ZED-F9Pの設定方法

基準局、移動局ともにF9P(M8T)を利用することを想定しています

アンテナとUSBを受信機とPCにつないで、u-centerを起動

バージョンは19.01以降



※受信機によってケーブルやUSBを挿し込む 位置は千差万別なので、そのつど要確認





設定の前にBaud Rateを設定

P COM8 -	u-center 18.11 - [M	lessages - UB	X]
🖻 File E	dit View Player	Receiver	Tools Window Help
0 🖬 🖬	š - ⊕ 🖪 X	Þa 💼	8
і́ =00= → Л.	v 🗸 💥 🛧		11 ● 41 1> → ↔ ⋈- 1
IH IW	1'200	þ 🗄 🔁) 🔠 🔁 🔲 🗉 🖬 🖛 🖛 🖬 🖛 🖬 🖬 🚳 📷 🖬 🖬 🐼 🐼
NMEA	2'400	^	
⊕- GxDTN	4'800		
⊕ GxGBS	9'600		
⊕ GxGG/	19'200	tem I	u-blox binary protocol (UBX)
	38'400	atitu	u-blox AG
	57'600		
⊕. GxGSA	• 115'200	atel	
⊕ GxGST	230'400	r Sta	
⊕ GxGSV	460'800		
	921'600	um S	
⊕. GxVLV	Custom	stand	The UBX protocol is a binary protocol with little endian byte sex.
⊕ GxVTG (Course Over Groun	d and Gr	Fach LIRX message starts with a two bute start code (NVR5
🕂 · GxZDA (Time & Date)		0x62). This is followed by a one-byte class code (which
			indicates the class of the message) and a one-byte ID code for this class.
?????? (Ur	known)		The next two bytes (little endian) give the length of the
RTCM3	stom)		payload. The payload is then transmitted with the number of
UBX			give the Checksum over the packet.
ACK (Ac	knowledge)		For checksum algorithm and individual payloads, please see

Baud Rateに関しては、 460800か、230400 が望ましい。 (F9Pのデータを用いてRTKLIBの STRSVRやRTKNAVIを動かす場合、 460800がRTKLIBにはないので、 230400とする)

移動·基準共通

※ここを設定せず、9600(デフォルト)のまま だとデータが抜けたりする

※F9Pをはじめて設定する場合

BeiDouのB2帯をデコードする設定をしなくてはならないので、以下の作業をする

		do + m + < ≱ ☆ = ▲ ■ II ● 4I ▶ + ₩ ₩	
	UBX - CFG (Config) - VALSET (New Configuration)	: ↓ H W ↓ C 禄 攀 ● ● : 爸 爸 爸 ■ 日 ↓ Σ □ ▼ 【 ▼ ▼ ■ ▼ ■ ● ● ◎ ■ 1 - PWR (Power) ^ UBX - CFG (Config) - VALSET (New Configuration)	
	Compose list entry Group CFG-ANA V Key name CFG-ANA-USE_ANA V CFG-ANA-USE_ANA V CFG-ANA-USE_ANA	RATE (Rates) REMFS (Remote FS C RINV (Remote Inven RST (Reset) RXM (Receiver Manz SBAS (SBAS Settings Key name CFG-SIGNAL BDS B2 FNA Description	クリックすると
SLAS (SLAS settings) SMGR (Sync Manager Config) SPT (Sensor Production Test Confic	Key ID 10230001 Add to List Type: L	SLAS (SLAS settings) SMGR (Sync Manage Key ID 1031000E Add to List	── Kevに名前が
TMODE (Time Mode)	Configuration changes to send		
IMODE2 (Ime Mode 2) TMODE3 (Time Mode 3) TP (Timepulse) TP5 (Timepulse 5) TXSLOT (Tx Time Slots)	Key ID Type Value	- TMODE2 (Time Mod - TMODE3 (Time Mod - TP (Timepulse) - TP5 (Timepulse 5)	追加される
USB (Universal Serial Bus) USBTEST (Universal Serial Bus Test)		TXSLOT (Tx Time Slo USB (Universal Serial	
		VALDEL (New Config	,の項目を選
ESF (External Sensor Fusion) HNR (High Navigation Rate) INE (Information)	B	ESF (External Sensor Fus	. trueを
LOG (Data Logger)	-Value-	- INF (Information)	
Hand MGA (Multiple GNSS Assistance) Hand MON (Monitor) Hand NAV (Navigation)		LOG (Data Logger) MGA (Multiple GNSS As O false MON (Monitor)	ックできたら、
由- RXM (Receiver Manager) 日- SEC (Security) 日- TIM (Timing)	Read rect	HAV (Navigation) B- RXM (Receiver Manager D- SEC (Security)	Sendボタン
	□ Flash □ BBR IF IF □ Image: Flash □ Image: Flash Image: Flash Image: Flash	■ TIM (Timing) ■ UPD (Firmware Update ! _ ??-?? (Unknown) _ ??-?? (Custom) _ UNKNOWN	す
< る × 語 Send 语 Poll 液 一個 感 Ready	< >		

設定したら(※重要)



を押す

Sendボタンを押した後は必ず Receiver→Action→Save Configも押す

UBXのCFGで各種設定(ここではRateの設定)^{移動・基準共通}



設定したら(※重要)



を押す

Sendボタンを押した後は必ず Receiver→Action→Save Configも押す

UBXのCFGで各種設定(ここでは測位モードの設定^{8動・基準共通}





設定したら(※重要)



を押す

Sendボタンを押した後は必ず Receiver→Action→Save Configも押す

RAWデータの出力設定

P COM8 - u-center 18.11 - [Messages - UBX - RXM (Receiver Manager) - RAWX (Multi-GNSS Raw Measurement Data)]

P File Edit View Player Receiver Tools Window Help

D■☞▼|@Q|%℡電|፼ |━▼▼┉▼|╲鯊★||▲■|Ⅱ|●|∢ ▷▶▼→>⊬⊥+

LOG (Data Logger)		BX - RX	M (Rec	eiver N	lanager) - RAWX (Mu	ilti-GN	ISS Raw Meas	urement Dai	ta)	
MGA (Multiple GNSS Assistance)	-									
i∰. MON (Monitor)		and Tim	Γ	2020		[4]				
ig. NAV (Navigation)	"	Juan nin		2030	.200002.002000000	[2]				
🖶 RXM (Receiver Manager)	Le	eap sec	onds		18 (VALID)	[\$]	Clock reset	Π		
ALM (Almanac)	ΙE	SV	Sig	G	Pseudo Range [m]	Carri	er Phase [c	Dopple	Lock T	٩C
EPH (Ephemeris)		G14	L1C		21884692.06	1	115004834.33	-2317.9	64500	
IMES (IMES Status)		G16	L1C		22861580.85	1	120138430.25	2277.4	64500	
MEASX (Measurement Data)		G25	L1C		25242688.85	1	132651225.80	-2962.8	64500	
PMRFO (Power Mode Request)		G26	L1C		21492912.48	1	112946019.82	1050.6	64500	
PAW/(Paw Measurement Data)		G29	L1C	•	22636471.49	1	118955460.50	-2247.7	64500	
RAW (Raw Measurement Data)		G31	L1C	•	21042028.90	1	110576608.33	210.3	64500	
RAWX (Multi-GNSS Raw Measurement Data)		G32	L1C	•	23293983.77	1	122410716.45	-3378.6	64500	
RLM (Return Link Message)		B01	B1D2	•	37674814.50	1	196182618.73	69.5	64500	
RTCM (RTCM input status)		BU4	B1D2	•	38169033.89	1	198756148.60	50.9	64500	
SERB (Subframe Data)		BZ3	BIDI	•	22577660.29		11/56///Z.Z/	-15.7	64500 C4500	
SERBY (Subfarma Data NG)		002	L1C	•	38208343.23	4	200787204.60	-355.4	64000 64500	
- SFRBA (Subframe Data NG)		002	110		33433777.44 27607642.21	1	207551714.05	-260.5	64500	
ch 0		809 B09	B1D1		3710049818	1	193192001 66	-200.5	64500	
ch 1		B25	B1D1		24942691 41	1	129883109.12	-1911.1	64500	
ch 2		B11	B1D1		24040404.79	1	125184677.38	-1136.8	64500	
ch 3		B16	B1D1		37546775.50	1	195515882.04	-1359.8	64500	
		B06	B1D1		37377124.80	1	194632464.44	-1276.5	64500	
cn 4		G21	L1C		24482548.12	1	128656655.36	1976.8	64500	
ch 5		B03	B1D2	•	38478428.73	2	200367252.79	56.9	64500	
ch 6		B10	B1D1	•	39150763.09	2	203868267.90	251.9	64500	
		B28	B1D1	•	24239701.34	1	126222456.17	2952.6	64500	
ch 8		B18	B1D1	•	38967575.09	- 2	202914365.16	360.0	64500	
		B07	B1D1	•	37403854.48]	194771648.69	158.1	64500	
		GU3	LIU	•	25/91148.3/		135533419.57	-1441.1	64500	
ch 10		B20	BIDI	•	25971305.40		135239385.19	-543.5	545UU 20C0	
ch 11		G 22	L1C		40373477.74	1	210230262.70	0.U 0100 A	2060	
		u25	L10	•	20773310.47		133471104.00	3102.4	64000	
SVSI (SV Status Info)										
H. SEC (Security)										
⊕. TIM (Timing)										
🖶 ·· UPD (Firmware Update Messages)										

後処理解析をする際は、 ・RAWX(観測データ) ・SFRBX(航法メッセージデータ) の2つがアクティブになっていることが極めて重要

もし左図のようにアクティブになっていない場合は、 RAWXとSFRBXをマウスオーバーし、右クリックをして Enable Messageを押す そうするとアクティブになる

移動·基準共通

設定したら(※重要)

🔞 COM8 - u-center 8.24			
File Edit View Player	Receiver Tools Window Help		
□ 🖬 🚅 + 🍜 🗟 🛥 + 👓 + 🌂 🎉	Port Baudrate	> Σ	■ ▼ ⊠ ▼ ■ ▼ ■ ▼ ■ ⊚ ⊚ ■ + → :
Messages - UBX - CFG	Location API Sensor API	>	
PMS (Power Ma PRT (Ports) PWR (Power)	Network connection NTRIP Server/Caster NTRIP Client	>	Time Source
RATE (Rates) RINV (Remote I RST (Reset) RXM (Receiver SBAS (SBAS Set SMGR (Sync Mi	Autobauding Debug Messages Generation Protocol Filter	>	Measurement Period 200 [ms] Measurement Frequency 5.00 [Hz] Navigation Rate 1 [cyc] Navigation Frequency 5.00 [Hz]
TMODE (Time N TMODE2 (Time TMODE3 (Time TP (Timepulse)	Action Differential GNSS Interface Epoch detection	>	Hotstart Warmstart Coldstart
TP5 (Timepulse TXSLOT (Tx Tim USB (Universal S ESF (External Senso	o) e Slots) Serial Bus) r Fusion) icon Bate)		Save Config Load Config Revert Config

Sendボタンを押した後は必ず Receiver→Action→Save Configも押す

NMEAの出力設定



NMEAの出力設定に関しては、基本的に必要 なものはGxGGAとGxRMCである(使用衛星の 情報が必要であれば、GxGSVも)。 他はいらないので、右クリックをして、Disable Messageを押す。 ※余計なものを出力しないことがデータ落ち の予防につながる。

⊡ · NMEA

- GxGBS (Satellite fault Detection)
- GxGGA (Global Positioning System Fix Data)
- GxGLL (Geographic Position Latitude/Longitude
- GxGNS (GNSS Fix Data)
- GxGRS (GNSS Range Residuals)
- GxGSA (GNSS DOP and Active Satellites)
- GxGST (GNSS Pseudorange Error Statistics)
- GxGSV (GNSS Satellites in View)
- 🖶 GxRMC (Recommended Minimum Specific GNSS
- GxTXT (Text Transmission)
- GXVLW (Dual Ground/Water Distance)
- GxZDA (Time & Date)
- PUBX
- 27777 /
- ????? (Unknown) ????? (Custom)
- ????? (Custom)

IMEA - GxGGA (Glob	al Positioning Syst	tem Fix Data)	1
Parameter	Value	Unit	Description
UTC	074239.00	hhmmss.sss	Universal time coordinated
Lat	3539.9910396	ddmm.mmmm	Latitude
Northing Indicator	N		N=North, S=South
Lon	13947.54334	dddmm.mmmm	Longitude
Easting Indicator	E		E=East, W=West
Status	1		0=Invalid, 1=2D/3D, 2=DGNSS,
SVs Used	12		Number of SVs used for Navigati
HDOP	0.63		Horizontal Dilution of Precision
Alt (MSL)	16.512	m	Altitude (above means sea level)
Unit	М		M=Meters
Geoid Sep.	39.449	m	Geoid Separation = Alt(HAE) - Alt
Unit	м		M=Meters
Age of DGNSS Corr		s	Age of Differential Corrections
DGNSS Ref Station			ID of DGNSS Reference Station



移動·基準共通

設定したら(※重要)

🔞 COM8 - u-center 8.24			
File Edit View Player	Receiver Tools Window Help		
□ 🖬 🚅 + 🍜 🗟 🛥 + 👓 + 🌂 🎉	Port Baudrate	> Σ	■ ▼ ⊠ ▼ ■ ▼ ■ ▼ ■ ◎ ◎ ■ + → :
Messages - UBX - CFG	Location API Sensor API	>	
PMS (Power Ma PRT (Ports) PWR (Power)	Network connection NTRIP Server/Caster NTRIP Client	>	Time Source
RATE (Rates) RINV (Remote I RST (Reset) RXM (Receiver SBAS (SBAS Set SMGR (Sync Mi	Autobauding Debug Messages Generation Protocol Filter	>	Measurement Period 200 [ms] Measurement Frequency 5.00 [Hz] Navigation Rate 1 [cyc] Navigation Frequency 5.00 [Hz]
TMODE (Time N TMODE2 (Time TMODE3 (Time TP (Timepulse)	Action Differential GNSS Interface Epoch detection	>	Hotstart Warmstart Coldstart
TP5 (Timepulse TXSLOT (Tx Tim USB (Universal S ESF (External Senso	o) e Slots) Serial Bus) r Fusion) icon Bate)		Save Config Load Config Revert Config

Sendボタンを押した後は必ず Receiver→Action→Save Configも押す

補足(割と重要): M8P、F9P等を使用した精密な測量レベルの位置が必要な場合

COM8 - u-center 18.11 - [Messages - UBX - CFG (Config) - NMEA (NMEA Protocol)] File Edit View Player Receiver Tools Window Help 🗅 🔲 🖆 🚽 🗇 🖪 👗 🖉 🖷 📳 🧭 === ▼ MU ▼ | 🏹 🌋 📥 | | | | 🔶 | 4| | ▶ ▶ ▼ | ▶ | ⊬ | Ŀ 📙 🕼 🕻с 👫 🏰 🏟 🏘 🏟 ` 🛗 🔛 🖸 🗉 👻 🔀 🕶 🏧 ????? (Unknown) UBX - CFG (Config) - NMEA (NMEA Protocol) ????? (Custom) . ∎ • RTCM3 CFG-NMEA-DATA2 -- Filters - ACK (Acknowledge) Permit position output for failed and invalid fixes GNSS to filter out: GPS AID (GPS Aiding) Permit position output for invalid fixes - CFG (Config) I SBA Permit time output for invalid times - ANT (Antenna Settings) 🔲 QZS Permit date output for invalid dates BATCH (Batch mode output) GLC GLC - CFG (Configuration) Restrict output to GPS SVs only 🔲 Beil DAT (Datum) Permit COG output even if COG frozen DGNSS (Differential GNSS configuration) DOSC (Disciplined Oscillator) NMEA Version 4.0 Ŧ EKF (EKF Settings) Numbering used for SVs not supported by NMEA ESFGWT (Gyro+Wheeltick) Max SVs per 0 - Standard Ŧ Talker Id ESRC (External Source Config) Main Talker ID 0 - Syst FXN (Fix Now Mode) Mode Flags GSV Talker ID 0 - GNS GEOFENCE (Geofence Config) ✓ High precision mode Compatibility mode GNSS (GNSS Config) BeiDou Talker ID GB Consider mode --- HNR (High Nav Rate) Remember to set the NME ... INF (Inf Messages) Strict limit 82 chars max ID in Tools->Preferences | ... ITFM (Jamming/Interference Monitor) . LOGFILTER (Log Settings) MSG (Messages) NAV5 (Navigation 5) NAVX5 (Navigation Expert 5) NMEA (NMEA Protocol) ODO (Odometer/Low-Speed COG filter) PM (Power Management) PM2 (Extended Power Management)

PMS (Power Management Setup)

PRT (Ports)

High precision modeに√を入れてSendボタン をクリックすることで、GxGGAやGxRMCの Lat/Lon/Hgtの小数点以下が細かくなる。 割と重要

```
常に✓を入れておくことが推奨
```

設定したら(※重要)



を押す

Sendボタンを押した後は必ず Receiver→Action→Save Configも押す

基準局設定

UBXのCFGでRTCMの設定

CONTRIP cli

) 🖬 🖆 🖌 🌆 🔂 ½ 🖻 💼 😹								
∞ + Ⅲ + 汽 滞 共 ▲ ■ Ⅱ	• • •	▶ • ₩ ₩ <u> </u>			→			
H 🕼 🕼 🗱 🎥 🗳 🏕 🕴 🖀 🏙		Σ 🔲 🕶 🔀 🕶 🏧	- 🖬 - 🗖	I 🚳 🔯 🔳		* X (
PWR (Power)	UBX - CFG (Co	nfig) - VALSET (New Conf	iguration)					
REMFS (Remote FS Config)	Compose list	entry			_ Details —			
	Crew				Title	Use Assist	Now Autonom	ous
RXM (Receiver Manager)	Group	JUFG-ANA	•					
SBAS (SBAS Settings)	Key name	CFG-ANA-USE_ANA		•	Descriptio	n		
SLAS (SLAS settings)	KoulD	10220001			Tupe: 1			
SMGR (Sync Manager Config)	ReyID	10230001		Add to List	туре. с			
	- Configuration	changes to send						
TMODE2 (Time Mode 2)	Keu			KeulD	Tune Va	ue		
TMODE3 (Time Mode 3)	i i i i i i i i i i i i i i i i i i i			Roy ID	1990 10			
TP (Timepulse)								
TP5 (Timepulse 5)								
TXSLOT (Tx Time Slots)								
USB (Universal Serial Bus)								
USBTEST (Universal Serial Bus Test)								
VALDEL (New Configuration)								
VALSET (New Configuration)								
ESF (External Sensor Fusion)								
🖶 HNR (High Navigation Rate)								
INF (Information)								
🗄 LOG (Data Logger)	-Value							
. MGA (Multiple GNSS Assistance)								
• MON (Monitor)								
🖶 NAV (Navigation)								
🖶 RXM (Receiver Manager)								Read
🖶 SEC (Security)								- Hicau
TIM (Timing)								
🕂 UPD (Firmware Update Messages)	Layers	Elash 🗆 BBB 🔽	BAM				I ransaction	
??-?? (Unknown)	· · · · ·		000				No transactio	n
??-?? (Custom)								
UNKNOWN								
CUSTOM								

Ready

UBX-CFG-VALSETに行く

こちらの項目で各種設定をする

基準局設定

CFG-MSGOUTを選択する

UBX - CFG (Config) - VALSET (New Configuration)

Compose list	entry		
Group	CFG-MSGOUT	-	
Key name	CFG-I2CINPROT CFG-I2COUTPROT CFG-INEMSG	^	30_USB 👤
Key ID	CFG-IDFM CFG-LOGFILTER		Add to List
C C			
	CEG.NAV/HPG		
Keu	CEG.NAVSPG		Key ID
	CEG-NMEA		
	CFG-ODO		
	CFG-PM		
	CFG-QZSS		
	CFG-BATE		
	CEG-BINV		
	CFG-BXM		
	CFG-SBAS		
	CFG-SFCORE		
	CFG-SIGNAL		
	CFG-SPI		
	CEG-SPIINPBOT		
	CFG-SPIOUTPBOT		
	CFG-TMODE		
	CFG-TP		
	CFG-TXREADY		
	CFG-UART1		
_ Value — —	CFG-UART1INPROT		
	CFG-UART10UTPROT		
	CFG-UART2		
1	CFG-UART2INPROT		
	CFG-UART2OUTPROT		
	CFG-UNITTEST		
	CFG-USB		
	CFG-USBINPROT		
	CFG-USBOUTPROT	\sim	

以下のMSM7のRTCMのフォーマットをKey nameか ら一つ一つ選択し、Add to Listをクリックしてリスト にいれる

• PT (Production Test)

MON (Monitor) NAV (Navigation) RXM (Receiver Manager)

PT (Production Test)		(Config) - VALSET (New	Configuration)					
PT2 (Multi-GNSS Production Test)		(coning) · VALSET (New	coninguration)					
PWR (Power)		list suture			Datai	-		
RATE (Rates)		list entry				s – I	Output sale of the DTCM 25	
REMFS (Remote FS Config)	Group	CEG-MSGOUT	•		Inde		output rate or the HTUM-3A	-TTPETZ3U
RINV (Remote Inventory)								
RST (Reset)	Key nam	e CFG-MSGOUT-RTC	M_3X_TYPE12	30_USB 💌	Desc	ription		
RXM (Receiver Manager)								
SBAS (SBAS Settings)	KeyID	20910306		Add to List	Туре	:U1		
SLAS (SLAS settings)								
SMGR (Sync Manager Config)	Configura	tion changes to send					-	
SPT (Sensor Production Test Config)	Key			Key ID	Туре	Value		
TMODE (Time Mode)	CFG-MS	GOUT-RTCM_3X_TYPE	1005_USB	0x209102c0	U1			
TMODE2 (Time Mode 2)	CFG-MS	GOUT-RTCM_3X_TYPE	1077_USB	0x209102cf	U1			
TMODE3 (Time Mode 3)	CEG-MS	GOUT-RICM_3X_TYPE	1087_058 1097_USB	0x209102d4	111	•		
TP (Timepulse)	CFG-MS	GOUT-RTCM_3X_TYPE	1127_USB	0x209102d9	U1			
TP5 (Timepulse 5)	CFG-MS	GOUT-RTCM_3X_TYPE	1230_USB	0x20910306	U1	-		
TXSLOT (Tx Time Slots)								
USB (Universal Serial Bus)								
USBTEST (Universal Serial Bus Test)								
VALDEL (New Configuration)								
VALSET (New Configuration)								F
ESF (External Sensor Fusion)								
HNR (High Navigation Rate)	Value-							
INF (Information)								
🗈 LOG (Data Logger)								
MGA (Multiple GNSS Assistance)								
• MON (Monitor)								
• NAV (Navigation)								Read rec
E PVM (Pessiver Manager)								



CFG-TMODEを選択する

UBX - CFG (Config) - VALSET (New Configuration)

Compose list	entry		
Group	CFG-TMODE	•	
Key name	CFG-12CINPROT CFG-12COUTPROT CFG-INFMSG	^	•
Key ID	CFG-ITFM CFG-LOGFILTER CFG-MOT		Add to List
Configuration	CFG-MSGOUT CFG-NAVHPG		
Key	CFG-NAVSPG		Key ID
CFG-MSGO	CFG-NMEA		0x209102c0
CFG-MSGO	CFG-ODO		0x209102cf
CFG-MSGO			0x209102d4
CFG-MSGO			0x2091031b
CFG-MSGO	CEG-BINV		0x209102d9
CFG-MSGO	CFG-RXM		0x20910306
	CFG-SBAS		
	CFG-SFCORE		
	CFG-SIGNAL		
	CFG-SPI		
	CEG-TP		
	CFG-TXREADY		
	CFG-UART1		
_ Value — —	CFG-UART1INPROT		
	CFG-UART10UTPROT		
	CFG-UART2		
	CFG-USB		
	CFG-USBINPBOT		
	CFG-USBOUTPROT	\checkmark	

以下の項目をKey nameから一つ一つ選択し、 Add to Listをクリックしてリストにいれる

Compose list entry		Detail	s	
Group CFG-TMODE]	Title	Receiver mode	
Key name CFG-TMODE-MODE	-	Desc	ription	
Key ID 20030001	Add to List	Туре	: E1	
Configuration changes to send				
Кеу	Key ID	Туре	Value	
CFG-MSGOUT-RTCM 3X TYPE1087 USB	0x209102d4	U1	1 0x1	
CFG-MSGOUT-RTCM_3X_TYPE1097_USB	0x2091031b	U1	1 0x1	
CFG-MSGOUT-RTCM_3X_TYPE1127_USB	0x209102d9	U1	1 0x1	
CFG-MSGOUT-RTCM 3X TYPE1230 USB	0x20910306	U1	1 0x1	
CFG-TMODE-MODE	0x20030001	E1	-	
CFG-TMODE-POS_TYPE	0x20030002	E1	-	
CFG-TMODE-FIXED_POS_ACC	0x4003000f	U4	 mm_scaled 0.1 	
CFG-TMODE-LAT	0x40030009	14	 deg scaled 1e-7 	
CFG-TMODE-LON	0x4003000a	14	 deg scaled 1e-7 	
CFG-TMODE-HEIGHT	0x4003000b	14	• cm	
CFG-TMODE-LAT_HP	0x2003000c	11	- deg scaled 1e-9	
	I AVADDADDDA	11	P.ef belens neb	



緯度経度楕円体高の精密位置に関しては、後処理のRTKもしくはVRSの平均値でよい

CFG-TMODEで新たにリストにいれた項目に関しては以下のように設定する

UBX - CFG (Config) - VALSET (New Configuration)					UBX - CFG (0	Config) - VALSET (New Configuration)				
Compose list entry Group CFG-TMODE Key name CFG-TMODE-MODE Key ID 20030001	▼ Add to List	Details Title Descriptior Type: E1	Receiver mode		– Compose li Group Key name Key ID	st entry CFG-TMODE CFG-TMODE-POS_TYPE 20030002	▼ Add to List	Detai Title Desc Type	Is Determines wheth ECEF or LAT/LO1 cription x E1	ier the ARP position is 1/HEIGHT?
Configuration changes to send					Configuratio	on changes to send				
Key CFG-MSGOUT-RTCM_3X_TYPE1087_USB CFG-MSGOUT-RTCM_3X_TYPE1097_USB CFG-MSGOUT-RTCM_3X_TYPE1127_USB CFG-MSGOUT-RTCM_3X_TYPE1127_USB CFG-MSGOUT-RTCM_3X_TYPE1127_USB CFG-MSGOUT-RTCM_3X_TYPE1127_USB CFG-MSGOUT-RTCM_3X_TYPE1230_USB CFG-TMODE-MODE CFG-TMODE-HOS_TYPE CFG-TMODE-FIXED_POS_ACC CFG-TMODE-LAT CFG-TMODE-LON CFG-TMODE-LAT_HP CFG-TMODE-LON_HP CFG-TMODE-LON_HP CFG-TMODE-LON_HP	Key ID 0x209102d4 0x2091031b 0x209102d9 0x20910306 0x20030001 0x20030002 0x4003000f 0x4003000b 0x2003000c 0x4003000b 0x2003000c 0x2003000c 0x2003000c 0x2003000c 0x2003000c 0x2003000c	Type Val U1 1 E1 - U4 - I4 - I1 - I1 -	ue x1 x1 x1 x1 deg scaled 0.1 deg scaled 1e-7 deg scaled 1e-7 cm deg scaled 1e-9 deg scaled 1e-9 mm scaled 0.1		Key CFG-MSG CFG-MSG CFG-MSG CFG-TMC CFG-TMC CFG-TMC CFG-TMC CFG-TMC CFG-TMC CFG-TMC CFG-TMC CFG-TMC	OUT-RTCM_3X_TYPE1087_USB OUT-RTCM_3X_TYPE1097_USB OUT-RTCM_3X_TYPE1127_USB OUT-RTCM_3X_TYPE1230_USB DE-MODE DE-POS_TYPE DE-FIXED_POS_ACC DE-LAT DE-LAT DE-LON DE-HEIGHT DE-LAT_HP DE-LON_HP DE-HEIGHT_HP	Key ID 0x209102d4 0x2091031b 0x209102d9 0x20910306 0x20030001 0x20030002 0x40030006 0x4003000b 0x2003000c 0x4003000b 0x2003000c 0x2003000c 0x2003000c 0x2003000c 0x2003000c 0x2003000c 0x2003000c	Type U1 U1 U1 E1 E1 U4 I4 I4 I4 I1 I1 I1	Value 1 0x1 1 0x1 1 0x1 1 0x1 1 0x1 2 -FIXED mm scaled 0.1 - deg scaled 1e-7 - deg scaled 1e-7 - cm - deg scaled 1e-9 - deg scaled 1e-9 - deg scaled 1e-9 - mm scaled 0.1	
Value Value 0 - Disabled 0 - Disabled 1 - Survey In 2 - Fixed Mode (true ARP position information	▼ required			Read	-Value 0 - Po 0 - Po 1 - Po	osition is ECEF osition is ECEF osition is Lat/Lon/Height	•			Read re

緯度経度楕円体高の精密位置に関しては、後処理のRTKもしくはVRSの平均値でよい

CFG-TMODEで新たにリストにいれた項目に関しては以下のように設定する

UBX - CFG (Config) - VALSET (New Configuration)		UBX - CFG (Config) - VALSET (New Configuration)		
Compose list entry Group CFG-TMODE	Title Fixed position 3D accuracy	Compose list entry Group CFG-TMODE	Details	Latitude of the ARP position.
Key name CFG-TMODE-FIXED_POS_ACC Key ID 4003000F Add to List	Description Type: U4	Key name CFG-TMODE-LAT Key ID 40030009	Descriptio to List Type: 14	on This will only be used if CFG-TMODE- MODE=FIXED and CFG-TMODE- POS_TYPE=LLH.
Configuration changes to send		Configuration changes to send		
Key Key ID CFG-MSGOUT-RTCM_3X_TYPE1087_USB 0x209102d4 CFG-MSGOUT-RTCM_3X_TYPE1097_USB 0x2091031b CFG-MSGOUT-RTCM_3X_TYPE1127_USB 0x209102d9 CFG-MSGOUT-RTCM_3X_TYPE1230_USB 0x20910306 CFG-MSGOUT-RTCM_3X_TYPE1230_USB 0x20910306 CFG-TMODE-MODE 0x20030001 CFG-TMODE-POS_TYPE 0x20030002 CFG-TMODE-IXED_POS_ACC 0x40030009 CFG-TMODE-LAT 0x4003000a CFG-TMODE-LON 0x4003000b CFG-TMODE-LAT_HP 0x2003000c CFG-TMODE-LAT_HP 0x2003000c CFG-TMODE-LON_HP 0x2003000c CFG-TMODE-LON_HP 0x2003000c CFG-TMODE-LON_HP 0x2003000c	Type Value Image: Constraint of the system Image: Constresystem Image: Constraint of the syst	KeyKey IDCFG-MSGOUT-RTCM_3X_TYPE1087_USB0x2091CFG-MSGOUT-RTCM_3X_TYPE1097_USB0x2091CFG-MSGOUT-RTCM_3X_TYPE1127_USB0x2091CFG-MSGOUT-RTCM_3X_TYPE1230_USB0x2091CFG-TMODE-MODE0x2003CFG-TMODE-POS_TYPE0x2003CFG-TMODE-FIXED POS ACC0x4003CFG-TMODE-LAT0x4003CFG-TMODE-LAT0x4003CFG-TMODE-LAT_HP0x2003CFG-TMODE-LON_HP0x2003CFG-TMODE-LON_HP0x2003CFG-TMODE-HEIGHT_HP0x2003CFG-TMODE-HEIGHT_HP0x2003	Type Va J2d4 U1 1 J31b U1 1 J2d9 U1 1 J2d9 U1 1 J306 U1 1 J0001 E1 2 D002 E1 1 D006 U4 10 D000a I4 3 O00a I4 - O00b I4 - O00c I1 - O00d I1 -	alue Ox1 Ox1 Ox1 Ox1 Ox1 Ox1 Ox1 FIXED LLH O Oxa mm scaled 0.1 56663420 Ox1542407c deg scaled deg scaled 1e-7 cm deg scaled 1e-9 mm scaled 0.1 Remove Remov
Value 100		Value 356663420 unit deg. gazled 16.7 (古平の)		Value hex 1542407c EINITE 7 +/=) Bead receiver
unit mm scaled 0.1 mm/よりノ C、 C	Iよ100Cし/こ Head receiver	1111111111111111111111111111111111111	長(小数) と、35666	品以下/117

CFG-TMODEで新たにリストにいれた項目に関しては以下のように設定する

UBX - CFG (Config) - VALSET (New Configuration)

- Compose list	t entry			Details	
Group	CFG-TMODE	•		Title	Longitude of the ARP position.
Key name	CFG-TMODE-LON		•	Description	This will only be used if CFG-TMODE- MODE=EIXED and CEG-TMODE-
Key ID	4003000A		Add to List	Type: 14	POS_TYPE=LLH.

Configuration changes to send

Key	Key ID	Туре	Value	^
CFG-MSGOUT-RTCM_3X_TYPE1087_USB	0x209102d4	U1	1 0x1	
CFG-MSGOUT-RTCM_3X_TYPE1097_USB	0x2091031b	U1	1 0x1	1.00
CFG-MSGOUT-RTCM_3X_TYPE1127_USB	0x209102d9	U1	1 0x1	
CFG-MSGOUT-RTCM_3X_TYPE1230_USB	0x20910306	U1	1 0x1	
CFG-TMODE-MODE	0x20030001	E1	2 - FIXED	
CFG-TMODE-POS_TYPE	0x20030002	E1	1 - LLH	
CFG-TMODE-FIXED_POS_ACC	0x4003000f	U4	10 Oxa mm scaled 0.1	
CFG-TMODE-LAT	0x40030009	14	356663420 0x1542407c deg scal	ed
CFG-TMODE-LON	0x4003000a	14	1397922104 0x53529938 dea sca	ale
CFG-TMODE-HEIGHT	0x4003000b	14	- cm	
CFG-TMODE-LAT_HP	0x2003000c	11	 deg scaled 1e-9 	
CFG-TMODE-LON_HP	0x2003000d	11	 deg scaled 1e-9 	
CFG-TMODE-HEIGHT_HP	0x2003000e	11	 mm_scaled 0.1 	\sim
<				>

-Value

	Value hex	
1397922104	53529938	
unit deg scaled 1e-7		Read receiver

精密位置の経度(小数点以下7桁) 139.7922104だと、1397922104

UBX - CFG (Config) - VALSET (New Configuration)

Compose list entry		Detail: Title	s Height of the ARP pos	sition.	
Group CFG-TMODE	•		ļ		
Key name CFG-TMODE-HEIGHT	•	Desc	ription This will only be used MODE=FIXED and CF	if CFG-TMOD G-TMODE-	E-
Key ID 4003000B	Add to List	Туре:	: 14 PUS_TYPE=LLH.		
- Configuration changes to send					
Key	Key ID	Туре	Value	^	
CEG-MSGOUT-BTCM 3X TYPE1087 USB	0x209102d4	U1	1 0x1		
CFG-MSGOUT-RTCM 3X TYPE1097 USB	0x2091031b	U1	1 0x1	_	
CFG-MSGOUT-RTCM 3X TYPE1127 USB	0x209102d9	U1	1 0x1		
CFG-MSGOUT-RTCM 3X TYPE1230 USB	0x20910306	U1	1 0x1		
CFG-TMODE-MODE	0x20030001	E1	2 - FIXED		
CFG-TMODE-POS_TYPE	0x20030002	E1	1 - LLH		
CFG-TMODE-FIXED_POS_ACC	0x4003000f	U4	10 Oxa mm scaled 0.1		
CFG-TMODE-LAT	0x40030009	14	356663420 0x1542407c de	g scaled	
CFG-TMODE-LON	0x4003000a	14	1397922104 0x53529938 d	eg scale	
CFG-TMODE-HEIGHT	0x4003000b	14	59 0x3b cm		Remov
CFG-TMODE-LAT_HP	0x2003000c	11	 deg scaled 1e-9 		Tremov
CFG-TMODE-LON_HP	0x2003000d	11	 deg scaled 1e-9 		
CFG-TMODE-HEIGHT_HP	0x2003000e	11	 mm_scaled 0.1 	~	Pomor
<				>	hemov
Value					
5976			Value hex		
59.76			Зb		
unit cm				Rea	d receiver

精密位置の楕円体高(小数点以下2桁) 59.76だと5976

CFG-TMODEで新たにリストにいれた項目に関しては以下のように設定する

ompose list entry		_ Detail	s			
Group CFG-TMODE	Title		High-precision height of the AP	}P po	sition.	
Key name CFG-TMODE-HEIGHT_HP	name CFG-TMODE-HEIGHT_HP		ription	n Accepted range is -99 to +99.		ill only be and CFG
Key ID 2003000E	Add to List	Type: 11		TMODE-POS_TYPE=LLH.		
onfiguration changes to send						
Key	Key ID	Туре	Value	•	~	
CFG-MSGOUT-RTCM 3X TYPE1087 USB	0x209102d4	U1	1 0x	1		
CFG-MSGOUT-RTCM 3X TYPE1097 USB	0x2091031b	U1	1 0x	1		
CFG-MSGOUT-RTCM_3X_TYPE1127_USB	0x209102d9	U1	1 0x	1		
CFG-MSGOUT-RTCM_3X_TYPE1230_USB	0x20910306	U1	1 0x	1		
CFG-TMODE-MODE	0x20030001	E1	2 · F	IXED		
CFG-TMODE-POS_TYPE	0x20030002	E1	1 - L	LH		
CFG-TMODE-FIXED_POS_ACC	0x4003000f	U4	10 0	xa mm scaled 0.1		
CFG-TMODE-LAT	0x40030009	14	3566	63420 0x7c deg scaled 1e-7		
CFG-TMODE-LON	0x4003000a	14	1397	922104 0x38 deg scaled 1e-7		
CFG-TMODE-HEIGHT	0x4003000b	14	59 0	x3b cm		Deres
CFG-TMODE-LAT_HP	0x2003000c	1	0 0xl	D deg scaled 1e-9		Remov
CFG-TMODE-LON_HP	0x2003000d	11	0 0xl	D deg scaled 1e-9		
CFG-TMODE-HEIGHT_HP	0x2003000e	11	0 0xl	0 mm scaled 0.1	\sim	
c				>		Hemov
alue						
				Value hex		
0			-	0		

High precision modeである細かい 設定の CFG-TMODE-LAT_HP CFG-TMODE-LON_HP CFG-TMODE-HEIGHT_HP に関してはイマイチ不明

とりあえず0で大丈夫そう

COM15 - u-center 19.01 - [Messages - UBX - NAV (Navigation) - PVT (Navigation PVT Solution)]

P File Edit View Player Receiver Tools Window Help

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INF (Information)	UBX - NAV (Navigation) - PVT (Navigation PVT Solut	ion)	6 s
⊞. LOG (Data Logger)			
MGA (Multiple GNSS Assistance)	Param	Value	Unite
⊞. MON (Monitor)	GPS Time Tag	198848 000	[9]
🖻 NAV (Navigation)	UTC Date and Time	26/ 2/ 2019 07:13:50 -000268842	[0]
AOPSTATUS (AssistNow Autc	UTC Date and Time Confirmation Status	Date: CONFIRMED, Time: CONFIRM	
ATT (Attitude Solution)	UTC Time Accuracy Resilien Fin Tupe	3 TIME	[ns]
CLOCK (Clock Status)	Fix Flags	FixOK	
COV (Covariance Matrices)	PSM state	n/a	
DGPS (DGPS Data)	Position Latitude, Longitude, Height, MSL Regition Acquirage Estimate Mariagnal Vertical	35.6663420, 139.7922104, 0.6, -38.9	[deg,deg,m,m] [m m]
DOP (Dilution of Precision)	Velocity North East Down	0.0, 0.0	[m,m] [m/s m/s m/s]
EELL (Position Error Ellipse)	Velocity, Heading Accuracy Estimate	20.000, 72.7	[m/s,deg]
EKFSTATUS (Status)	Speed over Ground	0.000	[m/s]
EOE (End Of Epoch)	Heading of Motion, Heading of Vehicle Magnetic Declination, Declination Accuracy Estim	U.U, n/a n/a n/a	(deg,deg) (deg.deg)
GEOFENCE (Geofencing statu	PDOP	99.99	[669,869]
HNR (High Navigation Rate)	#SVs Used	31	
HPPOSECEF (High Precision)	Carrier Range Status	Not used	
- HPPOSLLH (High Precision G			
ODO (Odometer)			
DOSECTE (Desition ECEE)			
POSELLU (Conduction ECEF)			
DVT (Navination DVT Solution)			
PELDOSN Poll Message			
PESETODI Enable Message			
SAT (Sate			
SBAS (SBAS) JISABLE Message			
SOL (Navigation Solution)			
SVIN (Survey-in)			
SVINFO (SV Information)			
TIMEBDS (BDS Time)			
TIMEGAL (Galileo Time)			
- TIMEGLO (GLO Time)			
TIMEGPS (GPS Time)			

UBX-NAV-PVTを右クリックし、Enable Messageをクリックする

右に表示されているFix Modeが3D から「TIME」になるとOK

基準局設定

設定したら(※重要)

🔞 COM8 - u-center 8.24			
File Edit View Player	Receiver Tools Window Help		
: □ ■ ≥ +	Port > Baudrate >		
Messages - UBX - CFG	Location API Sensor API	>	
PM2 (Extended PMS (Power M	Network connection	>	UBX - CFG (Config) - RATE (Rates)
PRT (Ports) PWR (Power) RATE (Rates)	NTRIP Server/Caster NTRIP Client		Time Source 1 - GPS time Measurement Period 200 [ms]
RINV (Remote I RST (Reset)	Autobauding Debug Messages		Measurement Frequency 5.00 [Hz]
SBAS (SBAS Set	Generation Protocol Filter	> >	Navigation Frequency 5.00 [Hz]
TMODE (Time M TMODE2 (Time	Action Differential GNSS Interface	>	Hotstart Warmstart
TP (Timepulse)	Epoch detection		Coldstart
	ne Slots) Serial Bus)		Save Config Load Config
ESF (External Sense	pr Fusion)		Revert Config

全部終わったら必ずReceiver→Action→Save Configを押す

RTKのやり方(VRSもしくはRTCM受信方式)

NTRIP client settings

Pu-center 19.01		
File Edit View Player	Receiver Tools Window Help	
🗅 日 🖻 🗕 🙆	Connection	>
ate v nnr v 😵 🎬	Baudrate	
	NTRIP Server/Caster	
ith tw to 路 牌 像	NTRIP Client	• 🖾 • 🖾 • 🕅 • 🖬 🔞
	Autobaudian	
	Autobauding	
	Debug Messages	
	Generation	>
	Protocol Filter	>
	Action	>
	Differential GNSS Interface	
	Epoch detection	

ReceiverにあるNTRIP Clientをクリックし、NTRIP client settingsを設定する(IPやマウントポイントなど) ここに関しては各自契約していたり、利用可能である サーバーの情報を打ち込む ※日本テラサットのVRSだと右のような設定になる (Usernameはかくしてあります)

-NTRIP caster settin	gs
Address:	ntrip.terasat.co.jp
Port:	5001
Username:	
Password:	*******
NTRIP stream	
	Update source table 🔀 Request Interval (sec)
NTRIP mount poin	t: VRS_RTCM3(GNSS) Mount point details
Use manual po	sition
Longitude (deg):	0
Latitude (deg):	0
Altitude (m):	0
Geoid sep. (m):	0

移動局設定

Х

上記の情報を埋め、「OK」をクリックすると、Fix modeの部分 が3D/DGNSS/FIXEDとなりため、RTK測位の状態になる (データ取得方法は次のスライドから) ※RTKしていない状態だと、NMEAは単独測位の結果となる

移動·基準共通

測位の始め方



移動·基準共通

測位の終わり方



測位を終える際は、同様に「Stop」ボタンをクリックする 保存先にファイル生成される(もしくはスタートと同時に表示される)

Untitled_190310...



以下の項目ではNTRIPサーバーの情報が出てきますが、 各自でNTRIPサーバーを契約してそちらのアドレスを利 用してください

STRSVRでNTRIPへRAWやRTCMをアップロード(基準局)

C:¥Users¥***¥test

Swap Intv

✓ TimeTag

バージョンは2.4.3 b31以降



※u-centerの設定が終わり、STRSVRを使用する際に はu-centerを必ず閉じる 同一のポートを使用している以上u-centerとSTRSVR は同時に動作させることができない

	Serial Option	5					×	
	Port Bitrate (bps) Byte Size	COM** 115200 8 bits eccived Str	✓ ✓ eam to	Parity Stop Bits Flow Contr TCP Port	No 1 No	one bit one	>	シリアル通 信の情報
				ОК		Cancel		
	NTRIP Server	Options					X	
	NTRIP Caster	Host		P	ort			
	*** *** **	**	_	~ 2	101			-
	Mountpoint	Use	r-ID	P	asswo	ord		アップロード
	ECJ**	~		•	••••	•••		先の情報
	String							
	Ntrip			ОК		Cancel		
File Option	s							×
Output File	Path							

....

Cancel

データを基準局用のPCのデスクトップにロギングしておく

2

✓ H

OK

STRSVRでNTRIPへRAWやNMEAをアップロード(移動局)



RTKPLOTを使用してモニタリング(観測局)

🧱 RTKPLC)T ver.2.4.3 b31		– 🗆 X					
File Edit	View Windows Help			Connection	n Settings	× NTRIP CI	ent Options	×
Open Open Open Open Open	Solution-1 Ctrl+S Solution-2 Ctrl+Alt+S Map Image Ctrl+N Sky Image Shapefile Waypoint			(1) NTRIP ((2) Time Fo	n Type Opt Cmd Solution Form Client V MMEA0183 V Lat/Lon/Height ormat Lat/Lon Format Fiel	A A A A A A A A A A A A A A A A A A A	ister Host int User-ID V gspase	Port 2101 Password
Open Open Open Visibili	Obs Data Ctrl+C Nav Data Ctrl+N Elev Mask) 1 		Timeout/Re	e-connect Intvl (ms) 0 100 OK Cance	el Ntri	р ОК	Cancel
Save In Save V Save # Save A	nage Ctrl+ Vaypoint of Sats/DOR Z/EL/SNR/MR				KTKPLOT ver.2.4.3 b31	ws Help		– – ×
Save E Conne Discor Conne Reloac	lev Mask ct Ctrl+1 anect Ctrl+E cction Settings d Ctrl+F		⊥m ⊢		Open Solution-1 Open Solution-2 Open Map Image Open Sky Image Open Shapefile	Ctrl+S Ctrl+Alt+S Ctrl+M		× ۵ \$
STRSVR ver.2.4.3 b31			• NTRIP Client Options	X	Open Waypoint Open Obs Data Open Nav Data	Ctrl+O Ctrl+N		
2019/02/26 06:36:2 Stream T (0) Input NTRIP	7 GPST Conner ype Opt Cmd Conv Client V	Bytes Bps	Minda Custer Hote *** *** ** Mountpoint User-ID	V 2101 Password	Open Elev Mask Visibility Analysis	Ctelul		
(1) Output File (2) Output (3) Output	···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ···· ····	0 0 0 0	String Ntrip O	K Cancel	Save Hinge Save Waypoint Save # of Sats/DOR Save AZ/EL/SNR/MR Save Elev Mask			
		. ?	NMEAデータを観	見測局用のPCの	Connect Disconnect Connection Settings	Ctrl+T Ctrl+D		1 m
► <u>S</u> tart	Cptions	E <u>x</u> it	デスクトップにロ	ギングしておく	Reload	Ctrl+R		+