GR-9028

User's Guide

Ver. 0.1

Revision History

Ver.	Date	Description
0.1	Jul. 14th, 2023	Draft for reference purpose only

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1 Overview

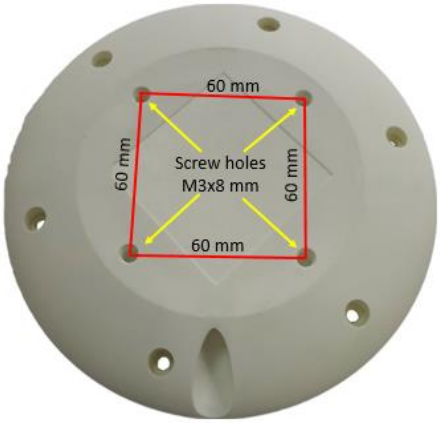
1.1 Product Configuration

Basic GR-9028 includes a disk body and a control cable, GR-9028E.

- The control cable is by default 70cm long. The cable length is customizable with MOQ.
  - The button is used to control power ON/OFF.
  - The USB type C connector is used for charging.

1.2 Fixing Screw Holes

At the bottom of the GR-9028 disk, there are four screw holes of M3x8 (mm). These four screw holes are located at the four corners of a rectangle with edge length of 60 mm as shown below.



One can attach a tripod, a selfie stick, or anything else via these 4 screw holes with screws of size M3x8.

For example, one option of pedestal with four magnets at the feet is attached to the

disk with 4 M3x8 screws, GR-9028Q, as shown above.

For base setup, it's convenient to further attach GR-9028Q to a tripod for stable

positioning as shown above.

Another example shown below is to attach a selfie stick to the disk of GR-9028E via a metal plate.

1.3 Power ON/OFF

At the end of the cable, there is a button for power control.

- When power is OFF, touch the button, LED blinks to indicate power ON.
- Hold the button (for about 3 seconds), LED would be OFF to indicate power OFF.

☛ Please be noted that it won't power off automatically if the BLE connection was lost.

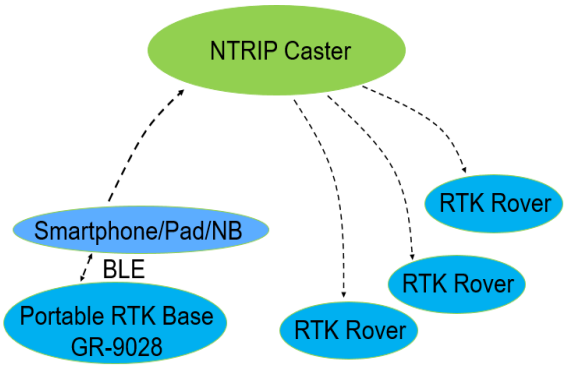
1.4 Charging

A USB type C cable is used for charging. The amber LED is ON during charging and goes OFF when charging is done.

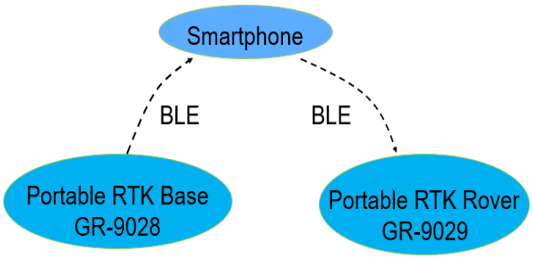
1.5 RTCM

Applications running on devices like smartphones, pads, tablets, notebooks etc. could communicate with GR-9028 via BLE to get the RTCM correction data. Depending on demand, budget, and application environment limit, devices could then send the data either to their own SNIP caster, a free NTRIP caster such as RTK2go, or forward the correction data directly to its rover partner, GR-9029.

- Forward RTCM messages to a caster via internet



- Forward RTCM messages to a rover, say GR-9029, via BLE connection.



RTCM 3.3 is supported with following messages.

1005 (Stationary RTK reference station ARP)
1074 (GPS MSM4)
1077 (GPS MSM7)
1084 (GLONASS MSM4)
1087 (GLONASS MSM7)
1094 (Galileo MSM4)
1097 (Galileo MSM7)
1124 (BeiDou MSM4)
1127 (BeiDou MSM7)
1230 (GLONASS code-phase biases)

Please be noted that MSM7 is enabled while MSM4 is not.

1.6 Portability

In case of forwarding RTCM data to the RTK2go SNIP caster, our test shows GR-9028 could be normally setup at locations far away using the same mount point. Nearby rovers could fix quickly as usual. The location of GR-9028 is supposed not to be an issue. It is really portable and RTK operations could be performed at the desired location.

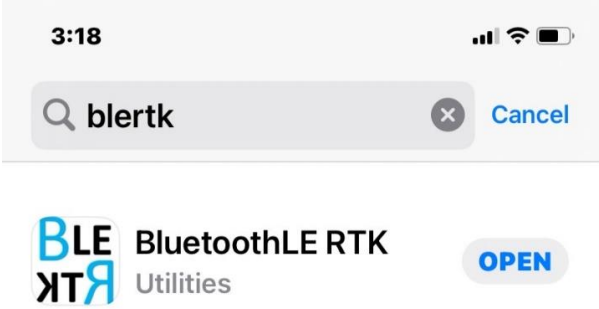
For example, a GR-9028 registered to rtk2go in Taiwan, see picture left below, and then brought to Japan. It worked smoothly as soon as it was powered on, see picture right below.

2 BLE RTK APP

2.1 Where is the APP

APP BLERTK for both iOS and Android are available for RTK base configuration. Devices running this APP could communicate with GR-9028 via BLE to configure it as a local base, receive the RTCM RTK correction data, and forward it to a caster or a rover.

- Download BLERTK from **APP Store** for iOS devices.



- Download BLERTK from **Google Play** for Android devices.

2.2 APP Overview

After downloading BLERTK, open it and one can see screen similar to following screenshot.

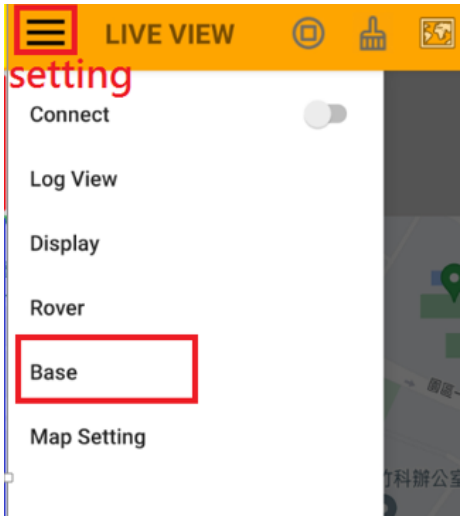
The yellow rectangle includes function buttons. For base configuration, just the setting button is used.

The red rectangle shows base and/or rover related information.

The blue rectangle is a map near you.

2.3 Base Configuration

To configure the base, click on the setting button, one could see following functions.



- Set BASE first
- Connect after BASE setting is done

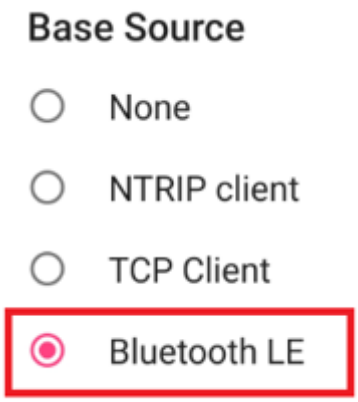
There are four settings for base configuration.

- Base Source
- Stream Settings
- Output Type
- Output Stream Settings

2.3.1 Base Source

The Base Source option allows one to select the RTCM data source.

- None, if there would be no RTCM data input.
- NTRIP client, acting as a NTRIP client to receive RTCM data from a server.
- TCP client, if RTCM data is from special TCP source, such as by RTKLIB.
- **Bluetooth LE, choose this one for GR-9028**.

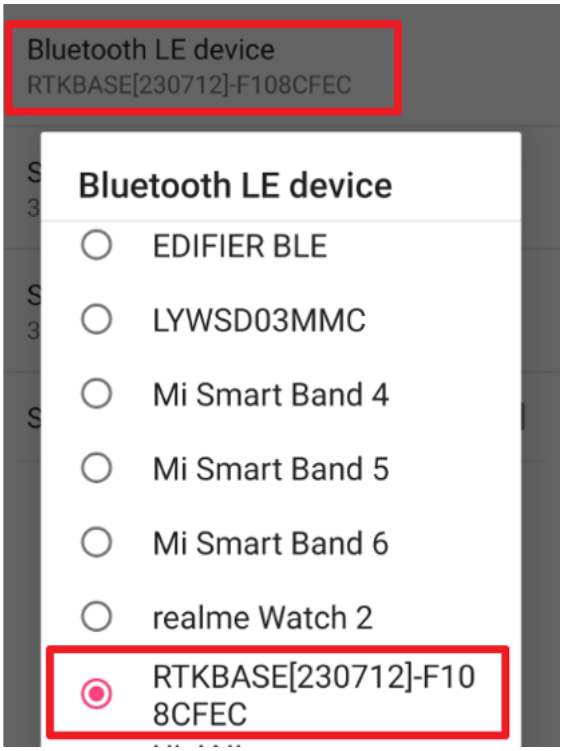


2.3.2 Stream Settings

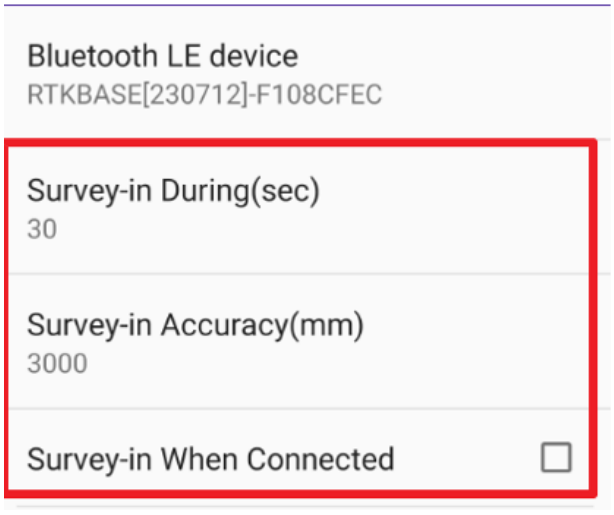
Stream Setting allows one to

- Select the BLE of GR-9028 from lots of neighboring BT devices

  Its name is started with **RTKBASE** as shown below.



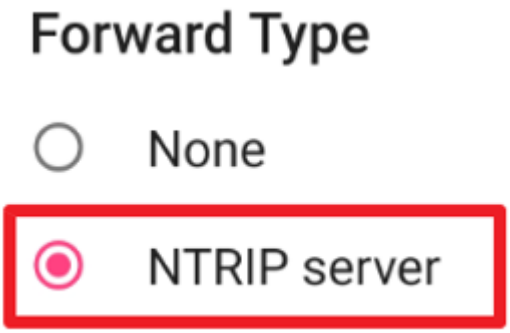
- Survey-in criteria
  - timeout period, e.g. 30 sec, means > 30 sec
  - accuracy, e.g. 3000 mm, means < 3000 mm
  - Criteria is met only when both conditions are met.
- Save current survey-in condition to GR-9028 for next survey-in.



2.3.3 Output Type

To determine if an outside forwarding is necessary.

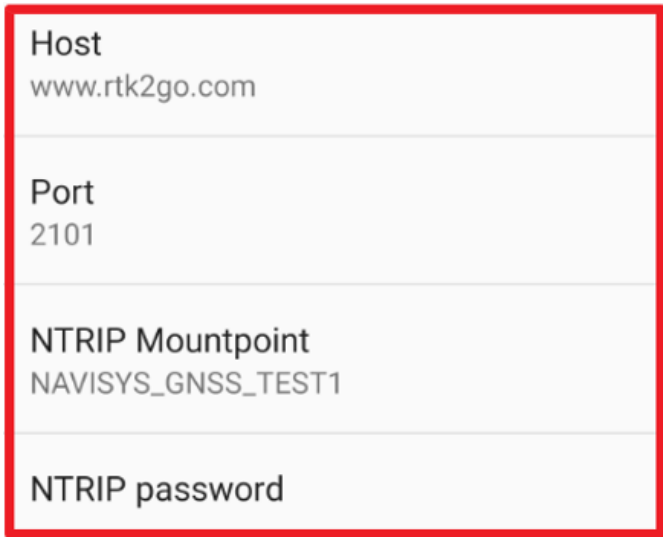
- None, when sending RTCM to GR-9029 via BLE only
- **NTRIP server, when forward to an external caster**



2.3.4 Output Stream Settings

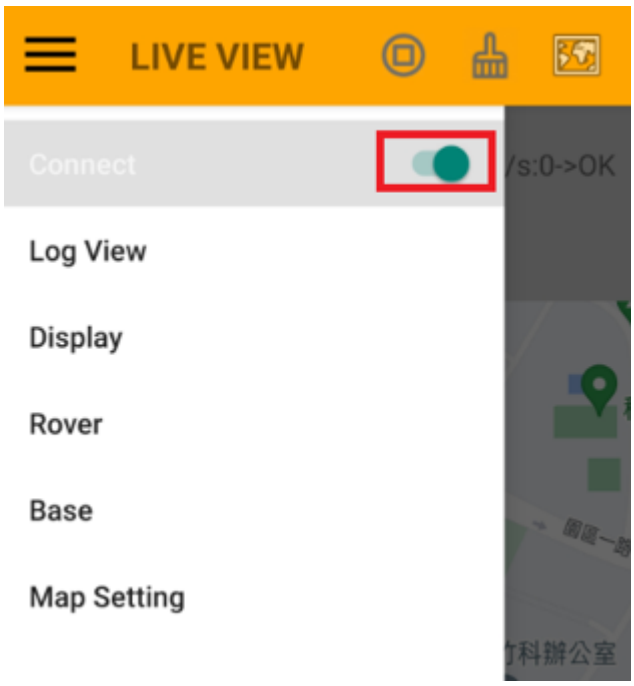
Before this setting, please visit caster, say Rtk2go, to register a mount point for GR-9028. After that, one can do the setting.

Here is an example.

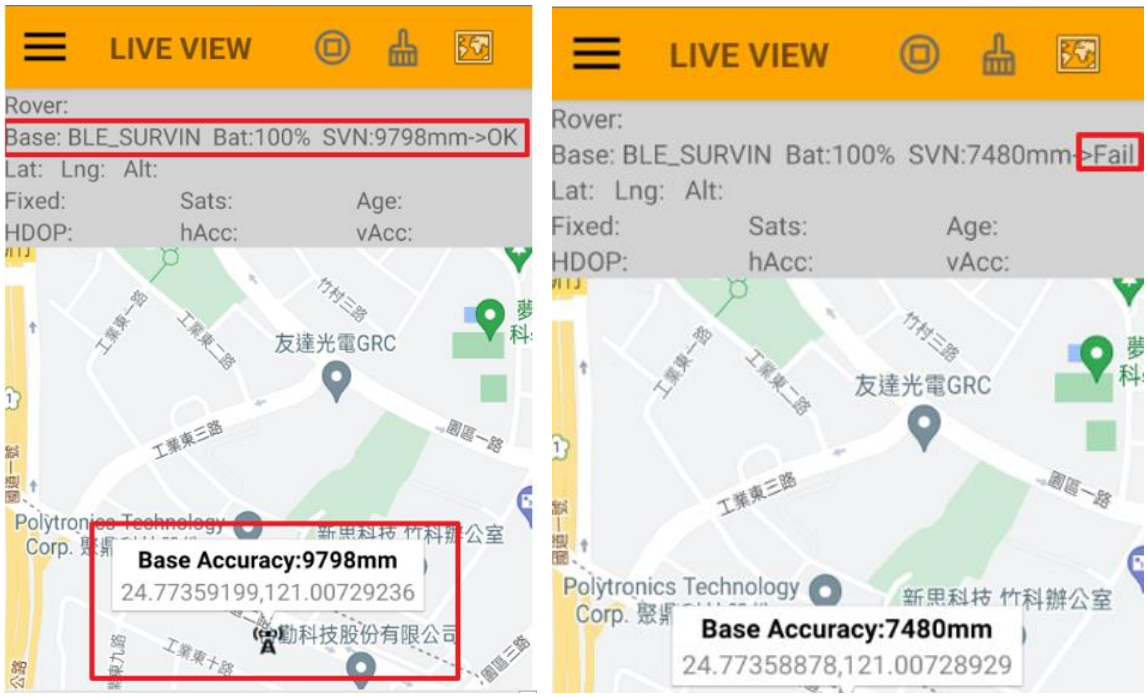


2.4 Connect

After NTRIP setting is done. Go back to main setting function. Click on , choose first option to connect to the specified caster and GR-9028.



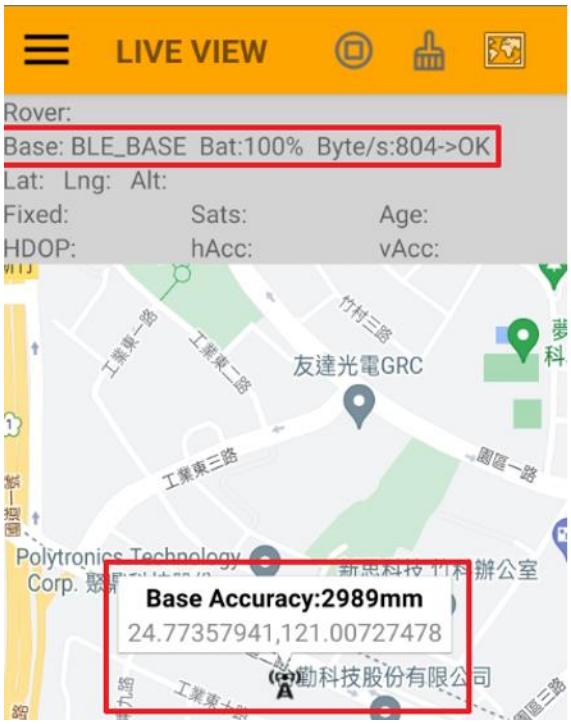
At the Base line of following screenshot, one can see it's under survey-in, current accuracy is 9798mm. OK means caster connection is ok. Otherwise, it would be Fail.



Survey-in done

When the survey-in condition was met, the Base line message changes and final accuracy, latitude, longitude as shown below.

- Bat: is the battery level of GR-9028.
- Byte/s is the data rate sending to the caster.


LIVE VIEW
Rover:
Base: BLE_BASE Bat:100% Byte/s:804->OK
Lat: Lng: Alt:
Fixed: Sats: Age:
HDOP: hAcc: vAcc:
友達光電GRC
Base Accuracy:2989mm
24.77357941,121.00727478