



LiBase
GNSS Receiver

Quick Start Manual



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LiBase

GNSS Receiver



Headquartered in Berkeley, California, GVI is a leading innovator of 3D mapping technologies. We provide a wide range of advanced aerial, terrestrial, and mobile LiDAR surveying and mapping hardware systems, as well as cutting-edge software and service solutions. By partnering with the industry's most innovative companies, such as Reigl, Velodyne, and DJI Livox, we strive to bring to our customers the most effective products that will get the job done.

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■ Introduction

Thank you for reading the "LiBase GNSS Receiver Quick Start Manual" by GreenValley International. This manual mainly describes the receiver's product functions, software operations, precautions and solutions to common faults.

Technical Support

From the date of purchase of LiBase products, users will enjoy the technical services and upgrade policies provided by GreenValley International inc.

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Users can learn about the latest developments of GreenValley International products and download technical information about the products on the website.

Complaints and Suggestions

Regarding any suggestions and complaints regarding this manual or products, please contact our service hotline or one of our technical support team at info@greenvalleyintl.com.

User Notice

- Before using this product, please read all the provided user information carefully to understand the usage and precautions of this product.
- In the process of outdoor installation of GNSS equipment, the GNSS host

■ Introduction

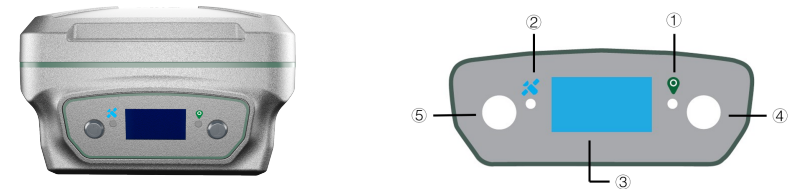
should pay attention to waterproof treatment, and the GNSS receiver must be placed in the outdoor open-air and open environment when using or testing.

- Be careful not to drop the product on the ground or take any strong direct shocks.
- Do not plug or unplug any connecting cables such as serial ports when the power is turned on.
- Please connect your device strictly according to the requirements stated in the manual. For cables such as seven-core data cables, you need to pinch the root of the plug and gently plug it in and pull it out.
- When supplying power to this product (system), pay attention to the power supply requirements of the equipment.
- The transmitting station may overheat during long periods of usage. Please be careful to avoid burns. In addition, you must avoid or reduce unnecessary coverings on the surface of the station, and maintain a good ventilation environment.
- When using the transmitting station for a long time, personnel should keep a distance of more than 2 meters from the transmitting antenna to avoid radiation.
- When the antenna is installed outdoors, users should take appropriate lightning protection measures to prevent lightning strikes.
- Please do not continue to use the connected cables after they are damaged. Please purchase and replace the new cables in time to avoid unnecessary damage and affect the use effect.
- If the equipment is damaged due to force (lightning strike, high voltage, collision), it no longer belongs to the scope of our company's free maintenance policies.
- Please do not disassemble the casing of this product by yourself, otherwise, the warranty will not be granted.

■ Product Introductions

1.1 Receiver Details

Familiarity with the functions of the buttons on the receiver panel and the meanings of the indicator lights are of great help for the correct use of the equipment and can greatly improve the efficiency of project implementation.



LiBase GNSS Receiver

| Part | Indication/Function |
|----------------------|---|
| ① Differential light | In RTK mode, the differential data is sent and received, and the orange differential signal light flashes once per second. |
| ② Satellite light | flashing quickly when searching for satellites; when N satellites are found, the green LED light flashes N times every 5 seconds; |
| ③ Display panel | First page: The left side of the first row displays the receiver status, and the receiver is configured through the panel or the handbook, and the receiver displays the status; the right side of the first row displays the WIFI and 4G status; WIFI off/on, 4G signal strength; |

| Part | Indication/Function |
|-----------------|--|
| ③ Display panel | <p>The second line shows the number of satellites, the left is the number of satellites involved in the current workflow, and the right is the number of tracking satellites; The left side of the third row displays the PDOP satellite position accuracy value, the right side displays the DC power supply icon, and the icon does not display if there is no DC power supply; The fourth line shows the battery status of battery A and battery B; The second page: When configuring the receiver through the panel or configuring the receiver in different modes, the data link, communication protocol, mode, and frequency display status; page three: Smart base station, radio configuration, clear memory, static switching, WIFI control, language selection, power-on auto-start configuration, restore factory settings and exit settings and other functions.</p> |
| ④ Function key | <p>Press the FN key to perform the page-turning operation of the LED display panel.</p> |
| ⑤ Power button | <p>Press this button to switch on or off the machine or to confirm a function; Press this button to turn on the power in the off state, all the lights will be on, and they will turn off after the self-test is completed; In the power-on state, press and hold this button for 4 seconds to turn off, the display indicates "shutdown", and the buzzer continues to sound.</p> |

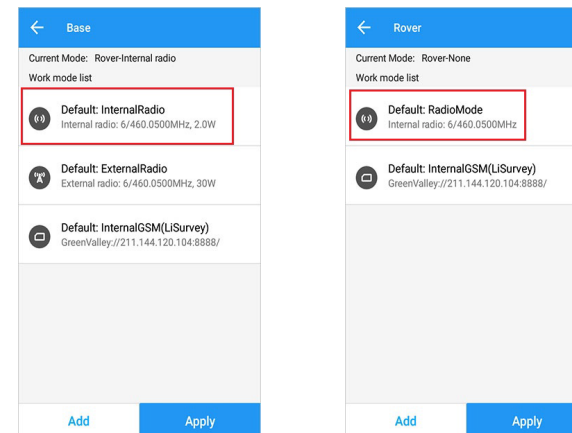
2.1 Receiver Connection

(Device) → (Connect Device) → (Target Device), start searching for the target device, select the device to be connected, and connect the device successfully.

2.2 Mode Settings

2.2.1 Built-in Radio Mode

- 1 Connect the handbook to the LiBase receiver, click (Base Station), select default: use the built-in radio to start the base station, enable, after the base station is successfully enabled, the status is displayed as the base station.
- 2 Connect the handbook to the rover receiver, click (Rover), select the default: radio receiver differential, and enable.



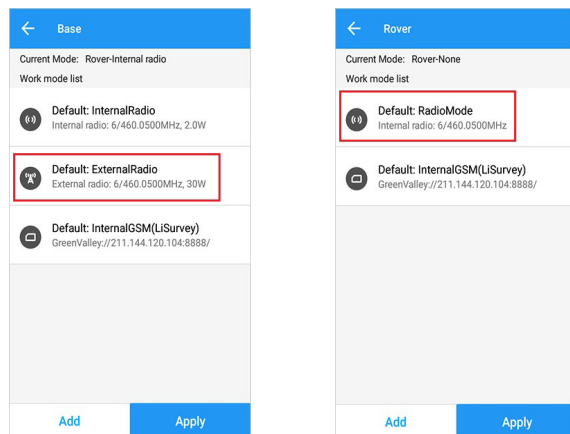
The frequency set in the default mode is 460.050MHz. If there is no other

base station around to use this frequency, you can choose the above short-cut operation.

If you want to change the frequency of the base station for transmission, select (Add) in the lower-left corner to add the mode, and set the built-in radio mode parameters by modifying the channel. After the setting is completed, (Save), customize the mode name, and click (Enable). It should be noted that the mobile station also needs to add the corresponding startup mode, and the parameter settings such as the protocol frequency must be consistent with the base station.

2.2.2 External Radio Mode

- 1 Connect the handbook to the LiBase receiver, click (Base Station), select default: use an external radio to start the base station, enable, after the base station is successfully activated, the status is displayed as the base station.
- 2 Connect the handbook to the rover receiver, click (Rover), select the default: radio receiver differential, and enable.



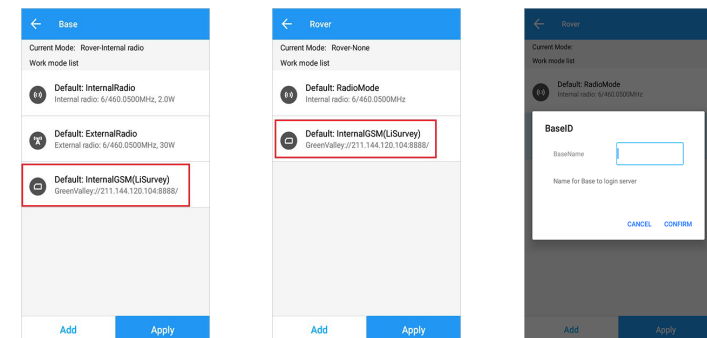
The frequency set in the default mode is 460.050MHz. If you need to modify the transmission frequency of the external radio, you can change it on the external radio. After modification, the mobile station selects the corresponding channel to receive the difference.

CDL plug-in radio "channel-frequency comparison table"

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---------|----------------|---------|----------------|
| Custom | Custom | 5 | 459.05 |
| 1 | 455.05 | 6 | 460.05 |
| 2 | 456.05 | 7 | 461.05 |
| 3 | 457.05 | 8 | 462.05 |
| 4 | 458.05 | 9 | 463.05 |

2.2.3 Host Network Mode

- 1 Connect the handbook to the LiBase receiver, click (Base Station), select Default: Receiver network service difference, enable, after the base station is successfully enabled, the status is displayed as the base station.
- 2 Connect the handbook to the rover receiver, click (Rover), select the default: receiver network service difference, enable, and the base station name fills in the SN number of the base station receiver.

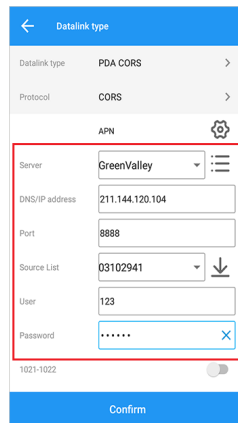


Receiver Connection and Mode Settings 02

The host network mode (network 1+1 mode) requires a built-in SIM card, the default IP address is 211.144.120.104, the port is 8888, the source list is the receiver SN number (such as XXXXXXXX), and the APN is CMNET.

2.2.4 CORS Mode

Connect the handbook to the LiBase receiver, click (Mobile Station), customize the add mode, click the (Add) button in the lower-left corner, select the host network or the handbook network for the data link, select CORS in the communication mode, enter the server name, domain name /IP address, and port. Click the 'Get' button on the far right of the source list to get the desired source list, enter the user name and password, save the mode, and start.

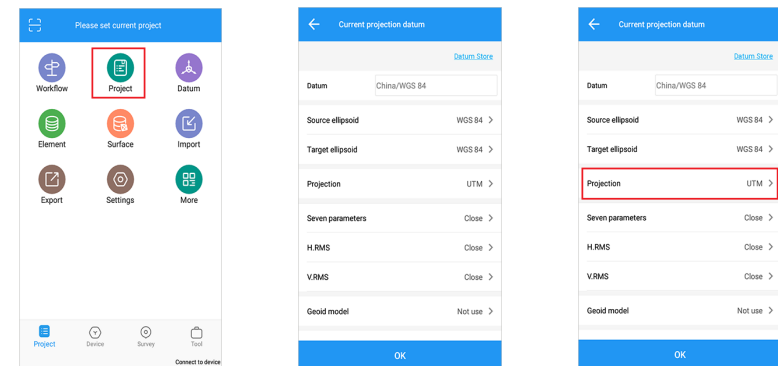


This mode needs to use the network, the SIM card is inserted in the LiBase receiver, and the data link selects the host network; when the SIM card is inserted in the handbook or the handbook is connected to WIFI, the handbook network is selected.

New Project 03

(Project) → (Project Management), click the "+" below to create, enter the project name → select the coordinate system, obtain or enter the local central meridian in the projection, and confirm.

The transverse Mercator projection is the Gauss-Krüger projection, and the universal transverse Mercator projection is the UTM projection.



Functional Usage 04

4.1 Parameter Calculation

Under normal working conditions, it is necessary to select control points in the measurement area for parameter calculation and coordinate system parameter conversion and then perform measurement operations.

The following are the control point requirements for parameter calculation:

- 1 The control points are generally required to be at least 3, and they are evenly distributed inside the survey area;

2 When there are only two control points, it is necessary to simply evaluate the correctness of the coordinates of the control points through the scale factor ($0.9999 < \text{scale factor} < 1.0001$).

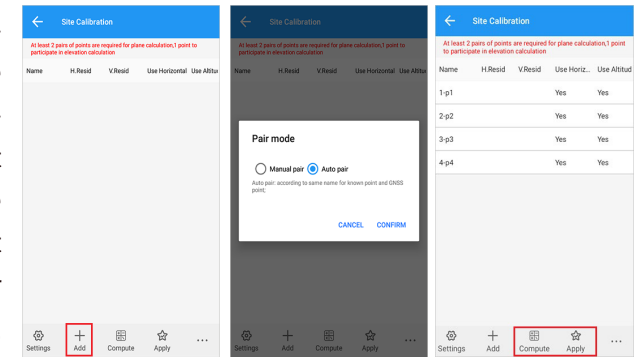
The parameter calculation operation is as follows:

① Input control point coordinates: (Project) → (Coordinate Point Library) → click “+” in the lower right corner → (Type in) → point name, code (optional), check control point for attribute type, and coordinate type as local plane coordinates → Enter the coordinates of the three control points in sequence → OK. After the coordinates are input, a detailed check must be done to avoid input errors and subsequent conversion problems.

② Collect the coordinates of the control point: on the (Survey) → (Point Survey) interface, click the button to collect the coordinates, and pay attention to keeping the rod height consistent with the actual one.

③ ((Tools) → (Parameter Calculation), click Add in the lower right corner, select manual pairing, select the corresponding control point from the (Control Point) library (the known control point entered in the point library before) or directly input, (GNSS Point). Select the point measured on the known control point from the library, select the horizontal and vertical for the (Correction method), and add the control point data cyclically according to this method. Click (Settings), and the coordinate conversion method can choose plane correction + elevation fitting, seven parameters or seven parameters + plane correction + elevation fitting. Elevation fitting method is selected automatically, (OK). Click (Calculate) to view the horizontal residual (the residual should be within 2 cm), and click (Apply) after

the accuracy meets the requirements. If automatic pairing is selected, the GNSS point name measured on the control point needs to be saved the same as the control point name. After the parameter calculation is completed, the job can be performed.

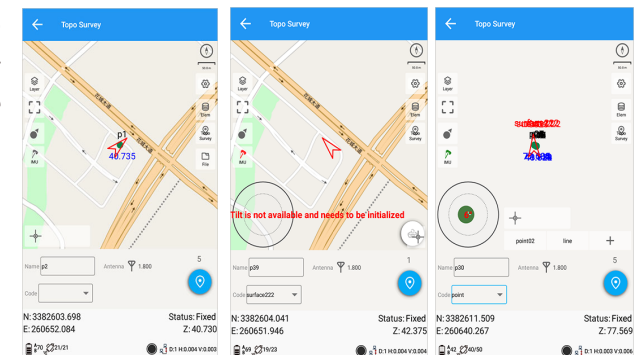


4.2 Point Survey

① (Survey) → (Point Survey) interface, modify the rod height to be consistent with the actual one, and the bubble can be centered to measure.

② If you want to perform tilt measurement, click the tilt icon on the (point survey) interface to enable the tilt measurement function. At this time, it will prompt the tilt measurement initialization. Follow the instructions on the handbook interface to initialize. After the prompt is completed, the tilt icon will change from red to green. Inclination measurement can be performed.

③ After the measurement, the data will be automatically saved in the coordinate point library.



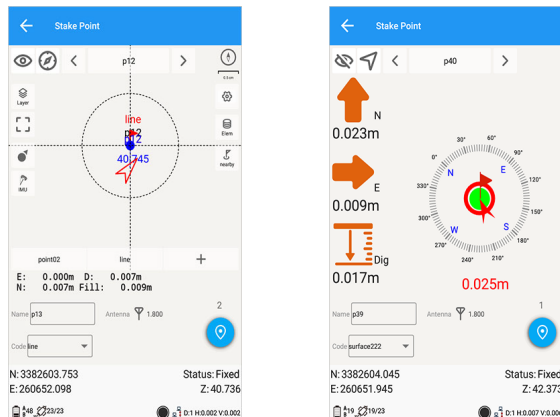
Note:

- ① Before initialization of tilt compensation, it is necessary to set the rod height value consistent with the actual value;
- ② During initialization, it is necessary to keep the bottom position of the centering rod unchanged during the front and rear shaking process; Do not turn the instrument too fast when using tilt-compensated measurement, otherwise it may need to be re-initialized.

4.3 Stakeout

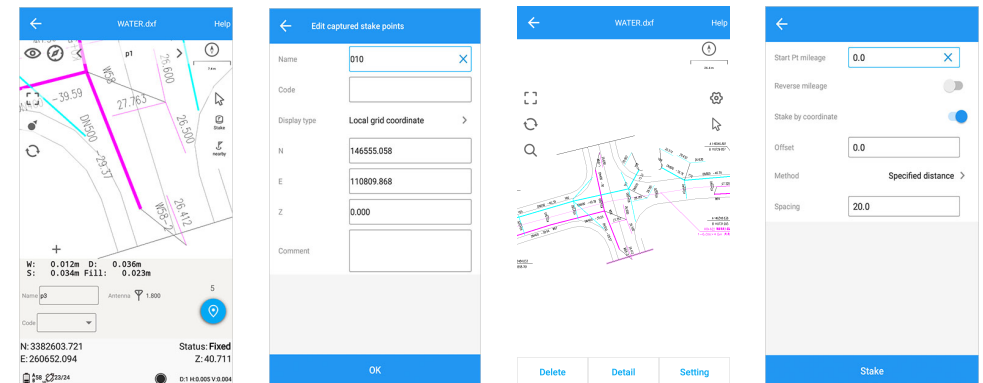
(Survey) → (Point Stake), enter the coordinate point library, click the "..." in the lower right corner, you can choose to add or import the coordinates of the stakeout point, then select the point you want to stake out, and click (Stakeout) to start stakeout.

If you need to modify the display method of the prompt data, you can click the setting button in the upper right corner to modify it. For example, the distance prompt can be east-west, north-south or front-back, left-right, and the elevation can be positive or negative or fill and dig.



4.4 CAD Stake

(Survey) → (CAD Stake), click "Import Drawing" at the bottom of the screen to select the desired CAD drawing, the file type is dxf or dwg format. After opening the diagram, click the point selection staking symbol in the upper right corner, select a point to be staked in the diagram, and the coordinate information of the point will pop up. After clicking OK, the point can be staked. Select a line in the figure, click the stakeout setting in the lower right corner to set the starting point mileage of the line and the offset distance, calculation method, and interval of stake-by-pile coordinate stakeout. After clicking stakeout, you can stake out the line.

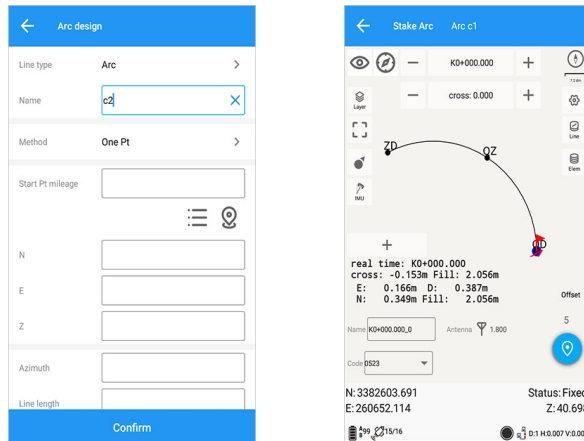


4.5 Curve Stake

(Survey) → (Curve), enter the curve library, click "+" in the lower right corner to add, enter the curve design interface, select the line type, and enter the curve name and related parameters. Taking the one-point method as an example, input the starting point mileage, input or measure the starting point coordinates, input the azimuth, line length, radius, and deflection, and click OK to set out.

■ Functional Usage

04



4.6 Data Import

(Project) → (Data Import) → Select the file format and point type, and select the desired file according to the path (the selected file format must be consistent with the actual file).

4.7 Data Export

(Project) → (Data Export) → Select the exported data format, filter the exported point type and acquisition time, enter the file name, select the save path, and click OK. It can be exported in CSV, txt, and dat formats. To export detailed data information or other formats, you need to select a format from "More Formats" for data export.

■ LiBase Receiver Recalibration 05

Under normal operation modes, recalibration is required when these two situations occur:

- 1 The base station has been re-erected or the tripod has been moved artificially;
- 2 Base station receiver restart.

After setting the mobile station to the fixed solution state, enter (Base Station recalibration), collect a GNSS point at the control point through point measurement (i.e., collect coordinates at known control points), Then select (Known Point) (or input the known coordinates of the control point) → (Calculate) → (Apply).

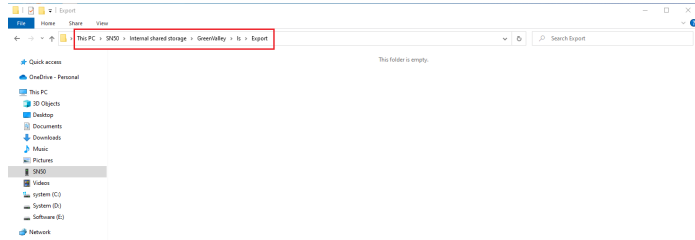
After the operation is completed, other control points must be retested. The measured coordinates are consistent with the known coordinates, indicating that the base station is successfully calibrated, and the measurement and stakeout work can be continued.

■ Data Transmission 06

Connect the LP1 handbook from GreenValley to the computer with the matching data cable, after the drop-down at the top of the handbook selects the "transfer file" method. The LP1 storage drive letter will appear on the computer interface. The measurement data path is GreenValley/ls/Export. The measurement task path is GreenValley/ls/Project.

■ Data Transmission

06



■ LiBase Receiver Registration

07

7.1 Expiration Reminder

If a permanent registration code for the receiver has not been entered or the temporary registration code has expired, when the Bluetooth connection to the receiver is successful, there will be a prompt message "RTK function expired". After the expiration date, the receiver will not be able to operate.

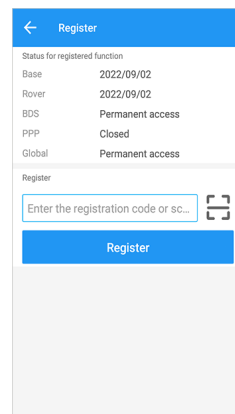
7.2 Contact Sales

Check the SN code of the RTK receiver device and contact sales.

7.3 Device Registration

Click [Device] → [Registration Information] → enter the registration code into the registration code box → click [Register] → restart the receiver and the registration is complete. You can also scan the QR code through this interface to register.

The registration code is generally in the form of a string or a two-dimensional code. The string is a group of 10-digit characters, such as 2259639206-2544851768-1170751387.



■ Common Faults and Disposing Method

| Fault | Indication/Function |
|--|--|
| Abnormal display on CDL external radio: E01 means the power supply voltage is too high; E02 means the power supply voltage is too low; E03 indicates that the configuration parameters are missing. | When the voltage is too low, it must be charged before use; When the parameters are lost, you can use the CRU software to reset them through the serial port. |
| LiBase station receiver restarts repeatedly. | The battery power is low, it can be used normally after charging. |
| The differential light does not light up after the base station is started. | Check whether the host registration code has expired. If it has expired, please contact the distributor to apply for the registration code. |
| When working in network 1+1 mode, the "fixed" state of the mobile station is unstable. | Check the local mobile phone signal strength, if the signal is not good, you can change to the built-in radio or external radio mode to work. |
| Other anomalies whose cause cannot be determined | Please contact one of the technicians of GreenValley for processing. |

■ Warranty Card

Commitment Warranty:

The main operating system of LiBase is guaranteed for 1 year, and the supporting accessories are guaranteed for 3 months.

In the event of replacement within the warranty period, the original product warranty period shall be followed.

For recalls due to product batch quality problems, the warranty period will be recalculated.

If the product requires paid repair or replacement services, the warranty period shall be recalculated for the repair/replacement part.

Disclaimer:

Improper use by the user, man-made damage, or unauthorized disassembly is not covered by the warranty.

Product failures caused by external forces such as environmental disasters are not covered by the warranty.

Environmental Tips:

After the product and accessories are invalid, please hand them over to a qualified waste recycling organization for disposal.