

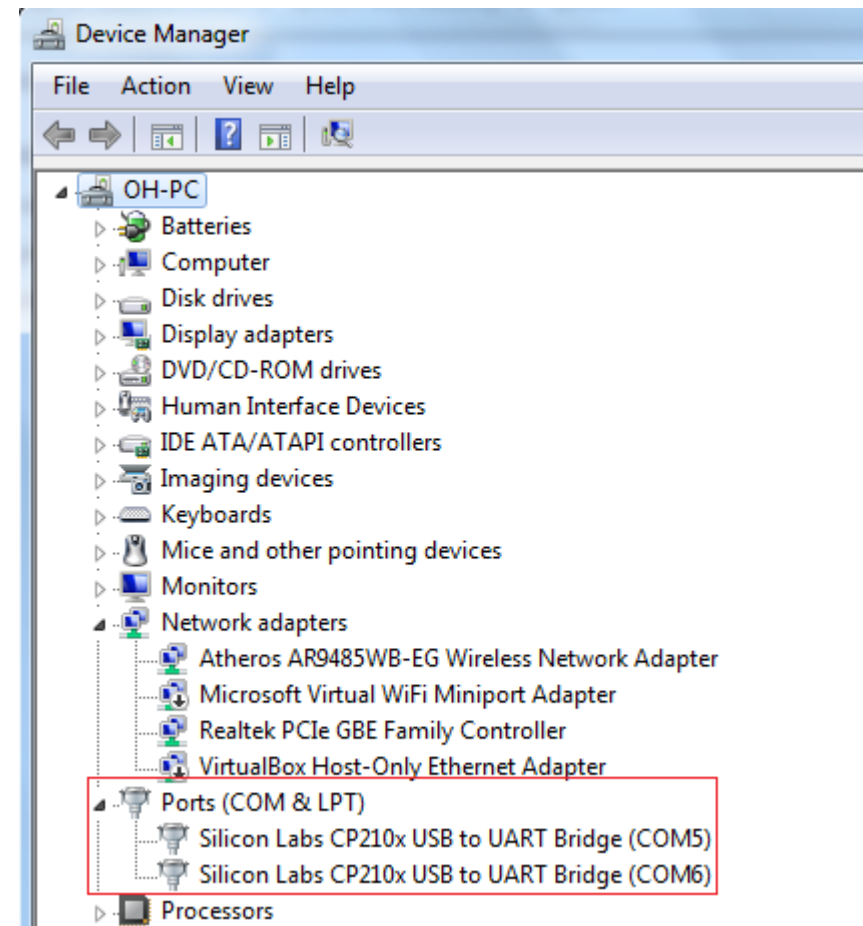
Getting Started with
S2525F8-BD-RTK EVB
or
S2525F8-GL-RTK EVB

Install USB Driver from Silicon Lab Site

<http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>

After connecting USB cables, should see 2 COM ports on Device Manager.

Take note of which physical connection results in which COM port



Get Windows GNSS Viewer

- http://navspark.mybigcommerce.com/content/GNSS_Viewer.zip
- <http://navspark.mybigcommerce.com/content/GNSSViewerUserGuide.pdf>

Default Rover Mode (USB)

Header Jumper Setting
for **USB** Interface Connection

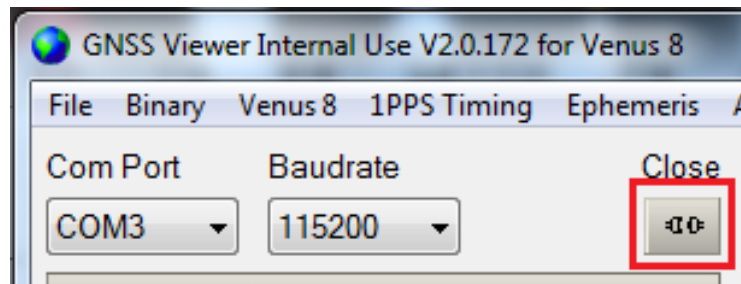
USB1 NMEA Output
 (from TX1)

RTCM 3.x Input USB2
or
SkyTraQ raw measurement input
(to RX2)



Connect Rover to Base Using Public/Private Base Station

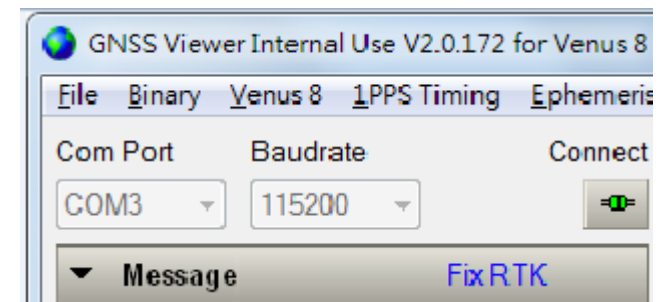
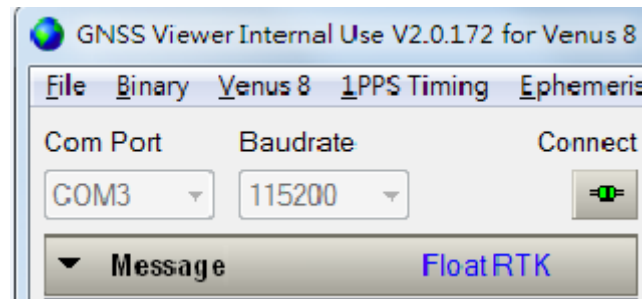
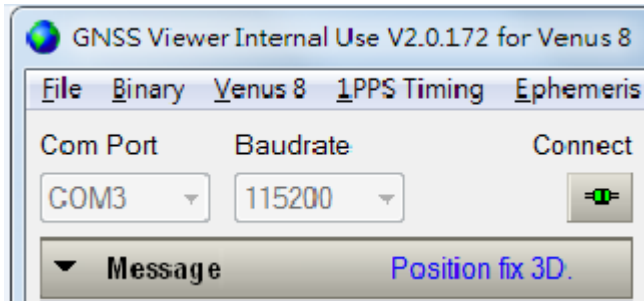
- Get NTRIP Client,
<http://lefebure.com/software/ntripclient/>
for example
- Setup NTRIP client to stream base station data to COM port on USB2 at 57600
- From GNSS Viewer select COM port for USB1, and 115200 baud rate, click button to right to connect



Rover Result

- Since most base stations are GPS/GLONASS type, and S2525F8-BD-RTK is GPS/BDS, only GPS portion would work for RTK when connecting to these GPS/GLONASS base station
- Due to GLONASS inter-channel bias issue, only GPS portion would work for RTK with S2525F8-GL-RTK
- If base station is within 10Km, antenna having clear view of sky unblocked, signal SNR over 38dB, and with usable satellite above 15 degree elevation angle having good geometry (low DOP), then after a while it should get RTK fix solution after going from 3D position fix to float solution

Rover Result on GNSS Viewer



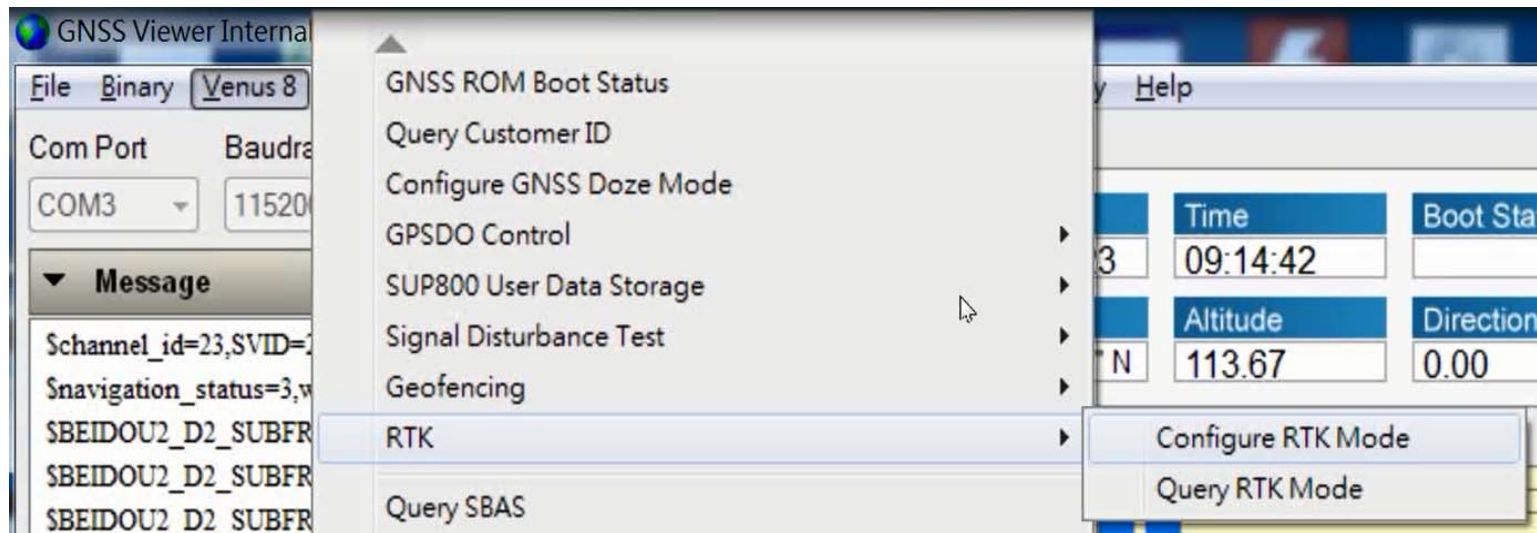
Frequently Used GNSS Viewer Controls

- See scatter plot => select suitable scale, click Set Origin to center plot, click Clear to erase scatter plot screen
- Log NMEA output for later analysis => From File pull-down menu select Save NMEA
- Re-start receiver => click Cold Start button

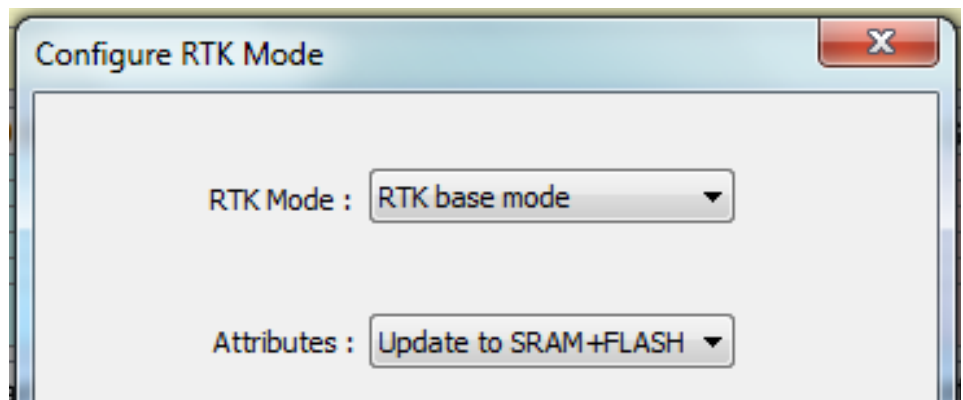
Setup EVB as Base Station (1/5)

- From GNSS Viewer

Venus8 → RTK → Configure RTK Mode → RTK base mode
update to SRAM+Flash

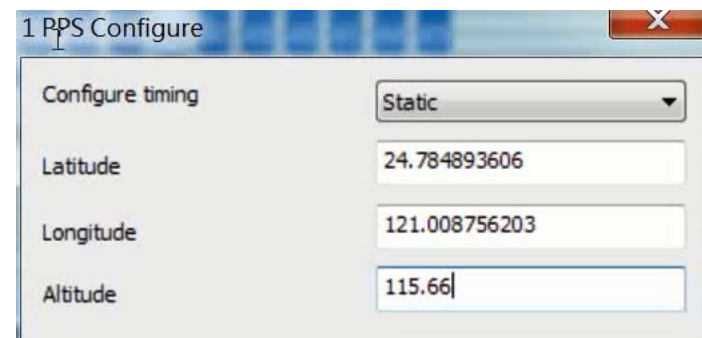
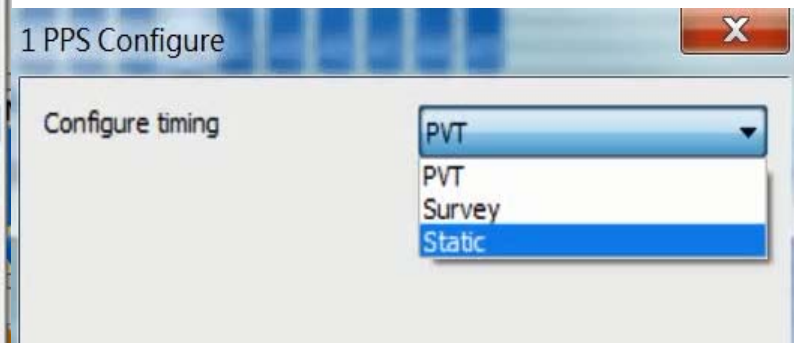
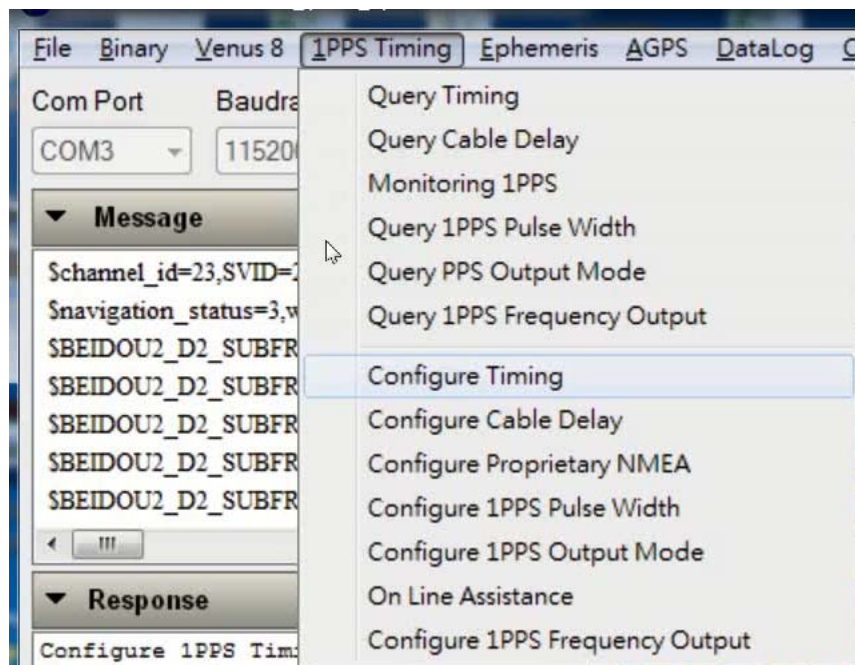


All configuration go through USB1 COM port



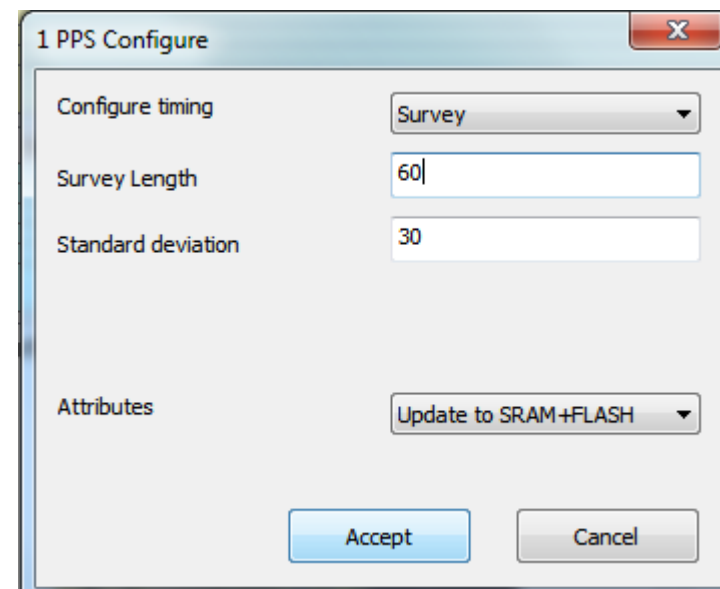
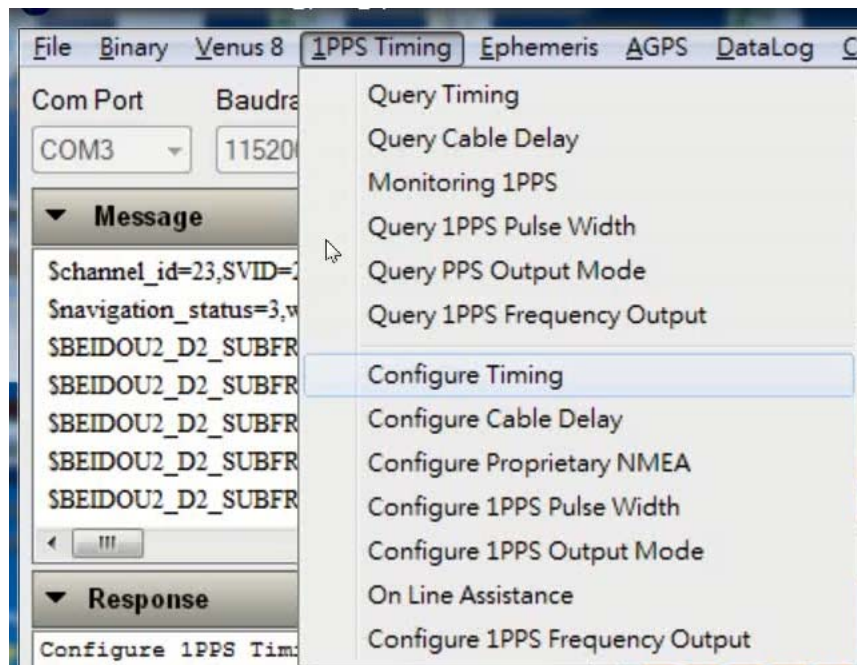
Setup EVB as Base Station (2/5)

If already know base antenna position, can enter from GNSS Viewer
1PPS Timing → Configure Timing → Static (*input antenna latitude/longitude in degrees and altitude in meter, update to SRAM+Flash*)



Setup EVB as Base Station (3/5)

- If don't know base antenna position, let it survey for 60sec:
From GNSS Viewer
1PPS Timing → Configure Timing → Survey (Survey Length 60,
update to SRAM+Flash)

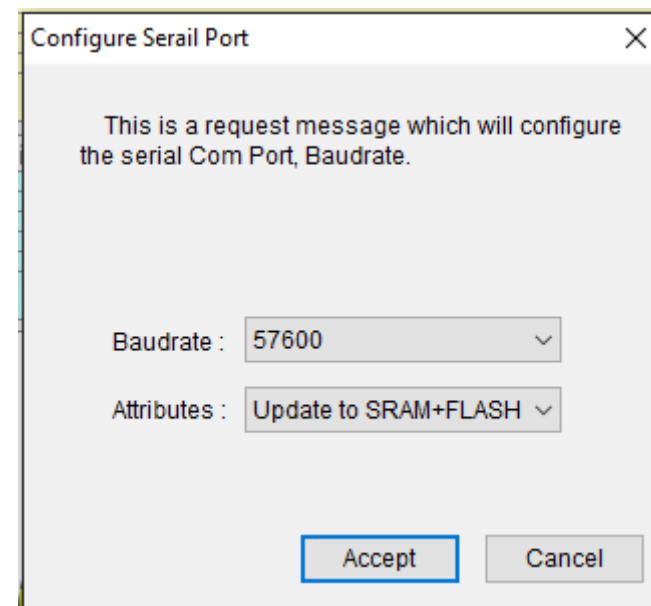
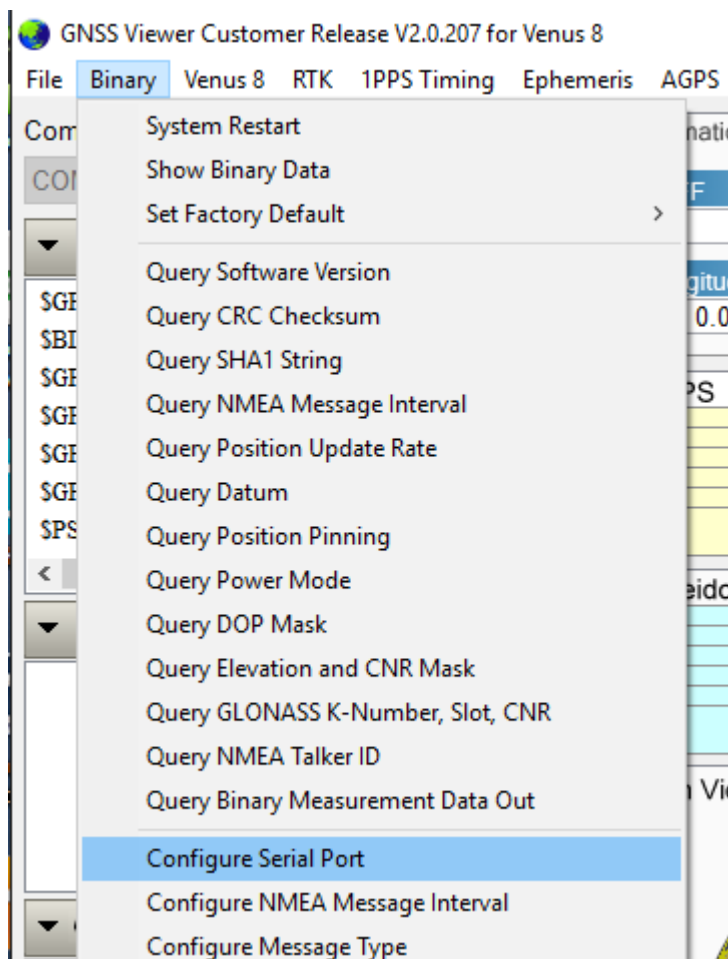


Setup EVB as Base Station (4/5)

- After it gets position fix and self-surveyed, the base enters into static mode. You should see the blue dot stop drifting around after static mode is entered from scatter plot view, may need to click Set Origin to see it first. Next power on will still start from survey mode, with self-surveyed antenna location at different place unless static mode is chosen and constant position is entered.
- To see what the self-surveyed latitude, longitude, and altitude values are, from GNSS Viewer 1PPS Timing → Query Timing
- To use the base at some fixed location, use above steps to self-survey and retrieve surveyed position, then set antenna position by 1PPS Timing → Configure Timing → Static (*input antenna latitude/longitude in degrees and altitude in meter, update to SRAM+Flash*)

Setup EVB as Base Station (5/5)

- Rover expect base to send data at 57600. When changing from 115200 rover mode to base mode, remember to change baud rate to 57600 to work with rover.



Base Station Mode (USB)

Header Jumper Setting
for **USB** Interface Connection

SkyTraQ raw measurement
Output (from TX1)

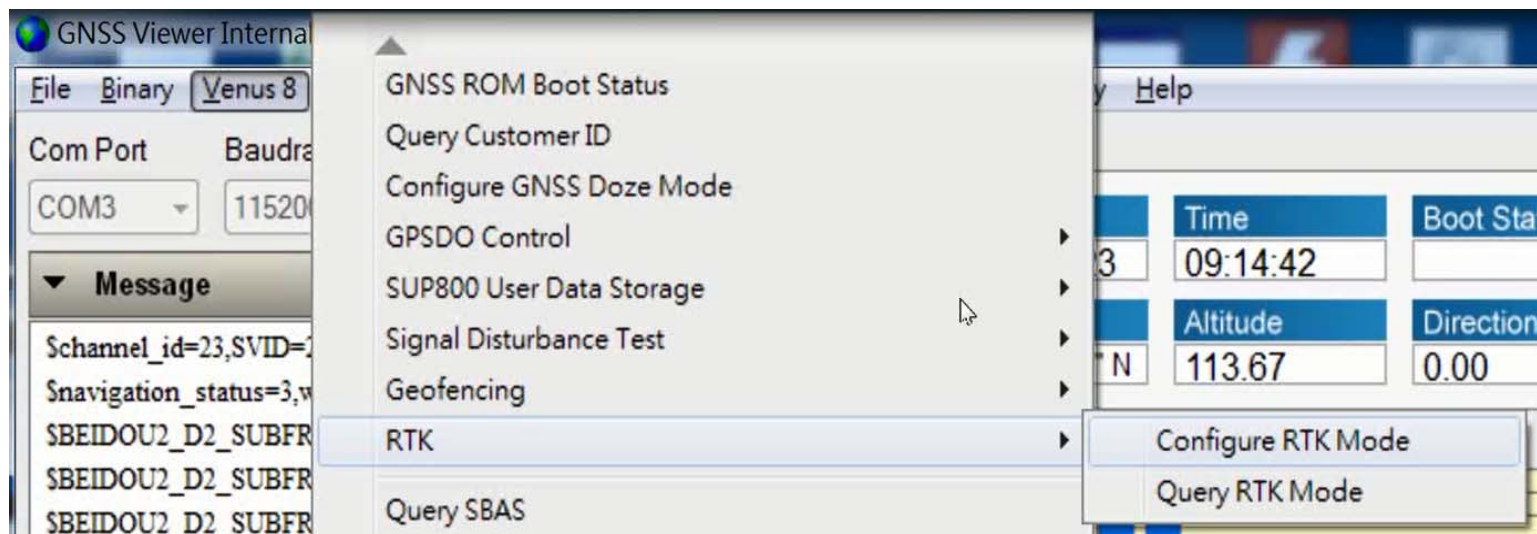
Not used



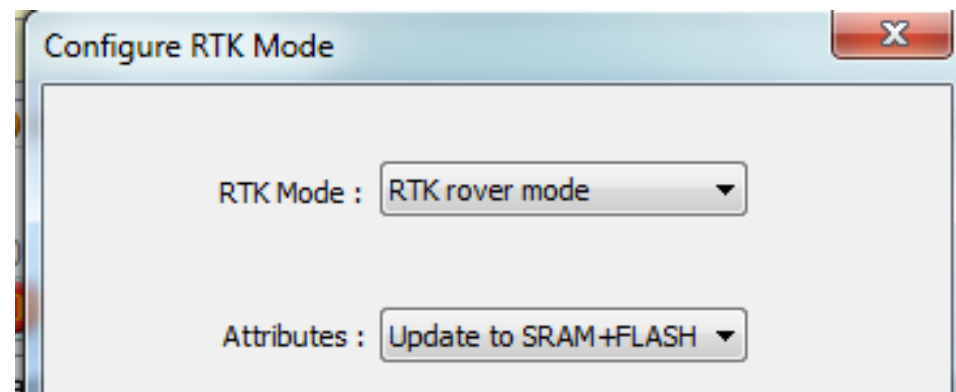
Setup as Rover

- From GNSS Viewer

Venus8 → RTK → Configure RTK Mode → RTK rover mode
update to SRAM+Flash



All configuration go through USB1 COM port



Rover Mode (USB)

Header Jumper Setting
for **USB** Interface Connection

USB1 NMEA Output
 (from TX1)

RTCM 3.x Input USB2
or
SkyTraQ raw measurement input
(to RX2)



3.3V TTL Interfacing

Remove J2 and/or J3 jumper and use these header pins

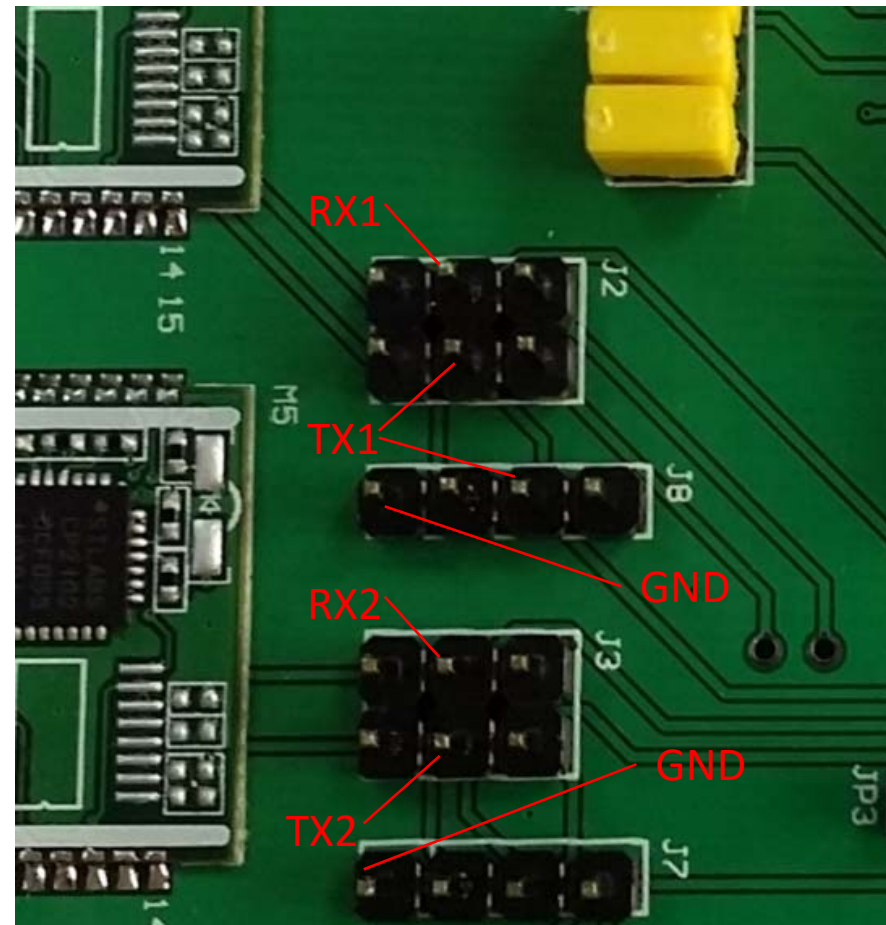


Rover Mode (TTL)

Header Jumper Setting
for **TTL** Interface

NMEA Output (from TX1)

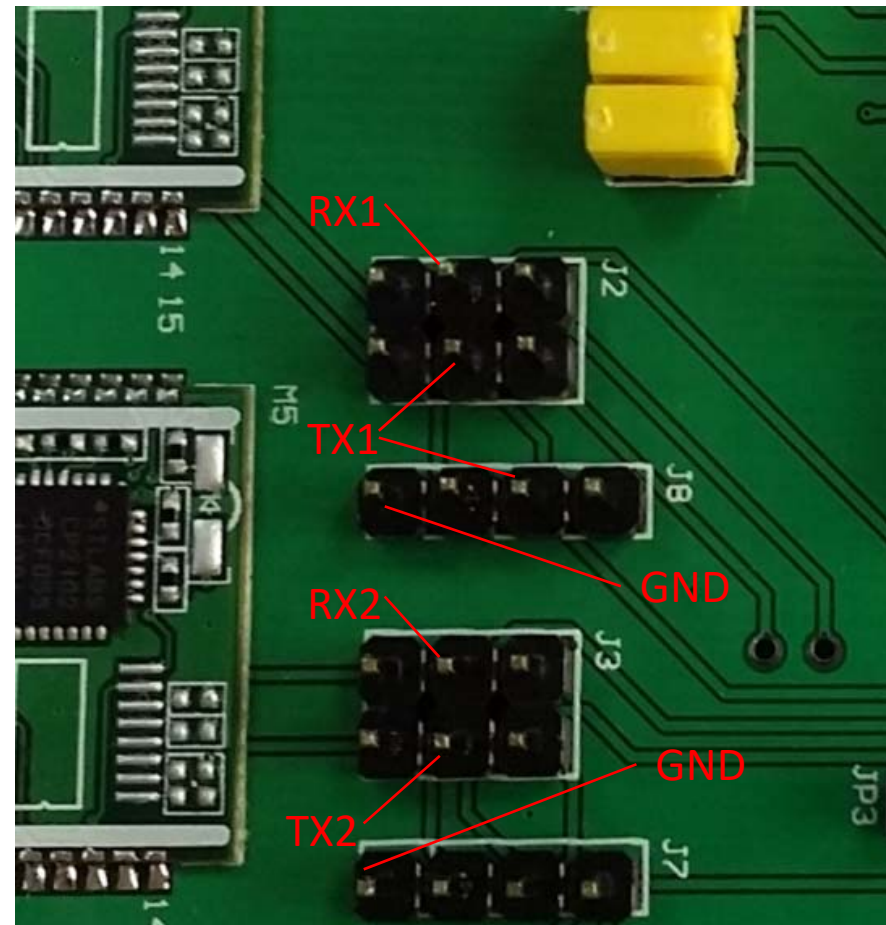
RTCM 3.x Input
or
SkyTraQ Raw Measurement Input
(to RX2)



Base Station Mode (TTL)

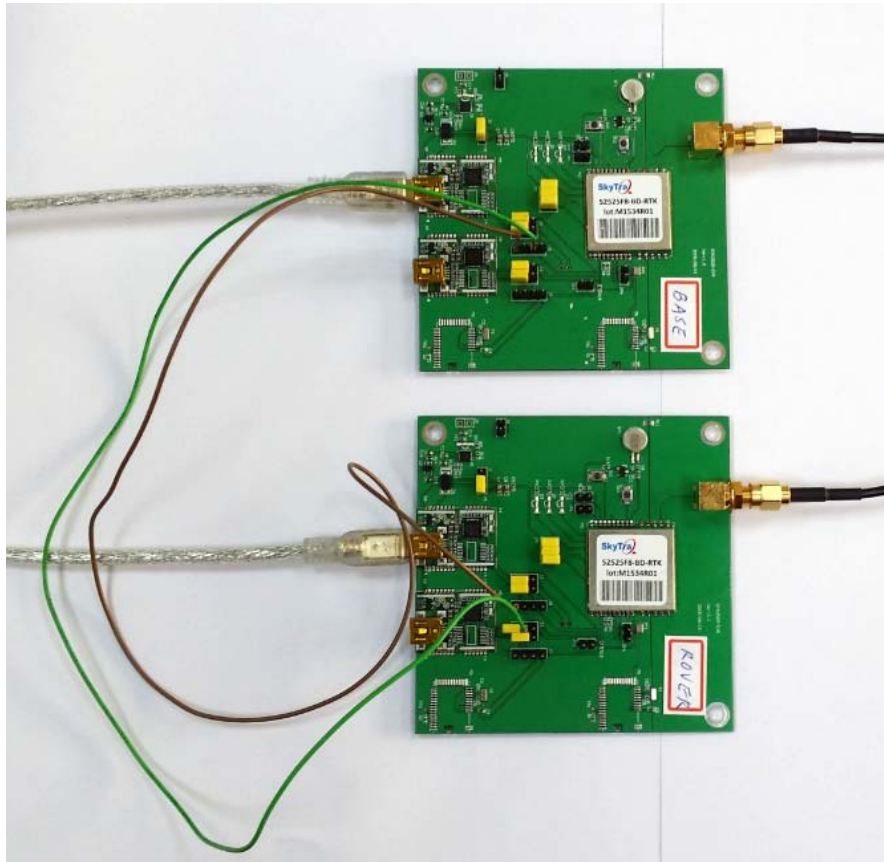
Header Jumper Setting
for **TTL** Interface

SkyTraq Raw Measurement Output
(from TX1)

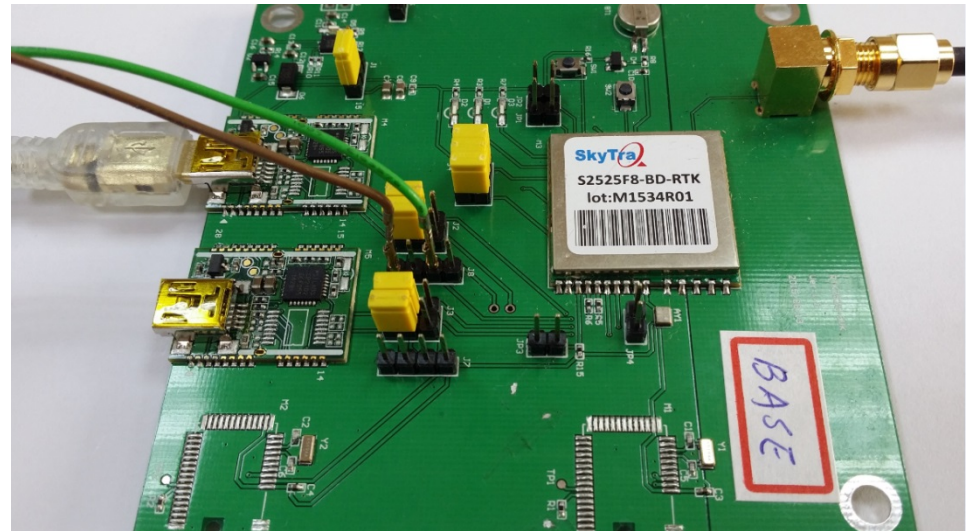


Very Short Baseline Quick Test

Connect Base to Rover via TTL UART

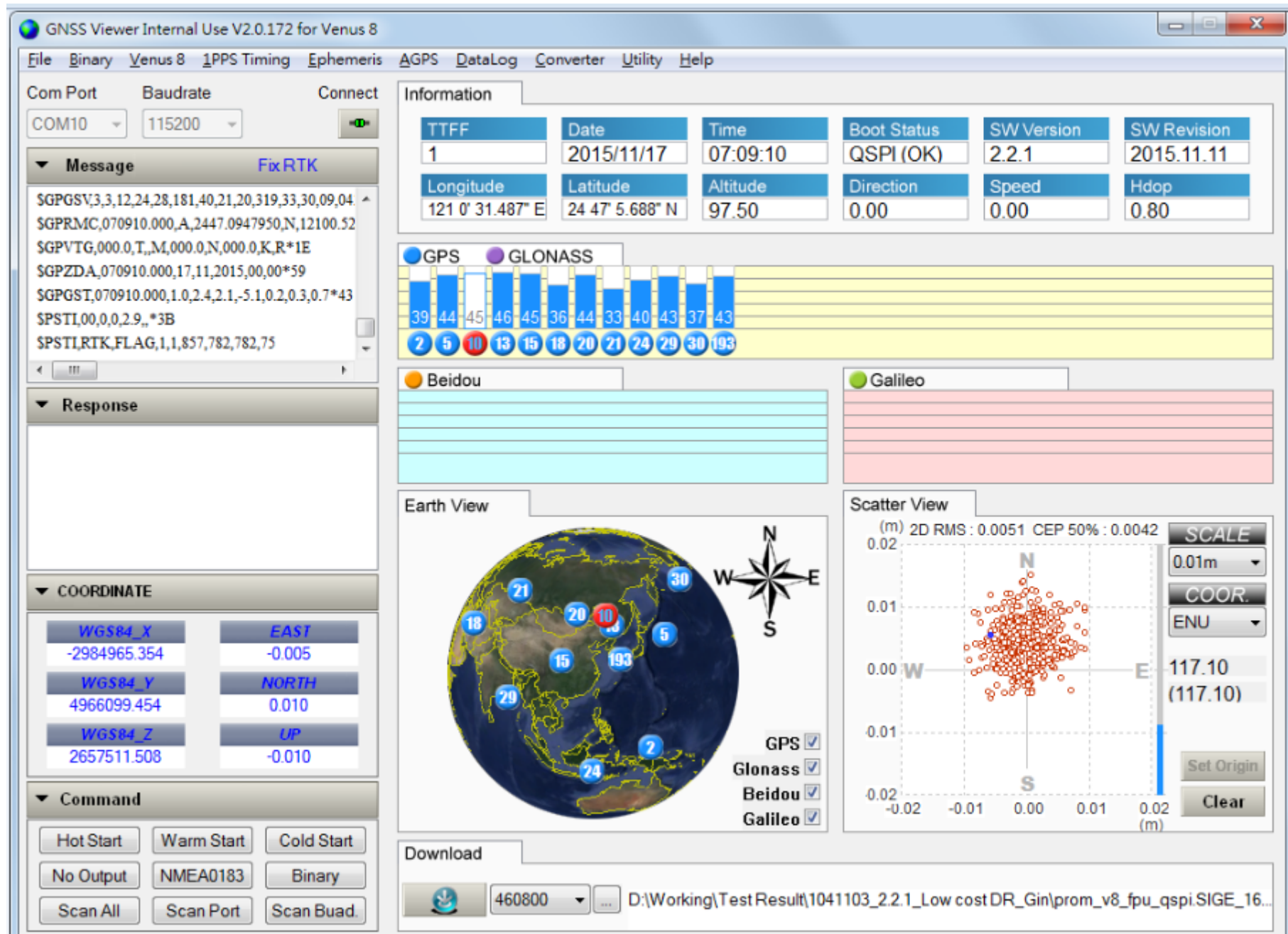


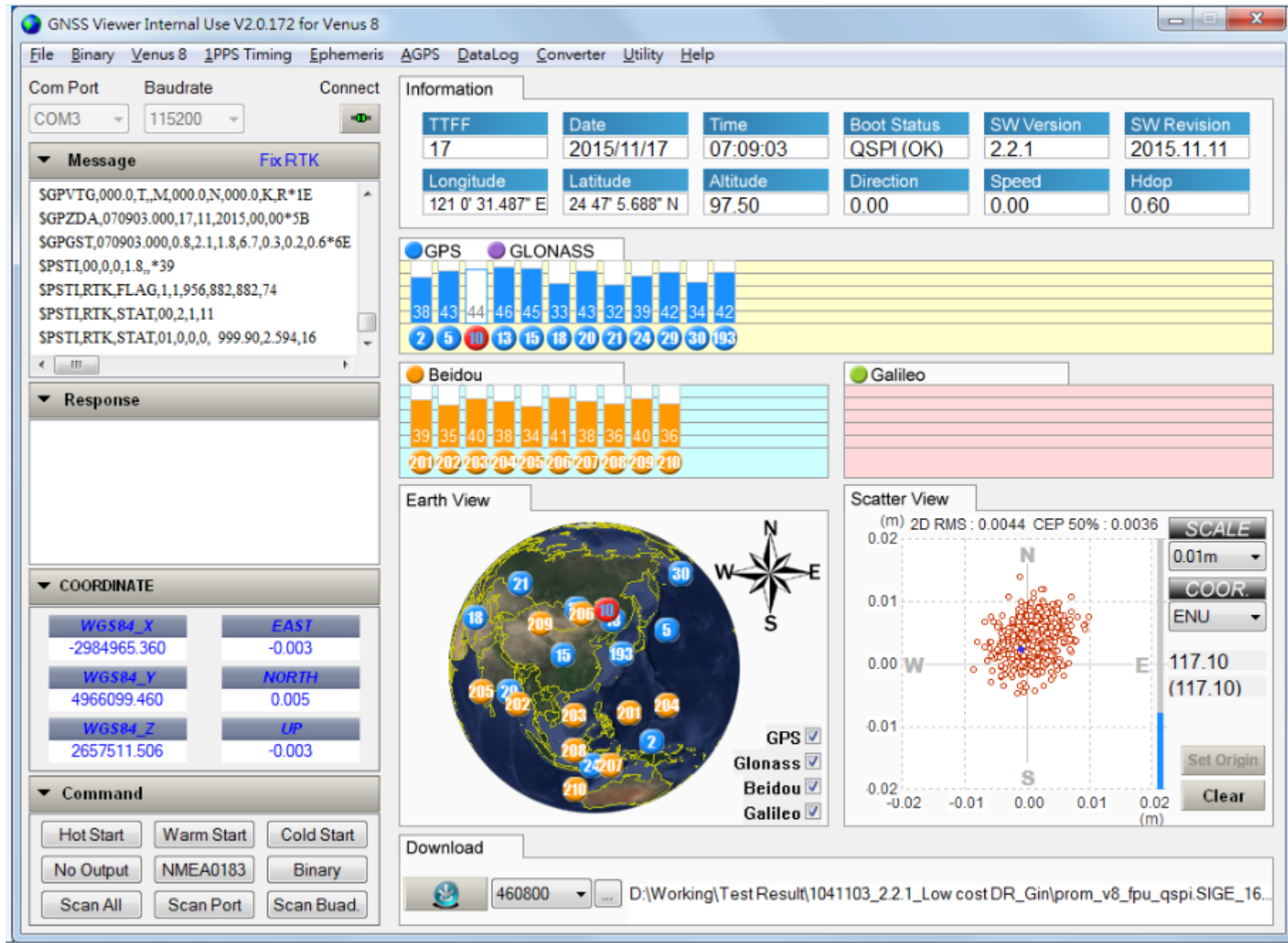
1. Connect ground of base and rover
2. Connect base TX1 to rover RX2



Setup

- Make sure antenna is under open sky and receiving signals over 38dB
- One evaluation board setup as base, let it self survey 60sec to determine antenna location
- The other evaluation should be in default rover mode
- Rover should initially have 3D fix, go through float solution, then later have fix solution





GNSS Viewer Internal Use V2.0.208 for Venus 8

File Binary Venus 8 RTK 1PPS Timing Ephemeris AGPS DataLog Converter Utility Help

Com Port Baudrate Connect
COM3 115200

Message Fix RTK

\$GPVTG,0.00,0.0,T,M,0.00,0.0,N,0.00,0.0,K,R*2E
\$GPZDA,051526.000,04,08,2016,00,00*5A
\$GPGST,051526.000,0.006,0.006,0.003,52.1,0.004,
\$PSTL,00,0,0,-3.0,*1E
\$PSTL,030,051526.000,A,2447.0947903,N,12100.5
\$PSTL,RTK,STAT,00,2,1,14
\$PSTL,RTK,STAT,01,0,0,0, 999.90,1.001,16.73487

Response

COORDINATE

WGS84_X	EAST
-2984965.374	0.001
WGS84_Y	NORTH
4966099.323	-0.001
WGS84_Z	UP
2657511.468	0.015

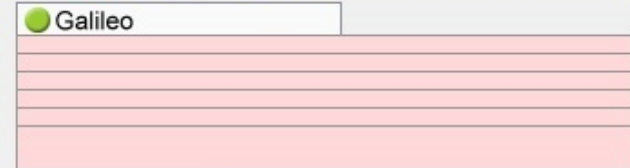
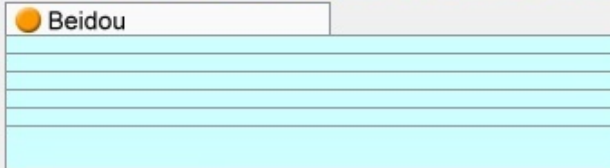
Command

Hot Start Warm Start Cold Start
No Output NMEA0183 Binary
Scan All Scan Port Scan Baud

Information RTK Info.

TTF	Date	Time	Boot Status	SW Version	SW Revision
22	2016/08/04	05:15:26	QSPI (OK)	2.2.3	2016.7.29

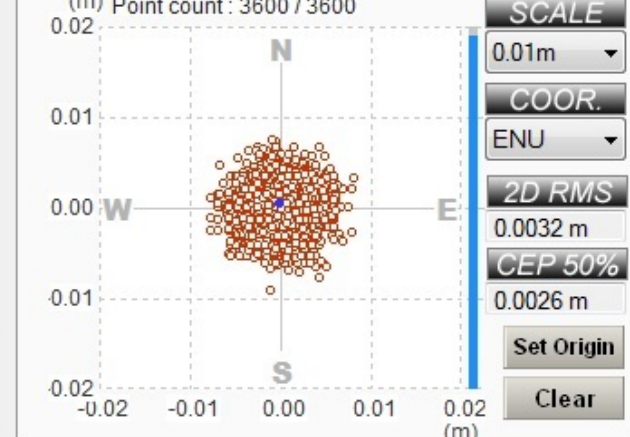
Longitude	Latitude	Altitude	Direction	Speed	HDOP
121° 0' 31.48631"E	24° 47' 5.68742"N	97.39	0.00	0.00	0.60



Earth View



Scatter View



Download

460800

What To Do Next

- After getting it to work in very short baseline configuration, you can extend base and rover distance by using
 - Simple radio link using transmitter and receiver
 - 3G or 4G network, using NTRIP Caster to send base station data over Internet, and NTRIP Client software to receive base station data over Internet.

Update EVB Firmware

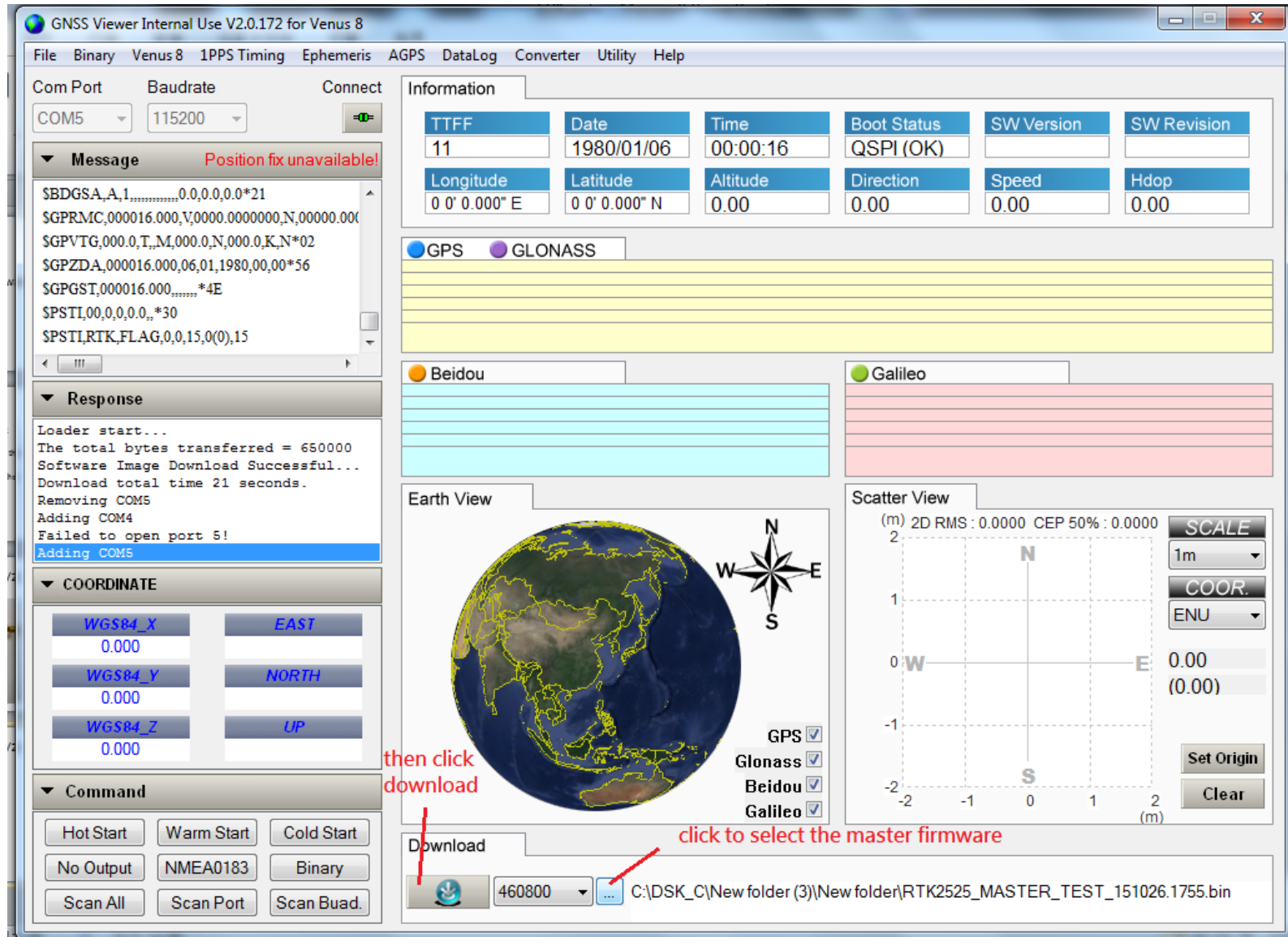
- There are two CPU inside S2525F8-BD-RTK and S2525F8-GL-RTK module, one is master, the other is slave.
- Two different firmware is used to program the master and slave CPU.
- Firmware for master CPU has “master” in the filename.
- Firmware for slave CPU has “slave” in the filename.

Update Master CPU Firmware (1/3)

Connect USB as below shows



Update Master CPU Firmware (2/3)



Update Master CPU Firmware (3/3)

- master CPU firmware has default mode for rover. If using the EVB as base, it needs to be set to base mode again after firmware update.

Update Slave CPU Firmware (1/3)

Connect second USB as below shows, take note of the 2nd COM port for the 2nd USB



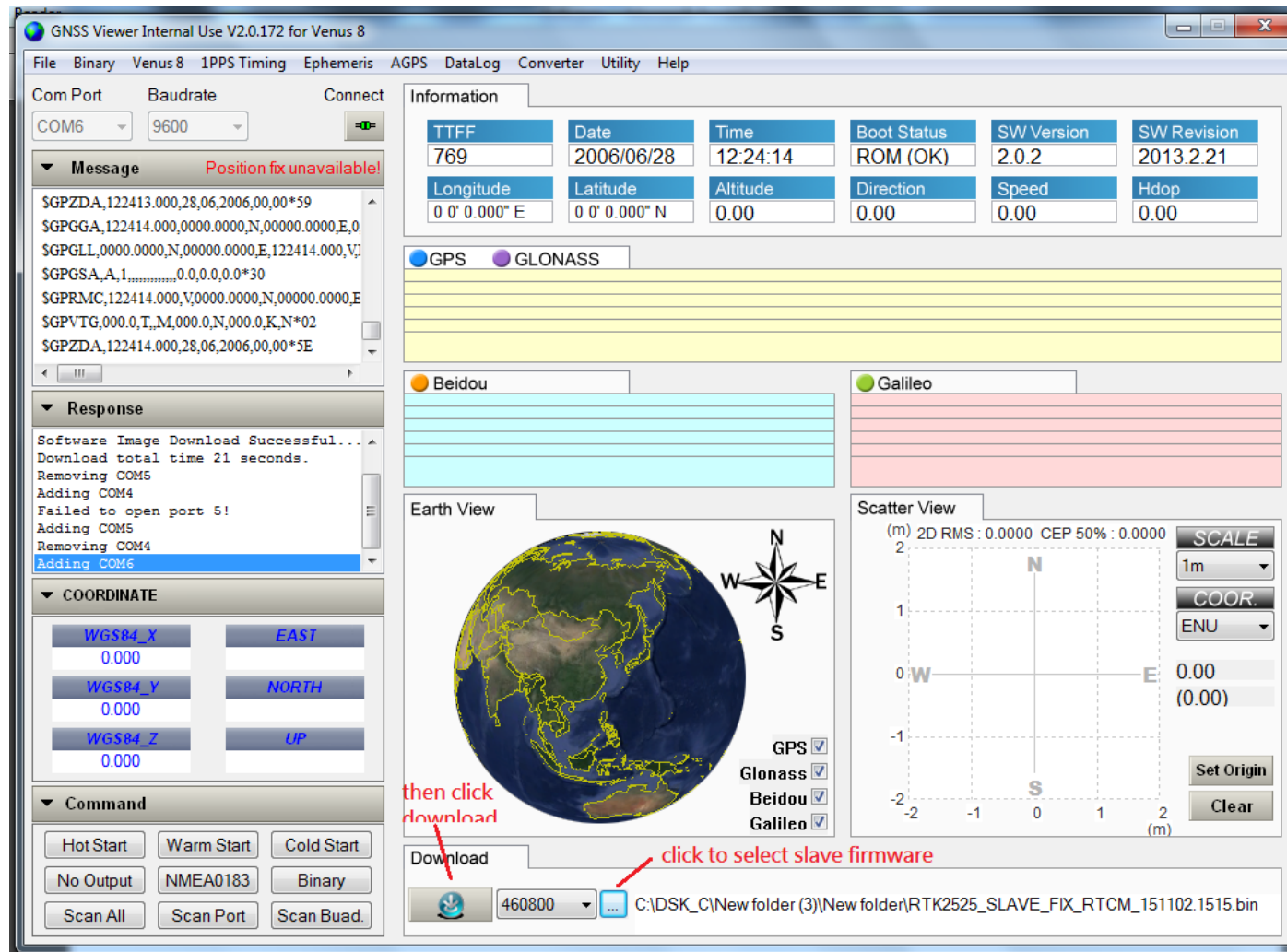
Update Slave CPU Firmware (2/3)

With both USB connected and powered, connect jumper to short JP2, then click SW1 and SW2 buttons



Update Slave CPU Firmware (3/3)

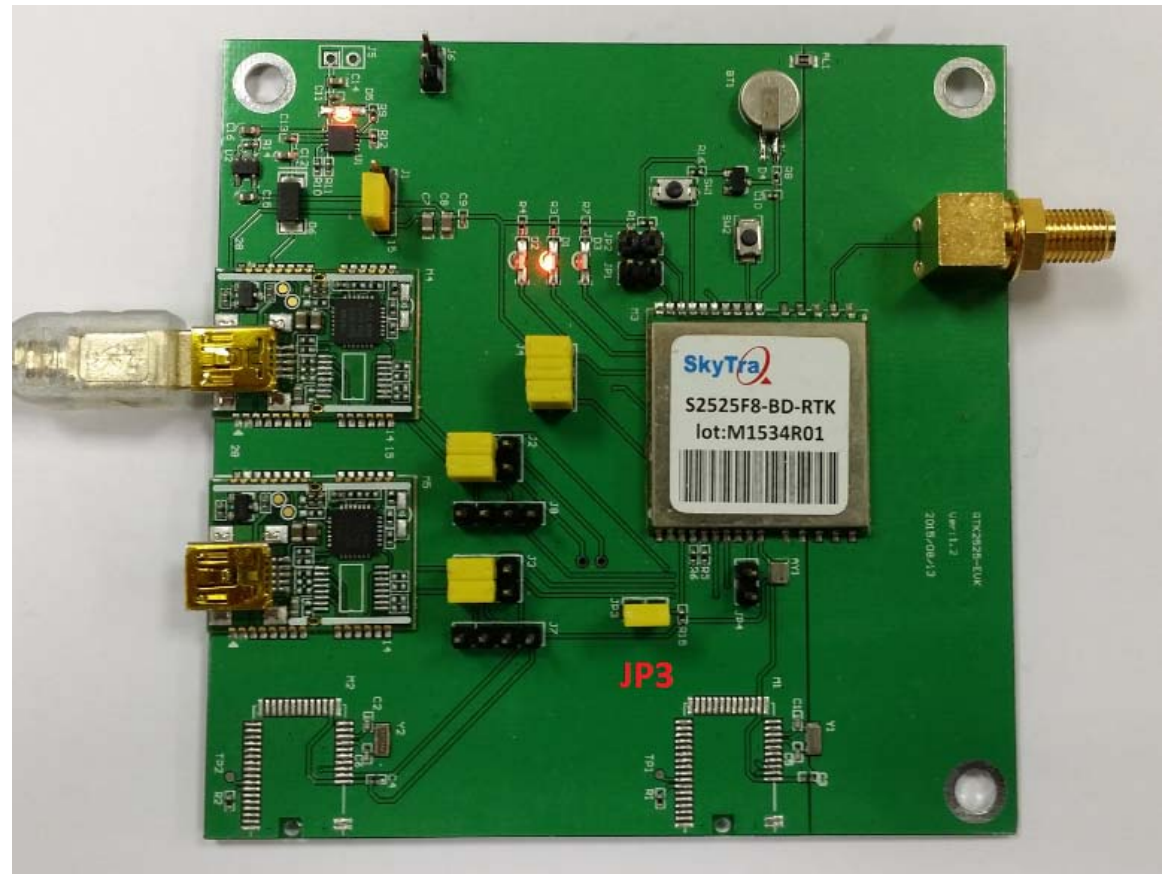
Disconnect the GNSS Viewer to select the second COM port, change baud rate to 9600, then connect. You should see NMEA coming out. Proceed to download firmware as shown below.



Once firmware download finished, remove JP2 jumper and USB cables. The EVB has firmware updated.

Update Corrupted Master CPU Firmware

1. Connect JP3 jumper
2. Connect to PC
3. GNSS Viewer connect with 4800 baud rate
4. NMEA should be seen coming out
5. Update firmware
6. GNSS Viewer disconnect
7. Disconnect from PC
8. Remove JP3



Update Corrupted Slave CPU Firmware

1. Connect JP2 jumper
2. Connect to PC with **both** USB
3. GNSS Viewer connect to #2 port with 9600 baud rate
4. NMEA should be seen coming out
5. Update firmware via #2 port
6. GNSS Viewer disconnect
7. Disconnect from PC
8. Remove JP2

