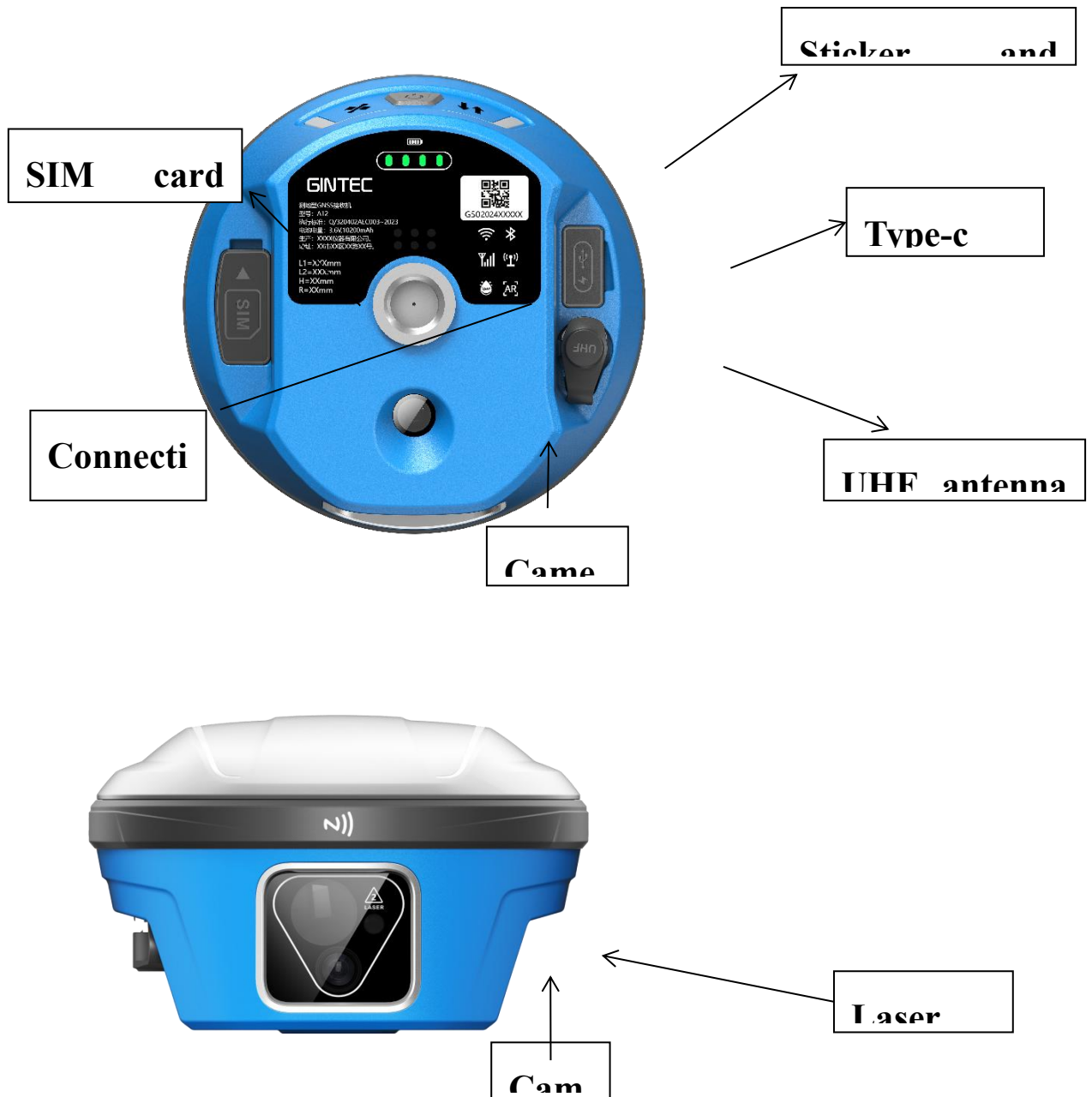
§2.1 Introduction

G50 measurement system is mainly composed of device, manual and accessories, as shown in the figure:



§2.2 Introduction of G50

§2.2.1 Structure and Interface



Structure and Interface	APPLICATION
Type-C interface	Charging and data transmission
UHF Antenna interface	Built-in radio: supports low power and high power options
Connecting screw hole	Used to fix the G50 on the base or pole
Serial number	To identify each device and register code
Sticker	To show some information about G50
Camera	Support AR stakeout/Assist laser spotting
SIM card interface	Insert SIM card to enable device access the internet

Laser module	To make measurement and stake out points
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§2.2.2 Buttons and Indicators

G50 has three indicators and one button.



Buttons and indicators	Function	Condition
	Switch on/off, confirm	Power on, power off, Broadcast the current work status
	Satellite indicator	Red light flashing indicates no satellite signal Green light flashing indicates receipt of satellite signal but

		not fixed Constant green light indicates device is fixed
	Data indicator	A constant blue light indicates that Bluetooth has been connected Blink blue: Data transmission
	Battery indicator	The indicator shows the current charge, divided into four pieces, each represents 25% of the electricity

§2.2.3 Function of Button

I Mode checking

When G50 is working normally, click the power button, then a voice will broadcast the current working mode. (mode, communication mode, solution state)

II Power on

In shutdown state, long press the power button, when G50 ticks and all the lights on, release the button and G50 will power on.

III Power off

In boot on state, long press the power button, when the voice broadcast "press again to power off", click the power button again to power off.

§2.3 P3 Controller

§2.3.1 Appearance



§2.3.2 Keyboard

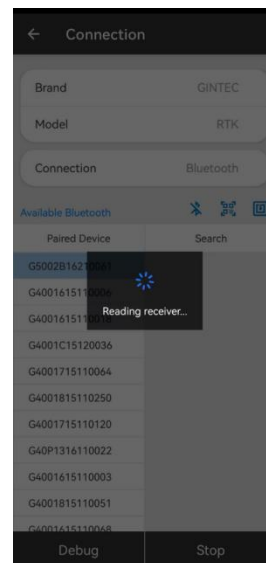
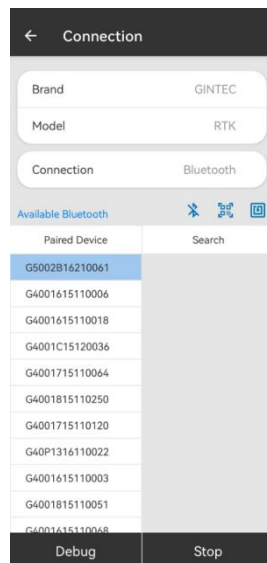
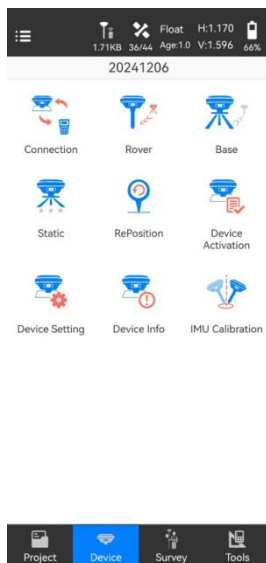


No.	Section	Specification
1	Numeric keys	Enter numbers
	Special function key	Orange icons take effects when "Fn" is locked The functions of F1-F6 can be customized by users in "Settings"
2	Power button	Turn on/off device/sleep/wake up
3	@key	Enter the character @
4	Input method switching	Input uppercase/lowercase/digital switch
5	Return Key	Back to last interface
6	Fn Key	Tap to lock Fn and activate the function indicated by the yellow icon on the number key
7	Shift Key	Input method select key, call out "Select input method" interface
8	Tab Key	Make tableadvance to the next anchor point or move the input focus to the next

		control
9	Delete Key	Delete one character before entering other characters
10	Survey Key	Users can customize the function in the "Settings" button
11	Keys for direction	Move the cursor or anchor point
12	Application Key	Users can customize the function in the "Settings" button

§2.3.3 Bluetooth Connection

Start the G50 first, and then use P3 controller to perform the following operations:



1. Open CreateYours software and click "Connection" to enter the connection interface.
 2. Select the manufacturer as "GINTEC", the device Model as "RTK", and the communication mode as "Bluetooth"
 3. Select the corresponding SN and click "Connect".
- The connection succeeds after the progress bar ends.

§2.4 Introduction of Accessories

§2.4.1 Packing List of G50+P3



G50+P3 Packing List

G50 GNSS Receiver (Rover)



- 1 Carrying Case
- 2 G50 GNSS Receiver
- 3 Charger and Adapter(AU/UK/EU/US)
- 4 USB to Type-C Data Cable
- 5 Type-C to Type-C Charging Cable
- 6 16 GB USB Flash Drive(manuals & tools)
- 7 3 meters Measuring Tape
- 8 Connector
- 9 430-450 MHz Radio Antenna
- 10 Height Measuring Plate
- 11 Carbon Fiber Pole

P3 Handheld Controller



- 1 P3 Handheld Controller
- 2 Charger and Adapter
- 3 USB to Type-C Data Cable
- 4 Type-C to Type-C Charging Cable
- 5 OTG Data Cable
- 6 Bracket
- 7 Screen Protector x1

TEL: 8620-82514956 | Website: www.gintec.cn | Email: overseas@gintec.cn

ADD: Room606, Building A02, No. 83, Kaiyuan Avenue, Huangpu District, Guangzhou, Guangdong, China

§2.4.2 Charger

Standard configuration includes charger and charging cable:

While charging, when the power indicator is red, it means charging; when the indicator is green, it means full.

Power adapter and charging cable:



§2.4.3 UHF Radio Antenna



UHF radio antennas are required for the built-in radio Base mode and the built-in radio Rover mode.

§2.4.4 TYPE - C Cable

TYPE - C cable is to connect the G50 with computer, used for

transmission of static data or receiver firmware upgrading.



Chapter III: Mode Setting

§ 3.1 RTK Mode (Internal Radio)

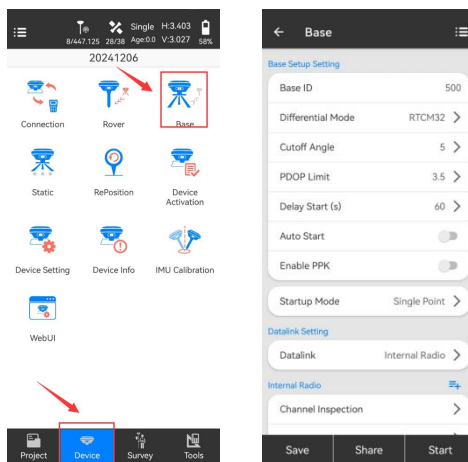
§3.1.1 Base setup

Base station must be set up in the open field, the surrounding environment should be open, the terrain should be higher. Do not set it up near high-voltage power transmission, transformation equipment, near radio

communication equipment antenna, or under trees and near water.

§3.1.2 Starting Base

**1) Open CreateYours in the controller, Click "Device"→
"Base" to set Base station.**



**2) Under "Base Mode Settings", Choose "Data link" to be
"Internal Radio", set the channel, frequency and
protocol, then start to finish setting.**

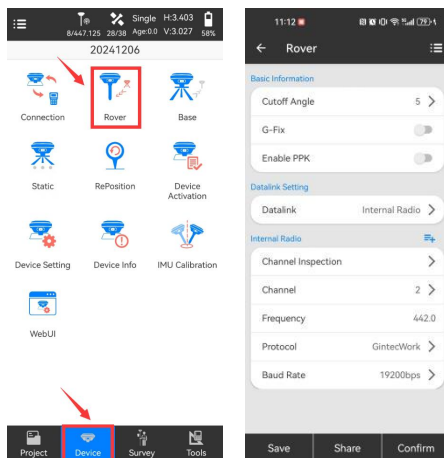
§3.1.3 Rover Setup

**After successful set up of the base station, now we can start
the rover setting.**

Install the G50 on the centering lever, install the radio antenna, bracket, clamp the controller.

The steps are as follows:

- 1) Turn on the G50 and controller, open CreateYours software and connect Bluetooth.**
- 2) Click "Device" - "Rover", choose "Data link" as "Internal Radio", and choose the same channel and protocol as Base. Click "Confirm" to start rover.**



- 3) When it shows "Fixed", it is correctly setting, now you can start the surveying work.**

§3.2 RTK Mode (Network Mode)

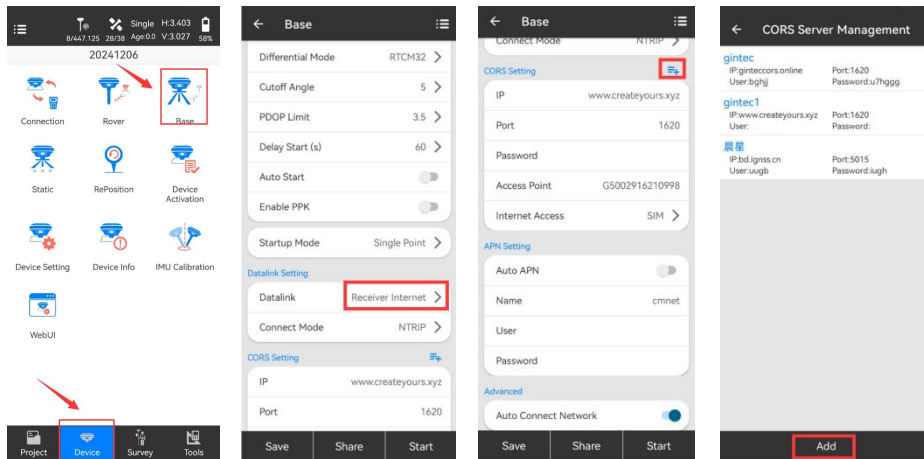
§3.2.1 Base Setup

Base station must be set up in the open field, the surrounding environment should be open, the terrain should be higher. Do not set it up near high-voltage power transmission, transformation equipment, near radio communication equipment antenna, or under trees and near water.

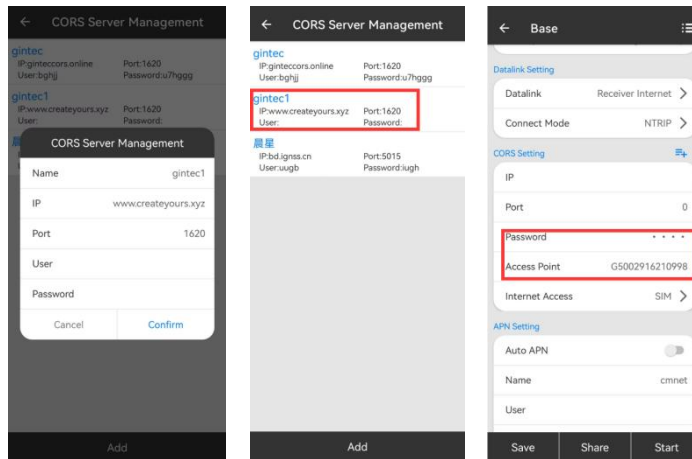
Set up the tripod, fix the G50.

§3.2.2 Starting Base

1) After setting, please make sure there is a workable Sim card inside G50 base. Then open CreateYours in the controller, Click "Device" → "Base" to set Base station.



- 2) Under "Base Setup Settings", Choose "Data link" to be "Receiver Internet", then go to set CORS parameter. (When use "Receiver Internet", please input the correct the APN setting as your mobile network service provider ask for)
- 3) Clip "Add" in the CORS setting page, then import your CORS "IP" and "Port", then choose the CORS information you set, clip "OK".
- 4) Input the name you want in "Base Access Point", and you can also input "password" , then apply. (Remember what you have input, it will be useful when you set up rover).



§3.2.3 Rover Setup

After successful set up of the base station, now we can start the rover setting.

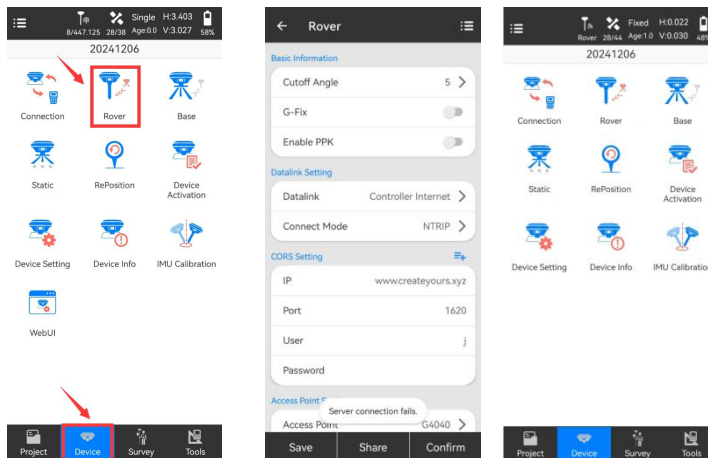
Install the G50 on the centering lever, install the bracket, clamp the controller.

The steps are as follows:

- 1) Turn on the G50 and controller, open CreateYours software and connect Bluetooth.**
- 2) Clip "Device" - "Rover", choose "Data link" as "Controller/Receiver Internet" (When use "Receiver Internet", please input the correct the APN setting as your**

mobile network service provider ask for).

- 3) Clip "CORS Setting" and choose the same item as what your base used.
- 4) "Get Access Point" and choose the access point as your base setting. Clip "Confirm" to start rover.



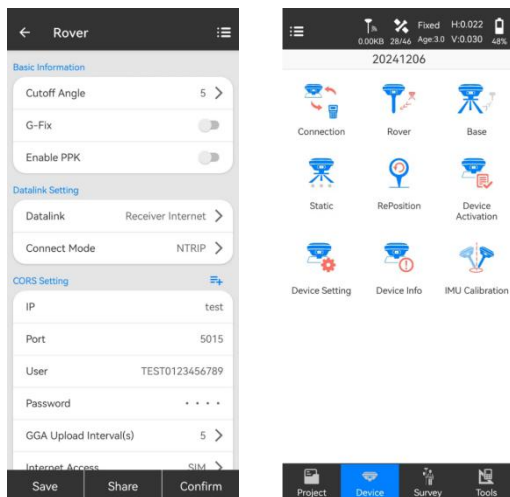
- 4) When it shows "Fixed", it is correctly setting, now you can start the surveying work.

§ 3.3 Laser Measurement

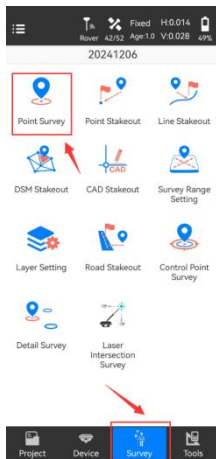
- 1) Turn on CreateYours software, Click "Device" - "Connection", Connection Mode choose "WIFI"



2) Click "Rover" - Choose “Controller/Receiver Internet” and finish the “CORS setting” to make the G50 meet “Fixed” solution.



3) Go to “Survey” interface, click “ Point Survey”

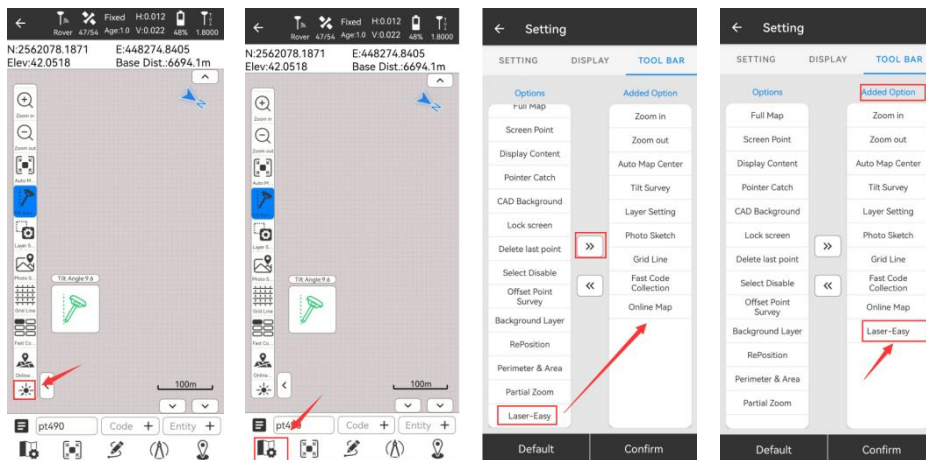


5) There will pop up a window to inform you to confirm the antenna height so that IMU Sensor works well. Do make sure the antenna height is the correct height. Then click “Confirm” .

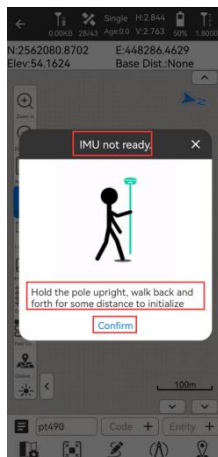


6) Find the Laser icon in the list on the left to turn on Laser. If you can't find this icon, you need go to the “Setting” interface to add the Laser first from the “TOOL Bar”, then

click “Confirm” to add it.

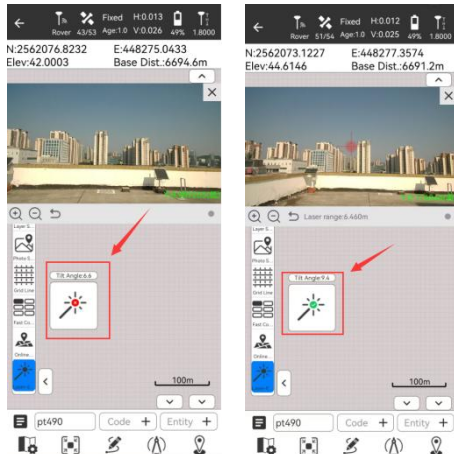


7) If the IMU is not ready, there will pop up a window to inform you “IMU not ready”, then follow the instructions to finish the IMU initialization.

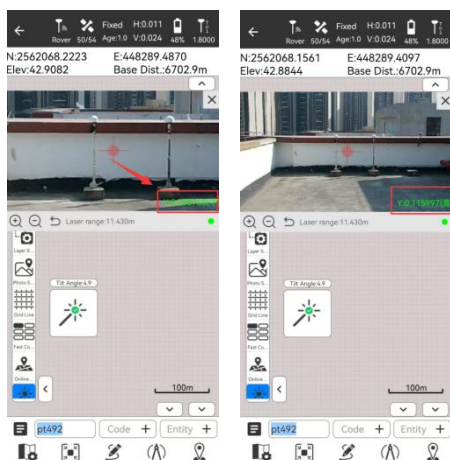


8) After all above settings finished, the Laser measurement is enabled, now we need to check if Laser module is ready, if it is not ready, the laser measurement icon is red color in the center. In this case, we need to hold the pole and

walk forward for a distance (about 3-5 seconds) to complete the initialization of the laser module until the icon is turned to green.

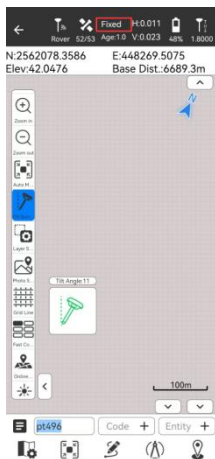


9) Observe the Y value in the upper right corner, if the value is greater than 0.2, it means that the current laser acquisition accuracy is not optimal, at this time, you need to hold the pole and walk around for a few seconds, and observe that the Y value is less than 0.2

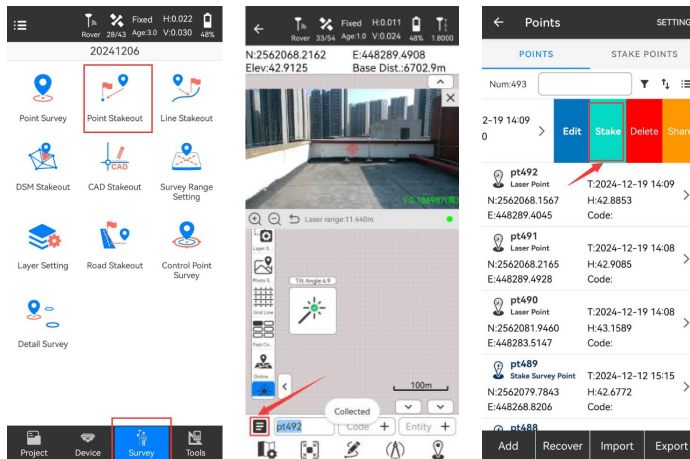


§ 3.4 Laser Stakeout

1) Make connection to G50 Receiver by CreateYours software, do the operation as above Rover setting in “Laser Measurement” and make G50 meet fix solution.



2) Click "Survey" - “Point Stakeout”, choose the point what you want to stakeout and click "Laser" Or you can choose the Points directly from the Survey interface and choose the “Points” icon to the points interface, find the points that you need to stake out and click “Stake”.



3) While the laser come to the point to be stake, the “Stake” interface will show the stake information and inform you that you’ve arrived at the target point. The stake out progress is finished.



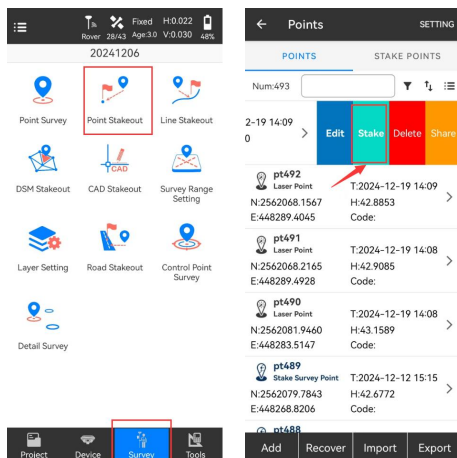
Note: While staking out points, do make sure the Y value is below 0.2.

§ 3.5 AR Stakeout

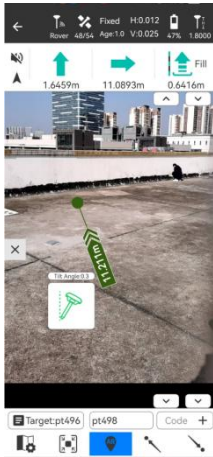
1) Turn on CreateYours software, Click "Device" -
"Connections", Connection Mode choose "WIFI"



2) Click "Survey" - "Point Stakeout", choose the point what
you want to stakeout and click "AR"



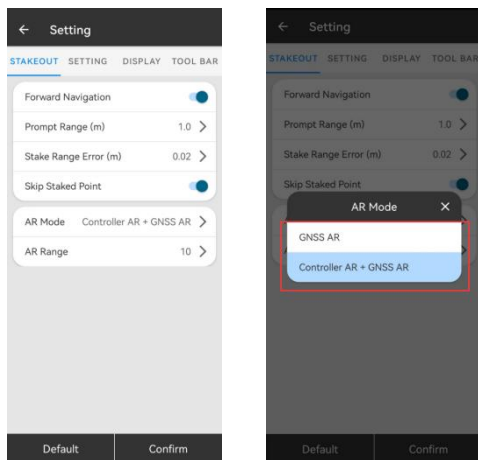
4) Find lofting points by following the arrows and line segments.(This is the phone AR mode,The camera settings for the lofting can be changed through settings)



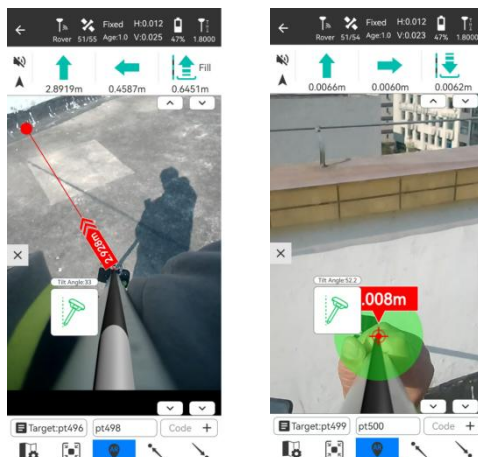
When the Default stakeout mode is set to“Phone AR+RTK AR”, the RTK AR prompt Range(m) is the boundary distance between the phone AR and the RTK AR.(e.g.If set to 10 meters, when the device distance from greater than 10m to less than 10m,the mobile phone screen will display phone camera to RTK camera)

You can also use Only RTK AR according to your personal preference or use a combination of phone AR and device 3D

view.



The following is the view of the RTK AR camera, when the target point is reached, a green circle will appear at the collection point.



§4.1 WEB UI Login

Start the G50 properly, use a mobile terminal such as a laptop or mobile phone, open WiFi, and find the G40Plus hotspot. The hotspot name format is the device SN number. After connecting successfully, enter 192.168.10.1 in the browser and go to the WEBUI background page.



The user name and password needs to be entered when first time login WEBUI through a new browser.

User name: admin

Password: password

§4.2 Common Function from WEB UI

§4.2.1 Code Registering

The screenshot displays the GINTEC web interface for device G5002916210998. The interface includes a sidebar with navigation options: Information, Settings, File Upload and Download, and Management. The main content area shows the 'Device Registration' section, which includes fields for 'Expiration Date' (20250319), 'Function' (2512), and 'Registration Code'. A 'Register' button is present next to the 'Registration Code' field. Other sections visible in the sidebar include 'System Management' and 'Developer Mode'.

Click "Management-System Manage"- "Device Registration", you can paste the register code here to active the G50.

§4.2.2 Time Zone Setting

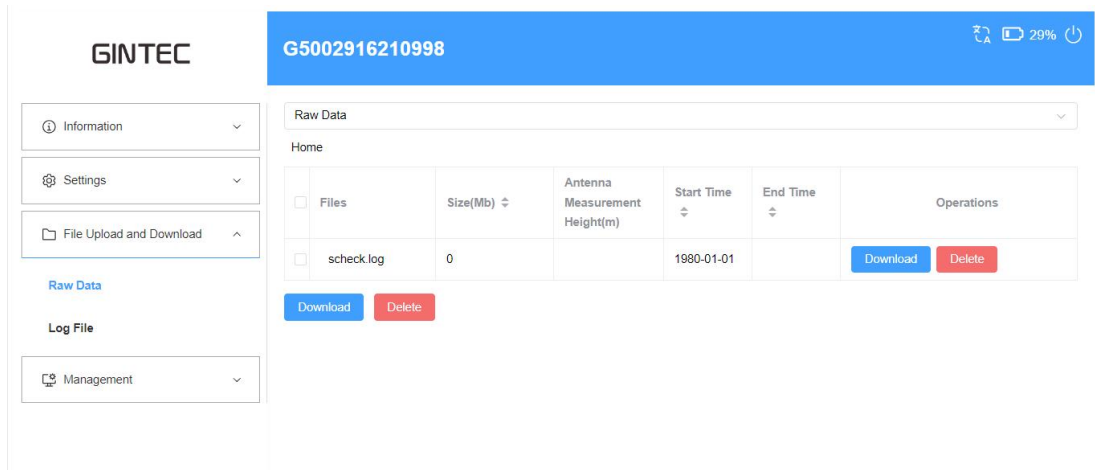
The screenshot displays the GINTEC web interface. At the top, a blue header bar contains the device ID 'G5002916210998' and status icons for signal strength, battery level (29%), and power. On the left, a sidebar menu lists navigation options: Information, Settings (selected), Mode Setting, Satellite Settings, Parameter Setting (highlighted in blue), Output Setting, File Upload and Download, and Management. The main content area is titled 'Time Zone' and features a dropdown menu set to 'GMT+8:00'. Below this, a 'Sensor' dropdown is set to '5Hz'. A series of settings follow, each with a toggle switch: 'Voice' (on), 'Base Station Transmission Site Information' (on), 'Base Station Alarm' (on), 'Automatic power-on when USB is inserted' (off), 'Automatic power-off when USB is removed' (off), 'Enable the WIFI client' (off), 'WIFI Hotspot Shared Network' (off), and 'Upload location information' (off). A 'Submit' button is located at the bottom left of the settings area. On the bottom right, there are icons for help and a network status indicator.

Click "Settings-Parameter Setting", where you can modify time zone. You can also modify other parameters here.

§4.2.3 Data Download

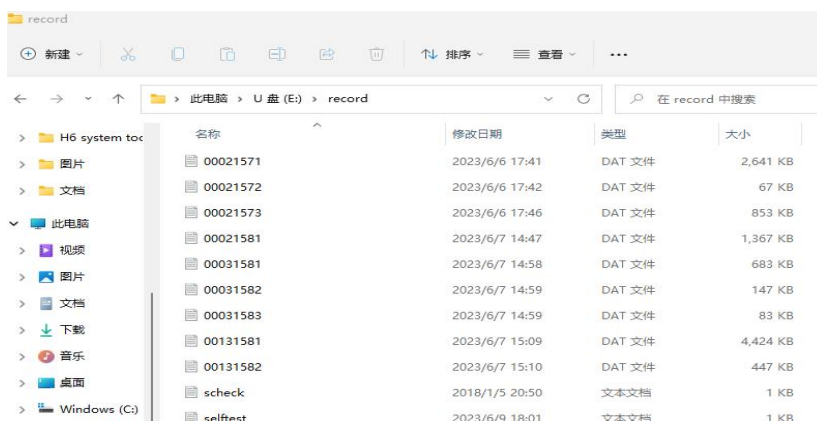
Methods I: WEBUI

Click "File Upload and Download - Raw Data", choose the right data format and date to get the data list. Download the data you want in the coming list.



Methods II: USB cable

Connect G50 with your PC by USB to Type-C cable, your computer will automatically read a G50 storage folder. Open it and choose the "record" to the folder you want and download the file you need.



§4.2.4 Device Firmware Update

Ask the newest firmware from the technician where you buy G50 from, follow the next steps to update the firmware.

Enter WEB UI

Click "Management- System Management", "System Upgrade"- "Select file" function. Choose the firmware file you got and upload. G50 will automatically restart after the firmware is installed successfully.

Information Settings File Upload and Download Management 

System Management

Developer Mode

System Upgrade 

Select File

Upload Device Registration GNSS Registration System Security System Operation 

FCC Warning

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: 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.**

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Appendix A: G50 Technical Specifications

Specifications



Positioning

Channels	1408
GPS	L1C/A,L1C,L2P(Y),L2C,L5
GLONASS	G1,G2,G3
BDS	B1I,B2I,B3I,B1C,B2a,B2b
GALILEO	E1,E5a,E5b,E6
QZSS	L1,L2C,L5,L6*
NAVIC(IRNSS)	L5
SBAS	L1C/A
PPP	B2B-PPP E6-HAS
Data Update Frequency	50Hz
Positioning Frequency	1Hz 2Hz 5Hz 10Hz 20Hz 50Hz
Cold Start Time	<12s
Initialization Time	<5s
Initialization Confidence	>99.9%



Measurement Accuracy

Static Mode Accuracy	H:±2.5mm+0.5ppm V:±5.0mm+0.5ppm
Single Point Solution Accuracy	H:1.5m V:2.5m
Differential Solution Accuracy	H:0.4m V:0.8m
RTK Accuracy	H:±8.0mm+1ppm V:±15.0mm+1ppm
Time Accuracy	20ns
Tilt Measurement Accuracy	≤2.5cm within 120°



Battery

Battery Life	Static 20h,Rover 16h,Base 10h
Power Supply	9V/2A MAX18W 3.6V_13600mAh



Physical Properties

Shell Material	Magnesium-Aluminum Alloy
Weight	990g
Dimensions	Φ135*90mm
Button	Power Button
Indicator Lights	Satellite Signal Light, Data Transmission Light, Current Battery Light



Laser - Easy

Type	Class 2, red
Range	0.05-49.99m By Daylight 0.05-99.99m By Moonlight
Distance Accuracy	2mm @1σ
Tracking Measurement	5-20Hz
Accuracy	2cm within 5m 3cm within 10m



System

Operating System	Linux
Memory	8G
Data Transmission	4G/Bluetooth/WIFI/Radio
Bluetooth	V5.0,BLE
WIFI	802.11a/b/g/n
Radio Power	1W
Radio Frequency	410-470MHz
Air Baud Rate	19200, 9600, 4800
Supported Protocols	Gintec Work,TrimTalk450s(T), TrimMark III, SOUTH, PCC-EOT, Hi-target, Satel, Farlink, etc.
Supported Languages	Chinese, English, Polish, Turkish, Korean, Indonesian, Spanish, Telugu, Russian, etc.



Camera

Number of Lenses	2
Front Lens Field of View	83.4°
Front Sensor Pixel	2 Mega Pixel
Front Camera Focal Length	5m
Front Sensor Resolution	1920*1080
Bottom Lens Field of View	83.4°
Bottom Sensor Pixel	2 Mega Pixel
Bottom Camera Focal Length	2m
Bottom Sensor Resolution	1920*1080



Environmental Adaptability

Operating Temperature	-30℃~+65℃
Storage Temperature	-40℃~+80℃
Water and Dust Resistance Rating	IP68
Shock and Drop Resistance	1.8m drop onto a rod
Operating Humidity	99.9% non-condensing

* LASER RADIATION: AVOID DIRECT EYE EXPOSURE