

NetView User Manual

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1. Getting Started

NetView is a Windows application for easy configuration and status of JAVAD GNSS products. Before using *NetView*, use this manual to become familiar with its functions and learn how to install, launch, exit, and uninstall the program.

NetView software provides the following functionality:

1. GNSS Receivers

- Connections:
 - Serial, USB
 - TCP/IP (Ethernet port or Wi–Fi adapter)
 - Secure TCP/IP (SSL/TSL)
 - Bluetooth.
- Satellite display: total number and status of all visible and tracked satellites, skyplot, orientation plots.
- PVT display: real-time position, velocity, time and measurements.
- Reset GNSS: clear NVRAM, reset receiver, restore initial parameter values, reset RTK.
- Reports: general, parameters and options reports.
- Firmware Update: online from website or from a file.
- OAF: load from website or from an Option Authorization File.
- Configuration: by graphical user interface or by command line.
- Raw Data Files: Start / stop recording, delete files, downloading files.
- Terminal: send commands with prompt tips and view receiver's response.
- GNSS & Radio Spectra: collect data and display.
- Multiple Receiver Connections

2. Modems

- Internal Modem Configuration by Graphical User Interface or by command line.
- External Modem Configuration.
- Connect with Serial or USB.



3. Terminals

- Send commands to a device and see both command and response.
 - Serial, USB
 - TCP/IP (Ethernet ports or Wi-Fi adapter)
 Secure TCP/IP (SSL/TSL)

 - o Bluetooth



1.1 Setting up NetView

1.1.1 System Requirements

Check that you have the following required (or recommended) items before installing and using *NetView*.

Operation System Requirements:

Windows 10, Windows Server 2016, Windows Server 2012 (64–bit edition), Windows Server 2008 R2 SP1, Windows Server 2008 R2 SP1, Windows Server 2008 SP2.

Hardware Requirements:

- 1 GHz or faster processor
- 512 MB of RAM
- 850 MB of available hard disk space (x86)
- 2 GB hard drive (x64)



1.1.2 Installing NetView

Two methods of *NetView* installation are available from the JAVAD GNSS website.

To install an automatically updated version, download file setup.exe and launch it. The application will be downloaded from website and installed.

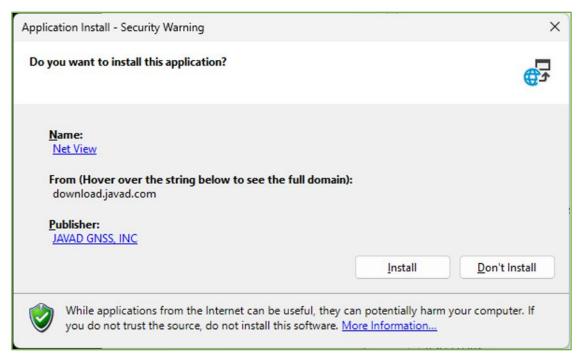


Figure 1. Installation with auto updating.

To install a version without automatically updating, download file *NetViewSetup_*.msi* and run it. Installation wizard will launch.



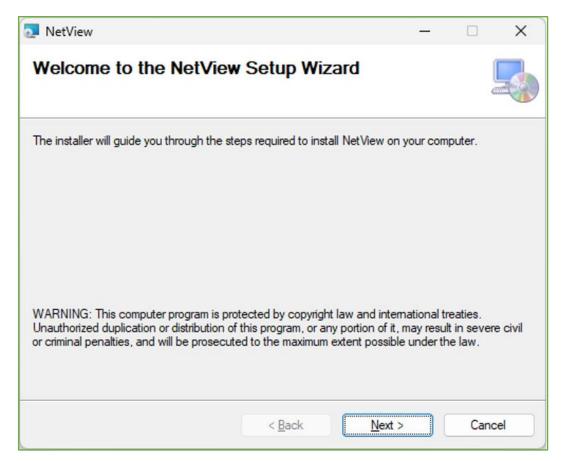


Figure 2. Installation without auto updating.

This installation method does not require an Internet connection. Both installations can operate simultaneously.

1.1.3 Uninstalling NetView

To uninstall NetView use *Start Menu* or *Settings > App & Features*. Find *NetView*, and click *Uninstall*. *NetView* will be uninstalled.



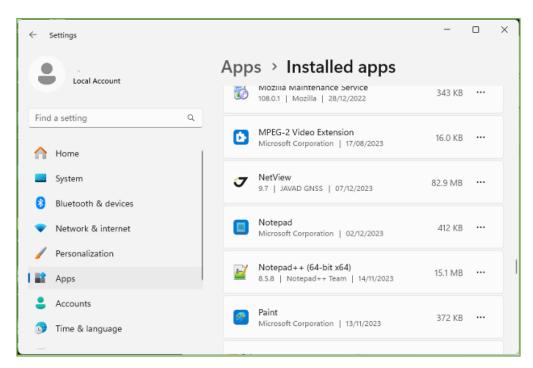
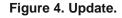


Figure 3. Uninstall.

1.1.4 Updating NetView

Automatically updated *NetView* installation checks updates after application closing. If a new version is available user will be prompted of updating when next start.

Update Available	×
Application update A new version of Net View is available. Do you want to download it now?	⊕ ^
Name: <u>Net View</u> From: download.javad.com	
<u>O</u> K	<u>S</u> kip





2. Getting Connected

2.1 Starting NetView

NetView can be launched, as any other Windows program, for example, with the *Start* > *All Programs* > *JAVAD GNSS* > *NetView*

Once *NetView* is launched, the *Main* window appears.

		- 🗆 X
	ect : 🜉 Receiver 🧼 Modem 🖸 Terminal	Help
. .	Connection Mode Receiver	0 🗴
Devices	тср	
Receiver 3	Address 192.168.10.61 • Port 8002 Logical Port Password AA0BCF2 TLS/SSL Raw	
• TRIUMPH3NR-00017	 TCP Connections • 192.168.10.61.8002 DELTA / S3D18526074CCS 	
• T TRIUMPH1MP-35020		
• 💺 SIGMA-03090 (OEM 4171696)		
Modem 1	COM4 115200 * TRIUMPH_3NR 00017 (,) C0EE40678A07 Bluetooth Receiver TRIUMPH_3NR	
• 🕡 HPT401BT - 00219	COM5 USB Serial Device (Microsoft) USB->SER	
Terminal 2	COM6 USB Serial Device (Microsoft) USB-SER Terminal	
 Serial: COM6 (USB->SER) 		
• 🖬 TCP 192.168.10.61:8002		
	X COM9 115200 r > Bluetooth	
	M COM11 115200 + Bluetooth M COM12 115200 + Bluetooth	
	COM12 115200 TRIUMPH3 00448 (931.) F460773F7CB4 Bluetooth Bluetooth	
	COMIT 115200 V P Bluetooth	
	COM25 115200 · TRIUMPH3 00452 (931.,) F460773F9540 Bluetooth	
	COM26 115200 • • • • • Bluetoath	
	COM27 115200 TRIUMPH_1MP 35020 (.) C0EE406C0A78 Bluetooth Receiver TRIUMPH_1MP	
	COM28 115200 * > Bluetooth	
	COM31 115200 GNSS Radio (US8 Serial) (JAVAD GNSS, INC) FTDI Modem	
	COM32 GNSS Receiver (USB CDC ACM) (JAVAD GNSS, INC) 0RXEVMSBYAKVL0QDSPVJA2QGHS USB->SER Receiver SIGMA	

Figure 5. Main Window.

It contains Connection Switcher, Connection Board, Devices pane and Help Menu.

• *Connection Mode Switcher* – Receiver, Modem and Terminal buttons accordingly switch connection mode.



- *Connection Board* Displays available communication interfaces and provides the ability to open a connection.
- Devices Pane Contains list of connected devices grouped by Receiver, Modem and Terminal.
- *Help Menu* Contains the links to *Drivers* page, Software *Manual and Application* page.

2.2 Connection Mode Switcher

Figure 6. Connection Mode Switcher.

- Receiver Button Enables the GNSS Mode. It means that connection is established using GREIS protocol and the graphical interface to control JAVAD GNSS Receiver is provided.
- *Modem Button* Enables the Radio Mode. The connection is established using the specific protocols and the graphic interface to control JAVAD GNSS Radio is provided. Radio mode allows only the serial communication interface.
- *Terminal Button* Enables the Terminal Mode. The connection is established as is and the panel for the communication is provided.



2.3 Connection Board

Conr	nection Mo	de Receiver						Refresh ports
тср								Disconnect all devices
*	Address	192.168.10.200	•	Port 8002	Logical Port	Passi	vord	a TLS/SSL Raw
тср	Connections	192.168.10.200:80	002 DELTA	_S-04450	DELTA_S	S361F	×	
	2.168.10.100:8	192.168.10.205:80	002 Tre_D	uo_lmu-494692	1 TRE_DUO_IM	U D369	×	
192	2.168.10.200.8	192.168.10.100:80	002 TRE_3	S-4981659	TRE_3S	\$3069	×	
192	2.168.10.205:8	192.168.10.203:80	002		DELTA_S	S341D	×	
CEDU		192.168.10.87:800	D2 TRE_C	UA-4235376	TRE_QUA	0K40Z	×	
	AL / USB->:	192.168.20.50:800	02 TRIUN	1PH3-00305	TRIUMPH3	H37E7	×	
*	COM3	115200 -	> Intel(R)	Active Manageme	nt Technology - SC	DL (Intel)		
•	COM4	115200 *	> TRIUN	/PH_3NR 00017	(.,) COEE40678A	07		Bluetooth Receiver TRIUMPH_3NR
*	COM5	USB Serial Device	(Microsoft)				USB->SER
•	COM6	USB Serial Device	(Microsoft)				USB->SER Terminal
*	COM7	115200 🔹	> TRIUM	1PH3 00451 (93	1,,) F460774158	F4		Bluetooth
*	COM8	115200 🔹	> TRIUM	ирн <mark>2 00051 (,,)</mark>	0018D7433196			Bluetooth
*	COM13	115200 🔹	> TRIUM	1PH3 00448 (93	1,,) F460773F7C	B4		Bluetooth
*	COM17	115200 🔭	>					Bluetooth
*	COM25	115200 *	> TRIUM	4PH3 00452 (93	1) F460773F95	40		Bluetooth
*	COM26	115200 💌	>					Bluetooth
•	COM27	115200 🔺	> TRIUN	4PH_1MP 35020	() COEE406C0/	A7B		Bluetooth Receiver TRIUMPH_1MP
*	COM28	115200 🔭	>					Bluetooth
•	COM31	115200 -	> GNSS R	adio (USB Serial) (JAVAD GNSS, INC)			FTDI Modem

Figure 7. Connection Board.

Connection board provides access to available communication interfaces.

- *TCP* Used to connect your computer and remote device. Disabled for the Modem mode.
- SERIAL / USB > SERIAL / BLUETOOTH Used to connect via serial or virtual serial ports.

In the upper right corner, there are:

- Refresh Button Refresh list of available interfaces.
- Disconnect Button Close all the opened connections and clear Devices pane.

Please see below the detailed description of each communication interface settings:



TCP Panel

TCP Panel allows establishing bidirectional connection to receiver which is configured as *TCP* server (see *C* [2, 4.4.6 *TCP* Server Configuration]) via LAN (local area network), *WLAN* (wireless LAN) or Internet.

ТСР	Connect					- -
Address	192.168.10.200	• Port 8002	Logical Port	Pass	word	a TLS/SSL Raw
 TCP Connection 	192.168.10.200:8002	DELTA_S-04450	DELTA_S	S361F	×	Remove from list
192.168.10.100	192 168 10 205 8002	Tre_Duo_Imu-4946921	TRE_DUO_IMU	D369	×	
• 192.168.10.200	192.168.10.100:8002	TRE_3S-4981659	TRE_3S	S3069	×	
• 192.168.10.205	192.168.10.203:8002		DELTA_S	S341D	×	
	192.168.10.87:8002	TRE_QUA-4235376	TRE_QUA	0K40Z	×	

Figure 8. TCP Connection panel.

The following fields should be filled.

- Address Host name or IP address of the receiver.
- *Port* TCP port of the receiver. This is the port on which the receiver listens for telnet–like connections. The receiver allows up to five simultaneous telnet–like connections.
- Logical Port One of the five logical port mapping (A, B, C, D, E). If the value is empty, then the connection is established with the first free logical port.
- *Password* An arbitrary sequence of characters. If the receiver is configured to bypass the login/password authentication you may simply leave this field blank.
- *TLS/SSL* Enables/disables the encrypting with cryptographic protocols that provide communications security over the Internet. This parameter should correspond with the receiver settings.
- *Raw* Connection without authorization. It is used to connect via serial adapters.

By clicking *Connect*, the connection establishes.



The successfully established connections are stored and can be selected from the drop–down next time.

The expandable list displays all connections with application startup time. The green circle marks alive connection, gray closed ones.

Default LAN Settings

The JAVAD GNSS receivers have the next factory LAN– settings:

IP 192.168.2.2

Mask 255.255.255.192

GW 192.168.2.1

The Receiver TCP Server default Configuration:

Port 8002

The password is seven symbols of the receiver ID ending with the penultimate (ex. 03B0RGGQNDYWZ1UDNV9W8X36HZ -> 9W8X36H)

тср				
Address 192.168.2.2	Port 8002 Logical Port	Password 9W8X36H	TLS/SSL	🗌 Raw
▲ ICP Connections				

Figure 9. First TCP Connection.

To connect the receiver with PC for the first time, the PC Ethernet Adapter must be configured as:

Receiver IP Address: 192.168.2.3 ("3" - can be any in range of 3-63)

Network mask: 255.255.255.192

Default Gateway: 192.168.2.1



Serial Panel

Bidirectional communication with the device connected to the computer via the RS–232(422), USB cable or Bluetooth is established using Serial or Virtual Serial port.

k.	COM3	115200	-	>	Intel(R) Active Management Technology - SOL (Intel)		
)	COM4		¥	>	TRIUMPH_3NR 00017 (,,) C0EE40678A07	Bluetooth	Receiver TRIUMPH_3NR
	COM5	USB Serial D	Device	(M	icrosoft)	USB->SER	
•	COM6	USB Serial D	Device	(M	icrosoft)	USB->SER	Terminal
	COM7 Connect		¥	>	TRIUMPH3 00451 (931.,) F460774158F4	Bluetooth	
	COM8	115200	¥	>	TRIUMPH2 00051 () 0018D7433196	Bluetooth	
k.	COM9		¥	>		Bluetooth	
	COM11		¥	>		Bluetooth	
k.	COM12		¥	>		Bluetooth	
k.	COM13		Y	>	TRIUMPH3 00448 (931,,) F460773F7CB4	Bluetooth	
	COM17		¥	>		Bluetooth	
L.	COM25		Ŧ	>	TRIUMPH3 00452 (931,,) F460773F9540	Bluetooth	
L.	COM26		¥	>		Bluetooth	
•	COM27		¥	>	TRIUMPH_1MP 35020 (,,) C0EE406C0A7B	Bluetooth	Receiver TRIUMPH_1MP
	COM28		¥	>		Bluetooth	
	COM31		¥	>	GNSS Radio (USB Serial) (JAVAD GNSS, INC)	FTDI	Modem

Figure 10. Serial Connection panel.

Serial panel provides the list of the existing Serial and Virtual Serial ports.

Information about connected device and driver are available for the virtual ports.

Set the following parameters for the physical serial and FTDI ports:

- Baud Rate Specifies how fast data is sent over a serial line. NetView may not work well on the lowest rates. The rates higher than 115200 speeds must be enabled in OAF.
- Advanced >Rts/Cts Transfer flow control parameter (request to send/ clear to send).
- *Connect* Establishes the selected connection.



The successfully established connections are marked by the green circle and are completed by the information about the device.

Virtual Serial Ports for the Bluetooth are created by the operating system automatically.

Before connecting a *USB* equipped JAVAD GNSS devices with PC *USB* port, make sure that the *USB Port* option enabled in the receiver and the JAVAD GNSS *USB* driver installed on the computer. The drivers are available on the JAVAD GNSS website update page **[**JAVAD GNSS update page**]**.

Installing Driver

The driver installation procedure varies slightly depending on the operating system used. In general, the installation procedure is as follows:

- 1. Visit the JAVAD GNSS website. Download the USB driver.
- 2. Unpack the archive into a separate, empty folder.
- 3. Run jgnssusb_x64L.exe or jgnssusb_x86L.exe depends on PC Operating System Type.
- 4. Connect the receiver to the computer through the supplied *USB* cable. Turn the receiver on.
- 5. Windows will automatically detect the new hardware device. Follow the onscreen instructions to finish installation process.

After Windows finishes installing the driver, you will be able to communicate the receiver connected with the computer via USB using virtual serial port.

Some receivers do not require a USB driver.



2.4 Devices Pane

After connecting successfully, the device is added to the corresponding group of *Devices* pane.

The Device item displays:

- Connection State green circle connected, gray disconnected.
- *Name By* default is created from the *Model* and *Identifier* of the receiver or modem. Double click to change. Name is stored and will be used next time.
- *Close Button* Disconnect from the device, close device page and remove the device from the list.

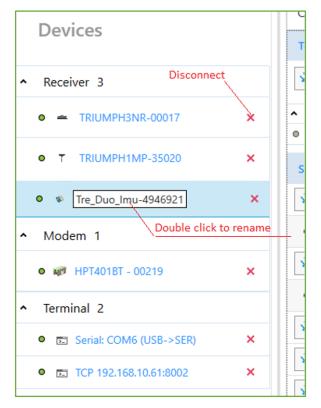


Figure 11. Devices pane.



Clicking on an item opens a device page in the right pane.

To disconnect from all the devices and clear *Devices* pane, click the *Disconnect* button on the *Connection Board*.

2.5 Closing NetView

To disconnect from the receiver, click the *Disconnect* button on the *Receiver* page or on the *Devices Pane*.

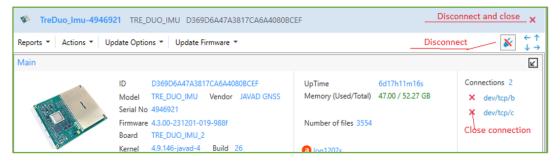


Figure 12. Disconnect and Close using the receiver page.

To disconnect from all the devices, click the *Disconnect* button on the *Connection Board*.

If the device has not been disconnected by the time the program is terminated, the connection will be automatically broken before *NetView* is closed.

If the receiver is in the file transferring mode or connection is captured by the Greis Commands terminal, the application cannot close the connection and the warning will be displayed.

Note: It is strongly recommended to close the connection with the device prior to switching the receiver off and disconnecting the cable.



3. GNSS Receiver

3.1 Operation

Connect to the receiver as described in *Getting Started*.

Click on the item in *Receivers* list on *Devices* pane. The *Receiver* page will appear.

Receiver page allows controlling the different aspects of receiver's functionality and will be detail described in the next chapters.

	🔹 Tre Duo Ir	nu 4946921 TRE I	NO IN	MU D369	D6A477	A3817CA	1A40801	ICEF											Disconnect and close		
evices	Reports - Actio	Reports * Actions * Update Options * Update Firmware *															Disconnect				
	Main																		Tiles position		
Receiver 3		ь ID	D3690	064474381	704644	OBORCEF		UpTin	10				6d1	7h17m25r				Conne	Connections 2		
		Model		UO_IMU	Vendo	r JAWAD	GNSS	Memo	Memory (Uked/Total) 47.00 / 52.27 GB									×	dev/tcp/b 🗙 dev/tcp/c		
🕸 TreDuo_ 🗙	Cont.	Serial No																			
	No.	Board		-231201-01 UO IMU 2	9-9881			Numb	er of file	\$ 5554											
DELTAS X	191	Kernel		6-javad-4	Build	26		() log	1207s												
										n Interface	. R. W.							Spoofing Mode S			
TRIUMP X														612.38*6	177.77 m.)			1 400	and those of		
	A Measurements			-																	
	Latitude	5414015.0096621N	Ι.	Satellites		· · ·	Orient	_	TK Engi	nes RT	PK W	eather	Station					_	1		
	Longitude	25*16'12.290532*E		Ant. 🔺		Num	8	Az	SNR						Track Time	Health	Used	Status			
		177.5624240 m 0.0090511 m		4 GPS - 1		5	16	116	CA 43	P1 40	P2 40	1.2C 43	15	LIC	00:10:25	~		30	No data from reference station ar		
	Velocity 2D	0.0044286 m/s		a a	GPS GPS	11	31	52	43	32	32	43	52		03:11:44	÷.	1	58	CA/L1 and L2C measurements ar		
		0.0090511 m 0.0113103 m/s			GPS	12	26	124	46	44	44	46	22		05:12:22	2	2	58	CA/L1 and L2C measurements ar		
		0.0045725 m		a	GPS	18	14	198	42	26	26	43	45		00.03:21	1		30	No data from reference station ar		
	VRMS	0.0078112 m			GPS	20	28	80	43	29	29				01:03:59	×	×	51	CA/L1 slot is used in RTK processi		
	RTK fixed (Phase d	20) 20		a	GPS	25	62	142	48	51	51	51	56		03:48:17	×	×	58	CA/L1 and L2C measurements ar		
	PDOP	1.1194132		а	GPS	26	15	300	41	35	35	42	48		00:08:53	× -		30	No data from reference station ar		
		0.5655144		a	GPS	28	45	262	49	36	36	49	53		02:17:49	<	< _	58	CA/L1 and L2C measurements ar		
		2023(12)7 (GP5)		a	GPS	29	75	246	48	51	51	51			02:18:48	<	×	58	CA/L1 and L2C measurements ar		
	Receiver Time	18/27/02		a	GPS	31	38	294	48	43	43	46			01:24:13	~	~	58	CA/L1 and L2C measurements ar		
		0.0003943 s		4 GLO - 6		-		200	CA	P1	P2	L2C			00.47.00			20	N 11 1 1 1 1 1 1 1		
	Osc. Offset	-0.0000146 ms/s		a a	GLO	7/5	15 40	356	46	45	40	40			00:47:20 04:07:31	1		30 58	No data from reference station ar CA/L1 and L2C measurements ar		
	 Base Lines 			8	GLO	19/-7	77	276	52	51	50	50			02:15:23	2	2	58	CAVET and L2C measurements ar		
			1						~										and the contract of the second life of the		
				Antenna 39 (30) 0			6/5	5AL - 8/7	BDS - 15	5/11 QZS	is - 0/0	NaviC -	0/0 584	5 - 0/0	LBAND - 0/0	GLCDMA	- 0/0				
	Parameters	Files 📑	GNS	S Spectra	C ²	Spoofir	9 C	Moder	C ²	Calibrat	ion 🗗	Opti	ons 🖓	Outpu	t B	Greis	Comma	ands 🖸	Real-Time Log		
	★ Settings	Total: 3554 0	12	Interfere		Spoofin	g	0	N M	S.	4	:= /	Actual	- Pr	rts Message				0		
	\$ Connected	TCP 192,168,10,205#						002 => do		-											

Figure 13. Receiver Page.

Receiver page consists of the Header, Menu Bar, Tile View and Status Bar.

Header.

• *Name* – Assigned by default first time. Double click to change. Name is stored and used next time.



- *Model, Identifier Model* and ID of the receiver.
- *Close Button* Disconnect from the device, close device page and remove device from the list on *Devices* pane.

Menu Bar.

- *Reports Menu* Main info, options and parameters reports.
- Actions Menu Performs reset, init parameter, clear NVRAM, init file system, reset RTK actions to the receive.
- Update Options Allows update receiver options online from JAVAD GNSS website or from Option Authorization File.
- Update Firmware Allows update GNSS firmware online from JAVAD GNSS website or from a file.
- *Disconnect Button* Disconnect from the device.
- *Tile Position Button* Arrange collapsed tiles to the chosen position.

Tiles:

- *Main* Receiver info, status parameters, connection state, measurements, satellites table, sky plots, orientation, RTK engines, RTPK, weather station.
- *Parameters* Graphic interface for the configuring of the receiver.
- *Files* Workings with the files in receiver memory.
- Spectra Graphic interface for the collecting of the GNSS spectra.
- Spoofing Table of the spoofing indicators for all satellites.
- *Modems* Graphic interface for the configuring of the communication module, pairing with the external radio and collecting radio spectra.
- *Calibration* Graphic interface for the calibrating IMU–module, compass and gyroscope.
- Greis Commands Manual mode terminal for the GREIS commands (see [2].)
- *Real-Time Logging* Logging jps or rtcm data to the PC memory.



To expand (collapse) a tile click on the arrow at the top right corner.

The *Modems* and *Calibration* tiles are only available for receivers that have the appropriate modules.

Status Bar is located at the bottom of the page and displays connection state, current operation and progress of the operation.



3.1.1 Reports

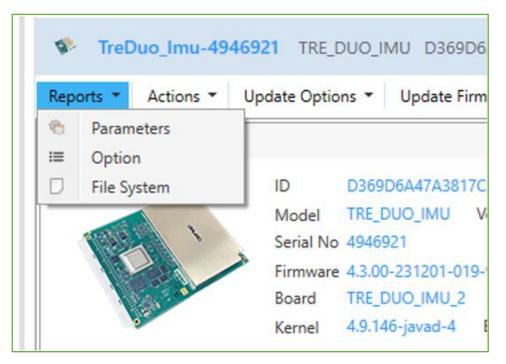


Figure 14. Reports.

The following reports on the receiver can be generated:

- *Parameters* The receiver's characteristics and list of all the parameters with values.
- Options The receiver's characteristics and list of options with current statuses (*Receiver Options* tile).
- File System The receiver's characteristics and list of all the files (name, size, modified date).

Select the desired report from the *Reports Menu* and the location for report saving in the *Save File Dialog* which will be opened. The report will be created and saved in a text file.



3.1.2 Actions

🌮 TreD	uo_Ir	nu-49	46921 TRE	_DUO_I	MU D369D6A47A	3817CA6
Reports 🔻	Actio	ons 👻	Update Opt	ions 🔻	Update Firmware	•
Main	2	Reset	:			
Wall	۰	Init P	arameters			
		Clear	NVRAM			BOBCEF
100	D	Init Fi	ile System			JAVAD
1111	5	Reset	RTK			
	5	Reset	PPP			
	•	Set W	/iFi AdHoc mo	de for IP	Phone/IPad	
	-	_	Kernel	4.9.14	to-javad-4 Build	26

Figure 15. Actions.

Initialization of the receiver can be performed using the following actions from the menu *Actions*:

- *Reset* Reset (reboot) the receiver. From a functional point of view, the reset is equivalent to turning the power off and then back on.
- Init Parameters to set all the receiver parameters to their default values:
- *Clear NVRAM* to clear NVRAM and reboot receiver. All the data stored in the NVRAM (almanacs, ephemeris, etc.) will be lost; all the parameters will be set to their default values after reboot.
- *Init File System* to initialize the file system (i.e., reformat the underlying medium). All files stored in the receiver will be lost. The operation can take some time depends of the memory size. Its progress is shown in the bottom status bar.
- *Reset RTK* to reset RTK engine.
- *Reset PPP* to reset RTK engine.
- Set WiFi Ad Hoc mode for iPhone/iPad to configure receiver as WiFi Ad Hoc.



3.1.3 Update Options

Receiver options can be updated via Internet or from OAF-file.

To see actual options expand *Options* tile. Clicking *Refresh* button requests options at the receiver and fills the list.

Reports 🔻	Action	s 🕶	Update Options	 Update Fit 	rmv	vare 🔻		
Options	2 2		n File n Website					
Option	_		Current	Purchased		Leased	Date	
GPS (_GPS))		1		0	51	11 15.12.2023	
GLONASS	GLONASS (_GLO)				0	51	11 15.12.2023	
L1 (L1)			1		0	51	11 15.12.2023	
L2 (_L2_)			1		0	51	11 15.12.2023	
Position up	odate ra	te(Hz)	(l 100		0	51	11 15.12.2023	
Raw data u	update r	ate(Hz) (100		0	51	11 15.12.2023	
Memory (M	Memory (Mb) (_MEM)				0	51	11 15.12.2023	
Common T	Common Tracking (COOP)				0	51	11 15.12.2023	
1-PPS Timi	ing Sign	al (_PF	PS) -1		0	51	11 15.12.2023	

Figure 16. Options Updating.

Uploading OAF from File

Click *From File* button and select **.jpo* or **.opt* file in *Open Options File* window. File name must correspond to the receiver identifier. Otherwise, the warning will be shown.

Uploading the options from file is happening the same way as via Internet.



Open Options File							×
$\leftrightarrow \rightarrow \checkmark \uparrow$	> 0	AFS		~	С	Search OAFS	م
Organize 👻 New	folder					≡	- 🗆 😗
 soft source Tracing Videos NVM Windows (C; Libraries Network OAFS)		Vame	447A381	7CA6A4(180BCEF.jpo	Date modified
		D369D6A47A38	17CA6A408	OBCEF.j	~ 00	Options File (*.jpo)	~
	File name:						
	Freq. Li	ock and Output ort A (Kbps) (RS	(FR -1		_	Open 511	Cancel

Figure 17. Updating Options from jpo-file.

Uploading OAF via Internet

Click From Website button to upload options from Internet and confirm the intention.

ptions					
Option		Current	Purchased	Leased	Date
GPS (_GPS)		1	C	51	1 15.12.2023
GLONASS (_GLO)	Ontio	ns uploading			× 12.2023
L1 (L1)					.12.2023
L2 (L2)					.12.2023
Position update rate(no you war	nt to update Optio	ons from server?	.12.2023
Raw data update rate					.12.2023
Memory (Mb) (_MEM			Да	Нет	12.2023
Common Tracking (C			A		12,2023

Figure 18. Updating Options via Internet.

The status of the uploading is displayed in the status bar.



After Options is uploaded receiver NVRAM is cleared and then it is reset.

To see updated *Options* click *Refresh* button after receiver reconnects.

Option	Current	Purchased	Leased	Date 🊊	0			
GPS (_GPS)	1	0	511	15.12.2023				
GLONASS (_GLO)	1	0	511	15.12.2023				
L1 (L1)	1	0	511	15.12.2023				
L2 (_L2_)	1	Options uploading	compete		\times			
Position update rate(Hz) (_I	100							
Raw data update rate(Hz) (100		ons loaded.					
Memory (Mb) (_MEM)	511	Do you want to clear NVRAM and Reset receiver?						
Common Tracking (COOP)	-1							
1-PPS Timing Signal (_PPS)	-1			Да Нет				
Event Markers (EVNT)	-1	0	511	15.12.2023				
In-Band Int. Rejection (_AJM	-1	0	511	15.12.2023				
Multipath Reduction (_MPF	1	0	511	15.12.2023				
Frequency Input (_FRI)	-1	0	511	15.12.2023				
Freq. Lock and Output (_FR	-1	0	511	15.12.2023				

Figure 19. Options are uploaded.

Update Firmware

Firmware of the receiver can be updated from file or via Internet.

Reports Actions Update Options	▼ Update Firmware ▼	
Main 23 Catest version 25 Cate	From File	
Model Ti Serial No	87X2ZOD86IQ1BR9IH5NNKW9Y IUMPH2 Vendor JAVAD GNSS 2.01-220630	UpTime Memory (Used/Total) Battery 93.99% Number of files 64
Board T	UMPH2_11	Communication Interfaces
▲ Measurements	Satellites Sky Plot Orien	tation Weather Station
Latitude Longitude Ellipsoidal height	Num El Az SN	R

Figure 20. Update Firmware.



Updating from File

Select From File and choose firmware file in Open File Dialog. If firmware is suitable to the receiver model and has higher version file uploading will be started. Otherwise, the warning appears.

Updating from Internet

Select *From* Website>Last *version* to load last available firmware. Last version is available on JAVAD GNSS website **[3]**.

After firmware file is downloaded from the site and has higher version file uploading will be started. Otherwise, the warning appears.

Status bar at the bottom of the window shows process progress after every part of the firmware uploaded receiver reboots and reconnects.

To cancel firmware downloading/updating click *Cancel FW Downloading / Cancel File Transfer* button.

D 0287X2ZOD86IQ1BR9IH5NNKW9Y Model TRIUMPH2 Vendor JAVAD GNSS Serial No Firmware 4.2.01-220630 Soard TRIUMPH2_11	UpTime 0d00h08m35s Memory (Used/To 2.31 / 3.68 GB Battery () 93.2 Number of files 64
	Communication Interfaces B+ W- G-
Satellites Sky Plot Orie	ntation Weather Station
El Az SNR	Track Time
-	>
	El Az SNR

Figure 21. Firmware Updating.



3.2 Monitoring

Main Tile shows the appearance of the receiver, its characteristics, available connections, and set of the panes and tabs for monitoring the measurements such as: *Measurements, Links, Satellites, Sky plots, Orientation, Angle and Base Lines, RTK engines, RTPK and Weather Station.*

	ID Mode		B0777505C MPH_3NR	72BA07DA Vendor		GNSS	UpTi Men	me iory (Used	/Total)				21h32m31s 03 / 52.27 GB				X dev/blt/a
		No 9999	-	Vendor		01100		ry 🗩									
in the	100		0-231201-0	19-9885				·									
	Board		MPH_3NR_1				Num	ber of file	s 2857								
	Kerne	4.9.1	46-javad-4	Build	26												
							Com	municatio	n Interfac	es B-	W- G- U- (Spoofing Mode O
 Measurements 		4	Satellite	s Skv	Plot	Orienta	tion 1	RTK Engi	nes R	TPK 1	Weather	Station					
atitude	54"43'5.373956"N	_	Sys	Num	EI	Az	SNR	the angl				Jul Harr	Track Time	Health	liked	Status	
ongitude Illipsoidal height	25°16'12.404226" 172.2753069 m		4 GPS - 1				CA	P1	P2	L2C	15	L1C	THE THE	ricaren	U.C.	Juitas	
osition SEP	0.8415039 m	- 11	GPS	5	47	276	46	41	41	45			02:15:07	× .	× .	0	CA/L1 data used for position computation
elocity 2D	0.0100216 m/s	- 11	GPS	7	56	76	47	46	46	48			04:07:56	·	¥	0	CA/L1 data used for position computation
osition RMS elocity RMS	0.8415039 m 0.0066407 m/s	- 11	GPS	8	19	72	40	36	36	42	47		00:54:29	×	1	0	CA/L1 data used for position computation
IRMS	0.4640267 m	- 11	GPS	9	14	122	38	36	36	45	46		06:00:58	×	1	0	CA/L1 data used for position computation
/RMS	0.7020028 m	- 11	GPS	13	39	290	45	31	31				01:25:08	1	1	0	CA/L1 data used for position computation
tand Alone			GPS	14	38	17 Rig	ht Click t	o hide/sh	ow info.	47	51		01:15:17	v .	1	0	CA/L1 data used for position computation
DOP	0.8372678		GPS	15	6	302	38	16	16	31			00:03:06	×		16	This SV has elevation lower than the specified
IDOP	0.4659526	- 11	GPS	18	11	336	38	18	18	41	43		00:43:48	×	×	0	CA/L1 data used for position computation
DOP	0.6956332	-11	GPS	20	38	226	40	31	31				03:37:56	×	×	0	CA/L1 data used for position computation
eceiver Date	2023:12:8 (GPS)	- 11	GPS	22	21	182	40	25	25				00:36:15	×	×	0	CA/L1 data used for position computation
leceiver Time Jock Offset	09:59:15 -0.0000991 s	- 11	GPS	27	13	32	40	36	36	43	49		01:24:21	×	×	0	CA/L1 data used for position computation
lsc. Offset	0.0002058 ms/s	- 11	GPS	30	85	170	49	49	49	51	55		03:02:53	×	×	0	CA/L1 data used for position computation
Angles			4 GLO - 8	8/7			CA	P1	P2	L2C	L3						
Pitch 0.5785	9°		GLO	1/1	58	152	45	43	42	43			03:52:53	×	×	0	CA/L1 data used for position computation
Roll -0.110		- 11	GLO	2/-4	63	310	45	47	47	47			01:59:57	×	×	0	CA/L1 data used for position computation
Heading 181.66	224 *	- 11	GLO	3/5	11	318	41	40	37	38			00:13:12	×	×	0	CA/L1 data used for position computation
Links			GLO	10/-7	13	40	37	36					04:11:59	×	×	0	CA/L1 data used for position computation
e Paine Data 🕅	-	-	GIO	11/0	67	56	44	46	49	49			02-54-40	1	1	0	CA/L1 data used for position computation

Figure 22. Receiver Main Tile.



3.2.1 Receiver Info

Main				
	ID R3B580777505C728A07DAA8A16 Model TRIUMPH_3NR Vendor JAVAD GNSS Serial No 99998 Firmware 4.3.00-231201-019-988F Board TRIUMPH_3NR_1 Kernel 4.9.146-javad-4 Build 26	UpTime Memory (Used/Total) Battery 🖮 100% Number of files 780 og log1208k 0 log1204b	6d21h32m31s 47.03 / 52.27 GB	 dev/blt/a dev/tcp/c
		Communication Interfaces B- W- G- U- C-		Spoofing Mode O

Figure 23. Receiver info.

Receiver *Main Tile* provides the following information:

- Image of the receiver
- Receiver Id Receiver's identifier
- *Model* The model of the receiver, e.g., TRIUMPH1
- Vendor JAVAD GNSS
- Serial Number A number assigned to the receiver on the factory
- Firmware Version
- Board Version
- Kernel Inux kernel version
- UpTime Time elapsed since last receiver reboot
- *Memory* (Used/Total) Used/Available Memory
- Battery Battery charge status
- *Number of files* Number of files in the receiver memory and recording status
- *Communication interfaces* Indicates whether the following communication interfaces are available and enabled:
 - B Bluetooth
 - W Wi–Fi
 - G GSM
 - U UHF / FH
 - C Communication Board (for TVS)



- *Reference station* Reference station ID, distance, position and GPS validity are displayed if corrections are received.
- Connections Amount and type of not locked connections. Connections are locked for the file transferring, manual mode, daisy chain, real time logging. Locked connections cannot be closed and displayed in the status bar (dark blue for the file transferring, red for others.)

Note: The static parameters can be copied to clipboard by double clicking.



3.2.2 Measurements

Measurements pane displays the basic tracking information for the locked satellites. It shows the receiver target point current position, coordinates, and the time–frequency parameters describing the behavior of the receiver's local oscillator.

 Measurements 	
Latitude	54°43'5.309698"N
Longitude	25°16'12.290512"E
Ellipsoidal height	177.5572426 m
Position SEP	0.0079177 m
Velocity 2D	0.0085230 m/s
Position RMS	0.0079177 m
Velocity RMS	0.0107210 m/s
HRMS	0.0043343 m
VRMS	0.0066260 m
RTK fixed (Phase c	liff)
PDOP	0.9792354
HDOP	0.5360486
VDOP	0.8194839
Receiver Date	2023:12:8 (GPS)
Receiver Time	10:16:30
Clock Offset	0.0004150 s
Osc. Offset	-0.0000162 ms/s

Figure 24. Measurements.

Navigation information

- Latitude, Longitude, Ellipsoidal height geodetic coordinates.
- Position SEP Spherical Error Probable.
- Velocity 2D Geodetic Velocity (m/s).
- *Position RMS* position RMS error (m).
- *Velocity RMS* velocity RMS error (m/s).
- *HRMS* horizontal position RMS error (m).
- *VRMS* vertical position RMS error (m).
- Solution type Standalone / DGPS /RTK float / RTK fixed .
- *PDOP* Position dilution of precision.



- *HDOP* Horizontal dilution of precision.
- *VDOP* Vertical dilution of precision.
- *Receiver date* "Date" part of the full receiver time representation (*[RD]* message).
- *Receiver time* shows the receiver's current time within day. This value is taken from the message [~~]. For more information about [~~]

Note: Currently the message [~~] reports the time within day in the GPS time scale only.

- Clock offset describes the time derivative of (*Trr Tr*), where Tr designates the receiver time, *Trr* designates the receiver reference time. This parameter is obtained from the [*TO*] message and is expressed in seconds.
- Osc. Offset is derived from the message [DO] and it is expressed in ppt. The parameter describes the difference between the VCO nominal and quiescent frequencies.

For detailed description of the messages used for navigation information see [2 Chapter 3. Receiver Messages].

Angles, Base Lines

Available for multi–antenna receivers, models with IMU–module and/or compass and gyroscope, and receivers in hd–mode.

 Angles 		
	4.95370 ° -179.70865 ° 30.09021 °	Angles
▲ Base Lin	nes	
X -2.58	200 m	
Y 0.555	92 m	
Z 1.827	04 m	
3D 3.211	51 m	
RTK fixed ((Phase diff)	

Figure 25. Angles. Base Lines.



The following parameters are shown and obtained from the messages – [AR]([ha], [ar]):

- *Pitch* pitch angle [deg] (graphically presented on the left plot)
- Roll roll angle [deg]
- *Heading* heading angle [deg] (graphically presented on the right plot)

[*mr*] ([*BL*]) – Baseline vectors:

- X baseline vector M–S0 in the current epoch[m]
- Y baseline vector M-S1 in the current epoch[m]
- Z baseline vector M–S2 in the current epoch[m]
- Solution

Links

/tcpcl/a
RTCM 3.0
0074
001
618801
0016
100.00,0.03,1.00

Figure 26. Links.

Links pane displays the status of the data links associated with the corresponding serial ports/modem.



For each link the following fields are shown:

- *Link Id* Corresponding stream.
- Decoder Id RTCM / RTCM 3.0 / CMR / JPS / SISNeT.
- Station Id Reference station identifier.
- *Time elapsed since...* Time [in seconds] elapsed since receiving last message (maximum value = 999). Estimated with an accuracy of ±1 second.
- *Received messages* Number of received messages (between 0001 and 9999). If no message has been received, this data field contains zero.
- Corrupt messages Number of corrupt messages (between 0001 and 9999). If no corrupt messages have been detected, this data field is set to zero.
- Link quality (%) Data link quality in percent (0–100)

3.2.3 Number of Satellites

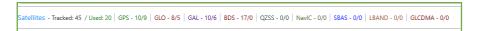


Figure 27. Number of Satellites.

Number of satellites pane shows:

- Total number of the locked satellites.
- Total number of the satellites used in the position calculating.
- The number of the locked satellites for each satellite system.
- The number of satellites used in the position calculating (after slash).

For multi antenna receiver number of satellites pane contains information for each antenna.



 Antenn 	a / Satellites					
a 37 (30)	GPS - 10/9 GLO - 8	8/6 GAL - 4/4 B	DS - 15/11 QZSS	- 0/0 NavIC - 0/0	SBAS - 0/0 LBAND - 0/0	GLCDMA - 0/0
b 37 (34)	GPS - 10/10 GLO -	8/7 GAL - 4/4	BDS - 15/13 QZS	S - 0/0 NavIC - 0/0	SBAS - 0/0 LBAND - 0/0	GLCDMA - 0/0

Figure 28. Multi Antenna Number of satellites.

3.2.4 Satellite Table

Satellite table shows all tracked satellites, their elevation, azimuth, signal-to-noise ratio and status. Satellites are grouped by the constellation. Each column of the table can be sorted.

Sys	Num	El	Az	SNR						Track Time	Health	Used	Status	
• GPS - 1	10/9			CA	P1	P2	L2C	L5	L1C					
GPS	5	38	244	47	44	44	45			03:09:44	×	✓	0	CA/L1 data used for position computation
GPS	7	33	82	44	42	42	44			05:02:33	✓	✓	0	CA/L1 data used for position computation
GPS	8	22	48	38	35	35	43	49		01:49:06	×	✓	0	CA/L1 data used for position computation
GPS	13	64	286	46	36	36				02:19:45	×	✓	0	CA/L1 data used for position computation
GPS	14	62	152	44	36	36	52	54		02:09:54	×	✓	0	CA/L1 data used for position computation
GPS	15	29	302	45	30	30	43			00:57:43	×	✓	0	CA/L1 data used for position computation
GPS	18	7	314	37	18	18	40	45		01:38:25	✓		16	This SV has elevation lower than the specified mask angle
GPS	20	15	212	37	24	24				04:32:33	✓	✓	0	CA/L1 data used for position computation
GPS	22	47	176	47	35	35				01:30:52	×	✓	0	CA/L1 data used for position computation
GPS	30	65	86	48	48	48	51	55		03:57:30	×	✓	0	CA/L1 data used for position computation
GLO - 8	B/7			CA	P1	P2	L2C	L3						
GAL - 9	9/6			E1	ABOC	E5B		E5A						
BDS - 1	17 / 12			B1	ABOC	B2(B)		B2A	B1C					
BDS	2	7	118	32		40				>18h	×		16	This SV has elevation lower than the specified mask angl
BDS	5	19	142	35		43				>18h	✓	✓	0	CA/L1 data used for position computation
BDS	7	38	76	38		49				03:31:35	✓	✓	0	CA/L1 data used for position computation
BDS	9	15	92	33		46				10:32:26	×	✓	0	CA/L1 data used for position computation
BDS	10	42	94	38		48				03:16:57	✓	✓	0	CA/L1 data used for position computation
BDS	19	22	170	41		49		47		06:01:07	✓	✓	0	CA/L1 data used for position computation
BDS	21	36	306	44		51		50		01:30:04	×	✓	0	CA/L1 data used for position computation
BDS	22	59	224	45		55		53		03:40:22	×	✓	0	CA/L1 data used for position computation
BDS	27	8	Right	Click to h	nide/show i	nfo.		44		00:13:16	×		16	This SV has elevation lower than the specified mask angl
BDS	28	11	32	41		44		43		00:51:26	✓	✓	0	CA/L1 data used for position computation
BDS	36	81	176	46		56		54		03:03:18	✓	✓	0	CA/L1 data used for position computation
BDS	40	38	62	43		50		49		03:23:00	✓	✓	0	CA/L1 data used for position computation
BDS	45	29	234	42		52		49		01:04:08	✓	✓	0	CA/L1 data used for position computation
BDS	46	41	66	44		53		50		04:36:42	✓	✓	0	CA/L1 data used for position computation
BDS	56			43						03:54:03	✓		29	Ephemeris is not available, similar to 05 above
BDS	58			38						00:34:13	✓		29	Ephemeris is not available, similar to 05 above

Figure 29. Satellite Table.



Parameter	Description
Sys	Satellite System:
	• GPS
	• GLO – GLONASS
	• <i>GAL</i> – GALILEO
	• SBAS
	• QZSS
	• BDS – BeiDou (COMPASS)
	• NavIC
	• GLCDMA
	Satellite systems are marked by different colors
Num	SV PRN
	SV PRN / SV Frequency Number for GLONASS.
	If the character "*" is shown next to PRN in the column, this means that almanac data are unavailable for the corresponding satellite
EL	Elevation angle in degrees.
AZ	Azimuth in degrees
SNR	Signal-to-noise ratio [dB*Hz] for all signals.
Track Time	Time elapsed since the last loss–of–lock in the C/A channel for the corresponding satellite. This time is given in minutes or, if the symbol ":" is specified in the column, in seconds.
Health	Green check mark if healthy, otherwise, red exclamation
Used	Green check mark if used in the position calculated.
Status	Satellite navigation status. For a complete description of the satellite navigation status structure, see [2, Table 3–4. Satellite Navigation Status].
Status description	Complete description of the satellite navigation status according [2, Table 3–4. Satellite Navigation Status].

Table 1 Tracking Parameters.



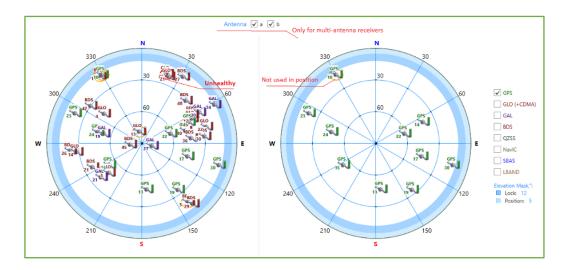
Satellite table for multi antenna receiver has also antenna column supporting sorting.

Satollitos	Sky I	Plot Or
Ant. 🔺	Sys	Num
► GPS - 20	/ 17	
► GLO - 2	/ 16	
⊿ GAL - 10	/ 10	
а	GAL	19
а	GAL	21
а	GAL	27
а	GAL	30
а	GAL	34
b	GAL	19
b	GAL	21
ь	GAL	27
ь	GAL	30
ь	GAL	34
RDS. 2	8/24	

Figure 30. Multi Antenna Satellite Table.



3.2.5 Sky Plots



The Sky Plot tab shows graphic representation of the satellite positions in the sky.

Figure 31. Sky Plots

Each concentric circle represents the elevation angle above the horizon. The outermost circle corresponds to 0 degrees above the horizon. The center of the sky plot represents 90 degrees above the horizon.

Satellite markers for different systems are shown by the different colors. The degree of filling of marker reflects the value of the signal-to-noise ratio. Satellite info is shown when mouse is over it. Elevation masks for the tracking and used in the position calculating are marked in the blue light blue correspondingly. Unhealthy satellites are displayed in a red crossed circle. Satellites that are not used in the calculated position are in an orange circle.

The flags on the right allow the user to select the desired systems to be displayed on the right plot.

For multi–antenna receivers, sky plots allow to display satellites for each antenna.



3.2.6 Orientation

This presentation is available for multi–antenna systems, receivers with IMU–module or/and compass, or in hd–mode and displays the orientation of the system.

There are two graphs on the tab: pitch-roll and heading.

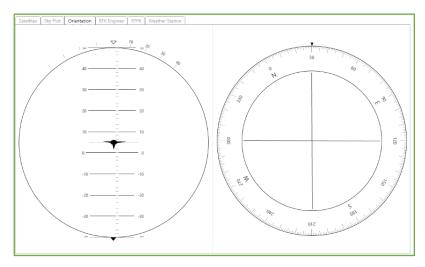


Figure 32. Orientation tab.



3.2.7 Multi–RTK

RTK Engines tab is available if Multi–band RTK mode is on and RTCM3 corrections are receiving.

RTK 1	Fixed		100%	RTK 2	😣 Inva	alid		RTK 3	Fixed		100%
GPS	7	QZSS	0	GPS	0	QZSS	0	GPS	8	QZSS	0
GLO	5	BDS	10	GLO	0	BDS	0	GLO	4	BDS	11
SBAS	0	NavIC	0	SBAS	0	NavIC	0	SBAS	0	NavIC	0
GAL	6	Total	28	GAL	0	Total	0	GAL	6	Total	29
Rms	0.0066			Rms	10.0000			Rms	0.0061		
Weight	0			Weight	0			Weight	0		
Epochs	648525			Epochs	0			Epochs	648742		

Figure 33. RTK Engines tab.

Each engine is shown in separate box and the following data are provided:

- Engine number.
- Solution.
- Progress (%).
- Satellite count for each satellite system used by engine.
- RMS value.
- Weight of the engine in the resulting solution.
- Epoch count.



3.2.8 RTPK

RTPK – Real Time Post–processed Kinematics (RTPK) solution – is available for firmware beginning with 4.0.2.0 and requires the RTPK option. User interface is provided in NetView 2.2.5.4 or higher.

Short Description of RTPK

Receiver supports running phase–differential post–processing engine and gathering its results. Only static occupations could be meaningfully processed this way.

Current requirement is availability of suitable RTCM3 corrections.

This is performed by storing all the needed data into a file on receiver, processing of the file by RTPK engine tool, monitoring the process and result, and finally downloading RTPK report file from receiver.

RTPK Option

RTPK is available if RTPK option is loaded. Option can be checked on the tile "Options".

Option 🔺	Current	Purchased	Leased	Date	A
Reserved (_LIM)	7	511	511	3/12/2021	
RTCM Input (RTMI)	5	511	511	3/12/2021	
RTCM Output (RTMO)	3	511	511	3/12/2021	
RTCM3 Input (RM3I)	1	511	511	3/12/2021	
RTCM3 Output (RM3O)	3	511	511	3/12/2021	
RTK distance [x100m (511-unlimited)] (I	511	511	511	3/12/2021	
RTK mode (Hz) (PDIF)	100	511	511	3/12/2021	
ТРК (RTPK)	0	0	511	3/12/2021	
erial Port A (Kbps) (RS_A)	460	511	511	3/12/2021	
erial Port B (Kbps) (RS_B)	460	511	511	3/12/2021	
erial Port C (Kbps) (RS_C)	460	511	511	3/12/2021	
chart of copy (ho_c)					
	460	511	511	3/12/2021	
Serial Port D (Kbps) (RS_D) Spectrum (SPEC)	460 1	511		3/12/2021 3/12/2021	

Figure 34. RTPK option.

User interface for RTPK is on Main tile > tab RTPK.



RTPK Tab

Select Main tile. Make sure that rover receives RTCM3 corrections from a reference station and the quality of the link is high. Select RTPK tab.

					Reference Station	ID 324 (10.97 km 55*4)	2'0.29"N 37"31'45.02"E 251.92 m.)
 Measurements 		Satellites	Sky Plot RTPK				
Latitude Longitude Ellipsoidal height		Start RTPK		Cont	inue 🕘 log0129a	b b b	6 0 0
Position SEP Velocity 2D Position RMS Velocity RMS HRMS VRMS	0.0132891 m 0.0057778 m/s 0.0132891 m 0.0151037 m/s 0.0078135 m 0.017494 m		log0124d log0124e log0124f		RTPK Report	¥	
RTK fixed (Phase of	liff)		log0124g				
PDOP HDOP VDOP	1.2844113 0.7551844 1.0389460		log0124h log0124i log0124j				
Receiver Date Receiver Time	2021:1:29 (GPS) 13:19:36		log0124k log0124l				
Links Link Id Decoder Id Station Id Time elapsed sin. Received messa Corrupt message	4996		log0124m log0128a log0128b log0129a log0129b				
Link quality (%)	100.00,0.04, 1.00						

Figure 35. RTPK tab.

The following functionality is provided:

- Start new RTPK-file on any free port.
- Continue existing RTPK-file.
- Process RTPK-file.
- Get RTPK–report.
- Download RTPK-report.

To start new RTPK type name to the Name textbox or leave auto name and click Start button near desirable free file–port (A, B, C, D, E).

To continue RTPK–file type name of the existing RTPK–file, check Continue flag and click Start button near desirable file–port. If Continue flag is not checked file will be overwritten.



		Reference Station ID 324 (10.97 km 55*42'0.29"N 37*31'45.02"E 251.92 m.)
 Measurements 	55°47'54.51632"N	Satellites Sky Plot RTPK
Longitude	37*31'15.091587"E	Start RTPK File Name: auto name Continue Olog0129a Olog0129c (RTPK) O O
Position SEP Velocity 2D Position RMS	0.0132730 m 0.0022337 m/s 0.0132730 m	RTPK File log0129c port b 24 epochs RTPK Report
/elocity RMS HRMS /RMS	0.0151364 m/s 0.0078304 m 0.0107172 m	C Process RTPK File
RTK fixed (Phase d	liff)	
PDOP HDOP /DOP	1.2828567 0.7568219 1.0358290	
Receiver Date Receiver Time	2021:1:29 (GPS) 13:20:28	
 Links 		
Link Id	/tcpcl/a	

Figure 36. RTPK–File log0129c is recorded on the port b. It is available for the processing.

If the RTPK–file is currently being recorded, only it can be processed. Otherwise, first select the file from the dropdown list. Click button "Process RTPK–file".

Reference Station ID 324✔(10.97 km 55*42'0.29*N 37*31'45.02*É 251.92 m.)
Satellites Sky Plot RTPK
Start RTPK File Name: auto name Continue O log0129a O log0129c (RTPK) 💿 C 🕑 C 📀
RTPK File log0129c port b • • • • • 78 epochs RTPK Report -
RTPK Processing
C Right Click to hide/show info.

Figure 37. RTPK–File processing.

After processing is finished RTPK information about result, BLH and raw report is output. NumFixed > 0 means that fixed epochs are in the file.



atellites Sky Plot RTPK			
Start RTPK File Name: auto name Conf	tinue 💿 log0129a 🛛 🕒 log0129c (RTPK		O Downloa Down
TPK File log0129c port b • • • • 140 epoch	RTPK Report rtpk-log0129c.json	rtpk-log0129c.jsor	*
C Process RTPK File	NumFixed 25	Result	0
•		Version	1.73.3.46
/	55.798476918	Elapsed	12.8
o error. Last RTPK run was successful and	Blh 37.520858437	File	/.gnss.log/log0129c
enerated report.	382.336678849	RoverInfo	
		AntennaHeight	0
		DE	0
		DN	0
		DH	0
		HeightType	0
		AntennaDescrip	
		BaseInfo	
		ARPX	2857033.1
		ARPY	2194590.737
		ARPZ	5245904.903
		AntennaHeight	0
		ITREYear	0
		RefStID	324

Figure 38. RTPK–File processed. No error information, BLH and raw report.

If processing is unsuccessful the following error code can be output.

- 31: "RTPK tool does not exist or is not executable"
- 32: "input file for RTPK does not exist or is not readable"

33: "error creating working environment for RTPK (e.g., dedicated working directory or changing there)"

40-50: "exit code of RTPK tool"

Download button is in the header of the raw report. Report is saved as json-file.



3.2.9 Weather Station

You can connect a compatible weather station to the receiver. The data it will receive is displayed on the *Weather Station* tab. The receiver can also output its own weather data, calculated based on the internal model. These data (temperature, humidity, etc.) are displayed in two tables respectively.

nss Meteo Data	Meteo Station Data							
ast Update (GPS time): 12:35:15	Name							
tation Name:	S/N :							
2WV [mm]: 4.5	Time:							
TD [mm]: 2339.8	Temperature	25,°C						
WD [mm]: 72.2	Pressure	0.9906,bar						
HD [mm]: 2267.6	Humidity	15.9 %						
emperature [°C]: -6.1	Wind Direction	95°						
ress [mBar]: 1014.4	Wind Speed	0.1,m/s						
H [%]: 116.7	Rain Gauge							
ource Model	Precipitation Ind.							
C Gnss Meteo Data C Meteo Station Data Data from connected meteo station								

Figure 39. Weather Station tab.

To enable/disable data from the receiver or weather station, use the corresponding checkboxes.



3.3 Configuring the Receiver

Expand Parameters Tile of the receiver to open Parameters window.

Parameters window provides the convenient graphic interface to view and change the settings of the receiver. All the parameters are grouped on the tabs according to the aspect of the behavior and fully match to *Greis Manual* [2].

Graphical User Interface for Working with the Receiver Parameters

Expand the *Parameters* Tile of the receiver to open the *Parameters* window.

The *Parameters* window provides the convenient graphical interface to view and change the settings of the receiver.

Note: All parameters are grouped on the tabs according to the aspect of the behavior and fully match to GREIS Manual [2]. The graphical user interface for working with the receiver parameters.

The representation of each parameter is determined by the type, facility of access and availability. The detailed description coincides with Greis Manual [2] and appears when the mouse is over the parameter. Read–only parameters are gray. Parameters which are not available for this model of the receiver are gray and empty.



TRIUMPH1MP-4946921 TRE_DUO_IMU D369D	5A47A3	817CA6A4080BC						×
Reports Actions Update Options Update Firm	/are 🔻							$\begin{array}{c} \bullet \\ \bullet \\ \bullet \end{array}$
Parameters								ĸ
General Log-Files TriPad Positioning Base Rove	r Port	s Networking	Event Adv	anced	Multi-Antennas	IMU/Mag		
General	Power	Management			Temperature			
Elevation Mask parameter is edited	Mod	es			Receiver Board	Temperature, *C	46.6	
Elevation Mask for SVs Locking 10	Batte	ry Charging Mode		Ŧ				
Elevation Mask for Position 100 *	Enab	le Power Output	~	¥				
* {2,,value out of range} parameter was not	Low	Power Mode	on	-	paramet	er is unavailab	le	
applyed due the error	Powe	er Off	on	-				
Antenna Input ext 🔻	Sleep	Mode	off	•				
Antenna Current Input ext	Volta	ides			readon	y parameter		
Status of External Antenna off		nal Power Voltage	17.95	-				
Status of External Antenna	Recei	iver Board Voltage	17.95					
/par/ant/dc Access: Read only	Batte	ry Voltage a						
Type: enumerated Values: off,normal,overload		ry Voltage b						
off – external antenna does not draw any DC		ger Output Voltage						
normal – external antenna draws normal DC overload – external antenna draws too high DC	Outp	ut Voltage						
Frequency Input and Output Parameters	State	of Charge						
parameter description	Batte	ry Charge, %						
(parameter description	Batte	ry B Charge, %						
refresh button apply button								
C V							Cor	nfiguration 🔻
								લ 💿 🔹
								A
							1	· ·
Main C Files C GNSS Spectr	-	Spoofing	Modem	2	Calibration	Options	Output	5
i Info 🗙 Measur Total: 3578 🧿 🗹 Interfere.		Spoofing	8 8	₩	SF 4	I Actual	→ Ports	Message

Figure 40. Parameters Tile.

Depending on the type of the parameter, a new value can be typed to text box, selected from the drop–down or checked. Edited parameter is marked by the *–sign and it is not set to the receiver until Apply button clicked. Apply action sets all edited parameters of all tabs to the receiver. If the receiver is not able to set new value error response is displayed under the parameter and warning box appears. Some settings come into effect after restarting. The confirmation dialog appears in this case. If it is confirmed receiver resets and reconnects.

To get the current values for the parameters on the selected tab click Refresh. Readonly parameters are refreshed every 10s even without manual refreshing.

The *Configuration* button saves/loads all parameters to the tcl–script. It is described below.

The location of the parameters on the tab varies when resizing the main window.



3.3.1 Parameter Tabs

Each parameter tab is detail described below. The references to relevant chapters of the *Greis Manual* are given for each group of parameters as [2, *Chapter ...*].

General

The tab *General* shows the most common settings.

General Log-Files TriPad Positioning Base Rover	Ports Networking Event Advanced IMU/Mag
General	Power Management Temperature
Elevation Mask	Modes Receiver Board Temperature, *C 49.6
Elevation Mask for SVs Locking 5	Battery Charging Mode auto 💌
Elevation Mask for Position 10	Enable Power Output
	Low Power Mode on 🔻
Antenna	Power Off on 🔻
Antenna Input int 💌	Sleep Mode off 👻
Antenna Current Input int	
Status of External Antenna	Voltages External Power Voltage 24.09
	Receiver Board Voltage 8.68
	Battery Voltage a 8.20
	Battery Voltage b 0.00
	Charger Output Voltage 8.20
	Output Voltage
	State of Charge
	Battery Charge, % 100.00
	Battery B Charge, %

Figure 41. General parameters.

- General [2, 4.4.5. Measurements Parameters]
 - Elevation mask Elevation masks for SVs locking and for Position Computation – [2, Satellites Tracking Parameters].
 - Antenna [2, Antenna Input Parameters].
- Power Management [2, 4.4.32 Advanced Power Management]
 - Modes power control modes.
 - Voltages power statuses (all are read–only).
 - State of Charge



Temperature – board temperature (C°, read–only) – [2, 4.4.44 Miscellaneous parameters].

Log–Files

Log–files tab contains parameters for file managing [2, 4.4.24 File Management, 4.4.20 Parameters of Generic GREIS Messages].

General Log-Files TriPad Positioning Base Rover Ports	Naturnian Event Advanced IMU/Man		
File a File b File c (TRE3) File d (TRE3) File c (TRE3)	AFRM	File Push	Push State
Current Log-file //og/log1209r	File Rotation Mode on *	File Push Made off 🔹	File Push Stage off
Number of Messages Enabled 97	File Rotation Running Counter 0	File Push Suspend off 🔹	Number of Files Queued for Push 0
Output Epochs Counters 2253	Force File Rotation off *	File Push Reset off *	Number of Files Pushed So Far 0
Implicit Message Output Period 1.000	Enable Oldest Log-file Removal on *	Version of jps2rin 2.1.231	Last Transfer Rate
Devetion Mask for 5	Scheduling Parameters	CGGTTS Converter Version 1.80.30.212	Transfer Progress
	File rotation counter 0	Destination A Destination B Destination C Destination D Destination E Destination F	Transfer Progress Current File Size
Satellites Number Mask for 0	File Rotation Period 3600		Transfer Progress Sent So Far
File Name Prefix log		File Push Host or IP Address "192.168.2.1"	Transfer Progress Rate
Manage by AFRM/TriPad	File Rotation Phase 0	File Push IP Port 21	Last Pushed File Name
Implicit Message Set to Enable def *	·	File Push User "anonymous"	Current File Name Being Pushed
		File Push Reservord	Number of Files Dropped From
		File Push Working Directory "filepush"	Number of Retry Attempts To
		File Push Timeout 600	Number of Rescheduled Files
			Number of Files Dropped
		Rinex Options "-v3.03"	Last System Error Code Number
		CGGTTS Options	Last System Error Code
		Files for pushing	
		a√ b√ c√ d√ e√	
Other			
Logging Period 30.000			
Output Stream to be Monitored /dev/null *			
Initial Dynamic Mode static *			
Memory to Use for Data Storage *			
Memory Currently in Use for			

Figure 42. Log–File parameters.

The following parameter groups are available:

- File a, File b, File c, File d, File e setting for configuring the output to File A (B, C, D, E) [2, Existing Files, Current Log–files, Masks and Counters, Implicit Output, Automatically Generated File Names Parameters].
- *AFRM* settings for automatically rotating the log–files according to the user– defined schedule. [2, Automatic File Rotation Mode (AFRM)].
- *FTP Push* settings for automatically putting log–files to an external server. [2, *File Push Parameters*].
- Push State read– only parameters aid in monitoring and troubleshooting of File Push operation. – [2, File Push Parameters].
- Other settings for history logger, initial mode, int (internal), ext (SDCARD) Data Storage. [2, Logging History, 2, 4.4.33 TriPad, 2, File–system Parameters].



Tri Pad

TriPad tab provides the parameters for configuring TriPad interface of the receiver.

General Log-Files TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	IMU/Mag
Function key								
<fn> Push Behavior</fn>								
<fn> Push Action</fn>	Turn Log	ging	•					
Turn Data Recording On at.	off		·					
Appending Data to a Specif	ic File							
<fn> Click Behavior</fn>								
<fn> Click Action led</fn>	•							
Initial Dynamic Mode stati	· ·							

Figure 43. Tri Pad parameters.

• Function key – [2, 4.4.33 TriPad Parameters].



Positioning

Positioning tab allows the user to select satellites to track, to specify which measurements to use in position computation and to enable solution mode. Since most of these parameters are described in the chapter [2, 4.4.8 Positioning Parameters] only the subtitles are shown below.

Parameters	
General Log-Files TriPad Positioning Base Rover Ports Networking Event Advan	nced IMU/Mag
Main Satellites Management	
Enable Solutions Position Masks	Lock Systems Lock Signals
Position Computation Mode pp * Elevation Mask for Position 5	GPS 🖌 GPS 🖌 CA 🖌 P1 🖌 P2 🖌 L2C 🖌 L5 🖌 L1C
Enable Single Point Position on PDOP Mask 30.00	GLO V GLO V CA V P1 V P2 V L2C
Enable Code Differential Position off	GLCDMA GLCDMA
Enable RTK Solution with Float on *	GAL ✓ GAL ✓ E1 ✓ ABOC ✓ E58 ✓ E5A SBAS ✓ SBAS ✓ L1 III L5
Enable SBAS Code DifferentiaL. off *	SBAS ♥ SBAS ♥ U 0Z55 ♥ 0Z55 ♥ CA ♥ L6 ♥ L2C ♥ L5 ♥ L1C
Enable PPP Solution off	
SBAS	NeviC 🖌 NeviC S 🖌 L5 L1
SBAS Mode manual *	
PPP	
PPP Mode jppp	
Position Systems Position Signals	Meas. Used Enable Corrections
GPS ✔ GPS ✔ CA ✔ P1 ✔ P2 ✔ L2C ✔ L5 ✔ L1C	Measurements Type to Use any Ionospheric Tropospheric
GLO ✔ GLO ✔ CA ✔ P1 ✔ P2 ✔ L2C ✔ L3 GAL ✔ GAL ✔ E1 ✔ ABOC ₹ E58 ✔ E66 ✔ E5A	any Enable Tropo. Corrections on 💌 Enable Iono. Corrections on 💌
	ionofree Tropospheric Model waasdef Iono. Corrections Type model all
QZSS QZSS √ CA L6 √ L2C √ L5 √ L1C	lonospheric Model Idab *
BDS V B1 V ABOC V 82(8) V 83 V 82A V 81C	Grid sbas 💌
NaviC S S IS	
BAIM Datum	
RAIM Mode on Current Datum for Position W84	
Alarm Limit Mode manual T Use Datum Rotations for off	
Alarm Limit for Manual Mode 555.6	

Figure 44. Positioning Main parameters.

General	Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking
Main Sa	tellites Ma	nageme	ent				
Trk Us All Y 1 Y 2 Y 3 Y 4 Y 5 Y 6 Y 7 Y 8 Y 9 Y 10 Y 11 Y 12 Y 13 Y 14 Y	Hih Ura Y 0	I I	> > 32 > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > >		0	IZSS BEI	DOU NaviC

Figure 45. Positioning Satellites Management parameters.



The following parameters can be queried and changed:

- Enable Solution configure the position computation. [2, Generic Positioning Parameters].
- *Position Masks* elevation mask for satellites and PDOP limited the position computation. [2, Generic Positioning Parameters].
- Lock Systems select satellite constellation(s) used for position computation. [2, Generic Locking Parameters].
- Lock Signals select satellite constellation(s) used for position computation. [2, Generic Locking Parameters].
- Positions Systems select satellite constellation(s) used for position computation. – [2, Enable Satellite System].
- Positions Signals select satellite constellation(s) used for position computation.
 [2, Enable Applicability of Measurements by Signal].
- *Meas. Used* specifies which measurements receiver will use for single point position computation. *[2, Generic Single Point Parameters].*
- Enable Corrections receiver will correct the measured pseudo–ranges for enabled corrections. [2, Generic Single Point Parameters].
- *RAIM* settings for the receiver autonomous integrity monitoring. [2, *RAIM Parameters*].
- Datum settings of the datum that will be used for position computation. [2, Datums].
- Satellite Management set of the similar tabs for each GNSS system. The tabs contain check boxes for enabling/disabling
 - Lock the receiver to track satellites by their PRN. [2, Satellites Tracking Parameters].
 - Use using of GNSS satellite number N for position computation. [2, Generic Positioning Parameters].
 - *Health* excluding satellite number N from position computation when the satellite is unhealthy. [2, Generic Positioning Parameters].
 - Ura exclude satellite number N from position computation when URA value exceeds the limit specified by URA mask parameter. [2, Generic Positioning Parameters].



• *Alm* – Green circle to the right of the check boxes indicates that the almanac is available for the satellite. [2, 4.4.7 Almanac Status].

Base

Base tab provides the capabilities to configure the receiver as a *Reference Base Station* and also allows getting receiver coordinates. Most of these parameters are described in **[2, 4.4.12 Reference Parameters, 4.4.17 RTCM 2.x Parameters, 4.4.18 RTCM 3.x Parameters]** and these references are passed.

Parameters	
General Log-Files TriPad Positioning Base Rover Ports Networking Event Advanced IMU/Mag	9
Reference Position Coordinate system: Gleodetic Acterns These Conter Follow (APC) Lat: 00 * 000 * 0000000 * (k * UK) Lat: 00 * 000 * 0000000 * (k * UK) Alt: +00000 * (k * UK) Cest from Reative: APC -> ABP L1 to ARP Offsets Height, m: Exating, m: Northing, m:	Reference Position Averaging
L1 APC to L2 APC Offset, meters RTCM 2x Base Station Identifier 450 RTCM 3	Sa Settings CAR Settings Da Reference Station 450 CMR Antonia Type 0 CMR Reference Station Identifier 0 Receiver Motion State for CMR unknown * Type of CMR Message to Use. Substitute PX1 for CAV1 m off Data for CMR Message Type 2 If *****

Figure 46. Base parameters.

The following parameters can be set using *Base* tab:

- Reference position the coordinates for L1 Antenna Phase Center (APC) and Antenna Reference Point (ARP). [2, Reference Station Coordinates].
- The APC and ARP coordinates in the receiver are entirely independent. To
 calculate one from another click APC > ARP or ARP > APC buttons. Calculating
 is carried out using L1 to APR Offsets the vector offset between L1 phase
 center and ARP, which is determined by the selected Antenna Type but can be
 changed manually.
- If the coordinates of *APC* and *ARP* are unknown, they can be collected from the receiver by clicking *Get from Receiver* button. The *APC* coordinates will be filled using (*[PG]* –message but this way should not use for real *Reference Station*.



- The RTCM 2.x message 24 as well as *RTCM 3.x* standard requires that *APC* and *ARP* coordinates to be transmitted from reference station to rover receivers.
- *Reference Position Averaging* Settings automatically calculating and setting reference position when precise position is unknown. [2, Reference Position Averaging].
- Reference Antenna Parameters The settings of the antenna and the vector components between a surveyed point (landmark) and the ARP. [2, Reference Antenna Parameters].
- Reference Antenna Offsets Parameter specifies the vector components between L1 Antenna Phase Center (APC) and L2 APC. [2, Reference Antenna Parameters].
- RTCM 2.x Settings Settings for configuring RTCM (Radio Technical Commission for Maritime Services) 2.x corrections. [2, RTCM 2.x Reference Station Parameters, 3.5.3 RTCM 2.x Messages].
- *RTCM 3.x Settings* Settings for configuring RTCM (Radio Technical Commission For Maritime Services) 3.x corrections. [2, RTCM 3.x Reference Station Parameters, 3.5.4 RTCM 3.2 Messages].
- CMR Settings Settings for configuring Compact Measurement Record (CMR) corrections. [2, CMR Reference Station Parameters, 3.5.5 CMR Messages].



Rover

Rover tab allows configuring the receiver as a *rover and* mostly useful for RTK operation. Parameters are described in the chapters [2, 4.4.9 Code Differential (DGPS) *Parameters, 4.4.10 Phase Differential (RTK)*].

eral Log-Files TriPad Pos	itioning E	Base Ro	over Ports Networking E	vent Advanced	IMU/Mag			
IGPS			RTK		RTK Heading Pa	rameters		
Source of DGPS Corrections	nearest	-	RTK Position Computation Mo	de delay	Heading Mode		off	*
Maximum Age of DGPS	30		RTK Delay Mode Variant	last	Use Fixed Baseli	ne Length	off	*
Maximum Age of Ionosphere	300		Rover Dynamics for RTK	1.0000	Fixed Baseline L	ength	0.000	
onosphere-free DGPS Mode	off	-	Confidence Level for Ambiguit	y medium	Fixed Baseline L	ength		
ixed Reference Station ID			Use CA/L1 Measurements for I	RTK on	Fixed Baseline L	ength		
ource Port of DGPS Corrections	any	•	Use P/L1 Measurements for R1	'K on	Penalty Factor for	or Baseline	0.0500	
			Use P/L2 Measurements for RT	Kon	•			
			Use CA/L2 Measurements for I	RTK on	-			
			Use L5 and E5a Measurements	on	•			
			Update Interval of RTK	1.000				
			Environmental Condition Facto	or open	•			
			RTK VRS Mode	off	-			
			RTK Maximum Extrapolation T	me 30.0				
			Multi RTK Mode	off	-			
				on	-			
			RTK Double Check Mode	on				
I-Star Service			RTK Double Check Mode	on				
-Star Service Stream			RIK Double Check Mode	on	Statistics			
	auto	•		user 💌		Plus (Beidou	u+Galileo+Gl	PS+Glona
Stream	Lie e ne	•	Beam		Statistics Solution status "G4 Position status "Co	nverged"		
Stream Correction Stream Source	e beam	•	Beam Beam channel Beam Carrier frequency	user 💌	Statistics Solution status "G4 Position status "Co Warning status bea	nverged"		
Stream Correction Stream Source Current Correction Stream Source	e beam		Beam Beam channel Beam Carrier frequency Beam Data Rate	user 💌	Statistics Solution status "G4 Position status "Co	nverged"		
Stream Correction Stream Source Current Correction Stream Sourc Preferred correction stream for Beam good messages' counter Beam bad messages' counter	e beam beam 767080 19		Beam Beam channel Beam Carrier frequency Beam Data Rate	user • 1545950000 2400	Statistics Solution status "G4 Position status "Co Warning status bea	nverged"		
Stream Correction Stream Source Current Correction Stream Sourc Preferred correction stream for Beam good messages' counter Beam bad messages' counter NTRIP good messages' counter	e beam beam 767080 19 0		Beam Beam channel Beam Carrier frequency Beam Data Rate Beam Scrambling Vector	user	Statistics Solution status "G4 Position status "Co Warning status bea Error status no	nverged" imupd - Glol "0"	bal Beams upo	
Stream Correction Stream Source Current Correction Stream Sourc Preferred correction stream for Beam good messages' counter Beam bad messages' counter	e beam beam 767080 19		Beam Beam channel Beam Carrier frequency Beam Data Rate Beam Scrambling Vector Beam Locking Status	user	Statistics Solution status *G4 Position status *Co Warning status bea Error status no Subscription start	nverged" imupd - Glol "0"	bal Beams upo	
Stream Correction Stream Source Current Correction Stream Sourc Preferred correction stream for Beam good messages' counter NTRIP good messages' counter	e beam beam 767080 19 0		Beam Beam channel Beam Carrier frequency Beam Data Rate Beam Scrambling Vector Beam Locking Status Beam Preamble Status	user	Statistics Solution status "C4 Position status bea Error status no Subscription start Subscription expiration	"0" "2024-03-	bal Beams upo	
Correction Stream Source Current Correction Stream Sourc Preferred correction stream for Beam good messages' counter Beam bad messages' counter NTRIP good messages' counter	e beam beam 767080 19 0		Beam Beam channel Beam Carrier frequency Beam Data Rate Beam Data Rate Beam Locking Status Beam Preamble Status Actual Carrier Frequency	user ▼ 1545950000 2400 5C08 *1* *1* *1545949472*	Statistics Solution status "G4 Position status to Co Warning status bea Error status no Subscription start Subscription expiration Engine version	"0" "2024-03- "HP 8.38e"	bal Beams upo	

Figure 47. Rover parameters.

Available parameter groups:

- DGPS Settings for differential corrections using [2, Generic DGPS Parameters].
- RTK Settings for RTK–engine [2, Generic RTK Parameters].
- *RTK Heading Parameters* Settings for configuring *RTK* engine to compute heading, pitch and orientation in the multi–antenna's receiver [2, *RTK Heading Parameters*], documentation on Duo and Quattro.
- *J–Star Service* these parameters govern JAVAD implementation of Precise Point Positioning service, or J–Star. [2, 4.4.11 Precise Point Positioning (PPP) Parameters].



• *Attitude Parameters*- mode and initial values for calculating vectors in the multiantenna's receiver [2, *Attitude Parameters*], documentation to Duo and Quattro receivers.

Ports

Tab *Ports* contains the nested tabs for configuring all the available *input/output* interfaces of the receiver.

For each interface can be query/set:

- Input Mode Specifies what type of incoming data to accept (excluding TCPO) [2, 4.4.27 Generic Communication Parameters (Basic Operation Mode)].
- Output Mode Periodic output. The messages can be selected from the predefined sets of messages (see Appendix 1. Predefined sets of messages. The list of the messages in the set is displayed when mouse is over the item of drop–down. If ordered output does not match any set it is shown as User Defined.

Most of the interfaces require additional settings.

The nested tabs are following:

Serial Tab

Serial tab – Contains parameters for configuring *serial A, B, C, D, E, F* ports such as *Baud Rate* and *RTS/CRS Handshake*, and so on [2, 4.4.28 Serial Port Parameters. (Hardware Settings)].



Pa	rameters								
G	General Log-Files TriPad Positioning Base Rover Ports Networking Event Advanced Multi-Antennas IMU/Mag								
S	Serial US8 Bluetooth TCP TCPO CAN UDP NTRIP Caster								
[Serial a			Serial b			Serial c		
	Input Mode	cmd 💌		Input Mode	cmd *		Input Mode	cmd *	
	Output	None Period (se	c): 1	Output	None *	Period (sec): 1	Output	None	 Period (sec): 1
	Baud Rate	None		Baud Rate	115200 *		Baud Rate	115200 *	
	RTS/CTS Handshake	DGPS RTCM {1,31,3}		RTS/CTS Handshake	off		RTS/CTS Handshake	off 🔹	
	Elevation Mask for	DGP5 RTCM {9,34,3}		Elevation Mask for	5		Elevation Mask for	5	
	Output Mode	DGPS RTCM (41,3) RTK RTCM (18,19,22,3)		Output Mode	std		Output Mode	std	
	Echo Port	RTK RTCM (20.21.22.3)		Echo Port	/dev/null		Echo Port	/dev/null	
	Serial Port Type	RTK RTCM (18,19,23,24)		Serial Port Type	rs232		Serial Port Type	rs232	
		RTK RTCM (20,21,23,24)							
	Serial d	RTK RTCM3 GD min		Serial e	×		Serial f		
	Input Mode	RTK RTCM3 GD full RTK RTCM3 GGD min	c): 1	Input Mode			Input Mode	User Defined	* Period (sec): 1
	Output Baud Rate	RTK RTCM3 GGD full	c): 🚺	Output Baud Rate	User Defined	Period (sec): 1	Output Baud Rate	User Defined	* Period (sec): 1
		RTK RTCM3 GGD full eph							
	RTS/CTS Handshake	RTK RTCM3 3.0		RTS/CTS Handshake			RTS/CTS Handshake		
	Elevation Mask for	RTK CMR {10,0,1}		Elevation Mask for			Elevation Mask for		
	Output Mode	RTK CMR+ (10,0,9)		Output Mode			Output Mode		
	Echo Port	/dev/null		Echo Port			Echo Port		
	Serial Port Type	rs232		Serial Port Type			Serial Port Type		

Figure 48. Serial ports parameters.

USB Tab

Parameters	
General Log-Files	TriPad Positioning Base Rover Ports Networking Event Advanced Multi-Antennas IMU/Mag
Serial USB Blueto	oth TCP TCPO CAN UDP NTRIP Caster
USB a	
Input Mode	cmd 🔻
Output	None Period (sec): 1
Elevation Mask for	5
Output Mode	std
Echo Port	/dev/null

Figure 49. USB port parameters.

Bluetooth Tab

Bluetooth tab – Allows setting input/output for the available *Bluetooth* ports and also provides *Hardware Settings* to configure *Bluetooth* module [2, 4.4.31 *Bluetooth Parameters*].



Parameters	
General Log-Files TriPad Positioning Base Rover Ports Netw	vorking Event Advanced IMU/Mag
Serial USB Bluetooth TCP TCPO CAN UDP NTRIP Caster	
Bluetooth a	Bluetooth b
Input Mode cmd 🔻	Input Mode Cmd 🔻
Output None Period (sec): 1	Output None Period (sec): 1
Chan Address 00000000000	Chan Address 00000000000
Current Address "unknown"	Current Address "unknown"
Elevation Mask for 5	Elevation Mask for 5
Output Mode std	Output Mode std
Echo Port /dev/null	Echo Port /dev/null
Hardware Settings	
Address "C0:EE:40:67:8A:6F"	
FCCID SQG-60SIPT	
IC 3147A-60SIPT	
Mode on 🔻	
Name "DELTA_S 04450 (,,)"	
PIN "1234"	

Figure 50. Bluetooth ports parameters.

TCP Tab

Receiver provides the TCP server functionality which allows establishing bidirectional TCP connections and also it is capable to operate as TCP client for different kinds of TCP servers.

TCP tab – Contains input/output settings for all types of the TCP ports and statistics on the use of TCP server ports. *[2, 4.2.2 Input and Output Ports Notations].*



Parameters						
General Log-Files TriPad Positioning Base Rover Ports Networking Event Advanced IMU/Mag						
Serial USB Bluetooth TCP TCPO CAN UDP NTRIP Caster						
ТСРа	TCP b					
Input Mode cmd 👻	Input Mode cmd 🔻					
Output None Period (sec): 1	Output None Period (sec): 1					
Elevation Mask for 5	Elevation Mask for 5					
Output Mode std	Output Mode std					
Echo Port //dev/null	Echo Port /dev/null					
TCP c	TCP d					
Input Mode cmd 🔻	Input Mode r					
Output None Period (sec): 1	Output Vone Period (sec): 1					
Elevation Mask for 5	Elevation Mask for 5					
Output Mode std	Output Mode std					
Echo Port //dev/null	Echo Port //dev/null					
ТСРе	TCP Client a					
Input Mode cmd 💌	Input Mode cmd 🔻					
Output None Period (sec): 1	Output None Period (sec): 1					
Elevation Mask for 5	Elevation Mask for 5					
Output Mode std						
Echo Port /dev/null						
TCP Client b	TCP Statistic Port a 10.81.234.3:64475					
Input Mode cmd 💌	Port a 10.81.234.3:04475 Port b 192.168.10.32:60656					
Output Vone Period (sec): 1	Port c					
Elevation Mask for 5	Port d					
	Port e					

Figure 51. TCP ports parameters.

- TCP a, TCP b, TCP c, TCP d, TCP e Input/output settings for the TCP streams (dev/tcp/a,...,dev/tcp/e)
- *TCP Client a, TCP Client b* Input/output settings for *TCP* client connections. Depending on receiver model, up to 2 independent connections could be established at any given time [2, *TCP Client Parameters*].
- *TCP Statistics* List of active incoming TCP connections (IP–address and port are displayed). [2, 4.4.29 Network Parameters (Network Statistics)].

TCPO Tab

TCPO tab – Is designed to enable output data for TCP output server ports. [2, 4.4.29 Network Parameters (TCP Output Server Configuration)].



Parameters	
General Log-Files TriPad Positioning Base Rover Po	rts Networking Event Advanced IMU/Mag
Serial USB Bluetooth TCP TCPO CAN UDP NTRIP O	Caster
TCPO a 8010 Output None Period (sec): 1	TCPO b 8011 Output None Period (sec): 1
Outgoing Message set for the port tcpo/a Output None Period (sec): 1	TCPO d 8013 Output None Period (sec): 1
TCPO e 8014 Output None Period (sec): 1	

Figure 52. TCPO ports output settings.

CAN Tab

CAN tab – The parameters which allow configuring CAN ports of the receiver to establish connections via *CAN* interface. *[2, 4.4.34 CAN Ports Parameters].*

6	
Parameters	
General Log-Files TriPad Po	ositioning Base Rover Ports Networking Event Advanced IMU/Mag
Serial USB Bluetooth TCP	TCPO CAN UDP NTRIP Caster
CAN a	
Input Mode	cmd 💌
Output	None Period (sec): 1
CAN Baud Rate	125
First SID for Input CAN Messages	0x700
The Number of SIDs for Input	8
First SID for Output CAN	0x700
The Number of SIDs for Output	8
Output Mode	std
Echo Port	/dev/null
CAN b	
Input Mode	cmd 🔻
Output	None Period (sec): 1
CAN Baud Rate	125
First SID for Input CAN Messages	0x700
The Number of SIDs for Input	8
First SID for Output CAN	0x700
The Number of SIDs for Output	8
Output Mode	std
Echo Port	/dev/null

Figure 53. CAN ports settings.



UDP Tab

Receiver supports data output using UDP packets. You will use receiver port name

dev/udp/X (X=[a...e]) with em or out commands to request UDP output. Parameters

described in this section specify destination of UDP packets generated by the receiver as well as the rules of splitting of output data stream of bytes into stream of UDP packets. [2, UDP Output Server Configuration].

Parameters	
General Log-Files TriPad Positioning Base Rover Ports Networking E	event Advanced IMU/Mag
Serial USB Bluetooth TCP TCPO CAN UDP NTRIP Caster	
UDP a UDP Destination Address 255.255.255	UDP b UDP Destination Address 255.255.255.255
UDP Destination Port 8004	UDP Destination Port 8004
Output None Period (sec): 1	Output Period (sec):
Output Size Margin for UDP 1200	Output Size Margin for UDP 1200
UDP Multicast TTL 1	UDP Multicast TTL 1
/par/dev/udp/a/dup /dev/null	/par/dev/udp/b/dup /dev/null
UDP c	UDP d
UDP Destination Address 255.255.255	UDP Destination Address 255.255.255
UDP Destination Port 8004	UDP Destination Port 8004
Output Period (sec):	Output Period (sec):
Output Size Margin for UDP 1200	Output Size Margin for UDP 1200
UDP Multicast TTL 1	UDP Multicast TTL 1
/par/dev/udp/c/dup /dev/null	/par/dev/udp/d/dup /dev/null
UDP e	
UDP Destination Address 255.255.255	
UDP Destination Port 8004	
Output Period (sec):	
Output Size Margin for UDP 1200	
UDP Multicast TTL 1	
/par/dev/udp/e/dup /dev/null	

Figure 54. UDP ports settings.



MDM Tab

MDM tab – Is available only for the receivers that support modem ports.

General Log-Files TriPad Positioning Base Rover Ports Networking Event Advanced IMU/Mag Serial USB Bluetooth TCP TCPO CAN UDP MDM NTRIP Caster	Parameters							
	General Log-Files TriPad Positioning Base Rover Ports Networking Event Advanced IMU/Mag							
MDM 5	Serial USB Bluetooth TCP TCPO CAN UDP MDM NTRIP Caster							
mon o	MDM a		MDM b					
Input Mode none 🔻 Input Mode cmd 🔻	Input Mode none 🔻		Input Mode	cmd 🔻				
Output None Period (sec): 1 Output None Period (sec): 1	Output None	 Period (sec): 1 	Output	None	 Period (sec): 1 			
Baud Rate 115200 - Baud Rate 115200 -	Baud Rate 115200 🔻		Baud Rate	115200 💌				
RTS/CTS Handshake on T	RTS/CTS Handshake on 🔻		RTS/CTS Handshake	on 🔻				
Output Mode std Output Mode std	Output Mode std		Output Mode	std				
Echo Port /dev/null Echo Port /dev/null	Echo Port //dev/null		Echo Port	/dev/null				

Figure 55. MDM ports settings.

NTRIP Caster Tab

NTRIP Caster output streams are called /dev/ntrip/X X=[a...e]. An NTRIP client that connects to mountpoint with the name matching /par/net/ntrip/X/mp, will receive the messages enabled to corresponding /dev/ntrip/X output stream. [2, NTRIP Caster Configuration].

Parameter	s									
General	Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	IMU/Mag
Serial U	SB Blueto	oth TC	P TCPO CA			RIP Cast	ter			
NTRIP a Output			•	Period	(sec): 1					
NTRIP b Output			•	Period	(sec): 1					
NTRIP c Output			•	Period	(sec): 1					
NTRIP d Output			•	Period	(sec): 1					
NTRIP e Output			•	Period	(sec): 1					





Networking Tab

Networking tab comprises in turn the set of the tabs to configure the receiver to establish connections via different network interfaces as a server, and client. In most cases, it requires a reboot to the network settings to take effect.

The following nested tabs are available:

LAN Tab

LAN tab – contains LAN DynDNS and DNS parameters described in [2, 4.4.29 Network Parameters].

Parameters							
General Log-Files TriPad Positioning Base Rov	er Ports Networking Event Advanced IMU/Mag						
LAN WLAN Server Client PPP NTRIP Caster							
IP Receiver IP Address 192.168.0.100 Default Gateway 192.168.0.1	DDNS DynDNS Receiver DNS Name "						
Default Gateway 192.108.0.1 DynDNS Mode off Network mask 255.255.255.0 DynDNS Password "s d" Maximum Transmission Unit 1500 DynDNS State off MAC Addeese "00-10-47-74-e=20" DynDNS User "user"							
MAC Address "00:18:d7:74:ec:20" DHCP Switch DHCP client on/off OHCP Client and Server cannot be simultaneously "ON"							
Current IP Address 192.168.10.200 DNS Default DNS Server 0.0.0.0 Current DNS Server 192.168.10.254							

Figure 57. LAN parameters.



LAN parameters are the following:

- *IP* Parameters which configure the receiver to be part of a *TCP/IP* local area network (*LAN*). [2, *LAN Configuration*].
- DHCP Enable the capability to automatically assign LAN/WLAN parameters to the receiver. [2, DHCP Client Configuration].
- Current IP Address IP address on the local network assigned to the receiver at the moment.
- DDNS Settings for accessing and using dynamic DNS server. [2, Dynamic DNS (DynDNS) Client Parameters].
- *DNS* Addresses of the DNS server to use by default and the DNS server used at the moment. [2, DNS Parameters].

WLAN Tab

WLAN tab – Provides parameters that configure the receiver to be part of a TCP/IP wireless local area network (WLAN). See detail description in [2, 4.4.29 Network Parameters (WLAN (WiFi) Configuration)].

Status IP Mode on • Connection State ssociated IP Error none Parameters	Access Point Hotspot Access Point ID "0000000000000" Hotspot SSID Access Point SSID "JAVAD_TRE 802.11 frequency band Current Access Point SSID "JVD" Country code Access Point RSSI -55 Channels	35_DELTA_S*
MAC Address "c0:ee:40:67:8a:6c" DHCP Switch DHCP Client on/off on • DHCP Client and Server cannot be simultaneously "ON" Switch DHCP server on/off • Current IP Address 192:168:20:42	AP Mode wpa * works if Access Point SSID is filled 802.11a channel 802.11b/g channel WEP	
Info /par/net/wlan/inf/fccid_SQG-60SIPT /par/net/wlan/inf/ic_3147A-60SIPT	Key4]





The following parameters configure WLAN:

- Status Mode (on, off, adhoc) and statuses.
- *IP* Parameters of the TCP/IP network and receiver identifier in it.
 - DHCP
 - *Client* Enables the capability to automatically assign *LAN/WLAN* parameters to the receiver. [2, *DHCP Client Configuration*].
 - Server Enables DHCP–server in the receiver.
 - *Current IP Address IP* address on the wireless local area network assigned to the receiver at the moment.
- Access Point ID Access point identifiers, received radio signal power and the type of the encryptions (WEP, WPA–PSK/WPA2–PSK).
 - WEP Key strings for the access point (write–only).
 - WPA Passphrase for the access point (write–only).
- Hotspot Hotspot identifiers, received radio signal power and the type of the encryptions (WEP, WPA–PSK/WPA2–PSK).
 - WEP Key strings for the hotspot (write–only).
 - WPA Passphrase for the hotspot (write–only).
- *Info* Certification parameters of the *WLAN*–module.

Note: Light gray tips appear under the parameters, if necessary.

Server Tab

Server tab – Contains parameters to enable and configure TCP, FTP, HTTP NTP and PTP servers implemented in the receiver. See [2, 4.4.29 Network Parameters].



Parameters									
General Log-Files TriPad Positioning Base Rover Ports Networking Event Advanced IMU/Mag									
LAN WLAN Server Client PPP NTRIP Caster									
TCP/FTP HT TCP Port 8002 HT	TP Port 80	NTP NTP Error							
	TP Connection Timeout 10	NTP Port							
TCP Output Base Port 8010		NTP Replies							
TCP Output Connection Idle 600 FTP Port 21									
FTP Connection Timeout 600									
TCP/FTP Password "a"									
PTP									
Settings	State								
PTP Mode off 👻	PTP Clock Synchronization State								
Maximum Time RMS for PTP 1e-07	PTP Port State								
Check Time Synchronization for on	PTP V2 Clock Accuracy								
PTP Version 2	PTP V2 Clock Class								
PTP One Step off 💌	PTP V1 Clock Identifier								
	PTP V1 Clock Preferred								
	PTP V2 Time Source								
	PTP Version Currently in Use.								
	PTP Version Currently in Use.								

Figure 59. Server parameters.

The following servers can be configured:

- TCP/FTP Parameters allow
 - TCP clients To establish bidirectional connections to receiver. [2, TCP Server Configuration].
 - *FTP-standard clients* To download files (for example). [2, *FTP Server Configuration*].
- *HTTP* Parameters allows external program running in a *WWW browser* (see [4]) to establish bidirectional connections to receiver on top of *HTTP* protocol. [2, *TCP Server Configuration*].



- *NTP* Parameters of the *Network Time Protocol* (*NTP*) for receivers that support it. [2, *NTP Server Configuration*].
- *PTP* Parameters and state of the *Precision Time Protocol (PTP)* for receivers that support it (IEEE Std 1588, versions 1 and 2) [2, *PTP Server Configuration*].

Note: Receiver behaves as PTP grand-master clock only.

Client Tab

Client tab – Allows configuring the receiver to operate as TCP client for different kinds of TCP servers [2, 4.4.29 Network Parameters (TCP Client Parameters)].

The parameters for *Client A* and *Client B* are identically. *Client B* is available depending on receiver model.

To access *Client B* parameters, it will need to be selected.

Parameters			
General Log-Files TriPad Pos	sitioning Base	Rover Ports Networking Event Advance	d IMU/Mag
LAN WLAN Server Client P	PPP NTRIP Cas	iter	
A B			
Mode		Raw TCP Client	NTRIP Client
TCP Client Mode off	•	Host Name of Raw TCP Server ""	Host Name of NTRIP Caster ""
TCP Client Connection State off		IP Address of Raw TCP Server 0.0.0.0	IP Address of NTRIP Caster 0.0.0.0
TCP Client Timeout 20		IP Port of Raw TCP Server 0	IP Port of NTRIP Caster 0
TCP Client Error "none		Login for Raw TCP Server	NTRIP User Name
TCP Client Suspend off	•	Password for Raw TCP Server ""	NTRIP Password
		TCP-client RAW mode off 🔹	NTRIP Mount Point
			NMEA GGA Period for NTRIP 0
			Host Name ""
			NTRIP Protocol Version 1
NTRIP Server		SISNeT Client	
Host Name of NTRIP Caster ""		Host Name of SISNeT ""	
IP Address of NTRIP Caster 0.0.0.	.0	IP Address of SISNet 0.0.0.0	
IP Port of NTRIP Caster 0		SISNet Password ""	
NTRIP User Name		IP Port of SISNet 0	
NTRIP Password		SISNet User Name ""	
NTRIP Mount Point ""			
NTRIP Host			
NTRIP Protocol Version 1			





The following parameters for both *Client A* and *Client B* can be set:

- *Mode* Causes the receiver to operate as a client of a certain type and displays statuses.
- *Raw TCP Client* Parameters to establish *TCP* connection to another (remote) *JAVAD GNSS* receiver. [2, *RCV Mode Parameters*].
- *NTRIP Client* Parameters to establish connection to an NTRIP caster as a client and request data from particular mount point. [2, NTRIP Client Parameters].
- *NTRIP Server* Parameters to establish connection to an *NTRIP* caster as a server and add itself as mount point. [2, *NTRIP Server Parameters*].
- SisNeT Client Parameters to establish connection to a SISNeT server.

PPP Tab

PPP tab – Displays *PPP* server settings and statuses. *PPP* server starts when receiver connects to *Internet* via *GPRS* and does not require configuring. Only authentication and compression parameters could be set in peculiar cases.

The parameters are described in [2, 4.4.29 Network Parameters (GPRS/DIALUP (PPP) Configuration)].

Parameters	
General Log-Files TriPad Positioning	Base Rover Ports Networking Event Advanced IMU/Mag
LAN WLAN Server Client PPP NTR	RIP Caster
State	Details
PPP Connection State off	Enable PAP Authenticaion on 🔻
PPP Baud Rate	Enable CHAP Authentication on 🔻
PPP Set Default Route	Enable Van Jacobson *
PPP Debugging	Enable Connection-ID *
PPP Error	
Server	IP
/par/net/ppp/srv/mode	Current IP Address
/par/net/ppp/srv/state	
/par/net/ppp/srv/port	
/par/net/ppp/srv/hisip	
/par/net/ppp/srv/ourip	
/par/net/ppp/srv/wndscr	
/par/net/ppp/srv/debug	





PPP parameters:

- State Connection statuses of PPP server [2, PPP Configuration Parameters].
- Details Additional authentication and compression settings [2, PPP Configuration Parameters].
- Server Internal PPP–server settings.
- *IP* Current IP address assigned by the cell operator.



NTRIP Caster tab

NTRIP Caster tab – displays *NTRIP caster* output streams parameters are called /dev/ntrip/X X=[a...e]. An NTRIP client that connects to mountpoint with the name matching /par/net/ntrip/X/mp, will receive the messages enabled to corresponding /dev/ntrip/X output stream.

The parameters are described in [2, 4.4.29 Network Parameters (NTRIP Caster Configuration)].

Parameters	
General Log-Files TriPad Positioning Base Pr	over Ports Networking Event Advanced IMU/Mag
LAN WLAN Server Client PPP NTRIP Caster	
LAN WLAN Server Client PPP NTRIP Caster	
Settings	Mount Point A Mount Point B Mount Point C Mount Point D Mount Point E
NTRIP Caster IP Port 2101	Name "DELTA_S_04450_A"
NTRIP Caster Connection Timeout 600	Type STR
NTRIP Caster Login User Name	identifier
NTRIP Caster Password **	format
NTRIP Caster Protocol Version 1	format-details Get From Port Output
NTRIP Caster Mode off 👻	carrier 0 💌
	nav-system
	network
	country
	latitude Get From Ref. ARP
	longitude Get From Ref. ARP
	nmea 0 💌
	solution 0 🔻
	generator
	compr-encryp
	authentication N 🔻
	fee N 🔻
	bitrate 0
	misc none

Figure 62. NTRIP Caster parameters.



NTRIP Caster parameters:

- Settings Network settings for connecting to the receiver's NTRIP output stream.
- Mountpoints 5 mountpoints can be configured by filling all standard fields. Format–details field can be got from the corresponding port, latitude and longitude – from Reference ARP. Mountpoint source entry sent in the NTRIP source table is concatenation of mountpoint name and then all the N strings for particular mountpoint X.

Event Tab

Tab *Event* is designed to configure *Pulse per Second* (PPS) signals and *External Events.*

Pulse per Second (PPS) signals [2, 4.4.8 Positioning Parameters. Pulse per Second (PPS) Parameters] have programmable reference time system, period and offset. There could be up to two *PPS* outputs in *JAVAD GNSS* receivers, "a" (PPSA) and "b" (PPSB). It is possible to use both PPS outputs concurrently. *PPSA* or both *PPSA* and *PPSB* can be available depends on *PPS* option value.

External Event functionality [2, 4.4.8 Positioning Parameters. External Event Parameters] allows the user to measure/record input event times. Up to two external event pins, *Event A* and *Event B* may be accommodated depending on receiver model. *EVNT* option value determines availability of *EventA* or both *EventA* and *EventB*.

Parameters											
General Log-Files TriPad Po		Positioning	Base	Rover	Ports	Networking	Event	Advanc	ed IMU	l/Mag	
PPS a					PPS b						
Enable PPS Generation on		on	•	Enable	able PPS Generation		on				
PPS Ref	erence Time		utc	-	PPS Reference Time			utc	-		
Tie PPS	to its Referer	ice Time	on	-	Tie PPS to its Reference Time		on	-			
PPS Per	iod		1000	00		PPS Period		1000			
Millised	onds of PPS (Offset	0		Millise	Milliseconds of PPS Offset		0			
Nanose	conds of PPS	Offset	0		Nanos	Nanoseconds of PPS Offset		0			
PPS Ref	PPS Reference Edge		rise	-	PPS Reference Edge		rise	•			
PPS Pul	PPS Pulse Length 200		2000000		PPS Pulse Length		2000000				
Period	Period of Marked PPS Pulses 0		0	=	Period	of Mark	ked PPS Pulses 0				
Length	Length of Marked PPS Pulses 300		3000000	=	Length	Length of Marked PPS Pulses		3000000			
Event a					Ev	ent b					
Enable	Enable Event Acquisition		off	off 🔹		Enable Event Acquisition		off		•	
Event R	Event Reference Time		utc	utc 🔻		Event Reference Time		utc		•	
Tie Mea	Tie Measured Event Time to its		s on	-] Ti	Tie Measured Event Time		e to its on		-	
Event R	Event Reference Edge		rise	rise 🔻		Event Reference Edge		rise		-	
Synchronize Receiver Clock with		th off	off 🔹		Synchronize Receiver Clos		ck with off		-		
Status of the Receiver Clock		off		St	Status of the Receiver Clock			off			
/par/dev/event/a/offs/ns			0		/par/dev/event/b/offs/ns 0						

Figure 63. Event parameters.

The following parameters are available:

- *PPS a (PPS b)* Settings for the *Pulse per Second* signals either *PPSA* or *PPSB*.
- Event a (Event b) Settings for external events input either EventA or EventB.



Advanced Tab

Tab Advanced contains the set of tabs for the fine settings that are rarely used.

Anti–Interference tab

Anti–Interference tab allows enabling anti–jamming mode for the GPS, GLONASS, GALILEO and BEIDOU bands [2, 4.4.5 Measurements Parameters. Anti–jamming Parameters].

Pa	aramete	rs								
(General	Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced
1	Anti-Inte	erference	Multipat	h Reduction	Loop	Manage	ement	External Freq	uency	Raw Data M
	Anti-ja	mming]				
	Anti-jar	mming Mode		n	•					
	Enable	Anti-jamming	g on gps1	on	-					
	Enable	Anti-jamming	g on gps2	on	-					
	Enable	Anti-jamming	g on gps5	on	-					
	Enable	Anti-jamming	g on glo1	on	-					
	Enable	Anti-jamming	g on glo2	on	-					
	Enable	Anti-jamming	g on glo3	on	-					
	Enable	Anti-jamming	g on gal5b	on	-					
	Enable	Anti-jamming	g on gal5	on	-					
	Enable	Anti-jamming	g on gal6	on	-					
	Enable	Anti-jamming	g on bei1	on	-					
	Enable	Anti-jamming	g on bei3	on	•					
	Enable	Anti-jamming	g on ind1	on	-					

Figure 64. Anti–Interference parameters.

Multipath Reduction tab

Multipath Reduction tab contains parameters for enabling code and carrier multipath reduction for CA/LI. [2, 4.4.5 Measurements Parameters. Correlator Parameters].



Parameters							
General Log-Files TriPad Pos	sitioning	Base	Rover	Ports	Networking	Event	Advanced
Anti-Interference Multipath Re	duction	Loop	Manage	ement	External Freq	uency	Raw Data M
CA/L1 Code Multipath Reduction	mpnew mpnew	•					

Figure 65. Multipath Reduction parameters.

Loop Management Tab

Loop Management tab contains tracking loop parameters which is not recommended to change from their default values [2, 4.4.5 Measurements Parameters. Tracking Loop Parameters].

General	Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	IMU/Mag
Anti-Inte	rference	Multipat	h Reduction	Loop	Manage	ement	External Freq	uency	Raw Data N	lanageme
CLL Tra	cking Loops				PL	L Tracki	ng Loops			
CA/L1 C	LL Bandwidt	th	3.0] CA	VL1 PLL	Bandwidth	2	25.0	
CA/L1 C	CLL Order		1] C4	VL1 PLL	Order		3	
CA/L1 C	CLL by CA/L1	PLL Guide	e 100] Str	rong Loo	ops PLL Bandwid	th 🗄	3.0	
Strong I	Loops CLL Ba	andwidth	3.0] Sti	rong Loc	ps PLL Order	[1	
Strong I	Loops CLL O	rder	1] Sti	rong Loc	ops PLL by CA/L1	PLL	100	
Strong I	Loops CLL by	y CA/L1 PL	L 100] w	eak Loop	os PLL Bandwidt	h [3.0	
Strong I	Loops CLL by	y Its Own	. 0] w	eak Loop	os PLL Order	-	1	
Weak Lo	pops CLL Bar	ndwidth	3.0] w	eak Loop	os PLL by CA/L1	PLL	100	
Weak Lo	oops CLL Or	der	1] └─					
Weak Lo	oops CLL by	CA/L1 PLL	100]					
Weak Lo	pops CLL by	Its Own P	LL 0		1					

Figure 66. Loop Management parameters.

The following parameters are available:

- *CLL Tracking Loops* Parameters for Code Lock Loop.
- *PLL Tracking Loops* Parameters for Phase Lock Loop.



External Frequency tab

External Frequency tab is designed to select and configure oscillator and hardware calibrator [2, 4.4.5 Measurements Parameters].

Parameters							
General Log-Files TriPad Positioning Ba	se Rover Ports	Networking Event	Advanced	IMU/Mag			
Anti-Interference Multipath Reduction Lo	op Management	External Frequency	Raw Data I	Management Attitude pa	rameters	Asic par	ameters
Frequency Input and Output Parameters	Oscillator Param	eters		Calibrator			
Input Frequency Amplitude off	Oscillator Freque	ency Offset off	•	Calibrator Mode	off	•	
Input Frequency Value 10				Use Calibrator Measurements	off	•	
Input Frequency Status off				Calibrator Measurements	n		
Frequency Mode off 💌			L				
Output Frequency Value 10							

Figure 67. External Frequency parameters.

The available parameters are the following:

- Frequency Input and Output Parameters Frequency parameters. [2, Frequency Input and Output Parameters].
- Oscillator Parameters Oscillator mode [2, Frequency Input and Output Parameters].
- Calibrator Parameters govern the behavior of the hardware calibrator. [2, Hardware Calibrator].



Raw Data Management Tab

Raw Data Management tab contains the settings of the internal receiver time grid and smoothing for different the indicators.

General Log-Files TriPad Positioning Base Roy	
General Log-riles Inrad rositioning base Kov	ver Ports Networking Event Advanced IMU/Mag
Anti-Interference Multipath Reduction Loop Man	agement External Frequency Raw Data Management
Update Rate	Smoothing
Measurements Update Rate 100	Pseudorange Smoothing Interval 100
Effective Measurements Update 100	Ionosphere Corrections 60
Position Update Rate 100	Minimum lonosphere 30
Effective Position Update Rate 100	Doppler Smoothing Bandwidth 3.0
	Doppler Smart Smoothing Mode. off

Figure 68. Raw Data Management parameters.

The following parameters are presented:

- Update rate Parameters specify the required period of the internal receiver time grid and position updates. [2, 4.4.5. Measurements Parameters. Generic Measurements Parameters, 4.4.8. Positioning Parameters. Generic Positioning Parameters]. Effective read–only values are depending of the available options.
- Smoothing Smoothing settings for the different indicators. [2, 4.4.5. Measurements Parameters. Generic Measurements Parameters].

Attitude parameters tab

Attitude parameters tab allows configure and calibrate multi antenna receiver (see documentation on Duo and Quattro and [2, 4.4.10 Phase Differential (RTK) Parameters. Attitude Parameter].



Parameters			
General Log-Files TriPad Positioning Base Rove	er Ports Networking Event Advanced II	MU/Mag	
Anti-Interference Multipath Reduction Loop Mana	gement External Frequency Raw Data Mar	nagement Attitude parameters Asic param	neters Spoofing Advanced Tracking
Attitude Parameters	Antennas length	Baseline vectors	Calibrator
Attitude Mode 0	Distance between A and B	X coordinate of vector AB	Start Self-calibration off 🔹
Pitch, Roll, and Heading Offsets {0.0000,0.0000,0.0000}	Distance between A and C	Y coordinate of vector AB	Use constraints
Number of Epochs to Use for 60	Distance between A and D	Z coordinate of vector AB	Angle Determination *
Attitude Processing Mode delay 🔻	Distance between B and C	X coordinate of vector AC	
Master Input Mode none 🔻	Distance between B and D	Y coordinate of vector AC	
	Distance between C and D	Z coordinate of vector AC	
		X coordinate of vector AD	
		Y coordinate of vector AD	
		Z coordinate of vector AD	

Figure 69. Attitude parameters.

The following parameters are available for the multi antenna receiver:

- Attitude Parameters [2, Attitude Parameters].
- Antennas length Distance between antennas.
- Baseline vectors Coordinates of the baseline vectors.
- Calibrator Staring self–calibration [2, Attitude Parameters], calibrator settings.

Asic parameters tab

Asic parameters tab allows setting processor clock frequency and displays current DSP (digital signal processor) sampling frequency [2, 4.4.44 Miscellaneous parameters].

ſ	Paramete	rs											
	General	Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	Multi-Antenr	as IMU/Mag	
	Anti-Inte	erference	Multipat	h Reduction	Loop	Manage	ement	External Freq	uency	Raw Data N	lanagement	Attitude parame	eters Asic parameters
	Freque	ncy			7								
	ASIC Fr	equency	120.	• 000									
	ASIC Cu	urrent Freque	ency 120.	000									

Figure 70. Asic parameters.



Spoofing Tab

Spoofing parameters tab allows setting processor clock frequency and displays current DSP (digital signal processor) sampling frequency [2, 4.4.5 Measurements parameters. Spoofing Detection Parameters).

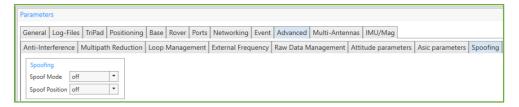


Figure 71. Spoofing parameters.

Advanced Tracking Tab

Advanced Tracking parameters tab allows to configure guided vs independent tracking [2, 4.4.4 Locking on Satellite Signals. Advanced Tracking Parameters).

Parameters								
General Log-Files	TriPad Positioning	Base Rover Ports	Networking Event	Advanced Multi-Anter	nnas IMU/Mag			
Anti-Interference	Multipath Reduction	Loop Management	External Frequency	Raw Data Management	Attitude parameters	Asic parameters	Spoofing	Advanced Tracki
Guide Tracking GPS GLO GLO GLOMA SBAS GAL BDS QZSS NavIC								

Figure 72. Advanced Tracking parameters.

Multi-Antennas Tab

Tab *Multi–Antennas* allows to configure output to each port for each antenna. Tab is available for multi–antennas receivers only [2, 4.4.20 Parameters of Generic GREIS Messages. Masks and Counters].



General	Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	Multi-Antenna	s IMU/Mag
Output	A B										
file a	\checkmark										
file b											
file c											
file d	\checkmark										
file e											
blt a											
blt b											
ser a	\checkmark										
ser b											
ser c	\checkmark										
ser d	\checkmark										
tcp a	\checkmark										
tcp b	✓ ✓										
tcp c											
tcp d											
tcp e											
tcpcl a											
tcpcl b											

Figure 73. Multi–antennas output parameters.

IMU/Mag Tab

Tab *IMU/Mag* allows to configure IMU–module and magnetometer [2, 4.4.40 IMU *Parameters*].



Parameters										
General Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	Multi-Antennas	IMU/Mag
IMU				N	Magneto	meter				
Settings IMU Identifier [IMU Mode [IMU Update Rate [IMU Filter Size [IMU Monitor [6 y y 0 0 42.60 none	05 • • • • • • • • • • • • •			Setting: Magnet Magnet Magnet State Magne		atus	*		

Figure 74. IMU/Mag parameters.

3.3.2 Set WiFi Ad Hoc Mode for iPhone/iPad

Button for setting up receiver as WiFi Ad Hoc for iPhone/iPad (duplicate 3.1.2 Actions).

Parameters		K
General Log-Files TriPad Positioning Base Roy	ver Ports Networking Event Advanced I	MU/Mag
General	Power Management	Temperature
Elevation Mask	Modes	Receiver Board Temperature, °C 41.0
Elevation Mask for SVs Locking 5	Battery Charging Mode auto 🝷	
Elevation Mask for Position 10	Enable Power Output	
	Low Power Mode on 💌	
Antenna	Power Off on 💌	
Antenna Input int 💌	Sleep Mode off 👻	
Antenna Current Input int		
Status of External Antenna	Voltages	
	External Power Voltage 0.00	
	Receiver Board Voltage 7.54	
	Battery Voltage a 7.52	
	Battery Voltage b 0.00	Set WIFI AdHoc mode for IPhone/IPad
	Charger Output Voltage 0.00	×
	Output Voltage	
○ ✓	~	Refresh read-only Params Configuration -
		Set WiFi AdHoc mode for IPhone/IPad 🗸 🗸 📀
		A



3.3.3 Save / Load Configuration

All the parameters from all the tabs can be saved to the *tcl*-script (see *Appendix 2. TCL*-*script example*). The saved parameters can be loaded to this or another receiver. To save configuration click button *Configuration > Save* and select file for saving.

eneral Log-Files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	M b	lulti-Antennas	IMU/Mag			
General Elevation Mask Elevation Mask for Elevation Mask for Antenna Antenna Input Antenna Current Ir Status of External J	SVs Lock Position.	ing 12 5 ext ext			Power M Modes Battery Enable Low Po Power I Sleep M Voltage Externa Receive Battery Battery Charge	anagement Charging Mode Power Output wer Mode Off Mode	on off 17.93	× × × ×		Temperature	Temperature,"C	: 46.6		
0 ✓					State o	f Charge		~	Ref	resh read-only Pa	rams		C	onfiguratio

Figure 76. Save / Load Configuration menu.

If any edited parameters were not applied the appropriate warning will be shown.

All the parameters from all tabs except *LAN* and *WLAN* will be saved to the file of the *tcl* format (Tool Command Language). The *tcl*-script cannot be loaded to the receiver using ordinary terminals *ONLY* using tab *Parameters* of *NetView*

While saving user interface is disabled and the corresponding information is displayed near the button.



arameters	
General Log-Files TriPad Positioning Base Ro	er Ports Networking Event Advanced Multi-Antennas IMU/Mag
General Elevation Mask Elevation Mask for SVs Locking 12 Elevation Mask for Position 5 Antenna Antenna Input Antenna Current Input Ext Status of External Antenna off	Power Management Modes Battery Charging Mode T Enable Power Output T Low Power Mode on Power Off on Sleep Mode off Voltages 17.95 Battery Voltage a 17.95 Battery Voltage a 17.95 Battery Voltage a 1000 Charger Output Voltage 1000 State of Charge 1000
○ ✓	C Save Configuration Script PPP is saving Configuration

Figure 77. Saving the configuration.

To load configuration, click button *Configuration > Load* and select *tcl*-file.

♂ Open		×
		^
$\leftarrow \rightarrow \checkmark \uparrow$ 🖹 « N ⁻ 'cina > Documents v 🗸	Search Documents	Q
Organize 👻 New folder		
This PC Name	Date modified	Туре
Desktop	1/18/2017 1:59 PM	TCL File
🔮 Documents		
🕹 Downloads		
h Music		
E Pictures		
🔗 Videos		
Local Disk (C:)		
👳 media (\\fs-2.gn 🗸 <		>
File <u>n</u> ame: 3W10.tcl ~	Tcl script	\sim
	<u>O</u> pen Cano	cel

Figure 78. Load configuration from script.

MuAfter checking the board compatibility, the script will be loaded to the receiver and the result will be output in the *Manual Mode* pane.

○ ✓		Configuration -
		 ب ب <u>ه</u> ه
Cheking receiver		A
Correct board: TRIUMPH2_11		
Setup receiver configuration		
Setup General		
> %/par/lock/elm%	OK	
> %/par/pos/elm%	OK	
Setup Log-Files		
> %/par/log/rot/mode%	OK	
> %/par/log/rot/rmold%	OK	
> %/par/log/push/mode%	OK	
> %/par/log/push/host%	OK	
Setup TriPad		
Setup Main		
> %/par/pos/mode/cur%	OK	
> %/par/pos/elm%	OK	-
> %/par/lock/sys/comp%	OK	
> %/par/pos/sys/comp%	OK	
Setup Satellites Management		
Setup Base		
> %/par/rtcm/base/stid%	OK	
> %/par/rtcm3/base/stid%	OK	
> %/par/cmr/base/stid%	OK	
Setup Rover		
> %/par/pos/pd/mode%	OK	v

Figure 79. Configuration *tcl*-script loaded.

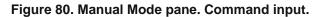
3.3.4 Limited Manual Mode Pane

The *Manual* pane is located under the parameter tabs and allows directly controlling the receiver by using of GREIS commands. The *Manual* pane works like a limited terminal communicating with the receiver, (i.e., it allows the user to send various receiver commands and get responses to these commands). For a complete list of commands supported by JAVAD GNSS receivers, refer to the *Greis Manual* [2].

The *Limited Manual* pane does not support outputting of the messages. Only the responses to the commands are displayed and can be logged.

The full–function terminal is provided on the *GREIS Commands* tile (see Manual Mode chapter).

0 🗸		Clear terminal	Configuration
print/			1- 4 2 3
⊴∳ cur			
=∳ dev			
🚰 log 🖞			Send
=∳ log			
🖤 msg			Load script
🕸 par			
Greis command	ds autocomplete		Last commands





The Manual pane consists of the following elements:

- The *Input* line for the Greis commands. As you type a hint is shown with a list of available commands.
- The *Output* window displays receiver responses. ">" means that the receiver responded and is followed by the text of the response.
- The *Last Commands* button allows select one of the previously used commands. Up to 50 commands are stored.
- The Send button sends command to the receiver (equivalent to Enter in Input Line)
- The *Clear* button clears the Output Window.
- Load Script button sends a set of the commands from the selected script to the receiver.



Figure 81. Manual mode output. The reply of the receiver.

The size of the pane can be changed by stretching out the slider, which separates the parameters and the field for manual input. The slider has a typical light blue handle in the middle.



3.4 File Operations

The *NetView* provides the friendly interface for monitoring and managing the memory of the receiver. You can start up 5 *jps*–files recording, send *free–events* to file, *stop* recording, *download* file from the receiver or delete it.

Expand *Files* tile to select the *File* window.

\$	TreDuo_Imu-494	6921 TRE_DUO_IMU D	369D6A47A3817CA6A40	80BCEF									×
Repo	ts • Actions •	Update Options + Upda	ate Firmware 🔹									*	←↑ ↓→
Files													¥
	Name	Size	Modified	Rec 🔻	State			Info					<u>^</u>
	log1211I	3.12 MB (3276330)	12/11/2023 11:10:23 AN	1 💿			×						
	log0824i	3.41 MB (3574454)	8/24/2023 7:11:28 AM	•	7		×						
	log0824p	2.31 MB (2422344)	8/24/2023 9:59:41 AM	-	F .		×						
	log1010i.rin.tar.gz	8.67 MB (9090416)	10/10/2023 8:59:41 AM	•	7		×						
	log0809q	11.43 MB (11989931)	8/9/2023 4:59:41 PM		r -		×						
	log0822u	18.09 MB (18968125)	8/22/2023 3:59:41 PM	-	F		×						
\checkmark	log1018h	17.11 MB (17938733)	10/18/2023 7:59	Providend			×						
	log1110p.rin.tar.gz	7.98 MB (8372558)	11/10/2023 3:59×	Download Cancel File Trans			×						
	log1127h.rin.tar.gz	8.51 MB (8922387)	11/27/2023 7:59×		er		×						
	log1207d.rin.tar.gz	7.27 MB (7627400)	12/7/2023 3:59:4	Delete			×						
	log1203p	17.74 MB (18602696)	12/3/2023 3:59:41 PM	-	F		×						
	log1201r	16.92 MB (17743310)	12/1/2023 4:59:41 PM	•	F		×						
	log1015k.rin.tar.gz	8.20 MB (8601326)	10/15/2023 10:59:41 AN	1 1	F		×						
	log1206f.rin.tar.gz	8.48 MB (8893265)	12/6/2023 5:59:41 AM	-	F		×						-
8	log12111 🖲 🕴 🌘	0000	• • • • •	Download	Files 3595	Memory (Free/Tot	al) 5.26 / 52.27	GB			X Delete	e 🗙 Delete	All
Ne	w File Settings				Free Event								
N	ame:	Elevation mask(°):	5 CMessage Set def	*	Site name:								
					Antenna			ht, m: 0 🗧	Slant				
R	ecording interval(s): 1	Send Antenna Fr	ee Event		Antenna		Heig	nt, m: 🕛 📰	Siant				
Mair	C7	Parameters 🗗 GNSS	Spectra 🗗 Spoofin	g 📑 Mode	m 🖸	Calibration	Options	Output	Ľ"	Greis Comman	ds 🗗 🖡	Real-Time Log	C2
i Infe	🗙 Measur	🗙 Settings 🛛 🗠 In	terfere Spoofin	9	∖ ⊮	SV 4	i≡ Actual	 Ports 	Message	0		·	
\$ c	onnected TCP 1	92.168.10.205:8002 => dev	/tcp/b 🖌 🖌 File List	Request									

Figure 82. File window.

In the upper part of the window is a list of files. If the list is large, it might take some time to get it. The following information is provided for each file:

- Name
- Size
- *Modified* Time of the last modifying
- Rec If the file is recording at the moment A or (B, C, D, E) is displayed depending *log–file A* (B, C, D, E) is recording
- State Status of downloading
- Delete button Removes file from the receiver.
- Info Displays path and speed of downloading.



Each file line in the list provides *Download* button and *Delete* button to download or delete concrete file.

To perform group operation, select file list items and right–click to open the context menu.

The information about *Total Files*, *Total Memory*, *Free Memory* available in the receiver is displayed under the file list.

3.4.1 Start/Stop File Recording

Under file list the pane for file recording is located.

The red circles with the letters A (B, C, D, E) inside are displayed if the corresponding file is recording. For the recording file the *Stop* button is available. Otherwise, there is the *Start* button. If no name is set a new file will be started with default name.

To configure a new file:

- Type file *Name* or leave the field empty to get default name.
- Specify the *Elevation Mask*, the parameter for excluding the satellites whose elevation angles are less than the specified value.
- Specify the Recording interval of output.
- Select Message Set from drop-down list, the parameter specifies the name of particular message set that will be enabled for corresponding log-file.
- Check the *Antenna Free Event* if desire to send the following free events when file is starting:
 - "_DYM=STATIC"
 - "_SIT=" name of the site
 - "_ANT=" type of the antenna
 - "_ANH=" height of the antenna (with slant if checked)
- The values for _SIT, _ANT, _ANH and slant can be specified on the Free Event pane.

Note: See information about the free events [2, 2.3.9 event].



3 log12111 Q 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	load Files 3595 Memory (Free/Total) 5.25 / 52.27 GB X Delete All
New File Settings Stop File A Start File D	Free Event
Name: Elevation mask(°): 5 💮 Message Set def	Site name:
Recording interval(s): Send Antenna Free Event usr/0 usr/1	Antenna 🗾 Height, m: 0 🚍 🗌 Slant
\$\$\$ Connected TCP 192.168.10.205:8002 => dev/tcp/b \$\$\$\$ rkk/jsr/max	

Figure 83. File recording.

Click *Start* button next to the red circle A (B, C, D, E) to start corresponding *log–file* If you try to start file that is already exists you will be suggested to append or overwrite it.

Name	Size		Modified	Rec 🔻		Stat
] log12111	17.61 MB	(18465292)	12/11/2023 11:59:41 AM		-	
log0824i	3.41 MB (3	3574454)	8/24/2023 7:11:28 AM		₹	
log0824p	2.31 MB (2	2422344)	8/24/2023 9:59:41 AM		-	
Start File	_		10/10/2023 8:59:41 AM		Ŧ	
			8/9/2023 4:59:41 PM		₹.	
File log0824p i	s already exis	sts.	8/22/2023 3:59:41 PM		Ŧ	
Append Ov	verwrite	Cancel	10/18/2023 7:59:41 AM		Ŧ	
log1110p.rin.tar.gz	7.98 MB (8	3372558)	11/10/2023 3:59:41 PM		Ŧ	
log1127h.rin.tar.gz	8.51 MB (8	3922387)	11/27/2023 7:59:41 AM		₹	
log1207d.rin.tar.gz	7.27 MB (7	7627400)	12/7/2023 3:59:41 AM		Ŧ	
log1203p	17.74 MB	(18602696)	12/3/2023 3:59:41 PM		Ŧ	
log1211m 💿	6	O O] 🕑 😑 💽 🔻	Download		Files
New File Settings					Fre	e Ev
Name: log0824p	Elevatio	on mask(º):	5 🔹 Message Set def	•	Si	te na
Recording interval(s): 1		end Antenna Fr	raa Evant		Δ	ntenn

Figure 84. Existing file is started.



3.4.2 Download Files

Select one or several files from the file list and click *Download* button or in the context menu. Specify the file path in case of single file or folder if several files are selected.

Name	Size	Modified	Rec 🔻	State		Info
log1211m	4.97 MB (5210769)	12/11/2023 12:16:28 PM	8		×	
log0824i	3.41 MB (3574454)	8/24/2023 7:11:28 AM		7	×	
log0824p	2.31 MB (2422344)	8/24/2023 9:59:41 AM	-	Downloaded (/dev/tcp/b - 4139.92 KB/s.)	×	C:\Users\natdvo\Desktop\tre_files\log0824p.jps
log1010i.rin.tar.gz	8.67 MB (9090416)	10/10/2023 8:59:41 AM	-	7	×	
log0809q	11.43 MB (11989931)	8/9/2023 4:59:41 PM	-	Downloaded (/dev/tcp/b - 4215.67 KB/s.)	×	C:\Users\natdvo\Desktop\tre_files\log0809q.jps
log0822u	18.09 MB (18968125)	8/22/2023 3:59:41 PM	-	Downloaded (/dev/tcp/b - 4068.16 KB/s.)	×	C:\Users\natdvo\Desktop\tre_files\log0822u.jps
log1018h	17.11 MB (17938733)	10/18/2023 7:59:41 AM		Downloaded (/dev/tcp/b - 4184.37 KB/s.)	×	C:\Users\natdvo\Desktop\tre_files\log1018h.jps
log1110p.rin.tar.gz	7.98 MB (8372558)	11/10/2023 3:59:41 PM	0	77% (6.16 MB)	×	C:\Users\natdvo\Desktop\tre_files\log1110p.rin.tar.gz
log1127h.rin.tar.gz	8.51 MB (8922387)	11/27/2023 7:59:41 AM	6		×	C:\Users\natdvo\Desktop\tre_files\log1127h.rin.tar.gz
log1207d.rin.tar.gz	7.27 MB (7627400)	12/7/2023 3:59:41 AM	0		×	C:\Users\natdvo\Desktop\tre_files\log1207d.rin.tar.gz
log1203p	17.74 MB (18602696)	12/3/2023 3:59:41 PM	0		×	C:\Users\natdvo\Desktop\tre_files\log1203p.jps
log1201r	16.92 MB (17743310)	12/1/2023 4:59:41 PM	0		×	C:\Users\natdvo\Desktop\tre_files\log1201r.jps
log1015k.rin.tar.gz	8.20 MB (8601326)	10/15/2023 10:59:41 AM		7	×	
log1206f.rin.tar.gz	8.48 MB (8893265)	12/6/2023 5:59:41 AM		7	×	
log1107b.rin.tar.gz	10.02 MB (10511567)	11/7/2023 5:59:41 PM	-	Ŧ	×	

Figure 85. Download files.

Downloading states are displayed in the file list. The *Cancel* button for interrupting of the file transfer is available instead of *Download* button.



3.4.3 Delete Files

Select the files you want to delete and click *Delete* button in the line, or in the context menu, or under the file list. A confirmation message will appear. Click Yes. Deleting of the file will start.

Name	Size	Modified		Rec	State	Info	
log0621c	11.00 MB (11535007)	6/21/2021 2:59:41	AM		Ŧ	×	
log0622d	12.15 MB (12734977)	6/22/2021 3:59:41	AM		•	×	
log0622r	12.41 MB (13011222)	6/22/2021 5:59:41	PM		Ŧ	×	
log0621p	10.99 MB (11518774)	6/21/2021 12:59:4	1 PM	1	Ŧ	×	
log0622n	11.62 MB (12179318)	6/22/2021 1:59:41	PM		Ŧ	×	
log0622b	11.55 MB (12113744)	6/22/2021 1:59:41	AM		Ŧ	×	
/ log0614a	11.90 KB (12187)	6/14/2023 11:09:05	5 AM	:	Ŧ	×	
log0622p	11.00 MB (11533569)	6/22/2021 3:59:41	PM		Ŧ	×	
log062	nation	<pre></pre>	1		•	×	
log062	hadon		И		•	×	
log062			M		Ŧ	×	
0 0	Do you really want to delete !	5 files from receiver?	al) 1.37	/ 3.68 GB	[× Delete	X Delete A
New File	Дi	а Нет			Free Event		
Name: log0622n	Elevation mask(°):	5 Message Set	ef	*	Site name:		

Figure 86. Delete files.

While deleting files window is disabled. Removal of a large number of files can take several minutes. To delete all the files just click the button *Delete All* without selecting the files.



3.5 GNSS Spectra

The *Spectra* tile allows collecting, display and store measurements of GNSS interference.

Number of spectra depends on receiver type and is equal to the number of RF bands implemented in the receiver.

The interference data for all the GNSS bands is collected separately. Filter, AJM (need to be *On*) and Channel modes are available.

Note: The option SPEC must be activated for spectra obtaining.

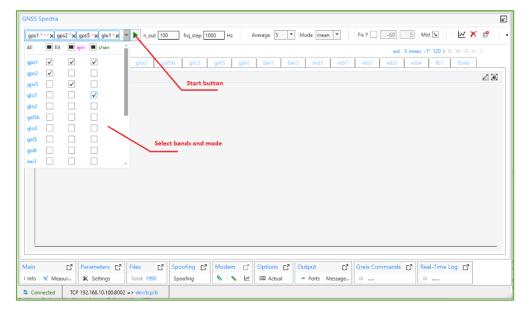


Figure 87. GNSS-spectra bands and mode.



STRIUMPH2-	TRIUMPH2 0287X2Z	OD86IQ1BR9IH5N	INKW9Y							>
Reports * Actions *	Update Options *	Update Firmware	•							* 🕻
GNSS Spectra										
▶ n_out 100	Average 5	* Mode mean	• Mid	AGC 🕨 🛛	Harmonics 🔻	mean 💌	2 🔻	o 🗠 🗙 🖻		
Start bu	tton							int 5 mean 5° 3	% 70 I- B+ W- G- U-	
gps1 gps2	glo1 glo2	Statistics								
gps1	A	v. AGC: Interf. Ma	gn.: RMS of AGC	: Spectrum	Mean: SN	Loss (CA/P)	Sat. Amour	nt (CA/P)		2.3
50]										
45										
40										
35										
35 35.36										
25 1555.9496										
20										
15										
10										
5		BeiB1					Gest Li	SalE1 SBASL1		
		1561.098					BeiB1C	QZSSL1		
1535 0s-	1550		1585 54-		1570		1575	158	0	150
Main 🖸	Parameters	Files 🖸 Mo	odem 🗗 Ca	libration 🗗	Options	Output	C2	Greis Commands	Real-Time Log	C7
i Info 🛛 🗙 Measur	★ Settings	Total: 65	S 2	🖓 😵	i≡ Actual	 Ports 	Message		·	
\$ Connected Seri	al:COM13 : 1500000 =	> dev/ser/a	 File List Req 	uest						

Figure 88. GNSS–spectra tile for old models.

For old models spectra for all the bands are collected simultaneously and only in a single mode (max 13):

- Gps L1, Gps L2, Gps L5
- Glo L1, Glo L2
- Glo L3/Gal E5B
- Gal E5, Gal E6
- Bei B1, Bei B2, Bei B3
- W1, W5, W6

Use the buttons to switch between the bands.



3.5.1 Collecting Spectra

To start the current measurements of the interference:

- Select bands and modes from the dropdown list.
- Specify the n_out Number of Points in Each Spectrum Message.
- Specify the freq_step Spectrum Frequency Step. Internally, spectrum data are computed with /par/spectr/frq_step interval.
- Specify the Samples to Average Time Interval of Incoherent Spectrum Data Accumulation.
- Specify the Mode (mean, min, max) Spectrum Averaging Mode.
- Click Start button.

Note: Please do not change /par/spectr/frq_step parameters from their default values if you are not an expert in the spectrum stuff as some combinations of these parameters may give unexpected results.

NSS Spectra				
gps1 f = = 🗙 gps2 f 🗙 gps5 = 🗙 glo1 = 🗙 👻 📕 n_ou	t 100 frq_step 1000 Hz	Average 5 🔻 Mode mean 👻	Fix Y60 Mi	id 🔽 🛛 📈 🏋 🔮
gps1 ✔ gps2 gps5 glo1	Cancel button		ext 5 mean -1° 120 I+ B- W- G-	U- C- 11/12/2023 13:45:06
gps2 utc 12/11/2023 🖌 Filt 13:46:06.403				2 (2)
.5	ووارد والمانية أوالله والمعايدة والمانية والمحاولة والمنابع	Antility of the state of the st		
45	/			
25				
45				
-55		1224.6558		
-65				
.75				
···		Gps2 QZSSL2	Gin2	
1200 1210	1220	1230	1240	1250

Figure 89. Collecting GNSS-spectra for selected bands.

The construction of graph begins. The status of the process will be shown in the status bar. Collecting can be interrupted by clicking button Stop.





Figure 90. GNSS-spectra for selected bands and modes are collected.

The following data are displayed on the charts:

- Black, green and magenta lines Show the spectrum output *filter, ajm* and *channel* modes, respectively.
- X axis The carrier frequency in MHz. For each GNSS band the values are different.
- X axis Time in seconds (blue numbers)
- Y axis Amplitude, dB.
- Red triangle Mid frequency.

In the upper right corner is shown the receiver status during the spectrum measuring.



It lists the following:

- Name of the test
- Position the antenna
- The number of measurements for averaging
- Elevation mask
- ASIC frequency
- AGC
- I Anti–Jamming mode (+ enabled; off)
- Status of communication module (gray if the module is not)
 - + enabled; off:
 - *B* Bluetooth
 - *W* Wi–Fi
 - *G* GSM
 - U UHF / FH
 - *C* Communication Board (for TVS)
- Time

All previously made measurements are available. To see them use the *Navigation buttons* in bottom.

For older models, the following data are output:

- Black show the spectrum output.
- Blue line Only shows the value of the system voltage (AGC).
- Green triangle harmonics.





Figure 91. GNSS–spectra for old models.

Also, Statistic tab is shown for older models.

orts 🔻	Actions 👻 Up	date Options 🔻	Update Firmware	e *						*
SS Spect	tra									
n_out	100	Average 5	 Mode mean 	• M	id 🕨 AGC 🝾	Harmonics	• max •	2 🝸 🄇	S 🗠 🗙	₽ I
gps1 🗸	gps2 🗸	glo1 🗸 🔤	alo2 🗸 Stat	istics						
gps1 🗸 Band	gps2 🗸	glo1 🗸 g	Stat		Spectrum Mea	SN Loss	SN Loss (P)	Satellites	Satellites (P)	
		-			Spectrum Mea 31.1	SN Loss	SN Loss (P)	Satellites	Satellites (P)	
Band	Calibration	Average AGC	Interference N	RMS of AGC						
Band gps1	Calibration	Average AGC 36.1	Interference N -36.1	RMS of AGC 1.3	31.1					

Figure 92. GNSS-spectra Statistics for old models.



There are following data are in the table:

- Calibration AGC calibration
- Av Agc Mean value of AGC divided by 2 for each of RF bands for the time interval the spectrum has been measured over.
- *Inter Magnitude* Interference magnitude, calculated from the average values and calibration of AGC.
- *RMS of Magnitude* RMS value of AGC for each of RF bands for the time interval the spectrum has been measured over.
- Spectrum mean Mean spectrum value for each of RF bands for the time interval the spectrum has been measured over.
- SN Loss Average loss in signal/noise ratio.
- Sat Amount The average number of satellites for CA and P codes.

Buttons *Calibrate* and *Calibrate Ext* set Spectrum/AGC Calibration and Spectrum/AGC Calibration for External Antenna Parameters.



3.5.2 Operation with Plots

The following chart manipulations are available:

- Show/Hide modes Flags to show/hide graphs for the particular mode.
- Fix Y-axis Set min and max values for Y-axis and fix it
- Show/Hide Mid Flag to show/hide middle frequency red triangle.
- *Zoom* Select region by mouse right button or turn the mouse wheel to zoom plot.
- *Pan* Left mouse button move the graph.
- *Fit to view* Return the graph to full view.
- Show band intersection Flags for show/hide bind intersections (for wide bands).

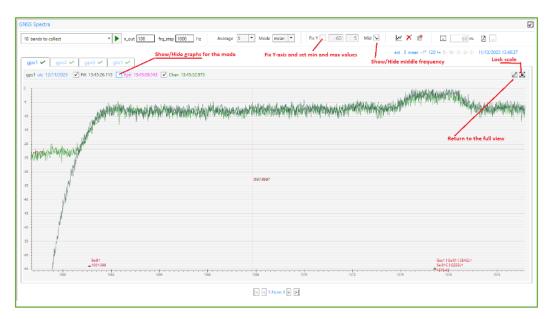


Figure 93. GNSS-spectra plot zooming and panning.



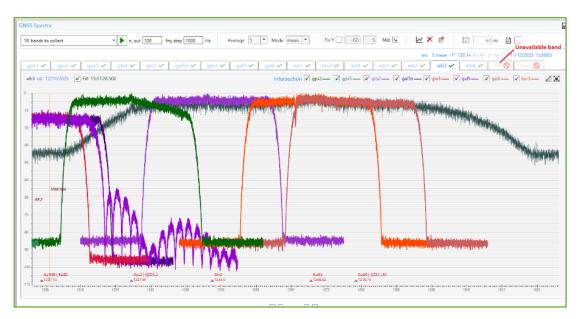


Figure 94. GNSS-spectra band intersections.

Available for older models only:

- Show/Hide AGC Shows/hides AGC line.
- *Harmonics* Shows/hides AGC additional harmonics.
- *Filter* Allows roughening plot using different mode.
- Lock Scale Completely, Y–axis 0–50.



3.5.3 Saving and Deleting

You can save and delete the spectra plots. Moreover, it is possible to configure schedule for collecting spectra periodically and saving reports.

18 bands to collect ▼ ▶ a, out 10 gps1 ✓ gps2 ✓ gps5 ✓ glo1 ✓ gps2 utc 12/11/2023 ✓ Filt 13/46/66.403	0 frq_step 1000 Hz Average 5 V H	Save graphs to pdf	G 60 m. 2 5- V 6- U- C- 11/10/2023 1346.27
3 4.95		Delete spectrum Delete all spect	ra Report saving
5	energia energia esta esta esta esta esta esta esta est	On sp	ectra collecting schedule
15	1		
15		1216.0442	
35	[1	

Figure 95. GNSS-spectra saving and deleting.

- Delete Deletes the current spectrum plots (all bands).
- Delete All Deletes all existing plots for the receiver.
- Save to File Saves the spectra for all bands pdf file.
- Enable Schedule Starts collecting spectra with a specified period.
 - Save Reports Enabling saving spectra to the specified folder.



3.6 Spoofing Detection

Spoofing detection is available for firmware beginning with 4.1.0.0 and requires the Spoofing Detection (_SPF) option. User interface is provided in NetView & Modem 2.2.7.0 or higher.

Short Description of Spoofing / Jamming Detection Algorithm

Receiver detects possible spoofing by analyzing number of correlation peaks. In normal conditions only one peak is present. In case of spoofing, there should be 2 peaks – original and from spoofer. If receiver detects 2 peaks – it marks signal as "spoofed". If number of spoofed satellites appeared to be more than one, that signal for all satellites is flagged as "spoofed".

Jamming detection based on analysis of incoming noise characteristics. In case of jamming "noise floor" increases. Also deviation of noise may increase. Receiver measures these parameters and in case at least one is more than threshold that signal for all satellites is flagged as "jammed".

3.6.1 Spoofing Option

Spoofing detection is available if Spoofing Detection (_SPF) option is loaded.

ptions					*
Option	▲ Current	Purchased	Leased	Date	
RTPK (RTPK)	1	511	511	02/10/2023	
Serial Port A (Kbps) (RS_A)	460	511	511	02/10/2023	
Serial Port B (Kbps) (RS_B)	460	511	511	02/10/2023	
Serial Port C (Kbps) (RS_C)	460	511	511	02/10/2023	
Serial Port D (Kbps) (RS_D)	460	511	511	02/10/2023	
Spectrum (SPEC)	1	511	511	02/10/2023	
Spoofing Detection (_SPF)	1	511	511	02/10/2023	
TCCL (TCCL)	31	511	511	02/10/2023	
TCP Connections (_TCP)	5	511	511	02/10/2023	
TCP Output (TCPO)	5	511	511	02/10/2023	
TLS/SSL Encryption (_TLS)	1	511	511	02/10/2023	
UDPO (UDPO)	5	511	511	02/10/2023	
UHF (_UHF)	511	511	511	02/10/2023	
USB Port (_USB)	1	511	511	02/10/2023	
WAAS (WAAS)	1	511	511	02/10/2023	~

Figure 96. Spoofing Option.



Detail spoofing detection information can be obtained on Spoofing Tile.

Also spoofed and jammed satellites are flagged in the main satellite table if spoofing mode is on.

Information about spoofing mode is presented on the main tile.

3.6.2 Spoofing Tile

Select tile "Spoofing". Toolbar and satellite system/signal table are on the tile.

The following settings configure spoof detecting:

- Mode On/off spoofing detection mode.
- Position On/off using of signal in positioning.
- Dependent Lock Switch tracking to dependent mode.

Note: For spoofing/jamming detection, signal should be tracked in independent (not guided) mode, so for checking of all possible signals.

Button "Enable Spoofing Details" starts collecting detail slots information (message [sj]).

Also, toolbar contains time of the last received message and button Expand All, which expand/collapse all systems in the table at once.

The table contains available signals for each satellite system.

Obtained data fills the table.



poofing						
Disable Spoofing Details	Mode Use	spoofed in position. 🕑 Depend	Sent Lock Last Messag	 3/19/2021 9:46:11 AM 	Sepand A2	
✓ GPS (16)	C/A #1 Satelites:16 Spooled-0 Noise Mean:85 Dev:112	n	12	uc	и	LNC Satellites 2 Spooled 0 Noise Mean: 79 Dev: 79
- GLONIASS (9)	CA43 Satellite:: 9 Spooled::0 Noise Mean:79 Dev:64	PI	92	6412	u	
- SBAS (WAAS, EGNOS) (7)	L3 21 Satellites 3 Spooled:0 Noise Mean 86 Den; 110				13	
· GALEEO (7)	81 Satellites 7 Spooled:0 Noise Mean/81 Dev;62	в	158	65	BA	
♥ QZ55 (2)	C/A 11 Satellites 2 Spooled:0 Noise Mean IS Dev:114	SAIF	LEX	uc	13	LIC Satellites 2 Spooled: 0 Noise Mean: 78 Dev: 78
< BeiDou (0)	81-1 Satellites 15 Spooled 0 Noise Mean/87 Dev/90	81-2 Satellites: 7 Spooled: 0 Noise Mean: 72 Dev: 76	82(8) Satelites 12 Spooled: 0 Noise Misan 76 Dev: 75		854	BIC Satellites 7 Spooled 0 Noise Mean: 78 Devi 78
					US Satellitei: 2 Spooled: 0 Noise Mean: 78 Dev: 78	
· OMINI	u					
¥ GLCOMA					U.	

Figure 97. Filled Spoofing Table. GPS/CA, SBAS/L1, QZSS/CA – jammed.

Receiver provides the following information for each available signal in every satellite system:

- Satellites Count of the locked satellites in the signal.
- Spoofed Count of spoofed satellites. If spoofed more than 1, the entire signal is considered to be spoofed. It is red and "S!" appears near the signal header.
- Noise Mean It is red if greater than 100. It means that signal is jammed and dark yellow "J!" appears near the signal header.
- Noise Deviation It is red if greater than 100. It means that signal is jammed and dark yellow "J!" appears near the signal header.



Expand System to See Satellites Information

poofing															
Disable Spoofing	Details 📕		✓ Mod	e 🗌 Use s	poofed in po	sition 🖌 De	ependent Lock	La	t Message - 3,	/19/2021 9:48:2	7 AM	Collapse Al			
GPS	21	255	63	27565											
GPS	23	140	77	16422									159	72	1436
GPS	24	171	63	-48680											
GPS	28	456	66	-32258											
GPS	30	411	80	-15835											
GPS	32	117	104	4105											
			CA/L1			P1		P2		CA/L2		L3			
 GLONASS (11) 		Satellit	es: 11 S	poofed: 1											
		Noise	Mean: 79	Dev.: 85											
GLO	-7	525	52	46379											
GLO	-4	275	58	-71624											
GLO	-2	218	55	-8806											
GLO	-1	524	50	-88649											
GLO	0	1285	39	-25244											
GLO	1	610	64	29941											
GLO	2	481	135	-26418											
GLO	3	270	53	-126810											
GLO	- 4	499	41	-65166											
GLO	5	878	51	-27592											
GLO	6	259	50	-112720											
			н л									L5			
 SBAS (WAAS, E 	GNOS) (2)	Satellite	est 2 S	poofed: 0											
		Noise	Mean: 86	Dev.: 108											
WAAS	130	109	86	-22873											
WAAS	185	139	70	26392											

Figure 98. Detail satellites info. GPS and SBAS are expanded.

GPS/CA – spoofed and jammed, SBAS/L1 – jammed.

Spoofing details contain the following columns:

- Satellites system.
- Satellite number.
- Signals. Each signals contains 3 sub columns.
 - Main Peak
 - Second Peak Gray if less than 100
 - Delta Range Gray if Second Peak less than 100

The entire signal is orange if spoofed, dark yellow if jammed and red if both.



3.6.3 Main Tile

Spoofing detection mode adds dark yellow, orange or red flag to the SNR – value of satellite in the main table if it is jammed, spoofed or both accordingly.

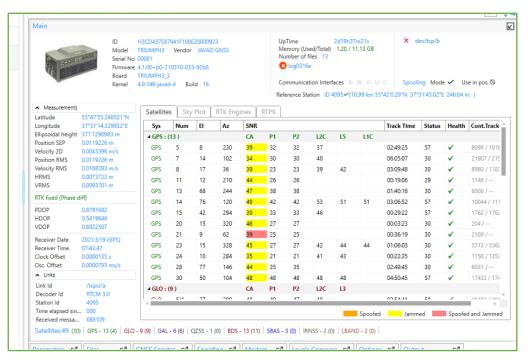


Figure 99. Spoofed and Jammed flags in the main satellite table.

GPS/CA jammed, 21-st satellite also - spoofed.



3.7 Modem Configuration

Expand *Modem* tile to configure an inner modem or pair an outer one.

Modem tile provides the toolbar with Update Firmware and Daisy Chain buttons and 3 tabs: Parameters, Pair via BT and Spectra.

Currently receivers support up to four GSM, UHF, or FH modems, called A, B, C and D.

Note: In JAVAD GNSS receivers, the internal GSM, UHF, or FH modem is usually hardware–wise connected to Port C. As for external GSM radio modems, it is common practice to connect such modems to the receiver's Port B or Port D, if available.

dem				
Update Firmware arameters Pairing via BT Spectra dodem a Modem b Modem c			Daisy Chain dev/blt/a 💌 Driver a	• 0
Current Mode off Receiver Port the Modern is /dev/mdm/a Modern Control State off Last Detected Modern Error none	Auto Prefer L-Band Raceiver Prefer LHF Raceiver ID Internal Product ID MCCU Board firmware version Model	v on v unknown unknown funknown* unknown*		
UHF Radio Cellular module L-Ban Mode 0 50 Cutpus Power 30 50 Frequency 44000000 UHF Modem 7X Freq. 0 UHF Modem 7X Freq. 0 9 9 UHF Modem 7X Freq. 0 9 9 9 UHF Golds Type 5mr * 10 10 TX Delay 20 7 10 <td>A Kecener Jeason Receiver Info Model unknow Product ID unknow Product ID unknow Serial Number unknow Hardware revision "unknow Software Version "unknow Boottoader version "unknow</td> <td>n Frame Counter 0 byte Counter 0 0 Current Bytes 0 0 Port Buffer 0 0 "m" Port Buffer 0 Output Power unknow 0 Output Power unknow 0</td> <td>n</td> <td></td>	A Kecener Jeason Receiver Info Model unknow Product ID unknow Product ID unknow Serial Number unknow Hardware revision "unknow Software Version "unknow Boottoader version "unknow	n Frame Counter 0 byte Counter 0 0 Current Bytes 0 0 Port Buffer 0 0 "m" Port Buffer 0 Output Power unknow 0 Output Power unknow 0	n	
C ✓	s [2] GNSS Spectra [3 Spoofing C2 Calibration C2 C	4 	iguration

Figure 100. Modem Tile.

Toolbar contains:

- Update Firmware menu Allows updating modem firmware from file or website.
- *Daisy Chain* group Allows selecting the channel and driver and start daisy chaining.



3.7.1 Updating Modem Firmware

Inner modem firmware can be updated from file or via Internet. Depending of the modem model *Radio*, *MCU* and *Internal MCU* firmware can be updating.

Updating from File

Click From File button and choose firmware file using Open File Dialog.

Updating from Internet

Click *From Website* button. Select modem type: *Radio* or *GSM* and provider for GSM. Firmware file will be downloaded from the site and checked.

M	lo	dem			
Ť		Update Firmware 🔻			
ſ		From File		-	
		🐮 From Website 🕨 🔋 Radio			
		Aodem a Modem b Mo III Cellular	۲	Generic	
	-		_	Verizon	
		General		Auto	
		Modem Mode off 💌		Prefer L-Band Receiver	on
		Current Mode off		Prefer UHF Receiver	on
		Receiver Port the Modem is /dev/mdm/a		ID	unknown
		Modem Control State off		Internal Product ID	unknown

Figure 101. Update Firmware menu.

Before updating the modem, need be to turn on and has the status *"Ready"*. Otherwise, a warning will appear.

After new firmware is download Confirmation *message* appears.



W TRIUMPH3-00452 TRIUMPH3 H32DC78022429EABAB75C75931	×
Reports * Actions * Update Options * Update Firmware * S Cancel FW Downloading	× +↑
Modem	K
Update Firmware * Daisy Chain dev/blt/a * Drive	er a 💌 🥜
Parameters Pairing via BT Spectra	
Modem a Modem b Modem c	
General Modem Mode Delese change just to "OFF" Current Mode Uniter Mode Modem Control State Last Detected Modem Is- Uder Mode UHF Radio Cellular module Last Detected Modem Error UHF Radio Cellular module Info Model Vers No UHF Radio Cellular module Info Model Product ID 931 Byte Counter Byte Counter 440000000	Emerica Configuration •
	. e 👲 🚦
Main C ² Parameters C ² Files C ² GNSS Spectra C ² Calibration C ² Options C ² Output C ³ i Info X Measur X Settings Total: 1 Interfere Q Q Image: Actual Ports Message Image: Actual	C ²
Connected Serial: COM26 (Bluetooth) => dev/blt/a O Downloading from site * *	

Figure 102. Updating modem confirmation.

Then new modem firmware will be uploaded to the receiver.

Update Firmware 🔻					Daisy Chain	▼ Drive	er a
arameters Pairing via BT Spectra							
lodem a Modem b Modem c							
General	Auto						
Modem Mode auto	Prefer L-Band Rec	eiver		*			
please change just to "OFF"	Prefer UHF Receiv	er	on	•			
Current Mode uhf	ID		931				
Receiver Port the Modem is /dev/mdm/a	Internal Product I	D	931				
Modem Control State ready	MCU Board firmw	are version	'unknown"				
Last Detected Modem Error none	Model		.MR400				
		_					
UHF Radio FH Radio Cellular module L-Ba	nd Receiver Beacon Receiver	er		ТХ		RX	
Output Power 30	Model	LMR400		IX		UHF RSSI -101 dl	Rm
	Product ID	931		Frame Counter	49	UHF BER DE-0	
	Internal Product ID	931		Byte Counter	5488		
UHF Modem RX Freq. 0	Serial Number	000004922	681	Current Bytes Port Buffer	0		
UHF Modem TX Freq. 0	Hardware revision	"Ver. 2.1"		Port Buffer Temperature	0 unknown	-1	
Protocol Type simrx 💌	Software Version	"Mar 20 R	1/ NA R66*	lemperature	unknown		
0 🗸							Conf

Figure 103. Uploading new modem firmware.

Status bar at the bottom of the window shows process progress.



Both the firmware downloading from the site and uploading to the receiver can be canceled.

After new firmware is uploaded to the receiver, it reboots and reconnects. Rebooting can take several minutes. Info about new firmware appears in the *Parameter Info* panel.

TRIUMPH3-00452 TRIUMPH3 H32DC78022429EABAB75C75931	
Reports Actions Update Options Update Firmware	
Modem	Let a let
Update Firmware 👻	Daisy Chain dev/blt/a 🔻 Driver a 💌 🥜
Parameters Pairing via BT Spectra	
Modem a Modem b Modem c	
General Auto	i
Modem Mode auto Prefer L-Band Receiver please change just to "OFF" Prefer L-Band Receiver Prefer L-Band Receiver	×
Current Mode uhf	•
ID 931	
Modem Control State ready	
Last Detected Modem Error none Model LLMR400	
UHF Radio FH Radio Cellular module L-Band Receiver Beacon Receiver	
Mode Info	TX
Output Power 30 Model LMR400	Frame Counter 47
Frequency 440000000 Product ID 931	Byte Counter 5264
UHF Modem RX Freq. 0 931	Current Bytes 0
Serial Number 000004922681	Port Buffer 0
Hardware revision "Ver. 2.2"	Temperature unknown
Software version Ver. 5.2 Rev 04 B70	Output Power unknown
UHF Call Sign "" BootLoader version "Ver. 4.0 Rev 04" TX Delay 20 MCU FW Version "Ver. 2.5"	Power Supply Voltage 4.21
MCU PW Version Ver. 2.3 MCU Board FW Version "unknown"	Antenna Status
	Configuration -
Connected Serial: COM26 (Bluetooth) => dev/blt/a Firmware updating	

Figure 104. Internal modem is updated.



3.7.2 Daisy Chaining

An inner modem can be accessed by daisy chaining. To start daisy chaining select the channel from *Daisy Chain* drop–down, modem driver and click *Daisy Chain* button.

Modem				K
Update Firmware 🔻			Daisy	Chain dev/blt/a 🔻 Driver b 💌 💋
Parameters Pairing via BT Spectra				
Modem a Modem b Modem c				
General	to			Start Daisy Chaining 🧯
Modem Mode auto 🔻 Pre	fer L-Band Receiver		¥	
	fer UHF Receiver or	n	•	
Current Mode ID	93	31		
Receiver Port the Modem is /dev/mdm/a	ernal Product ID 93	31		
Modem Control State ready MC	U Board firmware version	nknown"		
Last Detected Modem Error none Mo	del LN	/IR400		
UHF Radio FH Radio Cellular module L-Band Receiver	Beacon Receiver			

Figure 105. Daisy Chaining menu.

After connecting full info about the modem panel is displayed. There is full info is presented and firmware updating menu is available. *Log* panel displays all the commands which were send to the modem and responses. Content of the *Log* panel is also stored to the log file.

Firmware updating process is the same as for outer modems, described in the Modem chapter.



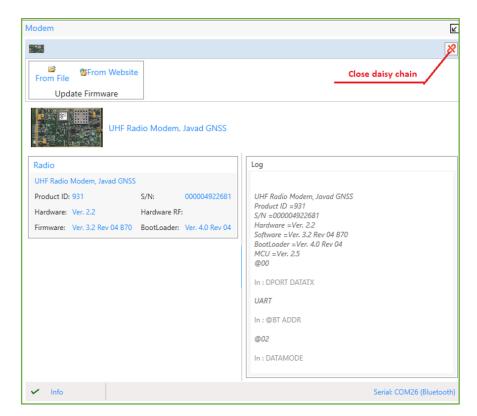


Figure 106. Internal modem connected by Daisy Chaining via Bluetooth channel.

To disconnect from the internal modem, click *Close* button. Daisy chaining will stop and the channel will be released.



3.7.3 Radio Parameters

Parameters tab – Contains up to four sub–tabs called *Modem c, Modem a, Modem b, and Modem d*. All the section provides the identically set of the settings for each modem. Receivers support GSM, UHF and FH modems which can be as internal so paired.

The parameters are described in [2, 4.4.30 GSM, UHF, and FH Modem Parameters].

Depending on the type of modem you may need to configure various settings. They are located at the respective nested tabs.

Parameters tab is arranged like Parameter tile (see 3.3 Configuring the Receiver).

Configuration buttons save/load work also like *Parameter* tile (see <u>3.3</u> <u>Configuring the</u> <u>Receiver</u>). But only radio configuration will save/load using *tcl*-script.

Limited Manual Mode pane is also provided and works like described in <u>3.3.4 Limited</u> <u>Manual Mode Pane</u>.

Modem								ĸ
Update Firmware 🔻						Daisy Chain dev/blt/a	* Driver a	· 8
Parameters Pairing via BT Spectra								
Modem a Modem b Modem c								
General	Auto							î l
Modem Mode auto *	Prefer L-Band Receiv	ver	*					
please change just to "OFF" Current Mode	Prefer UHF Receiver	on	-					
master	ID	931						
siave	Internal Product ID	931						
Modem Control State gprs		e version "unknown"						
Last Detected Modelli Chor Culta	Model	LMR400						
UHF Radio FH Radio Cellula	eceiver Beacon Receiver							
lband					1.[- III
Mode beacon	Info	LMR400	тх		RX UHF RSSI -55 dBm	Scan		
Output Power 30 auto		931	Frame Counter	0	UHF BER 0E-0	Start frequency 4		
Frequency 440000000		931	Byte Counter	0	OHP BER DE-0	Stop frequency 4		
UHF Modem RX Freq. 0		000004922681	Current Bytes	0		Frequency step 1		
UHF Modem TX Freq. 0	Hardware revision	"Ver. 2.2"	Port Buffer	0		Mode s	ican 💌	
Protocol Type simrx *	Software Version	"Ver. 3.2 Rev 04 B70"	Temperature Output Power	unknown		Timeout 1	500	
UHF Call Sign **	BootLoader version	"Ver. 4.0 Rev 04"	Power Supply Volta					
TX Delay 20	MCU FW Version	"Ver. 2.5"	Power Suppry Poila	ge na i				
	MCU Board FW Version		Antenna Status					
		WJ4LMR400		unknown				
	IC ID	3504A-LMR400	Reflected Power	unknown				
0 🗸			1			efresh read-only Params	Carta	uration *
v					V N	etresh read-only Params	Config	uration *
							+ +	<u>e</u> •
								~

Figure 107. Modem parameters.



The following parameters can be set for each modem:

- *General* Allows to specify the mode the modem connected to corresponding receiver port will use to communicate with the remote modem at the other end of the radio link. Connection statuses are displayed here too.
- Auto Auto modem parameters.
- Tabs for the different types of modems:
 - Uhf Radio [2, Uhf Modem Parameters].
 - *Mode* Settings configuring the uhf modem.
 - Info Internal settings of the modem (read–only.)
 - *TX* Counters of the transmitted data (read–only.)
 - *RX* Characteristics of the received signal (read–only.)
 - Scan Settings for scanning radio interferences.
 - Controls Settings for controlling antenna voltage and so an.
 - Protocols Configuring protocols to transmit and receive data via modem depending on selected UHF Protocol Type.

Modem a Modem b	Modem c					
UHF Radio FH Radio	Cellular module L-Band	d Receiver Beacon Receiv	er			A
Mode		Info		ТХ	RX	Scan
Output Power	30	Model	LMR400	Frame Counter 0	UHF RSSI -54 dBm	Start frequency 406000000
Frequency	44000000	Product ID	931	Byte Counter 0	UHF BER 0E-0	Stop frequency 470000000
UHF Modern RX Free	. 0	Internal Product ID	931	Current Bytes 0		Frequency step 12500
UHF Modem TX Free	0	Serial Number	000004922681	Port Buffer 0		Mode scan *
Protocol Type	simrx	Hardware revision	"Ver. 2.2"	Temperature unknown		Timeout 1500
UHF Call Sign	simox	Software Version BootLoader version	"Ver. 3.2 Rev 04 B70" "Ver. 4.0 Rev 04"	Output Power unknown		
TX Delay	simtx	MCU FW Version	*Ver. 2.5*	Power Supply Voltage 4.21		
TA Delay	simtr	MCU Board FW Versio		Antenna Status		
	simrtr	FCC ID	WJ4LMR400	VSWR unknown		
	tmorx	IC ID	3504A-LMR400	Reflected Power unknown		
	tmotx					
Control	trmox	Simplex (Jav	ad) Protocol Transparent	w/EOT Protocol Trimtalk 450S Protocol TT450	S(HW) Protocol Trimmark3 Protoco	Trimmark II/Ile Protocol Satel Protocol
Antenna Control	trmtx	•				
Voltage Standing Wa		Settings Modulatis	on Type dqpsk	•		
Wave Ratio Update T	tt450shwrx		Sandwidth 25000			
Gain Control Algoriti	tt450shwtx tt450shwtr	Scramblin				
Attenuation Control			rror Correction on	•		
FH/UHF Switch Cont	trmm3tx	SNRM	off	•		
	trmm3tr ~		011			
		Mode				
		Base RtrN	lum 0			
		11				
						Configuration *





The following protocols can be configured to transmit and receive data via modem depending on selected UHF Protocol Type.

- Simplex (Javad)
- Transparent w/EOT
- Trimtalk 450S
- TT450S(HW)
- Trimtalk3
- Trimmark II/Ile
- Satel

Settings for each protocol are available on the separate tab.

s	implex (Javad) Protocol Tra	ansparent w/EOT Protoc	ol Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
	Settings						
	Modulation Type	dqpsk 🔻					
	Channel Bandwidth	25000 👻					
	Scrambling	255					
	Forward Error Correction	on 🔻					
	SNRM	off 💌					
	Mode Base RtrNum 0 Rover Source auto RTR Echo a	v					

Figure 109. Simplex (JAVAD) protocol parameters.

Simplex (Javad) Protocol	Transparent w/l	EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
Modulation Type	gmsk	•					
Channel Bandwidth	25000	-					
Scrambling	255						
Forward Error Correction	on	-					

Figure 110. Transparent w/EOT protocol parameters.



Simplex (Javad) Protocol	Transparent w/E	OT Protocol	Trimtalk 450S Protocol	TT450S(HW)	Protocol	Trimmark3 Prot	ocol Trim	nmark II/IIe Protoc	ol Sate	I Protocol
Modulation Type	gmsk	•								
Forward Error Correction	on	•								
Channel Bandwidth	25000	•								
Scrambling	255									

Figure 111. Trimtalk 450S protocol parameters.

Simplex (Javad) Proto	ocol Transparer	nt w/EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Pro	otocol Tr	rimmark3 Protocol	Trimmark II/IIe	Protocol	Satel Protocol
Modulation Type		-							
Modulation Type	gmsк	•							
Channel Bandwidth	25000	-							

Figure 112. TT450(HW) protocol parameters.

Simplex (Javad) Prot	ocol Transpare	nt w/EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
Modulation Type	gmsk	•					
Channel Bandwidth	25000	-					

Figure 113. Trimtalk3 protocol parameters.

Simplex (Javad) Prote	ocol Transparer	nt w/EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
Modulation Type	gmsk	•					
Channel Bandwidth	25000	•					

Figure 114. Trimtalk II/IIe protocol parameters.

Simplex (Javad) Protocol	Transparent w/E	OT Protocol	Trimtalk 450S Protoco	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
Modulation Type	4fsk	•					
Channel Bandwidth	25000	-					
Forward Error Correction	on	•					
Clock Correction	on	•					
Compatibility	3as	•					

Figure 115. Satel protocol parameters.

- FH Radio [2, FH Modem Parameters]
 - Zone The zone of FH radio operation.
 - Info Internal settings of the modem (read–only).
 - *TX* Counter of the transmitted bytes (read–only).



- RX Characteristics of the received signal (read–only).
- Scan Settings for scanning radio interferences.
 - Go To Spectra Button for navigating to the receiver main window tab *Radio Spectra*.
- *Zones* The following zones can be configured to transmit and receive data via modem depending on selected *Zone*.
 - USA, AUS USA and Australia
 - EU Europe
- *Repeater* Repeater mode.
- *Port Buffer Status* Read–only numbers of bytes in RX and TX buffers.

UHF Radio FH Radio Cellular mod	dule L-Band Receiver Beaco	on Receiver									
Zone	nfo		ТХ			Scan		U	JSA, AUS, zones	s EU zone	
usa Pri aus Int eu Se	roduct ID nternal Product ID. erial Number	unknown unknown unknown	Byte Counter Temperature Output Power Power Supply	er u	nknown nknown nknown	Start frequency Stop frequency Frequency step	/ 930000000		Protocol	30 simrx	•
Fir Ba MI FC	CCID	"unknown" "unknown" "unknown" unknown unknown unknown	System Suppl RX FH RSSI unkr FH BSP 0 FH RSP 0	mown	nknown				Redundancy Simplex (Java Modulation [Scrambling]	single ad) Protocol gmsk 1	
Repeater Mode off Port Buffer Status RX Buffer 1274 TX Bu	Buffer 0		FH PER unkr	nown					FEC	cnv	

Figure 116. FH Radio parameters, USA, AUS zone.



USA, AUS, zones	EU zone
Settings	
Power	27
RX Frequency	86900000
TX Frequency	869000000
Protocol	simrx 🔻
	simrx
Simplex (Javad	simtx
Modulation	simtr
Scrambling	1
FEC	cnv 🔻
Channel Bandy	width 25000 🔻

Figure 117. FH Radio parameters, EU zone.

- Cellular module [2, GSM Modem Parameters].
 - Settings Settings which configure the receiver to control the cellular module.
 - Info- (read-only):
 - *Device* Internal settings of the modem.
 - *Network* The parameters of the cellular network
 - *Mode* The settings configuring two different modes of cellular module depending of selected modem mode:
 - CSD Master, slave
 - Dial Dial settings
 - *AT*+*CBST* Select bearer service type.
 - 3G/2G GPRS
 - *PPP* Connection statuses of the PPP server (duplicated on the *Networking.PPP* tab *PPP Configuration Parameters*).
 - GPRS GPRS connection parameters [2, GPRS Configuration].
 - PDP Packet Data Protocol (PDP) settings. [2, GPRS Configuration].



Settings for each mode are available on the separate tab.

Settings		Info				
GSM Hotstart Mode	off •	Device				
SIM Card Number	1	Vendor	"Sierra	Wireless, Incorpo	rated"	
PIN Code	"0000"	Model	"MC771	10*		
Registration Mode	auto 💌	Revision	"SW192	00X_03.05.24.00a	p r5792 carmd-en-10527 2013/05/0	2 13:35:47"
		Serial Number	*35817	8042463192"		
		FCC ID	N7NM0	7700		
		IC ID	2417C-	MC7700		
		Network				
		Cellular Operat	or Name	"Beeline"		
		Cellular covera	ge	gprs		
		Signal Quality		"-81 dBm"		
CSD 3G/2G						
PPP		GPRS			PDP	
PPP Connection Sta	te connected	GPRS Dial Nu	mber *	*99***1#*	GPRS PDP Context Identifier	1
PPP Baud Rate	460800	GPRS User Na	ame -	-	GPRS PDP Access Point Name	**
	(GPRS Passwo	-			

Figure 118. Cellular module parameters, 3G/2G mode.

Dial		AT+CBST	
Service Word Repeat Period	2	AT+CBST Connection Element	1
Data Wait Timeout	5	AT+CBST Bearer Service Name	0
Dial Number	**	AT+CBST Data Rate	71

Figure 119. Cellular module parameters, CSD mode.

- L Band Receiver [2, LBAND Receiver Parameters]
 - *Mode* The settings configuring *lband receiver* mode. Channel frequencies can be added, edited and deleted using *Channel map*. Selected frequency is set.
 - Info Internal settings of the Iband receiver (read–only).
 - *Rx* Characteristics of the received signal (read–only).



Mode			Info		Rx	
Channel map		**	Model	L-BAND/BEACON	RSID	N/A
1535000000	K N	*	Product ID	36	RSSI	-133 dBm
© 1539882500	В×		Serial Number	00000000066	SYNC	0
0 1	53 ~ X		Hardware revision	"Ver. 5.1"	BER	OE-0
		*	Software version	"Ver. 1.8 Rev 05 811"	Current Frequency	1535.000000 MHz
Link Rate	1200	•	Bootloader version	"Ver. 3.0 Rev 04"	Frequency Offset	0 Hz
Scrambling	1				Current Symbol Rate	2438.095
Unique Word (UW)	E15AE893E1	SAE893				
Antenna Power Switcher	00					

Figure 120. L–Band Receiver parameters.

- Beacon Receiver [2, BEACON Receiver Parameters].
 - Mode The settings configuring beacon receiver mode. Channel frequencies can be added, edited and deleted using *Channel map*. Selected frequency is set.
 - *Info* Internal settings of the beacon receiver (read–only).
 - *Rx* Characteristics of the received signal (read–only).

Mode				Info		Rx	
Channel map			+	Model	L-BAND/BEACON	RSSI	
© 283500	B 3	×	-	Product ID	36	SYNC	@00
284500	В 3	×		Serial Number	00000000066	Current Frequency	284.500 kHz
				Hardware revisio	"Ver. 5.1"	Frequency Offset	0 Hz
		_	*	Software version	"Ver. 1.8 Rev 05 811"	Current Symbol Rate	100.000
Link Rate	100		•	Bootloader versio	"Ver. 3.0 Rev 04"		
Antenna Beacon Connector	on		•				
Antenna Power Switcher	on			ē i			

Figure 121. Beacon Receiver parameters.

• Port Buffer Status – Read–only numbers of bytes in RX and TX buffers.



3.7.4 Outer Modem via Bluetooth

NetView provides the possibility of interfacing between modems and receiversBoth the receiver and modem need to be connected to *NetView*. Then outer modem and receiver can be paired via Bluetooth.

Select tab Pairing via BT.

Connected modem is available in the *Pair with Modem* drop-down if it is not paired yet.

Follow the next steps to pair modem to the receiver:

- 1. Select Driver
- 2. Set Port to dev/ser/blt/a (b)
- 3. Set *Mode* to *off* (Otherwise, an error window will appear and pairing process will not start)
- 4. Select modem from *Pair* drop-down.
- 5. Click Pair button to start

	TRIUMPH2-02435 TRIUMPH2 013Q302WGVDHF322HXD9LTDWIP	×
Devices	Reports * Actions * Update Options * Update Firmware *	¥ ←↑ ↓→
Receiver 2	Main C² Modem i Info St Messur_	K
 SIGMAS-10007 (OEN × 	Parameters 2	8
	X Settings Parameters Pairing via BT Spectra	
• • TRIUMPH2-02435 ×	Files Driver Click to pair Total: 6 Plaze with Click to pair	
 Modem 1 	GNSS Spectra C2 Port dev/bl/b Mode off State off O	
• 🕡 HPT401BT - 00219 🗙	Let Interfere Paired 81 Paired 81	
	Pairing Modem UHF - 00004290533 via dev/blt/ b Driver	
	Options C	
	Image: Actual Output	
	Ports Message	
	Greis Commands	
	\$ Connected SerialsCOM40 : 1500000 => dev/ser/a C Pairing Modem configured	

Figure 122. Pairing process.



While pairing is going, the panel is disabled. Progress and statuses are displayed. The paired modem appears in the Paired panel. Next to it is the *Unpair* button.

dem							
				Daisy Chain	dev/ser/a	Driver b	- <i>?</i>
arameters	Pairing via BT	Spectra					
Pair with M	odem			Driver b	- 5		
Port dev/blt/b	Mode off	State off					
	Paired mo	19 blt/b 🔀	Cli	ck to unpair			

Figure 123. Outer Modem via Bluetooth paired.

Clicking Unpair button starts unpairing procedure.



odem									
				Daisy Chain	dev/ser/a	•	Driver b	•	P
Parameters	Pairing via BT	Spectra							
Pair with	/lodem			Driver b	× 🖏				
Port dev/blt/	b Mode off	State off	Please wait						
Paired BT	blt/b		O						
Modem 🕷	HPT401BT - 0	0219 blt/b	8						
Unpairing	Vodem UHF - 000	0004290533 via	dev/blt/ b						

Figure 124. Unpairing the modem.

After modem is unpaired, it reappears in the *Pair* with drop–down and is available for paring again.



3.7.5 Radio Spectra

The Spectra tab allows collecting, display and store measurements of radio interference.

To start spectrum values collecting select *Modem Driver* and click the *Start* button.

Receiver automatically detects modem (*UHF* or *FH*) and gets spectrum from modem cyclically until *Stop* button press.

Modem	K
Update Firmware 👻	Daisy Chain dev/blt/a 💌 Driver a 💌 🥜
Parameters Pairing via BT Spectra	
Driver a Port dev/mdm/a Mode auto State ready	🗸 Mean 🗸 Max 🔛 🔀
Start collecting spectrum Uhf a 406000000 470	000000 125000 Started: 14/12/2023:17:24 (Utc) Duration 0:00 (h.m.)
-50	
-60	
-70	
-80	
E-40 -47.49 4358	57320.6
-100	
-110	
-120	
-130	
	ן
< < 2 From	2 2 2
	Navigation through all past spectra

Figure 125. Radio-spectrum (Uhf) collecting.

All previously made measurements are available. To see them use the navigation buttons in bottom.

Spectra collecting parameters can be set in the *Parameters* tab panel *Scan*. Mode *scan* needn't be set manually.

Parameters Pairing via BT Spect	ra		
Modem a Modem b Modem c M	odem	d	
UHF Radio FH Radio Cellular module I	-Band	Receiver Beacon Receiver	r
Mode		Info	
Output Power 30	٦L	Model	unknown
Frequency 44000000	-	Product ID	unknown
UHF Modem RX Freq. 0	=	Internal Product ID	unknown
UHF Modern TX Freq. 0	41	Serial Number	unknown
	-	Hardware revision	"unknown"
Protocol Type simrx	·	Software Version	"unknown"
UHF Call Sign "		BootLoader version	"unknown"
TX Delay 20		MCU FW Version	"unknown"
		MCU Board FW Version	"unknown"
		FCC ID	unknown
		IC ID	unknown
Scan	Cont	rol	
Start frequency 406000000	Ante	nna Control	ignore
Stop frequency 470000000	Volta	ge Standing Wave Ratio	3
Frequency step 125000	Wave	e Ratio Update Time (s.)	0
Mode scan 💌	Gain	Control Algorithm	on
Timeout 1500	Atter	nuation Control Level (dBr	n) -50
	FH/U	IHF Switch Control (dBm)	0

Figure 126. Radio Spectra scanning parameters.

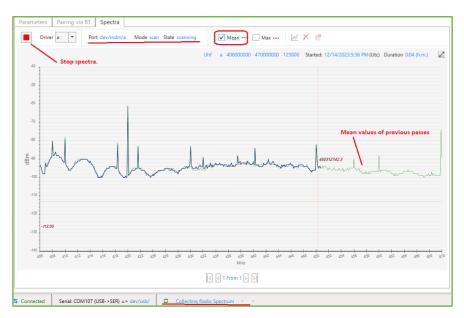


Figure 127. Radio-spectrum (Uhf) collecting.



The status of the process is shown in the status bar.

The following data can be displayed on the plots:

- Blue line Shows the current spectrum output.
- Green line Shows mean values of all previous passes.
- *Red line* Shows max values of all previous passes.
- X axis The frequency in MHz.
- Y axis RSSI (Received Signal Strength Indication), dBm.

Mean and max previous values can be shown simultaneously.

Above the graph the following parameters of the scanning are shown:

- *Modem Type* Uhf, Fh
- Modem Driver A, B, C, D
- Start Frequency
- Stop Frequency
- Frequency Step

Operation with Plots

- Zoom Select region by mouse right button or turn the mouse wheel.
- Pan Left mouse button move the graph.
- Fit to Whole View Top right button.



Saving and Deleting

You can save and delete plots.



Figure 128. Radio-spectrum (zoomed). Save and Delete buttons.

To save or delete the spectra, use the buttons in the right bottom:

- Save Plots Saves all the plots as png–files to the selected folder. (A subfolder will be created with a name consisting of the receiver model and the date of the spectra.)
- *Delete* Deletes the current spectrum plots.
- Delete All Deletes all plots for the receiver.



3.8 Calibration

JAVAD receivers can be equipped with internal *compass* and *levels* or *IMU* module which also provides *gyroscope* that allows to control device orientation parameters.

Compass and *gyroscope* should be calibrated for proper operation. You can check calibration and calibrate those using *NetView*.

If receiver is equipped with internal levels, compass ore IMU module the *Calibration* tile will appear.

Select *Calibration* tile to check current calibration or to calibrate devices.

arameters	C7 N	1ain														*	-
K Settings			I		Έ7ΒΔΔ544C	OASEEAD	AOPPOE		UpTime			4d19b19r			× dev/t	dt/a	
les	C2		N	lodel TRI	JMPH3 V		AVAD GN	ss		(Used/Tot	al)	14.47 / 16			a det/t	//ou	
otal: 778 0		0	S F	erial No 003 irmware 4.3.0		20-5f92			Battery	() 100	%						
NSS Spectra	C7		B	oard TRI	JMPH3_5					of files 77	8						
⊻ Interfere			K	ernel 4.9.	146-javad-4	Build	26		a log12	18h							
	-7											B- W- G-			Spoofing		0
	C7								Referenc	e Station	ID 25~	(0.00 km 54	4"43'5.4"N	25*16*12	2.38"E 177.84	m.)	
poofing		 Measurements 			Satellite	s Sk	y Plot	Orienta	ation	RTK Engi	nes	RTPK V	Veather S	Station			
		atitude .ongitude	54"43'5.30955 25°16'12.2906		EI	Az	SNR						Track Tir	ne He	alth		
s s 🗠	E	illipsoidal height	177.5538899		4 GPS -	10/6			CA	P1	P2	L2C	15	L1C			
libration		Position SEP /elocity 2D	0.0069226 m 0.0016130 m/		GPS	4	25	94	43	32	32	47	47	46	05:23:35	✓	
🖓 😵 🔇		Position RMS	0.0069226 m	·	GPS	5	14	314	41	26	26	39			00:22:45	✓	
otions		/elocity RMS HRMS	0.0141691 m/	s	GPS	6	17	228	42	39	39	44	47		04:05:42	~	
E Actual	-	IRMS /RMS	0.0043147 m 0.0054134 m	- 1	GPS	7	67	192 98	48	48	48	50	55		02:16:42	1	
		TK fixed (Phase d	liff)	_	GPS	11	30	260	49	32	32	47	51	46	02:53:41	2	
		DOP	1.1460546		GPS	16	25	48	42	22	22	-	21	40	02:16:41	~	
Ports Message		HDOP	0.7084565	_	GPS	20	45	294	46	35	35				01:45:55	~	
eis Commands	L. _	/DOP	0.9008499		GPS	26	8	30	38	22	22	40	44		03:02:59	~	
		Receiver Date Receiver Time	2023:12:18 (G 07:27:05	PS)	GPS	30	36	216	47	46	46	47	52		01:11:19	~	
2	-	 Angles 	01121100		- GLO -	10 / 4			CA	P1	P2	L2C	L3				
al-Time Log					4												

Figure 129. Calibration. Levels, Compass, IMU.

Green check marks on the device icons means that it is calibrated. Otherwise, red x-sign is displayed.

To check calibration or calibrate *Compass*, *IMU*–module and *Levels*, maximize the tile.

Depending on the hardware of the model, there will be different panels on the *Calibration* tile.



The Levels are calibrated at the factory and it is not recommended to recalibrate them. The Levels panel appears only under Development mode.

If *Compass*, *IMU*–module and *Levels* are already calibrated make sure that calibration is still good.

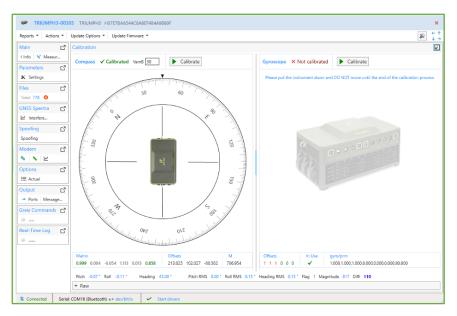


Figure 130. Calibration. Compass is calibrated, Gyroscope is not.

Calibration tile contains several panels depends of receiver equipment and *NetView* mode. Each panel provide the following controls:

- Toolbar Contains *Calibrate*, button and calibration settings.
- The picture depends of calibrated state.
- Table of the calibration parameters.

Below the calibration panels there is line with the data from the [MR] and [MA] messages updated 10 times per second: *Pitch, Roll, Heading, Pitch RMS, Roll RMS, Heading RMS, Magnitude, Flag, Difference* – magnitude difference between current magnitude and magnitude from the compass parameters.

Expand Raw panel to see messages data and calibration parameters in raw form.



3.8.1 Compass

Heading value is a correct direction. You can use another compass to check this.

Ideally compass should be calibrated before every usage due to a change in the magnetic environment.

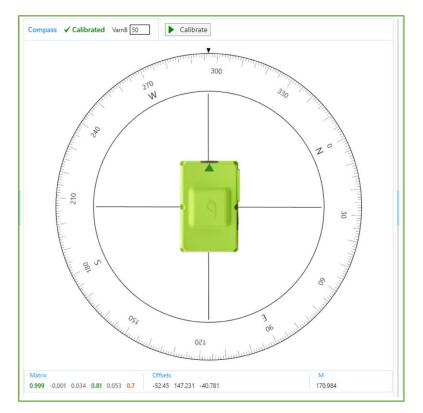


Figure 131. Compass is calibrated.

Calibration

If *Compass* is not calibrated you will see pictures prompting to calibrate. Heading values are not available.

Levels should be calibrated first.

Click *Calibrate* button to start calibration if it is not calibrated yet or you are not satisfied with current one.





Figure 132. Compass is not calibrated.

To start Compass calibration click the *Calibrate* button. Then rotate the receiver along each axis, following the pictures, until calibration is finished. Rotation directions should be changed six times.







Figure 133. Compass calibrating. Rotate the receiver along the three axes.

After calibration is completed wait for a moment until calibration matrix is calculated. Then Heading plot and calculated values will be displayed.





Figure 134. Compass calibration is completed.

Compass calibration *Matrix* shows calibration results. If first, forth and sixth values are more than 0.8 and less than 1 calibration is good. You can save results to non–erasable memory by clicking the *Save* button or use those only in the current session by clicking the *Cancel* button.

Offsets are offsets from real values; **M** is magnitude.

VarnB – scatter of acceptable values. It takes value from 30 to 50. You can play with *VarnB* to improve the calibration results.



3.8.2 Gyroscope

Calibration using a NetView is available for receivers equipped with IMU-module



Figure 135. Gyroscope is not calibrated.

Place the receiver on a flat surface and do not move it until the end of the process.

The msint parameter specifies the required time grid period for the internal receiver. The default is 10 (100ms). Calibration time 1000 epochs (10 sec).

Click *Calibrate* button to start the calibration process





Figure 136. Gyroscope is calibrating.

A progress bar is displayed in percentages and epochs.

The calibration can be canceled by clicking the Cancel button.

When the process is complete, the calibration flag appears and the offsets are updated.

The offsets modulus must be in the range [-0.5, 0.5]. Otherwise, they are red.

Save confirmation message appears.



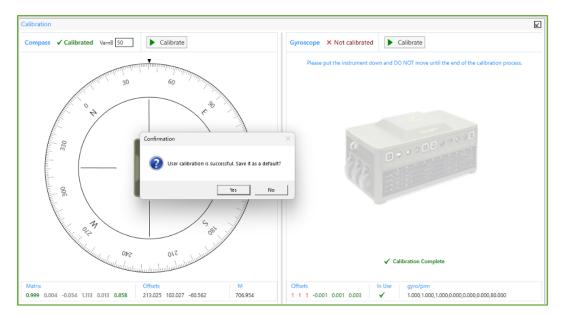


Figure 137. Gyroscope calibration save confirmation.

The new offsets will be saved in the receiver by clicking the Yes button.

ATTENTION! Saving offsets clears the factory calibration settings.

3.8.3 Base Line Calibration

For DUO receivers *Baseline* calibrating is available.

The following parameters can be set on the panel [2, RTK Heading Parameters]:

- *Fixed* length Base line length. Can be set manually.
- Use Fixed Line Flag, that RTK engine will use in the heading mode the apriori baseline from *fixed* length, unless its value is equal to zero.
- *Apply* button Applies manually set fixed length and flag.
- Calibrated (tune) length Calculated by calibrating.



- *Refresh* button Request heading parameters from the receiver.
- Update Fixed Length Sets calibrated length to fixed one.

Please put the in	Calibrate Epochs: 300 strument down and DO NOT move until the end of the calibration process.
	Fixed - 3.214 m Calibrated - NaN m
Baseline Fixed, m	
	d, m NaN 🖸 Refresh

Figure 138. Baseline calibration panel.

To start calibrating set epochs count and click *Calibrate* button. Calibrating will continue during set epochs. Default epoch count value is 300. Calibration can be stopped by clicking *Cancel* button.



Please put the instrument down and DO NOT move until the end of the calibration process.
Fixed - 3.214 m Calibrated - NaN m
25 %
calibration on
Baseline Length
Fixed, m 3.214
Siz 14 Size Fixed Length Apply

Figure 139. Baseline calibrating progress.

After calibrating is finish successfully green check appears and *Calibrated* field is filled.

To apply this calibrated value, click Update Fixed Length button.



Please put the instrum	ent down and DO NOT move until the end of th	e calibration process.
	Fixed - 3,212 m	
-	Calibrated - 3.212 m	
	✓ Calibration Complete Jpdate Fixed Length to Apply calibration.	
Baseline Leng	13.212 ✓ Use Fixed Length	✓ Apply
Fixed, m		

Figure 140. Baseline calibrated and applied.

Calibration Reports

The calibration reports is generated after calibration is saved.

Report path is C:\Users\% USER% \AppData\Roaming\JAVAD NET\Imu.



3.8.4 Levels (Development Mode Only)

Levels panel are visible only under *Development* mode.

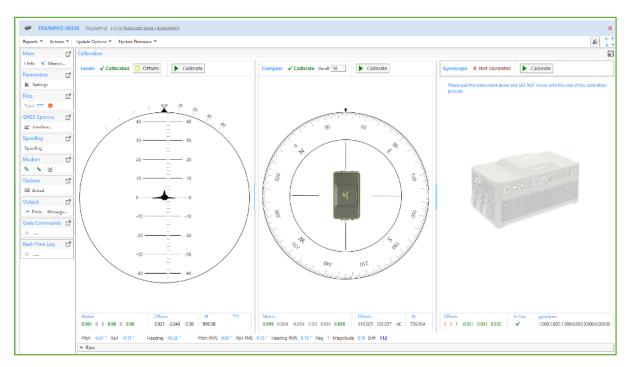


Figure 141. Calibration tile in Development mode. Levels and Compass are calibrated.

Calibration

If *Levels* are not calibrated you will see pictures inviting calibration. Pitch and roll values are not available.

Click *Calibrate* button to start calibration if it is not calibrated yet or you are not satisfied with current one.

Pitch and Roll values are within 0.5° for a receiver is placed on the absolutely flat horizontal surface.





Figure 142. First edge is ready for calibration.

After *Levels* calibrating is started six edges must be calibrated in proper order. Controls with current edges become available one by another. Place the receiver on the flat horizontal surface as shown on the picture and click *Start* button. Don't move or shake receiver until calibration is going on.

After current edge calibration is finished next edge become available. Put the receiver on every side following the pictures and calibrate all. The same way the next side will be calibrated.

Please be careful since pictures for TRIUMPH–2 show the real receiver position but in other cases it will be view from up.

If the receiver is placed wrong error message will be displayed.



Levels Compass		Levels Compass		
Levels X Not calibrated Calibrate	Compass × No	Levels X Not calibrated Calibrate		Compass >
Current Edge 1		Place the receiver on the side 2 and press Start		
Edge 1 Edge 2		Edge 1 Ed	lge 2	
Constant Line Line Line Line Line Line Line Line		III III or Issues		
54%		✓ Calibrated Edge 3 Er	Start	
	U.		-	1
Matrix Offsets M T*C 1 0 0 1 0 1 0 0 0 1020 50	Matrix	Matrix Offsets 1 0 0 1 0 1 0 0 0	M T*C 1020 50	Matrix 1 0 0 1 0
Pitch 0.00 * Roll 0.00 * Heading 0.00 * Pitch RMS 0.00 * Roll RMS 0.00 * Heading RMS 0.00	1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Pitch 0.00 * Roll 0.00 * Heading 0.00 * Pitch R	MS 0.00 * Roll RMS 0.00 * Heading RMS 0.0	0* Flag O

Figure 143. First edge is calibrated. Second one is ready.

Levels X Not calibrated D Calib	orate		Comp
Place the receiver on the side 3 and p	press Start X Calibration Erro	r Wrong Edge	
III III as TREATING	THANNAL TILL THE		1
✓ Calibrated Edge 3	✓ Calibrated Edge 4		
	Change		
Start		Ŧ	
Matrix Offsets		T°C	

Figure 144. Error. The receiver is not placed as shown in the picture.



After all sides are calibrated, the levels calibration is completed. Wait for a moment until calibration matrix is calculated. Then Pitch/Roll plot and calculated values will be displayed.

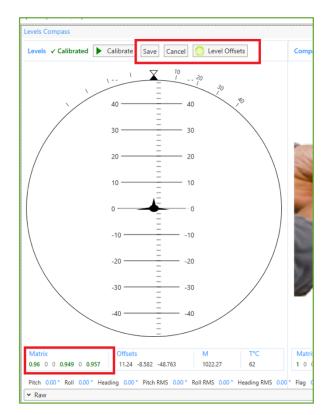


Figure 145. Levels calibration is finished successfully.

Levels calibration *Matrix* shows calibration results. If first, forth and sixth values are more than 0.9 and less than 1 calibration is good. You can save results to non–erasable memory by clicking *Save* button or use those only in the current session by clicking *Cancel* button.

Offsets are offsets from real values; **M** is magnitude. **T** is device temperature.

If it is necessary click Level Offsets to reset offsets as described below.

Removing Levels Offsets

If the surface on which the receiver is placed is not ideally flat and horizontal click *Level Offsets* button to reset level offsets.



3.9 Options

To see actual options expand Options tile.

JAVAD	Connect : A	leceiver 🧼	Modem	Terminal		Help		
. ·	STRIUMPH2- TRI	JMPH2 0287X22	OD86IQ1BR9IH	5NNKW9Y				
Devices	Reports • Actions • U	pdate Options 👻	Update Firmwa	re *			*	← ↓
	Options				Refr	esh butto	• <	[
 Receiver 1 	Option	▲ Current	Purchased	Leased	Date			S
o 🗢 TRIUMPH2- 🗙	1-PPS Timing Signal (_PPS)	-1		0	511 15.12.2023			
TRIOMPH2-	Authorization (AUTH)	511 (Justin L	ite,	0	511 15.12.2023			
	BeiDou System (COMP)	1		0	511 15.12.2023			
	Bluetooth (_BLT)	1		1 3	511 15.12.2023			
	CAN Ports (_CAN)	-1		0	511 15.12.2023			
	CANopen Interface (COPN)	-1		0	511 15.12.2023			
	Carrier Phase (_CPH)	1		0	511 15.12.2023			
	CMR Input (CMRI)	1		0	511 15.12.2023			
	CMR Output (CMRO)	1		0	511 15.12.2023			
	Common Tracking (COOP)	-1		0	511 15.12.2023			
	Corrections inputs (CORI)	511		0	511 15.12.2023			
	Datums support (_DTM)	1		0	511 15.12.2023			
	Devices (DEVS)	511		0	511 15.12.2023			
	DGPS mode (CDIF)	1		0	511 15.12.2023			
	E5B Band (_E5B)	-1		0	511 15.12.2023			
	E6 Band (_E6_)	-1			511 15.12.2023			
	Ethernet Port (ETHR)	-1			511 15.12.2023			
	Event Markers (EVNT)	-1		-	511 15.12.2023			
	Freq. Lock and Output (_FR				511 15.12.2023			
	Frequency Input (_FRI)	-1			511 15.12.2023			
	FTP Connections (FTP)	1		0	511 15.12.2023		, v	
	Main 🗗 Pa	rameters 🗗	Files C2 (GNSS Spectra	C ² Modem	C ² Cal	libration	Г
		Settings	-	M Interfere			2	

Figure 146. Options Tile.

Actual options are present in the convenient table supporting the sorting by columns.

Each option is characterized by the following columns:

- Option name
- Current value
- Purchased value
- Leased value
- Expiration date of leased value

See details in the Greis manual - [2, 4.4.45 Receiver Options].

Clicking *Refresh* button requests options at the receiver and fills the table.



3.10 Output

Select Output Tile.

It Contains Ports, Message Sets and Timing Tabs.

3.10.1 Ports Tab

Ports tab contains the list of the available ports and provides information about current output for each of them. It allows enabling and disabling output on the selected port or on the all ports.

1	Port	e Sets Timing Output Messages	em	dm
+	dev/ser/a	Port used by NetView	Message Set	•
	dev/ser/b		Message Set	-
	dev/tcp/a	kgr/kT=(1.000.0000,0.00), jps/kGT=(1.0000.0000,0.00), jps/kT=(1.000.0000,0.00), jps/kSX=(1.0000.0000,0.00), jps/kGT=(1.000.0000,0.00), jps/kGT=(1.0000,0000,0.00), jps/kGT=(1.0000,0000,0.00), jps/kGT=(1.0000,0000,0.00), jps/kGT=(1.0000,0000,0.00), jps/kGT=(1.0000,0000,0.00), jps/kGT=(1.000	SI= Disable output Message Set	ut on the port
	dev/tcp/b		Message Set	*
	dev/tcp/c	► /msg/def		
	dev/tcp/d	/msg/rtk/jps/mir		
	dev/tcp/e	/msg/rtk/jps/ma /msg/usr/0	Enable output	t
	dev/http/a	//msg/usr/1		
	dev/tcpcl/a	DGPS RTCM (1,3	1.3}	
		DGPS RTCM (9,3		
	dev/udp/a	 DGPS RTCM (41, 		
	dev/udp/b	RTK RTCM (18,19		
	dev/udp/c	 RTK RTCM (20,21 RTK RTCM (18,19 		
	dev/udp/d	 RTK RTCM (20,21 		
	dev/udp/e	RTK RTCM3 GD r	nin	
	dev/tcpo/a	RTK RTCM3 GD f		
	dev/tcpo/b	RTK RTCM3 GGD RTK RTCM3 GGD		
	dev/tcpo/c	RTK RTCM3 GGD		
	dev/tcpo/d	RTK RTCM3 3.0		
	dev/tcpo/e	RTK CMR {10,0,1		
	dev/blt/a	RTK CMR+ (10,0) RTK JPS min	9}	
2	Refi	resh button RTK JPS max		
	1	RTK RTCM3 MSN	1 Full	
n	E?	Parameters C Files C GNSS Spectra C Modem C Calibi		Dissable all ou
0	X Measur	* Settings Total: 65 1/2 Interfere S S 1/2 0/2 NTK RTCM3 MSN	I GPS+GLO	Dissupic un de

Figure 147. Output Ports tab.



The following buttons control output to the ports:

- *Refresh* Gets actual info about output from the receiver.
- Enable Opens dropdown list of message sets to enable output on the selected port. Message set list contains receiver predefined message sets, base correction predefined sets and custom sets. They can be edited on the Message Sets tab
- *Disable* button Stops the output on the selected port. The confirmation windows will appear.
- Disable All stops output on all the ports. The confirmation windows will appear.

Port	Output Messages	em	dm
\$ dev/ser/a		Message Set	
dev/ser/b		Message Set	
dev/tcp/a		Message Set	
dev/tcp/b	Confirmation	Message Set -	
dev/tcp/c	Do you really want to disable output messages on the port	Message Set 🔹	
dev/tcp/d	"dev/udp/a"?	Message Set 🔹	
dev/tcp/e	Da Her	Message Set 🔹	
dev/http/a	<u></u>	Message Set	
dev/tcpcl/a		Message Set	
dev/udp/a	jps/RT={1.000,0.000,0.0x0}, jps/GT={1.000,0.000,0.0x0}, jps/NT={1.000,0.000,0.0x0}, jps/SX={1.000,0.000,0.0x0}, jps/S1={1.000,0.000,0x0}, jps/rc={1.000,0.000,0.0x0}, jps/rc={1.000,0.000,0.0x0}, jps/rc={1.000,0.000,0.0x0}, jps/2p={1.000,0.000,0x0}, jps/RE={1.000,0.000,0.0x0}, jps/FT={1.000,0.000,0.0x0}	Message Set -	Ш
dev/udp/b		Message Set 👻	
dev/udp/c		Message Set -	
dev/udp/d		Message Set 🔹	
dev/udp/e		Message Set	
dev/tcpo/a		Message Set	
dev/tcpo/b		Message Set	
		Message Set	

Figure 148. Confirmation of output disabling.

Deferred Output

If port is currently used by *NetView* output enabling will be deferred until disconnect. It can be canceled by clicking Cancel button.



	ts Messac	e Sets Timing Cancel d	leferred output		
		Output Messages	em	dm	
ţ	dev/ser/a	Deferred: /msq/usr/0	Message Set	>	×
	dev/ser/b		Message Set	-	
	dev/tcp/a	jps/RT={1.000,0.000,0,x0}, jps/GT={1.000,0.000,0,x0}, jps/NT={1.000,0.000,0,x0}, jps/SX={1.000,0.000,0,x0}, jps/SI= {1.000,0.000,0,x0}, jps/rc={1.000,0.000,0,x0}, jps/cp={1.000,0.000,0,x0}, jps/CC={1.000,0.000,0,x0}, jps/EC= {1.000,0.000,0,x0}, jps/2r={1.000,0.000,0,x0}, jps/2p={1.000,0.000,0,x0}, jps/D2={1.000,0.000,0,x0}, jps/E2= {1.000,0.000,0,x0}, jps/BI={1.000,0.000,0,x0}, jps/ET={1.000,0.000,0,x0}	Message Set	•	II
	dev/tcp/b		Message Set	•	
	dev/tcp/c		Message Set	•	
	dev/tcp/d		Message Set	•	
	dev/tcp/e		Message Set	-	
	dev/http/a		Message Set	-	
	dev/tcpcl/a		Message Set	-	
	dev/udp/a		Message Set	-	
	dev/udp/b		Message Set	•	
	dau/uda/a		Marcana Cat		

Figure 149. Deferred output on the current port.



3.10.2 Message Sets Tab

Message Sets Tab contain the following editable message sets.

Predefined Message Sets

Predefined message sets are:

- /msg/def
- /msg/rtk/jps/min
- msg/rtk/jps/max

They can be edited and stored in the receiver.

Dutput	6			
Ports Message Sets Timing				
	_			
/msgidet	4			
jps / JP :{ 0} jps / MF :{ 0} jps / PM :{ 0} jps / AU :{ 0} jps / EV :{ 0} jps / RT :{ 1} jps / RD :{ 1} jps / SX :{ 1} jps / SX :{ 1} jps / SX :{ 1} jps / NN :{ 1} jps / EU :{ 1}				
jps/FC:{1} jps/prr:{1} jps/cp:{1} jps/cc:{1} jps/dtr:{1} jps/CE:{1} jps/FC:{1} jps/F1:{1} jps/F1:{1}				
jps/1d;(1} jps/1E;(1} jps/12;(1} jps/2r;(1} jps/2p;(1} jps/22;(1} jps/2d;(1} jps/2E;(1} jps/12;(1} jps/3p;(1}				
jps/c3;[1} jps/3E;[1} jps/3d;[1} jps/F1;[1} jps/Ir;[1} jps/Ir;[1} jps/c1;[1] jps/E1;[1} jps/Id;[1] jps/S5;[1] jps/SE;[1]				
jps/PV:{1} jps/ST:{1} jps/DP:{1} jps/IDP:{1} jps/IDO:{1} jps/IDO:{1} jps/GE:{1} jps/GA:{1} jps/IO:{1} jps/IO:{1}				
jps/NA(1,) jps/RE(1,) jps/RE(1,) jps/RE(1,) jps/RE(1,) jps/RA(1,) jps/RE(1,) jps/RE(1,) jps/RE(1,) jps/RE(1,) jps/RE(1,)				
jps/QU:[1} jps/QU:[1] jps/CN:[1] jps/CA:[1] jps/CI:[1] jps/CI:[1]				
/msg/rtk/jps/min Edit the message	1			
jps /RT i[1.000], 0 , 0 , 0 , 0 , 0 , 0 × jps /GT i[1] / jps /NT i[1] / jps /SI i[1] / jps //C i[1] / jps //C i[1] / jps //C i[1] /				
jos/2pi(1) / jos/ETi(1) / jos/ETi(1) / Delete the message				
+ Add message				
/msg/tk/jps/max 🕴				
jps/RT:{1} jps/GT:{1} jps/NT:{1} jps/SI:{1} jps/C2:{1} jps/rc3:{1} jps/CC:{1} jps/CC:{1} jps/CC:{1}				
jps/E2:{1} jps/81:{1} jps/ET:{1}				
/msg/usr/0 🕴	1.			
/msg/usi/1 👂	1			
Custom Message Sets	_			
4				
	э,			
lain C ² Parameters C ² Files C ² GNSS Spectra C ² Modern C ³ Calibration C ³ Options C ³ Greis Commands C ³ Info X Measure, X Settings Total: 65 W Interfere, S X W C ² W III Actual 0				
Info 📽 Measur 🛣 Settings 🛛 Total: 65 🛛 🗠 Interfere 🛛 🗞 💊 🖉 🧔 😵 🗮 Actual 🔍				
Connected SerialCOM13 : 1500000 => dev/ser/a Get Parameters				

Figure 150. Predefined message sets.



Editing Predefined Message Set

Click Edit button (blue pen) in the header. Edit button will be replaced by the following buttons:

- Apply Saves changes to the receiver.
- Cancel Receives actual message set from the receiver. All changes are lost.
- Reset Resets predefined message set to the initial value. All changes are lost.



Editing Message

Click Edit button near desired message. The following fields became available for the editing:

- Output Interval
- Phase
- Count
- Flag

Edited message will be signed by blue star.

Delete button deletes message from message set.

Adding Message to the Message Set

Click Add Button (green cross). Available messages tree will be opened. Expand desired messages node and click on message. It will be added to the set. Messages that are already in the set are shown semitransparent.



Figure 151. Adding of a message.

Custom Message Sets

Custom message sets can be created by the user. They are stored in the NetView and are available for the enabling in the Ports tab.



To create new custom messages set click Add button (Green cross).

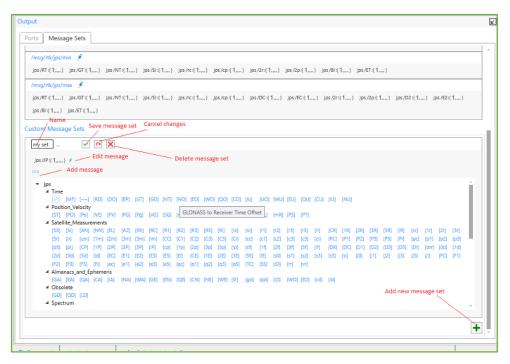


Figure 152. Custom message set.

Editing Custom Message Set

Click Edit button (blue pen) in the header. New message set is shown in the editing mode. The following buttons appear:

- Save Saves changes to the NetView.
- Cancel Receives last saved message set. All changes are lost.
- Delete Delete custom message set.
- Name box allows to change message set name.

Adding and Editing messages are carried out in the same way as for the predefined messages set.



3.10.3 Timing

CGGTTS stands for "CGGTTS–Version 2E: an extended standard for GNSS Time

Transfer".

CGGTTS support in JAVAD GNSS receivers is achieved by combining multiple receiver features to get suitable JPS files and then converting them to CGGTTS.

To start recording CGGTTS files select tile Output and tab Timing.

- Fill in data which will be put to the CGGTTS file headers:
 - Laboratory data.
 - Antenna Phase Center coordinates.
 - Internal delays (receiver + antenna) delays for each signal.
 - Cable delay. (Delays from the antenna to the main unit including delays in the filters, electronics and cable length).
 - Reference delay (Time delay between the local clock (or realization of UTC) and the receiver internal clock).
- Select file, output format and destination for converting. Any file from A, B, C, D, E can be used without affecting another tasks. For converting receiver uses FTP Push destination, but outputs result to the receiver internal file system. 6 FTP Push destination (A, B, C, D, E, F) are available and work independently. CGGTTS file can be output in text or tar.gz formats.
- Click Start button

Required parameters will be set and selected file will be started to record.

Essentials are to use special CGGTTS time scale, 30–seconds epochs, log–file rotation being multiple of 16–minutes being shifted a bit to start every log file a little bit earlier than corresponding CGGTTS time interval.



Laboratory		Antenna Phase Center Coordunates	Requiered Settings		
Laboratory Name	ASC *	Mode Marcal	Time Sync	steady	
Calibration ID (CAL ID)	123	Phase Center X 2850234.552 ,m	Fix Pos	on	•
Calibration revision date (REV DATE)	12-09-2022	Phase Center V 2182869.0502 ,m	Rotation Period	00	
Time Reference (RDF)	UTCIUSNOS	Phase Center 2 5252182.9313 ,m	Rotation Scale	cagts	
Comment (COMMENTS)	let	$[\checkmark]$ Use the same coordinates for all constellation	Rotation Factors	16	•
(IVV) - field	of the COGITS header	·	Rotation Phases	-120	
Laboratory ID	u.	File Settings	Log Period	30.000	
Receiver ID	RR	Fåg b	Hust	"oggitu"	•
908	d in CGGTTS file name	Destination a	Destination Files	locot	
		Format [*oggttu*] *	File Prefix	699	1*
			Elevation Mask		
Delays			Implicit Management	Incorel	
Internal Delays, ns (INTD(V) 0.3	0.4 0		Cidest File Removal	0.01	
Cable Delays,rs (CABDU) 02			Push Mode	(in)	•
Reference Delays,ns (REFDL/) 0.5	=		Rotation Mode	(un	_
annandahara (a				new values will b	er set
Start					

Figure 153. Timing settings. Start button is available.

If CGGTTS files are recording, Stop button is available. It stops recording current CGGTTS file, reset parameters and destination.

	For	mat "cggtts:" *	Destination Files	{y,y,y,y,y}
			File Prefix	cgg
Delays			Elevation Mask	0
Delays	GPSL1 GPSL2 GLOL1 GLOL1	GALE1 GALE5a BDSB1I BDSB2I	Implicit Management	$\{n,y,n,n,n\}$
Internal Delays,ns (INTDLY)	0.3 0.4 0 0		Oldest File Removal	on
Cable Delays, ns (CABDLY)	0.2		Push Mode	on
Reference Delays,ns (REFDLY	0.5		Rotation Mode	on
			· .	- new values will

Figure 154. Stop Timing.



3.11 Manual Mode

Greis Commands window is designed to direct control of the receiver as a same way as using an ordinary terminal. It allows the user to send various receiver commands, get receiver responses and to log them into the text–file. For a complete list of commands supported by *JAVAD GNSS* receivers, refer to the **[2]**.

Click on Greis Commands tile of the receiver to go to Manual mode window.

	Connect : 🛲 Receiver 🧼 Modem 🗈 Terminal	Help
	TRIUMPH2- TRIUMPH2 0287X2ZOD86iQ18R9iH5NNKW9Y	×
Devices	Reports * Actions * Update Options * Update Firmware *	★ ↓ →
 Receiver 1 	Greis Commands	
	dev/blt/a	i Info 🗙 Measur Parameters
o 🥌 TRIUMPH2- 🗙	[[dev/bit/a dev/ser/a	★ Settings
	^ ^	Files
		Total: 65 GNSS Spectra
		Mos spectra □
		Modem
		S S M
		Calibration
		Options 📑
		i≡ Actual
		Output 🗗
		Real-Time Log
	· · · · · · · · · · · · · · · · · · ·	
	Connected Serial: COM6 (Bluetooth) => dev/bit/a Serial:COM4 : 1500000 => dev/ser/a	

Figure 155. Manual Mode window.

The drop–down list contains the interfaces which *NetView* uses to communicate with the receiver.

Select one to capture for manual mode and press *Capture* button. This connection becomes unavailable for another functionality of *NetView* If the connection is the only communication with the receiver is carried out only manually.

After connecting all the elements of the user interface are enabled.

Use Input Line to type a command. The functionality of each button is described below.



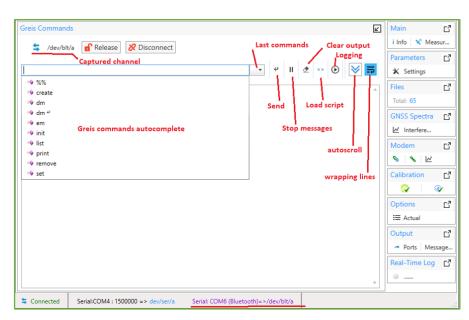


Figure 156. Manual Mode tools.

The following controls serve the manual operation:

- *Input line* for the *Greis* commands. As you type a hint is shown with a list of available commands.
- Output window displays receiver responses.
- *Last Commands list* Allows select one of the previously sent commands. Up to 50 commands are stored.
- Send button Sends command to the receiver (equivalent to Enter in Input Line)
- Stop Messages button Disables messages.
- Clear button Clears the Output Window
- Load Script button Sends a set of the commands from the selected file to the receiver. Only ordinary scripts are supported (*tcl*-scripts can be loaded using *Parameters* window).
- Start Logging (Stop Logging) button Saves receiver output to the selected file. After starting the button changes to Stop Logging. Log file path is displayed at the bottom.
- Auto scroll button On/off auto scrolling of the output window.
- Line wrapping button On/off wrapping of output lines.



·								
Greis Command	ıds	ĸ						
💲 /dev/blt	it/a 🖬 Release 🔀 Disconnect							
print,/par:on		∮ ⊒						
	.tate=idle,coher_aver=1,n_out=100,n_aver=5,m_aver=mean,							
	= 1000, resampl = 10,							
	D=gps1,1=gps2,2=glo1,3=glo2},							
	=1554.846,1=1212.154,2=1581.846,3=1231.154},							
	0=0.0,1=0.0,2=0.0,3=0.0},							
REOOC agc/mean								
	=0.0,2=0.0,3=0.0},							
REOOB agc/rms=								
	RE01C 0=0.0,1=0.0,2=0.0,3=0.0),							
REOOC calibext={ REO14 0=0.1=0.2=0.3=0}.								
REU14 U=U,1=U,2=U,3=U}, RE018 calib={0=0,1=0,2=0,3=0},								
RE018 Calib={soft={mode=qot, RE017 calib={soft={mode=qot,								
	REUT/ calib={soft={mode=got, RE036 brand={cur=unknown.got=unknown.fix=unknown.rcv=""},							
REOOF source=n								
RE01C bias={I1=	=0.00,12=0.00}}},							
RE018 mcu={ver:	r={main=0x31b1},							
RE022 rf={ver={r	{main=0x30b1,brd=0x1}}}							
\$GPGGA,141716.								
\$GPGGA,141717.	7.00,,,,,0,00,,,,,,,*4D							
	\$GPGGA,141718.00,0,00,*42							
\$GPGGA,141719.	3.00,,0,00,*43							
Logging C:\Us	sers\Admin\Documents\Log.log Started 12/15/2023 2:16:35 PM							
\$ Connected	Serial:COM4 : 1500000 => dev/ser/a Serial: COM6 (Bluetooth)=>/dev/blt/a							

Figure 157. Output and logging the stream of messages and replies.

Finish the manually operation can be done in two ways:

- Release button Returns the connection to the NetView Output of messages is stopped.
- *Disconnected button* Close the connection. The ordered messages continue to be output. *Net View* doesn't use the connection. This way is useful to configure receiver outputs.



3.12 Real – Time Logging

NetView allows logging *JPS* or *RTCM* files directly to the PC storage in real time. It can be useful, for example, for the receiver for which the internal memory is unavailable. In fact, *Real–Time Logging* in *NetView* is just a wrapper on the console application *RealTimeLogger* which is available on *JAVAD GNSS* site [5].

Click on *Real–Time Logging* tile to open the corresponding window.

Real-Time Logging	Main 🗗
▶ dev/bit/a ▼	i Info 🛛 🗙 Measur
dev/bit/a	Parameters
SaveTo: dev/ser/a ments\Test1 Browse	🗙 Settings
File Type: Jps ▼ Interval, s : 1 File Prefix: log	Files
File Rotation: 15 min 🔻 0 ,s Amount: 0 (unlimited) Timeout 30 ,s	Total: 65
	GNSS Spectra
Convert to Rinex: Version 3.02 Command Line:	interfere
Status:	Modem 🖸
A	S S M
	Calibration
	😪 🛛 😵
	Options 🖸
	i≡ Actual
	Output
	→ Ports Message
τ	Greis Commands
Save statistic C:\Users\Admin\Documents\stat.txt Browse	·
Connected Serial: COM6 (Bluetooth) => dev/blt/a Serial:COM4 : 1500000 => dev/ser/a	

Figure 158. Real–Time Logging window.

Follow these steps to start logging:

- Select from the drop-down list one of the connections, which is used by the *NetView* for the communication with the receiver. *NetView* will use the selected connection for *Real-time logging* exclusively.
- Specify the folder for logged files saving by typing or using button *Browse*.
- Set the following parameters:
 - File type JPS or RTCM3
 - Interval interval of messages generation (sec).



- *File Prefix* Prefix which will be added to the file name before the date.
- *File Rotation* Recording period (sec). It can be selected from the drop– down list or typed manually if *Other* value is selected.
- *Amount* File number. 0 means the files will be logged until *Real-time logging* is stopped. The value greater than 0 specifies file number to recording.
- Click Start button.

Real-time logging is started (in fact *RealTimeLogger.exe* executed). Status information is displayed below the setting pane and contains the command line which was used for *RealTimeLogger.exe* starting.

Real-Time Logging		Ľ
/dev/blt/a		
SaveTo: C:\Users\Admin\Documents\RTWithRin	Browse	
File Type: Jps 🔻 Interval, s : 1 File Prefix: log		
File Rotation: Other 🔻 60 , s Amount: 0 (unlimited) Timeout 30 , s		
Convert to Rinex: Version 3.03 Command Line:		
Status: Logging <u>3</u> complete files logged		
Connecting to Serial:COM6:115200 Receiver information: Port: /dev/blt/a Model: TRIUMPH2_11 Firmware: 43.00-231129 ID: 0287X:2COD86i0[JBR9H5NNKW99 Real Time Logging information: Log Rotation Time: 60 sec GNSS Message List: (/msg/def:1) Log Directory: CAUSers/Admin/Documents\RTWithRin\ 18:30:40 Log file strated: -log_2023:12,15:18:30.10 18:30:40 Stream check: OK (21 epochs, 244 msg, 12465 bytes, 6 msg/epoch) 18:30:41 Log file strated: -log_2023:12,15:18:30.10 18:30:41 Log file strated: -log_2023:12,15:18:30.41 18:30:45 Stream check: OK (31 epochs, 156 msgs, 973 bytes, 6 msg/epoch) 18:30:45 Stream check: OK (9 epochs, 168 msgs, 973 bytes, 6 msg/epoch) 18:30:45 Stream check: OK (9 epochs, 125 msg, 11873 bytes, 6 msg/epoch) 18:31:01 Stream check: OK (9 epochs, 123 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (29 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (29 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (29 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (29 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (29 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (29 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 11873 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 118:31 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 118:31 bytes, 6 msg/epoch) 18:31:11 Stream check: OK (20 epochs, 231 msgs, 118:31 bytes, 6 msg/epoch) 18:31:11 Stream check:	Browse	•
Connected Serial:COM4 : 1500000 => dev/ser/a Serial:COM6:115200=>/dev/blt/a		

Figure 159. Real-Time Logging is going on. Convert to Rinex on. Save statistics on.



For converting files to RINEX format:

- Check Convert to Rinex flag.
- Select Version from drop-down list.
- Type additional command line arguments if need. Button right of command line opens tips with all available command line arguments.

Check *Save statistic* and specify file path for saving statistics if desire. File path can be typed manually or selected using the button *Browse*.

Statistics window displays the statistics received from RealTimeLogger.exe.

Logged files are located in the selected folder.

If Convert to Rinex checked additional folder Rin appears.

Имя	Дата изменения	Тип	Размер
📙 Rin	15.12.2023 18:30	Папка с файлам	ли
org_2023_12_15_18.39.41.tmp	15.12.2023 18:39	Файл "ТМР"	1 КБ
Iog_2023_12_15_15.30.28.jps	15.12.2023 18:30	Файл "JPS"	14 KE
Iog_2023_12_15_15.31.00.jps	15.12.2023 18:31	Файл "JPS"	15 KB
Iog_2023_12_15_15.32.00.jps	15.12.2023 18:32	Файл "JPS"	15 KB
Iog_2023_12_15_15.33.00.jps	15.12.2023 18:33	Файл "JPS"	15 KB
Iog_2023_12_15_15.34.00.jps	15.12.2023 18:34	Файл "JPS"	15 KB
Iog_2023_12_15_15.35.00.jps	15.12.2023 18:35	Файл "JPS"	15 KE
Iog_2023_12_15_15.36.00.jps	15.12.2023 18:36	Файл "JPS"	15 KB
Iog_2023_12_15_15.37.00.jps	15.12.2023 18:37	Файл "JPS"	15 KG
Iog_2023_12_15_15.38.00.jps	15.12.2023 18:38	Файл "JPS"	15 KB
Iog_2023_12_15_15.39.00.jps	15.12.2023 18:39	Файл "JPS"	15 KB

Figure 160. Logged files.

First file is usually shorter then selected *File Rotation* due to time alignment. The file which is logging at the moment has extension *".tmp"*.

Real-time logging stops if specified file number reached or *Stop* button is clicked. *NetView* restores the connection and uses it as usually.



4. Modem

NetView provides functionality for interacting with the modems.

Switch connection mode to *Modem* and connect to the modem as described in 2.2. *Connection Mode Switcher.*

Connected modem will be added to the *Modem* list on *Devices* pane and the *Modem* page will appear.

	Connect : Receiver 🧼	Modem 🗔 Terminal		Help Close modern window
Devices	MT HPT401BT - 00219 HPT401BT BAT RADIO (LMR400)			x
	From File	From File	ite 💜 🚷	Pairing via BT
 Receiver 2 	Update Firmware	Update internal MCU	Data Interface	
• 🕼 SIGMA <u>S</u> -10007 (OEV 🗙				
• • TRIUMPH2-02435 ×	HP1401BI	BAT RADIO (LMR400)		
 Modem 1 	Radio		Log	
•	UHF Radio Modem, Javad GNSS Product ID: 741 S/f Hardware: Ver. 5.2 Ha Firmware: Ver. 3.2 Rev 04 B63 Bo MCU: Ver. 2.5	rdware RF: otLoader: Ver. 4.0 Rev 05	UHF Radio Modern, Javad GNSS Product ID = 741 S/N =000004290533 Hardware =Ver. 5.2 Software = Ver. 5.2 Rev 04 B63 BootLoader = Ver. 4.0 Rev 05 MCU = Ver. 2.5 @00 In : DATAMODE In : DATAMODE In : ####	A.
			©00 In : jiroute MDMUSB @00 In : iiroute MDMBT	
	🗸 Info			Serial:COM31 : 115200

Figure 161. Modem Page.

Modem page contains:

- Toolbar which provides:
 - Update Firmware and Update internal MCU if present groups.
 - Data Interface Set interface for the data transferring.
 - Pairing group.



- Information about modem.
- Log panel Outputs the commands and replies.

Status bar at the bottom of the page displays current or last operation state.

Close button in the header disconnect modem and close the page.

4.1 Update Firmware

Modem firmware can be updated from file or via Internet. Depending of the modem model *Radio*, *MCU* and *Internal MCU* firmware can be updating

4.1.1 Updating from File

Click From File button and choose firmware file using Open File Dialog.

4.1.2 Updating from Internet

Click From Website Button. Firmware file will be downloaded from the site and checked.

If firmware is suitable to the modem and has another version updating will be started. Otherwise, the warning will be shown.



👘 HPT401BT - 00219 НРТ40	1BT BAT RADIO (LMR400)	×
From File	From File	Pairing via BT
Update Firmware	Update internal MCU	Data Interface
	BAT RADIO (LMR400)	
Radio	Log	
Hardware: Ver. 5.2 H	/N: 000004290533 Pro S/N	F Radio Modern, Javad GNSS duct ID = 7741 I =000004290533 dware = LVer. 5.2
Firmware: Ver. 3.2 Rev 04 B MCU: Ver. 2.5	rmation	2 Rev 04 B63 4.0 Rev 05
MCU: Ver. 2.5	Firmware will be updated to 3.0.3.28. Co	untinue?
	Yes	No
	In :	****
	@0	0
	In :	jlroute
	MD @0	MUSB 0
	In :	ilroute MDMBT
✓ Info		Serial:COM31 : 115200

Figure 162. Modem Firmware updating confirmation.

Status bar at the bottom of the window shows process progress.

AW900BT RADIO (FH915)	
MCU Product ID: 51 S/N: 00011 Hardware: Ver. 1 Hardware RF: Ver. 2 Software: Ver. 1.0 Rev 03 B27 BootLoader: Ver. 1.0 Rev 2 B7 MDMBT SER. RS232	Log MDMSER: @00 In : jiroute MDMBT @00
Radio Product ID: 41 S/N: 1238817 Hardware: 4 Hardware RF: Firmware: 3.1.16 BootLoader: 4.03	In : #### @00 In : jroute MDMSER @00
	In : #### @00 In : xmod image Firmware: Flash Erased Starting to Download \$
Mcu Updating 48.88 / 103.64 (KB) jlink_1	_0_03_b28.mcu

Figure 163. MCU Firmware updating.

After firmware is updated, modem will reconnect and actual information will be displayed.

4.1.3 Pair Modem and GNSS Receiver via Bluetooth

NetView allows to pair outer modem and receiver via Bluetooth. Connected receivers are available in the *Pair* drop–down if it is not paired yet.

Devices		HPT4018T - 00219 HPT4018T BAT RADIO (LMR400)				
Derees		From File	From File	bsite SIGMAS-10007 (OEM 5C • d • /d SIGMAS-10007 (OEM 5040192) SIGMA	ev/blt/b 💊	
 Receiver 2 		Update Firmware	Update internal MC	North Annual Contract of Contr		
SIGMAS-10007 (OEV)	×	Pair button Pair button Driver for pairing				
TRIUMPH2-02435	×					
 Modem 1 		Radio		Log		
• 🕡 HPT401BT - 00219	×	UHF Radio Modem, Javad GNSS Product ID: 741 S	/N: 000004290533	@ <i>00</i>		
		Hardware: Ver. 5.2 Hardware RF:		In : jibt master off		
		Firmware: Ver. 3.2 Rev 04 B63 B	ootLoader: Ver. 4.0 Rev 05	@00		
		MCU: Ver. 2.5		In : mcu boot		
				Rebooting JLINK		
				In : ####		
				In : jiroute		
		HP		HPT401BT BAT Radio Firmware Version 1.0 Rev 03 B28 May 05 2016		

Figure 164. Select Pairing group.

Follow the next steps to pair modem to the receiver:

- Select *Receiver_*from the drop-down.
- Select Receiver Modem Driver.
- Click Pair to start

Receiver modem driver Port should be set to dev/ser/blt/a (b) and Mode to off

Otherwise, error window will be displayed and pairing process will not start.

While pairing window is disabled, commands to modem are output to the Log panel and status is displayed in the status bar.



From File	From File	S 1	STRIUMPH2-02435 TRI Y b Y /dev/blt/b S
Update Firmware	Update internal MCU	Data Interface	Pairing via BT
And the second second	AT RADIO (LMR400)		
Radio	Log	0	
UHF Radio Modem, Javad GNSS Product ID: 741 S/N			
Hardware: Ver. 5.2 Har			
Firmware: Ver. 3.2 Rev 04 B63 Boo	tLoader: Ver. 4.0 Rev 05		
MCU: Ver. 2.5		jlroute mdmbt Please wait	
	@0	° ()	
		jldev bt on	
	@0	0	
	@0	0 mcu boot	

Figure 165. Pairing process.

After receiver is paired, it is displayed instead of *Pair* drop–down and followed by the *Unpair* button.

Clicking *Unpair* button starts unpair procedure. It is going on in the similar way as pairing.

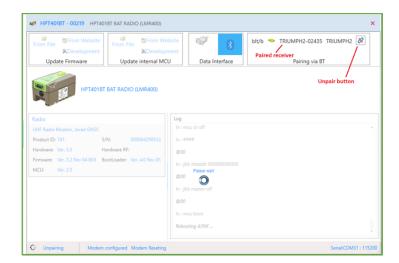


Figure 166. Outer Modem via Bluetooth paired. Unpairing started.



5. Terminal

NetView allows interacting with devices in terminal mode. It means that the application opens the channel, reads data from it and sends user's input as is.

Switch connection mode to Terminal and connect to the device as described in 2.2. *Connection Mode Switcher.*

Connection will be added to the *Terminal* list on *Devices* pane and the *Terminal* page will appear.

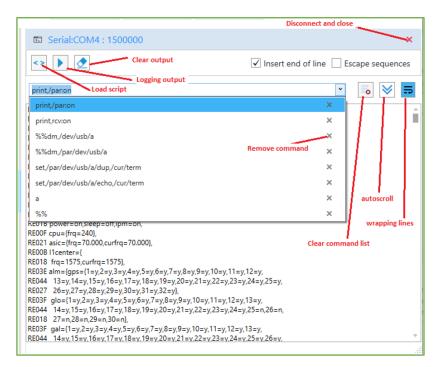


Figure 167. Terminal window.

The following controls serve the terminal operation:

- Input Line As you type press enter key to send command to the device.
- Output Window Displays device replies.



- Last Commands List Allows select one of the previously sent commands. Up to 50 commands are stored. Command can be removed from the list.
- Load Script Button Sends a content from the selected file to the device.
- Start Logging (Stop Logging) Button Saves output to the selected file. After starting the button changes to Stop Logging. Log file path is displayed at the bottom.
- Clear Button Clears the Output Window
- Insert End of Line Flag Adds "\r\n" to the end of the typed line.
- Escape Sequence Convert user's input of "\\\\","\\\"","\\0","\\b","\\f","\\r","\\r","\\t","\\v" to the corresponding Unicode characters.
- Clear Command List Button Remove all commands from the list.
- Auto Scroll Button On/off auto scrolling of the output window.
- Line Wrapping Button On/off wrapping of output lines.

E Serial:COM4 : 1500000	×
•• 💽 🖉	✓ Insert end of line □ Escape sequences
en Stop logging	× 🐻 😽 🚍
CE003uoR TC005e F1005\$\$\$ 17005\$. 17005\$. 17005\$. 17005\$. 17005\$. 17005\$. 17005\$. 17005\$. 17005\$. 18003\$. 18005\$. 18003\$. 18003\$. 18003\$. 18003\$. 18005\$. 18003\$. 18005\$. 1	
Logging C:\Users\Admin\Documents\Log.log Started 12/	15/2023 5:13:52 PM

Figure 168. Terminal Output and Logging.



6. Appendices

Appendix 1 – Predefined Sets of Messages

Name	Solution	Messages IDs (interval, s)
DGPS RTCM {1,31,3}	DGPS (Code diff)	1, 31, 3(10)
DGPS RTCM {41,3}	DGPS (Code diff)	9, 34, 3(10)
DGPS RTCM {9,34,3}	DGPS (Code diff)	41, 3(10)
RTK RTCM {18,19,22,3}	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	18, 19, 22(10), 3(10)
RTK RTCM {20,21,22,3}	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	20, 21, 22(10), 3(10)
RTK RTCM {18,19,23,24}	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	18, 19, 23(10), 24(10)
RTK RTCM {20,21,23,24}	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	20, 21, 23(10), 24(10)
RTK RTCM3 GD min	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1006(10), 1008(10), 1033(10), 1003
RTK RTCM3 GD full	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1006(10), 1008(10), 1033(10), 1004
RTK RTCM3 GGD min	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1006(10), 1008(10), 1033(10), 1003, 1011
RTK RTCM3 GGD full	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1006(10), 1008(10), 1033(10), 1004, 1012



RTK RTCM3 GGD full eph	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1006(10), 1008(10), 1033(10), 1004, 1012, 1019, 1020
RTK RTCM3 3.0	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1003 , 1011, 1005 (10), 1007 (10), 1033 (10)
RTK CMR {10,0,1}	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	10, 0, 1(10)
RTK CMR+ {10,0,9}	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	10, 0, 9(10)
RTK JPS min	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	RT, GT, NT, SI, rc, cp, 2r, 2p, BI, ET
RTK JPS max	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	RT, GT, NT, SI, rc, cp, DC, EC, 2r, 2p, D2, E2, BI, ET
RTK RTCM3 MSM	RTK float (Phase diff) RTK fixed (Phase diff) Fixed	1006(10), 1008(10), 1074, 1084, 1094, 1104, 1114, 1124



Appendix 2 – Script Example

The script should start from string: #!/usr/bin/tcl.

Below is the example of the script. It requests the receiver *baud rate* for serial *a* and checks that it is *115200*.

```
#!/usr/bin/tcl
```

```
puts "Checking of baud rate of serial port a. Expected value is
115200"
set result [send "print,/par/dev/ser/a/rate"]
#
      variable 'result' contains result of operations 'send'
       [lindex $result 0] shows error code. If code is "none" it
#
means no errors.
if {[lindex $result 0] == "none"} {
       Error code is 'none'
#
       [lindex $result 1] contains answer on command
print,/par/dev/ser/a/rated if {[lindex $result 1] == "115200"} {
puts [concat "Correct baut rate: " [lindex $result 1]]
} else {
puts [concat "Incorrect baut rate: " [lindex $result 1]]
}
} else {
      # Error code is NOT 'none', [lindex $result 1] contains
#
error text
puts [concat "Error while read baud rate. Error code '" [lindex
$result 0] "' " [lindex $result 1]]
}
puts "Script stopped"
```



7. Web Resources

JAVAD GNSS Web Site

GNSS Receiver External Interface Specification

JAVAD GNSS Update Page

<u>NetBrowser</u>

Real – Time Logger

<u>Kvaser</u>