

Setup guide

For Emlid RS2 / RS2+ with MALÅ GX and EL WR systems and cable

Introduction

This document provides instructions on how to configure the Emlid Reach RS2 / RS2+ for use with MALÅ GX Controller and EL WR Controller, connected by a serial RS232 cable to the Emlid unit.

The following four typical scenarios are defined and described in this guide:

- Single Emlid RS2 / RS2+ unit without any RTK correction
- Single Emlid RS2 / RS2+ unit using SIM card for RTK correction
- Single Emlid RS2 / RS2+ unit using hotspot on mobile device for RTK correction
- Two Emlid RS2 / RS2+ units used as base-rover set up

To be able to run the Emlid RS2 / RS2+ unit you also need a mobile phone or a tablet. Download the *Emlid Flow* app from Google Play or App store to your mobile device. More information on GNSS measurements with Emlid RS2 / RS2+ units are available on

<https://emlid.com/support/reach-rs2/>

Preparing the Emlid RS2 / RS2+

Start your Emlid unit by pressing and holding the start button. When started, wait until the battery indicators (nr 1 in the picture to the right) becomes solid. This takes approximately 60 seconds.

Make sure that the Wi-Fi indicator (nr 2 in the picture) is white. This indicates that the Emlid hotspot is active.

Note: If the Wi-Fi indicator is blue the Emlid unit is connected to a Wi-Fi hotspot. Connect to the same Wi-Fi network with your mobile device or move the Emlid unit away from the Wi-Fi network (to disconnect from the network). Then restart the Emlid unit and make sure the Wi-Fi indicator is white.



Connecting the Emlid Flow app to the Emlid unit

Make sure you have disconnected your phone or tablet from any Wi-Fi network.

Open the Wi-Fi settings on your phone or tablet and connect to the Wi-Fi network created by your Emlid unit. This is called *reach:xx:xx* Use the password *emlidreach* to connect.

Note: If the Emlid is connected to a Wi-Fi network, you can connect your mobile device to the same network and then proceed as below.

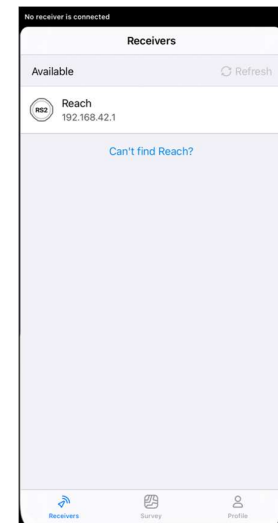
Start the *Emlid Flow* app on your phone or tablet.

Press the refresh button in the app and connect to the correct Emlid RS2 / RS2+ unit.

If you have several Emlid units powered on simultaneously, like a base and a rover, both will be displayed in the list.

Note: You can rename the Emlid units in the Emlid Flow app, for easier differentiation.

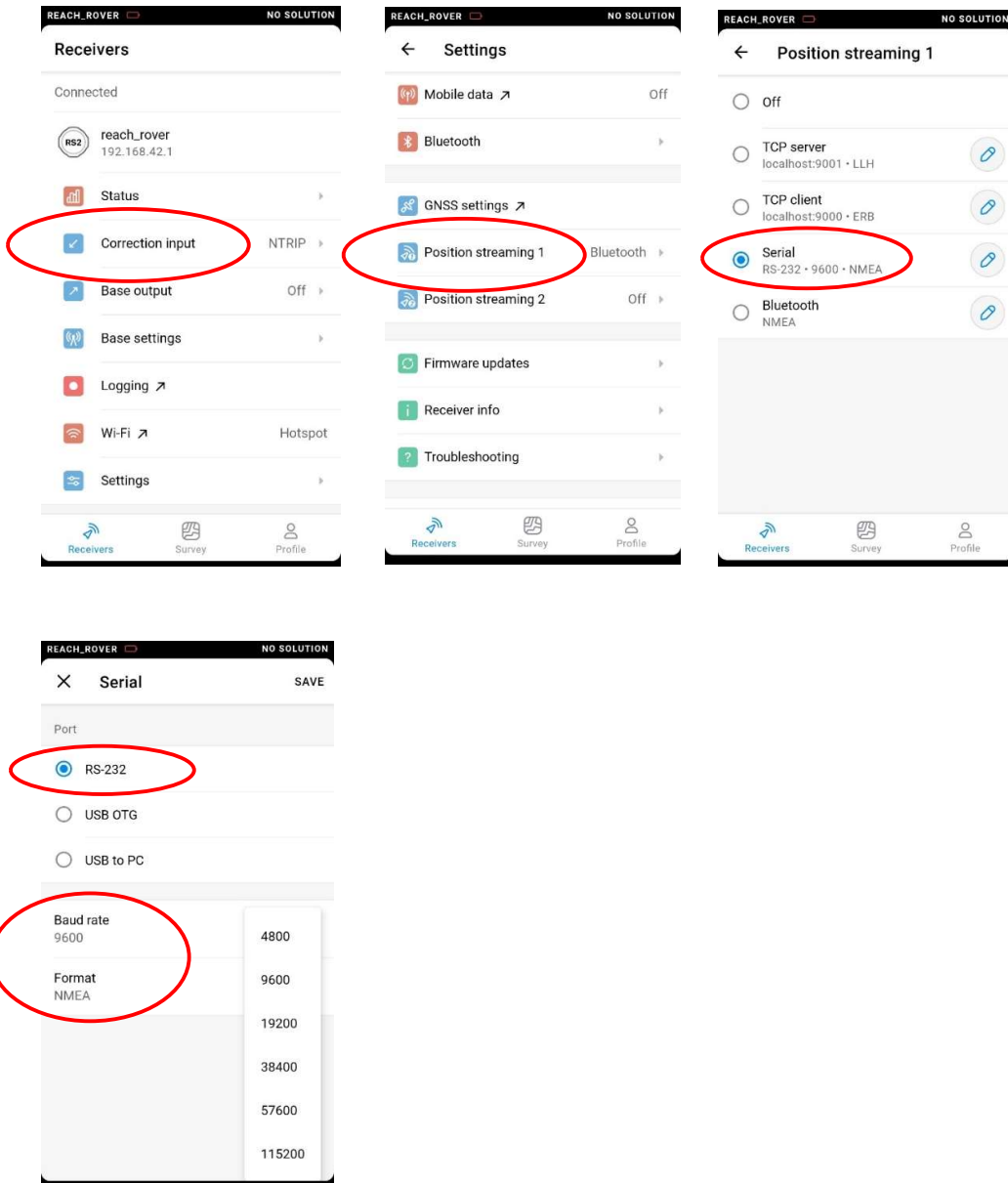
Note: More information is found here
<https://docs.emlid.com/reachrs2/before-you-start/first-setup/>




Set up for a single Emlid rover without correction

Follow the guide above (*Connecting the Emlid Flow App to the Emlid unit*) to connect your phone or tablet to the Emlid Reach RS2 / RS2+ unit.

Go to the Settings menu in the Emlid Flow app and choose Settings and then Position Streaming 1 (Position streaming 2 should be OFF). Set this to Serial and press on the pen symbol to choose RS-232, baud rate (e.g., 9600 or 19200) and format (NMEA).



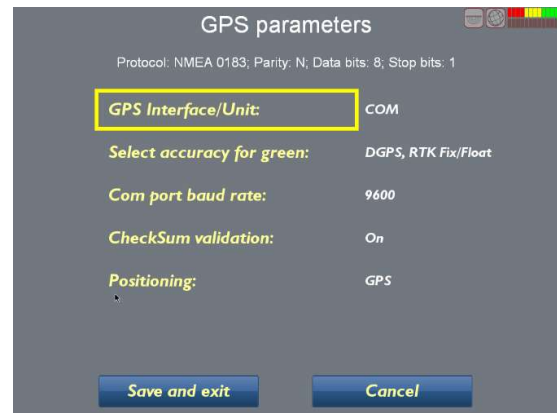
Note: The settings used for Baud Rate must be the same in the Emlid Flow app as well as in the MALÅ GX or EL WR Controller.

Go to the Settings menu  in the MALÅ GX / EL WR Controller, press **NEXT SCREEN >>** and choose **GPS Parameters**

Set the GPS Interface/Unit to COM for communication with RS-232 cable. Now the settings for accuracy, baud rate and check sum can be made.

The Select accuracy for green option allows the user to set the tolerance for the GNSS precision indicator that is displayed at the top right of the monitor's screen while in operation. High is used in utilizing an RTK GPS.

Note: Select the correct values for the Com port baud rate (the same as in the Emlid Flow app).



The CheckSum validation option is used in most cases. For e.g., a Leica 1200 Robotic Total station, which delivers a NMEA protocol without check sum, this should be turned OFF.

Connect the Emlid serial cable to the MALÅ Controller (9 pin D-sub connector) and the Emlid unit (to Ext).

The GPS indicator will be green, yellow, or red when positioning data is received. Coordinate data is also be displayed on the lower part of the GPS Parameters window.



S/N 21-0055907 Reach RS+/RS2 cable 2M with DB9 female connector

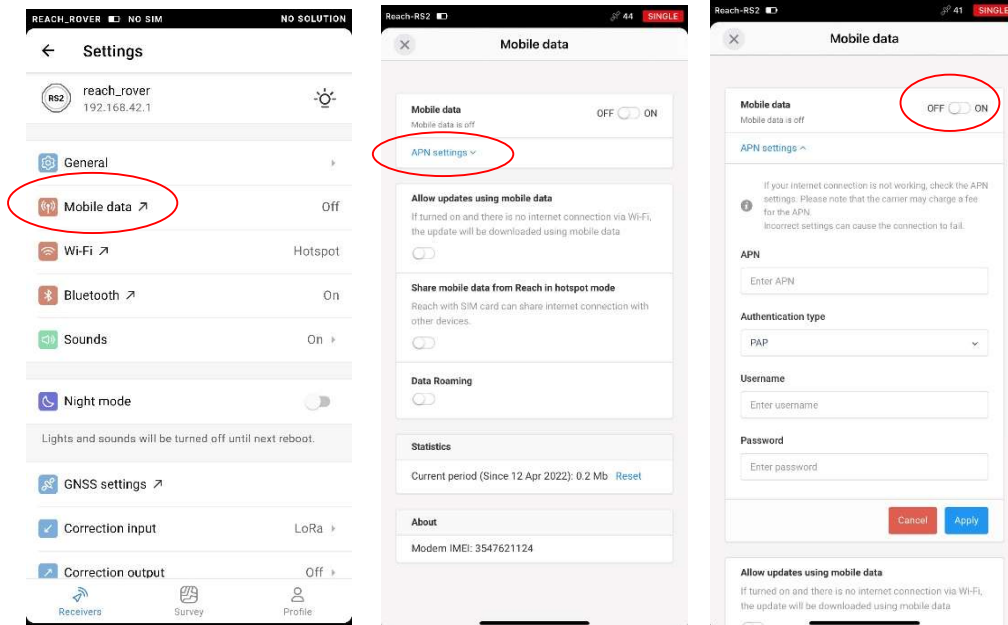
Set up for a single Emlid rover using SIM card

Insert your SIM card (with Internet subscription) into the Reach RS2 / RS2+ unit (see blue arrow).

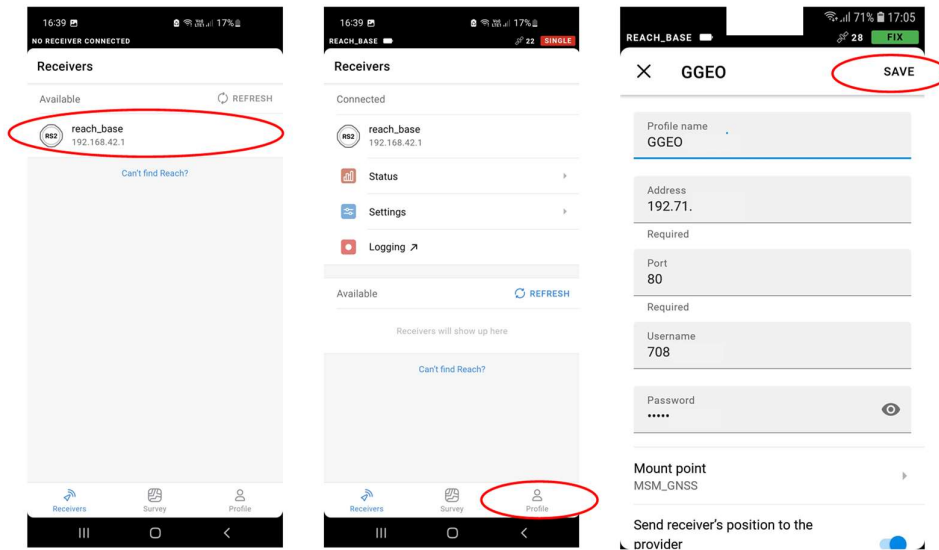
Follow the guide above (*Connecting the Emlid Flow App to the Emlid unit*) to connect your phone or tablet to the Emlid Reach RS2 / RS2+ unit.



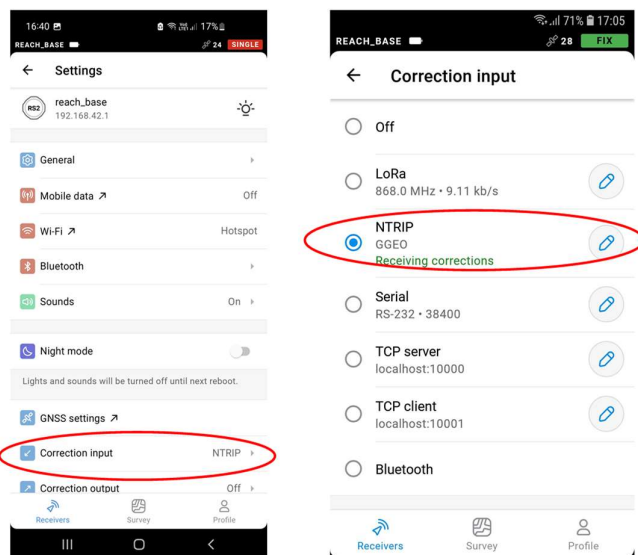
Go to the Mobile data settings in the app, enter a PIN-code if needed and fill out the information regarding APN (Access Point Name). When all information has been added, turn on the Mobile data.



Create an NTRIP (Networked Transport of RTCM via Internet Protocol) profile in My NTRIP Profiles.



Choose this profile for setting the correction input.



Follow the guide above (*Set up for a single Emlid rover without correction*) for settings on Positioning streaming (serial, baud rate and format) as well as settings for the MALÅ GX and WR Controllers.

Set up a single Emlid unit using hotspot on a mobile phone

If you do not have a SIM card (with Internet subscription) you can use your mobile phone to provide the Emlid with an internet connection.

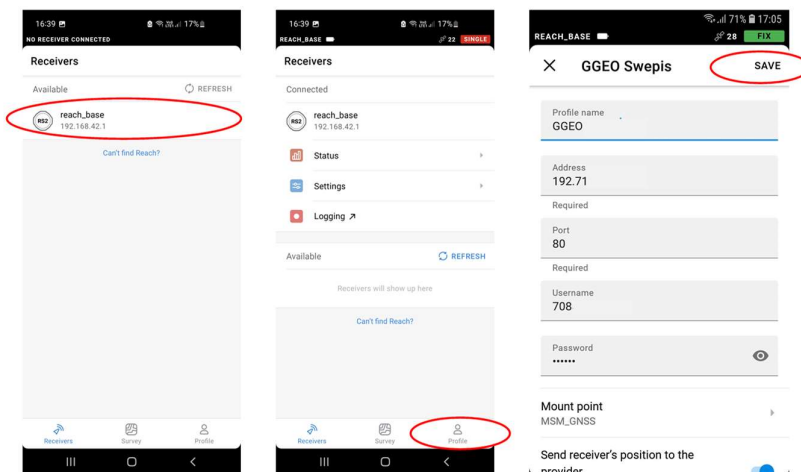
This will allow the Emlid to receive corrections to your positioning data through an NTRIP (Networked Transport of RTCM via Internet Protocol) service.

Start by configuring a hotspot on your mobile phone to share your mobile internet.

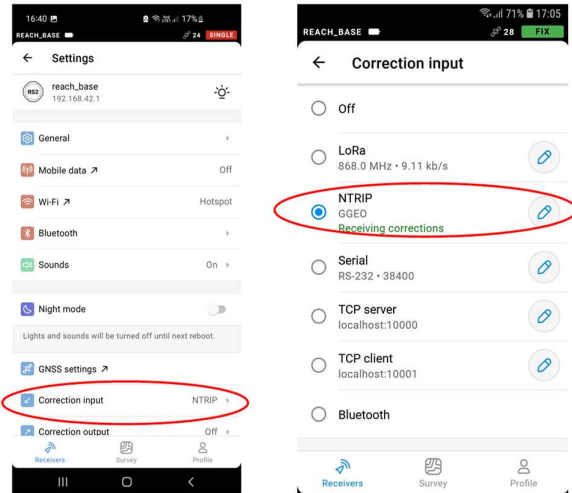
The hotspot in this guide is named *MALAdemo* with password *mala0123*, but you can of course choose any name you like.

Follow the guide above (*Connecting the Emlid Flow App to the Emlid unit*) to connect your phone or tablet to the Emlid Reach RS2 / RS2+ unit.

Create an NTRIP profile in *My NTRIP Profiles*.



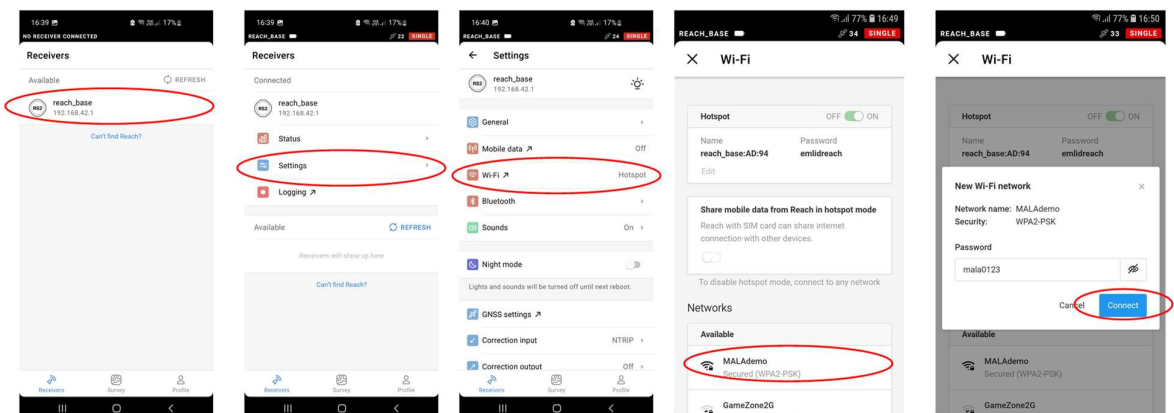
Choose this profile for setting the correction input.



Follow the guide above (*Set up for a single Emlid rover without correction*) for settings on Positioning streaming (serial, baud rate and format) as well as settings for the MALÅ GX and EL WR Controllers.

Note: The settings used for Baud Rate must be the same in the Emlid Flow app as well as in the MALÅ GX or EL WR Controller.

Then follow the sequence below to connect to the Wi-Fi hotspot provided by the mobile phone.



Set up of two Emlid units used as base-rover

If you do not have any correction service, by Internet and NTRIP as explained above, you can use two Emlid units to create a base-rover set up instead.

One Emlid (called the base) is mounted on a tripod at a preferably known position or on a fixed, clear and open location, that provides good GNSS reception. The other Emlid unit (called the rover) is used as a receiver mounted on top of the GPR antenna providing corrected positions by cable to the MALÅ Controllers.



Both Emlid units, the base and the rover, must be equipped with LoRa (Long Range) antennas to allow correction data to be sent from the base to the rover.

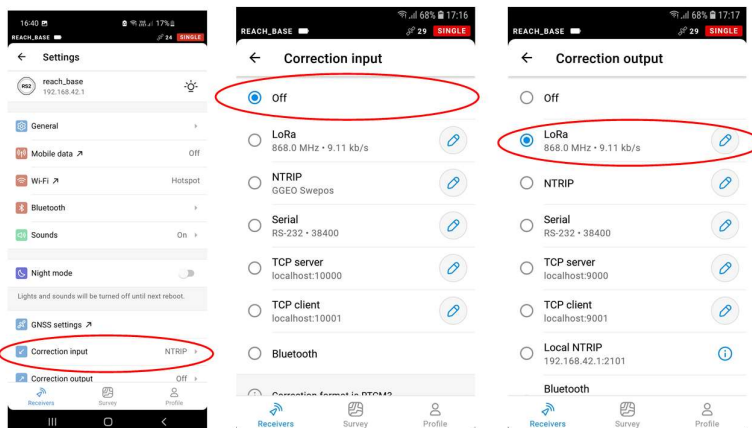
The LoRa antennas are found in the Emlid RS2 / RS2+ transport bags

Note: It is very important to set-up the base in a proper way to achieve a good positioning result. For more information visit <https://docs.emlid.com/reachrs/ppk-quickstart/placing-the-base>

Base configuration

Follow the guide above (*Connecting the Emlid Flow app to the Emlid unit*) to connect your phone or tablet to the Emlid Reach RS2 / RS2+ unit.

Choose *Off* as correction input and *LoRa* for correction output.

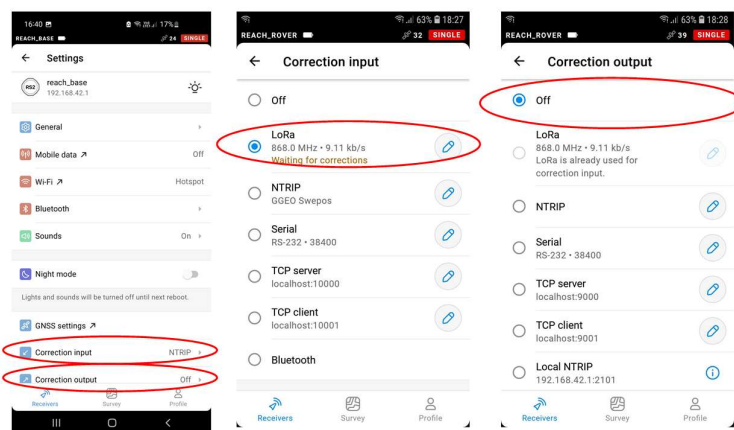


Place the base unit on a tripod at an open spot with good reception of GNSS satellites and restart the Emlid base unit. For best positioning, leave the base on for several minutes before starting the rover. When a sufficient time has passed, turn on the rover and place it at least > 10 m away from the base.

Rover configuration

Follow the guide above (*Connecting the Emlid Flow app to the Emlid unit*) to connect your phone or tablet to the Emlid Reach RS2 / RS2+ unit.

Choose *LoRa* as correction input and *Off* for correction output.



Follow the guide above (*Set up for a single Emlid rover without correction*) for settings on Positioning streaming (serial, baud rate and format) as well as settings for the MALÅ GX and EL WR Controllers.