RTK logger F9C setting manual

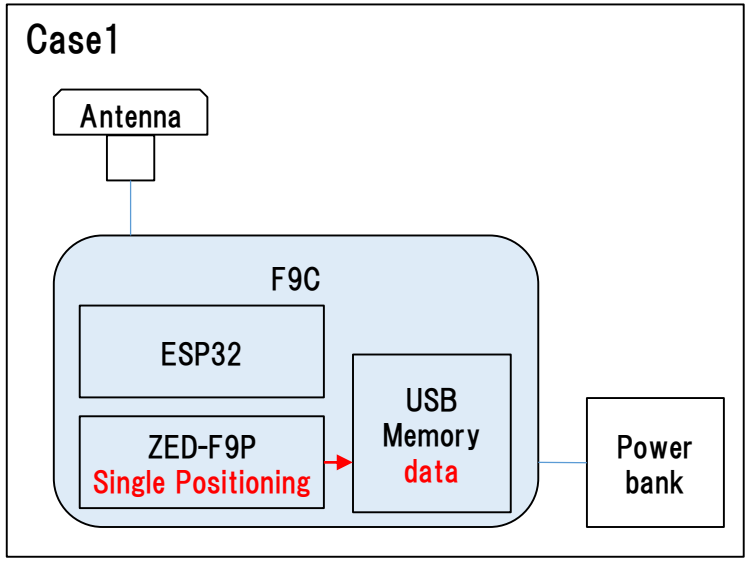
2020/04/20

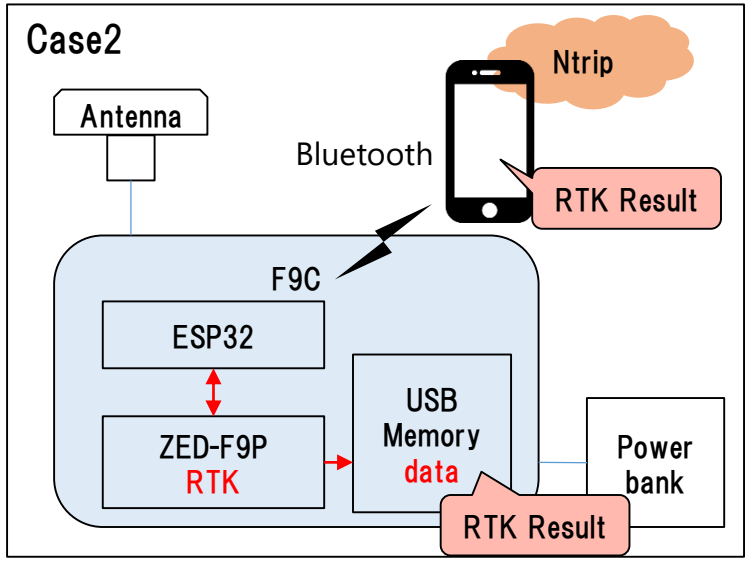
1. About F9C

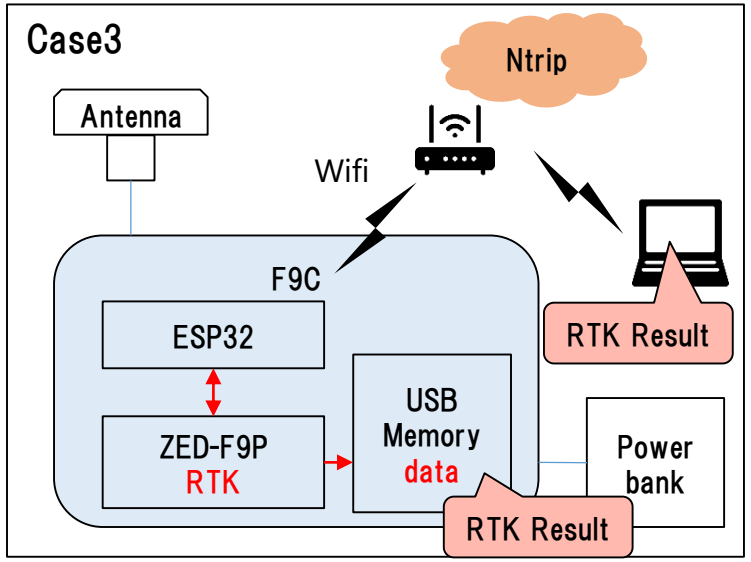
◆F9C is RTK data logger powered by ublox ZED-F9P.

◆Contact “Sensorcomm” to purchase.
http://www.sensorcomm.co.jp/

◆ESP32 WiFi and Bluetooth module is included.
(Case 2 and Case 3 are alternative)







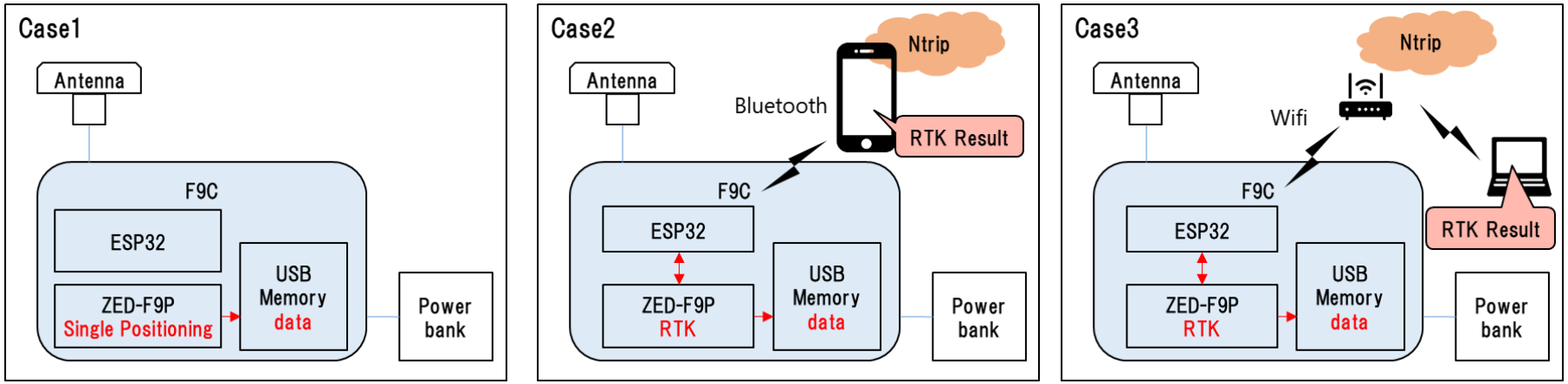
1. About F9C

◆Power consumption

Tested with 10000mAh power bank.

(Bluetooth and WiFi power consumption depend on the signal environment)

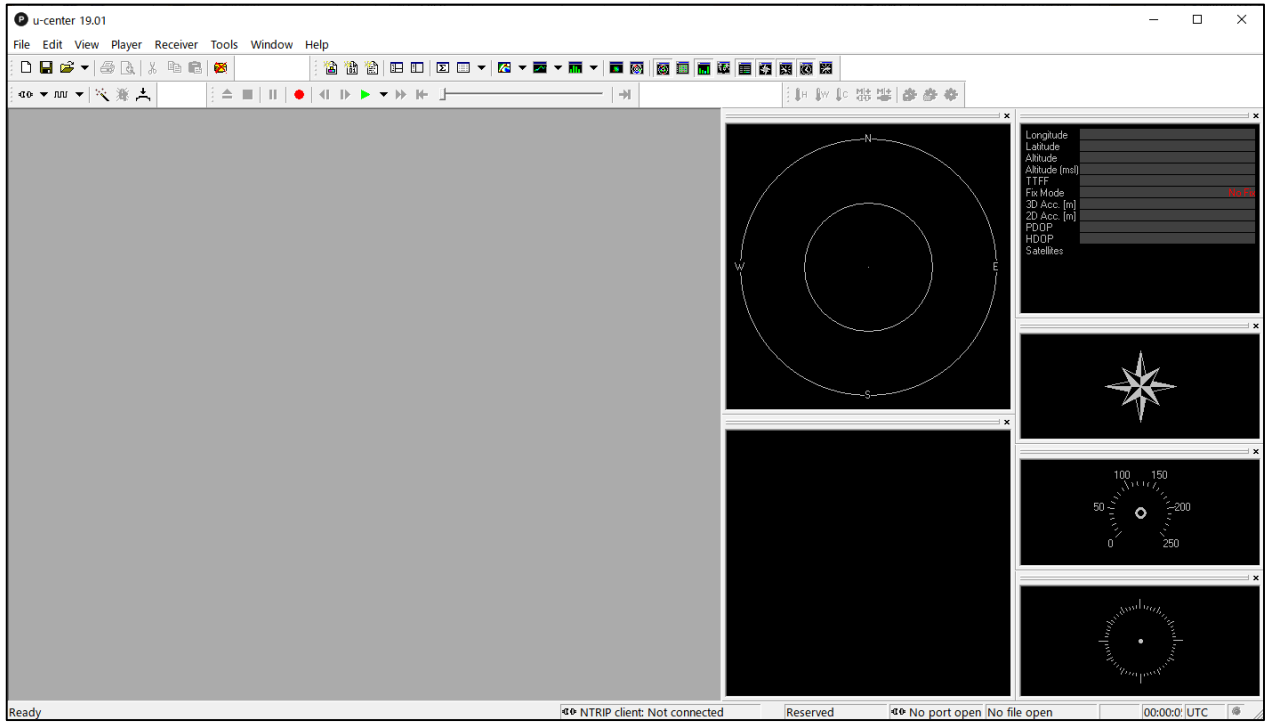
Running time　24 h　>　20 h　>　16 h



2. F9P setting

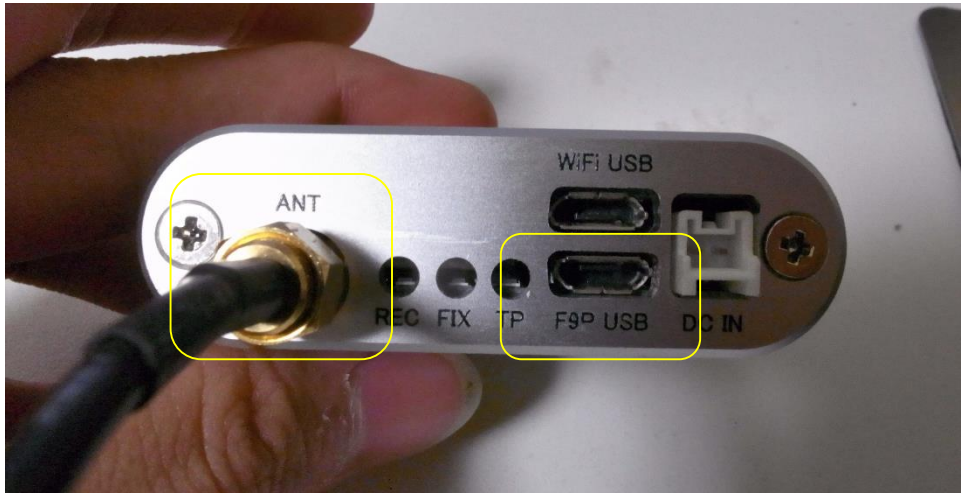
F9C can’t log data in factory default. You have to set it up yourself.

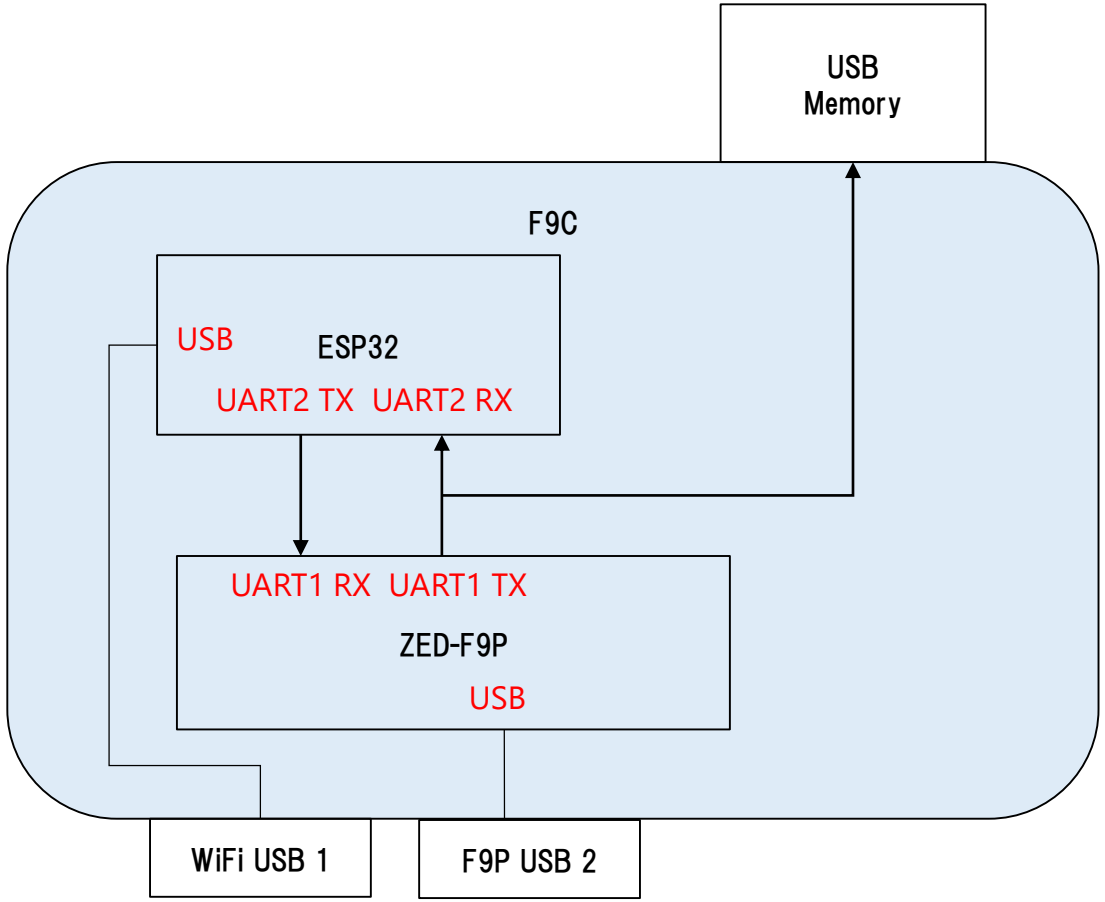
1. Install u-center, ublox GNSS software in your PC.
   https://www.u-blox.com/en/product/u-center



2. F9P setting

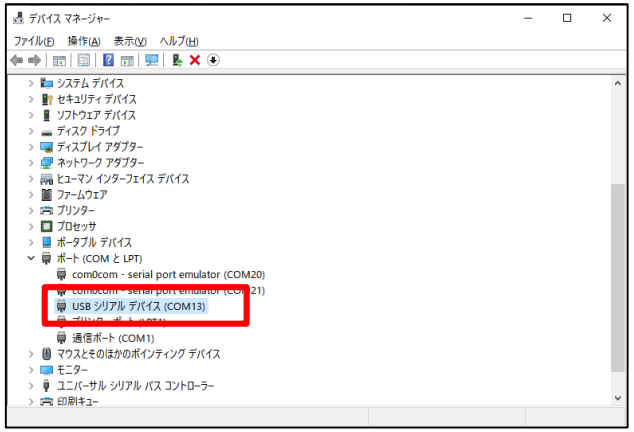
2. Connect GNSS Antenna.
3. Connect your PC and F9C by USB cable.

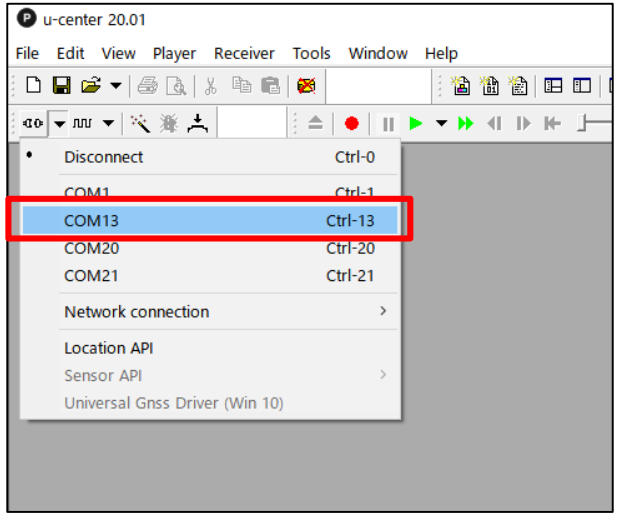


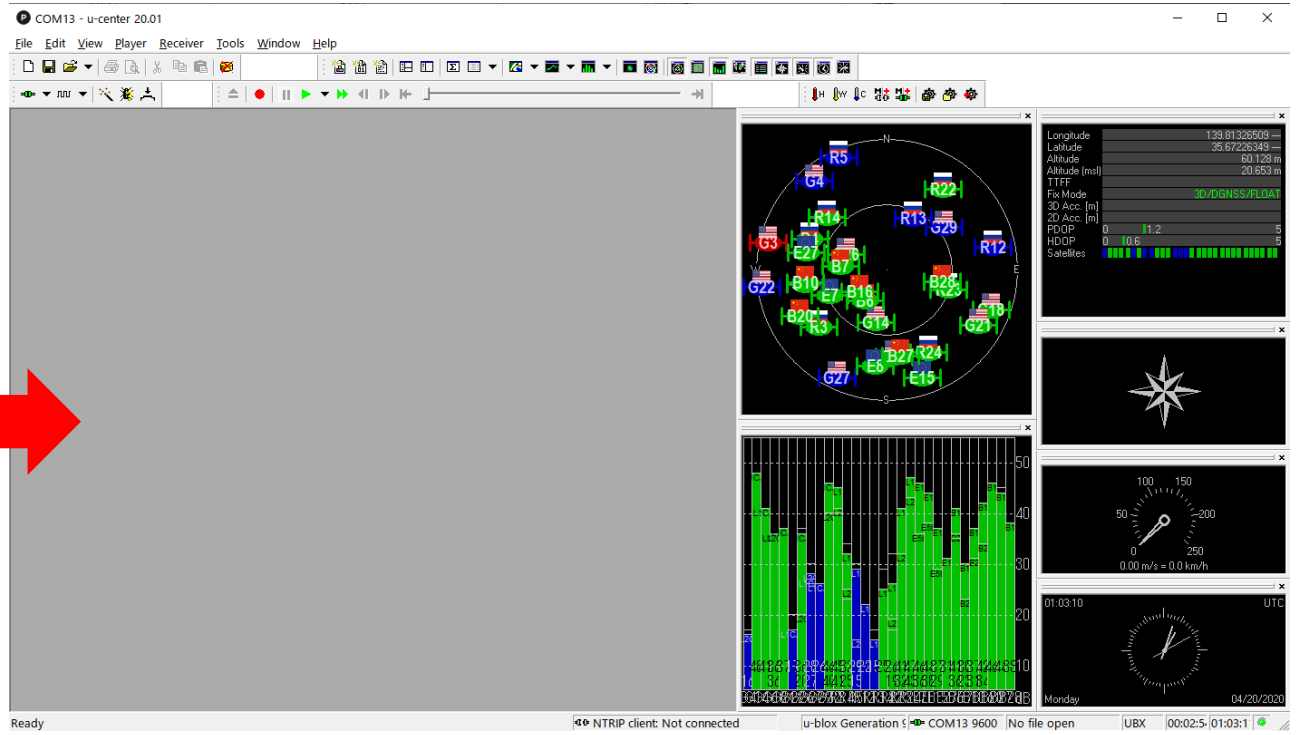


2. F9P setting

4. Select COM port and connect to F9P.

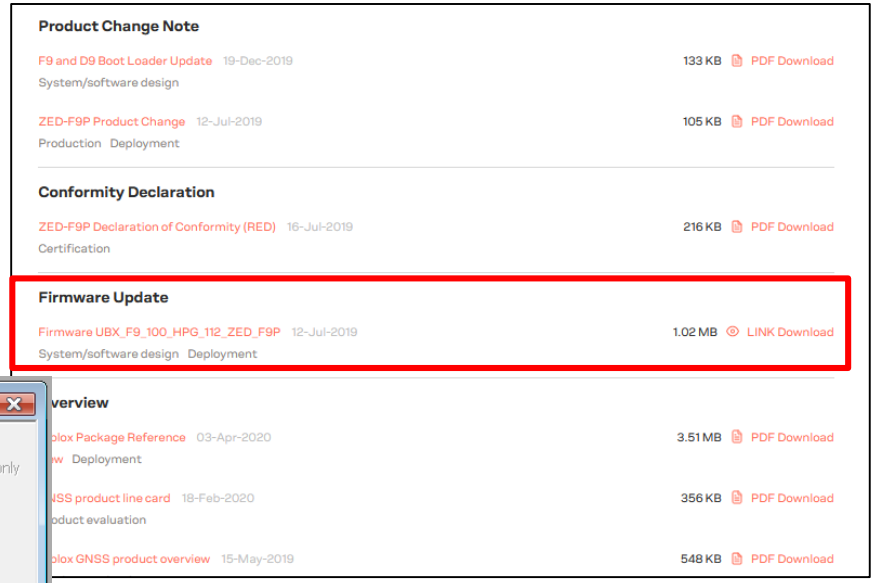


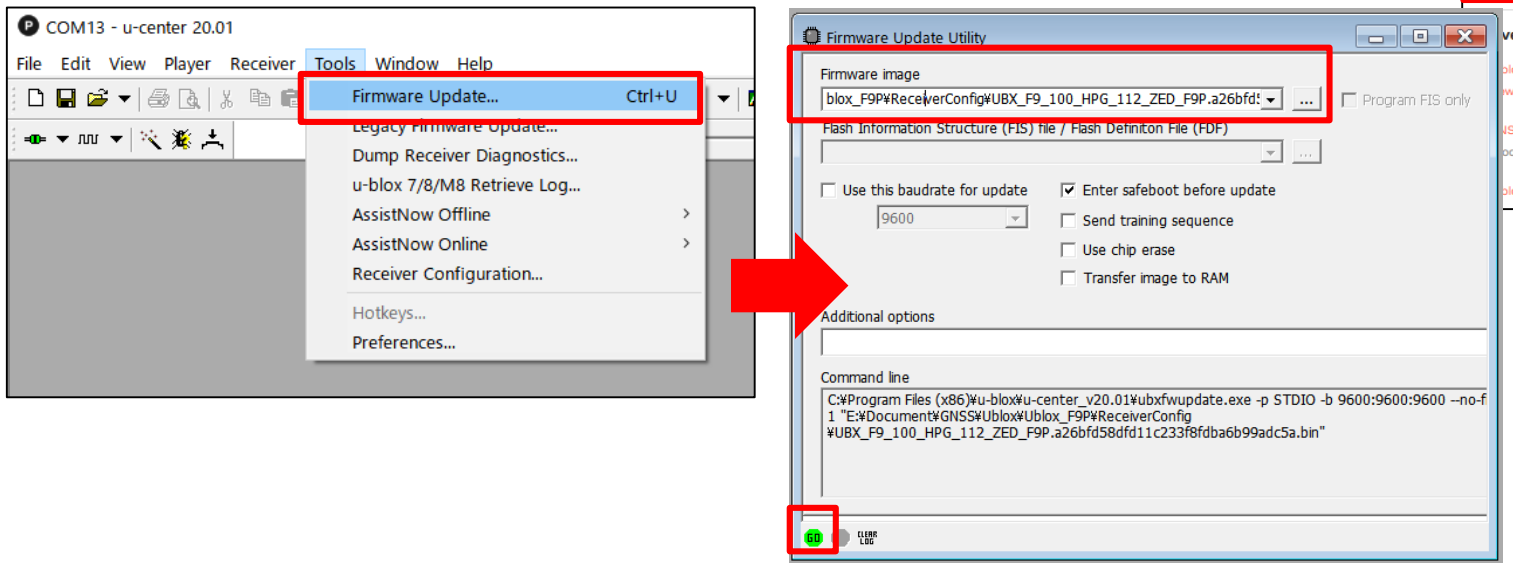




2. F9P setting

5. Download newest Firmware from u-blox web site.
   https://www.u-blox.com/en/product/zed-f9p-module#tab-documentation-resources
6. Tools>Firmware Update
   Select image file you downloaded and click “GO”.

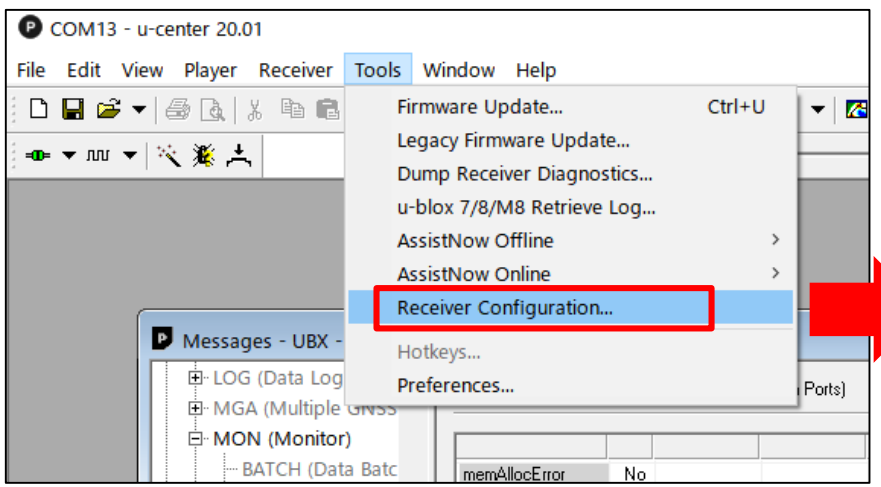


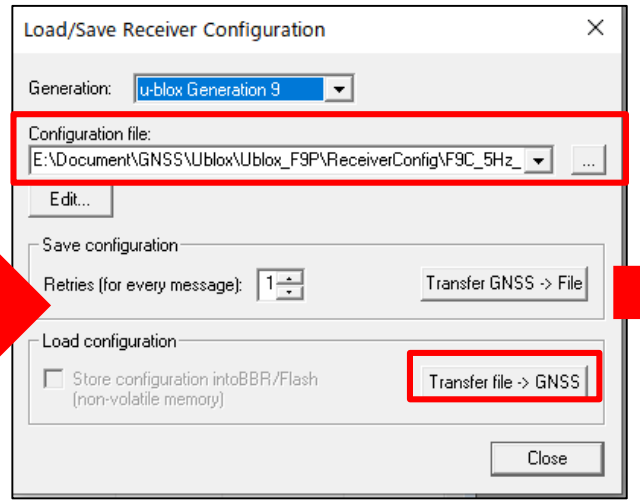


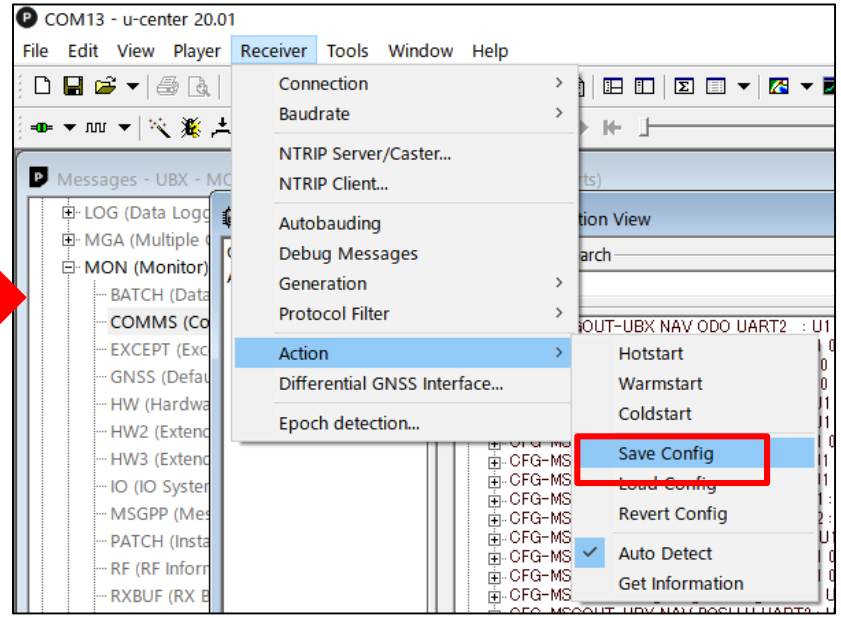
2. F9P setting

7. Download configuration sample file for F9C.
   http://www.denshi.e.kaiyodai.ac.jp/gnss_tutor/pdf/F9C/F9C_5Hz_NMEA.txt
   Load configuration file from Tools>Receiver Configuration.

   After loading configuration, don't forget to do "save config" before power off the receiver.







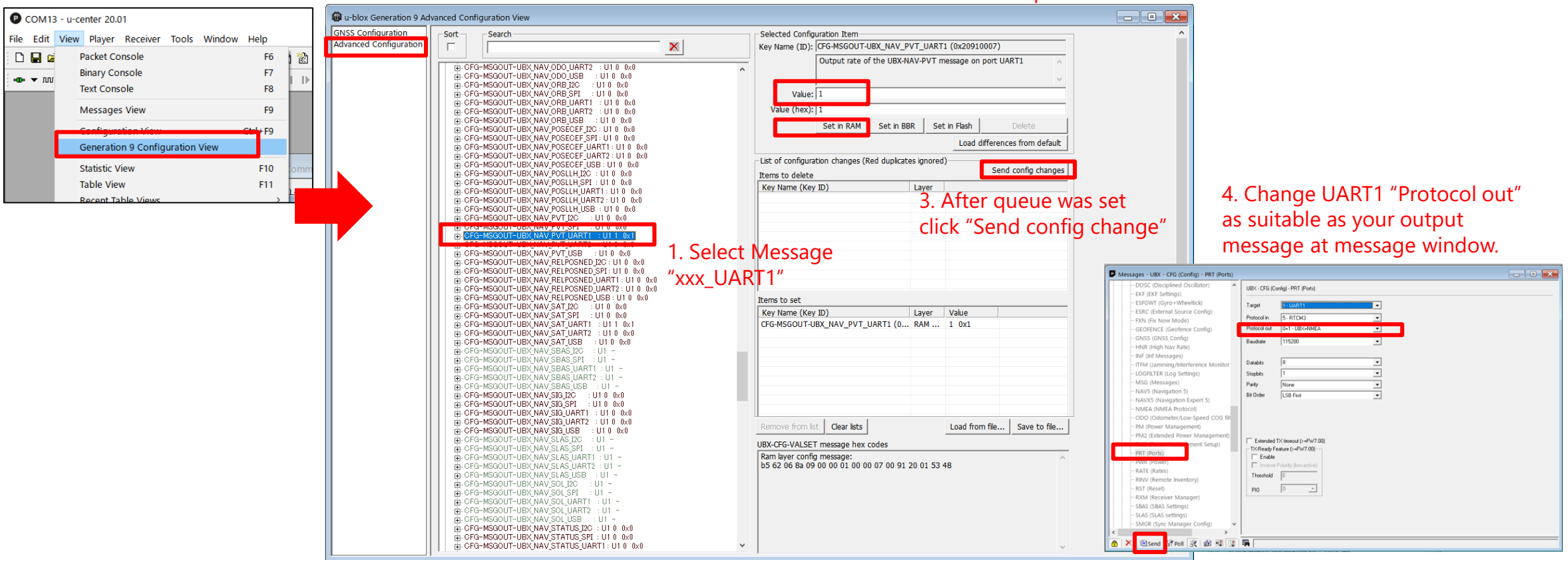
2. F9P setting

7. Note: This sample configuration file output following sentence to USB memory and ESP32.

・NMEA…GGA, RMC, VTG…5Hz

If you want other sentences, please customize yourself.

Example : output UBX-NAV-PVT



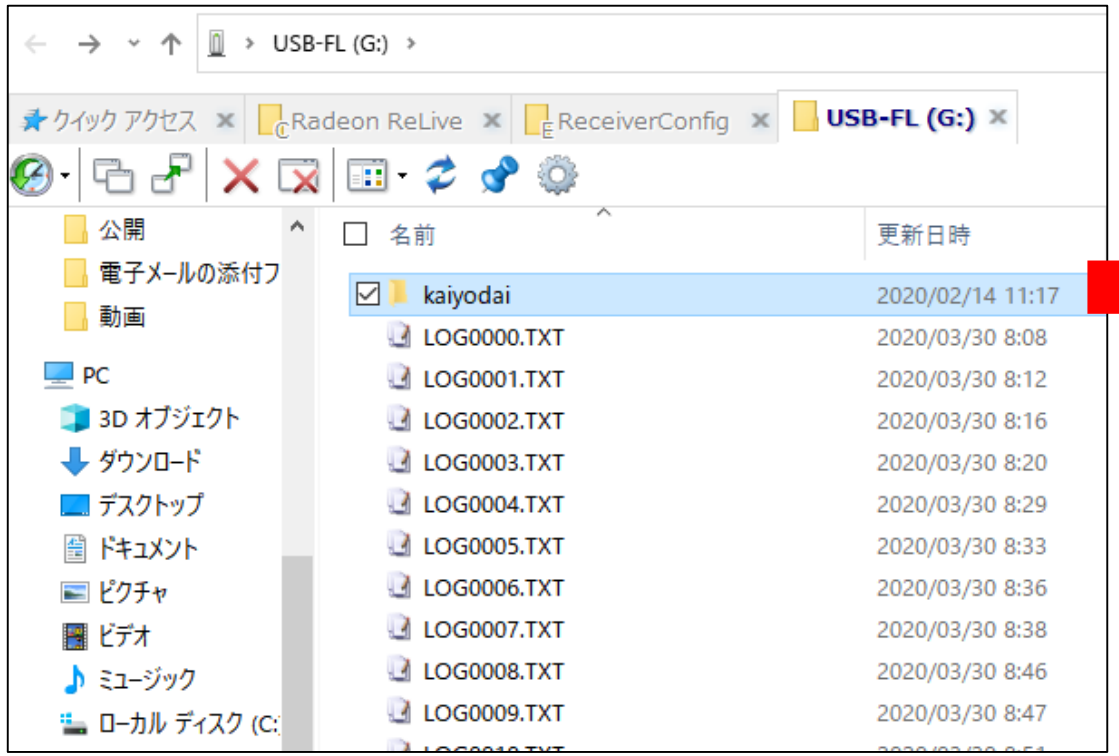
3. Data logging

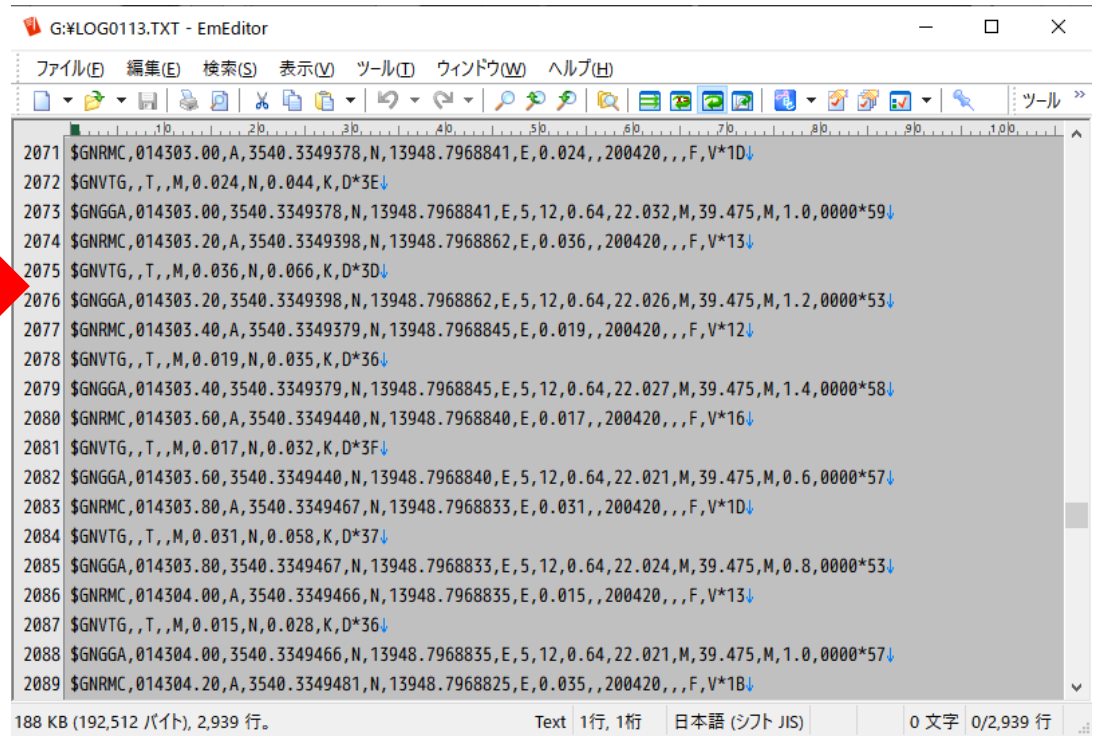
USB memory data logging will automatically start when you power on F9C.

And disconnect power USB, it stop logging.

3. Data logging

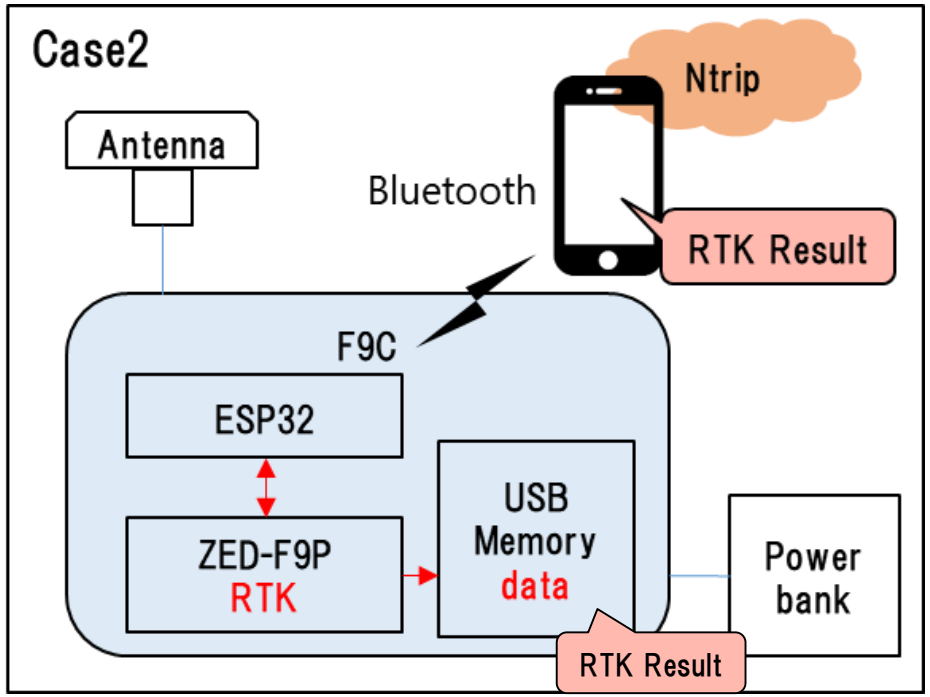
You can salvage data from USB memory. (USB memory data format should be FAT32)





4. Bluetooth setting

You can get RTK position with your smartphone (Android).

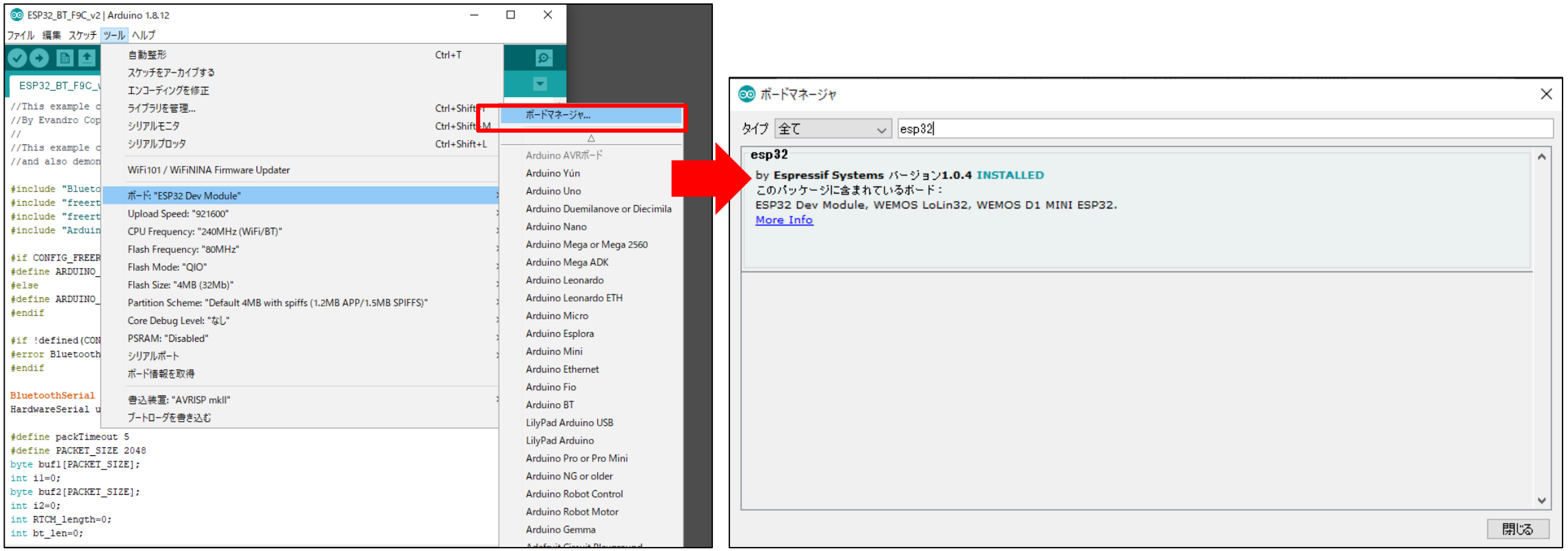


1. Install Arduino IDE in your PC.
   https://www.arduino.cc/en/main/software

2. Download sketch for ESP32.
   http://www.denshi.e.kaiyodai.ac.jp/gnss_tutor/pdf/F9C/ESP32_BT_F9C_v2.zip

4. Bluetooth setting

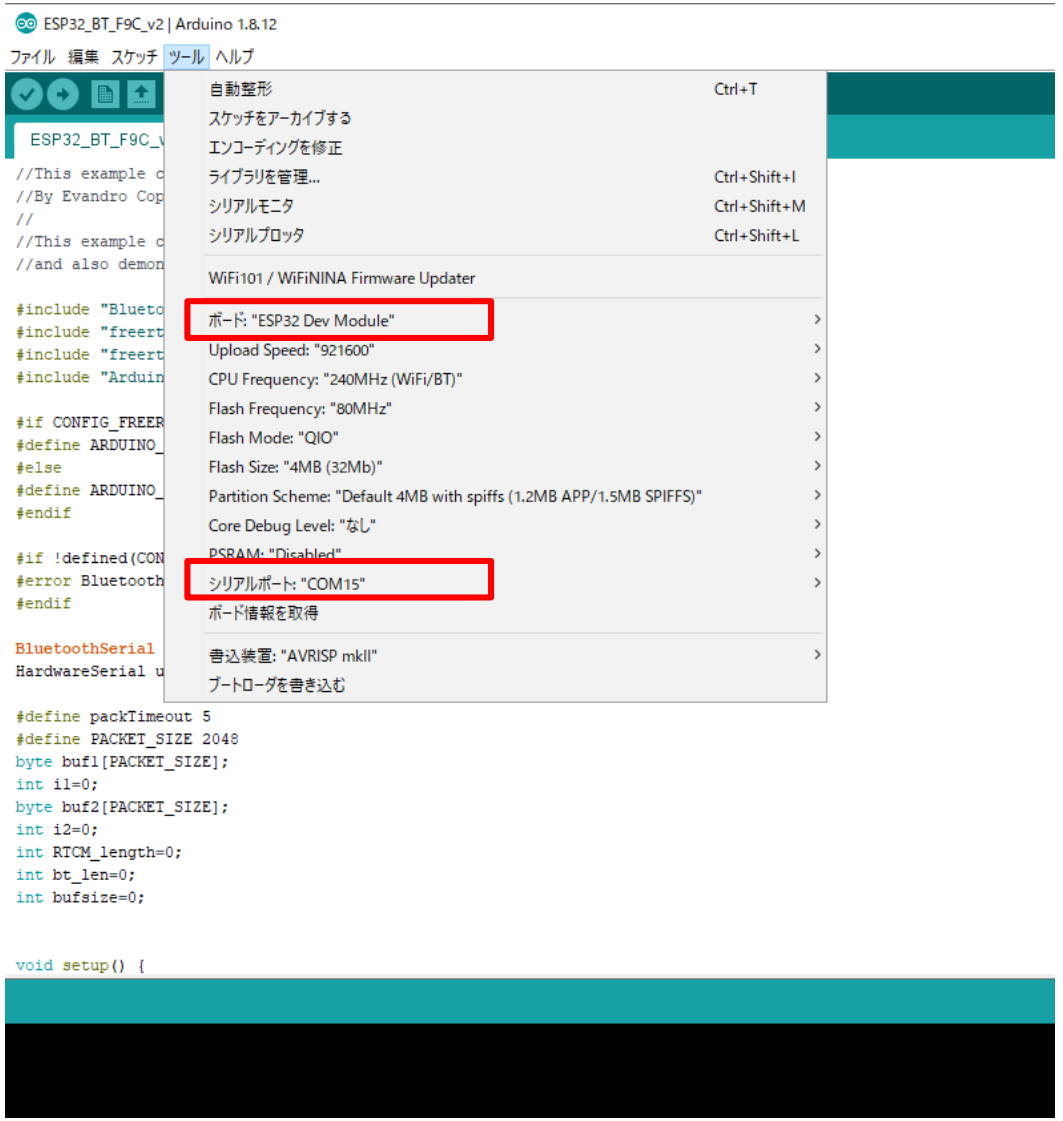
3. Open downloaded sketch “ESP32_BT_F9C_v2.ino”
4. Install the library for ESP32.
   Tool>Board>Board Manager. Then search by “esp32” and install the library.



4. Bluetooth setting

5. Connect F9C with PC by USB cable.

6. Select board type as “ESP32 Dev Module” and COM port.



4. Bluetooth setting

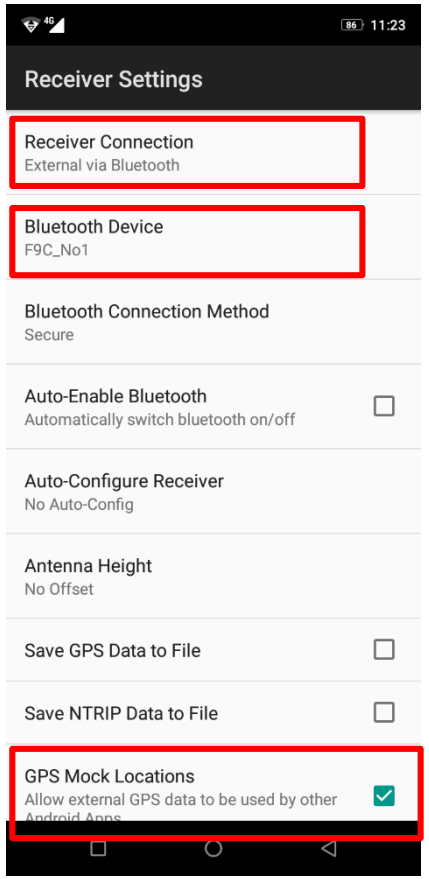
7. Change Bluetooth device name as you like.
8. Write sketch to the board.
   After writing completed you can disconnect USB from PC.

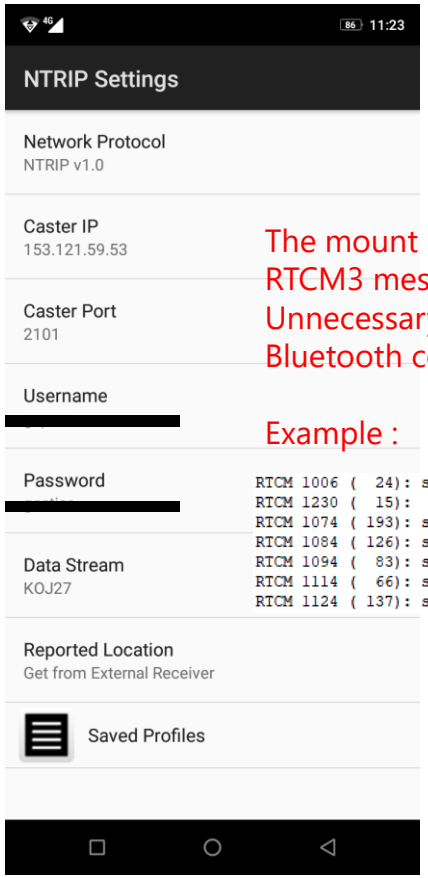
4. Bluetooth setting

9. Power supply to F9C.
10. Pairing F9C with your smartphone.

4. Bluetooth setting

11. Install “Lefebure NTRIP Client” from Google play store on your Android.
    Set receiver as F9C and configure NTRIP base station, Then click “Connect”.
    You can use RTK position on your smartphone app if you enable “GPS Mock Locations”.





The mount point should broadcast minimal RTCM3 messages.
Unnecessary messages will cause a stack of Bluetooth communication.

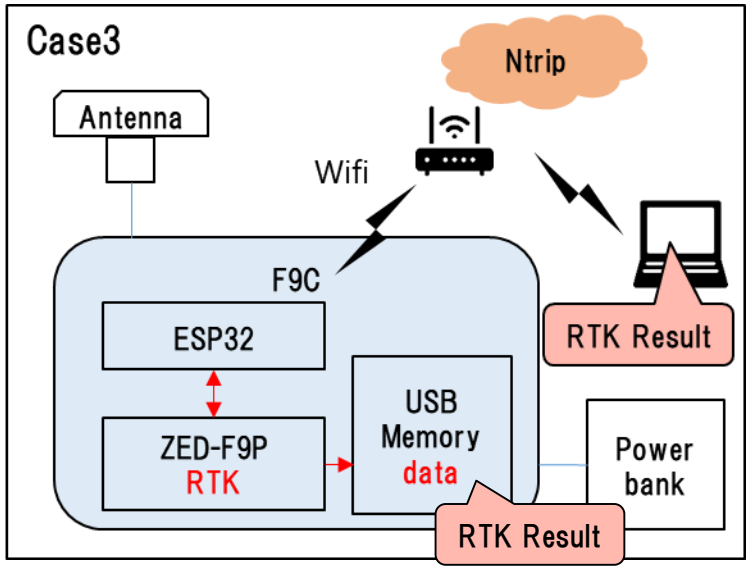
Example :

```
RTCM 1006 (  24): staid=   0 pos=35.55193529 139.64700590 94.419 anth=0.000
RTCM 1230 (  15):
RTCM 1074 ( 193): staid=   0 2020/04/20 02:43:47.00 nsat= 9 nsig= 4 iod= 0 ncell=24 sync=1
RTCM 1084 ( 126): staid=   0 2020/04/20 02:43:47.00 nsat= 7 nsig= 2 iod= 0 ncell=14 sync=1
RTCM 1094 (  83): staid=   0 2020/04/20 02:43:47.00 nsat= 4 nsig= 2 iod= 0 ncell= 8 sync=1
RTCM 1114 (  66): staid=   0 2020/04/20 02:43:47.00 nsat= 2 nsig= 3 iod= 0 ncell= 6 sync=1
RTCM 1124 ( 137): staid=   0 2020/04/20 02:43:47.00 nsat= 9 nsig= 2 iod= 0 ncell=15 sync=0
```

5. Wifi setting

F9C logger can get RTK position and store it in wifi coverage.

The other device in the same LAN can monitor F9C status.



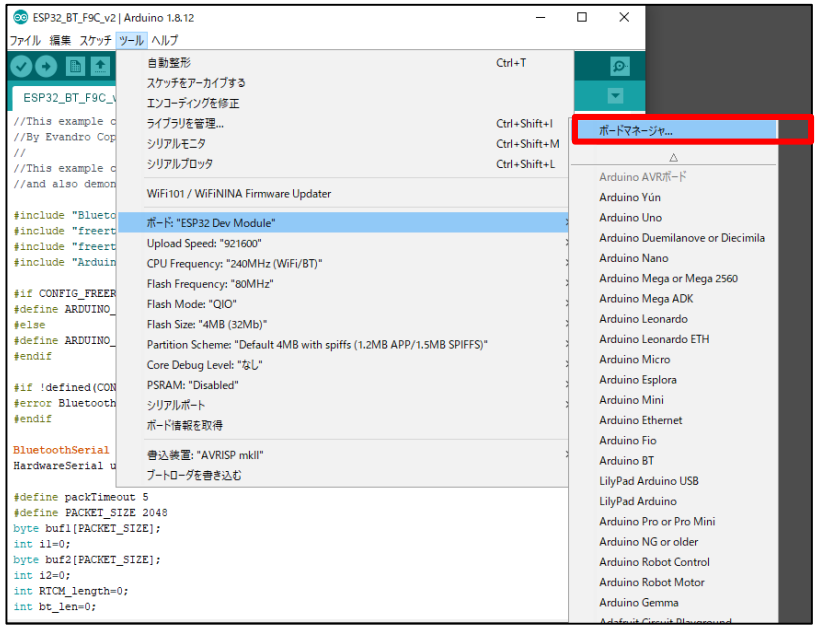
With mobile router

OR

RTK in Wifi coverage field

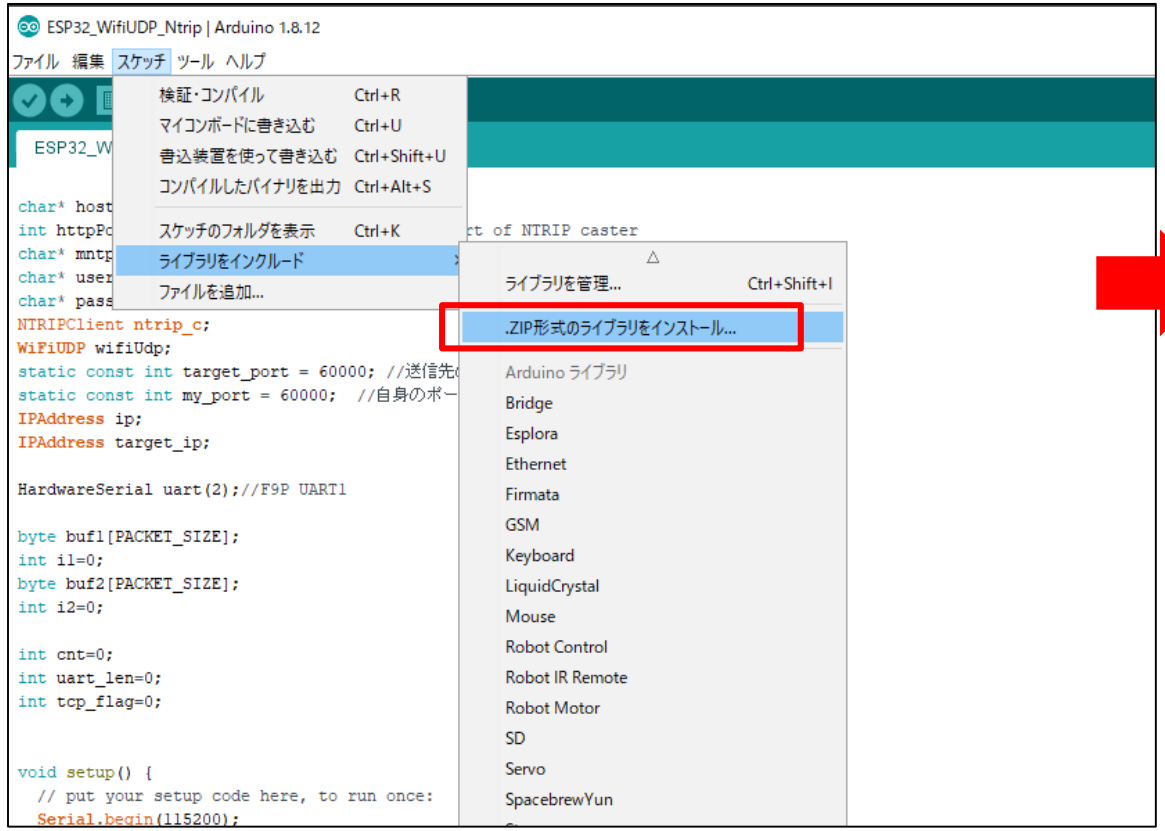
5. Wifi setting

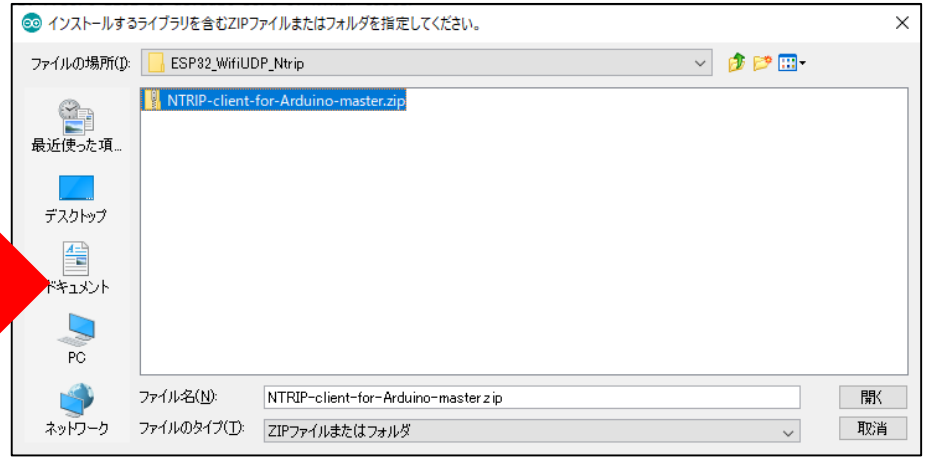
1. Install Arduino IDE in your PC.
   https://www.arduino.cc/en/main/software
2. Download the sketch for ESP32 and open the sketch “ESP32_WifiUDP_Ntrip.ino” .
   http://www.denshi.e.kaiyodai.ac.jp/gnss_tutor/pdf/F9C/ESP32_WifiUDP_Ntrip.zip
3. Install the library for ESP32.
   Tool>Board>Board Manager. Then search by “esp32” and install the library.



5. Wifi setting

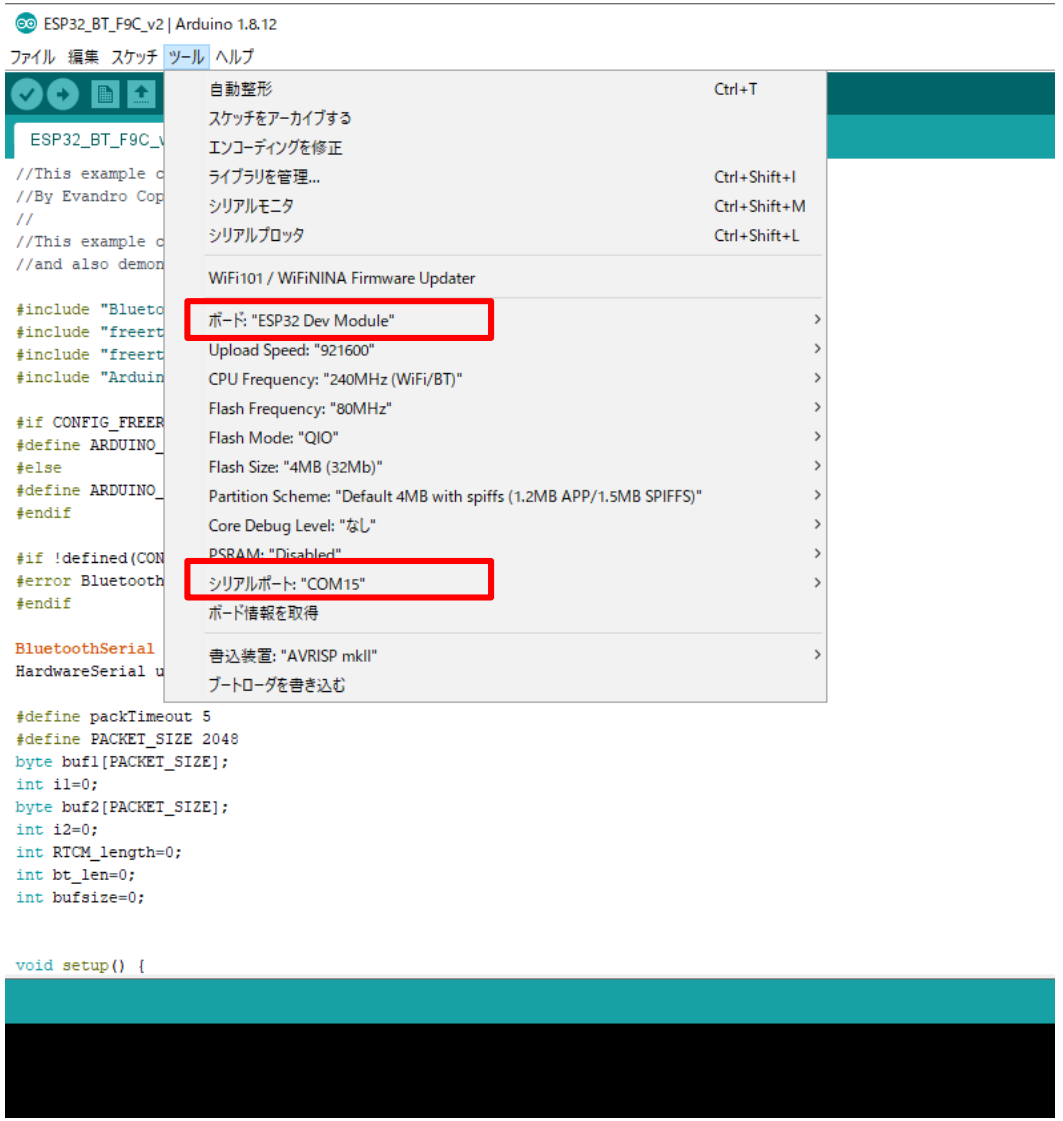
4. Install the library “Ntrip-clilent-for-Arduino-master.zip” from zip file. (In the download folder)





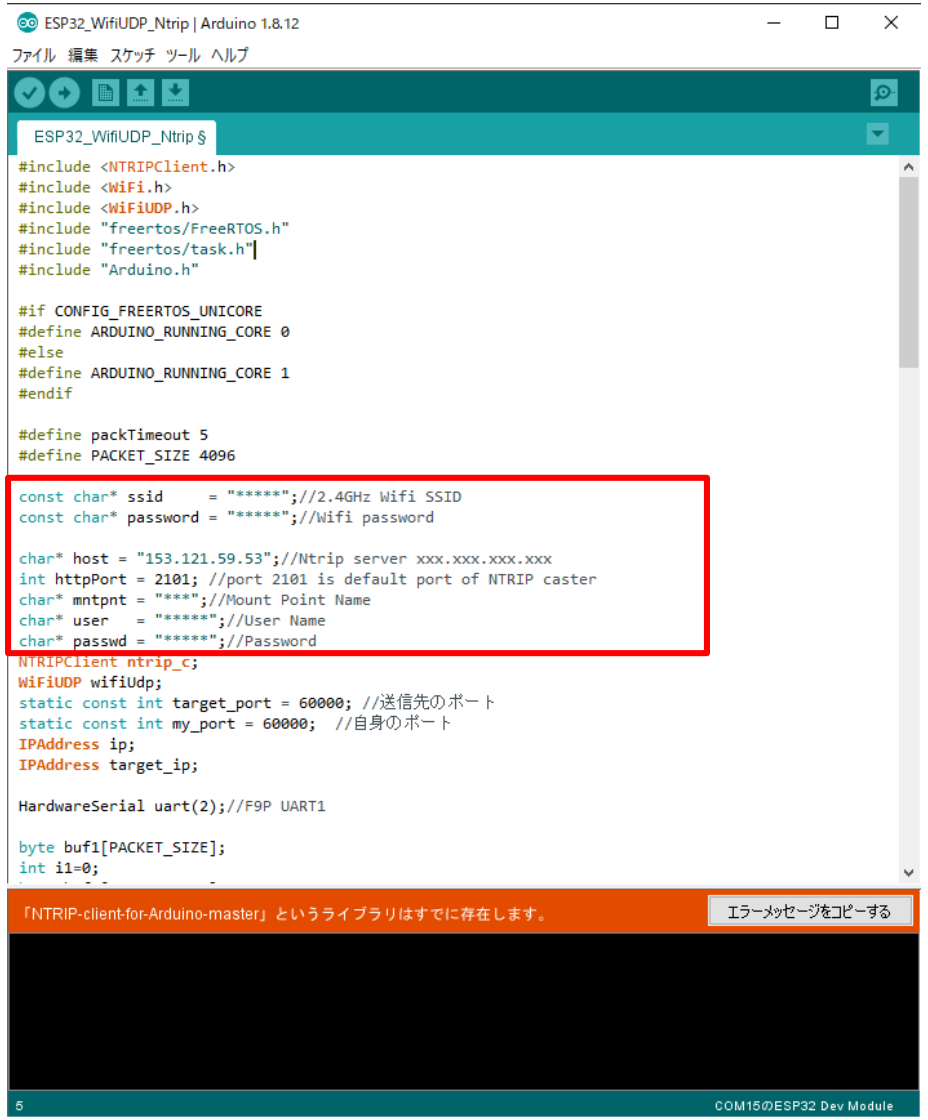
5. Wifi setting

5. Connect F9C with PC by USB cable.
   Select board type as “ESP32 Dev Module” and COM port.



5. Wifi setting

6. Change following line in the sketch.
   - WiFi SSID (2.4GHz)
   - WiFi password
   - Ntrip Server IP address
   - Ntrip Mount Point
   - Ntrip User name and password
     (Set blank it when you use Mount Point which don't require user name and password)

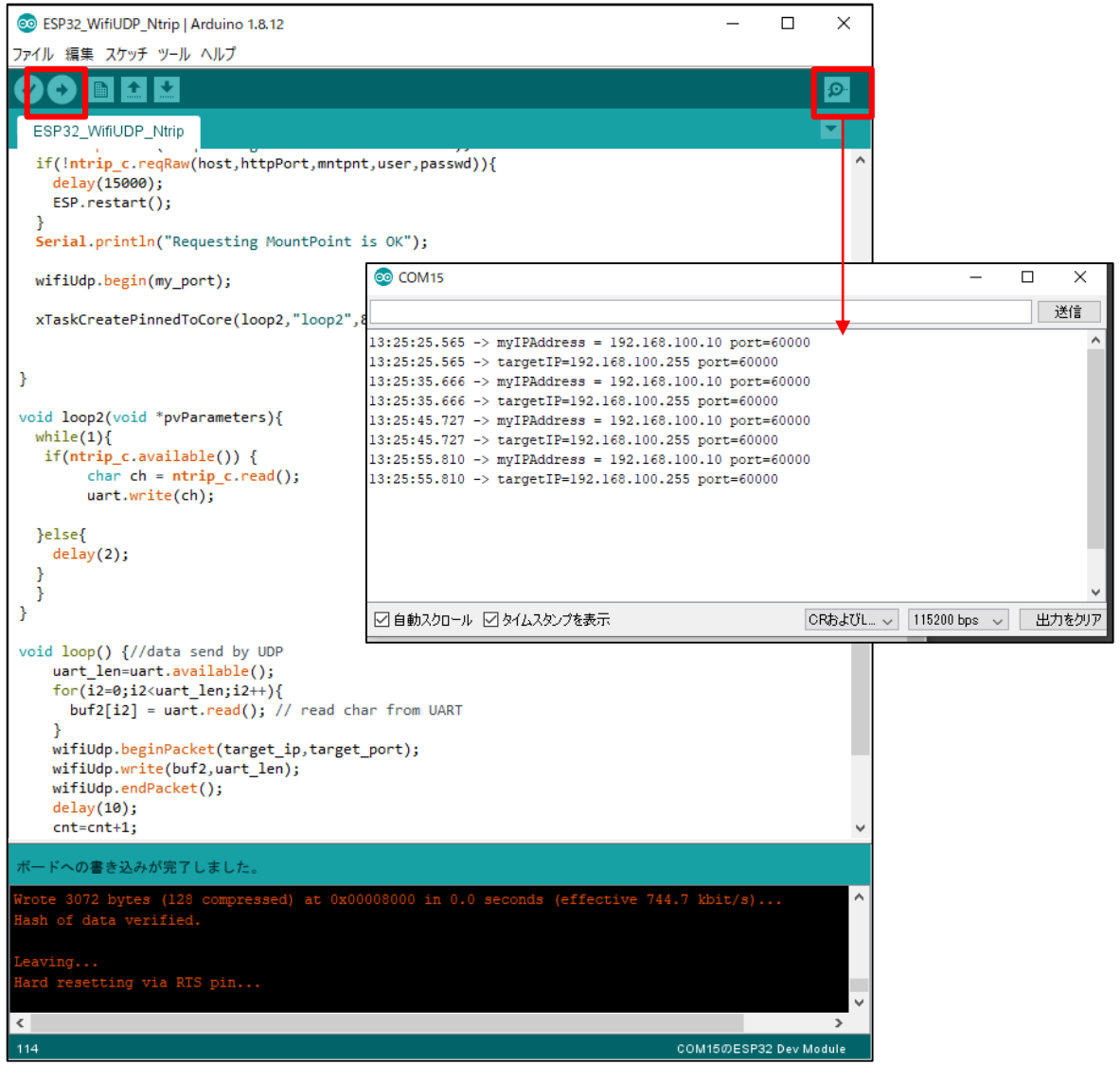


5. Wifi setting

7. Write the sketch to F9C.

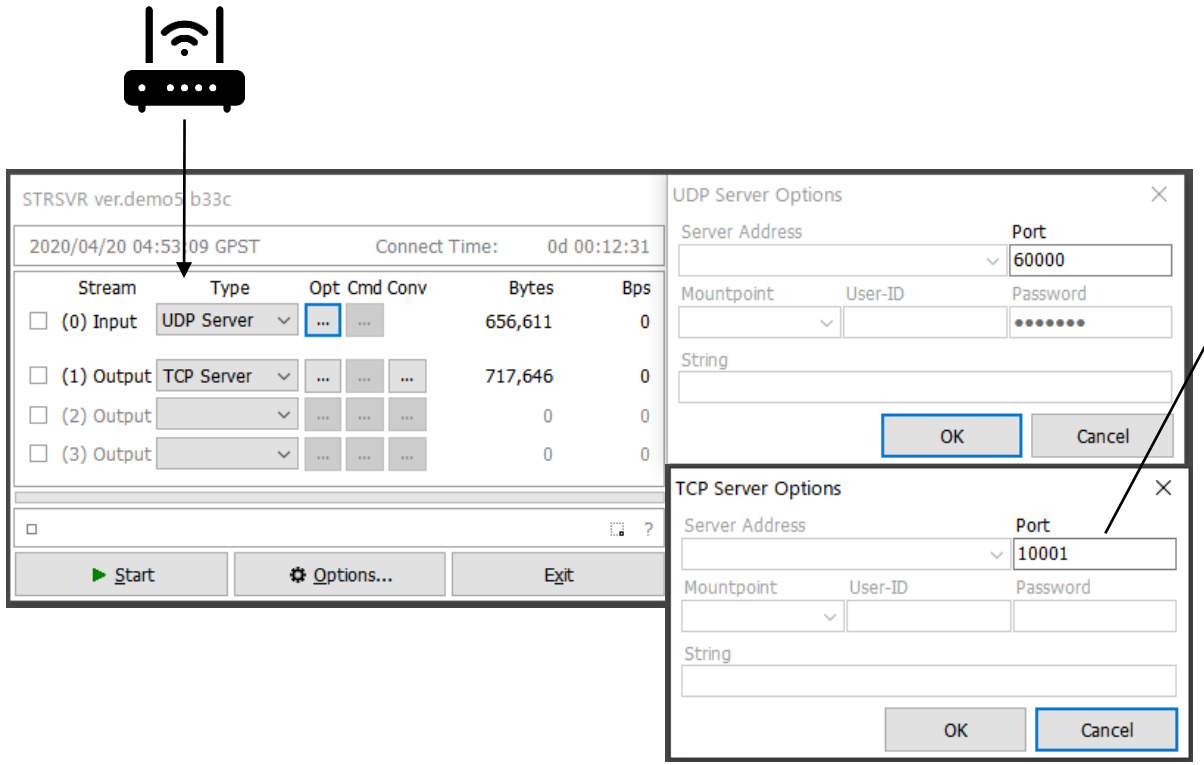
   You can found the IP address of F9C on Arduino IDE serial monitor after writing the sketch.

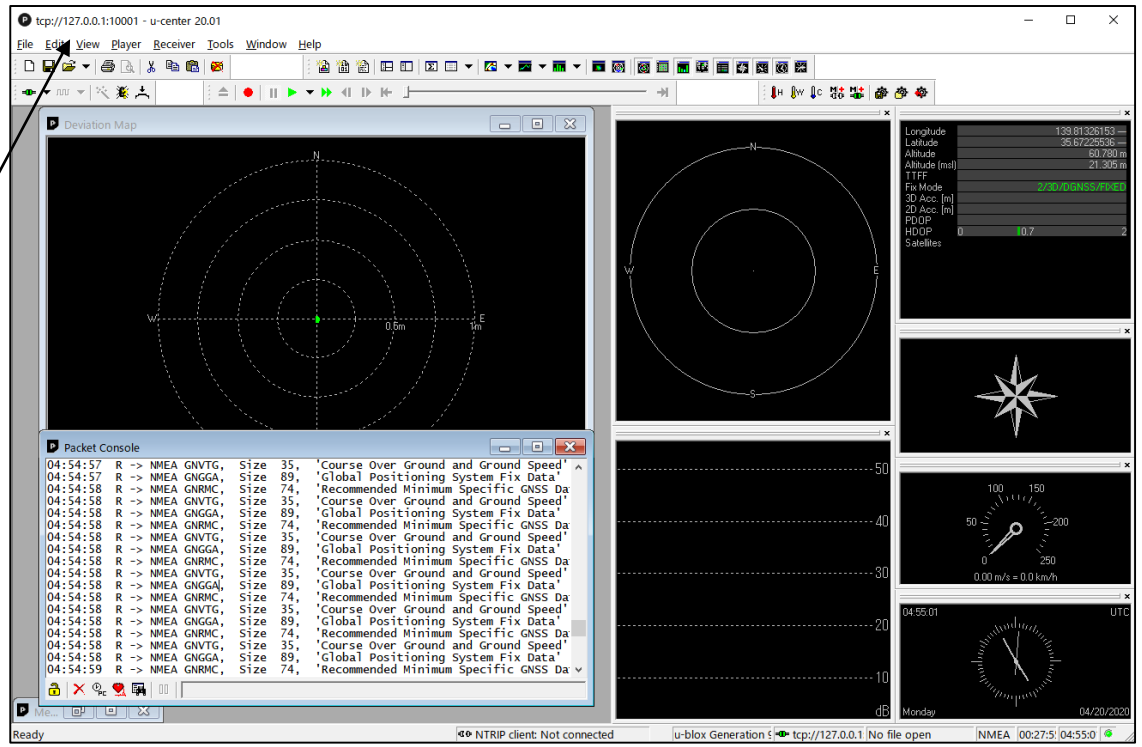
   When F9C is power supplied in the WiFi coverage, it automatically start RTK and store its result.



5. Wifi setting

8. If you want to monitor RTK result, listen UDP 60000 port in the same LAN as F9C.
   Here, we show the example using RTKLIB and u-center on PC.
   (F9C will broadcast data to xxx.xxx.xxx.255 of your LAN. Some firewall setting to allow UDP broadcasting may be required on your WiFi router or PC)





6. Erase the sketch of ESP32

How to put back F9C to not use WiFi or Bluetooth

1. Connect F9C to PC by USB cable and open Arduino IDE.
2. Create new sketch from File>New File.
3. Write the null sketch to ESP32.