AEMP-14 + EMLID RTK GPS SYSTEM (ROVER & BASE)

PUTTING IT ALL TOGETHER

BY LANDVISER LLC – HOUSTON, TX (2018)

EQUIPMENT PURCHASED

- AEMP-14 package:
  - ✓ AEMP-14 electromagnetic scanner (two pieces of transmitter and receiver in backpack)
  - ✓ Rigged Field Tablet (Android OS 4.4)
  - ✓ isystemXX.ini file specific to your AEMP unit is provided on USB and already loaded on your tablet in QZOND App

- Two RTK-GPS antenna units (interchangeable use as Rover or Base)

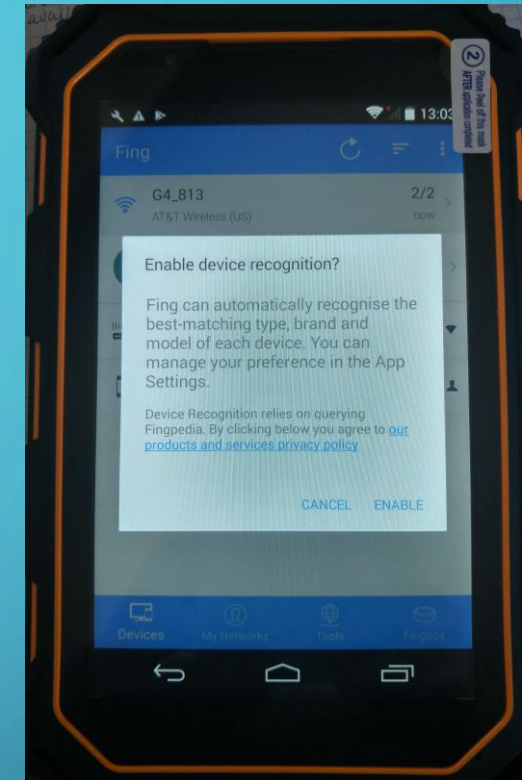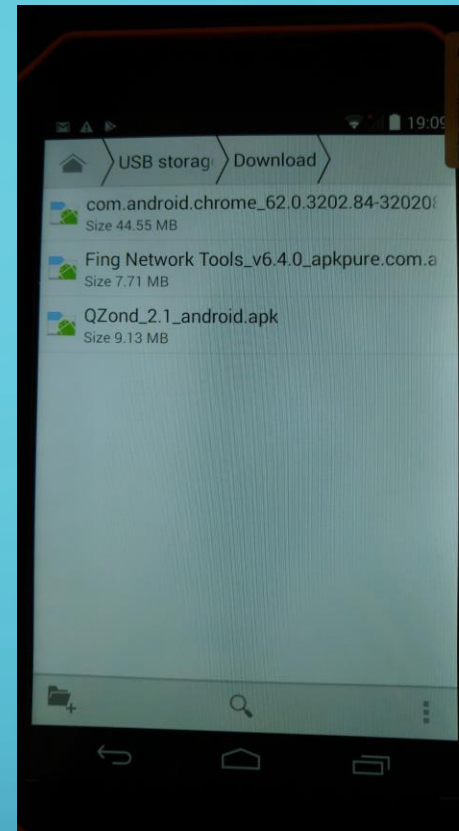Complimentarily – tripod and rover pole setup

CLIENT'S STANDARD EQUIPMENT

- PC computer

- Router with working WiFi network connected to Internet

- Mobile phone (preferably Android) with FING installed

PRELIMINARY STEPS

- Write down your WIFI network name, password and type (WPA2-PSK usually)
- Have Google browser (preferred) and FING apps installed on your cell phone

Download APKs and install on provided tablet:
QZOND: https://drive.google.com/file/d/1OxBS0l5jxuOERdljfhSLdJasAeSEiqDc/view?usp=sharing
Google Chrome: https://drive.google.com/open?id=1_aR5A8z6nihCn9PM4y-TY7A38OrRFdPe
FING: https://drive.google.com/open?id=13zsWAbzWyf-nADULF7R6AXCg9NUshBk4

UPDATING RTK GPS

- Refer to the steps and video on web-page
  https://docs.emlid.com/reachrs/quickstart/#intro

- I used laptop to connect to Home WiFi and update Reach + FING on Android phone (new version of iOS prohibit FING to show IPs) to detect IP addresses of Reach Base and Rover for software updates and pre-field work setup.
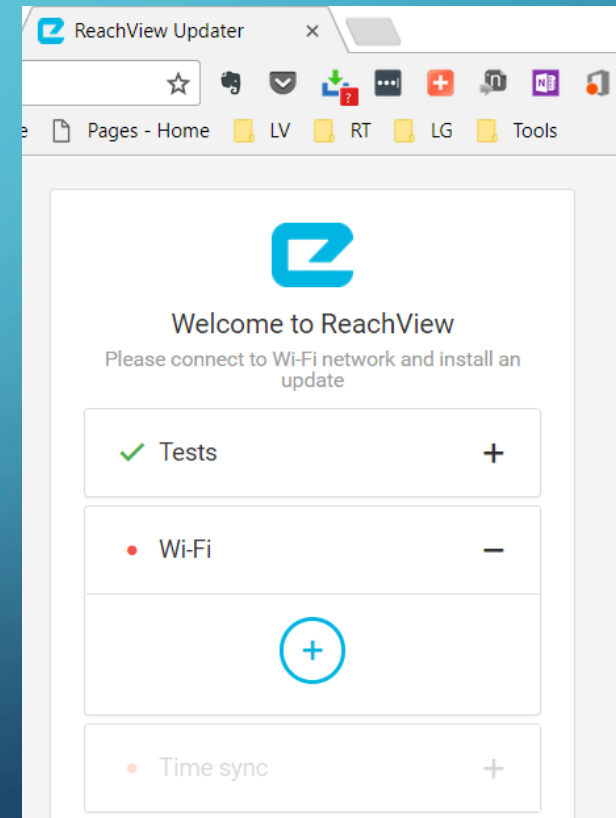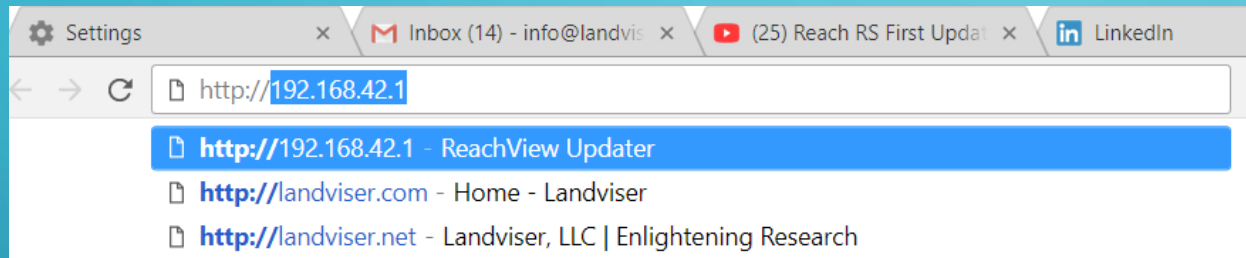
UPDATE STEPS (USUALLY DONE INSIDE)

1. Turn on one Reach unit and connect to it (see new device available in WiFi section in the righthand corner of your PC
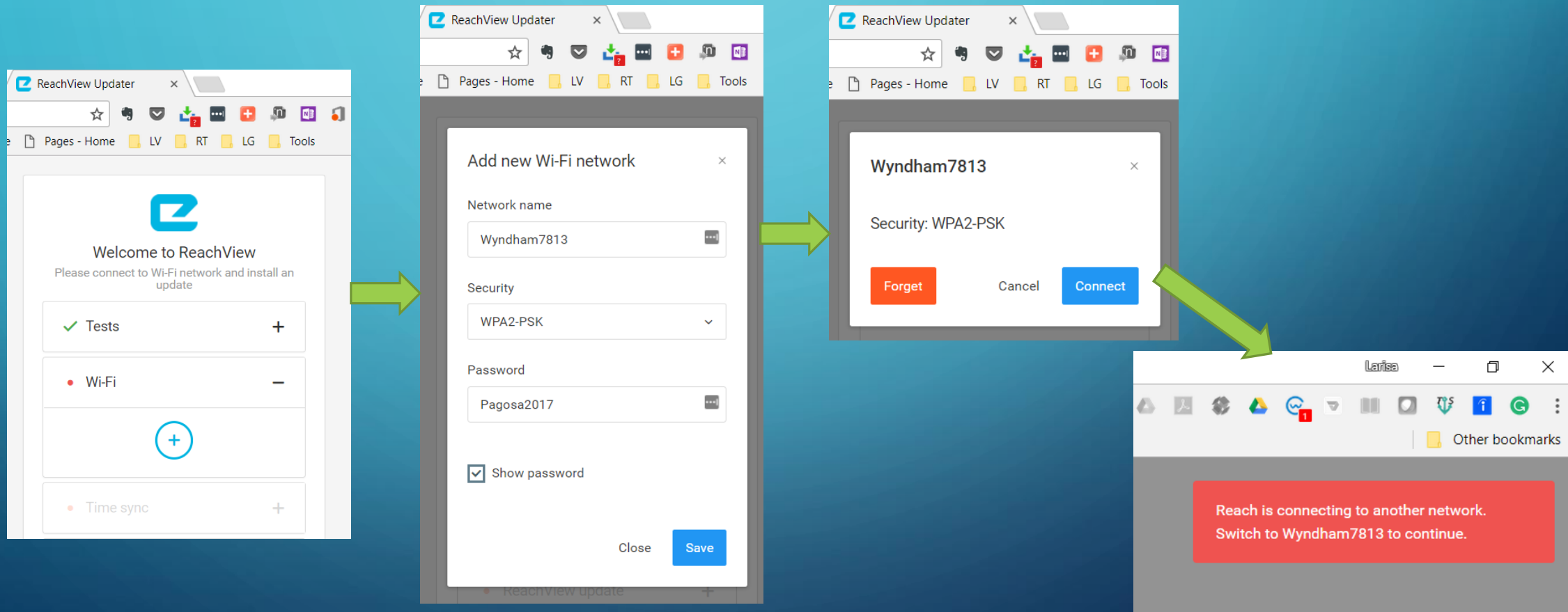
   • Password "emlidreach"
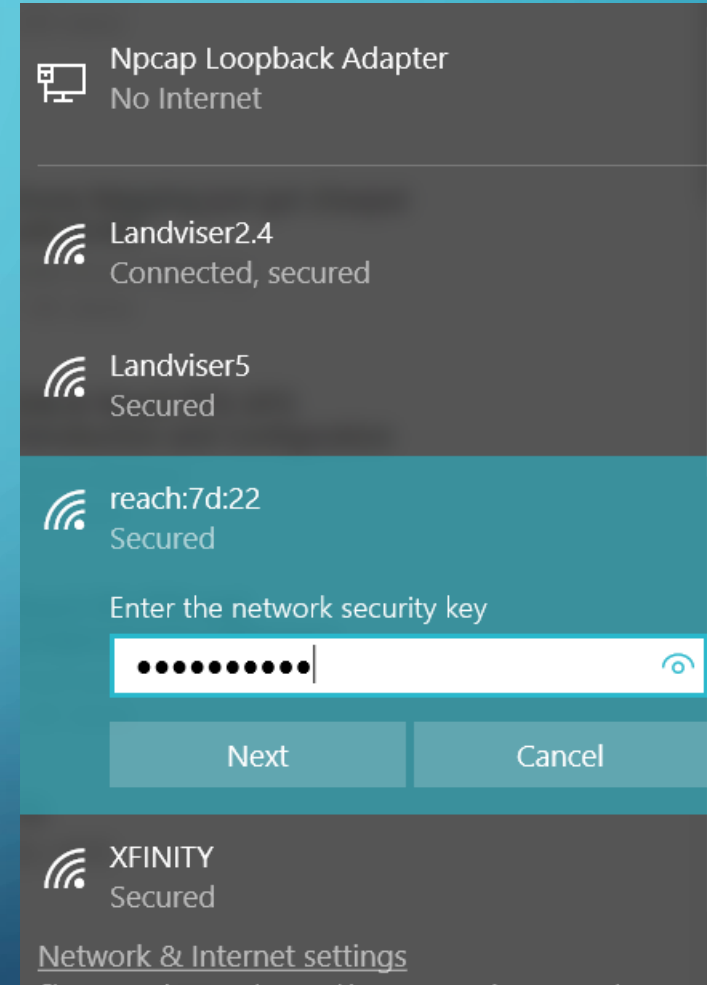
UPDATE STEPS (USUALLY DONE INSIDE)

2. Open Chrome browser on PC and type in

IP http://192.168.42.1 – it will load

ReachView/Updater App

UPDATE STEPS (USUALLY DONE INSIDE)

3. Go to WiFi setup tab in ReachView App and type in your WiFi network credentials to add and connect to the WiFi with internet access

UPDATE STEPS (USUALLY DONE INSIDE)

4. On you phone (make sure it is connected to the same Home WiFi) load FING and see new device (Generic/Murata manufacturer) and write down it's IP address
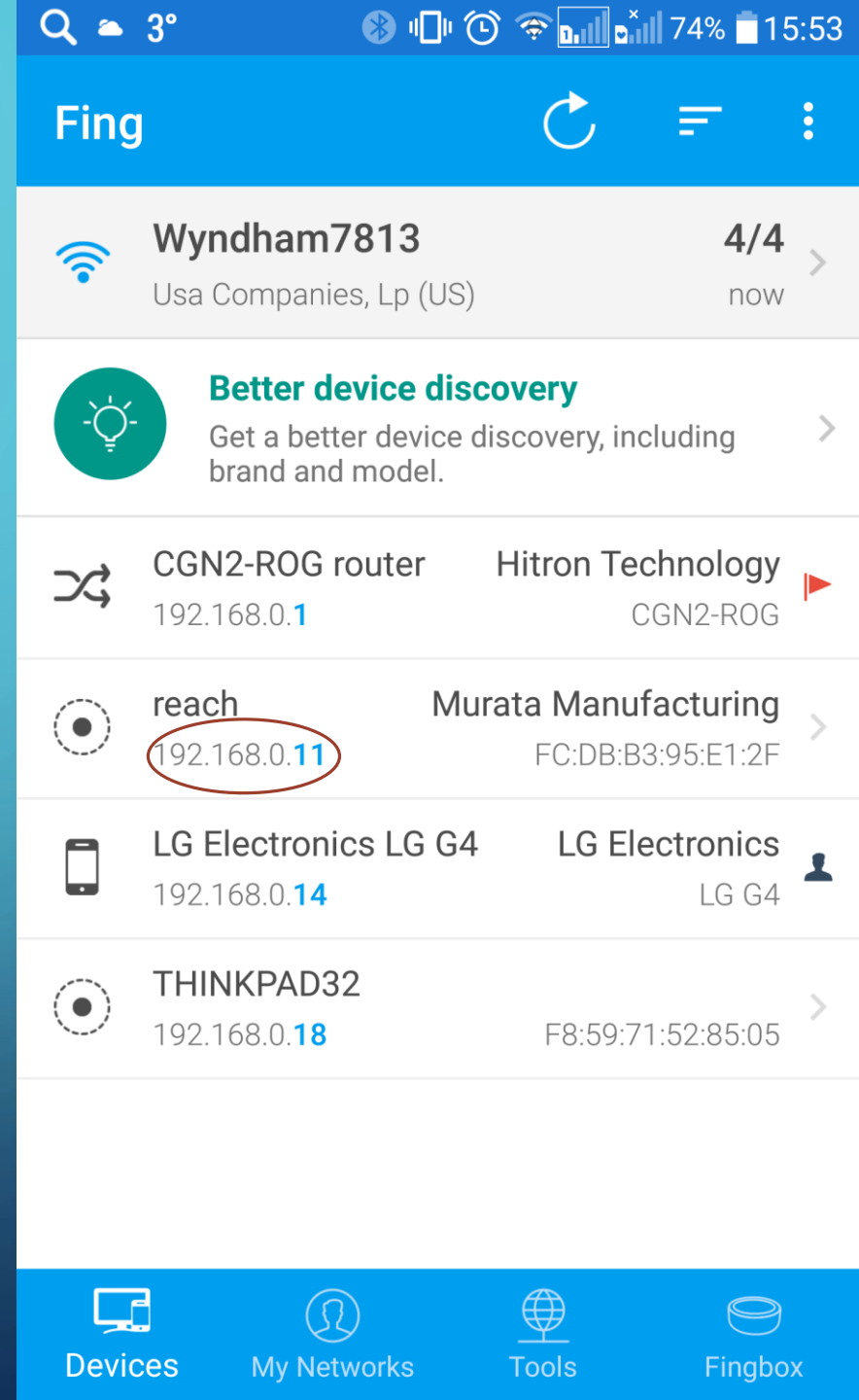
UPDATE STEPS (USUALLY DONE INSIDE)

5. On PC open another tab in the browser and type IP for Reach assigned to it by your WiFi router (every unit would get assigned different IPs which would be stable in the same network).
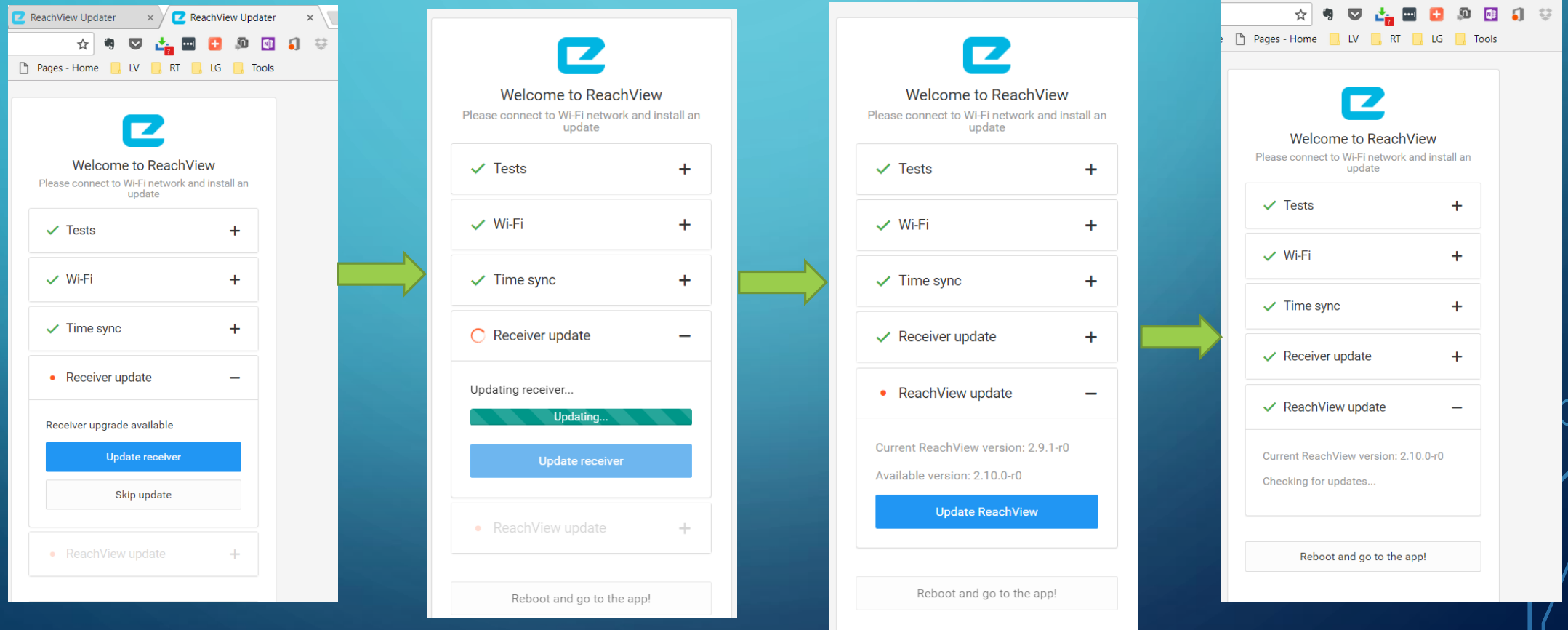

At the end click "reboot and go to the app!". Wait a few minutes.

Follow Steps 1-5 to update each Emlid unit.

It would take a few minutes per unit.

CONNECTING BASE/ROVER PAIRS OVER LORA (INSIDE =>OUTSIDE)

The following steps can be done on laptop or directly on the tablet you would be using with AEMP-14 in the field.

- Now pick three units as rovers, three as bases (mark them with stickers base1-3 and rover1-3. You also can dedicate one unit as Base and others as rovers1-5 if you want to use all tree AEMP-14 simultaneously with one Base and have two rovers to spare for different tasks.

- Turn the units on and navigate to their assigned IPs in Chrome Browser. You can have all of the units on your network simultaneously as each IP would be different.
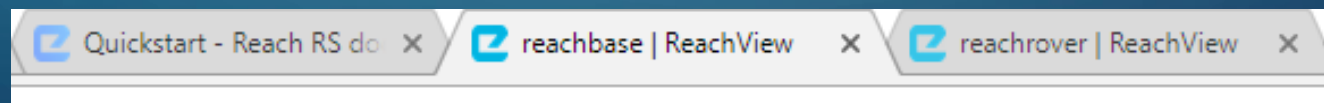
SETTING A BASE RTK-GPS UNIT ON LORA PROTOCOL

- Refer to this section of website https://docs.emlid.com/reachrs/quickstart/#setting-up-base-station

1. Go to IP address of the base station and navigate to settings Wheel.

2. Change Unit Name as discussed above.
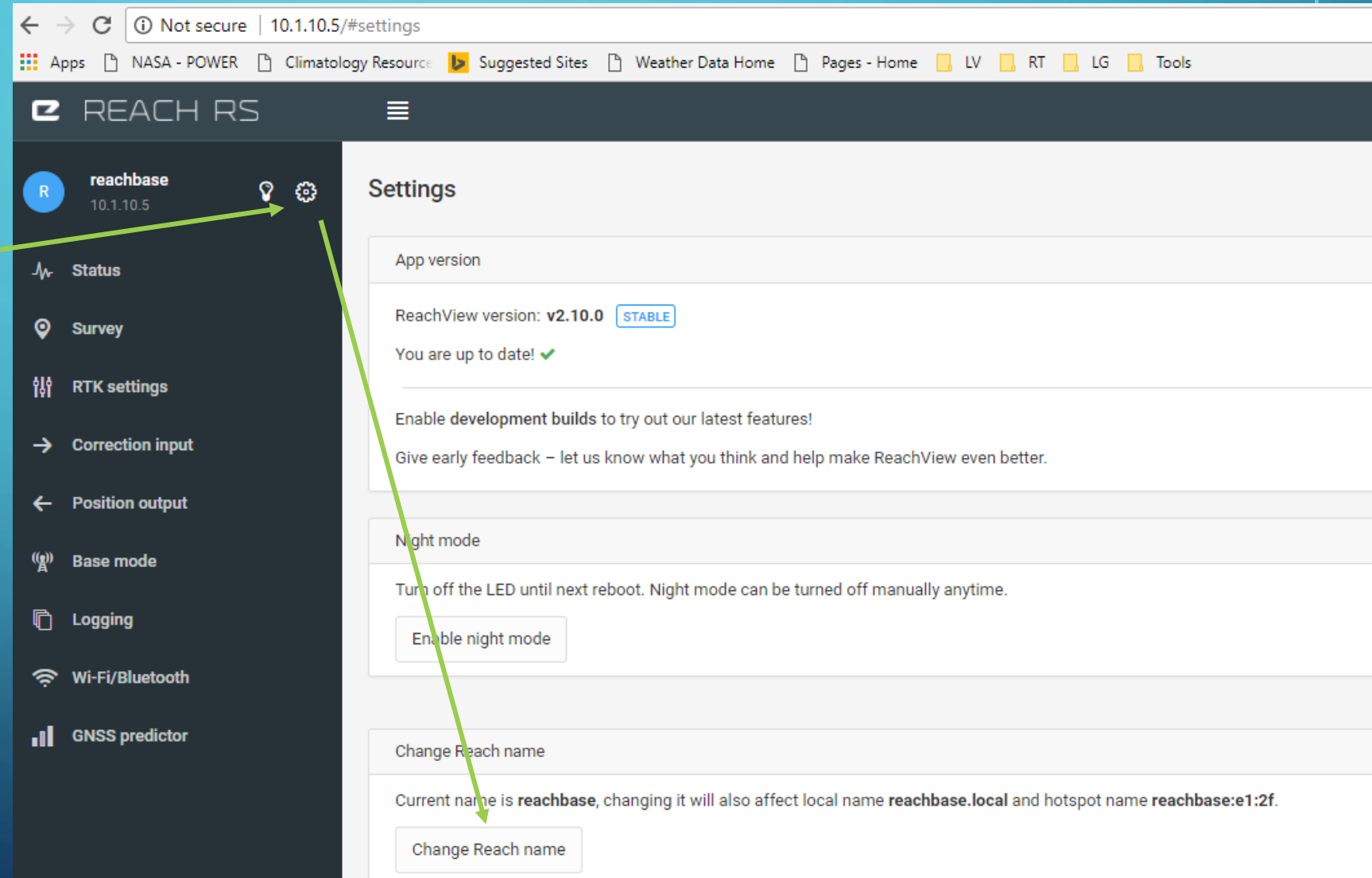
SETTING A BASE RTK-GPS UNIT ON LORA PROTOCOL

- Refer to this section of website https://docs.emlid.com/reachrs/quickstart/#setting-up-base-station

Go to IP address of the base station and navigate to Base mode section.
Select LoRa tab and set frequency between 862 MHz and 1020 Mhz and set output power.

Using LoRa modulation it is possible to hit up to 19km in line of sight or a few km in urban areas with just 20 dBm power output.

SETTING A ROVER RTK-GPS UNIT ON LORA PROTOCOL

- Refer to this section of website https://docs.emlid.com/reachrs/quickstart/#setting-up-rover

Go to settings and change the name to "reach-rover".
Navigate to **Correction input** tab.
Choose LoRa correction mode.
Frequency and air rate settings must match what was configured on the base.

Apply changes and you will see rover is connected to base.
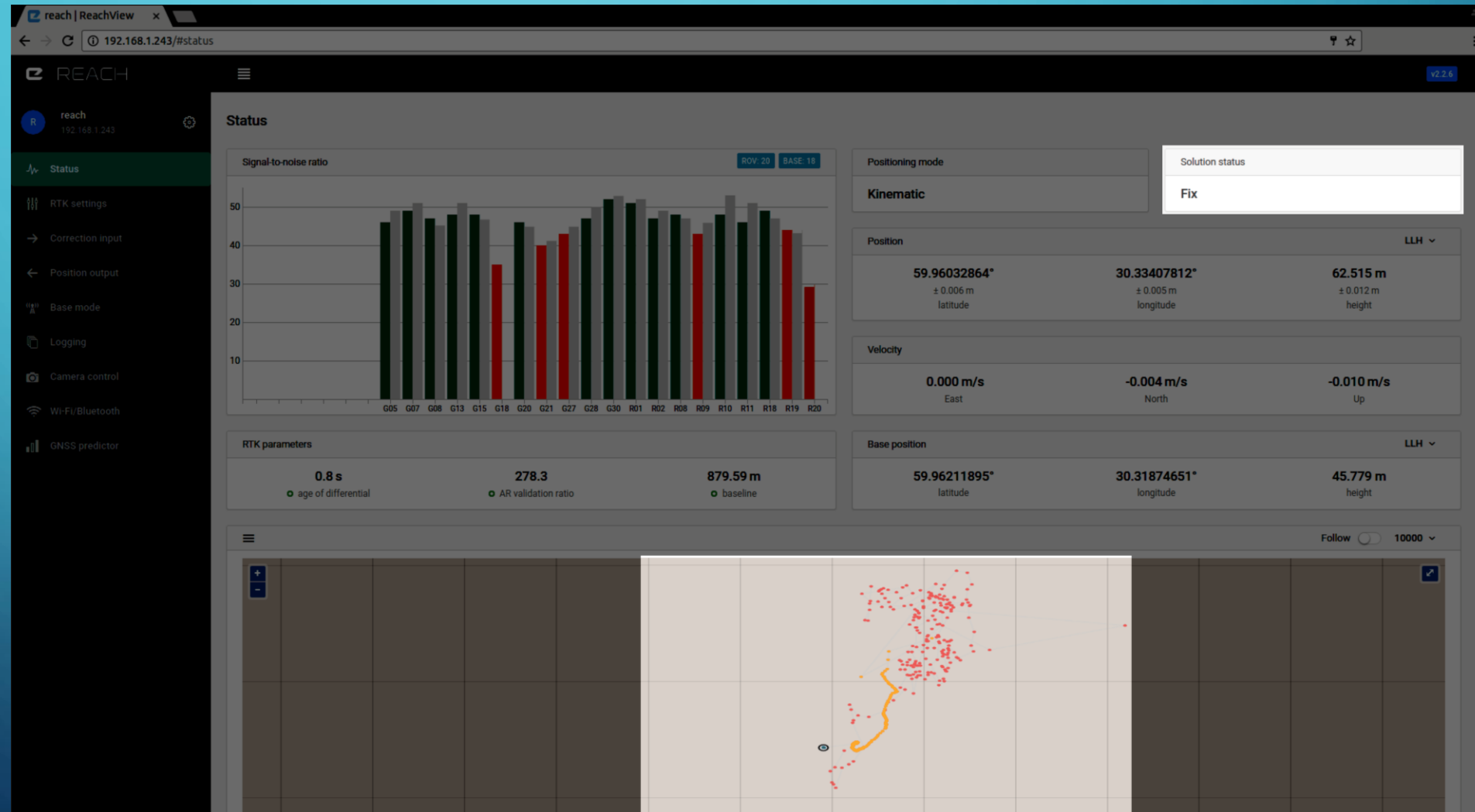The base now is sending corrections on rover via LoRa radio in RTCM 3 format

SUCCESS STATUS FOR RTK GPS LOCATION COLLECTION

- The successful setup would show red, gree, and gray (base) columns for satellites.
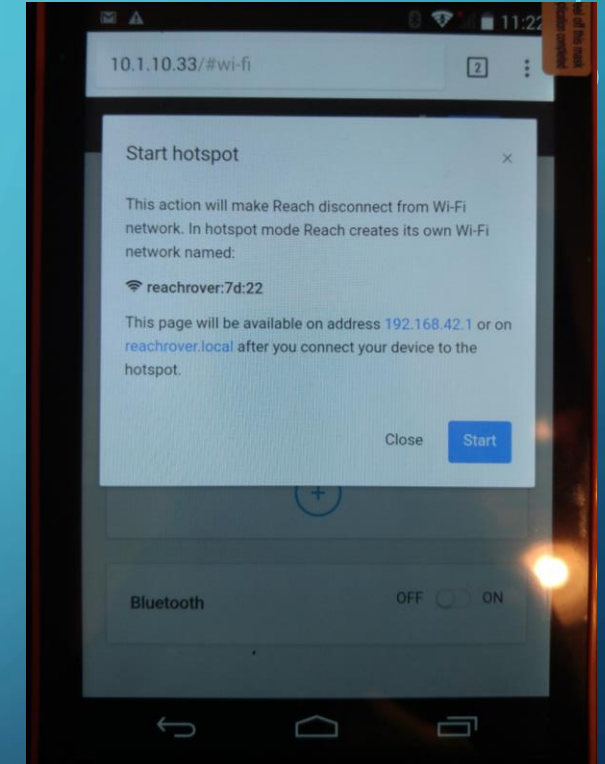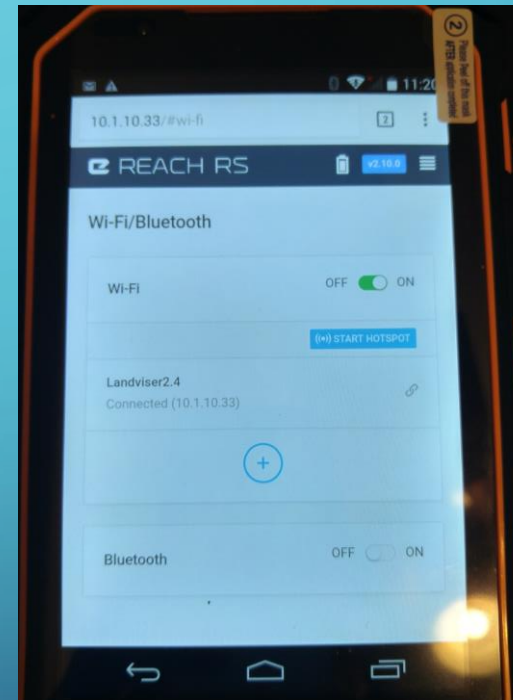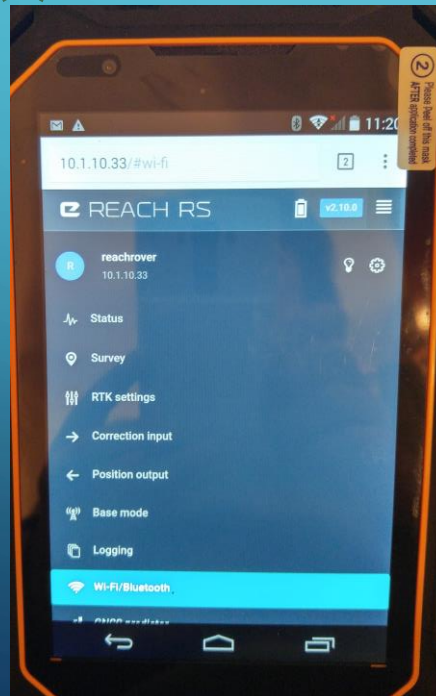
Positioning Mode:
Kinematic

Solution Status:
Fix

You would also see coordinates and accuracy.

PREPARING ROVER TO WORK WITH QZOND

- Turn on Rover GPS unit.

- Make sure tablet is connected to the same network you used to update Rover

- Using Tablet Chrome browser connect to IP of the Rover like http://10.1.10.33

- In WiFi/Bluetooth tab press (o)START HOTSPOT and follow the steps

ROVER IN HOT SPOT MODE FOR DATA COLLECTION

- Go to WiFi settings and type password "emlidreach"

- In Chrome browser type IP http://192.168.42.1to return to Reach View app.
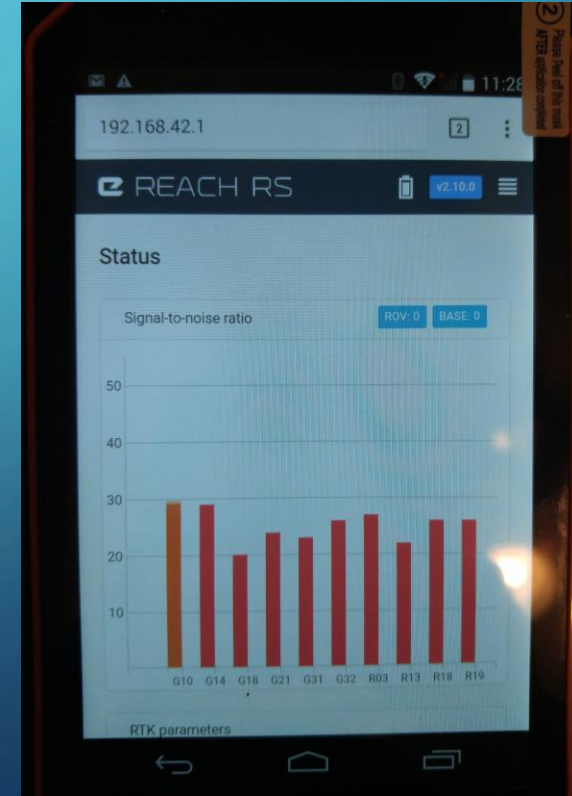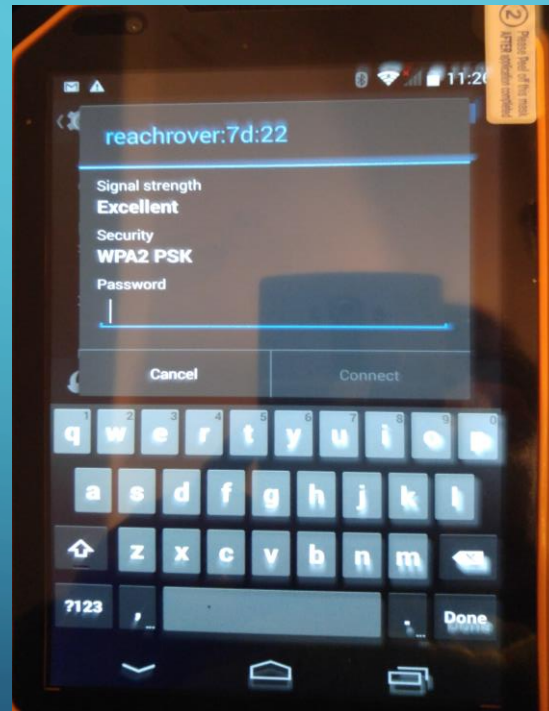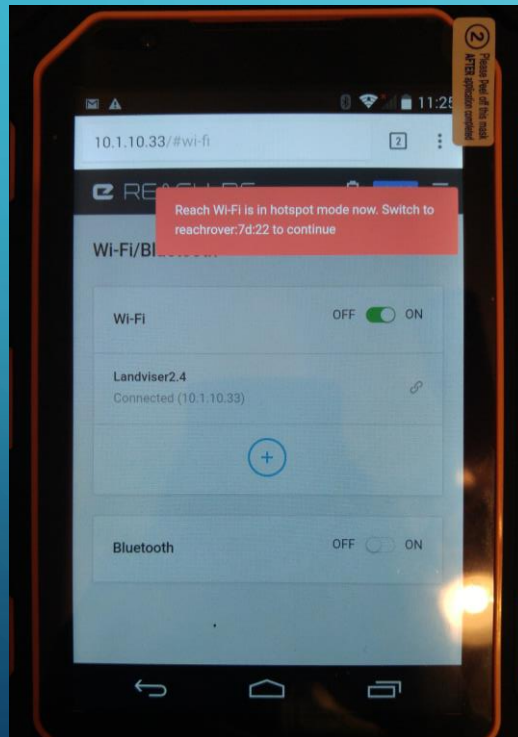
SETTING POSITION OUTPUT FOR QZOND

- Go to Position Output Tab in Reach View app and set TCP protocol as shown on the photo:

- Role: Server

- Port: 8888

- Format: NMEA
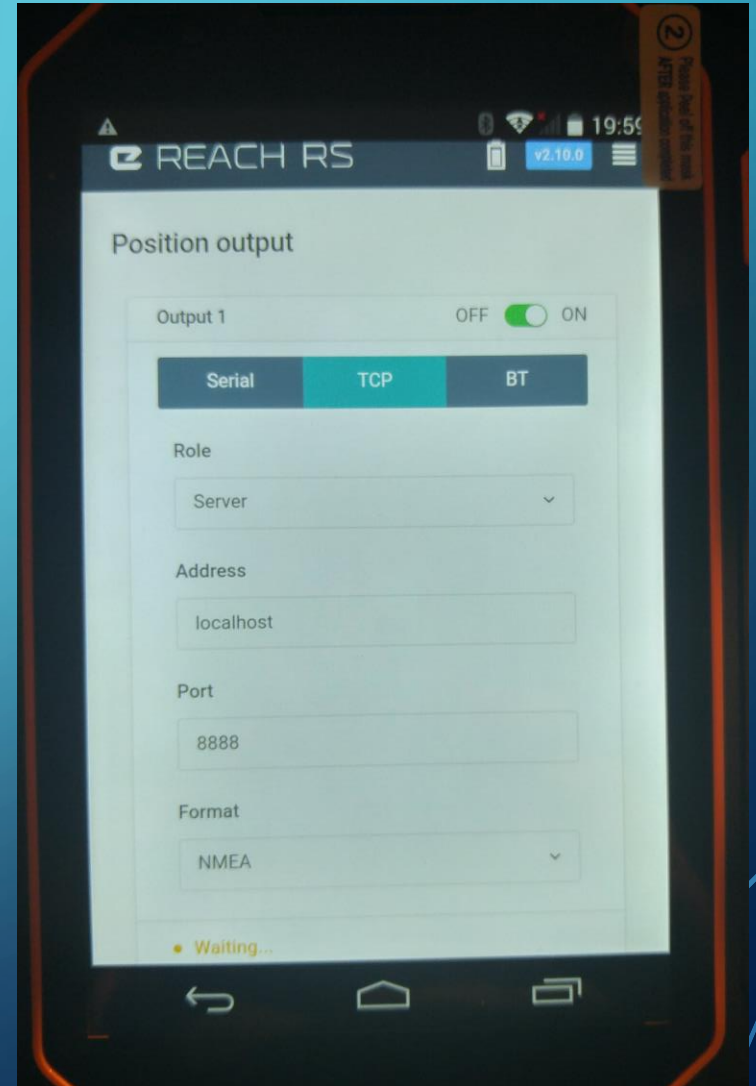
TIME TO GO OUTSIDE!!!

Make sure you screw on black LoRa antenna to all units.

- Set up Base unit on tripod in the middle of study area with clear view of the sky.

- Put Rover GPS unit in backpack for convenience.

- Turn everything, wait a couple of minutes and see Rover Status on http://192.168.42.1 . It should show red (rover) and grey (base) satellite bars.
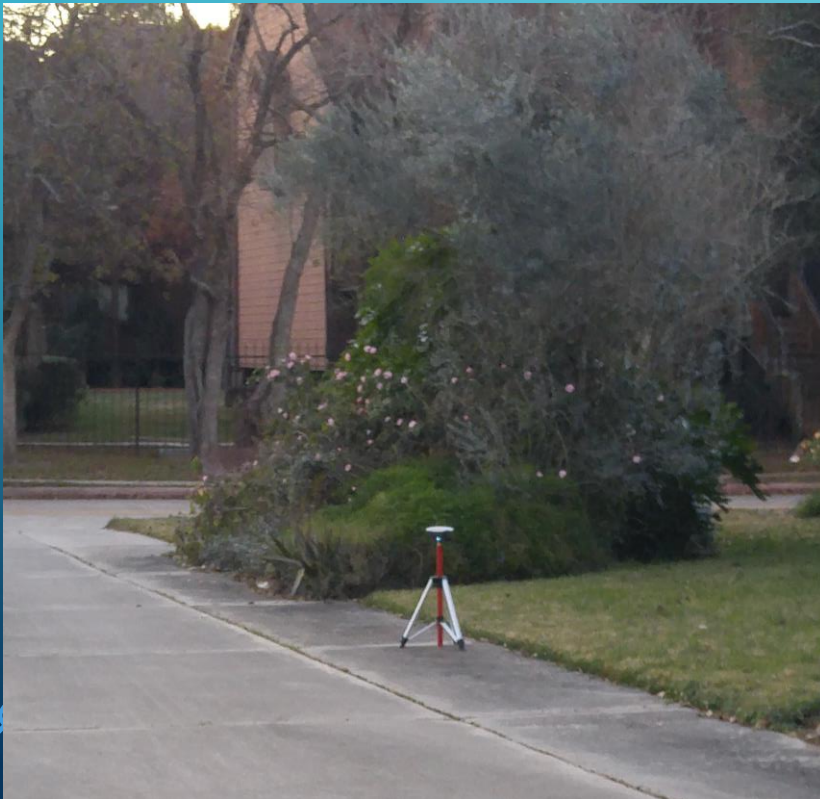
QZOND WITH NETWORK GPS (RTK ROVER)

- Make sure you have Bluetooth turned on and paired with your EMS (AEMP-14) unit

- Open QZOND application. In Equipment section select the EMS/Nemfis probe and correct .INI file through the series of questions.

Can not identify this probe. Is that EMS/NEMFIS?

No   Yes

When correct unit shows, click Accept.
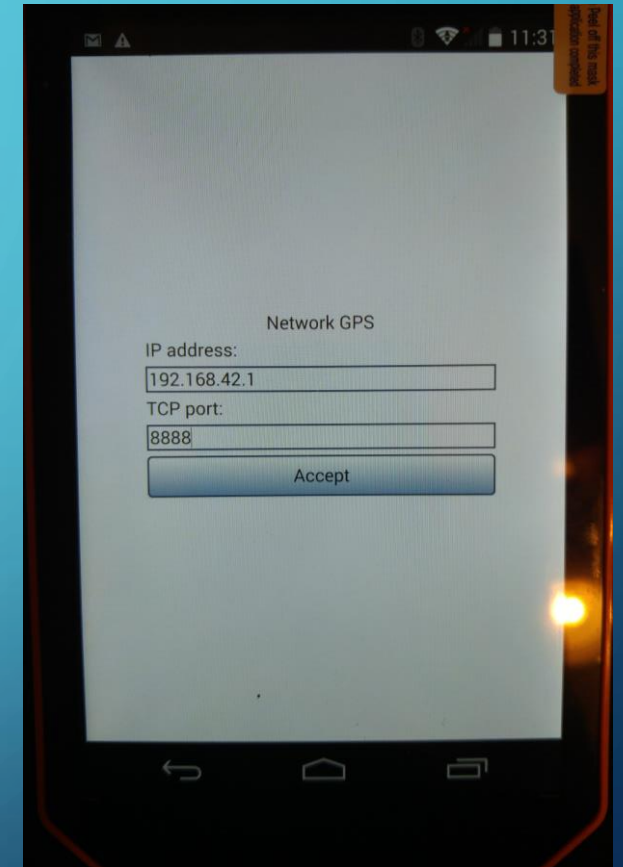
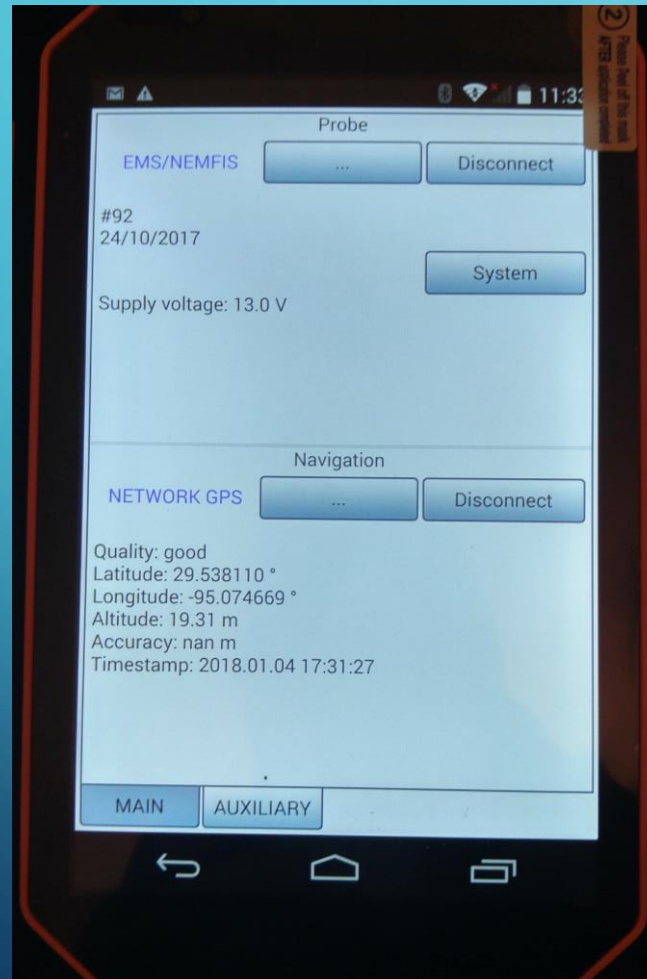EMS92-14/09/2017   ...

Accept

QZOND WITH NETWORK GPS (RTK ROVER)

- In Navigation select Network GPS and type IP address 192.168.42.1 and TCP port 8888
- If all went well, you will see output in QZOND similar to one below.

- Follow the directions in AEMP-14 manual to start field survey.