

How to Access GNSS Receiver and GNSS Data at UTokyo?

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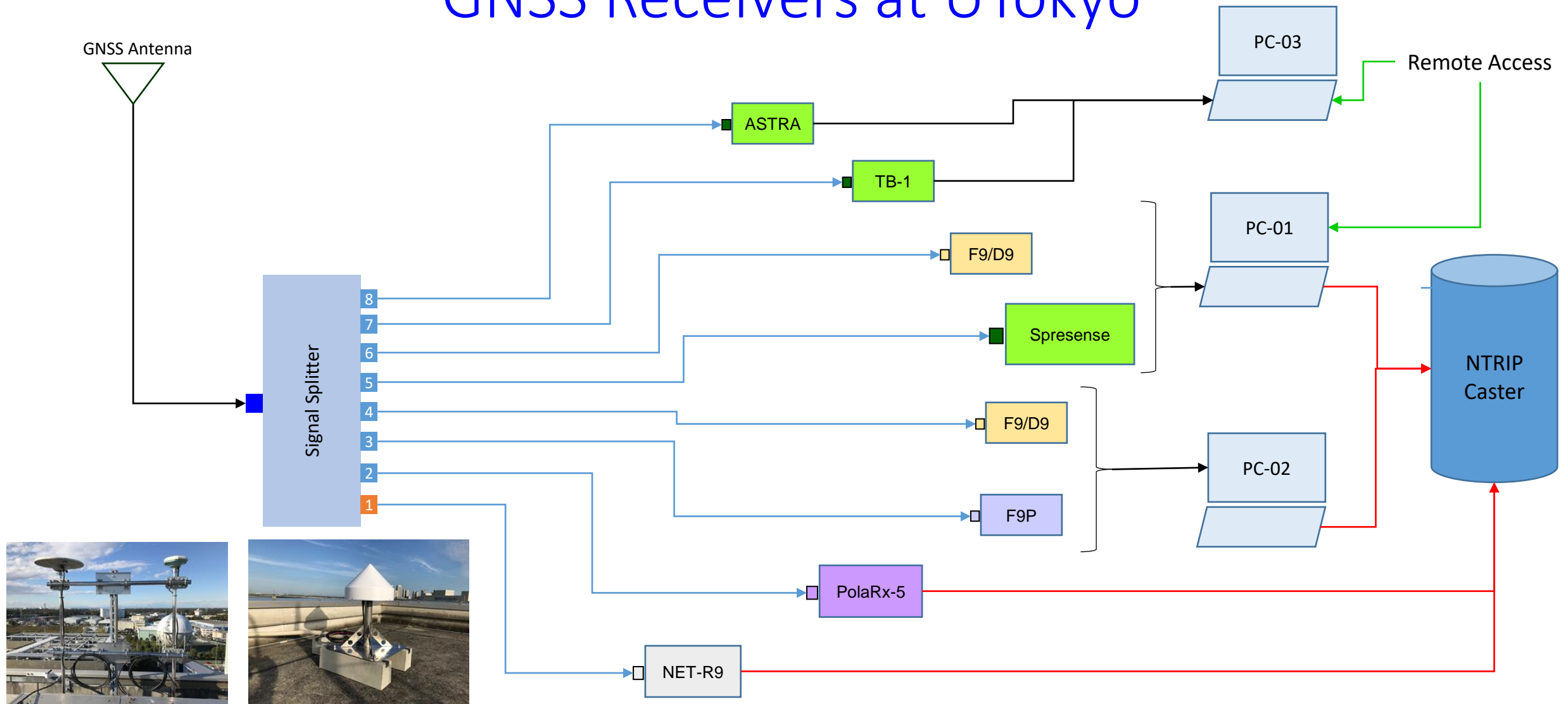
The University of Tokyo

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Data and Software for Hands-On

- DATA
 - STATIC DATA
 - DYNAMIC DATA
- Software
 - RTKLIB
 - U-center
 - MAD-WIN/MAD-PI/MADROID

GNSS Receivers at UTokyo

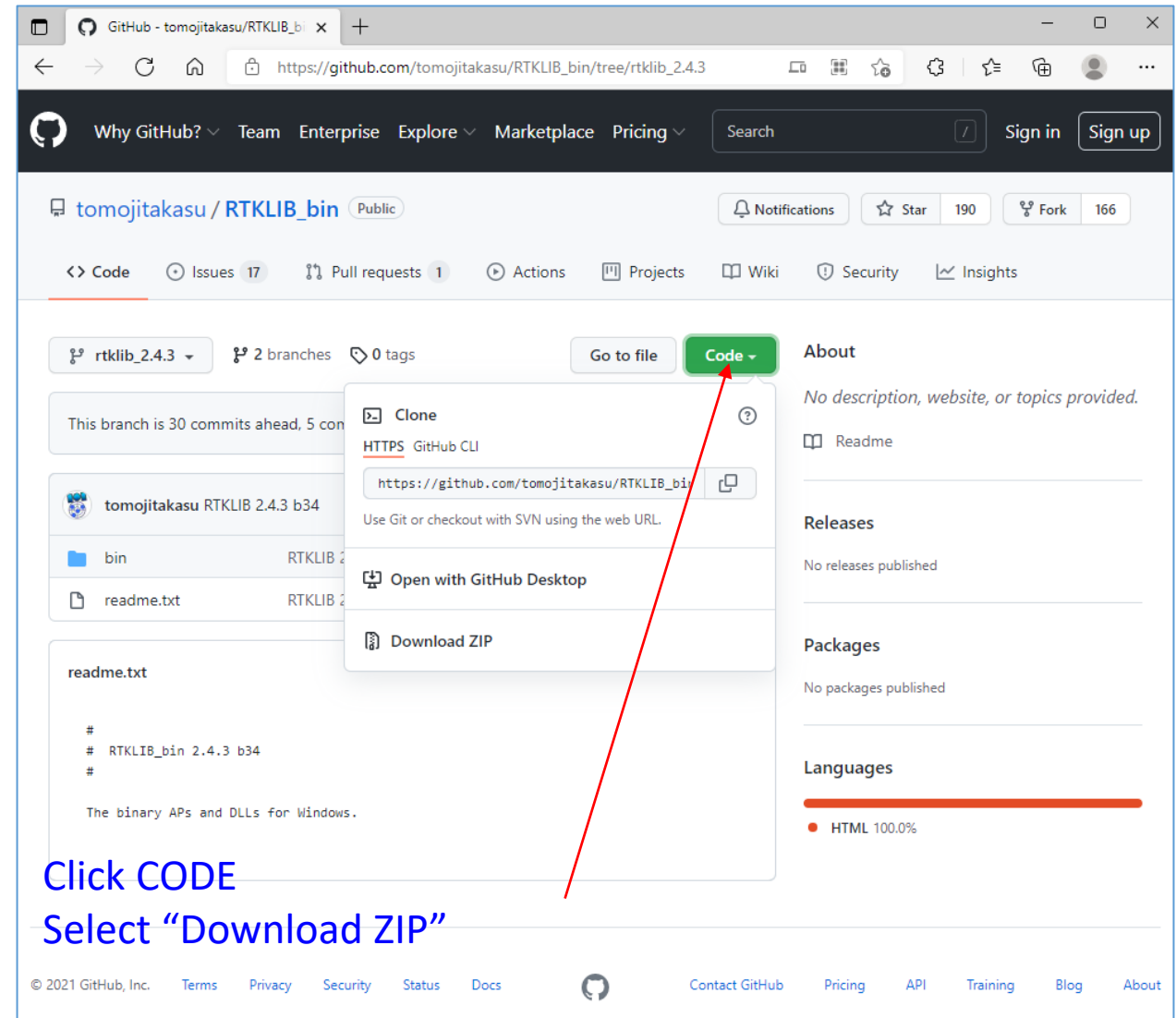


GNSS Receivers at UTokyo



Installation of RTKLIB

- Download RTKLIB software
 - Version 2.4.3b34
 - [Main Page: http://www.rtklib.com/](http://www.rtklib.com/)
 - **Windows Binary Files:**
https://github.com/tomojitakasu/RTKLIB_bin/tree/rtklib_2.4.3
 - Download the ZIP file to a PC
 - Unzip the folder to a working directory in the PC
 - Now go to unzipped folder
 - It may be something like rtklib_2.4.3
 - Go to “bin” folder



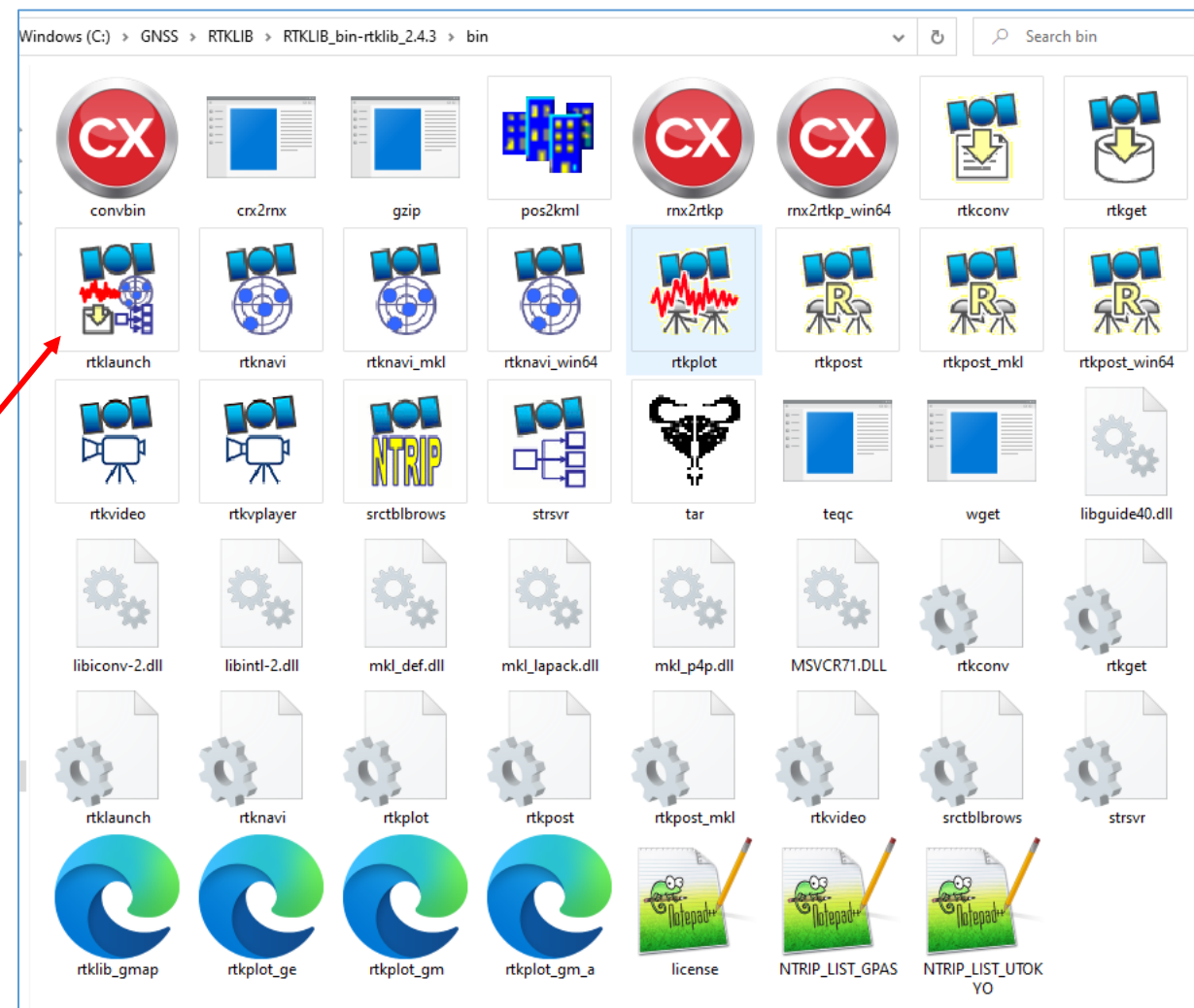
Click CODE

Select “Download ZIP”

RTKLIB Files in BIN Folder

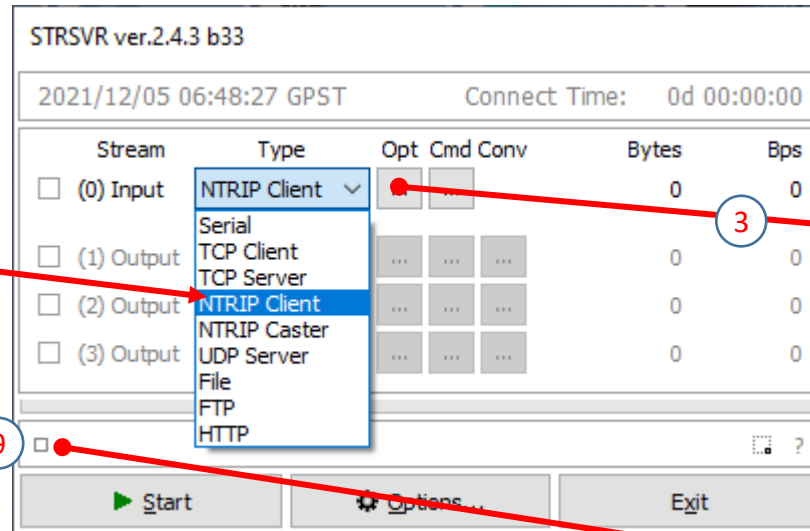
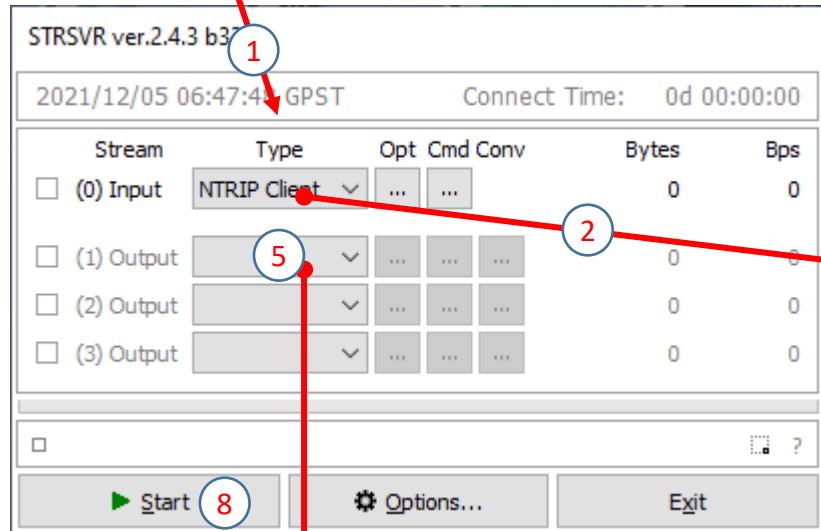
Windows (C:) > GNSS > RTKLIB > RTKLIB_bin-rtklib_2.4.3 > bin

| Name | Type | Size | Date modified |
|----------------|-------------|-----------|--------------------|
| convbin | Application | 2,392 KB | 2020/05/03 8:14 PM |
| crx2rnx | Application | 79 KB | 2020/05/03 8:14 PM |
| gzip | Application | 90 KB | 2020/05/03 8:14 PM |
| pos2kml | Application | 483 KB | 2020/05/03 8:14 PM |
| rnx2rtkp | Application | 2,719 KB | 2020/05/03 8:14 PM |
| rnx2rtkp_win64 | Application | 973 KB | 2020/05/03 8:14 PM |
| rtkconv | Application | 5,751 KB | 2020/05/03 8:14 PM |
| rtkget | Application | 3,544 KB | 2020/05/03 8:14 PM |
| rtklaunch | Application | 3,799 KB | 2020/05/03 8:14 PM |
| rtknavi | Application | 7,023 KB | 2020/05/03 8:14 PM |
| rtknavi_mkl | Application | 7,566 KB | 2020/05/03 8:14 PM |
| rtknavi_win64 | Application | 7,567 KB | 2020/05/03 8:14 PM |
| rtkplot | Application | 7,390 KB | 2020/05/03 8:14 PM |
| rtkpost | Application | 6,444 KB | 2020/05/03 8:14 PM |
| rtkpost_mkl | Application | 6,444 KB | 2020/05/03 8:14 PM |
| rtkpost_win64 | Application | 8,578 KB | 2020/05/03 8:14 PM |
| rtkvideo | Application | 10,656 KB | 2020/05/03 8:14 PM |
| rtkvplayer | Application | 10,574 KB | 2020/05/03 8:14 PM |
| srctblbrows | Application | 4,286 KB | 2020/05/03 8:14 PM |
| strsvr | Application | 4,395 KB | 2020/05/03 8:14 PM |
| tar | Application | 164 KB | 2020/05/03 8:14 PM |
| teqc | Application | 940 KB | 2020/05/03 8:14 PM |
| wget | Application | 395 KB | 2020/05/03 8:14 PM |

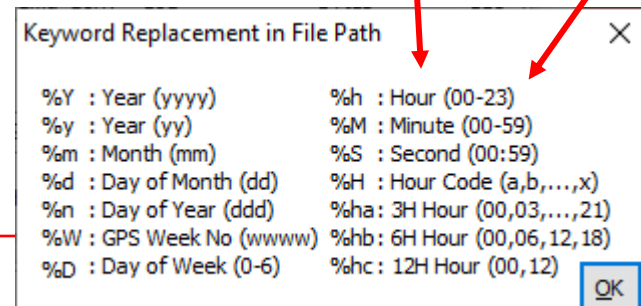
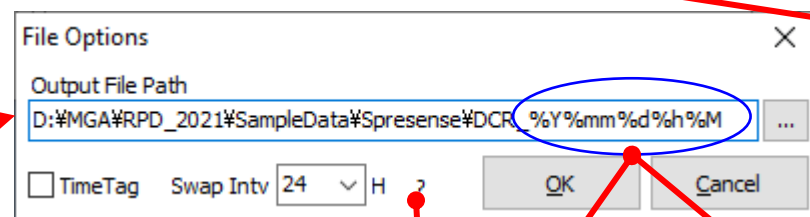
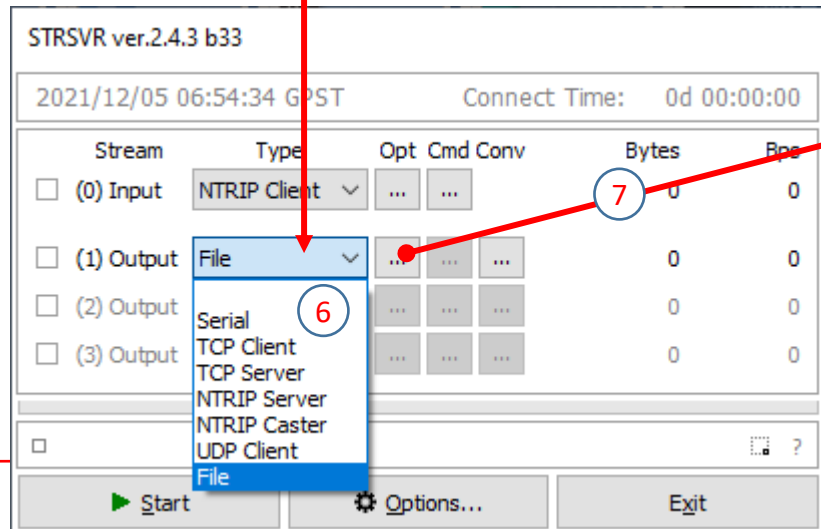
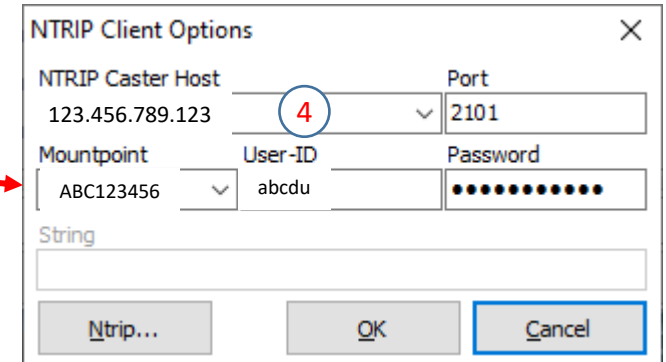


Double Click
RTKLAUNCH.exe
Or
Create a short-cut and
copy to Desktop for easy launching

Setting STRSVR of RTKLIB



NTRIP IP Address, User ID and Password will be provided during the lecture.



File name can be generated automatically
 %Y%mm%d%h%M%S generates filename with current date and time
 such as 20220526170000
 Example:
 %Y%mm%d%h%M%S.ubx → 20220526170000.ubx
 %Y%mm%d%h%M%S_Static.ubx → 20220526170000_Static.ubx
 KASH_%Y%mm%d%h%M%S.ubx → KASH_20220526170000.rtc

Select Correct File Format
It may be ublox, SBF, RTCM3 or other

RTKLIB v.2.4.3 b33

RTKNAVI ver.2.4.3 b34

2000/01/01 00:00:00.0 GPST

Lat/Lon/Height

Rover SYS

Solution: --- □

N: 0° 00' 00.0000"

E: 0° 00' 00.0000"

He: 0.000 m

N: 0.000 E: 0.000 U: 0.000 m

Age: 0.0 s Ratio: 0.0 #Sat: 0

Start Mark... Plot Options... Exit

Options

Setting1 Setting2 Output Statistics Positions Files Misc

Positioning Mode Kinematic

Frequencies / Filter Type L1+2 Forward

Elevation Mask (°) / SNR Mask (dbHz) 10 ...

Rec Dynamics / Earth Tides Correction OFF OFF

Ionosphere Correction Broadcast

Troposphere Correction Saastamoinen

Satellite Ephemeris/Clock Broadcast

Sat PCV Rec PCV PWU Rej Ed RAIM FDE DBCorr

Excluded Satellites (+PRN: Included)

GPS GLONASS Galileo QZSS BDS NavIC SBAS

Load... Save... OK Cancel

Options

Setting1 Setting2 Output Statistics Positions Files

Integer Ambiguity Res (GPS/GLO/BDS) Continu

Min Ratio to Fix Ambiguity 3.0

Min Confidence / Max FCB to Fix Amb 0.9999

Min Lock / Elevation (°) to Fix Amb 0

Min Fix / Elevation (°) to Hold Amb 10

Outage to Reset Amb / Slip Thres (m) 5

Max Age of Diff (s) / Sync Solution 30.0

Reject Threshold of GDOP/Innov (m) 30.0

Max # of AR Iter/# of Filter Iter 1

Baseline Length Constraint (m) 0.000

Load... Save... OK

Input Streams

| Input Stream | Type | Opt Cmd | Format | Opt |
|--|--------------|---------|------------|-----|
| <input checked="" type="checkbox"/> (1) Rover | NTRIP Client | ... | u-blox UBX | ... |
| <input checked="" type="checkbox"/> (2) Base Station | NTRIP Client | ... | RTCM 3 | ... |
| <input type="checkbox"/> (3) Correction | Serial | ... | RTCM 2 | ... |

Transmit NMEA GGA to Base Station OFF

Reset Cmd

Max Baseline 10 km

Input File Paths

NTRIP Client Options ROVER Setting

NTRIP Caster Address 123.45.678.900 Port 2101

Mountpoint TU001UB User ID utuser Password

Browse... Get Mountp OK Cancel

NTRIP Client Options Base Setting

NTRIP Caster Address 123.45.678.900 Port 2101

Mountpoint ECJ27 User ID gspase Password

Options

Setting1 Setting2 Output Statistics Positions Files Misc

Rover

Lat/Lon/Height (deg/m) 90.000000000 0.000000000 -6335367.6285

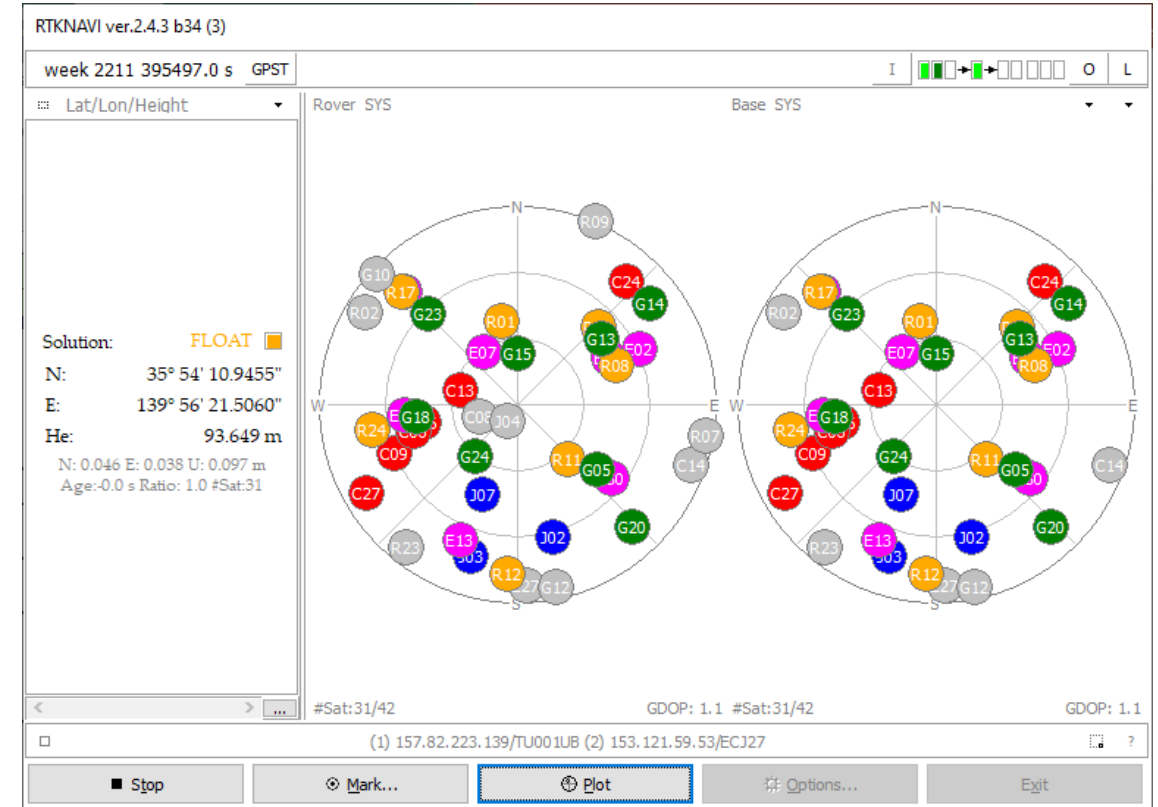
Antenna Type (*: Auto) Delta-E/N/U (m) 0.0000 0.0000 0.0000

Base Station

RTCM/Raw Antenna Posi 90.000000000 0.000000000 -6335367.6285

Antenna Type (*: Auto) Delta-E/N/U (m) 0.0000 0.0000 0.0000

Station Position File





RTKNAVI ver.2.4.3 b34

2000/01/01 00:00:00.0 GPST

Lat/Lon/Height

Rover SYS

Solution: --- □

N: 0° 00' 00.0000"

E: 0° 00' 00.0000"

He: 0.000 m

N: 0.000 E: 0.000 U: 0.000 m

Age: 0.0 s Ratio: 0.0 #Sat: 0

#Sat: 0/0 GDOP: 0.0

Start Mark... Plot Options... Exit

Input Streams

| Input Stream | Type | Opt | Cmd | Format | Opt |
|---|--------------|-----|-----|----------------|-----|
| <input checked="" type="checkbox"/> (1) Rover | NTRIP Client | ... | ... | Septentrio SBF | ... |
| <input type="checkbox"/> (2) Base Station | Serial | ... | ... | RTCM 2 | ... |
| <input type="checkbox"/> (3) Correction | Serial | ... | ... | RTCM 3 | ... |

Transmit NMEA GGA to Base Station: OFF

Reset Cmd: Max Base...

Input File Paths

Time x1 + 0 s 64bit

OK Cancel

NTRIP Client Options

NTRIP Caster Address: 123.45.678.900 Port: 2101

Mountpoint: WRC021SB User ID: utuser Password:

Browse... Get Mountp OK Cancel

Select Correct File Format
It may be ublox, SBF, RTCM3 or other

Options

Setting1 Setting2 Output Statistics Positions Files Misc

Positioning Mode: Single

Frequencies / Filter Type: L1+2 Forward

Elevation Mask (°) / SNR Mask (dBHz): 0 ...

Rec Dynamics / Earth Tides Correction: OFF OFF

Ionosphere Correction: Broadcast

Troposphere Correction: Saastamoinen

Satellite Ephemeris/Clock: Broadcast

Sat PCV Rec PCV PhWU Rej Ed RAIM FDE DBCorr

Excluded Satellites (+PRN: Included)

GPS GLONASS Galileo QZSS BDS NavIC SBAS

Load... Save... OK Cancel

Select Single
It may be DGPS, Kinematic, PPP or other

Use these buttons to select Output streams and Log Data files if required

Click these buttons to change display types

RTKNAVI ver.2.4.3 b34 (2)

2022/05/26 12:50:55.0 GPST

Lat/Lon/Height

Rover SYS

Solution: SINGLE

N: 28° 15' 18.3614"

E: 83° 58' 35.0876"

He: 940.740 m

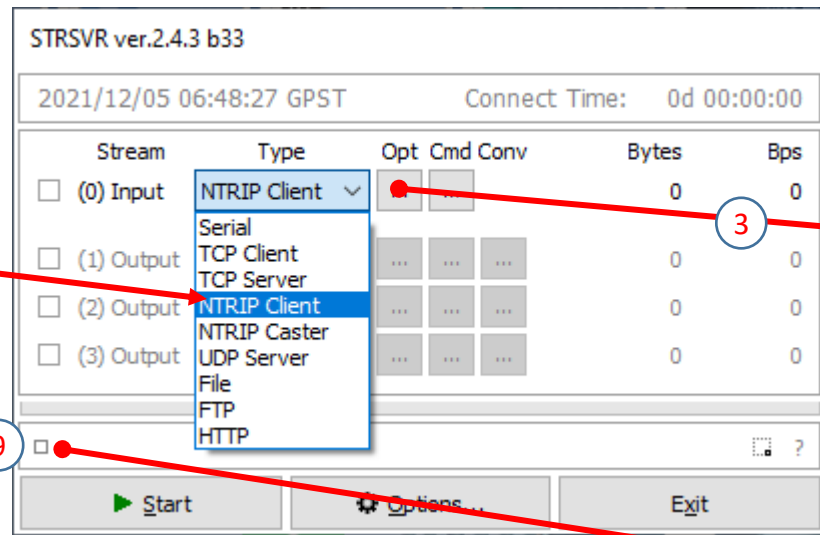
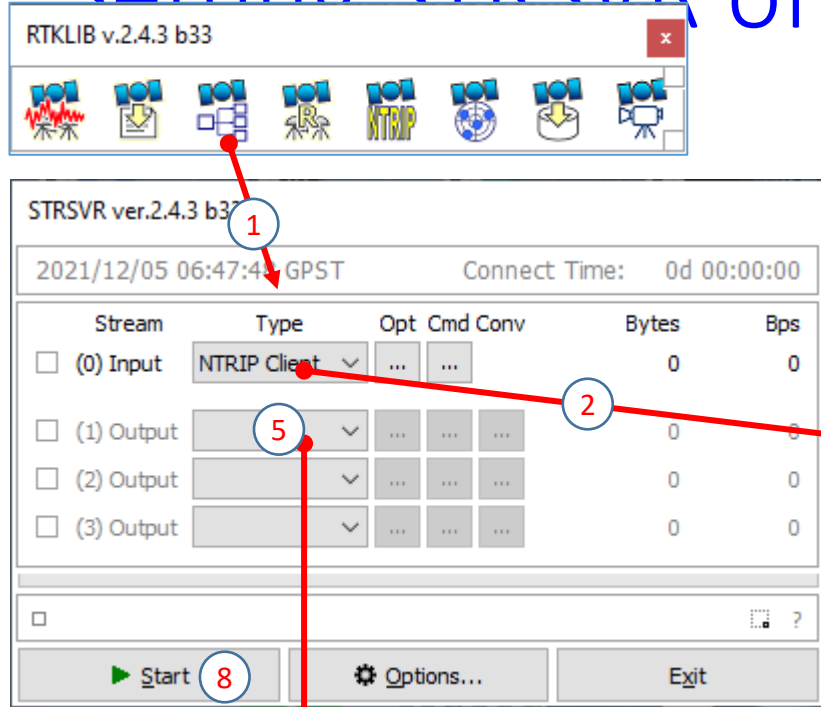
N: 1.307 E: 1.365 U: 2.738 m

Age: 0.0 s Ratio: 0.0 #Sat: 40

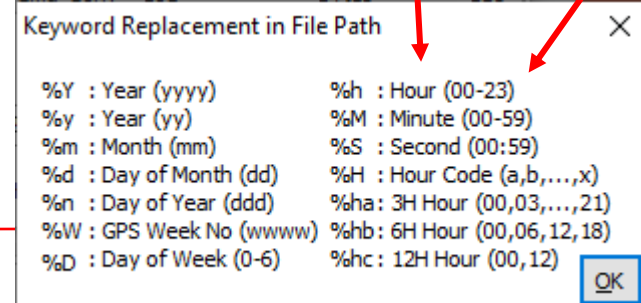
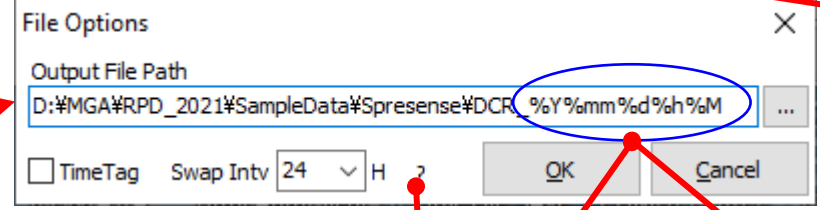
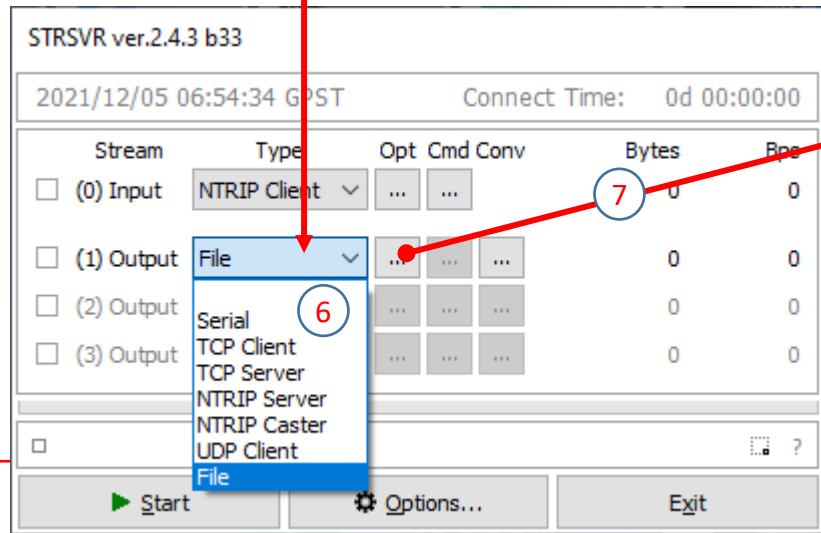
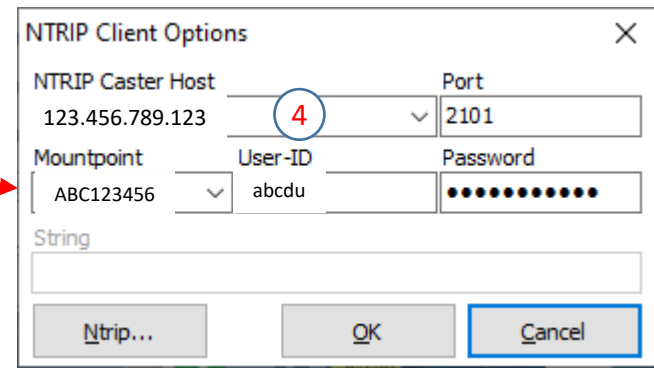
SNR (dBHz)

GREJ CS

Setting STRSVR of RTKLIB to Access Sprensense Receiver



NTRIP IP Address, User ID and Password will be provided during the lecture.



File name can be generated automatically
 %Y%m%d%h%M%S generates filename with current date and time
 such as 20220526170000
 Example:
 %Y%m%d%h%M%S.ubx → 20220526170000.ubx
 %Y%m%d%h%M%S_Static.ubx → 20220526170000_Static.ubx
 KASH_%Y%m%d%h%M%S.ubx → KASH_20220526170000.rtc

NTRIP Setup to Access SpreSense Receiver Data

NTRIP Client Options

NTRIP Caster Address: 123.456.78.90

Port: 2101

Mountpoint: ABC123

User ID:

Password: ●●●●●●●●●●●●

Browse... Get Mountp OK Cancel

Spresense Output in NMEA Format

GPS Position Output

QZSS Satellite Visibility

QZSS L1S Message

Two Message Types are defined for Early Warning Message:
MsgType: 43 for Japan use
MsgType: 44 for Overseas use

```

Input Stream Monitor
ASCII [X] [Pause] [Down Arrow] [Close]

$GNVTG,310.2,T,,M,0.0,N,0.0,K,D*16
$QZQSM,56,9AB3F8036D82261F8D809A73CB1CAC00480000012306000000000000366AC430*7D
$QZDCM,Message Type,15
$GPGGA,023825.00,3554.1825,N,13956.3582,E,2,08,1.5,54.1,M,39.3,M,,*59
$GPGSV,3,1,11,03,07,280,37,04,14,319,39,16,32,257,43,18,10,124,38,0*68
$GPGSV,3,2,11,25,14,060,36,26,57,286,48,27,07,204,,28,70,067,45,0*6A
$GPGSV,3,3,11,29,44,058,46,31,66,341,47,32,30,174,47,,,,,0*55
$GQGSV,2,1,05,56,87,205,48,02,87,205,46,03,18,168,41,04,32,207,43,0*6A
$GQGSV,2,2,05,07,46,201,38,,,,,,,,,,,,,0*5C
$GNRMC,023825.00,A,3554.1825,N,13956.3582,E,0.0,310.2,300124,,D,V*38
$GNVTG,310.2,T,,M,0.0,N,0.0,K,D*16
$GPGGA,023826.00,3554.1825,N,13956.3582,E,2,08,1.5,54.1,M,39.3,M,,*5A
$GPGSV,3,1,11,03,07,280,37,04,14,319,38,16,32,257,43,18,10,124,37,0*66
$GPGSV,3,2,11,25,14,060,36,26,57,286,48,27,07,204,,28,70,067,45,0*6A
$GPGSV,3,3,11,29,44,058,46,31,66,341,47,32,30,174,47,,,,,0*55
$GQGSV,2,1,05,56,87,205,48,02,87,205,47,03,18,168,41,04,32,207,43,0*6B
$GQGSV,2,2,05,07,46,201,39,,,,,,,,,,,,,0*5D
$GNRMC,023826.00,A,3554.1825,N,13956.3582,E,0.0,310.2,300124,,D,V*3B
$GNVTG,310.2,T,,M,0.0,N,0.0,K,D*16
$QZQSM,56,53B0600DE0000000000000000000000000000000000000000000000000000000800CAC*7D
$QZDCM,Message Type,12
$GPGGA,023827.00,3554.1825,N,13956.3582,E,2,08,1.5,54.1,M,39.3,M,,*5B
$GPGSV,3,1,11,03,07,280,36,04,14,319,39,16,32,257,43,18,10,124,37,0*66
$GPGSV,3,2,11,25,14,060,36,26,57,286,48,27,08,204,,28,70,067,45,0*65
$GPGSV,3,3,11,29,44,058,47,31,66,341,47,32,30,174,47,,,,,0*54
$GQGSV,2,1,05,56,87,205,48,02,87,205,47,03,18,168,42,04,32,207,43,0*68
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$GNVTG,310.2,T,,M,0.0,N,0.0,K,D*16
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$GPGSV,3,1,11,03,07,280,36,04,14,319,39,16,32,257,43,18,10,124,38,0*69
$GPGSV,3,2,11,25,14,060,36,26,57,286,48,27,08,204,,28,70,067,45,0*65
$GPGSV,3,3,11,29,44,058,47,31,66,341,47,32,30,174,47,,,,,0*54
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$GQGSV,2,2,05,07,46,201,40,,,,,,,,,,,,,0*53
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$QZDCM,Message Type,14
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$GPGSV,3,1,11,03,07,280,36,04,14,319,39,16,32,257,43,18,10,124,38,0*69

```

If you would like to get GNSS data from our lab, please send a request e-mail to
dinesh@csis.u-tokyo.ac.jp
Note: This is subject to approval of the request and it will be dealt case by case.