

C515 User Guide

C515 GNSS Receiver Quick Guide

JPS surveying and mapping

Keep this manual safe for reference and future maintenance

1、GNSS Receiver

1.1 C515 Description



Indicator Lights

Power On/Off

TNC Interface

SIM Card Slot



Height-measurement Line

Charging Ports (type-C)

1.2 Indicator Light

Indicators	color	Description
Power	green&red	Green light on: power 30%-100% Green light flashing: power 10%-30% Red light flashing: power < 10% Red light on: charging
Satellite	green&red	Light off: no stars found Red light flashing: few stars found without positioning Green light flashing: effective positioning but don't get fixed
Data link	green&red	Green light flashing: data transmission Red light flashing: recording static Red and green lights flash alternately: record static and transmit data Green light on: fixed Red light on: GNSS mainboard abnormal
Bluetooth	blue	Light off: no connection Light on: being connected Flashing: being connected and downloading differential data

1.3 Self-test Function

The self-test is used to examine whether each module of the receiver is working healthily. When the instrument is working abnormally, you can use the self-test function to test the receiver.

Operating instruction:

Two short press plus a long press until a long beep sound is heard, the instrument will begin the self-test process. If there is nothing wrong with the machine, there will be two short beep as a reminder, otherwise, the warning alarm will sound for a longer period of time.

2. Rocky G6



2.1 Red Positioning Button

- a. Turn on the Geofind: You can directly turn on the Geofind by pressing the red button when the controller is powered on;
- b. Measuring: When the Geofind is in the survey or stakeout interface, press the red button to collect and store the data. (1st press for gathering data, 2nd press for confirming the storage coordinates.)

2.2 Dat Button

- a. Show point database. The Dat button is connected to the point database when doing survey or stakeout work. The Dat button coordinated with the red positioning button makes possible a fast and direct interaction between measuring and stakeout work.
- b. Open the output folder. Press the Dat button can get quick access to the data output folder once the user logs out the Geofind.

2.3 Fn Button

The Fn button is used to switch the working mode of the key 2,4,6,8: Direction control mode / Digital mode. When the Fn button is activated, there will be a start prompt at the top of the controller.

3、 Guide For Outdoor Surveying

The following instructions are easy-to-follow tips for new surveyors. For detailed guidance, please read the user manuals. (Note: The manuals can be downloaded on the official website: alpha-surveying.com)

3.1 General Working Process Of Base & Rover:

- (1) Set up the base.
- (2) Open the controller and Geofind, connect them to the base station in a new project and set the parameters of the coordinate system and base station for sending differential data.
- (3) Connect the controller to the rover and prepare it for receiving differential signals from the base and getting the fixed solution.
- (4) Move the rover to a certain place in the measurement area to find out the original coordinates of the place. Calculate and apply the transfer parameters.

(5) Go to another known point to check whether the coordinates are right after coordinate transformation.

(6) Start the work.

*If the start-up coordinate or the position of the base station change, you need to perform a maker point calibration process.

(7) Finish the work and export the data file as required.

3.2 Detailed operation instructions of RTK:

3.2.1 Set up the base

Set up the base, and install the UHF antenna when using the radio mode. Press the power button to turn on the receiver, and wait for the base to target the satellite.

When the controller is connected to the reference station, click [Device]-[Base] to select the configuration set required in the measurement work.

UHF1(Base)

Base ID:01	Diff Mode:RTCM3.2
Single Point	Disable PPK
Internal Radio	Protocol:TrimMask III
Power:High	Frequency:438.125

network(Base)

Base ID:01	Diff Mode:RTCM3.2
Single Point	Disable PPK
Device Internet	Connect Mode:NTRIP
IP:122.13.16.137	Server Port:6060
Base access point:A02423102344571	

Requirements of the place you set up the base :

- a. Cut-off angle larger than 15 degrees; Open area without large obstructions.
- b. No electromagnetic interference(No microwave stations, radar stations, or cell phone tower within 200 meters; And no power lines within 50 meters.)
- c. Base station should be set up in higher places. There should be no large obstructions between the base and the rover or the differential data transmission distance would be shorter.

*Normally, it is recommended to set up the base stations in open areas or on the top of high buildings.

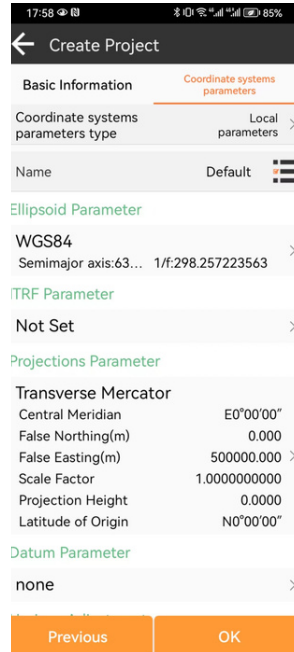
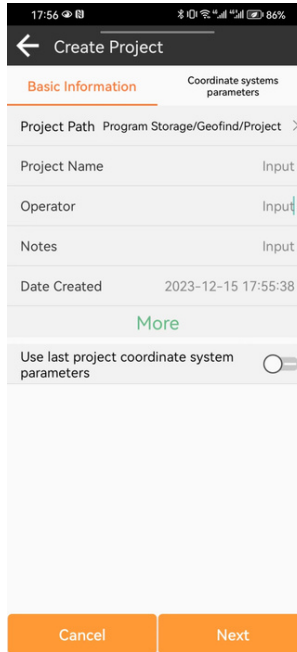


*E.g. Base station set at the top of a building

3.2.2 Create A New Project

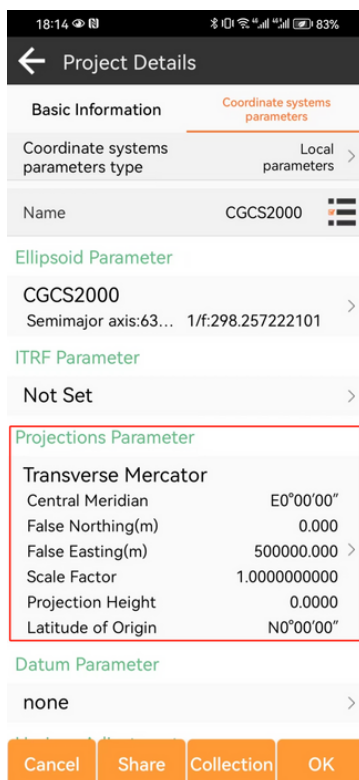
Open the Geofind, select [Project]-[Project manager]-[New] and then name the new project;

Select the coordinate system in the “Coordinate systems parameters” to confirm the new project in the new interface.



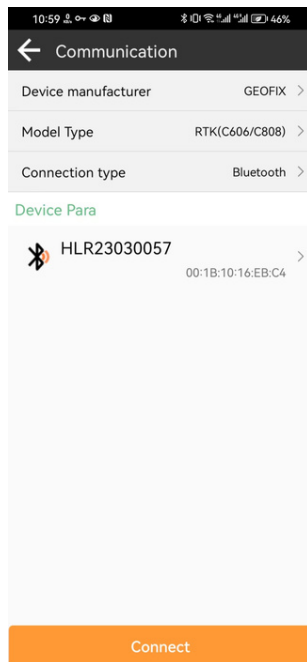
Click the Projection Parameter button to get the local central meridian in the Projection interface of the Coordinate system setting.

Then go back and click [OK] to keep the settings.



3.2.3 Connection Between Controller And Receiver

Click [Device]-[Connect], then search for corresponding serial number to connect the receiver.

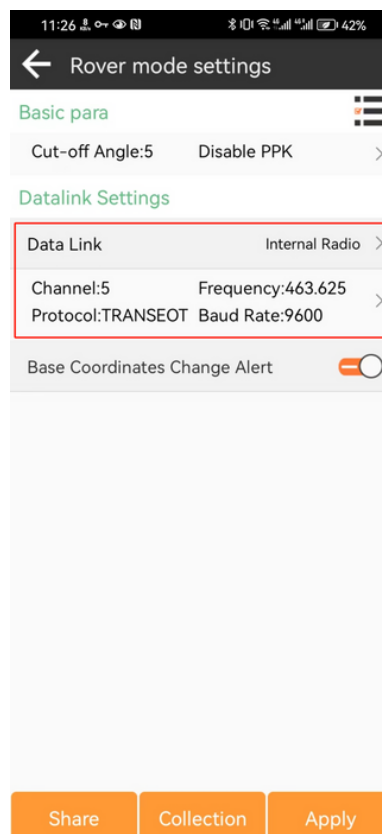


- ① Click [Device Para]
- ② Choose the corresponding Geofix device.
- ③ Click [device name] to connect the instrument

3.2.4 Setting Rover Mode

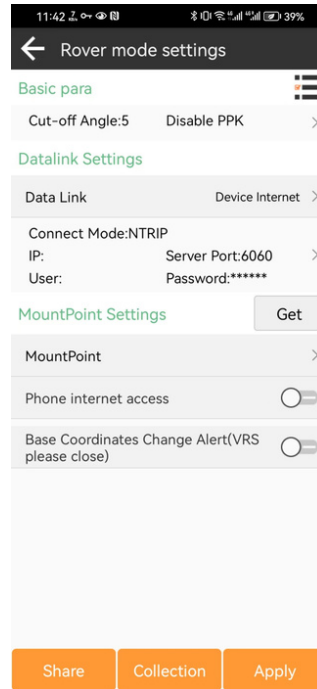
After bluetooth connectivity, click [Device]- [Rover Mode]. The settings are as follows according to the datalink mode:

【Built-in Radio】 click [Rover]- [Data Link:Internal Radio], Click [Apply] to open the built-in radio. After setting, the data link indicator light on the receiver flashes once per second, indicates that differential data is received normally.

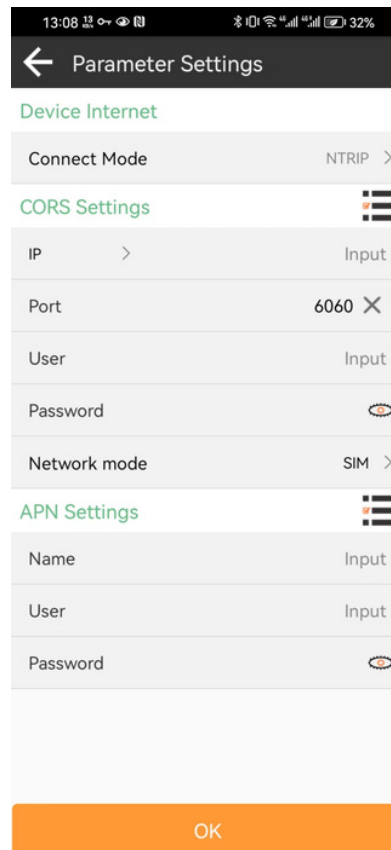


【Network of the instrument】

The mode is connected to the Internet by the Device Internet. As for the data link, select the Device Internet, connection mode



As for the CORS setting, provider choose “custom”- type the right IP address and ports, username and password first and then click [GET MOUNT Setting] to connect to the network. Pick the correct mount point and click [Apply] to begin using the network. Wait for the initialization process of the rover. The datalink light on the receiver is green and flashes once per second, indicating that the receiver is able to receive differential



【Network of the phone】 Insert the SIM card into the phone, and select PHONE Internet in the data link, the same way as setting network for the instrument. In general, when the rover gets differential solution and fixed solutions successfully, it is suggested that the rover has been set up.

3.2.5 Calculating Transformation Parameters

Taking four parameters as an example, the operational steps are as follows::

- 1、 Get fixed solution by setting the mobile station properly. Click [Survey]- [Point survey] to get the coordinates of two known controlling points.



Looking for the two already-known control points



Measuring the point to get its coordinates

- 2、 Click [Project]-[Localization]-[Add] (bottom left) and input the coordinates of the control point and the measuring point.

3.2.6 Data Exporting

When the measuring work is finished, the results can be exported in the format that caters to the needs of the surveyor by clicking [project]-[export data]. The export process is as follows.

a. Connecting the controller to a computer by Type-C cable. Set USB computer connection to MTP mode. The computer will read the U disk mode in the controller, open and copy the recorded results on the computer.

Note: Users need to export the results from the app to the controller before connecting the controller to a computer by USB.

b. When the recorded results have been exported to the controller, a share prompt will show up for users to send the results to a computer by wireless methods through WeChat, QQ, or Bluetooth.

The screenshot displays the 'Export data' screen of an application. At the top, the status bar shows the time 17:50 and 85% battery. The title bar contains a back arrow and the text 'Export data'. Below the title bar, there are two rows of configuration options: 'Export Path' set to 'Program Storage/Geofind/Export' and 'File Name' set to 'Project ame' with an 'Input' button. A green heading 'Choose Export File Format' is followed by a selection for 'Cass format(dat)' with a sub-label 'Point Name,Code,Easting,Northing,Elevation'. Another green heading 'Export Para' is followed by 'Distance Unit' set to 'Meter'. Under 'Point Type', there is a 'Select All' checkbox and four individual checkboxes for 'Survey Point', 'Control Point', 'Input Point', and 'Calculate Point', all of which are checked. A 'Time' section has an 'Enabled' checkbox which is unchecked. Below this, 'Start Time' is '2023-12-18 00:00:00' and 'End Time' is '2023-12-18 23:59:59'. At the bottom, there is a large orange button labeled 'Export'.

3.2.7 Point calibration

When the startup coordinates or position of the base station has changed, users have to find a known measuring point in the original measuring area for calibration if they still employ the original transformation parameters.

4、 Tilt compensation

C515 with the inertial navigation system is able to offer accurate inertial measurement in real-time even in the condition of high inclination or in highly dynamic situations.

4.1 Turn on/off the tilt compensation

When the rover gets the fixed solution, the measurement or stakeout interface will display a turn on/off button. You can press the button to turn on/off the function.

When the system is on, complete the initialization process according to the pop-ups.

4.2 Initialization of the INS

The inertial navigation system for measuring needs to be reset or initialized when it encounters situations such as inversion or intense shaking. You can complete the initialization process following the pop-ups

