G30 Gnss Receiver

User Manual

12/28/2021

Menu

Chapter I: Overview

In this chapter, you will learn about Gintec Team and G30 Gnss Receiver.

§1.1 Introduction

Welcome to use GNSS products of GINTEC team (Guangzhou **G**eosurv **In**formation **Tec**hnology 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 is G30 measurement system as an example, for how to install, set up, upgrade, daily maintenance, the use of accessories and how to use RTK system operation to explain. 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 G30

- **Faster Fixed solution**

BeiDou SOC chip with ROS new system, fixed faster, more stable accuracy.

- **Smaller in size, lighter in weight**

Diameter 135mm× height 84mm, 910g; Small size and light weight, more suitable for field work.

- **SOC chip**

Nanometer-level manufacturing process, super integrated design, smaller volume, lower power consumption.

- **Ultra-long endurance**

Built-in 6800mAh high-performance lithium battery, 18 hours of super long battery life, one charge, meet the whole day of operation.

Support the power supply scheme of charging bank, power supply anytime and anywhere, to meet the needs of higher intensity operations.

- **Type-c +PD, convenient and efficient**

Type-c interface design and PD fast charging scheme make charging and transmission more convenient and efficient

- **All constellation all frequency point**

Full constellation full frequency point reception, fully support Beidou third generation satellites, support ups to 16 frequency signal calculation.

- **Built-in radio with high performance**

Built-in transceiver integrated radio, working frequency 410-470MHZ, Trim talk 450s, TrimMarkIII, SOUTH, CHC, SATEL, HI-TARGET are all compatible. The “Farlink” protocol perfectly solves the problem of large data volume of multiple constellations transmission. And the power consumption can reduce about 60% in the same amount of data transmission compare to the traditional RTK, increase the sensitivity and efficiency of radio signal, achieve the typical working range as 5km operation, and meet the needs of customers for small and medium scale.

- **Smart locking to base station**

Based on Farlink "instant" protocol, one-to-one signal tracking and locking technology can realize the continuous tracking and locking of the target base station signal, and effectively eliminate crosstalk and interference.

- **Inertial tilt measurement**

Built-in IMU inertial measurement sensor, with 0° ~ 60° super-large angle, 200HZ ultra-high update rate, can automatically correct the coordinates according to the tilt direction and Angle of the centering bar, the user does not need to strictly be centering, lifting the bar to measure.

- **Base station movement alert**

Built-in IMU sensor can always read the attitude information, when the base station movement, tipping can accurately judge and remind.

- **Double backup of data:**

Field measurement data can be stored in the book and the host at the same time to realize double backup and effectively avoid data loss.

- **PPP function optional**

Optional PPP differential function can provide centimeter-level differential positioning services in the Asia-pacific region.

Chapter II: Product Introduction

By reading this chapter, you can master the composition, installation, and functions of the G30 measurement system in detail.

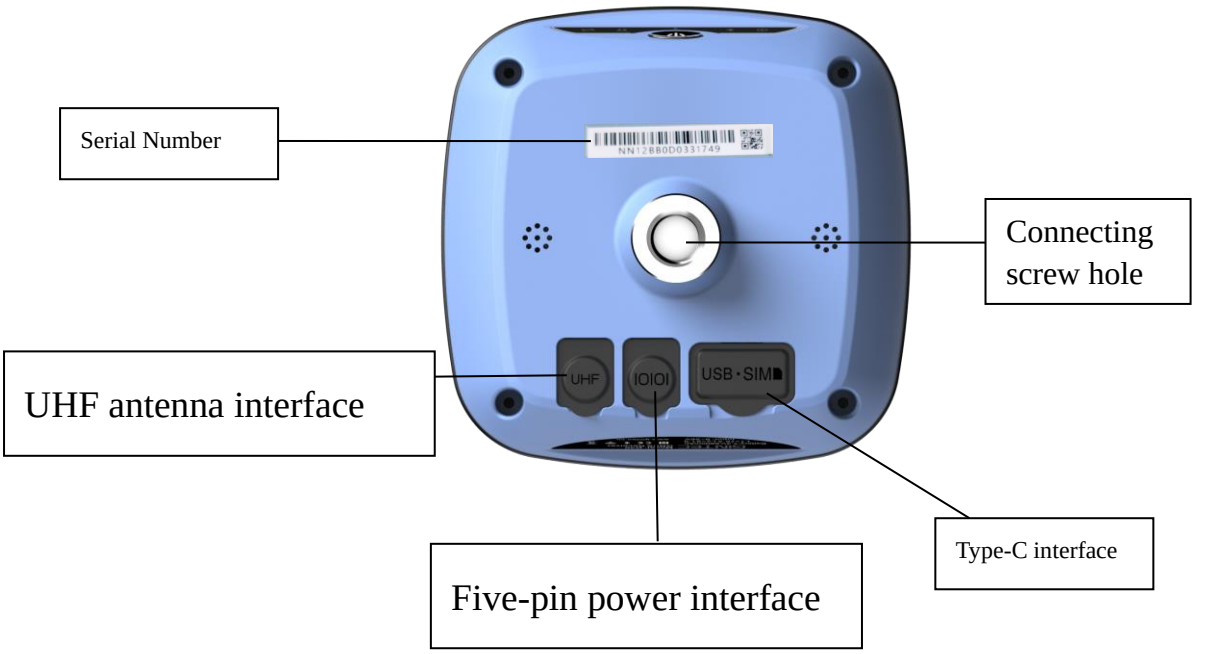
§2.1 Introduction

G30 measurement system is mainly composed of host, manual and accessories, as shown in the figure:

Schematic diagram of G30 measurement system

§2.2 Introduction of G30

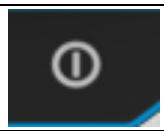
§2.2.1 Structure and Interface



Structure and Interface	APPLICATION
Five-pin power interface	As a power interface, can be connected to power bank and other power supply equipment. As a serial port output interface, you can view the output data and debug G30 through the serial port software
UHF antenna interface	Connecting build-in radio antenna
Type-C interface	Charging and data transmission
Connecting screw hole	Used to fix the G30 on the base or pole
Serial number	To identify each device and register code
Sticker and NFC	To show some information about G30, or connect to Bluetooth by pressing the controller close here

§2.2.2 Buttons and Indicators

G30 has four indicators and one button.:

Buttons and indicators	Function	Condition
	Switch on/off, confirm, modify	Power on, power off, confirm the modification item, and select the modification content
	Bluetooth indicator	Always on when Bluetooth is connected
	Data indicator	**Radio mode:** Blink by receiving interval or transmitting interval. **Network mode:** 1) Blink fast during network dial-up and WIFI connection (10Hz) 2) After successful dialing, blink by receiving interval or transmitting interval. **Static mode:** When recording data, blink at the set collection interval
	Satellite indicator	It starts flash every five seconds, and the number of flashes represents the number of locked satellites
	Power light	Always on when the battery is full; Flicker when power is low(＜10%)

§2.2.3 Function of Button

Ⅰ Mode checking

When G30 is working normally, click the power button, then a voice will broadcast the current working mode.

Ⅱ Power on

In shutdown state, long press the power button, when G30 tick and all the lights on, release the button and G30 will power on.

Ⅲ Power off

In boot on state, long press the power button, when the voice broadcast "power off", release to shut down 。

Ⅳ Mode setting

In boot on state, press the power button for more than 6 seconds and release, G30 will say "Start to set work mode", then take turns playing the various work modes. Click to select the mode you want to set when broadcasting

Ⅴ Self-check

In power-on state, long press power key about 10 seconds until the it read "Start to self-check", release the key and start self-test.

No matter the self-check passes or fails, it will announcement the result. After a few seconds, the instrument will restart automatically if it passes.

If the self-check fails, G30 will remain in the state of self-test result and will not be restarted to identify the problem

Ⅵ Restore factory setting

Long press the power button for more than 20 seconds and it will say “start to restore manufactory default”, release to restore factory settings.

§2.3 P9III Controller

§2.3.1 Appearance

§2.3.2 Keyboard

No.	Key	Description
Number /alphabet keys	Number keys	0-9,input number keys（also can be used to make phone call in special model.） The second function keys（Press “Shift” key at the same time）: 1- ！,2- @,3- #,4- $,5- %,6- ^,7- &,8-*,9- (,0-)
	Alphabet keys	A-Z, input alphabet.
		Move up and down or left and right in the screen menu. Under function key state, use up and down keys to adjust volume. Under function key state, use right key to lock the upper caps.
①	Power	Turn on/off the device.
②	Tab	Tabulation
③	Shift	Short press shift key to switch Chinese / English input method, long press Shift key to switch Fn function key in number area or to switch English input upper / lower case.
④	Menu	System settings
⑤	Home	Back to Home screen.
⑥	Return	Return to previous interface
⑦	Measure	Press it to open or switch to the controller software interface. If in the controller software interface, press it to collect data.
①	OK	Confirm information
⑨	Delete	Delete a character forward
⑩	Dot	Input decimal point
⑪	Space	Input space
⑫	+-	Input +/-

§2.3.3 Connector

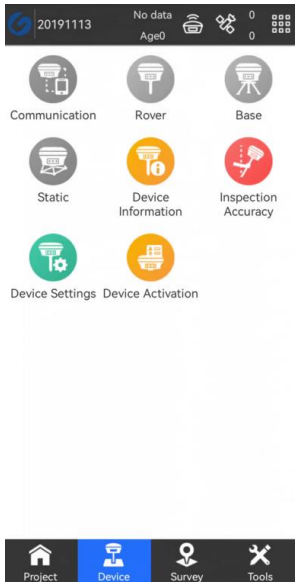
Connector of P9III controller

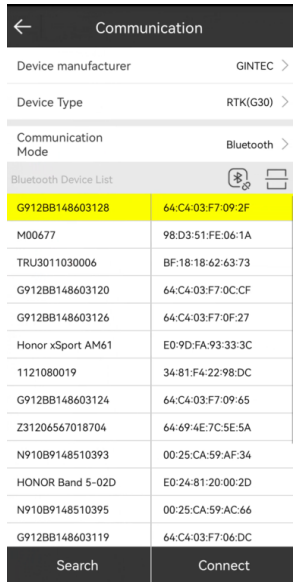
Function description of connector

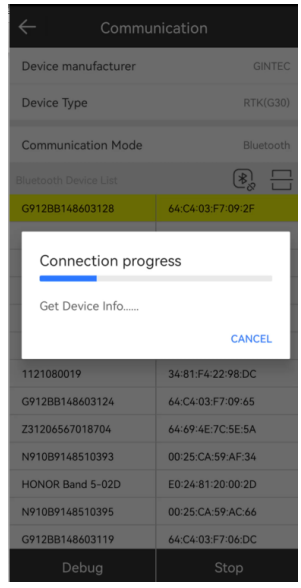
No.	Port	Description
①	USB Type-C	To charge device and transmit data. Support USB OTG.
②	TF card slot	To install TF card.

§2.3.4 Bluetooth Connection

Start the G30 first, and then use P9III controller to perform the following operations:







1. Open SurPad/Create Yours software and click "Communication" to enter the connection

interface.

2. Select the manufacturer as "Gintec", the device as "G30", 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 Instrument Container

§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.

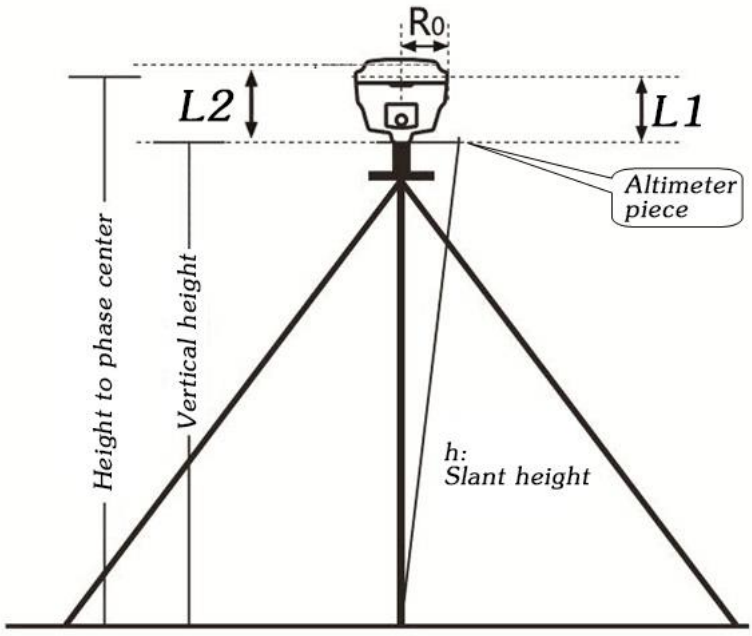
§2.4.4 TYPE - C Cable

TYPE - C cable is to connect the G30 with computer, used for transmission of static data or receiver firmware upgrading.

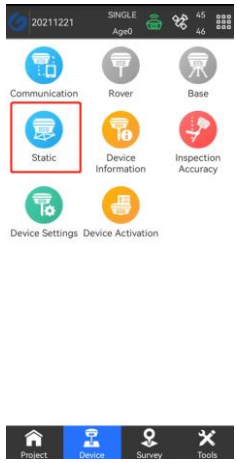
Chapter III: Mode Setting

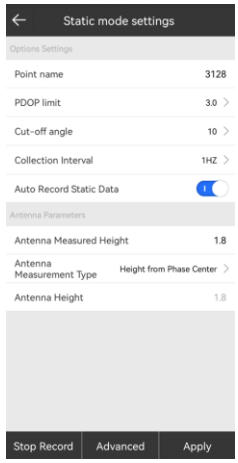
§3.1 Static Mode

1) Set up a tripod at the control point, connect the tribrach, strictly center and level the measuring point.



2) Measure instrument height for three times, and the difference between the three times shall not exceed 3 mm and take the average value.
3) Record SN, point name, instrument height and start time.





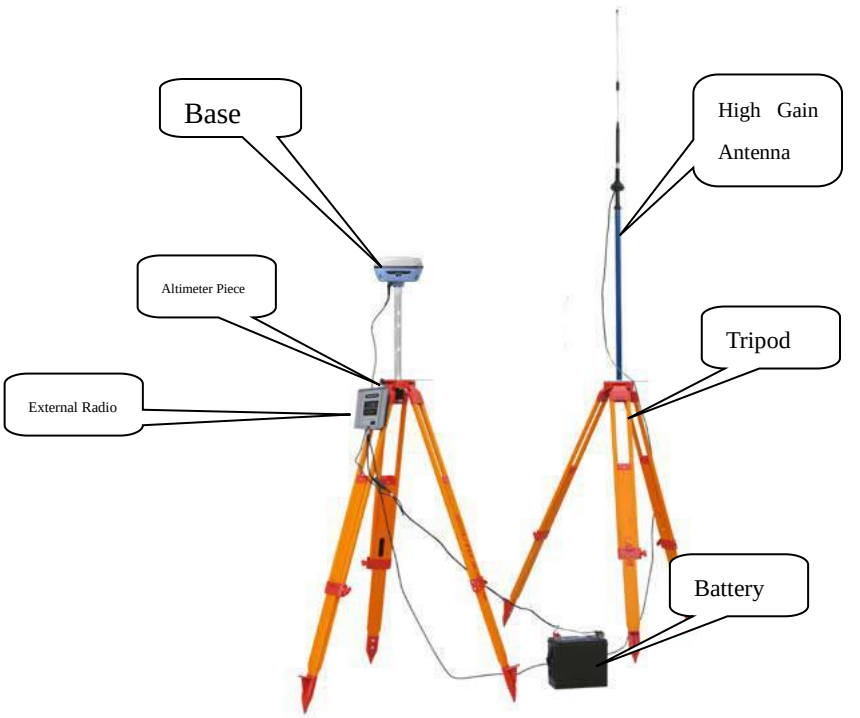
4) Switch on the G30 and connect with controller software, set the receiver to static mode, and set the parameters as the picture shows. (The memory capacity of G30 must be sufficient.

Generally, 8 MB storage capacity is required in an hour.)

5) G30 starts to search for satellite and the satellite lights start flashing. When the recording condition is reached, the status light will flash at the set sampling interval, and the flash indicates that an epoch is collected.

6) After the surveying finished, shut down G30, and then transport the data and process data.

§ 3.2 RTK Mode（External Radio）



§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.

Setting steps:

1) Set up the tripod as shown in the figure above, hang up the radio, fix the G30, and connect the extension rod and the large radio transmitting antenna.

2) Connect G30 by 5-pin data transmission cable with external radio. Connect the battery with Radio by Y-type power cable.

(G30)

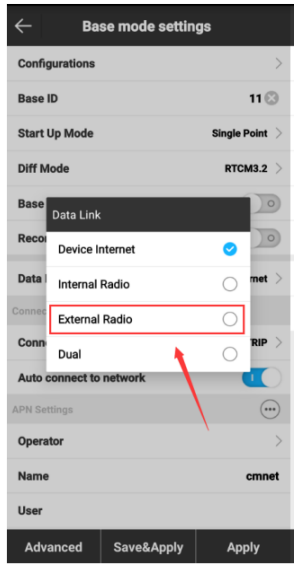
(External Radio)

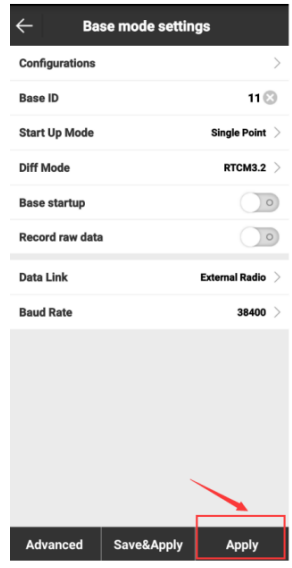
(Battery)

§3.2.2 Starting Base

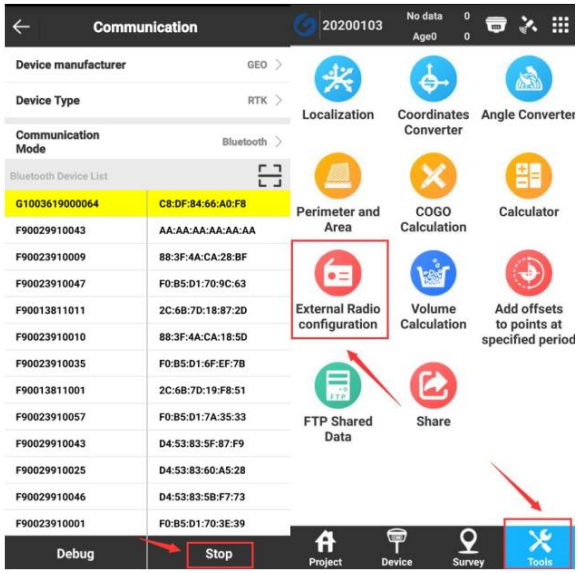
Used TRU35 external radio as an example to show the process, and if has another radio, please consult the technicist.

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

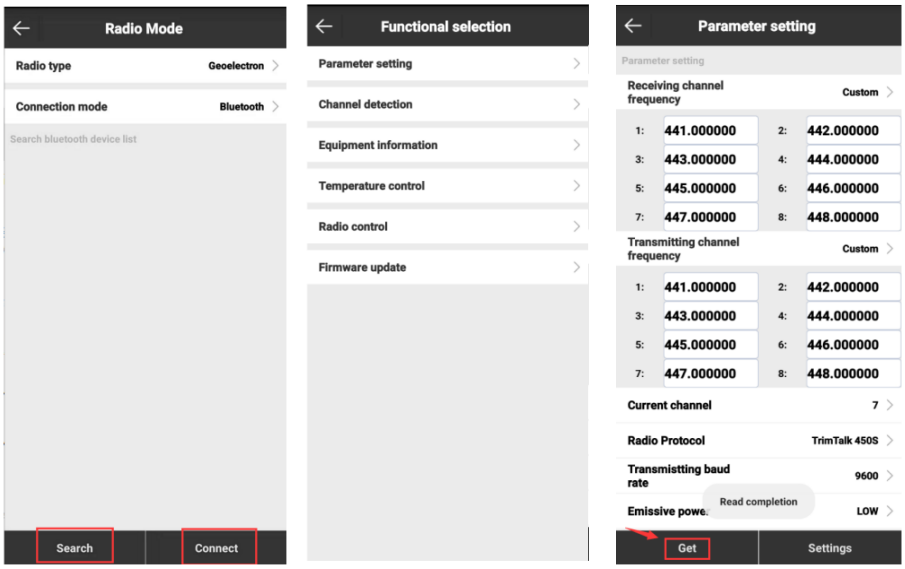




2) Under "Base Mode Settings", Choose "Data link" to be "External Radio" and apply.
3) Disconnect G30 receiver and Open "External Radio Configuration" under "Tools" in SurPad.



4) In “External Radio configuration”, choose “Radio type” to be “Geoelectron” and “Connection mode” to be “Bluetooth”, then search TRU35 radio and connect it.(Pairing code is “1234”).

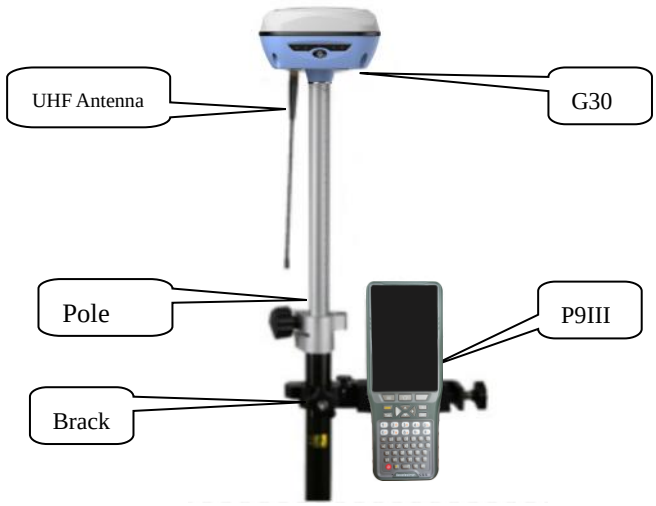


5) After connected, you will come to “Functional selection” interface, click “Parameter settings”, click “Get” to receive TRU35 parameters and there to change the “Receiving channel frequency”, “Transmitting channel frequency” and other settings, then press “Settings” to finish settings.

§3.2.3 Rover Setup

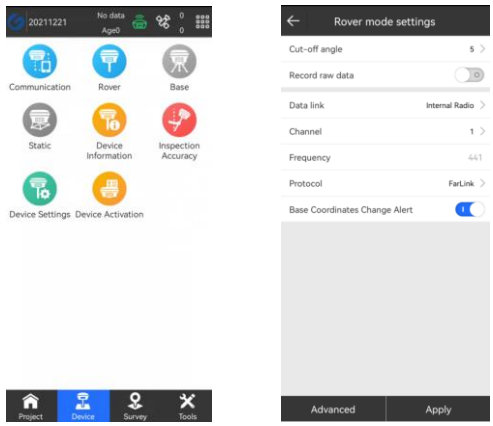
After successful set up of the base station, now we can start the rover setting.

Install the G30 on the centering lever, install the radio antenna, bracket, clamp the controller.



The steps are as follows:

1) Turn on the G30 and controller, open SurPad software and connect Bluetooth.
2) Clip “Device” - “Rover”, choose “Data link” as “Internal Radio”, and choose the same channel and protocol as Base. Clip “Apply” to start rover.



3) When it shows “Fixed”, it is correctly setting, now you can start the surveying work.

§ 3.3 RTK Mode（Internal Radio）

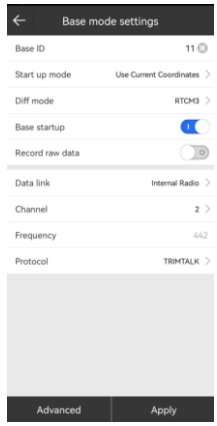
§3.3.1 Base setup

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 as shown in the figure above, fix the G30, and connect the radio antenna.

§3.3.2 Starting Base

1) Open SurPad 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 apply to finish setting.

§3.3.3 Rover Setup

This step is the same as §3.2.3 Rover Set up, please check this section.

§3.4 RTK Mode（Network mode）

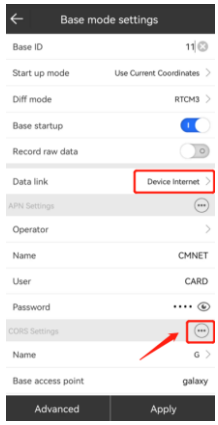
§3.4.1 Base Setup

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.

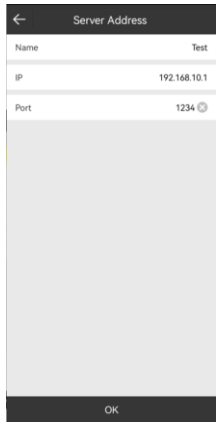
Set up the tripod as shown in the figure above, fix the G30, and connect the radio antenna.

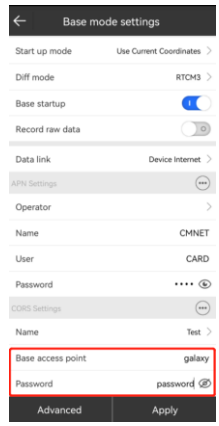
§3.4.2 Starting Base

1) After setting, please make sure there is a workable Sim card inside G30 base. Then open SurPad in the controller, Click “Device”→ “Base” to set Base station.



2) Under “Base Mode Settings”, Choose “Data link” to be “Device Internet”, then go to set Cors parameter. (When use “Device 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 “Bae access point”, and you can also input “password” , then apply. (Remember what you have input, it will be useful when you set up rover).





§3.4.3 Rover Setup

After successful set up of the base station, now we can start the rover setting.
Install the G30 on the centering lever, install the radio antenna, bracket, clamp the controller.

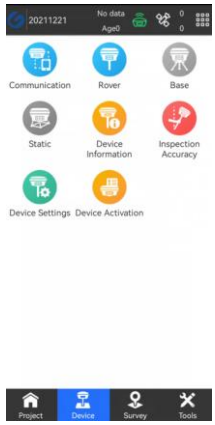
The steps are as follows:

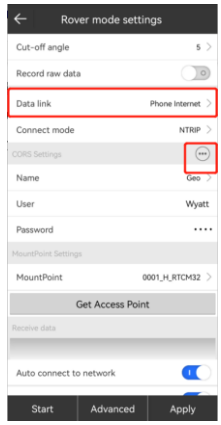
1) Turn on the G30 and controller, open SurPad software and connect Bluetooth.

2) Clip “Device” - “Rover”, choose “Data link” as “Phone/Device Internet”(When use “Device 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 “Apply” to start rover.



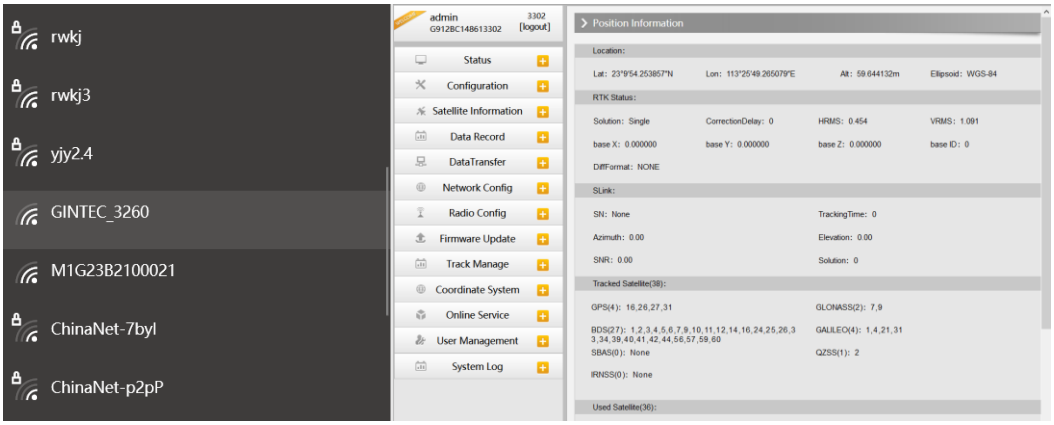


4) When it shows “Fixed”, it is correctly setting, now you can start the surveying work.

Chapter IV: WEB UI

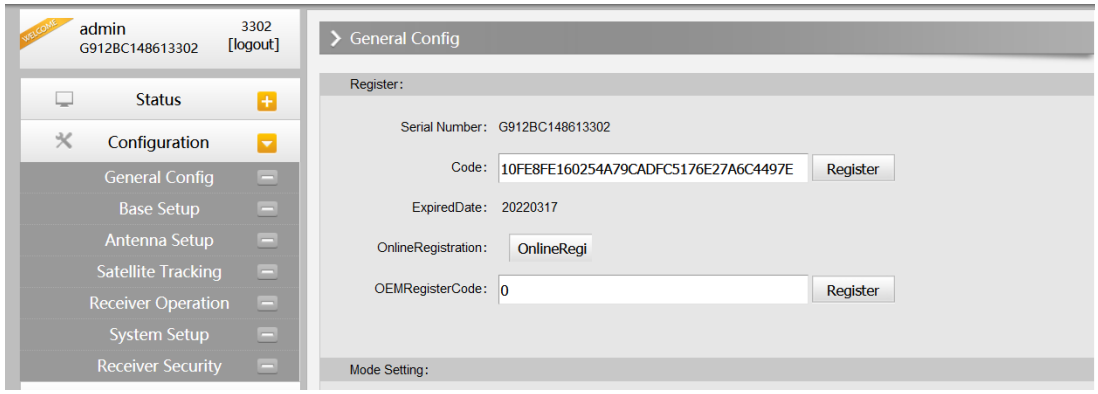
§4.1 WebUI Login

Start the G30 properly, use a mobile terminal such as a laptop or mobile phone, open wifi, and find the G30's hotspot. The hotspot name format is "GINTEC_XXXX"(GINTEC_3260). After connecting successfully, enter 192.168.10.1 in the browser and go to the WebUI background page.



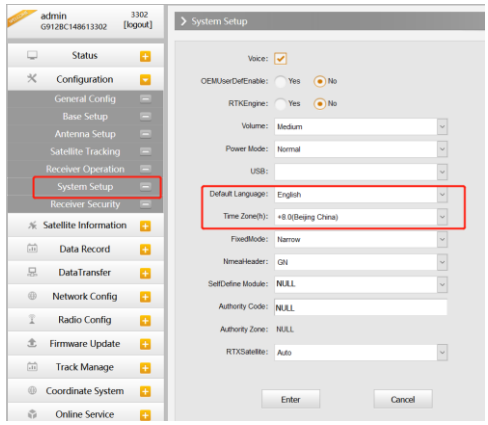
§4.2 Common Function from WEB UI

§4.2.1 Code Registering



Clip "Configuration-General Config", you can paster the register code here to active the G30. Function codes such as PPP activation codes are also registered here.

§4.2.2 Language/Time Zone Setting

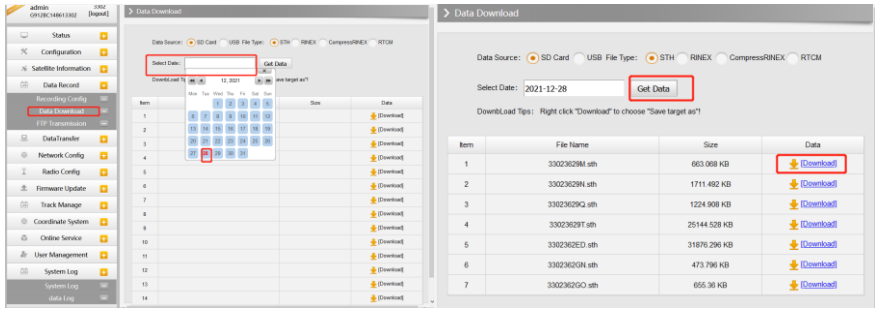


Clip “Configuration-System Setup”, where you can modify language and time zone. You can also modify other parameters here.

§4.2.3 Data Download

Methods I: WebUI

Clip “Data-Download”, 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

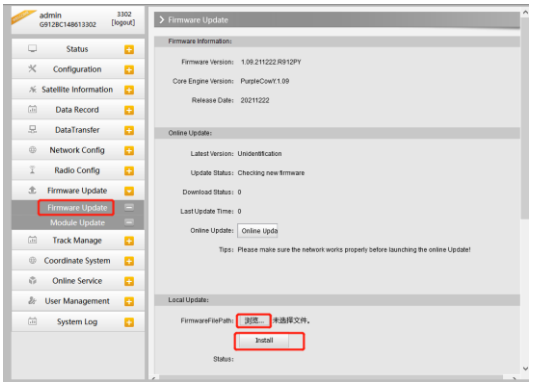
Connect G30 with your PC by USB to Type-C cable, your computer will automatically read a G30 storage folder. Open it and choose the “Date – Format” to the folder you want and download the file you need.

§4.2.4 Device Firmware Update

Ask the newest firmware from the technicist where you buy G30 from, follow the next steps to update the firmware. There are 2 kinds of methods, you can choose as you wish.

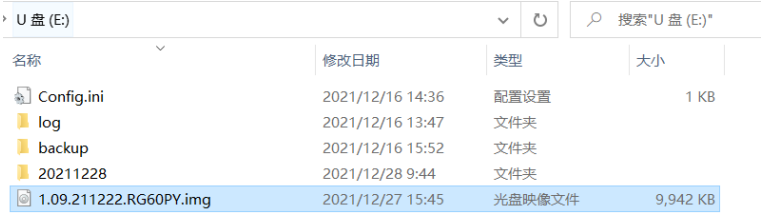
Methods I: WebUI

Clip "Firmware Update-Firmware Update", better to use "Local Update" function. Choose the firmware file you got and upload. G30 will automatically restart after the firmware is installed successfully.



Methods II: USB cable

Connect G30 with your PC by USB to Type-C cable, your computer will automatically read a G30 storage folder. Copy the firmware to this folder and restart the G30 to automatically upgrade the firmware.



Appendix A: G30 Technical Specifications

Configuration		Detailed Indicators
Measurement Performance	Signal Tracking	1 5 9 8 Channels GPS: L1/L1C/L2C/L5 /L2P/ GLONASS: G1/G2/G3 BDS-2: B1I/B2I/B3I BDS-3: B1I/B3I/B1C/B2a/B2b Galileo: E1/E5a/ E5b/ E6C SBAS: L1 QZSS: L1 /L2C/ L5 IRNSS: L5
	GNSS Features	Positioning output rate: 1Hz ~ 20Hz Initialization time: < 10 秒 Initialization reliability: > 99.99%
Positioning precision	Static GNSS Surveying	Horizontal: ±（2.5mm+0.5ppm） Vertical: ±（5mm+0.5ppm）
	Real-Time Kinematic Surveying	Horizontal: ±（8mm+1ppm） Vertical: ±（15mm+1ppm）
Inertial sensing system	IMU	Support
	Tilt Angle	0° ~ 60°
	Tilt compensation accuracy	10 mm + 0.7 mm/°tilt(1.8m pole)
	Electronic bubble	Support
	Thermometer	Support
User interaction	Operating system	Linux
	Buttons	One button operation
	Indicators	Five indicate lights
	Web UI	Support to access Web UI via Wi-Fi and USB
	Voice guide	Support for multiple languages: Chinese, English, Korean, Russian, Portuguese, Spanish, Turkish and user define
Hardware Performance	Dimension	135mm (Diameter)x84mm (Height)
	Weight	910g
	Material	Magnesium aluminum alloy shell

	Temperature	Operating: –25 °C~+65 °C Storage: –35 °C~+80 °C
	Humidity	100% Non-condensing
	Protection	IP68
	Shock	Withstand 2 meters pole drop
Power and Battery	Power Supply	6-28V DC, overvoltage protection
	Battery	Internal Li-on, 6800mAh, 7.2V
Communications	I/O port	5PIN LEMO (External power port + RS232) Type-C port（Charging and data transmission） 1 radio antenna interface Micro SIM card slot
	Wireless modem	Built-in radio, 1W, typically work range: 8KM Frequency Range: 410-470MHz Communication Protocol: SOUTH, Farlink, TrimTalk, Hi-target, HUACE, Satel
	4G	LTE FDD: B1/B3/B5/B7/B8/B20 LTE TDD: B38/B40/B41 WCDMA: B1/B5/B8 GSM: 850/900/1800/1900MHz
	Double Module Bluetooth	Bluetooth 3.0/4.1 Bluetooth 2.1 + EDR standard
	NFC	Support
	WiFi	802.11 b/g standard
	WIFI data link	To work as the datalink that receiver can broadcast and receive differential data via WIFI
Data storage/ Transmission	Data Storage	4GB internal storage, Changeable record interval, up to 20Hz raw data collection
	Data Transmission	USB data transmission, supporting FTP/HTTP data download
	Data Format	Differential data format: CMR, sCMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 GPS output data format: NMEA 0183, PJK plane coordinates, Binary code Network model support: VRS, FKP, MAC, fully support NTRIP protocol

Appendix B: Packing List