

## **NetView**

## **Software Manual**

Version 2.0

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# Preface

Thank you for using this product. The materials available in this Manual (the "Manual") have been prepared by JAVAD GNSS, Inc. ("JAVAD GNSS") for owners of JAVAD GNSS products. It is designed to assist owners with the use of NetView and its use is subject to these terms and conditions (the "Terms and Conditions").

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## **Screen Captures**

This manual includes sample screen captures. Your actual screen can look slightly different from the sample screen due to the receiver you have connected, operating system used and settings you have specified. This is normal and not a cause for concern.

## **Technical Assistance**

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer. Alternatively, request technical support using the JAVAD GNSS World Wide Web site at: www.javad.com

		MENU				
PRODUCTS	SUPPORT	SALES	JAVAD	MY		
OEM		DEALERS	CONTACT	LOGIN		
RECEIVERS	UPDATE	OPTIONS	NEWS	PROFILE		
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ACCESSORIES	PUBLICATIONS	ARTS& SLIDES	JNS	QUESTIONS		
Ask us questions and view our answers from over 20 highly qualified specialists (including Javad himself). It is much better than e-mails, or phone calls						

To contact JAVAD GNSS Customer Support use the QUESTIONS button available on the www.javad.com

# **Getting Started**

NetView is a Windows application for controlling navigation receivers developed and manufactured by JAVAD GNSS. Before you start using NetView, you should become familiar with its functions and learn how to install, launch, exit, and uninstall the program.

NetView software provides the following functionality:

- Directly connect to the receiver(s), using one of the following interfaces: serial, USB, TCP/IP (through the Ethernet ports or WiFi adapter), Secure TCP/IP (SSL/TSL), Bluetooth, CAN (Kvaser CAN Interface).
- Slots to store the most frequently used connection settings.
- Displaying of the total number and the status of all visible and tracked satellites.
- Displaying the receiver current position and time in real time.
- Real time satellites mapping. Satellite sky plots and orientation plots.
- Clear NVRAM, receiver reset, return to the initial parameter values, init file system, reset RTK.
- Create receiver, parameters and options reports.

• Update firmware direct from the JAVAD GNSS website by the user request. (Support is available starting with firmware version 3.2.1).

- Display of the current receiver options and loading of Option Authorization Files into the receiver.
- Setup of various parameters of receiver.
- Start and stop file recording, deleting files, downloading files using file manager.

• Manual mode terminals allow sending commands with prompt tip and view receiver response. Limited terminal supports a TCL script language to automate the "common" receiver control tasks.

- Collecting and display GNSS and Radio Spectra.
- Connecting to multiple receivers.
- Support for multiple connections to the receiver for optimized simultaneous work.

## **Setting up NetView**

#### **System requirements**

- Check that you have the following required (or recommended) items before installing and using NetView.
- PC-compatible with Intel® Pentium® 1.2 GHz or faster<sup>1</sup>.
- 100 MB free disk space.
- 512 MB RAM or more (1024 MB recommended).
- 32-bit or 64-bit operating system such as MS Windows NT, 2000, XP, Windows Server 2003, Windows Server 2008, VISTA, Windows 7, Windows 8, Windows 10.
- Color monitor at 800x600 screen resolution.

#### **Installing NetView**

NetView is available from the JAVAD GNSS website. If downloading the program from the website, extract the program files into a folder on your hard drive.

Navigate to the location of the NetView program and double-click the *Setup.exe* The installation process will be started. Click *Install* to install the software. Click *Don't Install* to quit.

Application Install - Security Warning	×						
Do you want to install this application?	Ś						
Name: Net View From (Hover over the string below to see the full domain): C:\Users\nc iiia\AppData\Local\Temp\Temp3_NetView_4_7_3_79.zip Publisher: JAVAD GNSS, INC							
<u>I</u> nstall	<u>D</u> on't Install						
While applications can be useful, they can potentially harm your computer. If source, do not install this software. <u>More Information</u>	you do not trust the						

Figure 1. Installation

#### **Uninstalling NetView**

To uninstall NetView use the Add and Remove Programs from the Control Panel.

Open the Control Panel, then Add or Remove Programs tool. Find NetView, and click Change/Remove.

<sup>1</sup> Processor speed, RAM and disk space depends on the number of concurrent receivers

O P	Programs and Features							- 0	×
÷	→ ~ ↑ 🖸 > Control I	Panel → Progra	ams > Programs and Featur	es		∨ Ö S	earch Programs	and Features	٩
(	Control Panel Home	Uninst	tall or change a progra	im					
١	view installed updates	To unin:	To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.						
T 🐶	Turn Windows features on or off	Organize 💌	Uninstall/Change				Bii 👻 🗂		0
h	Install a program from the	Name			Publisher	Installed On	Size	Version	^
	FELINOIR	Microsoft Microsoft Microsoft Microsoft Microsoft Wicrosoft View IS Exp	t SQL Server System CLR Type t System CLR Types for SQL Si t System CLR Types for SQL Si t SQL Server System CLR Type t SQL Server Data Tools Build t SQL Server 2012 Command I Uninstall/Change	ss (x64) erver 2012 (x64) erver 2012 ss Utilities - enu ( Line Utilities ie for x86	Microsoft Corporation Microsoft Corporation Microsoft Corporation Microsoft Corporation Microsoft Corporation JAVAD GNSS	7/1/2015 7/1/2015 7/1/2015 7/1/2015 7/1/2015 7/1/2015 9/23/2015 7/7/2015	3.13 MB 2.91 MB 2.80 MB 2.53 MB 2.40 MB 2.38 MB	10.50.1600.1 11.1.3366.16 11.1.3366.16 10.50.1600.1 12.0.30919.1 11.1.3000.0 4.7.3.79	
		<	s Application compationity o	atabase for xo4		1/1/2015			>
		à	Currently installed progra 48 programs installed	ams Total size:	17.2 GB				
			Fi	gure 2.	Uninstall				

NetView will be uninstalled.

#### **Updating NetView**

NetView checks updates automatically after closing. If a new version is available, the user will be prompted of updating when next start.

	Update Available
Application A new now?	on update v version of Net View is available. Do you want to download it
Name: From:	Net View storage.javad.com
	OK Skip

Figure 3. Update

## **Getting Connected**

#### **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 Start window appears.



Figure 4. Start Window

- Visit NetView page opens software page on JAVAD GNSS web site
- WEB APP NetBrowser opens netbrowser page (new software for the receivers managing)
- Display this page on start if "off" NetView opens Connection Tab when starting.
- Select interface language- change the language of the user interface. (English, Polish or Russian).
- Drivres link to the page contains firmware, software and drivers (Updates [3])
- GREIS link to the page contains Greis Manual (GNSS Receiver External Interface Specification [2]).

Start window can also be opened by selecting Help tab.

#### **Establishing connection**

Select Connection Tab and set connection parameters.

🗸 Net View	-					_ • •
Connection	Description of the	Rec1	Rec2	Slot 3	Slot 4	Slot 5
Receivers	Recall from slot:	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10
Help						<ul> <li>More Slots</li> </ul>
	Connection settir	igs Slot 3				
	TCP  TCP SFR	Address Port		Logical Port Password		
	USB				TLS/SSL	Raw 🔲
			:	Save to slot: Slot 3	<ul> <li>Slot name: Slot 3</li> </ul>	Save
				Connect		
	Last connections:					
	Connection settings Status Time Slot					
WEB APP Not Browness						
NetBrowser						Remove Disconnected

Figure 5. Connection Windows

Select from the drop-down list a connection type to establish connection between your computer and JAVAD GNSS receiver via one of the following communication interfaces:

- TCP used to connect your computer and remote receiver;
- SER via serial ports;
- USB via USB ports;
- CAN via CAN ports;

If you plan to use such type of connection in the future, click on *Save to Slot* button. The connection settings will be saved. You can use as many connection slots as you'd like. To increase slots number click *More Slots* button.

**Note:** The number of the slots does not limit the number of receivers that can be connected. The amount of receivers is limited only by the performance of your computer.

Click *Connect* button to establish the connection. The result can be seen in the table *Last Connections*. If your connection settings are correct, a new receiver will be added in the left navigation bar.

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

#### **TCP** connection

TCP connection allows establishing bidirectional connections to receiver which is configured as TCP server (see [2] Network Servers Parameter) via LAN (local area network), WLAN (wireless LAN) or Internet.

Connection settin	gs Rec1					
TCP 🔻	Address	192.212.195.19		Logical Port		
	Port	8002		Password	pasw	
					TLS/SSL	Raw 📃
			Save to slot: Re	ec1	<ul> <li>Slot name: Rec1</li> </ul>	Save

Figure 6. TCP connection settings

• 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.

#### **Serial connection**

To establish a connection between your computer and the receiver using serial ports, follow the steps:

- 1. Connect one of the available receiver port (usually A) to a communication port on the computer using a Receiver-to-Computer RS-232 serial cable.
- 2. Supply power to the receiver and computer and then turn them on.

Connection settings Rec2								
SER 🔻	Port	COM1 -	Advanced					
	Baud Rate	115200 🔹	Rts/Cts Enable 🔽					
Refre	sh Ports	9600 19200 38400	Save to slot: Rec2   Slot name: Rec2  Save					

Figure 7. Serial port connection settings

Set the following parameters:

- Port Select from drop-down. If needful port is absent in the list click Refresh Ports button
- *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).

#### **USB** connection

**Note:** Before connecting a USB equipped JAVAD GNSS receiver 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 [3].

#### **Installing Driver**

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

- 1. Visit the JAVAD GNSS website. Download the USB driver.
- Unpack the archive into a separate, empty folder. 2.
- 3. Run jgnssusb x64L.exe or jgnssusb x86L.exe depends on PC Operating System Type.
- Connect the receiver to the computer through the supplied USB cable. Turn the receiver on. 4.
- 5. Windows will automatically detect the new hardware device. Follow the on-screen instructions to finish installation process.

After the driver is succesfully installed, you will be able to connect the receiver with the computer via USB ports.

If the receiver is equipped by the built-in USB to RS232 FTDI converter the virtual serial port will be created. In this case connect to receiver as described in "Serial connection" on page 12.

Otherwise just select the appropriate identifier from the drop-down list. If there is no needful port in the list, click Refresh Ports button.

Connection settings Slot 3		
USB  Id USB\VID_1A4	6&PID_0000\3W101QKZ0I0I03VZB2PQNQ2V1Z	-
USB\VID_1A46	5&PID_0000\3W101QKZ0I0I03VZB2PQNQ2V1Z	
Refresh Ports	Save to slot: Slot 3 ▼ Slot name: Slot 3	Save

**USB** connection settings Figure 8.

#### **CAN** connection

Note: Before connecting a CAN equipped JAVAD GNSS receiver with PC make sure that the CAN Port option is enabled in the receiver.

Connection setting	gs Slot 4					
CAN 🔻	Channel		•	Baud Rate	250K	•
	In ID 1792 In Count 8	Out Id 1792 Out Count 8	Delete			
			Add Can Id			
Refres	h Ports	Save t	o slot: Slot 4	▼ Slot	name: Slot 4	Save

Figure 9. **CAN** connection settings

Set the following parameters before establishing the CAN connection

- Channel allows selecting channel;
- Baud rate data transfer rate;
- In ID, In Count first Standard Identifier (SID) of the input CAN messages and range of in SIDs
- Out Id, Out Count first Standard Identifiers (SIDs) of the CAN messages generated by the receiver and the range of out SIDs.

Connection via CAN allows connecting multiple receivers, which are in the same CAN network. In this case, the incoming (In) and outgoing (Out) identifiers should not overlap the ranges. To add a new CAN SIDs, click Add Can Id button. To delete existing SIDs, click Delete button in the appropriate line.

All devices are in one of CAN networks operate at one speed. The software supports only Kvaser (http://kvaser. com) adapters [6].

#### **Closing NetView**

To disconnect from the receiver, click the *Disconnect* button on the receiver page or in the connections list on the *Connection* tab or just close the NetView.

σ	Net View					
	Connection		Display Name Receiver Id	Receiver 1 3W1010KZ0I0I03VZB2PONO2V1Z	Connections 1 -	
•	Receivers	. and a second	Vendor Serial Number Firmware Version Board Version Model UpTime	JAVAD GNSS 00015 3.6.3 Jul(01,2015 TRIUMPH_3 TRIUMPH1 1d09h11m56s	/dev/usb/a USB	/dev/usb/a
	Help	Reports + Actions + Measurements Sky plo Latitude 55°47	Vice of the second of the	55°47'54.52"N 37°31'15.09"E H:382.41 . ↓ o Spectrums Metrics Orientation Sys ▼ Num El Az CA P1	Options Base/Rover Settings P2 L2C L5 L1C Track Tim-	Status Cont. Track L1/L2

Figure 10. Disconnecting using the receiver page

σ	Net Vie	w						
	Con	nection	Barry from elect	Rec1	Rec2	Slot 3	Slot 4	Slot 5
-	Rece	eivers	Recall from slot:	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10
	- N	< Receiver 1						
		Parameters						More Slots
		Files	_					
		Greis commands	Connection setting	gs Rec1				
		Real-Time Logging						
	Help	>	Refree	Id USB\VID_1A46&	PID_0000\3W101QK2010103V2821	Save to slot: Rec1	Slot name: Rec1	Save
			Last connections:					
			Connect	ion settings	Stat	us	Time	Slot
			USB 3W101QKZ0I	0I03VZB2PQNQ2V1Z	Connected to receiver ID:3W101	QKZ0I0I03VZB2PQNQ2V1Z /	dei 9/2/2015 5:23:37 PM	Rec1 Disconnect
								7

Figure 11. Disconnecting using the Connection tab

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

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

# **OPERATION AND MONITORING**

Connect to the receiver as described in "Getting Connected" on page 9.

There is a navigation bar in the left pane of the program window. This pane is arranged as a tree, and the nodes can be expanded by mouse click. Clicking on the elements of the navigation pane on the right pane a page with relevant content appears. In this case, the active element remains selected. To see the table of the available receives, click *Receivers* node.

J Net View							- <b>-</b> X
Connection	Connected	Name	Rec	Memory (Used/Total)	Connection	Rover	Delete
<ul> <li>Receivers</li> </ul>		Receiver 1	AB	1.82 / 1.83 GB	/dev/tcp/c (Command)	$\odot$	
🗙 📕 🚺 Receiver 1	100	Receiver 2		383.98 KB / 1.83 GB	/dev/ser/a (Command) /dev/usb/a (Command)		
Parameters	100	Receiver 3	Δ	1.01 / 1.01 GB			×
Files							
Greis commands							
Real-Time Logging							
Receiver 2							
Receiver 3							
Help							
NetBrowser	•						

Figure 12. Receivers tab

On the right pane the following information about each receiver is displayed:

- Connected green flag indicates that the receiver is now connected and available.
- Name the name of the receiver.
- *Rec* the current files, which are logging.
- Memory (Used/Total) receiver memory capacity.

• *Connection* - active connections. The color means connection status (green – monitoring, blue – file transferring, red – exclusive in manual mode);

- *Rover* rover status, if receiver is configured as a rover using *NetView*;
- *Delete* button a disconnected receiver can be deleted. It disappears from the receiver list (tree) and is removed from the NetView database.

Each receiver node on the navigation pane contains the following sub-nodes, clicking on it opening the corresponding window:

- Parameters graphic interface for the configuring of the receiver;
- *Files* operations with the files in receiver memory;
- Greis Commands manual mode terminal for the GREIS commands entering (see [2]);
- *Real-Time Logging* logging *jps* or *rtcm* data to the PC memory.

These pages allow controlling the different aspects of receiver functionality and will be detailed described below.

Click on the receiver's root node to select the main page. This page shows the appearance of the receiver, its characteristics, and available connections, contains menu for generating the reports, perform initialization actions, and update firmware and set of the tabs for monitoring the measurements such as: *Measurements, Sky plot, Spectra, Radio Spectra, Metrics, Orientation, Options,* and *Settings.* 

J	Net	Vie	w																	x
Ļ	C	ion lece	nection		Disp Rec Ven	play Name eiver Id idor	Rec 03V JAV	eiver 3 1CU9G8 AD GNS	6LGD0	0RN2Z	Z4M10	G0TM	Conn /dev/	ections 1 /usb/a U	. ▼ SB			Disc	onnect	
	* *		Receiver 1     Parameters     Files     Greis commands     Real-Time Logging     Receiver 3     Parameters     Files     Greis commands     Real-Time Logging	Reports - A Measurements	Seri Firm Boa Moi UpT Mer Pos ctions ~	ial Number nware Version del Fime mory (Used/ ition Update Firm Spectra Ra	001 3.6. TRE SIG 0d0 Total) 127 55%	54 (OEN 3 Jul,01,7 G3TH_{ MA 0h03m2 (.99 KB / 17'54.55 a Met	1 13000 2015 3 5s 7 1.83 G "N 37"3 rics C	062) 38 31'15.1 Drienta	."E H::	376.06r Optio	ns Ba	se/Rover	Settin	ıgs				
	H	lelp	)	Latitude Longitude Ellipsoidal heigh Position SEP Velocity 2D Position RMS Velocity RMS PDOP	55°47'54.5 37°31'15.0 t 376.06085 1.525859 0.0071908 1.5258588 0.0119235 1.1726894	55043873"N 09904559"E 58308338 88 84 58 58 47	Sys GPS GPS GPS GPS GPS GPS	Num 12 23 3 31 22 32	El 8 12 48 34 10 88	Az 26 224 274 120 98 208	CA 43 40 49 50 39 55	P1 22 22 43 43 21 47	P2 22 43 43 21 47	L2C 36 52 50	L5 49	L1C	Track Tim 00:03:19 00:03:19 00:03:19 00:03:19 00:03:19 00:03:19	Status 0 0 0 0 0 0 0	Cont." / / / / / / /	

Figure 13. Receiver 3 main page

## **Receiver Info**

Display Name Receiver Id Vendor Serial Number Firmware Version Board Version Model UpTime Memory (Used/Total) Position	Receiver 3 03V1CU9G86LGD00RN2Z4M1G0TM JAVAD GNSS 00154 (O 03V1CU9G86LGD00RN2Z4M 3.6.3 Jul,Q Double click copy to clipboa TRE_G3TH_8 SIGMA 0d00h52m20s 0.00 Bytes / 1.83 GB 55°47'54.51"N 37°31'15.07"E H:382.9(	Connections 1 - /dev/usb/a USB //IGOTM ard
 Board Version Model UpTime Memory (Used/Total) Position	TRE_G3TH_8 SIGMA 0d00h52m20s 0.00 Bytes / 1.83 GB 55°47'54.51"N 37°31'15.07"E H:382.9(	

Figure 14. Receiver info

Receiver window provides the following information:

- Image of the receiver.
- *Display Name* name set on the tab Settings (by default "*Receiver*" + sequence number).
- *Receiver Id* a piece of text uniquely identifying your receiver.
- Vendor JAVAD GNSS.
- Serial Number Serial number assigned to the receiver on the factory.
- Firmware Version.
- Board Version.
- Model The model of the receiver, e.g., SIGMA.
- *UpTime* Time elapsed since last receiver reboot.
- Memory (Used/Total) Used /Available Memory.

- Position current receiver position.
- *Connections* amount and type of connections. The connection used to transfer file is shown in blue. And if the connection is captured by manual mode it is red and not used.

Every parameter can be copied to clipboard by double clicking.

## Reports



The following reports on the receiver can be generated:

- *Receiver Info* receiver characteristics, position and satellites table (*Receiver Info* described above and content of *Measurements* tab)
- *Options* receiver characteristics and list of options with current statuses (*Receiver Info* and content of *Options* tab)
- Parameters receiver characteristics and list of all the parameters with values.

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.

## **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 – Set all the receiver parameters to their default values.

• *Clear NVRAM* – 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* - Initialize the file system (i.e., reformat the underlying medium). All files stored in the www.javad.com

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 - Reset RTK engine.

## **Update Firmware**

Measurements	Sky plot	2	From Fi	ile			Me	trics	Orient	ation	Opt
Latitude	55°47'54	2	From In	nteri	net	•	~	Stable	versio	on	
Longitude	37°31'15	.0863	7622"E	П	GPS	11		Latest	versio	n	
Ellipsoidal heigł	ht 379.6428	5692	0138	Ξ	GPS	4	6	5 278	8 56	48	48
Position SEP	1.807515				GPS	1	31	7 296	5 31	15	15

Receiver's firmware can be updated from a file or via Internet.

#### Updating from a file

Select *From File* menu item and select the firmware file using *Open File* dialog window. If the firmware is suitable to the receiver model and has the newer version, file uploading will be started. Otherwise the warning will be shown.

#### Updating from the Internet

Select *From Internet* ► *Stable version* to load the last stable firmware or ► *Last version* to load the last available firmware. Both versions are available on JAVAD website [3].

After the firmware file is downloaded from the site, the file uploading will be started.

J	Net View																	x
•	Connection Receivers Receiver 1 Parameters Files Greis commands		Display Name Receiver Id Vendor Serial Number Firmware Versio Board Version Model	on	Recei 03V1 JAVA 0015 3.6.3 TRE_0 SIGM	iver 3 CU9G86 D GNSS 4 (OEM : Jul,01,20 G3TH_8 IA	LGD00 13000 )15	DRN2Z 62)	(4M10	GOTM	Con /dev	nections 1 /usb/a U	t <del>↓</del> SB		File trans	fering	Disconnect	
	Real-Time Logging  Receiver 3  Parameters  Files  Greis commands  Real-Time Logging	Reports - A	Up I ime Memory (Used, Position tions - Update Firr Sky plot Spectra R	Tota nwar adio	0000 1) 127. 55°47 re • Spectra	h00m32 99 KB / 1 7'54.57"N Metric	s I.83 G N 37°3 cs 0	B 1'15.0 rienta	15"E H	:378.31 Optio	ns Ba	ase/Rover	Settin	gs		Cance	l FW upload	ing
	Help	Latitude	55°47'54.57066801"N	*	Sys 🕶	Num	El	Az	CA	P1	P2	L2C	L5	L1C	Track Time	Status	Cont. Trac	k I 🗠
		Longitude	37°31'15.04984309"E		GPS	31	36	118	53	43	43	50			00:00:35	0	/	
		Ellipsoidal heigh	t 3/8.311625580303		GPS	22	8	100	40	23	23				00:00:35	0	/	
		Velocity 2D	0.01123539		GPS	11	44	210	50	40	40				00:00:35	0	/	=
		Position RMS	1.62722961		GPS	14	33	58	48	36	36				00:00:35	0	/	
		Velocity RMS	0.01151799	-	GPS	23	14	224	43	23	23				00:00:35	0	/	
		PDOP	1.10769384		GPS	1	67	228	55	48	48	56	54		00:00:35	0	/	
		HDOP	0.7200422		GPS	19	29	250	43	35	35				00:00:35	0	/	
		VDOP	0.841/392		GPS	3	51	276	51	45	45	54	50		00:00:35	0	/	
		Receiver Time	13:02:37		GPS	32	88	150	56	47	47				00:00:35	0	/	
		Receiver Date	2015.11.10		GPS	12	9	24	42	22	22	39			00:00:35	0	/	
		Clock Offset	-0.00026234		GLO	10/-7	30	98	54	53	37	34			00:00:39	0	/	
		Osc. Offset	-3.919E-05		GLO	27/7*	28	38	50	49	42	43	47(G3)	)	00:00:33	6	/	
		Links			GLO	23/3	16	200	44	43	30	32			00:00:39	0	/	
		<ul> <li>Number of sa</li> </ul>	tellites 34 (20)*		GLO	9/-2	29	38	46	45	34	35			00:00:39	0	/	-
	WEB APP	GPS - 10 (10)	GLO - 9 (8)	Ŧ	- C	0.15										<u>^</u>	I	•
	NetBrowser	Firmware uploa	ding File 1/2	Prog	ress 1,17	7MB/2,99	MB 3	9%	ו		R	over		Spectra	GNSS		Radio	

Figure 18. Firmware updating

The status bar at the bottom of the window shows the process progress. After every part of the firmware uploaded receiver reboots and reconnects.

To cancel the firmware updating, click the *Cancel FW updating* button.

## **Measurements**

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

Measurements	Sky plot Spectra	Radio	Spectra	Metrics	C	)rienta	tion	Optio	ns Base	/Rover	Setting	5				
Latitude	55°42'0.29121696"N	*	Sys 🕶	Num E	1	Az	CA	P1	P2	L2C	L5	L1C	Track Time	Status	Cont. Track L1/L2	*
Longitude	37°31'45.0990905"E		GPS	20	31	58	44	30	30				04:03:53	55	1	
Ellipsoidal heigh	nt 249.153189360164		GPS	29	7	134	37	17	17	36			06:29:59	58	/	
Position SEP	0.006445085		GPS	22	34	202	45	35	35				01:13:18	55	/	
Velocity 2D	0.00736099		GPS	26	22	214	43	27	27	44	47		04:29:26	58	/	
Position RMS	0.00644509		GPS	10*	59	282	52	44	44				02:24:27	30	,	
Velocity KMS	0.01634422		GPS	16	39	242	48	36	36				03:21:39	55	/	
HDOP	0.6242541		GDS	19	65	156	51	42	42				02.22.18	55	,	
VDOP	0.9725478		CDS	7	7	220	20	10	10	27			01.16.20	50	1	
Solution	RTK fixed (Phase dif	Ð	GPS	<i>'</i>	12	330	30	19	19	37	45		01:10:20	50	/	
Receiver Time	11:21:05	"   I	GPS	8	13	306	41	20	20	39	45		00:33:43	58	/	
Receiver Date	2015.9.23		GPS	15	30	76	47	33	33	45			01:52:14	58	/	
Clock Offset	-0.00035674		GPS	21	65	92	50	43	43				04:14:18	55	/	
Osc. Offset	-4.371E-05		GPS	27	48	296	50	43	43	52	56		01:54:15	58	/	
Links			GLO	5/1	43	46	46	45	44	46			02:52:56	58	/	
Link Id	/ser/b		GLO	22/-3	43	306	51	50	46	47			01:34:27	58	/	
Decoder Id	RTCM 3.0		GLO	21/4	77	92	54	53	49	50			03:27:52	58	/	=
Station Id	0000		GLO	26/-5*	29	116	45	45	42	43			05:09:49	30	/	=
Time elapsed	si 001	=	GLO	12/-1	17	282	39	37	38	39			02:41:13	58	/	
Received mes	sa 7472		GLO	7/5	15	188	40	39	38	40			00:25:46	58	/	
Corrupt mess	ag 0000		GLO	13/-2	21	338	40	38	38	39			01:06:59	58	,	
Link quality (	a) 100.00	,	GLO	6/-1	50	150	52	52	42	11			01,42,25	50	,	
Link Id	/tcp/c		GLO	20/2	26	116	41	40	40	41			05.02.22	50	1	
Decoder Id	JPS		GLU	20/2	20	110	41	40	40	41	47/55-)		05:05:52	20	/	
Station Id	0000		GAL	12	30	118	44		43(EDD)		47(EDa)		00:30:27	30	/	
Time elapsed	si 001		GAL	11	/9	142	50		52(E5b)		54(E5a)		04:33:11	30	/	
Received mes	sa 2680		GAL	19	35	54	46		43(E5b)		46(E5a)		03:19:33	30	/	
Corrupt mess	ag 0000		SBAS	128	15	130	36				42		>18h	30	/	
Link quality (	o) 100.00	<u>,</u>	SBAS	136	20	218	38				42		>18h	30	/	
<ul> <li>Number of sa</li> </ul>	tellites 36 (20)*	_	SBAS	127	25	160	36				43		>18h	30	/	
GPS - 13 (12)	GLO - 9 (8)		SBAS	140	9	118	32						00:05:02	30	/	
GAL - 3 (0)	QZSS - 1 (0)		SBAS	120	11	238	32						13:36:28	30	/	
BDS - 5 (0)	IRNSS - 0 (0)		QZSS	193	9	66	35	35		35	43	38	07:58:57	30	/	
SBAS(WAAS/E	GNOS) - 5 (0)		BDS	2	16	132					39(B2)		00:00:00	30	/	
Unknown - 0 (	0)		BDS	12	46	294					51(B2)		00:00:00	30	/	
()* - used in r	ositioning		RDS	6	39	56					45(B2)		00.00.00	30	/	Ŧ
() - used in p	ostaoning	-	٠												Þ	

Figure 19. Measurements

#### **Navigation information**

- Latitude, Longitude, Ellipsoidal height geodetic coordinates<sup>2</sup>
- Position SEP Spherical Error Probable
- Velocity 2D Geodetic Velocity (m/s).
- Position RMS position RMS error<sup>3</sup> (m).

<sup>2</sup> These geodetic coordinates are computed in WGS 84 regardless of the current value of /par/pos/datum/cur.

<sup>3</sup> More precisely, this is the square root of the trace of the position error variance-covariance

- *Velocity RMS* velocity RMS error (m/s).
- *PDOP* Position dilution of precision.
- HDOP Horizontal dilution of precision.
- *VDOP* Vertical dilution of precision.
- Solution type Standalone / DGPS /RTK float / RTK fixed

• *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  $[\sim\sim]$  reports the time within day in the GPS time scale only.

• *Receiver date* - the "date" part of the full receiver time representation ([RD] message).

• *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.

#### Links

The Links group 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  $\pm 1$  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).

#### **Number of satellites**

*Number of satellites* field shows:

- The total number of the locked satellites.
- The number of the locked satellites for each satellite system.
- The number of satellites used in the position calculating (in parentheses)

#### **Satellite table**

Parameter	Description
Sys	Satellite System: GPS GLO - GLONASS GAL - GALILEO SBAS QZSS BDS - BeiDou (COMPASS) IRNSS Satellite systems are marked by different colors
Num	SV PRNSV 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
СА	Signal-to-noise ratio [dB*Hz] C/A – GPS, QZSS L1 - SBAS E1 (B + C) – GALILEO CA/L1- GLONASS B1-1 - BeiDou (COMPASS)
P1	Signal-to-noise ratio [dB*Hz] P1 – GPS, GLONASS SAIF - QZSS E5 – GALILEO
P2	Signal-to-noise ratio [dB*Hz] P2 – GPS, GLONASS LEX (P + D) - QZSS E5B (I + Q) – GALILEO
L2C	Signal-to-noise ratio [dB*Hz] L2C – GPS, QZSS E6 (B + C) – GALILEO CA/L2- GLONASS B3 - BeiDou (COMPASS)
L5	Signal-to-noise ratio $[dB*Hz]$ L5(I + Q) – GPS, QZSS L5 - SBAS E5A (I + Q) – GALILEO L3 (I + Q) – GLONASS B2 - BeiDou (COMPASS)
L1C	Signal-to-noise ratio [dB*Hz] L1C (I + Q) - GPS, QZSS
Track Time	Time elapsed since the last loss-of-lock in the C/A channel for the corresponding satellite. This time is given in HH:mm::ss.
Status	Satellite navigation status. For a complete description of the satellite navigation status structure, see [2]: Table 3-4. Satellite Navigation Status.

**Table 1 Tracking Parameters** 

## Sky plot



The Sky Plot tab shows a graphic representation of the satellites' positions in the sky.

Figure 20. Sky Plot tab

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.

The 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. The satellite info is shown when mouse is over it.

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

## Spectra



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





Figure 22. GNSS-spectra for TRE-3 finished (W5)

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

The data about interference is collected simultaneously for all GNSS bands (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.

All previously made measurements are available, to see them use the navigation buttons in left bottom corner. The following data can be displayed on the graphs:

- Black line shows the spectrum output.
- Blue line shows the value of the system voltage (AGC)
- 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.

Above the graph the values of calibration and statistical data are shown.

Red numbers at the top of the graph are the signatures to the points of the spectrum, which amplitude exceeds 50 dB.

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

#### **Collecting spectra**

To receive the current measurements of the interference

- 1. Enter the Title;
- 2. Specify the Samples to Average Time Interval of Incoherent Spectrum Data Accumulation;
- 3. Specify the *Mode(mean, min, max)* Spectrum Averaging Mode;
- 4. Click Get Spectrums.

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

#### **Operation with plots**

- Zoom select region by mouse right button or turn the mouse wheel to zoom plot.
- Pan left mouse button move the graph.
- *X axis* completely, *Y axis* 0-50 top left button
- *X axis* completely, *Y* completely top right button
- Plot in separate window double click.



Figure 23. GNSS-spectra plot zooming and panning

Test_2								<b>2</b>
GpsL1	GpsL2 GpsL5	GloL1 GloL2 S	Summary Tes	st_2 int 10 mean -1	1° 3% 50  + B+	N- G- U- C- 10/	29/2015 7:16	:17 AM
GPS L1 C	alibration: <b>44</b> Av. A	AGC: <b>36</b> Interf. Magr	n.: 8 RMS of A	GC: <b>0.5</b> Spectrum M	Mean: 27.4 SN	Loss (CA/P) :	/ Sa	t.A 🗹 🗐
50				51.8				
40								
30	and and a strate of the	when the second second and the	manipulation	hidrobalded and Marchalassall	www.	e year and a start water the second start of t	un warman highly mile	Writementer.
20 10 19.82	winder							
10				Gps1	1574.4			
0 3	1588 1586	1584 1582	1580 157	3 1576	1574 1572	1570	1568	1565
05.	55-		105.	155.		205-		

Figure 24. GNSS-spectra plot in separate window

To analyze the different aspects of the interference, the plots can be processed. Expand the *Plot Settings* group, specify processing settings and click *Apply* button.

Plot Settings are the following:

- Filter allows roughening plot using different mode,
- Show shows/hides AGC line, Middle Frequency and additional harmonics.

Click Clear button to return to the original plot.



Figure 25. GNSS-spectra plot min and max filters, AGC, Mid and Harmonics 19.2 and 60

#### Statistics and additional data

Above the graph the statistics and calibration data are displayed:

• 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* - 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.

Click *Summary* button, to see the statistics collected for the all bands.

easuremen	ts Sky plot	Spectra Radio S	pectra Metrics Orientation	Options Base	e/Rover Settings					
GpsL1	GpsL2 Gp	sL5 GloL1	GloL2 GloL3 Sum	mary	Test_1	ext 10 m	ean -1° 3% 50	I- B+ W- G	- U- C- 10/29/20	015 7:11
Band	Calibration	Average AGC	Interference Magnitude	RMS of AGC	Spectrum Mean	SN Loss	SN Loss (P)	Satellites	Satellites (P)	
GPS L1	11.1	39.2	-28	0.7	30.4	0.8	2.5	7.7	7.7	
GPS L2	2.2	37.2	-35	0.7	30.4	0.8	2.5	7.7	7.7	
GPS L5	0.3	39.9	-39.6	0.7	30.3	0.8	2.5	7.7	7.7	
GLO L1	444.4	39.1	405.3	0.7	30.3	2.3	1	6.7	6.7	
GLO L2	5.5	33.2	-27.6	2.2	30.4	2.3	1	6.7	6.7	
GLO L3	-20	37.6	-57.6	0.6	30.4					

#### Figure 26. GNSS Spectra Summary

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

#### Saving and deleting

You can save the spectra with additional information or only plots and delete them. To save or delete the spectra, use the buttons in the right bottom:

- 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 with the additional information to the special file.
- Save all Saves all spectra to the selected folder.
- Save Plots Saves the plots (all bands) as png-files to the selected folder.

## **Radio Spectra**

The Radio 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.



Figure 27. Radio-spectrum (Fh) collecting



Figure 28. Radio-spectrum (Uhf) stopped

The status of the process is shown in the status bar field Spectra | Radio.

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

The following data can be displayed on the plots:

- *Blue line* shows the current spectrum output.
- Gray line shows the value from the previous pass
- *X axis* the frequency in MHz.
- Yaxis RSSI (Received Signal Strength Indication), dBm.

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

Select *Modem Driver* from the drop-down below the plot and click link *Go to Settings*, to change scanning parameters. Corresponding tab of *Parameters* will be opened. After the parameter is set and applied, click link *Go to Spectrum* to return.

General Log-files TriPad Po	sitioning Base	Rover Ports	Networking	Event	Advanced			
LAN WLAN Server Client	PPP Modems							
Modem c								
Common								
Modem Mode	off •	•						
Current Mode	off							
Receiver Port the Modem is	/dev/ser/c							
Modem Control State	off							
Last Detected Modem Error	none							
Auto								
Prefer L-Band Receiver	$\overline{\nabla}$							
ID 74								
Model unk	nown	External	Modem via Bl	uetooth	1			
UHF Radio FH Radio Cell	ular module 🛛 L-Ba	and Receiver	Beacon Receiv	er				
Mode		Info				ТХ		
UHF Modem Output Power	15	Model		unknow	'n	Frame Counter	0	
UHF Modem Frequency	423750000	Product I	D	unknow	'n	Byte Counter	0	
UHF Protocol Type	simrx •	Serial Nu	mber	unknow	'n	RX		
UHF Call Sign	**	Hardware	e revision	"unknov	vn"	UHF RSSI unkn	iown	
		Software	version	"unknov	vn"	UHF BER unkn	iown	
		BootLoad	der version	"unknov	vn"	Scan		
		MCU firm	nware version	"unknov	vn"	Start frequency	40600000	
		FCC ID	[	unknow	'n	Stop frequency	47000000	
		IC ID		unknow	'n	Frequency step	125000	
						Mode	scan 🔻	
						Timeout	1500	
						Go to Spectra		

Figure 29. Radio Spectrum scanning parameters

#### **Operation with plots**

- Zoom select region by mouse right button or turn the mouse wheel.
- *Pan* left mouse button move the graph.
- *X axis* completely, *Y* completely top right button

To analyze the different aspects of the interference, the plots can be processed. Expand the *Plot Settings* group, specify *Filter Mode* and *Resolution* and click *Apply* button. To return to the original plot, click *Clear* button.



Figure 30. Radio-spectrum zoomed, panned and filtered

#### Saving and deleting

You can save plots and delete them. To save or delete the spectra, use the buttons in the right bottom:

- Delete Deletes the current spectrum plots.
- Delete all Deletes all plots for the receiver
- Save Plots Saves all the plots as png-files to the selected folder.

## **Metrics**

The Metrics tab allows tracing the behavior of the navigation indicators and provides the following tables:

- Signals
- Cycle Slips

Select Te	SNR mplate	ECA_P Temp Temp CA_F	90 4 2_B1 • olate1 2 olate_2 2 2_B1	7.1	38.5 urrent 1 CA_P2_	i 43.4 Femplate B1 🗹 Aver e 🖬 Sar	age by Epoc ve Template	hs As T	「emplati	e_3							
PS	ochs: 6	590	Averag	e SNR:	17.625				L2 Er	ochs:	690	Avera	ae SNR:	37.125	;		
SNR	Neat	Timei	Neat aver	Sat %	Nelin	Nolin aver	Slip / hour		SNR	Neat	Timei	Neat aver	Sat %	Nelin	Nelin aver	Slip / hour	
50	A	600	103	50.88			NA		50		10		10.00		NA NA	NA	
45	2	685	1.79	22.39	0	NA	NA	-	45	2	690	2.42	31.94	0	NA	NA	
40	2	423	1.44	11.15	0	NA	NA	-	40	2	649	1.68	20.79	0	NA	NA	
35	0	518	1.45	13.69	0	NA	NA		35	1	611	1.04	12.17	0	NA	NA	
30	0	94	1.03	1.77	0	NA	NA		30	1	664	1.12	14.20	0	NA	NA	
25	0	7	1.00	0.13	0	NA	NA		25	2	65	1.08	1.34	0	NA	NA	
20	0	0	0.00	0.00	0	NA	NA		20	0	430	1.51	12.44	0	NA	NA	
0	0	0	0.00	0.00	0	NA	NA		0	0	325	1.15	7.13	0	NA	NA	
LO ——	ochs: 6	590 Timei	Averag Nsat aver 2.54	e SNR: 4 Sat % 39.27	17 Nslip 0	Nslip aver NA NA	Slip / hour NA NA		L2 Ep SNR 50 45	ochs: 6 Nsat 0 2	<b>90</b> Timei 0 673	Averag Nsat aver 0.00 1.08	e SNR: 4 Sat % 0.00 16.33	<b>40.667</b> Nslip 0	Nslip aver NA NA	Slip / hour NA NA	
L1 Ep SNR 50 45	Nsat 3	690 690	1.47	22.01			-		1.0					-			
L1 Ep	Nsat 3 1	690 690 593	1.47	13.26	0	NA	NA		40	1	690 I	2.42	37.61	0 1	NA I	NA	

Figure 31. Metrics tab. Navigation indicators are accumulating

#### **Signals**

The *Signals* table can contain both simple SNR indicators and expressions. The first column is called *Epochs* and always contains amount of the epochs from start. Other columns are configured by user.

To add a new field, click to the green cross in the right column of the table. Add Column window will be opened.

Add Column		_		-	-	<b>E</b>			
Name: p2 Expression (GpsP2Aver+GloP2Aver)/2									
GPS/CA	GPS/P1	GPS/P2	GPS/L2C	GPS/L5	GPS/L1C	GLO/CAL1			
GLO/CAL2	GLO/P1	GLO/P2	GLO/L3	GAL/E1	GAL/E5	GAL/E5B			
GAL/E6	GAL/E5A	SBAS/L1	SBAS/L5	QZSS/CA	QZSS/SAIF	QZSS/LEX			
QZSS/L2C	QZSS/L5	QZSS/L1C	BDS/B1	BDS/B2	BDS/B3	IRNSS/L5			
Valid Range Min 0 - Max 100									
					UK	Cancel			

Figure 32. Add (edit) field in the Signals table

Specify the *Name* (column header), check the desired signals and type valid value range. The values outside the range will be shown in red. The expression for calculation is shown in the upper part.

To edit the existing column click left button in the column header, to delete click right button.

The configured table is the part of the Current Template.

The *Average by Epochs* flag is applied to the whole table and specifies if the value of the current epoch or average from start.

The table settings can be saved to current *Template* or as the new one and used for another receiver.

The saved templates can be selected from the Select Template drop-down list box.

#### **Cycle Slips**

The Cycle Slips tables allow checking the cycle slips for the following signals:

- GPS L1
- GPS L2
- GLO L1
- GLO L2

The tables represent the set of *SNR* (50, 45, 40, 35, 30, 25, 20, and 0) and show the following indicators for each of *SNR*:

- *NSat* number of satellites.
- Timei number of the epochs when satellites were tracked.
- Nsat aver average number of satellites from start.
- Sat % the ratio of the number of satellites with this SNR to the total number of satellites in the band (%).
- Nslip number of the cycle slips for the all satellites.
- Nslip aver average number of the cycle slips per satellite.
- *Nslip / hour* number of the cycle slips per hours.

Above the each table signal epoch number and average SNR are displayed.

Click the *Start* button to start the accumulation.

The status of process, Started Time and Duration are displayed in the status bar at the bottom.

Click the Stop button to finish the accumulation.

## Orientation

This tab information is available for the multi-antenna systems only and displays the orientation of the system.

Receiver fit and the second se							
Measurements         Sky plot         Specta         Radio Spectra         Metrics         Options         Base/Rover         Settings           Expand Info	Reports - Acti	Display Name Roceiver Id Vendor Serial Numbers Firmware Version Nodel UpTime Memory (Used/ Position	Receiver 6 3VTCQYNKHDF603VP583 JAVAD GNS5 01061 (OEM 15731) m 3.5.5 Mar,03,2014 QUA (30_3 StGMA 0d00h07m47s Total) 130,24 MB / 1.83 GB 55%47/54.63"N 37%31'14"	Conne 02IGPO5 /dev/ E H:378.28m	ctions I ▼ I <b>ser/a</b> COMI:115200, Handsha	ske:True Discor	nnect
Expand Info       Time ± 04309000 Pitch 0.2245657 Roll 0.2512951 Heading SK.066089 Pitch RMS 3.086666 Heading RMS 3.086666 Heading RMS 3.086676 Heading RMS 3.086676       Time measurements is available for multi-antenna systems or 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Measurements	Sky plot Spectra	Radio Spectra	Metrics Orientation	Options Base/Rover	Settings	
	<ul> <li>Time Pitch Roll Heading Pitch RMS Roll RMS Heading RMS Flag</li> <li>Baseline vecto AB fixed 22.16 AC fixed 8.445 AD float 7.077</li> </ul>	41819000 2.296557 25.12951 56.06609 4.832025 4.031479 3.096606 1 751 264, 5.85701, -15.3415 802, -15.8885, 2.76899	41 4 1		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	This measurements is available for multi-antenna sys	6.06609

Figure 33. Orientation tab

The following parameters are shown and obtained from the messages:

#### [AR]

- *Time* receiver time [ms]
- *Pitch* pitch angle [deg] (graphically presented on the left plot)
- *Roll* roll angle [deg]
- Heading heading angle [deg] (graphically presented on the right plot)
- *Pitch RMS* pitch angle RMS [deg]
- Roll RMS roll angle RMS [deg]
- Heading RMS heading angle RMS [deg]
- Flag- 0 no data available / 1 data are valid

#### [mr] - Baseline vectors:

- AB code diff baseline vector M-S0 in the current epoch[m]
- AC code diff baseline vector M-S1 in the current epoch[m]
- AD code diff baseline vector M-S2 in the current epoch[m]

The pitch value is also represented on the left plot and Heading on the right.

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## Options

The Ontions tab	is designed to	check and undate f	he receiver's options
	is designed to	oneen una apaale l	

Measurements Sky plot Spectra	Radio Sp	ectra Metri	s Orient	ation Options	Base/Rover	Settings		
Option	Current	Purchased	Leased	Date				
GPS (_GPS)	1	0	1	5/1/2015				
GLONASS (_GLO)	1	0	1	5/1/2015				
L1 (_L1_)	1	0	1	5/1/2015				=
L2 (_L2_)	1	0	1	5/1/2015				
Position update rate(Hz) (_POS)	1	0	1	5/1/2015				
Raw data update rate(Hz) (_RAW)	1	0	1	5/1/2015				
Memory (Mb) (_MEM)	128	0	128	5/1/2015				
Common Tracking (COOP)	-1	0	511	11/2/2015				
1-PPS Timing Signal (_PPS)	0	0	0					
Event Markers (EVNT)	0	0	0					
In-Band Int. Rejection (_AJM)	1	0	1	5/1/2015				
Multipath Reduction (_MPR)	1	0	1	5/1/2015				
Frequency Input (_FRI)	-1	0	0					
Freq. Lock and Output (_FRO)	-1	0	0					
Serial Port A (Kbps) (RS_A)	460	0	460	5/1/2015				
Serial Port B (Kbps) (RS_B)	460	0	460	5/1/2015				
Serial Port C (Kbps) (RS_C)	460	0	460	5/1/2015				
Serial Port D (Kbps) (RS_D)	460	0	460	5/1/2015				
Infrared Port (INFR)	-1	0	511	11/2/2015				
Parallel Port (_PAR)	-1	0	511	11/2/2015				
GSM (_GSM)	3	0	3	5/1/2015				
UHF (_UHF)	3	0	3	5/1/2015				
RAIM (RAIM)	1	0	1	5/1/2015				
Datums support ( DTM)	1	0	1	5/1/2015				*
			Upl	oad: From Int	ternet	From File	Refresh	
			Rov	er S	pectrums	GNSS	Radio	

Figure 34. Options tab

Each option in the table above contains the following descriptors:

- Option option name
- *Current* current value of the option and either coincide with the larger of the purchased and leased values or -1.
  - -1 the corresponding receiver option is not supported by the firmware version.
  - 0 the corresponding receiver option is disabled.
  - a positive integer the option is enabled.
- Purchased value of purchased option or 0
  - 0 the corresponding receiver option is not purchased.
  - *a positive integer* the option is purchased.
- Leased Value of the leased option and the expiration date or 0.
  - 0 the corresponding receiver option is not leased.
  - *a positive integer* the option is leased.
- Date expiration date for the leased option

By default, receiver options are disabled so you have to take special measures to activate them. It can be done by uploading an *Option Authorization File (OAF)* to the receiver from the local store or via Internet.

Note: For the complete description of the supported options see [2, Table 4-2. Receiver Options].

#### **Uploading OAF via Internet**

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

Measurements Sky plot Sp	ectra R	adio Spectra	Metrics	Orienta	ation Options	Base/Rover	Settings		
Option	Cu	irrent Purc	hased l	Leased	Date				
GPS (_GPS)	1	0	1		5/1/2015				
GLONASS (_GLO)	1	0	1		5/1/2015				
L1 (L1_)	1	0	1		5/1/2015				=
L2 (L2)	1	0	1		5/1/2015				
Position update rate(Hz) (_PC	S) 1	0	1		5/1/2015				
Raw data update rate(Hz) (_R	AW) 1	0	1		5/1/2015				
Memory (Mb) (_MEM)	12	3 0	1	28	5/1/2015				
Common Tracking (COOP)		Ор	tions up	loadin	g	×			
1-PPS Timing Signal (_PPS)									
Event Markers (EVNT)		D		0.0					
In-Band Int. Rejection (_AJI		Do you war	it to updat	e Optior	is from server:				
Multipath Reduction (_MPF									
Frequency Input (_FRI)					1	1			
Freq. Lock and Output (_FR				Yes	No				
Serial Port A (Kbps) (RS_A)									
Serial Port B (Kbps) (RS_B)	460	0 (	4	60	5/1/2015				
Serial Port C (Kbps) (RS_C)	460	0 (	4	60	5/1/2015				
Serial Port D (Kbps) (RS_D)	460	0 (	4	60	5/1/2015				
Infrared Port (INFR)	-1	0	5	11	11/2/2015				
Parallel Port (_PAR)	-1	0	5	11	11/2/2015				
GSM (_GSM)	3	0	3		5/1/2015				
UHF (_UHF)	3	0	3		5/1/2015				
RAIM (RAIM)	1	0	1		5/1/2015				
Datums support ( DTM)	1	0	1		5/1/2015				-
				Uple	oad: From In	ternet	From File	Refresh	
				Rove	er   S	Spectrums	GNSS	Radio	

Figure 35. Updating Options via Internet

The status of the uploading and the result are displayed in the bottom status bar. After *Options* are uploaded, receiver *NVRAM* is cleared and then receiver is reset.

Measurements Sky plot S	Spectra Radio	Spectra	Metrics	Orientation	Options	Base/Rover	Settings	
Option	Curren	t Purc	hased L	eased	Date			
GPS (_GPS)	1	0	1	5/1/	2015			
GLONASS (_GLO)	1	0	1	5/1/	2015			
L1 (L1)	1	0	1	5/1/	2015			=
L2 (L2)	1	0	1	5/1/	2015			
Position update rate(Hz) (_P	OS) 1	0	1	5/1/	2015			
Raw data update rate(Hz) (_	RAW) 1	0	1	5/1/	2015			
Memory (Mb) (_MEM)	128	0	12	28 5/1/	2015			
Common Tracking (COO	(	Options	s uploadi	ng compe	te	×		
1-PPS Timing Signal (_PP								
Event Markers (EVNT)	🛕 Opti	ons was l	oaded succ	cessfully.				
In-Band Int. Rejection (_A	🔔 Doy	ou want f	to clear NV	RAM and Res	et receiver	?		
Multipath Reduction (_M								
Frequency Input (_FRI)								
Freq. Lock and Output (				Yes	No			
Serial Port A (Kbps) (RS_A								
Serial Port B (Kbps) (RS_B)	460	0	46	50 5/1/	2015			
Serial Port C (Kbps) (RS_C)	460	0	46	50 5/1/	2015			
Serial Port D (Kbps) (RS_D)	460	0	46	50 5/1/	2015			
Infrared Port (INFR)	-1	0	51	11 11/2	/2015			
Parallel Port (_PAR)	-1	0	51	11 11/2	/2015			
GSM (_GSM)	3	0	3	5/1/	2015			
UHF (_UHF)	3	0	3	5/1/	2015			
RAIM (RAIM)	1	0	1	5/1/	2015			
Datums support ( DTM)	1	0	1	5/1/	2015			Ŧ
				Upload :	From In	ternet	From File	Refresh
Options uploading	✔ 216 - optic	ons loade	d	Rover	9	Spectrums	GNSS	Radio

Figure 36. Options are uploaded

To see updated Options, click the Refresh button after receiver reconnects.

#### **Uploading OAF from File**

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

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

σ				Net Vi	ew			-	
•	Connection Receivers Parameters Files Greis commands Real-Time Logging	• 220000 • 40	Display Nan Receiver Id Vendor Serial Numb Firmware Ve Board Versio Model UpTime	ne Receiver 2 <u>3W101QK</u> JAVAD GN ber 00015 ersion 3.6.3 Jul,0 on TRIUMPH TRIUMPH 0d00h09n 005 cr. kn	2 IZOIQIO3VZB2PQNQ2V NSS 1,2015 I 3 1 1 19s	Con 1Z /den	nections 1 ▼ v/tcp/a TCP 17	Disco	nnect
	Help	σ		Open Options File					
		Reports 🛞 🤄	> ↑ 1	Users → · ·	'ı → Desktop	~ C	Search Desktop	م	
		Measur Orga	nize 🔻 New fo	older				. 🔟 🔞	)
		GPS ( 🔶 F	avorites	^ Name	<u>^</u>		Date modified	Туре	
		GLON.	Desktop	3W1010	QKZ010103VZB2PQNQ2	V1Z .jpo	10/30/2015 6:33 AM	JPO File	
		L1 (L1 🦊	Downloads Recent places						Ξ
		Positic	his PC						
		Memo		< <					>
		Comm	File	e name: 3W101Q	KZ010103VZB2PQNQ2V	/1Z .jpo 🛛 🗸	Options File (*.jpo)	~	
		1-PPS Event					Open	Cancel	


# **Base/Rover**

The Base/Rover tab allows configuring receiver as a base or a rover.

## **Configuring a base**

To configure a base receiver perform the following:

- Check Use receiver as reference base;
- Specify the Public base name, Country, City and Network (optional);
- Select the corrections for transmitting from the list of the predefined message sets (see "Appendix 1. Predefined sets of messages" on page 82). You can select any number of the sets;
- Click Save to apply settings.

J	Net Vie	w					100.1					
-	Con Rece •	nection vers construction Parameters Files Greis commands Real-Time Logging Receiver 3 Parameters Files Greis commands	Reports - Actic	Display Name Receiver Id Vendor Serial Number Firmware Version Board Version Model UpTime Memory (Used/Tota Position ns - Update Firmwa	Receiver 1 3W101QKZ0I0I03VZB2P JAVAD GNSS 00015 3.6.3 Ju(01,2015 TRIUMPH_3 TRIUMPH1 0d02h29m50s a) 895.95 KB / 1.83 GB 55*47'54.69"N 37*31'14.	Connections 1 - PQNQ2VIZ /dev/tcp/b TCP 172.17 Disconnect 4.04"E H:379.61						
		Real-Time Logging	Measurements Sk	y plot   Spectra   Radio	Spectra Metrics Orient	ation Optio	ns Base/Rover	Settings				
	Help		Base Use receiver as Public base name: Country City Network Allowed correction OGPS RTCM (1 OGPS RTCM (2) RTK RTCM (20) RTK RTCM (20) RTK RTCM 3 G RTK RTCM3 GG R	reference base Base Russia Moscow s: 31.3) 19.22.3) 19.22.3) 19.23.24) 21.23.24) 21.23.24) 21.23.24) 0 full 5D full	),1033(10)	Rover Use reco	eiver as rover rence base: ection type: port for correction	is redirect:				
		B APP etBrowser	RTK CMR (1070 RTK CMR+ (10 RTK JPS min RTK JPS max RTK RTCM3 M	,1) 0,9) 5M		Rover	Spect	Refresh rums GNSS	Save Radio			

Figure 38. Base/Rover tab. Receiver 1 is configured as a base transmitting RTCM3 corrections

For the base receiver the following parameters should be set as described below on tab *Parameters* > *Positioning*:

- coordinates of Antenna Phase Center (APC);
- coordinates of Antenna Reference Point Position (ARP);
- Reference Antenna Parameters.

## **Configuring a rover**

For the rover receiver do the following:

- 1. Click the *Refresh* button to get base list.
- 2. Check Use receiver as rover.
- 3. Select reference base from the drop-down list box.
- 4. Select correction type from the drop-down list box.
- 5. Select free port for correction redirect (ser/b is suitable for most cases).
- 6. Click *Save* to apply settings.

Also the *Position Computation Mode* suitable for the correction type, must be specified on the *Parameters*  $\triangleright$  *Positioning* tab.

J Net View			1.1	-		and a	-	- • ×			
Connection  Receivers  Receiver 1  Parameters Files Greis commands Real-Time Logging  Receiver 3  Parameters Files Greis commands	Display         Receiv         Vendo         Serial I         Firmwit         Board         Model         UPTim         Memo         Positio         Reports •       Actions •	Name         Receive           er Id         03V10           r         JAVAA           vumber         00154           version         3.6.3           Version         TRE_C           SIGM.         SIGM.           e         0d006           n         55*47           date Firmware ▼	ver 3 CU9G86LGDi D GNSS 4 (OEM 1300 Jul,01,2015 33TH_8 A 18m41s Bytes / 1.83 "54.53"N 37"	00RN22 062) GB 31'15.0	Z4M1G0TN D6"E H:379	Connections 1 M /dev/usb/a USB Disconr 9.11					
Real-Time Logging	Measurements Sky plot Spe	ctra Radio Spectra	Metrics	Orienta	ation Opt	tions Base/Rove	er Settings				
Help	base Use receiver as reference by Public base name: Country City Allowed corrections: DGPS RTCM (1,31,3) DGPS RTCM (1,31,3) DGPS RTCM (41,3) RTK RTCM (18,19,22,3) RTK RTCM (18,19,22,4) RTK RTCM (10,21,22,3) RTK RTCM (20,21,23,24) RTK RTCM (20,21,23,24) RTK RTCM 3 GD min RTK RTCM3 GD full RTK RTCM3 GGD min RTK RTCM3 GGD full RTK CMR (10,0,1) RTK CMR+ (10,0)9) DFT JPC min	35E			Image: Select reference base:         Name:       Receiver 1 (Base)         Corrections:       rk.rkm3_GGD         Position:       55.7985143230772 37.5205685497332 H:378.767         Distance:       17 m         Select correction type:         RTK RTCM3 GGD full         Select free port for corrections redirect:         ser/b						
WEB APP NetBrowser							Refresh	Save			
		Rover 🕖	)Waiting for	correct	tions on ro	over   Spectru	ms GNSS	Radio			

Figure 39. Receiver 3 is configured as a rover of Base (Receiver 1)

The rover status is displayed in the status bar at the bottom. After the rover begins to receive the corrections you will see the corresponding *Link* on the *Measurement* tab.

J Net View															٢
Connection Receivers	Display Name Receiver Id Vendor Firmware Versia Board Version Model UpTime Memory (Used, Position Actions • Update Firm	on /Tota mwar	Receiver 3 03V1CU9G86LGD00RN2Z4M1G0TM JAVAD GNSS 00154 (OEM 1300062) 3.6.3 Jul(01,2015 TRE_G3TH_8 SIGMA 0d00h26m11s ) 0.00 Bytes / 1.83 GB 55*47*54.53*N 37*31*15.06*E H:379.1					Coi /de	nnectio	ons 1 /a US	B		Disconnect		
Real-Time Logging Measuremen	ts Sky plot Spectra R	adio	Spectra	Metrics O	rientat	tion	Optio	ns	Base/R	over	Settings				
Help Latitude	55°47'54.52749462"N	, A	Sys	<ul> <li>Num</li> </ul>	EI	Az	CA	P1	P2	L2C	L5	L1C	Track Time	Status	<u>^</u>
Longitude	37°31'15.05925192"E		GPS	1	7	186	39	19	19	37	36		00:26:36	58	
Ellipsoidal h	eight 379.119904295541		GPS	16	12	118	45	21	21				00:26:12	58	
Position SEP	0.03676267		GPS	3	59	146	55	48	48	54	49		00:26:36	58	
Velocity 2D	0.00619134		GPS	26	23	90	44	34	34	47	43		00:26:36	30	
Position RM	S 0.03070200 S 0.02285701		GPS	9	38	256	47	39	39	49	46		00:26:36	58	
PDOP	1 61629796	Ξ	GPS	23	79	242	57	49	49				00:26:36	58	Ξ
HDOP	1.084442		GPS	32	23	128	43	28	28				00:26:36	58	
VDOP	1.198501		GPS	31	25	48	46	37	37	46			00.26.36	30	
Solution	RTK fixed (Phase diff)		GLO	15/0	12	22	42	/11	25	26			00:25:54	58	
Receiver Tim	ne 16:12:44		CLO	15/0	20	150	42	41	20	20			00.25.54	50	
Receiver Dat	te 2015.10.30		GLO	9/-2	59	100	47	40	50	59			00:25:54	50	
Clock Offset	0.00034195		GLO	16/-1	57	/6	53	53	46	47			00:25:54	58	
Osc. Offset	0.00017376		GLO	6/-4	45	104	55	54	41	43			00:25:54	58	
Links			GLO	7/5	75	326	52	52	46	47			00:25:54	58	
Link Id	/ser/b		GLO	27/7*	39	156	51	49	45	46	46(G3	)	00:25:54	30	
Decoder I	d RTCM 3.0		GLO	23/3	27	300	32	31		24			00:04:05	30	
Station Id	ion Id 0000		GLO	22/-3	9	246	47	45	34	36			00:25:54	58	
Time elap:	sed si 001		GLO	8/6	24	298	30	30		28			00:25:54	30	
Corrupt m	essa 5496		SBAS	128	15	130	37						00:26:32	30	
Link qualit	v (%) 100.00		SBAS	123	26	188	44						00:26:36	30	Ŧ
WEB APP	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Ŧ	٠				"	1						÷.	
NétBrowser						Rove	er   🥑	)	S	pectru	ms GN	ss	Radi	0	

Figure 40. Fixed rover. Links displays input corrections

# **Settings**

J Net View	
Connection Receivers Parameters Files Greis commands Real-Time Logging Parameters Files Greis commands Real-Time Logging	Display Name       Rover       Connections 1 •         Receiver Id       03V1CU9G86LGD00RN2Z4M1G0TM       /dev/usb/a       USB         Vendor       JAVAD GNSS       Serial Number       00154 (OEM 1300062)         Firmware Version       3.6.3 Jul(01,2015       Board Version       TRE_G3TH_8         Model       SIGMA       UpTime       0400h48m44s         Memory (Used/Total)       0.00 Bytes / 1.83 GB       Position       55*47'54.53''N 37*31'15.06''E H:379.11         Reports •       Actions •       Update Firmware •         Measurements       Sky plot       Spectra       Radio Spectra
Help	Display Name:       Rover         Resource usage priority:       FileDownloading <ul> <li>Corrections</li> <li>FileDownloading</li> <li>Status:</li> <li>Fixed              <ul> <li>Height, m:</li> <li>123.41</li> <li>Vislant</li> <li>Ring, m:</li> <li>56.398</li> <li>Northing, m:</li> <li>142.63</li> <li>RINEX profile:</li> <li>Browse</li> <li>Browse</li> </ul></li></ul>
WEB APP NetBrowser	Rover Spectrums GNSS Radio

Figure 41. Receiver setting tab

The Settings tab is designed to change the receiver Display Name and manage Resource usage Priority.

- *Display Name* the name for displaying at the left panel and on the tab *Receivers*.
- *Resource usage Priority (Corrections, File Downloading)* Specifies which operation will have higher priority. This does matter for base if it connected via single channel.
- Site Configuration Antenna settings can be used for free-events generating. See [2]: 2.3.9 event.
- Site name and Rinex profile are used only by NetHub and they do not need to be specified.

# **CONFIGURING THE RECEIVER**

Click to the *Parameters* sub-node of the receiver to select the *Parameters* window. The *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

The representation of the each parameter is determined by the type, facility of access and availability. The detailed description coincides with *GREIS Manual* [2] and appears when mouse is over the parameter.

Read-only parameters are gray. Parameters which are not available for this model of receiver are gray and empty.

J Net View		×
Connection	General Log-files TriPad Positioning Base Rover Ports Networking Event Advanced	
Receivers     Receiver 1     Parameters     Files     Greis commands     Real-Time Logging     Receiver 3	General     parameter is edited     Power Management     Temperature (Celsius degrees)       Elevation Mask for SVs Locking     1     Battery Charging Mode     auto        Receiver Board Temperature     42.0       Elevation Mask for Position     100     •     Enable Power Output         parameter is unavailable        • Receiver: ER01E%04153%[2_value out of range]     parameter not             • Anterna     applyed due the error             • Omer Off	*
Field Interes Field Commands Real-Time Logging Help	Antenna Input       ext         Antenna Current Input       ext         Status of External Antenna off       Very Access: Read & Write access         Ext Default Value: on Type: boolean       Type: boolean         read-only parameter       Bai on - setting this parameter to off turns the receiver off. There is no way to turn the Bai receiver on after that using GREIS commands, and after receiver is turned on by other means (e.g., using a power button), this parameter returns back to on.         Output Voltage       parameter's description	-
	Refresh Apply Save Configuration to Sc	ript
	Greis commands mode, press Ctrl for Help Tip, Ctrl+Space for print/set rotation	*
HIEBAPP MARDrowers		
	Send Clear Start Logging Load Scrip	π

Figure 42. Parameters window.

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

To get current values for the parameters on the selected tab, click *Refresh*. Read-only parameters are refreshed every 10s even without manual refreshing.

The Save Configuration to Script button saves all the parameters to the tcl-script. It is described below.

Note: Location of the parameters on the tab varies when resizing the main window.

# **Parameter Tabs**

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

### General

The General tab shows the most common settings.

eneral Log-files TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced		
General Elevation Mask Elevation Mask for SVs Loci Elevation Mask for Position Antenna Antenna Input	king -1 5			Power Mod Batte Enab Low Powe	Management les ery Charging N le Power Outp Power Mode er Off	lode au out or or	ito 1	•	Temperature (Celsius degrees) Receiver Board Temperature 44.0
Antenna Current Input Status of External Antenna	Sleep Volta	o Mode ages	of	f	•				
				Exter Rece	mal Power Vol	tage 11 tage 8.	1.72 79		
				Batte Batte	ery Voltage a ery Voltage b	8. 8.	21 24		
				Char Outp	ger Output Vo out Voltage	ltage 0.	00		

Figure 43. General parameters

• General - [2]: 4.4.4. 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, 4.4.28 Advanced Power Management]
  - *Modes* power control modes.
  - Voltages power statuses (all are read-only).
- *Temperature* board temperature (C°, read-only) [2, 4.4.35 Miscellaneous parameters].

## Log-Files

The *Log-files* tab contains parameters for file managing [2, 4.4.20 File Management, 4.4.16 Parameters of Generic GREIS Messages].

General Log	-files	TriPad I	Positio	ning	Base	Rover	Ports	Networking	Event	Advanc	ed			
File a							File l	0						*
Current Log	-file						Curre	ent Log-file						
Number of I	Message	es Enabled	l for	0			Number of Messages Enabled for 0							
Output Epoc	ths Cou	nters		0			Output Epochs Counters 0							
Implicit Mes	sage Oi	utput Perio	bd	1.00			Impl	icit Message C	Output Pe	riod	1.00			
Elevation Ma	Elevation Mask for Measurements 5					Eleva	tion Mask for	Measure	ments	5				
Satellites Nu	Satellites Number Mask for 0				Sate	lites Number	Mask for.		0					
File Name P	File Name Prefix log				File 1	Name Prefix			log					
Manage by a	AFRM/T	riPad		у		•	Man	age by AFRM/	TriPad		n	•		
AFRM							listony I	ogging				Initia	al Dunamic Mode	
File Rotation	Mode		off			- 1	ogging	Period		30.00	_	Initia	al Dynamic Mode static 🔹	
File Rotation	Runnir	ig Counte	r O				Output S	tream to be N	Ionitored	/dev/ni	ull 🔻			
Force File Ro	otation	Ĩ	off			-	1							
Enable Olde	st Log-f	ile Remov	al off			-								
Scheduling	Param	eters												Ξ
File rotatio	n count	er 0												
File Rotatio	on Perio	d 3600												
File Rotatio	on Phase	e 0												
FTP Push							/lemorv							
File Push Mo	ode d	off	-	•		N	1emory	to Use for Dat	a Storage	int		•		
File Push Re	set (	off	-			N	lemory	Currently in U	se for Dat	a int				
File Push Tin	neout	500												
FTP Conne	ction													
File Push H	lost or I	P Address	"1	' ?.	1"									
File Push I	Port		21											
File Push U	lser		"anor	nymou	ıs"									
File Push P	assword	ł	**											
File Push V	Vorking	Directory	"filep	ush"										
														-

Figure 44. Log-file parameters

The following parameter groups are available:

• *File a, File b* – settings for configuring the output to File A (File B) - [2, Existing Files, Current Log-files, Masks and Counters, Implicit Output Parameters].

• *AFRM* – settings for automatically rotating the log-files according to the user-defined schedule. [2, Automatic File Rotation Mode (AFRM)].

- *History Logging* settings for history logger which collects and records statistical information. [2, Logging History].
- *Initial Dynamic Mode* specify the initial mode for all of the new files opened through *TriPad*. [2, 4.4.29 TriPad Parameters].
- FTP Push settings for automatically putting log-files to an external server. [2, File Push Parameters].
- *Memory* int (internal), ext (SDCARD) Data Storage. Available for the receiver with external memory. [2, File-system Parameters].

## TriPad

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

General Log-files Tri	Pad	Position	ing	Base	Rove	r Ports	Networking	Event	Advanced	
Function key <pre><fn> Push Behavior</fn></pre>										*
<fn> Push Action</fn>			Turr	n Loggi	ng 🔹					
Turn Data Recording	On at	t Startup	off		•					
Appending Data to a	Spec	ific File								
<fn> Click Behavior</fn>										
<fn> Click Action</fn>	led		•							
Initial Dynamic Mode	stat	tic	•							
										*
·										······································

Figure 45. TriPad parameters

• Function key - [2, 4.4.29 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, 4.4.6 Positioning Parameters] only the subtitles are shown below.

General Log-files TriPad Posi	tioning Ba	se Rover	Ports	Networking	Event	Advanced			
Enable Solutions Position Computation Mode Enable Single Point Position Enable Code Differential Position Enable RTK Solution with Float Enable SBAS Code Differential	• • •	Position Elevatio PDOP N	n Masks In Mask for Position 5 Mask 30.00 GAL Ø SBSS Ø QZSS Ø COMP I IRNSS Ø						
Satellite Management           SBAS(WAAS, EGNOS)         Q           GPS         GPS Ext.         Lock?         Use?         Health?         Ura?         A           1         V         V         0         12         V         V           2         V         V         0         12         V         V           3         V         V         0         15         V         V           4         V         0         16         V         V         5         V         V         0         V         V         V         0         V         V         0         0         V         V         0         0         V         V         0         0         V         V         0         0         V         V	ZSS B GLONASS Jm <sup>1</sup> 2 23 V V 2 4 V V 2 5 V V 2 6 V V 2 7 V V 2 8 V V 2 9 V V 3 0 V V 3 1 V V 3 2 V V 4 1 V 4	eiDou GA	IRNSS ALILEO	Meas. U Measure	sed ments 1	Type to Use ca p1 12 12c 15 iono all	free		
Enable Corrections Enable Ionospheric Corrections Enable Tropospheric Corrections Datum Current Datum for Position Use Datum Rotations for Position	on on W84 off	•	RAIM RAIM M Alarm Li Alarm Li	ode imit Mode imit for Manua	l Mode	on manual s555.6			

Figure 46. Positioning 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].

• *Positions Systems* - select satellite constellation(s) used for position computation. [2, Enable Satellite System].

• *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, 4.4.5 Almanac Status].

• *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].

#### 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, 4.4.9 Reference Parameters, 4.4.13 RTCM 2.x Parameters, 4.4.14 RTCM 3.x Parameters] and these references are passed.

eneral Log-files TriPad Positioning Base Rover Ports	Networking Event Advance	ed			
Reference Position			Reference Position Averaging		
Coordinate system: Geodetic 🔹			Reference Position Averaging Mode	off	•
Antenna Bhase Center Position (ABC)	Antonna Reference Doint Dorit	ion (APD)	Reference Position Averaging Interval	180	
Lat 55 ° 47 ' 54 522000 " N ¥ W84 ¥	Lat 55 ° 47 ' 54 523009	" N ¥ W84 ¥			
		10 - 1004			
Lon. 037 • 31 • 15.111982 • E •	Lon. 037 * 31 * 15.111982	"Е <b>т</b>			
Alt. +377.1527	Alt. +377.1527				
Get from receiver APC -> ARP	APC <- ARP				
L1 to ARP Offsets					
ACCG8ANT_3A4TB1 NONE Height, m: 0.0175					
Easting, m: 0.0015 Northing, m: 0.0024					
Reference Antenna Parameters	Reference Antenna Off	sets	RTCM 2.x Settings		
Intenna type (for RTCM 2.x and 3.0) ACCG8ANT_3A4TB1 NONE	L1 APC to L2 APC Off	set, meters	RTCM 2.x Base Station Identifier	0	
Antenna Serial Number	East Offset of L2 APC	0.0000	Enable CA/L1 in RTCM 2.x Message	on	•
Antenna Setup ID 0	Height Offset of L2 Al	PC 0.0000	Enable P/L1 in RTCM 2.x Message	off	•
ARP Offsets	North Offset of L2 AP	C 0.0000	Enable P/L2 in RTCM 2.x Message	on	•
East Offset of ARP 0.0000			Maximum Number of Satellites for	0	_
Height Offset of ARP 0.0000			Schelling Constallation for BTCM 2	(	_
North Offset of ARP 0.0000			Satellite Constellation for RTCM 2.x	{on,on}	_
Noter Office of Alter			RTCM 2.x Base Station Health	good	•
			Use Smoothed Pseudoranges in	off	•
CMR	Settings				
RTCM 3.x Reference Station Identifier 0 CMR	Antenna Type	0			
par/rtcm3/base/l2c n CMR	Reference Station Identifier	0			
Rece	iver Motion State for CMR	unknown 🔹			
Туре	of CMR Message to Use for	3			
Subs	titute P/L1 for CA/L1 in CMR	off 🔹			
Data	for CMR Message Type 2	{"","",""}			

Figure 47. 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 got from the receiver by clicking Getfrom 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 (land mark) 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, 4.4.7 Code Differential (DGPS) Parameters, 4.4.8 Phase Differential (RTK)].

General Log-files TriPad Position	ning Base Rover	Ports Networking Event Advance	ed		
DGPS		RTK		RTK Heading Parameters	
Source of DGPS Corrections	nearest 🔹	RTK Position Computation Mode	delay 🔻	Heading Mode	off 🔹
Maximum Age of DGPS Corrections	30	RTK Delay Mode Variant	last 🔹	Use Fixed Baseline Length	off 🔹
Maximum Age of Ionosphere	300	Rover Dynamics for RTK	1.0000	Fixed Baseline Length	0.000
Ionosphere-free DGPS Mode	off 🔹	Confidence Level for Ambiguity	medium 🔹	Fixed Baseline Length	
Fixed Reference Station ID	0	Use CA/L1 Measurements for RTK	on 🔹	Fixed Baseline Length	
Source Port of DGPS Corrections	any 🔻	Use P/L1 Measurements for RTK	on 🔹	Penalty Factor for Baseline Length	0.0500
		Use P/L2 Measurements for RTK	on 🔹		
		Use CA/L2 Measurements for RTK	on 🔹		
		Use L5 and E5a Measurements for	off •		
		Update Interval of RTK Reference	1.00		
		Environmental Condition Factor	open 🔹		
		RTK VRS Mode	off •		
		Multi RTK Mode	off •		
- Attitude Parameters					
Attitude Mode					
Pitch, Roll, and Heading Offsets					
Number of Epochs to Use for Self					
Attitude Processing Mode	~				
Master Input Mode					

Figure 48. Rover parameters

Available parameter groups:

- DGPS settings for differential corrections using.
- 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-antennas receiver [2, RTK Heading Parameters], documentation on Duo and Quattro.

• *Attitude Parameters-* mode and initial values for calculating vectors in the multi-antennas 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, 4.4.23 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" on page 82. 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:

#### **USB** tab

General Log	-files TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	
Serial USB	Bluetooth T	СР ТСРО	CAN						
USB a Input Mode	cmd	•							*
Output	None	•	Perio	d (sec):	1				
	None DGPS RTCM { DGPS RTCM { DGPS RTCM { RTK RTCM {1/ RTK RTCM {2/ RTK RTCM {2/ RTK RTCM3 G RTK CMR {10, RTK CMR {10, RTK CMR {10, RTK CMR {10, RTK CMR {10, RTK JPS min RTK JPS max RTK RTCM3 M	1,31,3} 9,34,3} 41,3} 3,19,22,3} 0,21,22,3} 3,19,23,24} 0,21,23,24} 0,21,23,24} 0,0 full GGD full GGD full GGD full GGD full 0,0 0,1} 0,0,9}							

Figure 49. USB port parameters

#### Serial tab

Serial tab contains parameters for configuring serial a, b, c, d ports such as Baud Rate and RTS/CRS Handshake [2, 4.4.24 Serial Port Parameters. (Hardware Settings)].

Serial a			Serial b		
Input Mode	cma •		Input Mode	cma 🔹	
Output	None	<ul> <li>Period (sec): 1</li> </ul>	Output	None	<ul> <li>Period (sec): 1</li> </ul>
Baud Rate	115200 🔹		Baud Rate	115200 🔹	
RTS/CTS Handshake	off 🔹		RTS/CTS Handshake	on 🔻	
Serial c			Serial d		
Input Mode	cmd 🔹		Input Mode	cmd 🔹	
Output	None	<ul> <li>Period (sec): 1</li> </ul>	Output	None	<ul> <li>Period (sec): 1</li> </ul>
Baud Rate	115200 🔹		Baud Rate	115200 🔹	
RTS/CTS Handshake	off •		RTS/CTS Handshake	off 🔹	

Figure 50. Serial ports parameters

#### **Bluetooth tab**

*Bluetooth* tab allows setting input/output for the available *Bluetooth* ports and also provides *Hardware Settings* to configure *Bluetooth* module [2, 4.4.27 Bluetooth Parameters].

General Log-files	TriPad Positioning Base	e Rover Ports	Networking Event	Advanced		
Serial USB Blue	etooth TCP TCPO CAN					
Bluetooth a			Bluetooth b			*
Input Mode	cmd 🔹		Input Mode	cmd 🔹		
Output	None 🔻	Period (sec): 1	Output	None	<ul> <li>Period (sec): 1</li> </ul>	
Chan Address	00000000000		Chan Address	00000000000		
Current Address	"unknown"		Current Address	"unknown"		
- Hardware Setting	js					
Address "00:19:8	8:07:6D:A3"					
FCCID U9R-W2	2CBW003					
IC 7089A-1	W2CBW003					
Mode on	-					
Name "TRIUM	IPH1 00015"					
PIN "1234"						

Figure 51. 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].

General Log-	files TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced		
Serial USB	Bluetooth	ГСР ТСРО	CAN							
TCP a Input Mode	cmd	•				TCP b Input Mode	cmd	•		
Output	None		<ul> <li>Perio</li> </ul>	d (sec):	1	Output	None		▼ Period (sec): 1	
TCP c						TCP d				
Input Mode	cmd	•				Input Mode	cmd	•		
Output	None		<ul> <li>Perio</li> </ul>	d (sec):	1	Output	None		▼ Period (sec): 1	
TCP e						TCP Client a				
Input Mode	cmd	•				Input Mode	cmd	•		
Output	None		<ul> <li>Perio</li> </ul>	d (sec):	1	Output	None		<ul> <li>Period (sec): 1</li> </ul>	
TCP Client b Input Mode Output	cmd None	•	▼ Perio	d (sec):	1	TCP Statistic Port a 172. Port b Port c Port d Port e	17.0.229:3	207		

Figure 52. 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.

• *TCP Statistics* - list of active incoming TCP connections (IP-address and port are displayed). [2, 4.4.25 Network Parameters (Network Statistics)].

#### TCPO tab

*TCPO* tab is designed to enable output data for TCP output server ports. [2, 4.4.25 Network Parameter (TCP Output Server Configuration)].

General Log-files TriPad	Positioning Base Rover	Ports N	etworking	Event	Advanced	l
Serial USB Bluetooth	TCP TCPO CAN					
- TCPO a 8010		ТСРО Ь	8011			
Output None	<ul> <li>Period (sec): 1</li> </ul>	Output	None		•	Period (sec): 1
ТСРО с 8012			8013			
Output None	▼ Period (sec): 1	Output	None		•	Period (sec): 1
- TCPO e 8014						
Output None	<ul> <li>Period (sec): 1</li> </ul>					

Figure 53. 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, 4.4.30 CAN Ports Parameters].

General Log-files TriPad Positioni	ng Base Rover Ports	Networking Event	Advanced		
Serial USB Bluetooth TCP TCPC	CAN				
CAN a			CAN b		*
Input Mode	cmd 🔹		Input Mode	cmd 🔹	
Output	None	<ul> <li>Period (sec): 1</li> </ul>	Output		<ul> <li>Period (sec):</li> </ul>
CAN Baud Rate	125		CAN Baud Rate	125	
First SID for Input CAN Messages	0x700		First SID for Input CAN Messages	0x700	
The Number of SIDs for Input CAN	8		The Number of SIDs for Input CAN	8	
First SID for Output CAN Messages	0x700		First SID for Output CAN Messages	0x700	
The Number of SIDs for Output	8		The Number of SIDs for Output	8	
					Ŧ

Figure 54. CAN ports settings

## **Networking**

*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, 4.4.25 Network Parameter].

General Log-files TriPad Position	ing Base Rover F	Ports Networking Event Advanced	
LAN WLAN Server Client PPP	Modems		
IP		DDNS	
Receiver IP Address	192.168.0.100	DynDNS Receiver DNS Name (Alias)	"us 📜 dns.org"
Default Gateway	192.168.0.1	DynDNS Mode	off 🔹
Network mask	255.255.255.0	DynDNS Password	"passwd"
Maximum Transmission Unit (MTU)	1500	DynDNS State	off
MAC Address	"00:18:d7b8"	DynDNS User	"user"
DHCP			
Switch DHCP client on/off off	•		
Current IP Address	192.168.0.100		
DNS			
Default DNS Server 0.0.0.0			

Figure 55. 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, 4.4.25 Network Parameters (WLAN (WiFi) Configuration)].

eneral Log-files TriPad	Positioning Base	Rover	Ports	Networking	Event	Advanced	
AN WLAN Server Cli	ient PPP Modem	5					
Mode		~IP					
WLAN Error	"association"	WLAN I	Receiver	IP Address		10.1.10.5	
WLAN Mode	on 🔻	WLAN I	WLAN Default Gateway				
WLAN Connection State	WLAN I	Network	mask		255.255.255	.0	
	WLAN I	Maximu	m Transmissio	on Unit	1500		
		WLAN I	MAC Ad	dress		"00:18:d7:c8	:c1:5b"
		DHCP					
		Switch	DHCP	client on/off	off	•	
		Switch	DHCP	server on/off	off	•	
		Current	IP Addr	ess		10.1.10.5	
Access Point		In	fo				
WLAN Access Point ID	"00:00:00:00:00:00"	/р	ar/net/v	vlan/inf/fccid	U9R-W2	CBW003	
WLAN Access Point SSID	"G_02_00004	," /р	ar/net/v	vlan/inf/ic	7089A-V	V2CBW003	
works if WLAN Access Poir	nt ID is 00:00:00:00:00	:00					
WLAN Access Point RSSI	204						
WLAN AP Mode	wpa 🔹						
works if WLAN Access Poir	nt SSID is filled						
WLAN Key N ********							
WIAN Key N *******							
WI AN Key N *******							
WI AN Key N *******							
WEAN KEY N							
WPA							
WLAN WPA Passphrase	******						

Figure 56. WLAN parameters

The following parameters configure WLAN:

• *Mode* – mode (on, off, adhoc) and statuses.

• *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).
- *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.
- 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 and NTP servers implemented in the receiver. See [2, 4.4.25 Network Parameters].

CP/FTP		T C HTTP	
CP Port	8002	HTTP Port 80	NTP Error NONE
CP Connection Timeout	600	HTTP Connection Timeout 10	NTP Port 123
CP Server TLS/SSL Mode	off •	HTTP Server TLS/SSL Mode off	▼ NTP Requests 0
CP Output Base Port	8010		NTP Replies 0
CP Output Connection Idle Timeout	t 600		
TP Port	21		
TP Connection Timeout	600		
CP/FTP Password	"a"		

Figure 57. Server parameters

The following servers can be configured:

- *TCP/FTP* parameters allows
  - TCP client to establish bidirectional connections to receiver. [2, TCP Server Configuration].
  - FTP-standard client 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].

#### **Client tab**

*Client* tab allows configuring the receiver to operate as TCP client for different kinds of TCP servers [2, 4.4.25 Network Parameters (TCP Client Parameters)].

The parameters for *Client* and *Client b* are identically. *Client b* is available depending on receiver model. To access *Client b* parameters it need be expanded.

lient							
Mode			Raw TCP Client	_			
TCP Client Mode		off 💌	Host Name of Raw TCP Serve	er			
TCP Client Connection	State	off rcv	IP Address of Raw TCP Serve	er 🗄	172.17.0.215		
TCP Client Timeout		ntrip	IP Port of Raw TCP Server	1	8082		
TCP Client Error		ntrips sisnet	Login for Raw TCP Server			•	
			Password for Raw TCP Server	r	"1"		
			TCP-client RAW mode		off	•	
NTRIP Client			NTRIP Server				
Host Name of NTRIP C	aster	***	Host Name				
IP Address of NTRIP Ca	aster	0.0.0.0	IP Address of NTRIP Caster	0.0	0.0.0		
IP Port of NTRIP Caste	r	0	IP Port of NTRIP Caster	0			
NTRIP User Name			NTRIP User Name				
NTRIP Password			NTRIP Password				
NTRIP Mount Point		••• •	NTRIP Mount Point				
NMEA GGA Period for	NTRIP	0	NTRIP Protocol Version	1			
SISNeT Client							
Host Name of SISNeT	***						
IP Address of SISNet	0.0.0.0	)					
SISNet Password	**						
IP Port of SISNet	0						
SISNet User Name	**						

Figure 58. Client parameters

The following parameters for both *Client* 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 Client* 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, 4.4.25 Network Parameters (GPRS/DIALUP (PPP) Configuration)].

AN WLAN Server	client PPP Mode	ems						 
DPD Connection State	connected	F	petalls Inable DA	P Authe	enticaion	-	00	•
DDD David Data	460800						011	
PPP Baud Kate	400800	E	nable CH	IAP AUT	nentication		on	•
PPP Set Default Route	on 🔻	E	nable Va	n Jacob	son Compressi	on	off	•
PPP Debugging	off 🔻	E	nable Co	nnectio	n-ID Compress	sion	off	•
PPP Error r	none							
Server			-IP					
/par/net/ppp/srv/mode	off		Current	t IP Add	ress 1128.21	.3.134	4	
/par/net/ppp/srv/state	down							
/par/net/ppp/srv/port	/dev/blt/a							
/par/net/ppp/srv/hisip	192.168.100.2							
/par/net/ppp/srv/ourip	192.168.100.1							
/par/net/ppp/srv/wndsc	r off							
/par/net/ppp/srv/debug	off							

Figure 59. PPP parameters

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.

#### **Modems tab**

*Modems* tab - contains up to four expanding sections 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, 4.4.26 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.

General Log-files TriPad Positioning Base Rover Doctr Natura	rking Event Advanced							
Law With Concerned Positioning Dase Rover Ports Rection	Livent Auvanced							
LAN WLAN Server Client PPP Modems								
Common Modem Mode Current Mode Current Mode Current Mode Current Mode Current Mode Current Mode Current Mode Current Mode Save gprs Common Last Detected Modem Error than Auto D Unknown Model External Modem External Modem	via Bluetooth							
UHF Radio FH Radio Cellular module L-Band Receiver Beacon P	Receiver							
GSM Hotztart Mode off		CSD 3G/2G						
Child Could Number 1	Jor "Sierra Wireless, Incorporated"	Dial		AT+CBST				
SIM Card Number 1 Model "MC771	10"	Service Word Repeat Period	2	AT+CBST Connection Element	1			
PIN Code "0000" Registron "SMIPO	"SWI9200X_03.05.24.00ap r5792 carmd-en-10527 2013/05/02 13:35:47"	Data Wait Timeout	5	AT+CBST Bearer Service Name	0			
Registration Mode 3g		Dial Number		AT+CBST Data Rate	71			
Serial Number [3581/8	8042463721							
FCC ID N/NMC	27700							
IC ID 2417C-1	MC7700							
Network								
Cellular Operator Name	"Beeline"							
Cellular coverage	wcdma							
Signal Quality	"-91 dBm"							
Madan								
widdem a								
(⊙								
Modem d								

Figure 60. Modem parameters

The following parameters can be set for each modem:

• *Common* – allows setting the *mode* which will use to communicate with the remote modem, corresponding *receiver port* and to monitor the current *mode* and *statuses*.

- Auto identifiers, filled the modem is detected. [2, Auto modem parameters].
- *External modem via Bluetooth* button for pairing with an external modem

Note: Pairing process is described below.

• 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.

Go to spectra - button for navigating to the receiver main window tab Radio Spectra.

Current Mode	uhf					
Receiver Port the Modem is.	/dev/ser/c					
Modem Control State	ready					
Last Detected Modem Error	none					
Auto						
Prefer L-Band Receiver	Ŧ					
ID 28						
Model LN	1R400					
		External Modem via E	lluetooth			
UHF Radio FH Radio Cel	Ilular module L-Band	Receiver Beacon Recei	ver			
Mode		Info		TX		
UHF Modem Output Powe	er 30	Model	LMR400	Frame Counter	0	
UHF Modem Frequency	44000000	Product ID	28	Byte Counter	0	
UHF Protocol Type	simrx	Serial Number	000001351145	RX		
UHF Call Sign	simtx	Hardware revision	"Ver. 2.0"	UHF RSSI -146	i dBm	
	simtr	Software version	"Ver. 3.2 Rev 04 B17"	UHF BER 0E-0	)	
	simrtr	BootLoader version	"Ver. 3.0 Rev 01"	- Scan		
	tmotx	MCU firmware version		Start frequency	40600000	
	tmotr	FCC ID	W14I MR400	Stop frequency	47000000	
	trmtx	ICID	2504A LMP400	stop nequency	12500	
	trmtr	IC ID	5504A-LIVIK400	Frequency step	12500	
	tt450shwrx = tt450shwtx			Mode	scan 🔻	
	tt450shwtr			Timeout	1500	
	trmm3rx trmm3tx			<u>Go to Spectra</u>		
	trmm3tr					
Simplex (Javad) Protocol	trmm2rx Pi	rotocol   Trimtalk 450S Pi	rotocol   TT450S(HW) Pro	tocol Trimmark	3 Protocol   Trimmark II/Ile Protoco	ol Satel Protocol
Settings	trmm2tr					
Modulation Type	stirx					
Channel Bandwidth	stitx					
Scrambling	255					
Forward Error Correction	on 🔻					

Figure 61. UHF Radio parameters

• *Protocols* – 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 ll/lle
- Satel

Settings for each protocol are available on the separate tab.

Simplex (Javad) Protocol	Transparent w/EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protoco
Settings						
Modulation Type	dqpsk 🔹					
Channel Bandwidth	25000 🔹					
Scrambling	255					
Forward Error Correction	on 🔻					
Mode						
Base RtrNum 0						
Rover Source auto	-					
RTR Echo a	-					

Figure 62. Simplex (Javad) protocol parameters

Simplex (Javad) Protocol	Transparent w/EOT Protoco	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 63. Transparent w/EOT protocol parameters

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

#### Figure 64. Trimtalk 450S protocol parameters

Simplex (Javad) Prot	tocol	Transparent w/EOT Proto	ol Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
Modulation Type	gmsk	•					
Channel Bandwidth	2500	) <b>-</b>					

#### Figure 65. TT450(HW) protocol parameters

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

#### Figure 66. Trimtalk3 protocol parameters

Simplex (Javad) Prot	tocol	Transparent	t w/EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
Modulation Type	gmsk	•						
Channel Bandwidth	25000	• •						

Figure 67. Trimtalk II/IIe protocol parameters

plex (Javad) Protocol	Transparent w/E	OT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol
lodulation Type	4fsk 🔹					
hannel Bandwidth	25000 🔻					
Forward Error Correction	on 🔹					
Clock Correction	on 🔹					
Compatibility	3as 🔹					

#### Figure 68. 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

Common				
Modem Mode	auto 🔻			
please change just to "OFF"				
Current Mode	fh			
Receiver Port the Modem is	/dev/ser/c			
Modem Control State	ready			
Last Detected Modem Error	none			
Auto Prefer L-Band Receiver ID 41	~			
Model FH9	15	External Modem v	ia Bluetooth	
UHF Radio FH Radio Celle	ular module L-Band	Receiver Beacon Re	eceiver	
Zone	Info		ТХ	USA, AUS, zones EU zone
Zone usa	Model	FH915	Byte Counter 0	Settings
usa	Product ID	41	RX	Power 30
eu	Serial Number	63341	FH RSSI -140.7 dBm	Protocol simrx
	Hardware revision	"3"	FH BSP 0	FRule 0
	Firmware version	"3.1.16"	FH RSP 0	Simpley (Javad) Protocol
	Bootloader version	"4.03"	FH PER 0.00E+00	Modulation gmsk
	FCC ID	WJ4FH915	Scan	Scrambling 1
	IC ID	3504A-FH915	Start frequency 900000000	FEC cnv •
			Stop frequency 930000000	
			Frequency step 10000	
			Go to Spectra	

Figure 69. FH Radio parameters, USA, AUS zone

USA, AUS, zones EU zone								
Settings								
Power	27							
RX Frequency	8690	00000						
TX Frequency	8690	00000						
Protocol	simn	¢	•					
Simplex (Javao	simtx simtx simtr	[ [	-					
Scrambling	2	1						
scrambling		1						
FEC		cnv						
Channel Bandy	width	25000	•					

Figure 70. 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.

ommon							
lodem Mode		gprs	•				
lease change just to "OF	F"						
urrent Mode		gprs					
eceiver Port the Moder	n is	/dev/ser/c					
Iodem Control State		connect					
ast Detected Modem Er	ror	none					
Auto							
Prefer L-Band Receiver		Ŧ					
ID	unkn	iown	]				
Model	unkn	iown					
			External	Mode	m via Bluetooth		
IHF Radio FH Radio	Cellu	lar module	L-Band Receiver	Beaco	n Receiver		
Settings			Info				
GSM Hotstart Mode	ff	•	Device				
SIM Card Number 1			Vendor	"Sierr	a Wireless, Incorpor	ated"	
PIN Code	0000"		Model	"MC7	710"		
Registration Mode a	uto	•	Revision	"SWI9	9200X_03.05.24.00ap	o r5792 carmd-en-10527 2013/05/	02 13:35:47"
2			Serial Number	"3581	78042463192"		
			FCC ID	N7N	AC7700		
			IC ID	24170	C-MC7700		
			Network				
			Cellular Opera	tor Nai	me "Beeline"		
			Cellular covera	ae.	aprs		
			Signal Quality	9-	"-91 dPm"		
			Signal Quality		-01 000		
CSD 3G/2G							
PPP			GPRS			PDP	
PPP Connection State	con	nected	GPRS Dial Nu	umber	"*99***1#"	GPRS PDP Context Identifier	1
	460	800	GPRS User N	ame	***	GPRS PDP Access Point Name	
PPP Baud Rate							

Figure 71. Cellular module parameters, 3G/2G mode

CSD 3G/2G						
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 72. 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 lband receiver (read-only).
  - *Rx* characteristics of the received signal (read-only).

Current Mode	Iband					
Receiver Port the Modem	is /dev/ser/b					
Modem Control State	ready					
Last Detected Modem Err	or none					
Auto						
Prefer L-Band Receiver	on 🔻					
ID	36					
Model	L-BAND/BEACON					
UHF Radio FH Radio	Cellular module L-Ban	Receiver Beacon Re	eceiver			
Mode		Info		Rx		
Channel map	* +	Model	L-BAND/BEACON	RSID	N/A	
1535000000	ĭ× ^	Product ID	36	RSSI	-133 dBm	
0 1539882500	Ľ ×	Serial Number	00000000066	SYNC	0	
	153 ~ ×	Hardware revision	"Ver. 5.1"	BER	0E-0	
	-	Software version	"Ver. 1.8 Rev 05 B11"	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)	E15AE893E15AE893					
Antenna Power Switche	r on 🔻					

Figure 73. 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).

eral Log-files TriPad Pos	itioning Base	Rover Ports	Networking	Event	Advanced			
N WLAN Server Client	PPP Modems							
Antenna Power Switcher or	ו 🔻							
Andem b								
A								
Common								
Modem Mode	auto	•						
please change just to "OFF"		_						
Current Mode	beacon							
Receiver Port the Modem is	/dev/ser/b							
Modem Control State	ready							
Last Detected Modem Error	none							
Auto								
Prefer L-Band Receiver off	•							
ID 36								
Model L-BA	ND/BEACON							
UHF Radio FH Radio Cellu	ılar module L-B	and Receiver	Beacon Rece	iver				
Mode		Info				Rx		
Channel map		+ Model	L	-BAND/BEA	CON	RSSI		
© 283500	Ľ× ^	Product	ID 3	6		SYNC	@00	
284500	R X	Serial Nu	imber 0	000000000	66	Current Frequency	284.500 kHz	
		Hardwar	e revision 🛛	Ver. 5.1"		Frequency Offset	0 Hz	
	-	Software	version "	Ver. 1.8 Rev	05 B11"	Current Symbol Rate	100.000	
Link Rate	100	<ul> <li>Bootload</li> </ul>	ler version "	Ver. 3.0 Rev	· 04"	,		
Antenna Beacon Connector	on	•						
Antenna Power Switcher	on	•						

Figure 74. Beacon Receiver parameters

#### **External Modem via Bluetooth**

An external modem can be pairing with the receiver using the *External Modem via Bluetooth* button. If the receiver is already paired with the modem, unpairing can be performed in much the same way.

Follow the next steps to pair/unpair modem to the receiver:

- 1. Set *Receiver port the Modem* to... *dev/ser/blt/a (b);*
- 2. Set *Modem Mode* to *off* (Otherwise error window will displayed and pairing process won't start);
- 3. Connect the radio to the PC via serial interface;
- 4. Click *External Modem via Bluetooth* button and confirm the action.

General Log-files TriPad Po	sitioning Base	Rover Ports	Networking	Event	Advanced
LAN WLAN Server Client	PPP Modems				
Modem c Modem a Common Modem Mode Receiver Port the Modem is Modem Control State	off /dev/blt/a off	•			
Last Detected Modem Error	none	Externa	l Modem via Bl	uetooth	
UHF Radio FH Rac		Info			×
Mode UHF Modem Outp UHF Modem Frequ UHF Protocol Type	Please conne	ct modem to t	he PC and turn	it on.	
UHF Call Sign				ОК	
		BootLoa FCC ID IC ID	der version "u un un	nknown" known known	<b>51</b>
TX					

Figure 75. External Modem via Bluetooth confirmation

Pairing External Modem dialog appears:

General Log-files TriPad Positioning Ba	se Rover Ports Networking Event Advanced
LAN WLAN Server Client PPP Mode	ms
Modem c	Pairing External Modem
$\odot$	Select modem serial port: Refresh Ports
Modem a	COM1 COM3 COM10
Common	COM20
Current Mode off off	COM21 COM22 COM54
Receiver Port the Modern is /dev/blt/a	
Last Detected Modem Error none	Pair Unpair Close
Model unknown	External Modem via Bluetooth

Figure 76. Pairing External Modem dialog

5. Select serial port from drop-down list box. Then click *Pair/Unpair* button. If the needed port is not in the list, click *Refresh Ports*. If the receiver has been previously paired with any radio, a message to confirm continuing with the pairing process appears. After NetView connects to the radio, it displays its info and then starts pairing/unpairing. The process status is shown in status bar at the bottom.

Pairing External Modem		<b>E</b>
Select modem serial por	t: COM1 🔹	Refresh Ports
Baud Rate : 115200		
Modem HPT404BT High Pow	er UHF Transceiver, J	avad GNSS ()
Product ID: 46	S/N:	00000000027
Hardware: Ver. 2.2	Hardware	e RF:
Software: Ver. 3.2 Re	ev 04 B9 BootLoad	der: Ver. 3.0 Rev 01
	Pair	Unpair Close
✓ Connected Mode	em configuring	Bluetooth programming

Figure 77. Modem connected. Pairing process

After pairing/unpairing finished successfully corresponding status displayed in status bar. Otherwise error message appears.

Pairing External Modem		<b>8</b>
Select modem serial po	rt: COM1 🔹	Refresh Ports
Baud Rate: 115200		
Modem HPT404BT High Pow	ver UHF Transceiver,	, Javad GNSS ()
Product ID: 46	S/N:	00000000027
Hardware: Ver. 2.2	Hardware	RF:
Software: Ver. 3.2 R	ev 04 B9 BootLoade	er: Ver. 3.0 Rev 01
	Pair	Unpair Close
✓ Paired		blt/a

Figure 78. Pairing finish successfully

6. Close the window and check that the corresponding Bluetooth parameters are changed.

General Log-files TriPad	sitioning Base Rover Ports Networking Event Advanced	
Serial USB Bluetooth	TCPO CAN	
Bluetooth a	Bluetooth b	^ *
Input Mode cmd	▼ Input Mode cmd ▼	
Output None	Period (sec): 1 Output None Period	od (sec): 1
Chan Address 0018D7	3A Chan Address 0000000000	
Current Address "00:18:D	43:3A" Current Address "unknown"	
Hardware Settings           Address         "00:18:D7:42:38:1           FCCID         U9R-W2CBW003           IC         7089A-W2CBW003           Mode         on           Name         "Triumph-1M 35           PIN         "1234"		

Figure 79. Bluetooth parameters after pairing

## **Event**

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

*Pulse per Second (PPS)* signals [2, 4.4.6 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, 4.4.6 Positioning Parameters External Event Parameters] allows the user to measure/record input event times. Up to two external event pins, *EventA* and *EventB* may be accommodated depending on receiver model. *EVNT* option value determines availability of *EventA* or both *EventA* and *EventB*.

General Log-files TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	
PPS a			PPS	5 b				*
Enable PPS Generation	on	•	Ena	ble PPS	Generation	on	,	•
PPS Reference Time	utc	•	PPS	Referen	nce Time	utc		•
Tie PPS to its Reference Time	on	•	Tie	PPS to i	ts Reference Ti	me on		•
PPS Period	1000		PPS	Period		1000	)	
Milliseconds of PPS Offset	0		Mil	lisecond	s of PPS Offset	0		
Nanoseconds of PPS Offset	0		Na	nosecon	ds of PPS Offse	et O		
PPS Reference Edge	rise	•	PPS	Referen	nce Edge	rise		•
PPS Pulse Length	2000000		PPS	Pulse L	ength	2000	0000	
Period of Marked PPS Pulses	0		Per	Period of Marked PPS Pulses		ses 0		
Length of Marked PPS Pulses	3000000		Len	Length of Marked PPS Pulses 30			0000	
Event a				Event	<b>b</b>			
Enable Event Acquisition	off		•	Enable	Event Acquisit	ion	off	•
Event Reference Time	utc		•	Event Reference Time			utc	•
Tie Measured Event Time to it	ts on		•	Tie Measured Event Time to i		ime to its	on	•
Event Reference Edge	rise		•	<ul> <li>Event Reference Edge</li> </ul>			rise	•
Synchronize Receiver Clock w	vith off		•	Synchronize Receiver Clo		Clock wit	th off	•
Status of the Receiver Clock	off			Status of the Receiver Clo		Clock	off	
/par/dev/event/a/offs/ns	0			/par/dev/event/b/offs/ns			0	

Figure 80. 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

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

#### Anti-Interference tab

The *Anti-Interference* tab allows enabling anti-jamming mode for the GLONASS and GPS bands [2, 4.4.4 www.javad.com 65

Measurements Parameters Anti-jamming Parameters].

General Log-files TriPad Po	ositioning Base Rover	Ports Networking Even	t Advanced			
Anti-Interference Multipath R	eduction Loop Manage	ement External Frequency	Raw Data Management 🛛	Attitude parameters	Asic parameters	
Anti-jamming						
Anti-jamming Mode	у 🔻					
Enable Anti-jamming on glo1	у 🔻					
Enable Anti-jamming on glo2	у 🔻					
Enable Anti-jamming on gps1	у 🔻					
Enable Anti-jamming on gps2	у 🗸					
Enable Anti-jamming on gps5	у 🗸					
						-

Figure 81. Anti-Interference parameters

#### **Multipath Reduction tab**

The *Multipath Reduction* tab contains parameters for enabling code and carrier multipath reduction for CA/Ll. [2, 4.4.4 Measurements Parameters Multipath Reduction Parameters].



Figure 82. Multipath Reduction parameters

#### Loop Management tab

The *Loop Management* tab contains tracking loop parameters which is not recommended to change from their default values [2, 4.4.4 Measurements Parameters Tracking Loop Parameters].

Anti-Interference Multipath Reduction	Loop Management	External Frequency Raw Data	Management Attitu	ude parameters	Asic parameters
CLL Tracking Loops		PLL Tracking Loops			
CA/L1 CLL Bandwidth	3.0	CA/L1 PLL Bandwidth	25.0		
CA/L1 CLL Order	1	CA/L1 PLL Order	3		
CA/L1 CLL by CA/L1 PLL Guide Factor	100	Strong Loops PLL Bandwidth	3.0		
Strong Loops CLL Bandwidth	3.0	Strong Loops PLL Order	1		
Strong Loops CLL Order	1	Strong Loops PLL by CA/L1 PLL	100		
Strong Loops CLL by CA/L1 PLL	100	Weak Loops PLL Bandwidth	3.0		
Strong Loops CLL by Its Own PLL	0	Weak Loops PLL Order	1		
Weak Loops CLL Bandwidth	3.0	Weak Loops PLL by CA/L1 PLL 100			
Weak Loops CLL Order	1				
Weak Loops CLL by CA/L1 PLL	100				
Weak Loops CLL by Its Own PLL	0				

Figure 342. 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**

The *External Frequency* tab is designed to select and configure oscillator and hardware calibrator [2, 4.4.4 Measurements Parameters].



Figure 83. 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**

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

General Log-files TriPad Positionir	ng Base Rover Po	orts Networking Event Advanced		
Anti-Interference Multipath Reductio	n Loop Managemen	t External Frequency Raw Data Mar	agement Attitude paramete	rs Asic parameters
- Update Rate		Smoothing		*
Measurements Update Rate	100	Pseudorange Smoothing Interval	100	
Effective Measurements Update Rate	100	Ionosphere Corrections Smoothing	60	
Position Update Rate	100	Minimum Ionosphere Corrections	30	
Effective Position Update Rate	100	Doppler Smoothing Bandwidth	3.0	
		Doppler Smart Smoothing Mode.	off 🔹	
				Ŧ

Figure 84. Raw Data Management parameters

The following parameters are presented:

- *Update rate* –parameters specifies the required period of the internal receiver time grid and position updates. [2, 4.4.2. Measurements Parameters Generic Measurements Parameters, 4.4.6. Positioning Parameters Generic Positioning Parameters]. Effective read-only values are depends of the available options.
- *Smoothing* smoothing settings for the different indicators. [2, 4.4.2. Measurements Parameters Generic Measurements Parameters].

#### Attitude parameters tab

The *Attitude parameters* tab allows configuring and calibrating a multi-antennas receiver (see documentation on Duo and Quattro and [2, 4.4.8 Phase Differential (RTK) Parameters Attitude Parameter].

General Log-files TriPad Positioning Base	Rover Ports Networking Event Advanced								
Anti-Interference Multipath Reduction Loop Management External Frequency Raw Data Management Attitude parameters Asic parameters									
Antennas length	Baseline vectors	Calibrator							
Distance between A and B 0.001000	X coordinate of vector AB 0.001000	Start Self-calibration off							
Distance between A and C 0.001000	Y coordinate of vector AB 0.000000	Use constraints on 🔻							
Distance between A and D 0.001000	Z coordinate of vector AB 0.000000	Angle Determination on 🔹							
	X coordinate of vector AC 0.000000								
	Y coordinate of vector AC 0.001000								
	Z coordinate of vector AC 0.000000								
	X coordinate of vector AD 0.000000								
	Y coordinate of vector AD 0.000000								
	Z coordinate of vector AD 0.001000								
		•							

Figure 85. Attitude parameters

The following parameters are available for the multi-antennas receiver:

- Antennas length distance between antennas.
- Baseline vectors coordinates of the baseline vectors
- Calibrator staring self-calibration [2, Attitude Parameters], calibrator settings.

#### **ASIC** parameters tab

The *ASIC parameters* tab allows setting processor clock frequency and displays current DSP (digital signal processor) sampling frequency (4.4.35 Miscellaneous parameters).



Figure 86. ASIC parameters

# **Save Configuration**

All the parameters from all the tabs can be saved to the *tcl*-script (see "Appendix 2. TCL-script example" on page 82) and then be loaded to this or another receiver using the *Load Script* button.

To save configuration, click the Save Configuration to Script button and select file for saving.



Figure 87. Save configuration to script

If any edited parameter was not applied, the appropriate warning will be shown.

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

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

General	Log-files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced	
Genera	l					Power N	lanagement –			Temperature (Celsius degrees)
Elevat	tion Mask					Modes				Receiver Board Temperature 30.0
Elevat	tion Mask for	Position	5			Battery	Charging Mo	de auto	*	
Anten	nna					Enable	Power Output	off	Ŧ	
Anten	ina Input		ext	~		Low Po	wer Mode	on	Ŧ	
Anten	ina Current li	nput	ext			Power	Off	on	Ŧ	
Status	of External	Antenna	off			Sleep N	Node	off	Ψ.	
						Voltage	es			
						Externa	al Power Voltag	ge 12.0	8	
						Receive	er Board Volta	ge 8.96		
						Battery	Voltage	8.21		
						Battery	Voltage	8.23		
						Charge	er Output Volta	ge 0.02		
						Output	t Voltage	0.0		
Refr	esh	Apply								USB is saving Save Configuration to Scrip

Figure 88. Saving the configuration. User interface is disabled

## **Limited Manual Mode Pane**

Manual panel is located under the parameter tabs and allows directly controlling the receiver by GREIS commands. The manual pane serves as 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 [2].

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

The full-function terminal is provided on the Greis commands page (see "Manual Mode" on page 76).

print,dev	
<ul> <li>♀ cur</li> <li>♀ dev</li> <li>♀ log</li> <li>♀ msg</li> <li>♀ par</li> </ul>	drag to resize history
Send	Clear Start Logging Load Script

Figure 89. Manual mode pane. Command input

Manual pane consists of the following elements:

• Input line for the Greis commands. As you type a hint is shown with a list of available commands.

• *Output window* displays receiver responses. ">" means that the receiver responded and is followed by the text of the response.

- \* (history button) allows select one of the previously used commands. Up to 30 commands are stored.
- Send button sends command to the receiver (equivalent to Enter in Input Line).
- Clear button clears the Output 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.

• *Load Script button* – sends a set of the commands from the selected script to the receiver. Both ordinary and *tcl*-scripts (see "Appendix 2. TCL-script example" on page 82) are supported.

print,dev/blt/a:on	*
<pre>&gt; /par/dev/blt/a={rate=115200,rtscts=off,rts=on,cts=off, bits=8,parity=N,stops=1,ir=off, oframe={mode=off,period=1.000,length=1.000,delay=0.000}, imode=cmd,omode=std,echo=/dev/null,eoff="#OFF#",ewrap=off,</pre>	print,dev/blt/a:on 한 ਦ em,,/msg/nmea/GRS 한 ਦ print,/par/asic:on 한 ਦ
<pre>wsize=128,dup=/dev/null, jps={ 0={mode=none,id=-1,skip=y,port=""}, 1={mode=none,id=-1,skip=y,port=""}, 2={mode=none,id=-1,skip=y,port=""}, chan={addr=0018D700433A,curaddr="unknown",rssi=unknown}}</pre>	
Send Clear Start Logging	Load Script

Figure 90. Manual mode pane. 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 three points in the middle.

General Log-files TriPad Positioning Base Rover Ports Networking Event Advanced	
General     Power Management       Elevation Mask     Modes       Elevation Mask for SVs Locking     -1       Refresh     Apply	Save Configuration to Script
print/par/asic/frq	*
> Cheking receiver > Correct board: TRIUMPH_3 > Setup receiver configuration > Setup General > %/par/lock/elm% - OK > %/par/pos/elm% - OK > %/par/pwr/charge/bat% - OK > %/par/pwr/out/ab% - OK > %/par/pwr/out/ab% - OK > %/par/power% - OK > %/par/power% - OK > %/par/leg > %/par/log/a/sc/period% - OK > %/par/out/elm/cur/file/a% - OK > %/par/out/minsvs/cur/file/a% - OK	
Logging . D:\Log.log Send Clear Stop	Logging Load Script

Figure 91. Configuration tcl-script loading

# FILE OPERATION

*NetView* provides the friendly interface for monitoring and managing the memory of the receiver. You can start up two *jps*-files recording, send *free-events* to file, *stop* recording and *download* file from the receiver.

Click on the Files sub-node of the receiver, to select the File window.

J Net View						
Net View Connection  Receivers  Parameters  Files  Greis commands  Real-Time Logging  Parameters  Files  Greis commands  Receiver 3  Parameters  Files  Greis commands  Receiver 3  Parameters  Files  Greis commands  Real-Time Logging  Help	Name log1111e log1111d log1111c log1111b log1111a	Size 3.30 MB (3455478) 10.73 MB (11251599) 9.58 MB (10050507) 8.68 MB (9104623) 3.23 MB (3387583)	Rec	Modified 11/11/2015 12:17 11/11/2015 11:59 11/11/2015 10:59 11/11/2015 9:59: 11/11/2015 8:59:	7:56 PM 9:42 AM 9:42 AM 42 AM 42 AM	State
WEB APP NetBrowser	Start F Elevation ma Send Ant	ile Name: Aask(°): 5 🕐 Recording tenna Free Event (JAVGR Nur	g interval(s) ANT_G3 nber of file	b • • • • • • • • • • • • • • • • • • •	<ul> <li>a) log1111e</li> <li>b) No file is recording.</li> <li>Total memory: 1.83(GB)</li> <li>Dad</li> </ul>	Stop Stop Free memory: 1.79(GB) Delete All

Figure 92. 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
- Rec if the file is recording at the moment A or B is displayed depending log-file a or log-file b is recording
- Modified time of the last modifying
- State status of downloading

# Start/Stop file recording

Under the file list the interface for starting and stopping the file is displayed. If the *log-file a* or *log-file b* is recording, the button *Stop* is enabled for the recording file. Clicking the *Stop* button stops the recording of the corresponding file.

To start new file:

- 1. Type file Name
- 2. Select *a* or *b* from drop-down. If file is already recording the corresponding list item is unavailable.
- 3. Specify the *Elevation Mask* parameter for excluding the satellites whose elevation angles are less than the specified value.
- 4. Specify *Recording interval* of output.
- 5. Check *Antenna Free Event* if desire to send the following free events when file is starting:
  - "\_DYM=STATIC"
  - "\_ANT="
  - "\_ANH="

6. The values for \_*ANT* and \_*ANH* are displayed in the brackets. They can be specified on the Settings tab of the receiver main page (see "Settings" on page 40).

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

7. Click *Start* button.

J	Net View						- • • × •
	Connection	Name	Size	Rec	Modified		State
•	Receivers	test_a log1111e log1111d log1111c log1111b log1111a	59.41 KB (60835) 4.57 MB (4792673) 10.73 MB (11251599) 9.58 MB (10050507) 8.68 MB (9104623) 3.23 MB (3387583)	Kec	11/11/2015 12:26 11/11/2015 12:25 11/11/2015 11:55 11/11/2015 10:59 11/11/2015 9:59; 11/11/2015 8:59;	5:07 PM 5:19 PM 9:42 AM 9:42 AM 42 AM 42 AM	State
	Help	Start I Elevation m	ile Name: test_b ask(°): 5 Recording tenna Free Event (JAVGRA	interval(s)	a • a : 1 b NONE H:123.25 )	<ul> <li>a) No file is recording</li> <li>b) No file is recording</li> <li>Total memory: 1.83(GB) File</li> </ul>	Stop Stop
	WEB APP NetBrowser		Num	ber of file	s: 6 Downlo	Delete	Delete All

Figure 93. File recording starting

At the bottom of the window the information about *Total Memory*, *Free Memory* available in the receiver and *Number of files* is displayed.

If you try to start the file that already exists you will be suggested to append or overwrite it.

J Net View	-	a and "Receive - Receiv			Dealers	
Connection	Name	Size	Rec	Modified		State
- Receivers	test_b	202.09 KB (206940)	11/1	1/2015 12:55:46 PM		
💌 🍺 🥌 Receiver 1	test_a	59.41 KB (60835)	11/1	1/2015 12:26:07 PM		
Parameters	log1111e	4.57 MB (4792673)	11/1	1/2015 12:25:19 PM		
Files	log1111d	10.73 MB (11251599)	11/1	1/2015 11:59:42 AM		
Greis commands	log1111c	9.58 MB (10050507)	11/1	1/2015 10:59:42 AM		
Real-Time Logging	log1111b	8.68 MB (9104623)	11/1	1/2015 9:59:42 AM		
Receiver 3	log1111a	3.23 MB <u>(3387583)</u>	11/1	1/2015 8:59:42 AM		
Files		🛛 🗸 Start File				
Greis commands						
Real-Time Logging		File	test_b is already	exists.		
Help		Append	Overwrit	e Cancel		
					9	
	Start Fi	le Name: test_b		b 🔻 🧿 N	o file is recording	Stop
	Elevation ma	sk(º): 5 🖨 Recording i	nterval(s): 1	b N	o file is recording	Stop
	Send Ante	enna Free Event ( JAVGRA	NT_G3 NONE	H:123.25 ) Total n	nemory: <mark>1.83(GB)</mark> Fr	ee memory: <mark>1.79(GB)</mark>
WEB APP NetBrowser		Numb	per of files: 7	Download	Delete	Delete All

Figure 94. Existing file starting

### **Downloading Files**

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

J	Ne	et View								- • ×
	(	Connection	Name	Size	Rec	Modified		State		
-	ī	Receivers	log1111f	1.25 MB (1312891)	۵	11/11/2015 1:06:54 PM				
	+	N 🔿 Receiver 1	test_b	202.09 KB (206940)		11/11/2015 12:55:46 PM				
		Parameters	test_a	59.41 KB (60835)		11/11/2015 12:26:07 PM				
		Files	log1111e	4.57 MB (4792673)		11/11/2015 12:25:19 PM				
		Greis commands	log1111d	10.73 MB (11251599)		11/11/2015 11:59:42 AM	Downloaded			Finished D:\download
		Real-Time Logging	log1111c	9.58 MB (10050507)		11/11/2015 10:59:42 AM	Downloading	52% (5.00 MB)	0	File saving D:\downle
	*	M Neceiver 3	log1111b	8.68 MB (9104623)		11/11/2015 9:59:42 AM				
		Parameters	log1111a	3.23 MB (3387583)		11/11/2015 8:59:42 AM				
		Files Greis commands		5125 1110 (5507 505)		11, 11, 2010 0.001.12, 0.0				
		Real-Time Logging								
			Start	File Name:		b *		a log1111f		Stop
			Elevation m	ask(°): 5 🖨 Record	ling inten	val(s): 1		b No file is recording		Stop
			Send An	tenna Free Event ( JAV	GRANT_G	63 NONE H:123.25 )		Total memory: 1.83(GB) Fro	ee me	mory: 1.79(GB)
	C	WEB APP NetBrowser				Number of files: 8	Download	Delete		Delete All

Figure 95. Downloading files

Downloading states are displayed in the file list. The *red button* for interrupting of the downloading is located next.

### **Deleting Files**

Select the files you want to delete and click *Delete* button. Confirmation message will be displayed. Click *Yes*. Deleting process will start.

J Net View						
Connection	Name	Size	Rec	Modified		State
<ul> <li>Receivers</li> </ul>	log1111f 3	3.31 MB (3473568)	4	11/11/2015 1:19:05 PM		
- Receiver 1	test_b 2	202.09 KB (206940)		11/11/2015 12:55:46 PM		
Parameterr	test_a 5	59.41 KB (60835)		11/11/2015 12:26:07 PM		
Files	log1111e 4	4.57 MB (4792673)		11/11/2015 12:25:19 PM		
Greis commands	log1111d 1	LO.73 MB (11251599)		11/11/2015 11:59:42 AM	Downloaded	
Real-Time Logging	log1111c 9	9.58 MB (10050507)		11/11/2015 10:59:42 AM	Downloaded	
👻 🏴 🌭 Receiver 3	log1111b 8	3.68 MB (9104623)		11/11/2015-9:59:42 AM		
Parameters	log1111a 3	3.23 MB (3387583)		11/11/2015-8:59:42 AM		
Greis commands						
Real-Time Logging						
Help						
	Start File	Name:		b * a	log1111f	Stop
	Elevation mas	k(º): 5 🔷 Record	ing interva	l(s): 1 (b	No file is recording	Stop
	Send Ante	nna Free Event ( JAV	GRANT_G3	NONE H:123.25 ) Tot	al memory: <mark>1.83(GB)</mark>	Free memory: <mark>1.81(GB)</mark>
WEB APP NetBrowser	• Deleting file	<u>s</u> N	lumber of	files: 4 Download	Delete	Delete All

Figure 96. Downloading files

While deleting *File* 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.

## MANUAL MODE

*Manual Mode* 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 sub-node of the receiver to go to Manual mode window.



Figure 97. Manual Mode window

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

Select one to use it in manual mode and click the *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 the Input Line to type a command. The functionality of each button is described below.

J Net View						- 0 X			
Connection	Warning! Use the manual mode will deprive the program of the ability to manage receiver. If you decide to use it, please press Release button when you finish.								
<ul> <li>Receivers</li> </ul>	/dev/usb/a	-	Capture	Release	Disconne	ct			
<ul> <li>Receivers</li> <li>Receiver 1</li> <li>Parameters</li> <li>Files</li> <li>Greis commands</li> <li>Real-Time Logging</li> <li>Receiver 3</li> <li>Parameters</li> <li>Files</li> <li>Greis commands</li> <li>Real-Time Logging</li> <li>Help</li> </ul>	/dev/usb/a em,,/	4)	Capture	Release	Disconne	.ct			
WEB APP NetBrowser	Send	Stop mess	ages	Clear	Start Logging	Load Script			

Figure 98. Manual Mode window. Typing the command

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 as is.
- \* (history button) allows select one of the previously used commands. Up to 30 commands are stored.
- Send button sends command to the receiver (equivalent to Enter in Input Line).
- *Stop messages* button.
- Clear button clears the Output 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.

• *Load Script* button – sends a set of the commands from the selected script to the receiver. Only ordinary scripts are supported (*tcl*-scripts can be loaded using *Parameters* window).

7	Net View		x
	Connection	Warning! Use the manual mode will deprive the program of the ability to manage receiver. If you decide to use it, please pr Release button when you finish.	ess
-	Receivers	/dev/usb/a T Canture Release Disconnect	
	▼ Parameters	em_/msg/nmea/GGA	*
	Files Greis commands Real-Time Logging	\$GPGGA,071850.00,5547.9081922,N,03731.2518740,E,1,17,0.70,366.0962,M,15.0350,M,"*58 \$GPGGA,071851.00,5547.9081911,N,03731.2518728,E,1,17,0.70,366.0925,M,15.0350,M,"*57 \$GPGGA,071852,00,5547.9081871,N,03731.2518724,E,1,17,0,70,366,1012,M,15,0350,M, *55	*
	👻 🏴 陷 Receiver 3	\$GPGGA,071853.00,5547.9081852,N,03731.2518740,E,1,17,0.70,366.1054,M,15.0350,M,,*53	
	Parameters Files Greis commands Real-Time Logging	\$GPGGA,071854.00,5547.9081858,N,03731.2518732,E,1,17,0.70,366.1100,M,15.0350,M,,*58 \$GPGGA,071855.00,5547.9081895,N,03731.2518662,E,1,17,0.70,366.1133,M,15.0350,M,,*59 \$GPGGA,071856.00,5547.908199,N,03731.2518658,E,1,17,0.70,366.1272,M,15.0350,M,,*56 \$GPGGGA,071857,00,5547.9081926,N,03731,2518658,E,1,17,0.70,366,1372,M,15.0350,M,*52	
	Help	\$GPGGA,071858.00,5547.9081926,N,03731.2518690,E,1,17,0.70,366.1385,M,15.0350,M,"59           \$GPGGA,071859.00,5547.9081930,N,03731.2518700,E,1,17,0.70,366.1472,M,15.0350,M,"50           \$GPGGA,071900.00,5547.9081930,N,03731.2518682,E,1,17,0.70,366.1540,M,15.0350,M,"50           \$GPGGA,071901.00,5547.9081948,N,03731.2518682,E,1,17,0.70,366.1540,M,15.0350,M,"57           \$GPGGA,071901.00,5547.9081888,N,03731.2518687,E,1,17,0.70,366.1540,M,15.0350,M,"57           \$GPGGA,071903.00,5547.9081888,N,03731.2518686,E,1,17,0.70,366.1540,M,15.0350,M,"57           \$GPGGA,071904.00,5547.9081888,N,03731.2518686,E,1,17,0.70,366.1580,M,15.0350,M,"55           \$GPGGA,071904.00,5547.9081888,N,03731.2518671,E,1,17,0.70,366.1643,M,15.0350,M,"55           \$GPGGA,071905.00,5547.9081888,N,03731.2518694,E,1,17,0.70,366.1642,M,15.0350,M,"55           \$GPGGA,071905.00,5547.9081888,N,03731.2518702,E,1,17,0.70,366.1642,M,15.0350,M,"55           \$GPGGA,071907.00,5547.9081883,N,03731.2518703,E,1,17,0.70,366.1642,M,15.0350,M,"58           \$GPGGA,071908.00,5547.9081883,N,03731.2518703,E,1,17,0.70,366.1642,M,15.0350,M,"58           \$GPGGA,071908.00,5547.9081907,N,03731.2518703,E,1,17,0.70,366.1731,M,15.0350,M,"56           \$GPGGA,071908.00,5547.9081907,N,03731.2518703,E,1,17,0.70,366.1731,M,15.0350,M,"50           \$GPGGA,071908.00,5547.9081907,N,03731.2518701,E,1,17,0.70,366.1721,M,15.0350,M,"50           \$GPGGA,071908.00,5547.9081928,N,03731.2518701,E,1,17,0.70,366.1721,M,15.0350,M,"50           \$GPGGA,071908.00,5547.9081928,N,03731.2518701,E,1,17,0.70,366.1704,M,15.0350,M,"50	
	WEB APP NetBrowser	SGPGGA,071911.00,5547.9081920,N,03731.2518704,E,1,17,0.70,366.1745,M,15.0350,M,*57         SGPGGA,071912.00,5547.9081944,N,03731.2518704,E,1,17,0.70,366.1745,M,15.0350,M,*57         SGPGGA,071913.00,5547.9081944,N,03731.2518712,E,1,17,0.70,366.1795,M,15.0350,M,*5F         SGPGGA,071914.00,5547.9081945,N,03731.2518712,E,1,17,0.70,366.1795,M,15.0350,M,*5B         SGPGGA,071915.00,5547.9081945,N,03731.2518712,E,1,17,0.70,366.1861,M,15.0350,M,*5D         SGPGGA,071915.00,5547.9081944,N,03731.2518715,E,1,17,0.70,366.1861,M,15.0350,M,*5D         SGPGGA,071916.00,5547.9081948,N,03731.2518720,E,1,17,0.70,366.1906,M,15.0350,M,*51         Logging       D:\Log.log         Send       Stop messages       Clear         Stop Logging       Load Scrip	≡ ▼

Figure 99. Manual Mode window. Output and logging the stream of messages

Finish the manually operation in one of two ways:

- Click *Release* button and the connection will be returned to the NetView. Output of messages is stopped.
- Click *Disconnect* button to close the connection. The ordered messages continue to be output. NetView doesn't use the connection. This way is useful to configure receiver outputs.

### **REAL-TIME LOGGING**

NetView allows logging JPS or RTCM messages from the receiver directly to the PC storage in real time. It can be useful, for example, for the receiver which 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* sub-node of the receiver, to open the corresponding window.

J Net View	
Connection Receivers	Connection : //dev/usb/a
Receiver 1     Parameters     Files     Greis commands	SaveTo: D:\RT_03V1 Browse File Type: Jps  Interval , s: 1 File Prefix: log
Real-Time Logging  Real-Time Logging  Receiver 3  Parameters  Files	File Rotation: 15 min 900 , s Amount: 0 (unlimited)
Greis commands Real-Time Logging Help	Status: 1 hour 3 hours Statistics 24 hours Other
WEB APP NetBrowser	Save statistic D:\RT_03V1\RealTimeLogging_03V1.txt Browse

Figure 100. Real-Time Logging window

Follow the steps below to start logging:

1. 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.

- 2. Specify the folder for logged files saving by typing or using button *Browse*.
- 3. Set the following parameters:
- File type Jps or Rtcm3
- Interval interval of messages generation (seconds)
- *File Prefix* prefix which will be added to the file name before the date.

• *File Rotation* - recording period (seconds). 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.
  - 4. Check *Save statistic* and specify file path for saving statistics if desire. File path can be typed manualy or selected using the button *Browse*.
  - 5. 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.

J	Net View	
Ţ	Connection Receivers	Connection: /dev/ser/a
	Receivers  Receivers  Receivers  Receiver 1  Parameters  Files  Greis commands  Real-Time Logging  Help  Receiver 3  Real-Time Logging  Help	SaveTo:       D:\RT_03V1       Browse         File Type:       Jps       Interval , s:       1       File Prefix:       log         File Rotation:       15 min       900       , s       Amount:       0       (unlimited)         Status:       -r       USB:03V1CU9G86LGD00RN2Z4M1G0TM -d "D:\RT_03V1" -t 900 -s 1 -p log       0 complete files logged         Statistics       Connecting to USB:03V1CU9G86LGD00RN2Z4M1G0TM       Receiver information:
		Port:       /dev/usb/a         Model:       SIGMA         Board:       TRE_G3TH_B         Firmware:       3.6.3 Jul(01,2015         ID:       O3V1CU9686LGD00RN2Z4M1G0TM         Real Time Logging information:       Log Rotation Time:         Log Rotation Time:       900 sec         GNSS Message List:       (/msg/def1)         Log Directory:       D/RT_03V1         12:42:28 Log file started: ~log_02015_11_11_242.28         12:42:38 Stream check: OK (10 epochs, 593 msgs, 37986 bytes, 45 msg/epoch)         12:42:48 Stream check: OK (20 epochs, 1033 msgs, 65339 bytes, 43 msg/epoch)         12:43:09 Stream check: OK (30 epochs, 1456 msgs, 91258 bytes, 40 msg/epoch)         12:43:09 Stream check: OK (30 epochs, 1901 msgs, 118487 bytes, 40 msg/epoch)         12:43:31 Stream check: OK (63 epochs, 2790 msgs, 172894 bytes, 40 msg/epoch)         12:43:43 Stream check: OK (64 epochs, 3638 msgs, 24733 bytes, 40 msg/epoch)         12:44:33 Stream check: OK (95 epochs, 4499 msgs, 227128 bytes, 40 msg/epoch)         12:44:33 Stream check: OK (105 epochs, 497 msgs, 301621 bytes, 40 msg/epoch)         12:44:24 Stream check: OK (125 epochs, 2481 msgs, 328785 bytes, 43 msg/epoch)         12:44:42 Log file closed: log_2015_11_11_09.42.46         12:44:42 Log file closed: log_2015_11_11_09.42.46         12:44:42 Log file closed: log_2015_11_11_12.44.42         1
	WEB APP NetBrowser	Save statistic D:\RT_03V1\RealTimeLogging_03V1.txt Browse

Figure 101. Real-Time Logging is going on

*Statistics* window displays the statistics received from *RealTimeLogger.exe*.

Logged files are located in the selected folder.

	RT_03V1			- 🗆 🗙
,	View			× 🕐
nis PC	C → Local Disk (D:) → RT_03V1	~ C	Search RT_03V1	م,
^	Name		Date modified	Туре
	log_2015_11_11_09.45.00.jps		11/11/2015 1:59 PM	JPS File
	log_2015_11_11_10.00.00.jps		11/11/2015 2:14 PM	JPS File
	og_2015_11_11_10.15.00.jps		11/11/2015 2:29 PM	JPS File
1)	📄 log_2015_11_11_10.30.00.jps		11/11/2015 2:44 PM	JPS File
55	log_2015_11_11_10.45.00.jps		11/11/2015 2:59 PM	JPS File
0	log_2015_11_11_11.00.00.jps		11/11/2015 3:14 PM	JPS File
:5	log_2015_11_11_12.15.36.jps		11/11/2015 1:15 PM	JPS File
.r	RealTimeLogging_03V1		11/11/2015 3:24 PM	TXT File
~	<			>
				:== 🖿

Figure 102. 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.

# **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. TCL-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"
```

#### Web Resources

1. JAVAD GNSS web site: www.javad.com

2. GNSS Receiver External Interface Specification: http://www.javad.com/downloads/javadgnss/manuals/ GREIS/GREIS\_Reference\_Guide.pdf

- 3. JAVAD GNSS update page: http://javad.com/jgnss/support/update.html
- 4. NetBrowser: http://www.javad.com/jgnss/products/software/netbrowser.html
- 5. Real-Time Logger: http://www.javad.com/jgnss/products/software/rtlogger.html
- 6. Kvaser: https://www.kvaser.com/



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