

NTRIP Introduction and GNSS Data Access over NTRIP

UTOKYO/ICG Workshop on GNSS for Policy and Decision Makers
9th January 2023
(Online Workshop)

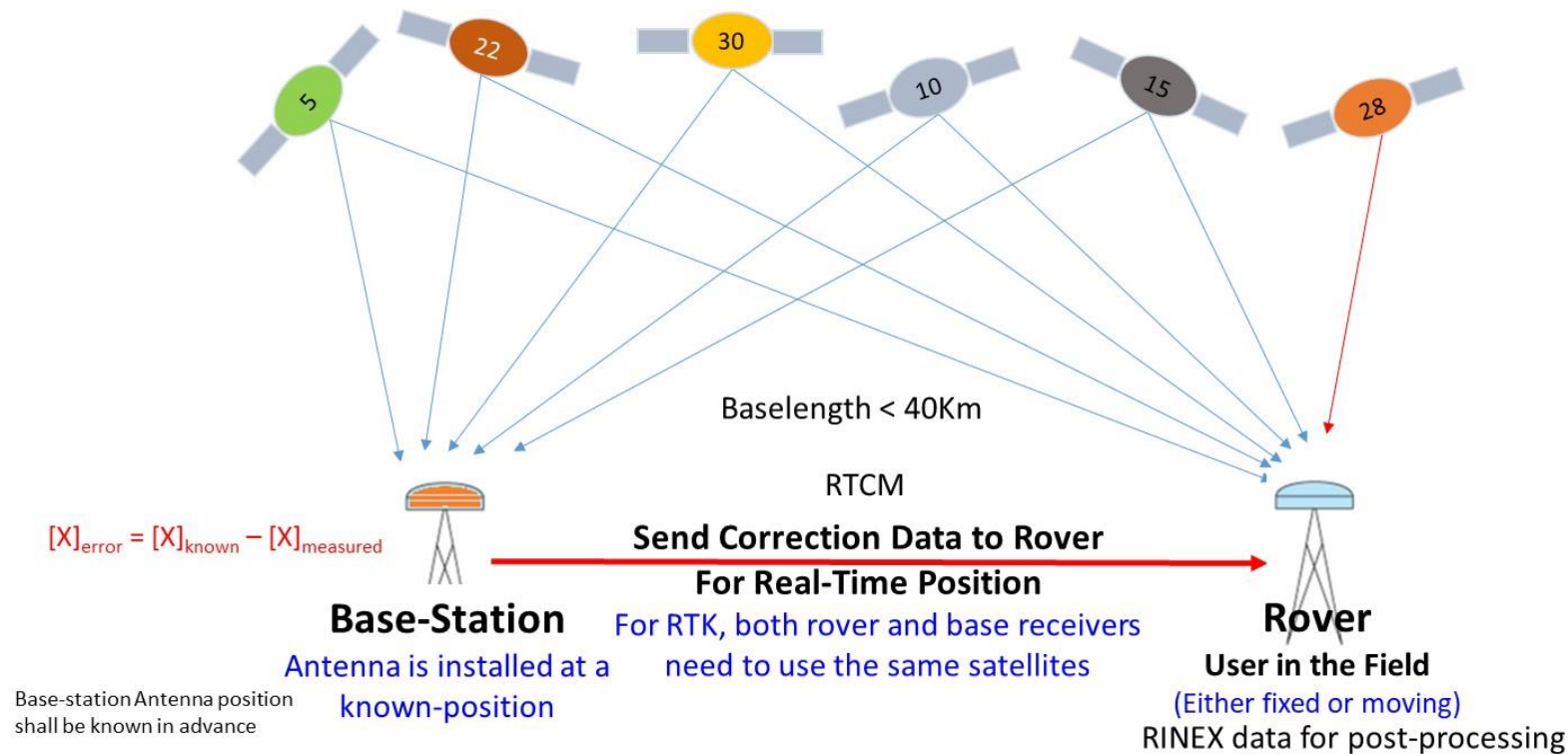
Dinesh Manandhar, Associate Professor (Project)
Center for Spatial Information Science (CSIS), The University of Tokyo

dinesh@csis.u-tokyo.ac.jp

We have no intention to prefer any brand names mentioned in these slides. They are used only for reference.
There are many other products in this category from different manufacturers, please search in internet

How to send a correction data from a base-station to several multiple rovers at the same time?

- Real-Time data processing like RTK requires correction data from the base-station.
- It can be transmitted via Radio Links, Internet, Data Modems or other communication links
- But, how to send a correction data from a base-station to several multiple rovers at the same time?



NTRIP Introduction

➤ NTRIP

- Network Transport of RTCM via Internet Protocol
- NTRIP is a protocol to send GNSS correction data to a receiver over internet.
- It is an application based software level implementation.

➤ NTRIP Architecture

➤ NTRIP Caster

- It's a data server that collects RTK corrections from one or several base stations, and distributes them to rovers.

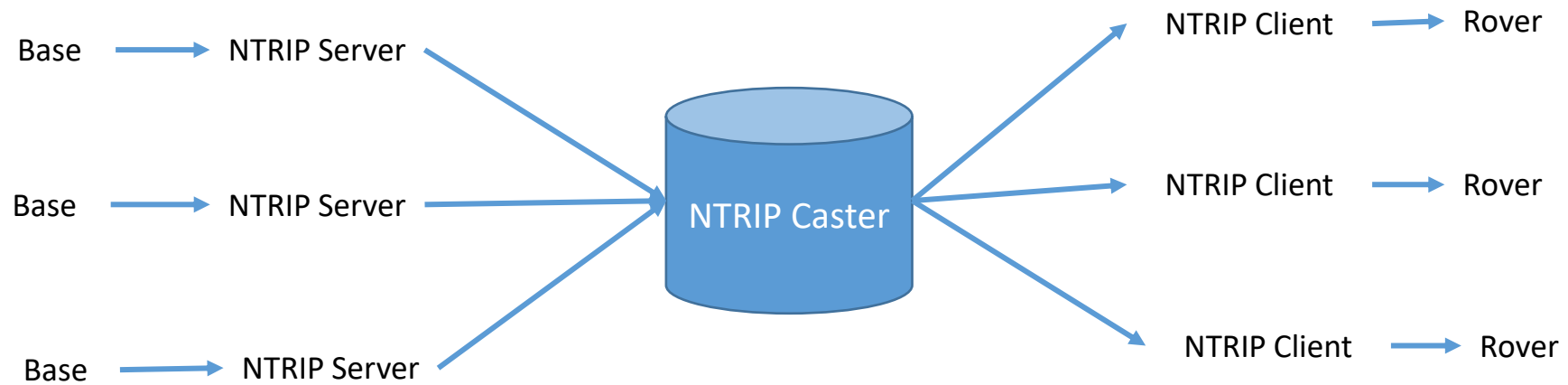
➤ NTRIP Server

- It sends correction data from a base-station to NTRIP Caster.
- A base-station may have both NTRIP Server and Caster . In this case the base-station can be set as a NTRIP Caster. In such setup, simultaneous access of the server/caster may be limited to certain numbers, such as 10 users.

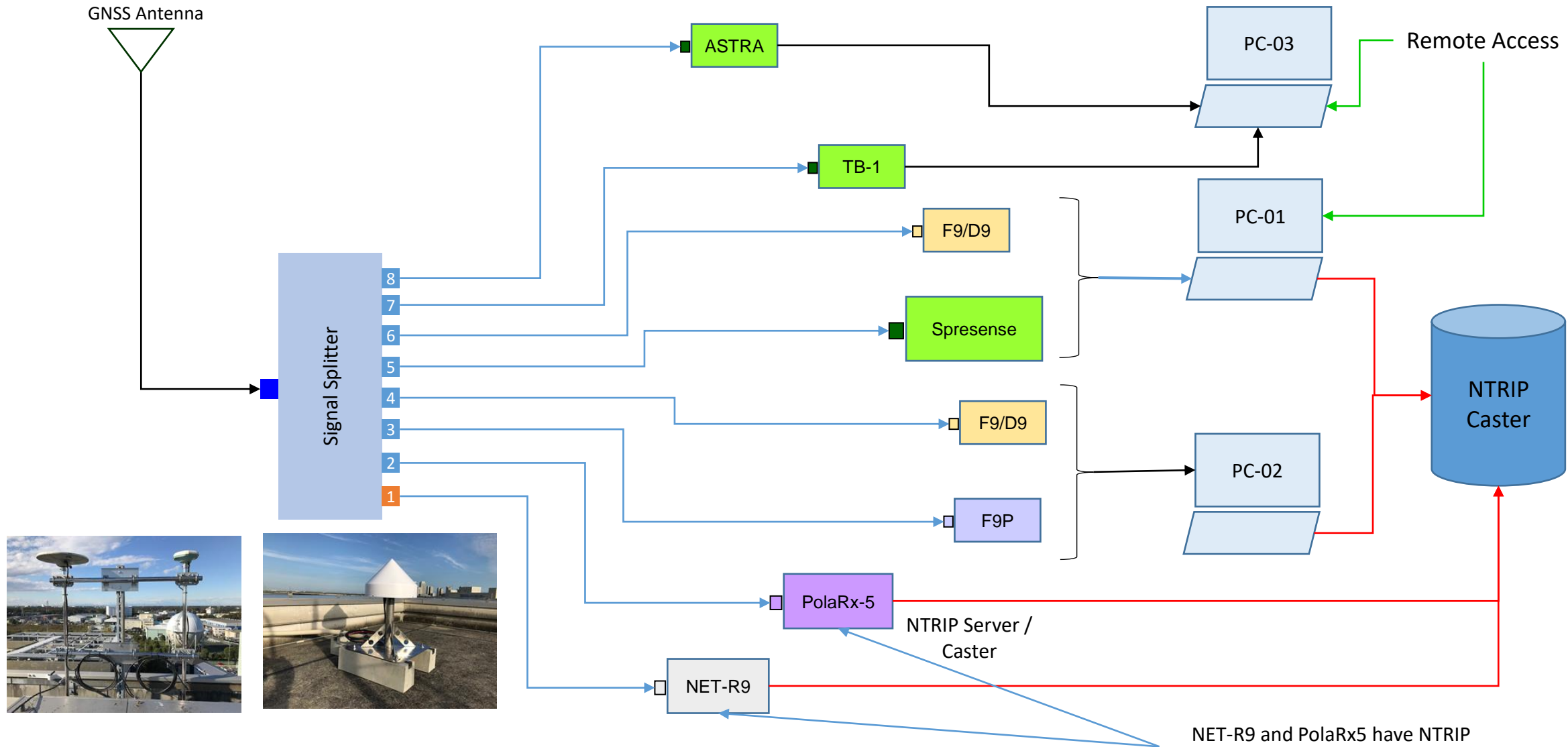
➤ NTRIP Client

- NTRIP Client receives correction data from a NTRIP Caster
- NTRIP Client is implemented in a Rover to receive correction data from a base-station

NTRIP System

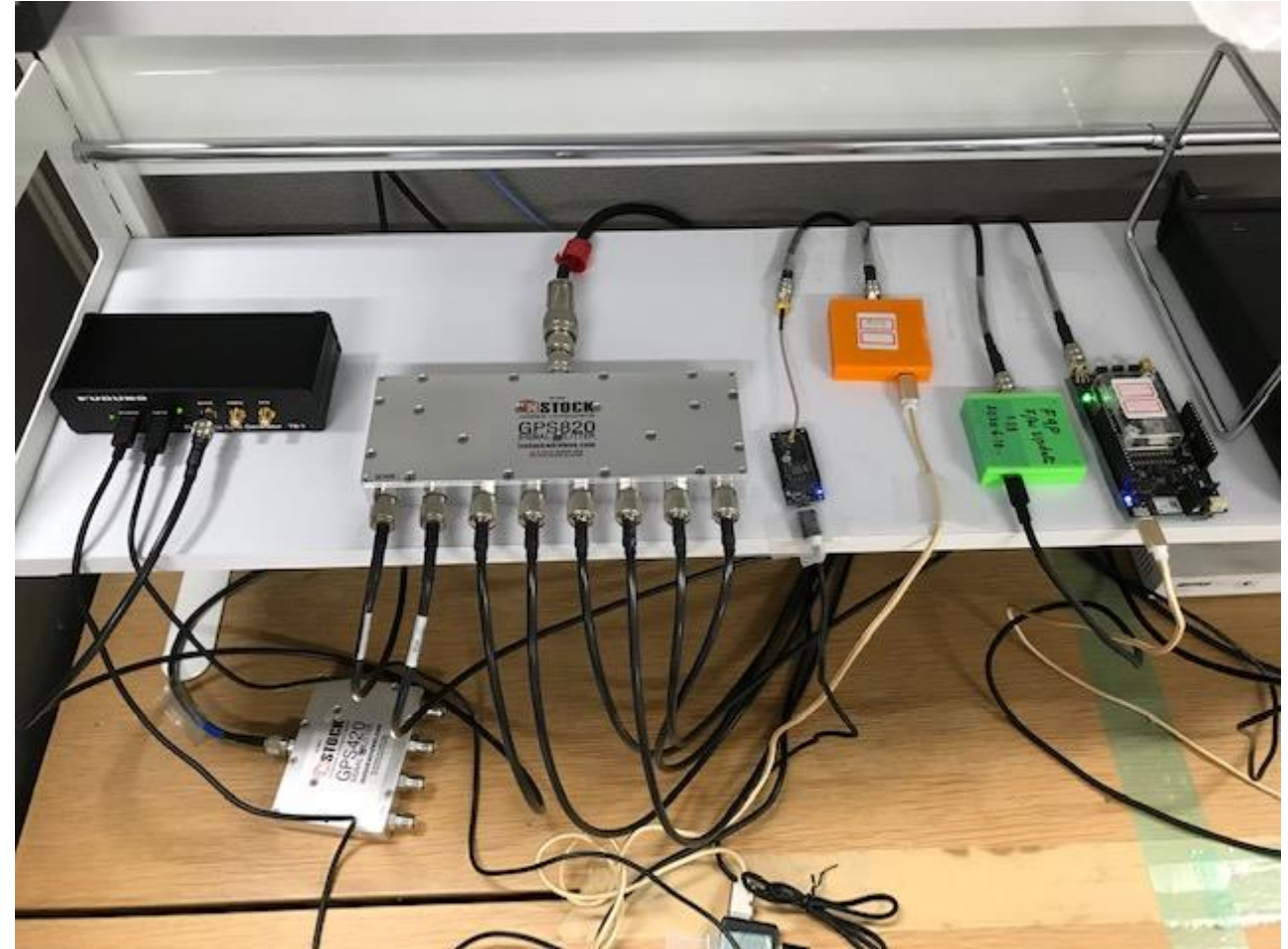


GNSS Receivers at UTokyo



NET-R9 and PolaRx5 have NTRIP Server/Caster in the receiver

GNSS Receivers at UTokyo



Installation of RTKLIB

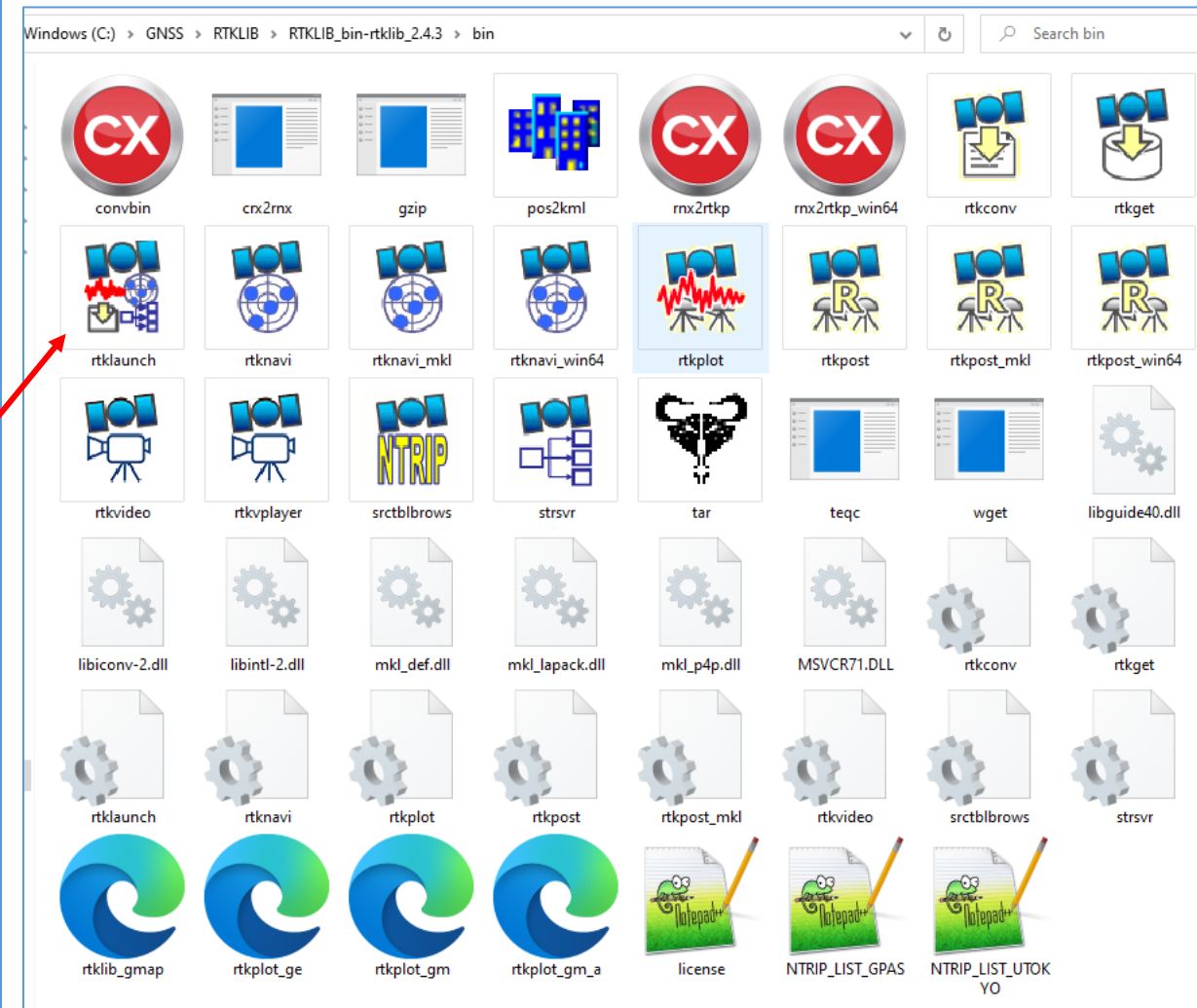
- Download RTKLIB software
 - Version 2.4.3b34
 - Main Page: <http://www.rtklib.com/>
 - Windows Binary Files:
https://github.com/tomojitakasu/RTKLIB_bin/tree/rtklib_2.4.3
 - Download the ZIP file to a PC
 - Unzip the folder to a working directory in the PC
 - Now go to unzipped folder
 - It may be something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

Click CODE
Select “Download ZIP”

RTKLIB Files in BIN Folder

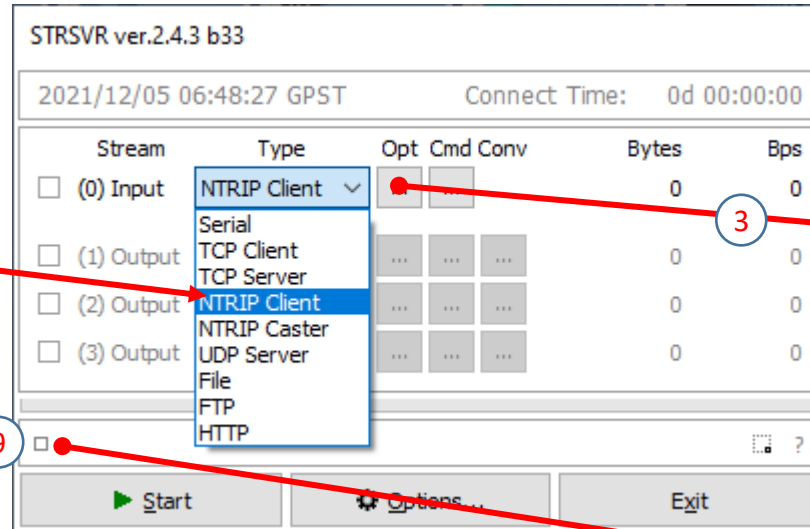
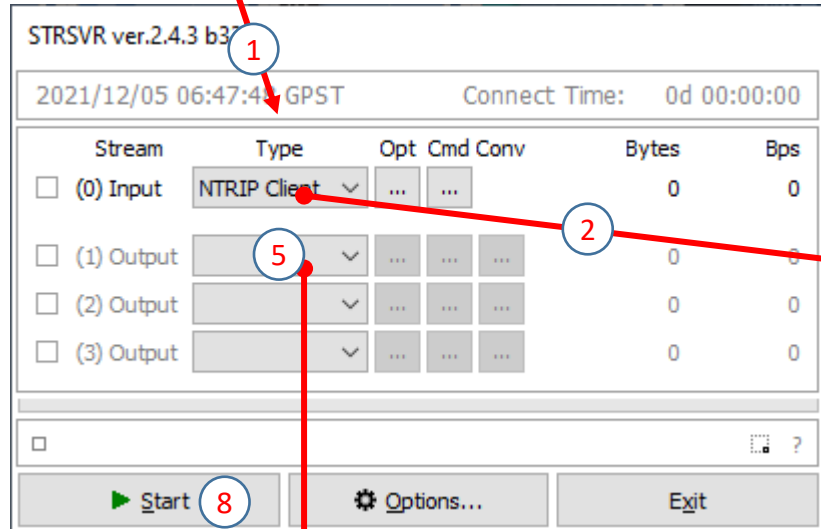
Windows (C:) > GNSS > RTKLIB > RTKLIB_bin-rtklib_2.4.3 > bin

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

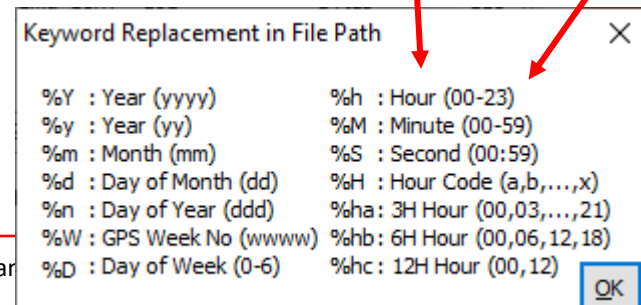
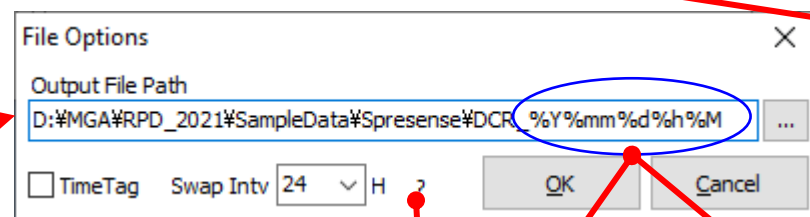
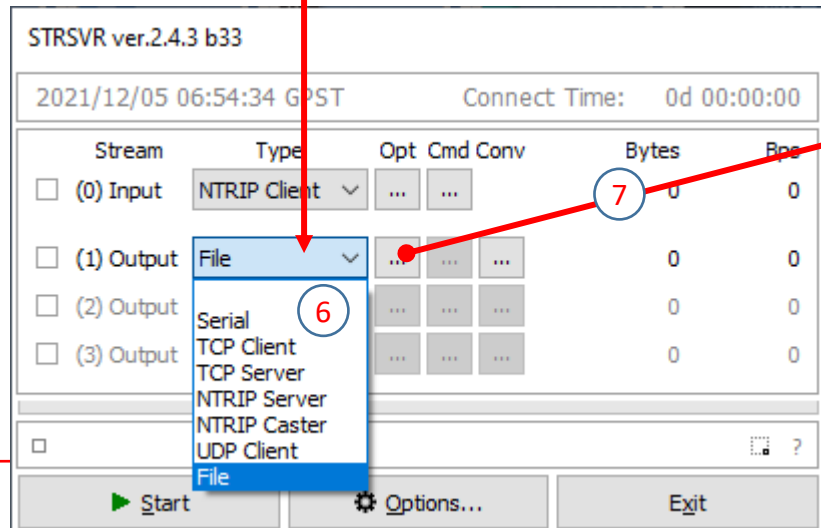
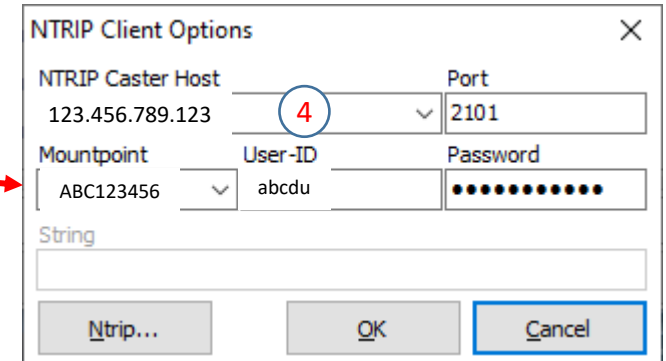


Double Click
RTKLAUNCH.exe
Or
Create a short-cut and
copy to Desktop for easy launching

Setting STRSVR of RTKLIB



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



File name can be generated automatically
 %Y%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

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

#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: 157.82.223.139 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

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

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

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

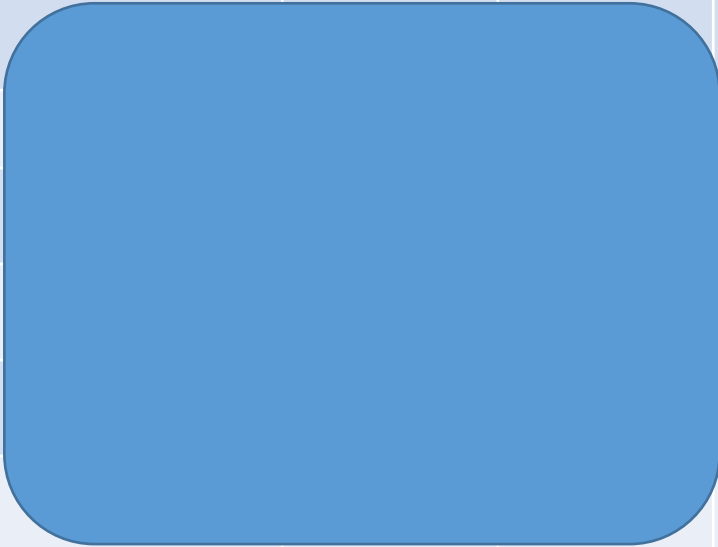
Age: 0.0 s Ratio: 0.0 #Sat: 40

SNR (dBHz)

GREJCS

Click these buttons to
change display types

NTRIP Details

	IP Address	Port	Mount Point	User ID	Password	Receiver	Data Format	Purpose
1						U-blox F9P	UBX	RTK or MADOCA
2						U-blox D9C	UBX	MADOCA Only
3						Sony Spresense	NMEA	QZSS L1S EWS Message
4						U-blox F9P	RTCM3	RTK or MADOCA
5						Septentrio PolaRx5	SBF	RTK Or MADOCA
6						Trimble NetR9	RTCM3	
7								

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.