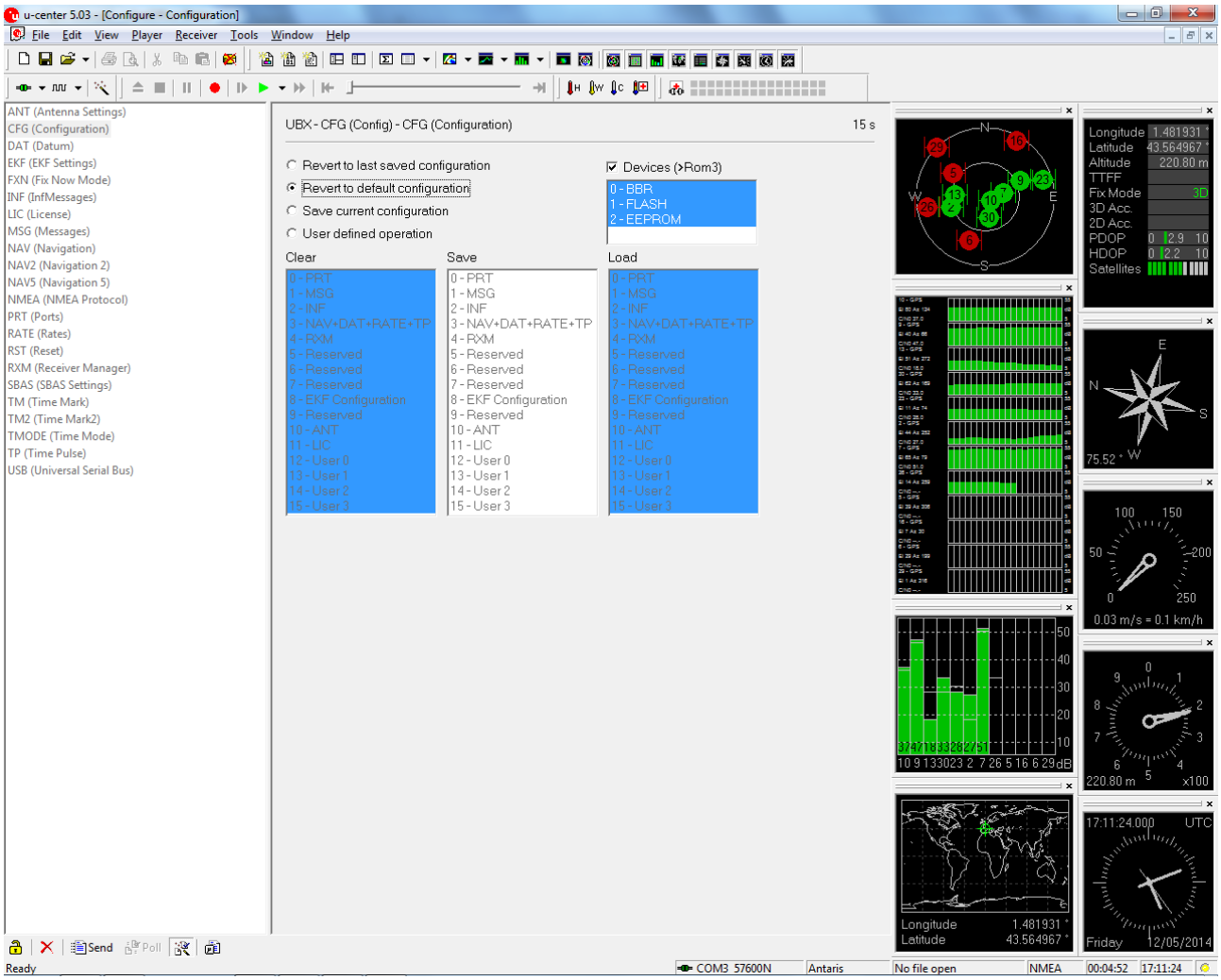
RAW Data Recording with U-Blox AEK-4T

Things to be done prior to each record are as follows:

1 Reset to the default configuration

Menu View → Configuration view → CFG (Configuration): Revert to default configuration then click on the "Send" button at the bottom left of the Configuration window.

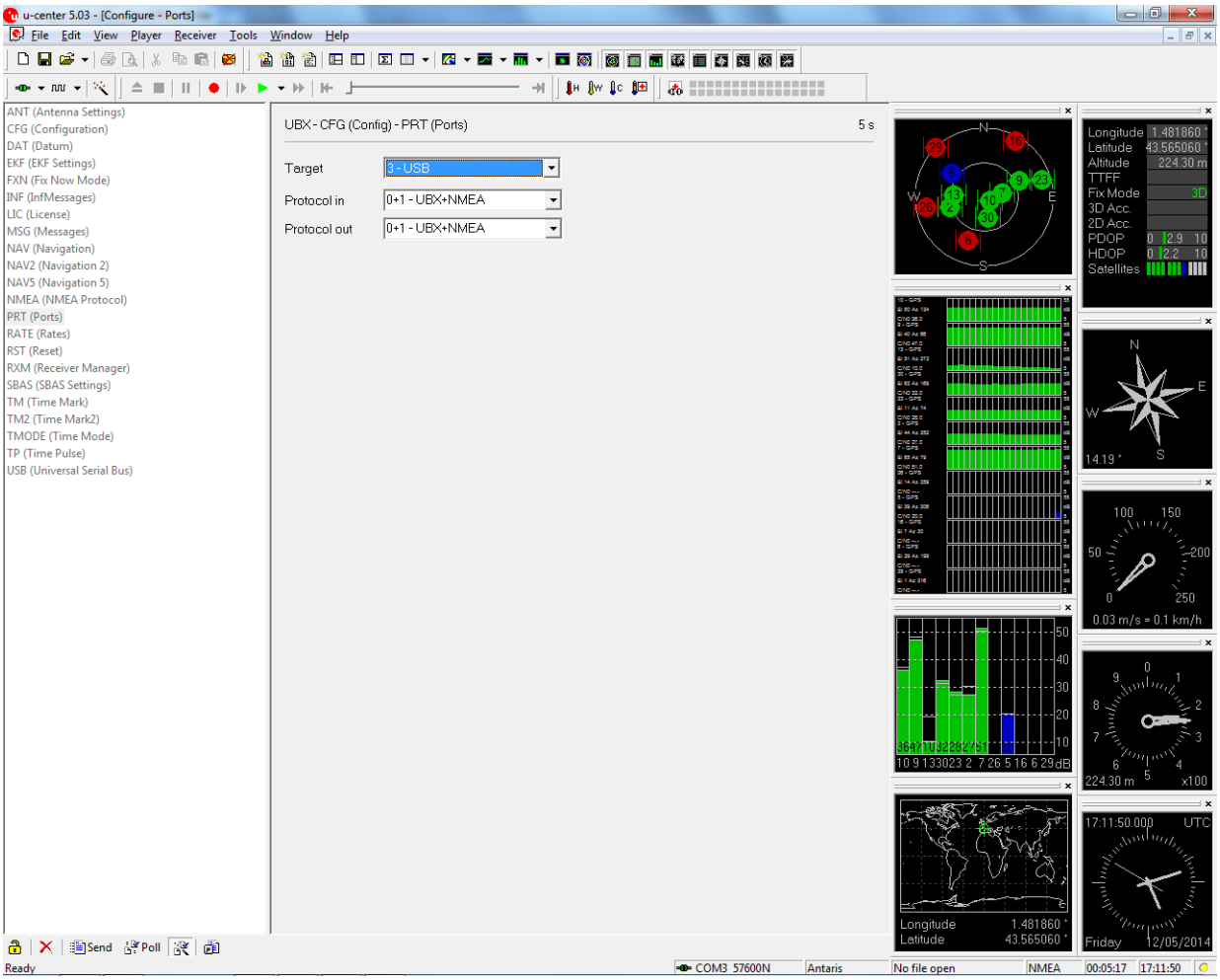


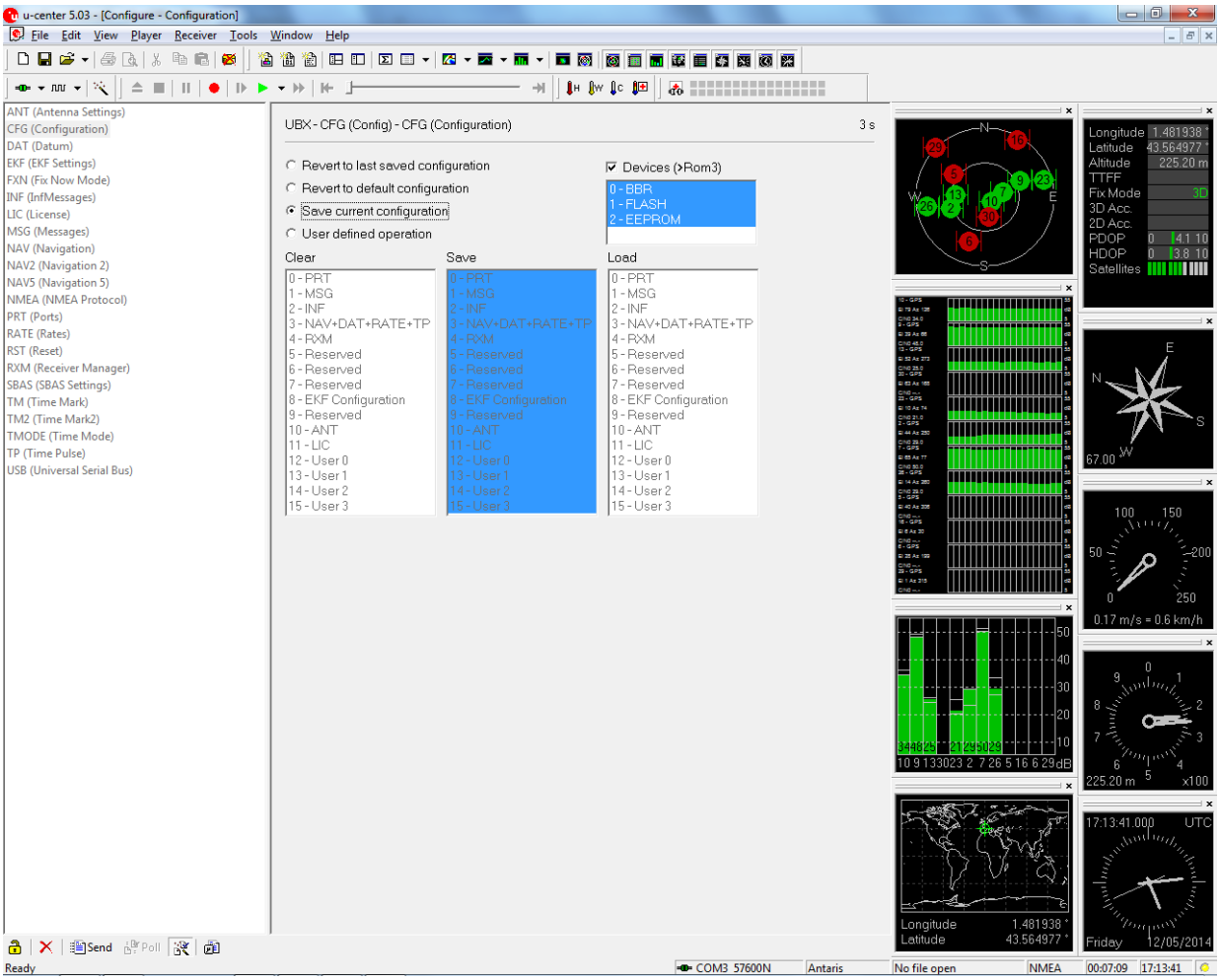
2 RAW messages

2.1 Configuration view

Menu View → Configuration view → PRT (Ports): select Target "3 - USB", Protocol in "0+1 - UBX+NMEA" and Protocol out "0+1 - UBX+NMEA". Then click on the "Send" button at the bottom left of the Messages window.

Menu View → Configuration view → CFG (Configuration): Save to current configuration. Then click on the "Send" button at the bottom left of the Configuration window.


u-center 5.03 - [Configure - Ports]
File Edit View Player Receiver Tools Window Help
ANT (Antenna Settings)
CFG (Configuration)
DAT (Datum)
EKF (EKF Settings)
FXN (Fix Now Mode)
INF (InfMessages)
LIC (License)
MSG (Messages)
NAV (Navigation)
NAV2 (Navigation 2)
NAV5 (Navigation 5)
NMEA (NMEA Protocol)
PRT (Ports)
RATE (Rates)
RST (Reset)
RXM (Receiver Manager)
SBAS (SBAS Settings)
TM (Time Mark)
TM2 (Time Mark2)
TMODE (Time Mode)
TP (Time Pulse)
USB (Universal Serial Bus)
UBX - CFG (Config) - PRT (Ports)
5 s
Target
3 - USB
Protocol in
0+1 - UBX+NMEA
Protocol out
0+1 - UBX+NMEA
Send
Poll
Ready
COM3 57600N
Antaris
No file open
NMEA
00:05:17
17:11:50


u-center 5.03 - [Configure - Configuration]
File Edit View Player Receiver Tools Window Help
ANT (Antenna Settings)
CFG (Configuration)
DAT (Datum)
EKF (EKF Settings)
FXN (Fix Now Mode)
INF (InfMessages)
LIC (License)
MSG (Messages)
NAV (Navigation)
NAV2 (Navigation 2)
NAV5 (Navigation 5)
NMEA (NMEA Protocol)
PRT (Ports)
RATE (Rates)
RST (Reset)
RXM (Receiver Manager)
SBAS (SBAS Settings)
TM (Time Mark)
TM2 (Time Mark2)
TMODE (Time Mode)
TP (Time Pulse)
USB (Universal Serial Bus)
UBX - CFG (Config) - CFG (Configuration)
3 s
Revert to last saved configuration
Revert to default configuration
Save current configuration
User defined operation
Devices (>Rom3)
0 - BBR
1 - FLASH
2 - EEPROM
Clear
Save
Load
0 - PRT
1 - MSG
2 - INF
3 - NAV+DAT+RATE+TP
4 - RXM
5 - Reserved
6 - Reserved
7 - Reserved
8 - EKF Configuration
9 - Reserved
10 - ANT
11 - LIC
12 - User 0
13 - User 1
14 - User 2
15 - User 3
Send
Poll
Ready
COM3 57600N
Antaris
No file open
NMEA
00:07:09
17:13:41

2.2 Messages view

Menu View → Messages view → UBX → CFG → MSG (Messages): select Message "02-10 RXM-RAW", uncheck USART2 and check USB. Then click on the “Send” button at the bottom left of the Configuration window.

Menu View → Messages view → UBX → CFG → MSG (Messages): select Message "02-11 RXM-SFRB", uncheck USART2 and check USB. Then click on the “Send” button at the bottom left of the Configuration window.

Menu View → Messages view → UBX → CFG → MSG (Messages): select Message "02-30 RXM-ALM" and check USB. Then click on the “Send” button at the bottom left of the Configuration window.

Menu View → Messages view → UBX → CFG → MSG (Messages): select Message "02-31 RXM-EPH" and check USB. Then click on the “Send” button at the bottom left of the Configuration window.

Menu View → Messages view → UBX → CFG (Configuration): Save to current configuration. Then click on the “Send” button at the bottom left of the Messages window.

3 Message recording

Click on the red dot button in the icon bar, then click "Non" in the pop-up window. Click on the black square button to stop the recording. Click on the green arrow button to replay the record. File → Close to come back to the normal GPS message reception.

4 Conversion to RINEX format

4.1 With teqc

Windows “Start” menu → “Éxécuter” → cmd, then go into the correct directory with the “cd” command and:

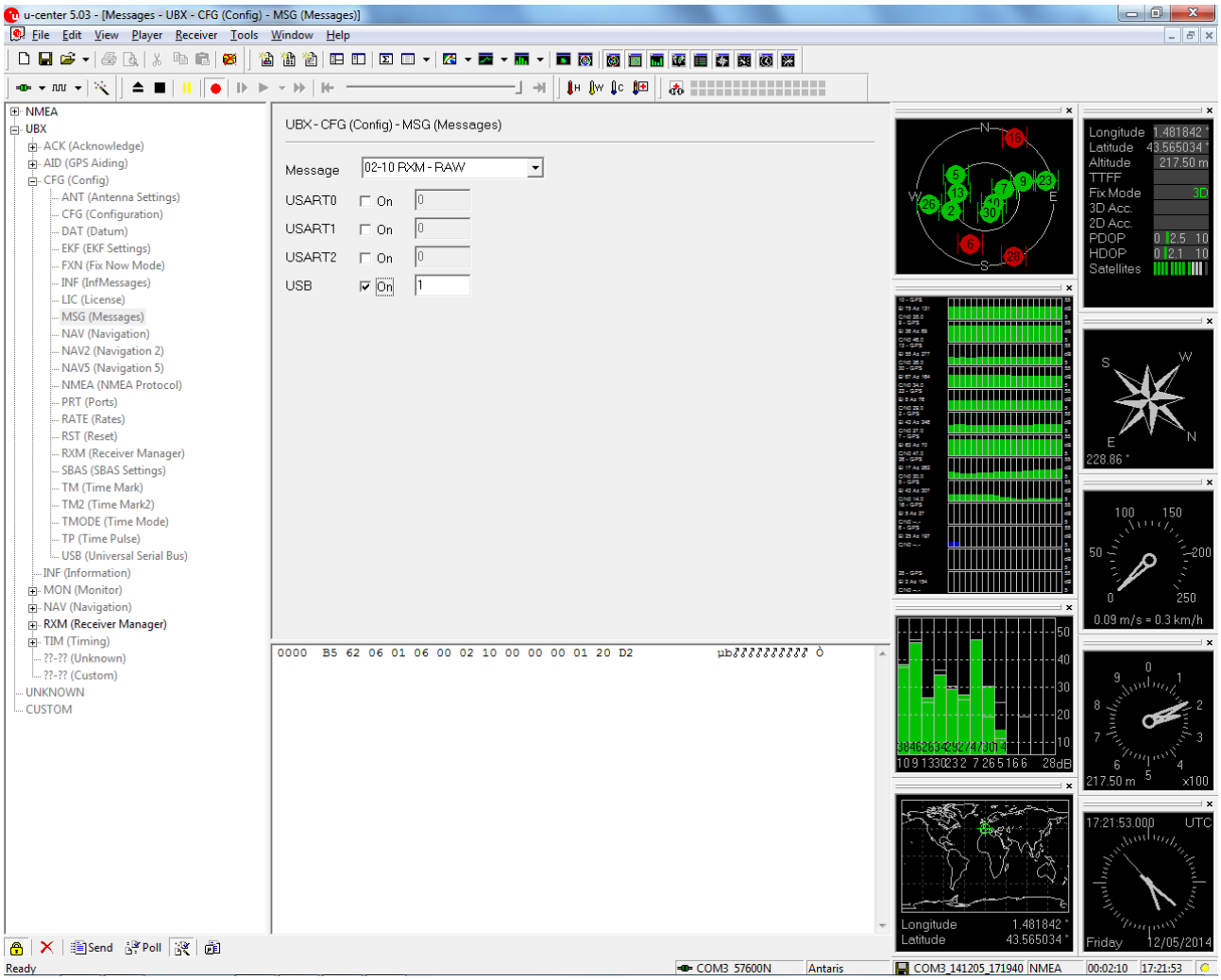
```
teqc.exe +nav nav.rinex +obs obs.rinex +dump_ion +dump_utc
COM3_141203_092521.ubx
```

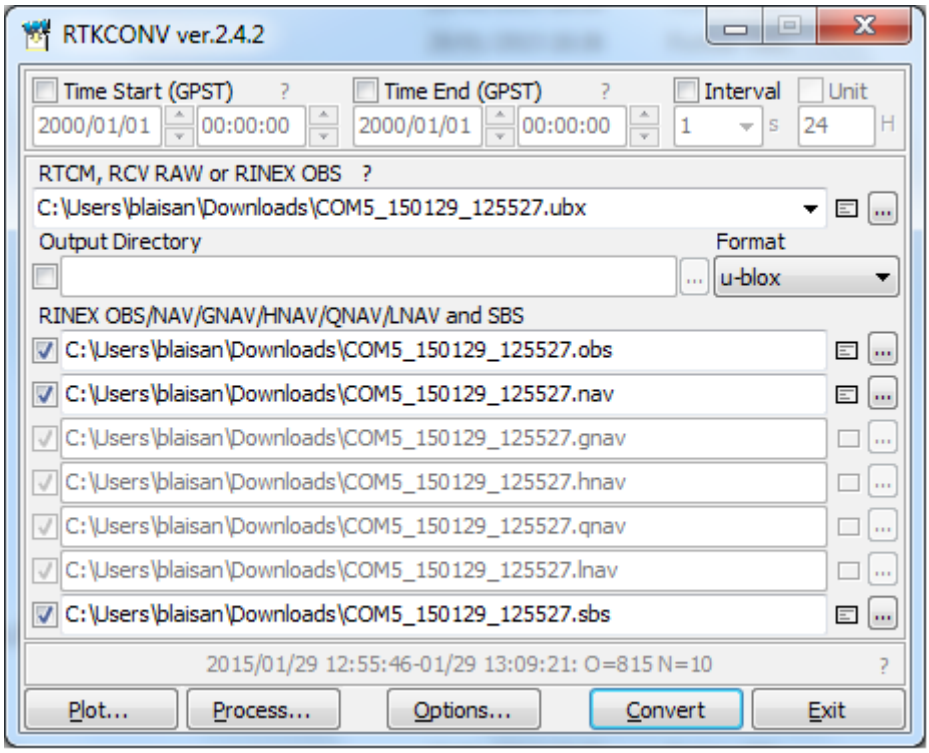
The problem is that, if the first navigation frame does not include the ionosphere model parameters, teqc is not able to write them in the header afterward, as the file is written sequentially. This seems to be true also when the option +dump_ion is specified.

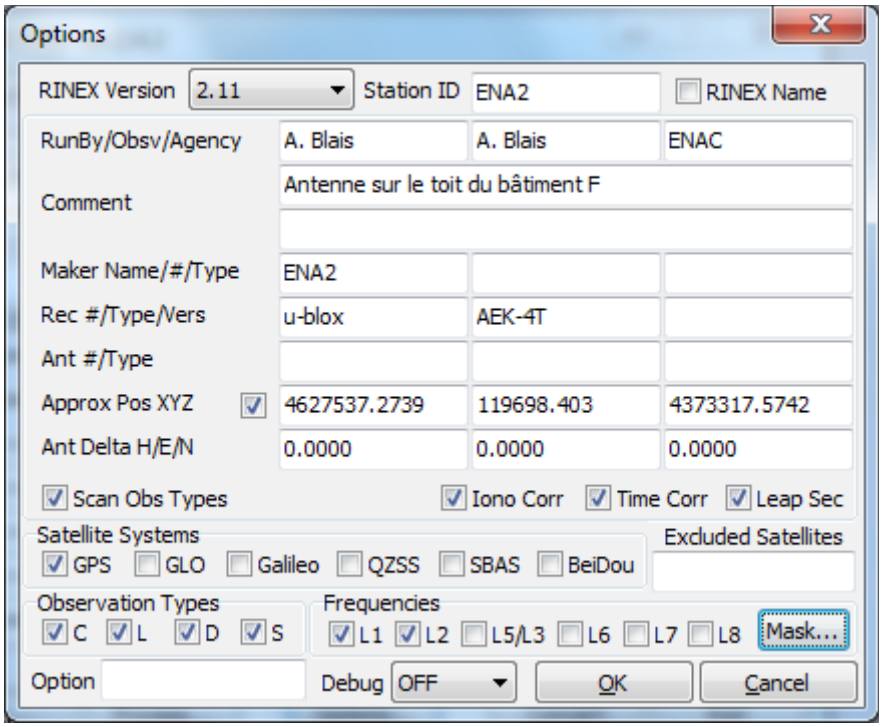
4.2 With rtklib

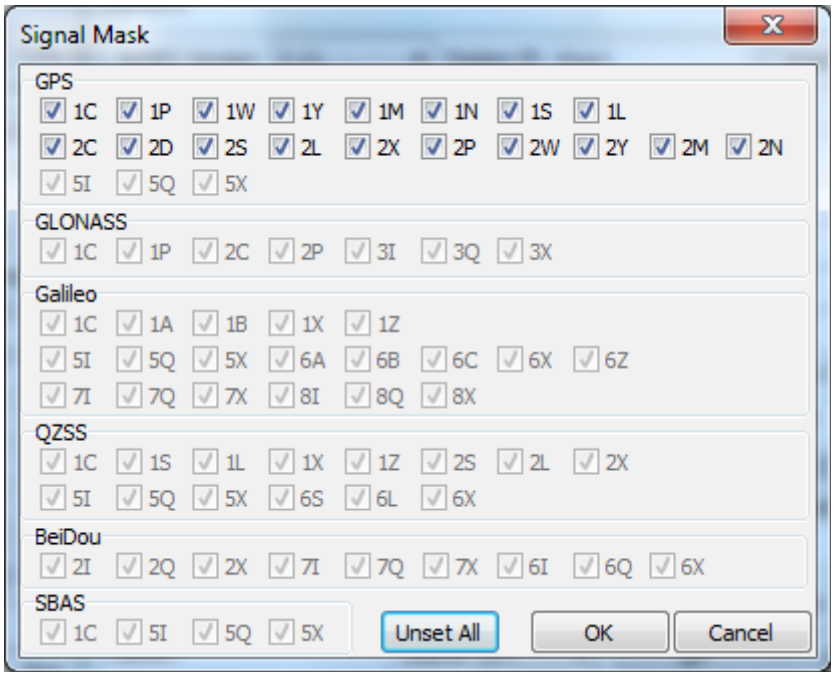
Launch rtkconv (C:\Program Files (x86)\rtklib_2.4.2\bin\rtkconv.exe). In the main window:

- In the “RTCM, RCV RAW or RINEX OBS ?” field set the ubx file name,
- Select the u-blox format,
- Press the “Options...” button. In the options window:
    - Select the 2.11 Rinex Version,
    - Enter the different field values,
    - Be sure to check “Scan Obs Types”, “Iono Corr”, “Time Corr” and “Leap Sec”,
    - Press the “Mask...” button. In the mask window:
        - press the “Set all” button,
        - Press the “OK” button,
    - Press the “OK” button,
- Press the “Convert” button. In the status bar, just above the buttons, check that the number of observation frames (O=...) and the number of navigation frames (N=...) processed by rtkconv is different from 0.


u-center 5.03 - [Messages - UBX - CFG (Config) - MSG (Messages)]
File Edit View Player Receiver Tools Window Help
NMEA
UBX
ACK (Acknowledge)
AID (GPS Aiding)
CFG (Config)
ANT (Antenna Settings)
CFG (Configuration)
DAT (Datum)
EKF (EKF Settings)
FXN (Fix Now Mode)
INF (InfMessages)
LIC (License)
MSG (Messages)
NAV (Navigation)
NAV2 (Navigation 2)
NAV5 (Navigation 5)
NMEA (NMEA Protocol)
PRT (Ports)
RATE (Rates)
RST (Reset)
RXM (Receiver Manager)
SBAS (SBAS Settings)
TM (Time Mark)
TM2 (Time Mark2)
TMODE (Time Mode)
TP (Time Pulse)
USB (Universal Serial Bus)
INF (Information)
MON (Monitor)
NAV (Navigation)
RXM (Receiver Manager)
TIM (Timing)
??-?? (Unknown)
??-?? (Custom)
UNKNOWN
CUSTOM
UBX - CFG (Config) - MSG (Messages)
Message 02-10 RXM - RAW
USART0 On 0
USART1 On 0
USART2 On 0
USB On 1
0000 B5 62 06 01 06 00 02 10 00 00 00 01 20 D2
Send Poll
Ready
COM3 57600N
Antaris
COM3_141205_171940 NMEA
00:02:10
17:21:53
Longitude 1.481842 °
Latitude 43.565034 °
Altitude 217.50 m
TTFF
Fix Mode 3D
3D Acc.
2D Acc.
PDOP
HDOP
Satellites
228.86 °
0.09 m/s = 0.3 km/h
217.50 m
17:21:53.000 UTC
Friday 12/05/2014


RTKCONV ver.2.4.2
Time Start (GPST) ?
2000/01/01 00:00:00
Time End (GPST) ?
2000/01/01 00:00:00
Interval Unit
1 s 24 H
RTCM, RCV RAW or RINEX OBS ?
C:\Users\blaisan\Downloads\COM5_150129_125527.ubx
Output Directory
Format
u-blox
RINEX OBS/NAV/GNAV/HNAV/QNAV/LNAV and SBS
C:\Users\blaisan\Downloads\COM5_150129_125527.obs
C:\Users\blaisan\Downloads\COM5_150129_125527.nav
C:\Users\blaisan\Downloads\COM5_150129_125527.gnav
C:\Users\blaisan\Downloads\COM5_150129_125527.hnav
C:\Users\blaisan\Downloads\COM5_150129_125527.qnav
C:\Users\blaisan\Downloads\COM5_150129_125527.lnav
C:\Users\blaisan\Downloads\COM5_150129_125527.sbs
2015/01/29 12:55:46-01/29 13:09:21: O=815 N=10
Plot... Process... Options... Convert Exit

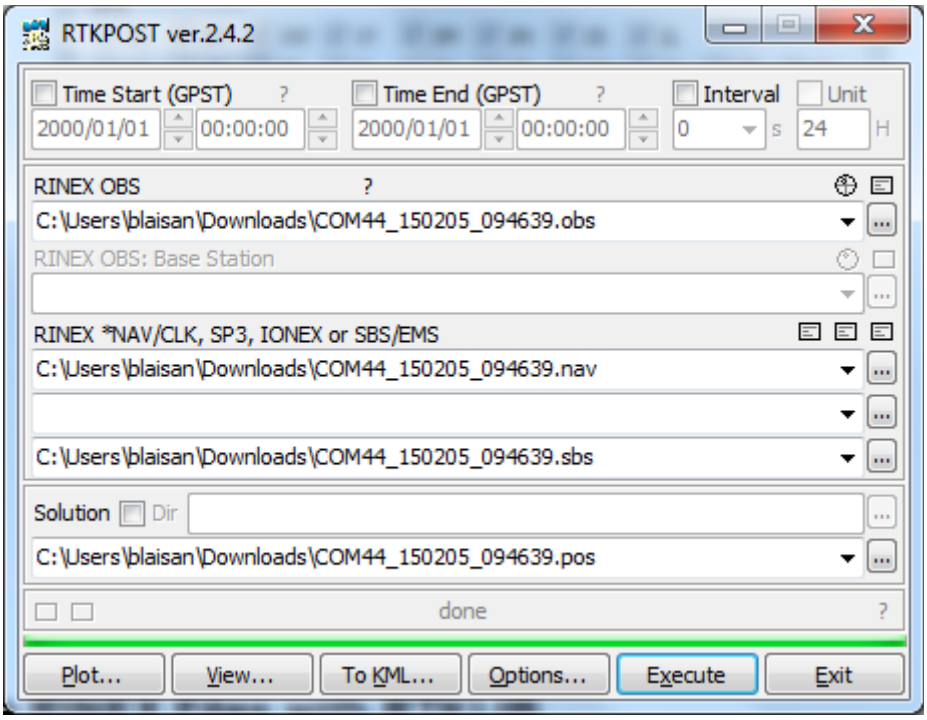


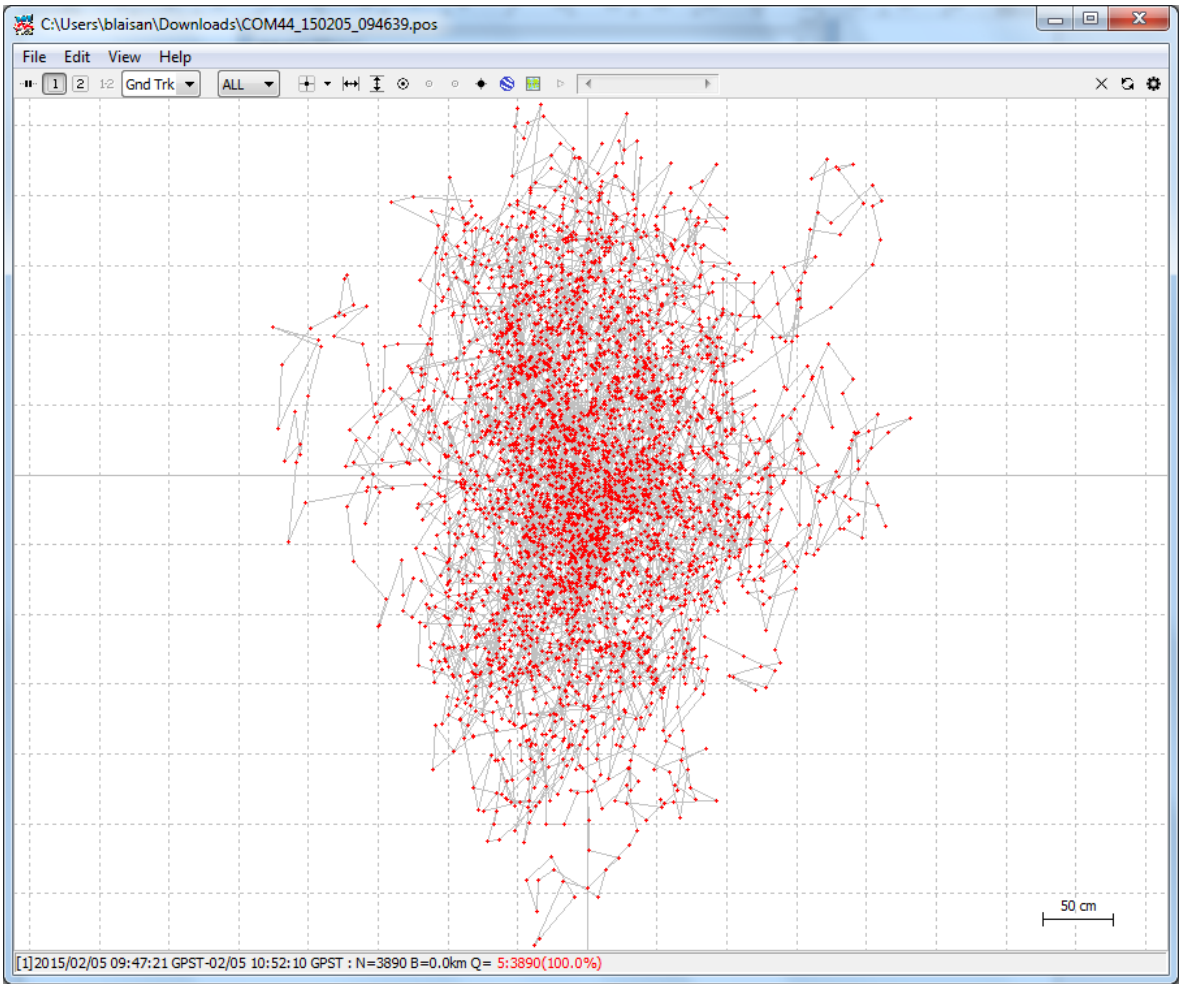


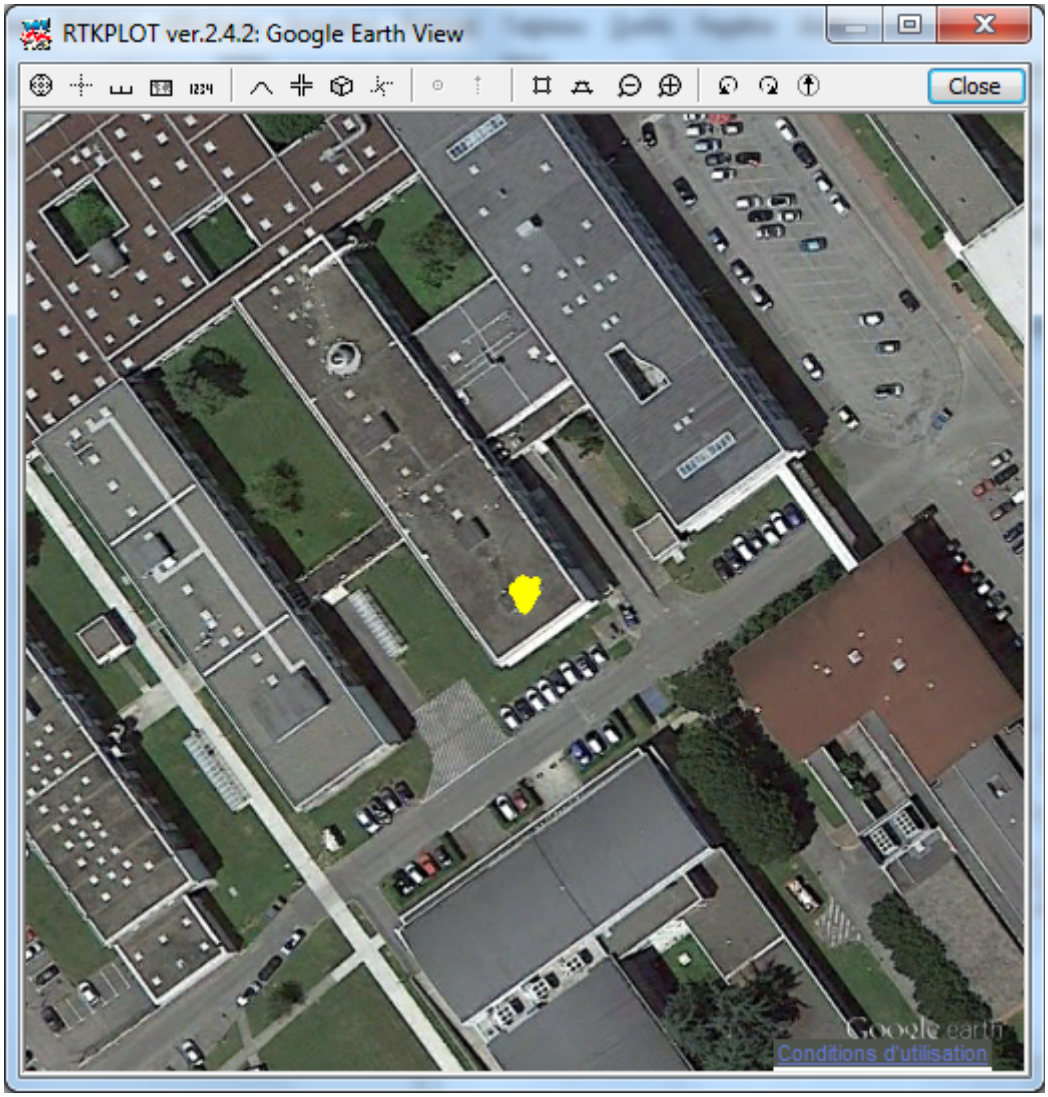
5 Use of the RINEX Files with RTKLIB

After the conversion, press the “Process... button”. In the process window:

- Set the name of the navigation file in the “RINEX *NAV/CLK, SP3, IONEX or SBS/EMS” field. This file has been generated during the conversion step and has a “.nav” extension.
- Press the “Options...” button to set the different options for the calculation of the PVT solutions.
- Press the “Execute” button.
- The “View...” button gives access to the PVT solutions in text format.
- The “Plot...” button plots a 2D representation of the PVT solutions.
    - Press the “Google Earth View” button and enjoy.


RTKPOST ver.2.4.2
Time Start (GPST)
2000/01/01
00:00:00
Time End (GPST)
2000/01/01
00:00:00
Interval
Unit
0
s
24
H
RINEX OBS
C:\Users\blaisan\Downloads\COM44_150205_094639.obs
RINEX OBS: Base Station
RINEX *NAV/CLK, SP3, IONEX or SBS/EMS
C:\Users\blaisan\Downloads\COM44_150205_094639.nav
C:\Users\blaisan\Downloads\COM44_150205_094639.sbs
Solution
Dir
C:\Users\blaisan\Downloads\COM44_150205_094639.pos
done
Plot...
View...
To KML...
Options...
Execute
Exit


C:\Users\blaisan\Downloads\COM44_150205_094639.pos
File
Edit
View
Help
Gnd Trk
ALL
50 cm
[1]2015/02/05 09:47:21 GPST-02/05 10:52:10 GPST : N=3890 B=0.0km Q= 5:3890(100.0%)


RTKPLOT ver.2.4.2: Google Earth View
Close
Google earth
Conditions d'utilisation