A Tokyo University of Marine Science and Technology

Laboratory of Satellite Navigation Engineering



How to use Receiver/Antenna Test Package





antenna

Use Ublox as the reference station

- Reference station uploads raw data
- Ntrip server can distribute the data



Download RTKLIB

w.rtklib.co	m	(2) Q、検索	☆ 自 ♥ ♣ ⋒					
erview <u>Re</u> TKLIE	ilease Notes Si 3: An Ope	upport Documents References Porting en Source Program Pac	to BB To Do Statistics SDR Receiver Ckage for GNSS Positioni					
	Data							
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1.0.0	2000/12/16		rtklib 1.0.0 zie (10 EMP)					
1.0.0	2007/09/20		rtklib 1.1.0 zip (F0.5MB)					
210	2009/07/15		rtklib 2.1.0 zip (0.2MB)					
220	2009/01/31	rtklib 2.2.0 bio zin (10.7MB)	rtklib 2.2.0 zip (22.3MB)					
2.2.0	2009/05/17	rtklib 2.2.1 bin zin (15.3MB)	rtklib 2.2.1 zip (30.6MB)					
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230 2009/12/17 rtklib 230 bio zip (26 7MB) rtklib 230 zip (35 9MB)								
2.4.0	2010/08/08	rtklib 2.4.0 bin.zip (17.4MB)	rtklib 2.4.0.zip (26.5MB)					
2.4.1	2011/06/11	rtklib_2.4.1_bin.zip (16.5MB)	rtklib_2.4.1.zip (26.4MB)					
2.4.2	2013/04/29	rtklib_2.4.2_bin.zip (30.4MB)	rtklib_2.4.2.zip (55.2MB)					
2.4.3	2015/03/31	rtklib_2.4.3_bin.zip (??.?MB)	rtklib_2.4.3.zip (??.? MB)					
Please refer the <u>support information</u> to get the latest patches. RTKLIB 2.4.3 betas are available at GitHub. (<u>RTKLIB - branch rtklib 2.4.3</u>)								
en Repository in GitHub.								
nd Demo	nstration							
torial and Demonstration								

<u>Overview</u>

RTKLIB is an open source program package for standard and precise positioning with GNSS (global navigation satellite system). RTKLIB consists of a portable program library and several APs (application programs) utilizing the library. The features of RTKLIB are:

(1) It supports standard and precise positioning algorithms with:

RTKLIB: An Open Source P × 📿 GitHub - ton	nojitakasu/ 🗙	+					
🗲 🔒 GitHub, Inc. (US) https://github.com/tomojita	kasu C' 🤇	検索	☆ 自		↓ 俞	⊜ ≡	
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No description or website provided.							
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Branch: rtklib_2.4.3 • New pull request			(Find file	Clone or do	wnload -	
This branch is 74 commits ahead, 39 commits behind master.			Clone with HTTPS	0		Use SSH	
🖬 tomojitakasu rtklib 2.4.3 b10			Use Git or checkout with SVN using the web URL.				
in app	rtklib 2.4.3 b10		https://github.co	n/tomojitaka	su/RTKLIB.git	100 A	
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<pre> </pre>	III						

Start RTKLIB





Start STRSVR

- Click the icon that is the third from the left
- STRSVR is the application for the data streaming server
 - -We need to select input and output settings
 - Three output files can be selected for each input file

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						(2) Output			0	(
						(3) Output		•	0	9
						Start	Stop	Option	ns	Exit

STRSVR : Setting input and output

• Select input data source At this time

USB serial port from u-blox receiver: port ##, bitrate:115200

- Select the output data destination
 - upload the data to the Ntrip caster prepared in advance within the Ntrip server
 - At this time

upload the data to the Ntrip caster in the Sakura server as mount point ECJ02

STRSVR : Setting input and output



Start STRNAVI

- Click the icon that is the second from the right
- STRNAVI is an application for real-time analysis
- It can access logged data

2000/01/01 00:00:00.0 GPST I □□□→□→□□□□□ 0
Image: Lat/Lon/Height ▼ Rover:Base SNR (dBHz) 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:

STRNAVI : Setting input

• Select input data source Select format to match the input data source At this time, Base: ECJ02, rover: Serial

RTKNAVI ver.2.4.2)	Input Streams						23
2000/01/01 00:00:00.0 GPST	1 000 -0 -00 000		Input Stream		Type (Opt C	md	Format	Op
: Lat/Lon/Height 🔹	Rover:Base SNR (dBHz)	• •	🔲 (1) Rover	Serial	Ŧ			RTCM 2	*
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RTKNAVI : Setting input

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RTKNAVI : Setting output



RTKNAVI : Setting options

RTKNAVI ver.2.4.2			
En Lat/Lon/Height Kover:Base SNR (dBHz) • Solution:	Options 82 Setting1 Setting2 Output Statistics Positions Files Misc Positioning Mode Single • Frequencies /Filter Type L1+L2 * Forward • Elevation Mask (9) /SNR Mask (dbHz) 15 • Rec Dynamics /Earth Tides Correction Broadcast • Ionosphere Correction Broadcast • Satellite Ephemeris/Clock Broadcast • Sat PCV Rec PCV Ph-Windup Reject Ed Excluded Satellites (+PRN: Included) Image: SBAS Bellou	Options XX Setting1 Setting2 Output Statistics Positions Files Misc Integer Ambiguity Res<(GPS/GLO/BDS) Cont + OFF + OFF + Min Ratio to Fix Ambiguity 3.0 .0 + - - - Min Confidence / Max FCB to Fix Amb 0.9999 0.20 - <t< th=""><th>Options 82 Setting1 Setting2 Output Statistics Positions Files Misc Rover Lat/Lon/Height (deg/m) * -90.000000000 -6378137.0000 Antenna Type (*: Auto) Delta-E/N/U (m) -90.0000 0.0000 Base Station Lat/Lon/Height (deg/m) * -90.00000000 -6378137.0000 Lat/Lon/Height (deg/m) * -90.00000000 -6378137.0000 Station Prize -90.00000000 0.000000000 -6378137.0000 Station Prize Station Position File </th></t<>	Options 82 Setting1 Setting2 Output Statistics Positions Files Misc Rover Lat/Lon/Height (deg/m) * -90.000000000 -6378137.0000 Antenna Type (*: Auto) Delta-E/N/U (m) -90.0000 0.0000 Base Station Lat/Lon/Height (deg/m) * -90.00000000 -6378137.0000 Lat/Lon/Height (deg/m) * -90.00000000 -6378137.0000 Station Prize -90.00000000 0.000000000 -6378137.0000 Station Prize Station Position File
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使用衛星群

RTKNAVI : Processing results







• Start U-center ver. 8.20 or later



 Connecting Receiver->Port-> Select receiver port number



• Set USB Baud rate Receiver->Baudrate (Recommendation: 115200)



- Set detailed configuration settings
- View->message view (see next slide)



- Select satellites
 - -UBX->CFG->GNSS
 - -Cannot use GLONASS and Beidou at the same time
 - -After changing Configuration, click Send

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BX		N
- ACK (Acknowledge)	Channels	
- AID (GPS Aiding)	GNSS ID configure GNSS name enable min max Signals	
-CFG (Config)	0 🔽 GPS 🔽 8 16 🔽 LICA	B156 B8B1151 G11
ANT (Antenna Settings)	1 V SBAS I I 3 V LICA	Y (522, 👯
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DAT (Datum)		G30 B1 04
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DYNSEED (Dynamic Seed)	4 IV IMES I 0 8 IV L1CA	-s
EKF (EKF Settings)	5 🔽 QZSS 🖾 0 3 🖾 L1CA 🗆 L1SAIF	
ESFGWT (Gyro+wheeldck)	6 🔽 GLONASS 🗆 8 14 🔽 L10F	
ETVEEED (Eived Good)	7	
- EXN (Fix Now Mode)	Number of American International	
- GEOFENCE (Geofence Config)		
	Number of channels to use 32 Auto set	
- INF (Inf Messages)	For specific SBAS configuration use CFG-SBAS	
		·····························
LOGFILTER (Log Settings)		
MSG (Messages)		
NAV5 (Navigation 5)		
NAVX5 (Navigation Expert 5)		
NMEA (NMEA Protocol)		
ODO (Odometer/Low-Speed COG		
PM (Power Management)		
PM2 (Extended Power Manageme		
PMS (Power Management Setup)		
PRT (Ports)		
PWR (Power)		
RATE (Rates)		
RINV (Remote Inventory)		
: PCT (Pornt)	4 III	·

- Change NMEA data mode
 - -UBX->CFG->NAV5
 - -After changing Configuration, click Send

(COM12 - u-center 8.20 - [Messages - UBX - CFG (Config) - NAV5 (Navigation 5)]	
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- NAVXS (Navigation Expert 5) - NMEA (NMEA Protocol) PAce ADR Mask 0 (m) - ONDA (NMEA Protocol) - ONDA (NMEA Protocol) - State Hold State Hold Threshold - PM (Power Management) - PM2 (Extended Power Management Setup) - PMR (Power) - PMR (Power) - RATE (Rates) - RATE (Rates) - RITUR (Remotel Inventory) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates) - RATE (Rates)	

- Confirm output of each port
 - -UBX->CFG->PRT
 - -Baud rate and UART are the same as for USB

(a, 11500)	COM12 - u-center 8.20 - [Messages - UBX - CFG (Config) - PRT (Ports)]	
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	PRI (Ports) →PWR (Power) RATE (Rates) RINV (Remote Inventory) DET (Power) REMOV (Remote Inventory) Ready R	

- Setting output data interval (data rate)
 –UBX->CFG->RATE
 - -(200 ms = 5 Hz)



- Output SVINFO (recommended)
 - -UBX->NAV->SVINFO
 - Right click SVINFO->Enable SV information
 Message & Poll Message



😯 COM12 - u-center 8.20 - [Messages - UBX -	NAV (Navigation) - SVINFO (SV Information)]		
File Edit View Player Receiver Tool	3 Window Help	_ 8 ×	
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⊕ INMEA ⊖ UBX ⊕ ACK (Acknowledge) ⊕ ALD (GPS Aiding) ⊕ CFG (Config) ⊞ SEF (External Sensor Fusion) − INF (Information) ⊕ ING (Multiple GNSS Assistance) ⊕ MAX (Navigation) ⊂ ALOCK (Clock Status) − DGPS (DGPS Data) − DOP (Dilution of Precision) − EKFSTATUS (Status) − DOP (Oldution of Precision) − EKFSTATUS (Status) − DOP (Oldution of Precision) − EKFSTATUS (Status) − DOP (Oldution of Precision) − EKFSTATUS (Status) − DOD (Odometer) − ONB (Orbit Info) − POSECEF (Position ECEF) − POSLLH (Geodetic Position) − PKT Solution) − RESETODO (Reset Odometer) − SAT (Satellite Information) − SAS (SBAS Status)	UEX: NAV (Navigation) - SVINFD (SV Information) CNO Residual Nav Q E DOPS 0 G1 A OPS DOPS 0 G1 A OPS DOPS 0 G1 A OPS DOPS 0 G1 CO OPS OPS D N OPS 0 G1 OPS OPS OPS OPS N N OPS OPS <th cols<="" th=""><th></th></th>	<th></th>	
- SOL (Navigation Solution) - STATUS (Navigation Status) - STATUS (Navigation Status) - TI Foll Message - TI Enable Message - TI Disable Message - TI Disable Message			
Ready	- COM12 11520(u-blox M8 No file open	UBX 00:02:49 09:34:46	

- Output RAWX (obs file)
 - -UBX->RXM->RAWX
 - -Right click RAWX
 - Enable Message & Poll Message
- Output SFRBX (nav file)
 - -UBX->RXM->SFRBX
 - -Right click SFRBX
 - Enable Message & Poll Message
- This data is used by RTKNAVI

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INF (Intormation)	GE3 L1C	à .	20557918.19	108032589.79	2096.5	64510	45	0.32	0.004		
(H-LOG (Data Logger)	GE8 L10	1 1	22623750.61	110001605.45	-2065.1	64500	41	0.32	0.004		(S) 10.00
H-MGA (Hutple GRSS Assistance)	G17 L10	ā .	22916863.91	120428926.08	2731.4	64510	41	0.32	0.004		6
H-MUN (Monisor)	G22 L10	4 -	20502398.02	107741829.09	117.2	64510	45	0.32	0.004		s
H NAV (Navigation)	804 810	2 .	37127642.31	193333344.32	228.7	64510	41	0.32	0.004		-
 RXM (Receiver Manager) 	801 810	2 .	36806912.09	191663218.52	205.2	64500	40	0.32	0.004		
ALM (Aimanoc)	630 110		23912745.83	125652331.87	-142.3	64510	35	0.52	0.004		
- EPH (epnemens)	E08 E10		23940960.13	125810608.34	1092.3	64510	40	0.32	0.004		
OHIDEO (Deuror Meda Request)	B11 B10	1	21967122.39	113957810.29	-4048.0	64500	42	0.32	0.004		
- RAW (Raw Measurement Data)	B03 B10	2 .	37385677.04	194677002.97	232.7	21650	38	0.32	0.004		
RAWY (Multi-CNCC Paur Meanurs	E26 E10 B08 B10		22028930.04	115/62819.79	465.7	64500	41 39	0.32	0.004	1	
- RIM (Return Link Messane)	815 810	1 -	37696969.32	196297457.51	580.5	64520	38	0.32	0.004		
- SERB (Subframe Data)	632 L10 812 810	1	25300433.80	132954655.21	123.7	30350	33	2.56	0.012		
E SFRBX (Subframe Data NG)	GEE LIC	È	25010792.86	131432633.71	3127.0	29910	29	2.56	0.016		
l-dh 0	G14 L10	80 (m)	25519987.42	134109465.97	681.7	6400	26	1.28	0.020		
- ch 1											
- ch 2											
ch 3											
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- ch 5											
ch 6											
ch 7										1.00	
- ch 8											
ch 9											
- ch 10											
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- Save receiver configuration
- Receiver->Action->Save config
- After setting and saving, Close u-center

