

NetView&Modem

Software manual

Version 1.2

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Preface

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Note: Please read these Terms and Conditions carefully.

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About this Manual

This Manual is designed to help you get familiar with the JAVAD Mobile Tools User Interface and introduce you to the JAVAD Mobile Tools main features.

Symbols and Typographic Conventions

This Manual uses the following text conventions:

Example Description.

Main Titles of dialog windows/boxes, names of menu options.

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.

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

JAVAD	PRODUCTS		T SALES	JAVAD	MY N
	OEM	Activate	Dealers	Contact	Login
	Receivers	Update	Options	News	Profile
	Antennas	Upgrade	Pricing	RSS	Cart
	Software	Knowledge	Events	Photos	Orders
	Accessories	Publications	Arts&Slides	JNS	
	Ask us questions and vi hin	ew our answers nself). It is much	from over 20 hi better than e-i	ghly qualified s mails, or phone	pecialists (including Javad

Getting Started

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

Net View & Modem software provides the following functionality:

GNSS Receivers

- Directly connect to the receiver(s), using one of the following interfaces: serial, USB, TCP/IP (through the Ethernet ports or Wi-Fi adapter), Secure TCP/IP (SSL/TSL), Bluetooth.
- User-friendly connection board.
- Displaying of the total number and the status of all visible and tracked satellites.
- Displaying the receiver current position, time and other measurements in real time.
- Satellite sky plots and orientation plots.
- Clear NVRAM, receiver reset, return to the initial parameter values, initiation file system, reset RTK.
- Create general, parameters and options reports.
- Update Firmware online from Javad website or a file.
- Loading Options online from Javad website or Option Authorization File.
- Setup of various parameters of the receiver using the graphical interface or command line.
- Start and stop file recording, deleting files, downloading files using file manager.
- Configure internal modems using the graphical interface or command line.
- Update internal modem Firmware online from Javad website or a

file.

- Pairing with the external modems.
- Manual mode terminal allows sending commands with quick 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.

Modems

- Directly connect to the modem(s), using one of the following interfaces: serial, USB.
- Update Firmware online from Javad website or a file.
- Pairing with GNSS receiver.

Terminals

• Directly connect to the devices(s), using one of the following interfaces: serial, USB, TCP/IP (through the Ethernet ports or Wi-Fi adapter), Secure TCP/IP (SSL/TSL), Bluetooth.

Setting up

System Requirements

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

Operation System Requirements

Windows 10, Windows 8.1, Windows 8, Windows 7 SP1, Windows Vista SP2, Windows Server 2016, Windows Server 2012 (64-bit edition), Windows Server 2008 R2 SP1, Windows Server 2008 R2 SP1, Windows Server 2008 SP2.

Hardware Requirements

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

Installing NetView & Modem

NetView & Modem 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 Net View & Modem program and double-click the *Setup.exe*

The installation process will be started. Click *Install* to install software. Click *Don't Install* to quit.

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

Installation

Uninstalling Net View & Modem

To uninstall NetView & Modem software use *Start Menu* **or** *Settings* **>** *App* & *Features.* **Find NetView & Modem, and click** *Uninstall*.



The NetView & Modem software will be uninstalled.

Updating NetView & Modem

The NetView & Modem checks the updates automatically after closing. If a new version is available, the user will be informed of updating next start meanwhile.



Update

Getting Connected

Starting NetView & Modem

NetView & Modem can be launched, like any other Windows program, for example, with the *Start* > *All Programs* > *JAVAD GNSS* > *Net View & Modem*

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

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

- Connection Mode Switcher Receiver, Modem, Terminal buttons accordingly switch connection mode.
- Connection Board displays the available communication interfaces and provides the ability to open a connection.
- Devices pane contains a list of the connected devices grouped by *Receiver, Modem, Terminal.*
- Help Menu contains the links to the Drivers page, Software Manual, Application page.

				– 🗆 X
	Connect	🦘 Receiver 🛛 🤟 Modem 🖾 Terminal		Help \sim
Devices		ionnection Mode Receiver		<u> </u>
 ▲ Receiver 3 ● ◆ TR1 TRIUMPH1 3W10 ● TR2 TRIUMPH2 0013E ● DELTA-1223326 DELTA 	× × ×	TCP Port 8002 Address 172.17.254.41 Port 8002 TCP Connections 0 172.17.254.41: 8002 TRIUMPH1 / 3W101QKZ0 • 172.17.254.41: 8002 Receiver TRIUMPH1 / 3W101QKZ0	Logical Port Password a TLS/SSL	Raw 🗌
 Modem 1 AW900BT RADIO 	×	89.175.180.254: 8002 Receiver DELTA / 02RXFD9 172.17.254.41: 8002 TRIUMPH1 / 3W101QKZ0	19Y90D2	
 Terminal 2 TCP 172.17.254.41:8002 	×	SERIAL / USB->SERIAL / BLUETOOTH	² ort (Standard port types)	<u>.</u>
• E Serial: COM11 (Bluetooth)	×	COM2 115200 → MOXA Port 0 Mo MOXA Port 1 Mo MOXA Port 1 Mo MOXA Port 1 Mo	xa Inc. Mov	dem
		COM4 115200 > MOXA Port 2 Mox COM5 115200 > MOXA Port 3 Mox	xa Inc.	
		COM7 GNSS Receiver (USB CDC ACM) JAVAD GNS	S, INC 027DFK9MBOLR00II0HK5TK9O1A USB->SER	
		● COM9 1500000 → GNSS Receiver (US	iB Serial) JAVAD GNSS, INC FTDI Rec	eiver TRIUMPH2
		COM10 115200 · · · · · Microsoft	Bluetooth	
		COM11 115200 TRIUMPH_1M 35	008 (,,) 0018D74D9782 Microsoft Bluetooth Terr	ninal
		COM12 115200 · · · · · Microsoft	Bluetooth	
		COM13 115200 · > TRIUMPH2 T2008	(,,) 0018D7A99E13 Microsoft Bluetooth Rec	eiver TRIUMPH2
		COM14 115200 > Microsoft	Bluetooth	
		COM15 115200 > TRIUMPH1 00036	(28,,) 0019880AE466 Microsoft Bluetooth	

Main Window

Connection Mode Switcher

JAVAD	Connect :	Receiver	🥓 Modem	🖾 Terminal	Help \sim

Connection Mode Switcher.

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

Connection Board

The *Connection Board* provides access to the available communication interfaces. The interfaces are enabled depending on the connection mode.

- *TCP* used to connect your computer and remote device. Disabled for Modem mode;
- SERIAL / USB->SERIAL / BLUETOOTH used to connect via serial or virtual serial ports;
- Refresh button refreshes the list of the available interfaces;
- Disconnect button closes all opened connections and clears Devices pane.

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

Connection Mod	de Receiver			Refre	sh ports
ТСР				Disco	nnect all devices
Address Address TCP Connect 172.17.254. 172.17.254.	172.17.254.41 172.17.254.41: 172.17.0.120: 172.17.0.32: 172.17.0.32: 8180.254	8002 8002 8002 :8002	Port 8002 Logical Port Password a TR1 TRIUMPH1 3W101 DELTA-1223326 DELTA 02RXF		/SSL Raw 🗌
• • • • • • • • • • • • • • • • • • • •	254: 8002	Receive	er DELTA / 02RXFD9J9Y90D2		
0 172.17.254.4	41: 8002	TRIU	MPH1 / 3W101QKZ0I		
SERIAL / USB-	>SERIAL / BLUE	etoot	н		٥.
🥖 COM1	115200	× >	Communications Port (Standard port types)		
COM2	115200	~ >	MOXA Port 0 Moxa Inc.		Modem
💋 СОМЗ	115200	~ >	MOXA Port 1 Moxa Inc.		
Ø COM4	115200	~ >	MOXA Port 2 Moxa Inc.		
ZOM5	115200	~ >	MOXA Port 3 Moxa Inc.		
💋 СОМ7	GNSS Receiver (USB CD	C ACM) JAVAD GNSS, INC 027DFK9MBOLR00II0HK5TK9O1A	USB->SER	
COM9	1500000	~ >	GNSS Receiver (USB Serial) JAVAD GNSS, INC	FTDI	Receiver TRIUMPH2
2 COM10	115200	~ >	Microsoft	Bluetooth	
• COM11	115200	~ >	TRIUMPH_1M 35008 (,,) 0018D74D9782 Microsoft	Bluetooth	Terminal
Ø COM12	115200	~ >	Microsoft	Bluetooth	
O COM13	115200	~ >	TRIUMPH2 T2008 (,,) 0018D7A99E13 Microsoft	Bluetooth	Receiver TRIUMPH2
Ø COM14	115200	~ >	Microsoft	Bluetooth	
Ø COM15	115200	~ >	TRIUMPH1 00036 (28,,) 0019880AE466 Microsoft	Bluetooth	

Connection Board

TCP Panel

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

тср	Conne	ct				
1	Address	172.17.254.41	۲ Port 8	002 Logical Port	Password a TLS/	SSL Raw
		172.17.254.41:	8002 TR1	TRIUMPH1 3W101		
	CD Comment					
^	ICP Connecti	172.17.0.120:	8002			
0	172.17.254.4	172.17.0.32 :	8002			
		c 100.054				
	172 17 254 4	٤ 180.254	8002 DELIA-12233	26 DELIA 02RXF		
U	172.17.234.49		ccene: month	.,	-	
•	180.25	54: 8002	Receiver DELTA / 02	RXFD9J9Y90D2		
-				10//70		
0	172.17.254.41	1:8002	TRIUMPH1 / 3W10	1QK20I		

TCP Connection panel

The following fields should be filled:

- Address Host name or IP address of the receiver;
- *Port* TCP port of the receiver. It 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 just leave this field blank);
- *TLS/SSL* Enables/disables the encrypting with cryptographic protocols that provide communications security over the Internet. This parameter should correspond to the receiver settings.
- *Raw* The connection without an authorization. It is used to connect via serial adapters.

By clicking *Connect*, the connection establishes.

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

The drop-down list displays all connections with application startup time. The green circle marks existing connection, gray closed ones.

Default LAN Settings

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

- *IP* **192.168.2.2**
- Mask 255.255.255.192
- GW 192.168.2.1

The Receiver TCP Server default Configuration:

• Port 8002

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

Connection Mode Receiver		℃ 👗
тср		
Address 192.168.2.2	Port 8002 Logical Port Password 9W8X36H TLS/SSL] Raw
 TCP Connections 		
• 172.17.254.43:8002 Receiver	TRIUMPH_1M / 1PV9UF25	

First TCP Connection

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

- Receiver IP Address: 192.168.2.3 ("3" can be any in range of 3-63)
- Network mask: 255.255.255.192
- Default Gateway: 192.168.2.1

Serial Panel

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

Conne Seria	ect .L / USB->	SERIAL / BL	UETO	отн	I.		Refre	sh ports
	COM1	115200	~	>	Communications Port (Standard port types)			_
•	COM2	115200		>	MOXA Port 0 Moxa Inc.		Modem	
ø	СОМ3	115200	~	>	MOXA Port 1 Moxa Inc.			
1	COM4	115200	v	>	MOXA Port 2 Moxa Inc.			
#	COM5	115200	v	>	MOXA Port 3 Moxa Inc.			
#	COM7	GNSS Receive	r (USB	CDC	ACM) JAVAD GNSS, INC 027DFK9MBOLR00II0HK5TK9O1A	USB->SER		
۰	COM9	1500000		>	GNSS Receiver (USB Serial) JAVAD GNSS, INC	FTDI	Receiver	TRIUMPH2
#	COM10	115200		>	Microsoft	Bluetooth		
•	COM11	115200		>	TRIUMPH_1M 35008 (,,) 0018D74D9782 Microsoft	Bluetooth	Terminal	
ø	COM12	115200		>	Microsoft	Bluetooth		
•	COM13	115200		>	TRIUMPH2 T2008 (,,) 0018D7A99E13 Microsoft	Bluetooth	Receiver	TRIUMPH2
#	COM14	115200		>	Microsoft	Bluetooth		
ø	COM15	115200		>	TRIUMPH1 00036 (28,,) 0019880AE466 Microsoft	Bluetooth		

Serial Connection panel

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

The information about the connected device and driver is available for the virtual ports.

Set the following parameters for the physical, Bluetooth and FTDI ports:

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

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

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

Before connecting a USB equipped JAVAD GNSS device with PC USB port, make sure that the USB Port option is enabled in the receiver and the JAVAD GNSS USB driver is installed on the computer.

Note: The drivers are available on the JAVAD GNSS website update page.

Installing Driver

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

- Visit the JAVAD GNSS website. Download the USB driver.
- Unpack the archive into a separate, empty folder.
- 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.
- Windows will automatically detect the new hardware device. Follow the on-screen instructions to finish the installation process.

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

Devices Pane

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

The Device item displays:

- Connection State green circle connected, gray disconnected;
- *Name* is assigned by default first time. Double click to change. The name is stored and will be used next time.
- *Model, Identifier* the model and ID of the receiver or modem.
- *Close* to disconnect from the device, close device page and remove the device from the list.



Devices pane

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

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

Closing NetView & Modem

To close the device page click the *Close* button on the device page or in the *Devices* pane. Closing the page disconnects the device.

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

To disconnect from the receiver, click the *Disconnect* button on the receiver page.

🦚 TR1 TR	RIUMPH1	3W10				Discon	nect and Close X
Reports 👻 Act	tions 👻	Update Options 👻 Update	Firmware 🔹				
Parameters		Main					
★ Settings			ID	3W101QKZ0I0I03VZB2PQNQ2	UpTime	0d00h50m13s	Connections 1
Files Total: 214 🙆 lo	g 0119m		Model Vendor	TRIUMPH1 JAVAD GNSS	Memory (Used/Total) Number of files 214	1.70 / 1.83 GB log0119m	K dev/tcp/b
Spectra	2	- manage	Serial No Firmware Board	00015 3.6.7 Jul,28,2016 TRILIMPH 3	Communication Interfa	aces B+ W- G- U+ C-	Disconnect
Modem	[7]		bound		Reference Station ID	13 🗸 (13.82 km 55*54'2.82	"N 37*23'44.99"E 259.52 m

Disconnect and Close using the receiver page

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

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

GNSS Receiver

Operation

Connect to the receiver as described in Getting Started chapter.

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

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

Devices	TR1 TRIUMPH1	e Click to Rename 3W10	2									Di	sconn	ect and	Clo	se_×
▲ Receiver 1	Reports 👻 Actions 👻	Update Options 👻 Up	date Firmware 👻													
	Parameters 🛛	Main														F
o 🗢 TR1 TRIL	K Settings Files Image: Collecting and C		ID Model Vendor Serial No Firmware Board	3W101Q TRIUMPH JAVAD G 00015 3.6.7 Jul, TRIUMPH	KZ010103' +1 NSS 28,2016 +_3	VZB2PQN	Q2V1Z	Up Me Nur Cor	UpTime Od00146m42s Memory (Used/Total) 17.07 / 188 GB Number of files 214 Olog0119m Communication Interfaces B+ W- G- U+ C-					Connections 1		
	Madan 78							Reference Station ID 13 ✓ (13.82 km 55°54'2.82"N 37°23'44.99				19"E 2	9"E 259.52 m.			
		 Measurements 		Satel	ites S	ky Plot										
	σσ	Latitude 55*4	7'54.551765"N	Sys	Num	El	Az	CA	P1	P2	L2C	L5	L1C	Track Tim	5	<u>ر</u> ^
	Options 2	Longitude 37*3	1'15.117877"E	GPS	2	21	284	40	30	30				00:17:35	0	1056
	Actual	Ellipsoidal height 381.0	0438552 m	GPS	4	10	28	42	30	30				00:17:40	6	1060
	Greis Commands	Velocity 2D 0.00	13890 m/s	GPS	6	15	242	44	30	30	43	19		00:17:52	0	1065
	◎	Position RMS 1.210	55526 m	GPS	7	59	214	53	43	43	47			00:19:45	0	1186
	Real-Time Logging	Velocity RMS 0.00	76986 m/s	GPS	9	84	132	56	47	47	52	59		00:20:27	0	1227
:	 /dev/usb/a 	Stand Alone		GPS	16	36	62	48	40	40				00:19:24	0	1061
		PDOP 1.25	32507	GPS	23	42	106	56	43	43				00:21:27	0	1083
		HDOP 0.86	29731	GPS	26	18	38	49	35	35	47	52		00:21:36	0	1065
		VDOP 0.91	56812	GPS	30	22	226	46	34	34	46	53		00:17:36	0	1056
		Receiver Date 2017	:1:19 (GPS)	GLO	7/5	41	140	53	52	48	49			00:20:37	0	1133
		Receiver Time 11:4	3:47	GLO	8/6	81	290	53	52	50	51			00:18:01	0	1061
		Osc. Offset -0.00	01912 s)29520 ms/s	GLO	9/-2	52	50	53	52	47	49			00:17:40	0	1060
		A Links		GLO	10/-7	58	192	56	55	40	40			00:27:48	0	1061
			(have all for	GLO	11/0	8	208	46	45	32	34			00:17:32	0	1052
		Decoder Id	RTCM 3.0	GLO	16/-1	7	36	40	39	33	36			00:17:40	0	1060
		Station Id	0013	GLO	18/-3	8	36	47	45	40	41			00:17:53	0	1061
		Time elapsed since rece	eivi 001	SBAS	120	11	238	40						00:17:30	19	0/
		Received messages	6405	SBAS	123	26	188	46				48		00:20:17	19	0/
		Link quality (%)	100.00	SBAS	126	22	148	41						00:17:36	19	0/
		Satellites 27 (15) GPS - 9 (8) GLO - 7	(7) GAL - 2 (0) QZSS	- 0 (0)	BDS - 0 (0)) SBA	.S - 6 (0)	IRNSS -	3 (0)						
		b														

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

Receiver Page

Header:

- *Name* is assigned by default first time. Double click to change. The name is stored and will be used next time.
- www.javad.com

- *Model, Identifier* model and ID of the receiver or modem.
- *Close* disconnect from the device, close device page and remove the device from the list on *Devices* pane.

Menu Bar:

- Reports menu Main info, options, and parameters reports;
- Actions Menu performs reset, init parameter, clear NVRAM, init file system, reset RTK actions to the receiver;
- Update Options allows updating receiver options online from Javad website or Option Authorization File (OAF).
- Update Firmware allows update GNSS firmware online from Javad website or a file;

Tiles:

- *Main* receiver info, state parameters, connection state, measurements, satellites table, sky plots, orientation;
- Parameters graphical interface for configuring the receiver;
- *Files* operations with the files in receiver's memory;
- Spectra graphical interface for the GNSS spectra;
- Greis Commands manual mode terminal for the GREIS commands (see [2]);
- *Real-Time Logging* logging jps or rtcm data to the PC memory;
- To expand (collapse) a tile click on the arrow at the top right corner.

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

Reports

		TR	TRIUMPH1	3W10			
_	Repo	orts 👻	Actions 👻	Update Options 👻	Update	Firmware	•
-	8	Receiver Info		Main			
•	Y -	Optio	n			ID	3W101OKZ010103
	1	Paran	neters			Model	TRIUMPH1
				Reports			

The following reports on the receiver can be generated:

- *Receiver Info* receiver's characteristics, position and satellites table (Receiver Info described below and content of Measurements pane)
- *Options* receiver's characteristics and list of options with current statuses (Receiver Info and content of Options tile)
- *Parameters* receiver's characteristics and list of all 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* to set all receiver parameters to their default values.
- *Clear NVRAM* to clear NVRAM and reboot receiver. All data stored in the NVRAM (almanacs, ephemeris, etc.) will be lost; all parameters will be set to their default values after reboot.
- *Init File System* initializes the file system (i.e., reformat the underlying medium). All files stored in the receiver will be lost. The operation can take some time depends on the memory size. Its progress is shown in the bottom status bar.
- *Reset RTK* to reset the RTK engine.

Update Options

The receiver options can be updated via the Internet or from the OAF.

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

TR1 TRIUMPH	I 3W10					×			
Reports • Actions •	Update Options 👻	Update Firmware 👻	adate Firmware - Refresh butto						
Main 🛛	From File								
into incostremento	opuon	Current	Purchased	Leased	Date	<u>^</u> 0			
Parameters 🛛	GPS (_GPS)	1	0	1	8/1/2017				
★ Settings	GLONASS (_GLO)	1	0	1	8/1/2017				
Files D	11/11)	1	0	1	8/1/2017				



Uploading OAF via Internet

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

TR1 TRIUMPH1	3W10							×
Reports	Update Options 👻	Up	date Firmw	are 👻				
01 ×	ptions							Ľ
Ontiene unleading	~		Current	Purchased	Leased	Date	^	0
Options uploading			1	0	1	8/1/2017		
			1	0	1	8/1/2017		
Do you want to update Option	ns from server?		1	0	1	8/1/2017		
			1	0	1	8/1/2017		
	_	(Hz)	100	0	100	8/1/2017		
Yes	No	e(Hz	100	0	100	8/1/2017		
Modem [7]	wemory (wb) Civier	4)	2048	0	2048	8/1/2017		
R R	Common Tracking (00	-1	0	511	1/17/2017		
	1-PPS Timing Signal	(_PF	0	0	0			
Greis Commands [2]	Event Markers (E\/N	n	n	0	0			

Updating Options via Internet

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

After the file is uploaded receiver NVRAM is cleared and then it is reset.

	TR1 TRIUMPH1	I 3W10			2
	Reports 👻 Actions 👻	Update Options 👻 Update	e Firmware 👻		
	Main 🗵	Options			
H1 3W101 🗙	Info Measurements		t Purchased	Leased [Date ^ C
Options uploading	compete		×	1 8	3/1/2017
			0	1 8	3/1/2017
219 - op	tions loaded.Do you want to clea	ar NVRAM and Reset receiver?	0	1 8	3/1/2017
			0	1 8	3/1/2017
			0	100 8	3/1/2017
		Yes No	0	100 8	3/1/2017
	Modem [7]	Memory (Mb) (MEM) 20	40 0	2048 8	3/1/2017
	: A A	Common Tracking (COO -1	0	511	1/17/2017
	Grais Commands	1-PPS Timing Signal (_PF_0	0	0 -	
	Greis Commands M	Event Markers (EVNT) 0	0	0 -	
	<u> </u>	In-Band Int. Rejection (_/ 1	0	1 8	3/1/2017
	Real-Time Logging [2]	Multipath Reduction (_M 1	0	1 8	3/1/2017
	/dev/usb/a	Frequency Input (_FRI) -1	0	0 -	
		Freq. Lock and Output (1	0	0 -	
		Serial Port A (Kbps) (RS_/ 46	0 0	460 8	3/1/2017
		Serial Port B (Kbps) (RS_E 46	0 0	460 8	3/2/2017
		Serial Port C (Kbps) (RS_(46	0 0	460 8	3/1/2017
		Serial Port D (Kbps) (RS_I 46	0 0	460 8	3/1/2017
		Infrared Port (INFR) -1	n	511	/17/2017 ×
	Ø Connected dev/tcp	⊳/a ✓ Options up	loading		

Options are uploaded

To see updated options, click *Refresh* after receiver reconnects.

Uploading OAF from File

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

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

1			e options - optione rin				
TRIUMPH1 3W101 🗙	Main 🖸	Options					
J Open Options File	in into inseatinements.			×	Leased	Date	
					0 1	8/1/2017	
$\leftarrow \rightarrow \land \uparrow \blacksquare \rightarrow$ This	PC > Desktop >	~ Ö	Search Desktop	Q	0 1	8/1/2017	
Organize - New folder			BE • 0	1 0	0 1	8/1/2017	
	News		Data and Effect	-	0 1	8/1/2017	
Y This PC	Name		Date modified	type	0 100	8/1/2017	
> 📃 Desktop	Down		1/19/2017 9:13 PM	File folder	0 100	8/1/2017	
> 😫 Documents	publish		1/20/2017 11:50 AM	File folder	0 2048	8/1/2017	
> 🕹 Downloads	Release		1/19/2017 10:09 PM	File folder	0 511	1/17/2017	
> 👌 Music	Release_sc	0.07	1/19/2017 2:40 PM	File folder	0 0		
> 📰 Pictures		2V1Z-Jpo	9/3/2010 12:00 PM	JPO File	0 0		
> 📕 Videos					0 1	8/1/2017	
> Local Disk (C:)					0 1	8/1/2017	
> media (\\fs-2.gn Y	c			>	0 0		
File ou	200101010101000000		Ontions File (* inc)	~	0 0		
File nar	SWIDIQK20005V21	42412 0	options rile (.jpo)	¥	0 460	8/1/2017	
			Open Car	ncel	0 460	8/2/2017	
		Serial F	Port C (Kbps) (RS (460	ai	0 460	8/1/2017	
						0/1/2017	

Updating Options from jpo-file

Update Firmware

The receiver's firmware can be updated from the file or via the Internet.

🦈 TR1	TRIUMPH1	3W10						
Reports 👻	Actions 👻	Update Options 👻		Upda	ate Firmware 👻		_	
Parameters		Main		2	From File	,		
★ Settings				2	From Website	•	~	Stable
Files		annual C			Model	TRIUMPH		Latest
Total: 215 🙆	log0119n	-			Vendor	JAVAD GN	ISS	
		Update Firm	war	e				

Updating from the file

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

Updating from Internet

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

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

Status bar at the bottom of the window shows the progress. When every part of the firmware is uploaded the receiver reboots and reconnects. To cancel the firmware updating click *Cancel File Transfer*.

Reports Actions	Update Options 👻	Update Firmware	- 6	Cancel F	File Tra	nsfer						
arameters 🛛	Main											
X Settings iles 21 Total: 215 2 log0119n pectra 2		ID Model Vendor Serial No Firmware	3W101C TRIUMP JAVAD G 00015 3.6.7 Jul	2KZ0I0I H1 NSS 28,2016		UpTime Memory (U Number of Communica	sed/Total files 21: ation Inte	0d01h) 1.70 / 5 🙆 log rfaces B	24m46s 1.83 GB g0119n + W- G- 1			
Collecting	-	Board	TRIUMP	H_3		Reference	tation	D 13 🗸	(13.82 km	55°54'2	82"NI 37°0	22
Nodem 🔊	Measurement	ts	Satel	lites S	kv Plot			0 10 4	(15.02 Kill	55 542.	52 11 57 2	
I I	Latitude	55°47'54.554153"N	Sys	Num	EI	Az	CA	P1	P2	L2C	L5	
ptions 🛛	Longitude	37°31'15.114857"E	GPS	2	12	270	35					
Actual	Ellipsoidal height	381.2632072 m	GPS	7	77	210	54	47	47	51		
reis Commands 🛛 🛛	Velocity 2D	0.0053308 m/s	GPS	9	66	122	56	47	47	53	59	
◎	Position RMS	1.5788309 m	GPS	16	28	46	47	35	35			
eal-Time Logging 🛛	Velocity RMS	0.0059501 m/s	GPS	23	25	114	49	50	42	42		
/dev/usb/a	Stand Alone		GPS	26	5	30	38	24	24	41	47	
	PDOP	1.2528329	GPS	27	11	80	48	35	35	47	51	
	HDOP	0.7777371	GPS	30	39	232	45				44	
	VDOP	0.9821993	GLO	7/5	22	148	48	45	33	27		
	Receiver Date	2017:1:19 (GPS)	GLO	8/6	73	176					45(G3)	
	Receiver Time	12:21:53 0.0000600 c	GLO	9/-2	33	44	49	46	47	49		
	Osc. Offset	-0.0029516 ms/s	<								>	
	Satellites 24 (14) O 6 (4) GAL 1 (0759	S - 0 (0)	RDS - I	0.(0) SBA	S - 6 (4)	IRNSS -	3 (0)			

Firmware Updating

Monitoring

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

arameters		Main															
¥ Settings les Fotal: 215 ② log01: pectra ∡ Collecting	19n	- alabama		ID Model Vendor Serial No Firmware Board	3W101Q TRIUMPH JAVAD G 00015 3.6.7 Jul,2 TRIUMPH	KZ01010 11 NSS 18,2016 1_3	3VZB2PQN	Q2V1Z		UpTime Memory (Number o Communi Reference	Used/Tota f files 21 cation Int Station	0d01H al) 1.70 / L5 (2) lo erfaces B ID 13 (n33m49s 1.83 GB g0119n + W- G- U (13.82 km	+ C- 55°54'2.82'	Con × × ×	dev/tcj dev/us dev/se	; 3 p/d b/a r/a 259.52 m.
odem		 Measurement 	ts		Satell	tes	Sky Plot										
e e		Latitude	55°47'54.5	550889"N	Sys	Num	El	Az	CA	P1	P2	L2C	L5	L1C	Track Tin	Stat	Cor
tions	2	Longitude	37*31'15.:	L26246"E	GPS	27	13	76	46	35	35	47	50	c	0:50:04	0	3009/2
ctual		Ellipsoidal height Position SEP	380.83942	281 m) m	GPS	30	43	234	52	44	44	51	57	C	1:04:44	0	3884 / :
eis Commands		Velocity 2D	0.0040724	l m/s	GLO	1/1	53	310	41	41	28	30		C	0:07:41	0	431/45
		Position RMS	1.9527936	5 m	GLO	7/5	17	150	47	46	41	43		0	1:07:45	0	3961/3
al-Time Logging	ime Logging 🔄 Velocity RMS 0.0097110 m/s) m/s	GLO	8/6	68	174	57	55	45	47		c	1:05:09	0	3889 / 3		
/dev/usb/a Stand Alone	GLO	9/-2	28	44	53	52	47	48		C	1:04:48	0	3888 / 3				
		PDOP	1.2262641		GLO	10/-7	85	164	57	55	42	42		C	1:14:56	0	3889 / 3
		HDOP	0.7418879 0.9763842	GLO	11/0	32	218	54	53	43	44		C	1:04:40	0	3880 / 3	
		Pacaivar Data	2017-1-10 (CDS)	GLO	18/-3	17	14	41	41	44	45		c	1:05:01	0	3889 / 3	
		Receiver Time	12:30:55	(0+3)	SBAS	120	11	238	36					C	1:04:38	19	0/
		Clock Offset	0.0004601	s	SBAS	123	26	188	48				48	C	1:07:25	19	0/
		Osc. Offset	-0.002951	5 ms/s	SBAS	126	22	148	44					C	1:04:44	19	0 /
		 Links 			SBAS	127	25	158	43				42	0	1:04:46	19	0/
		Link Id		/tcpcl/a	SBAS	128	15	128	40				45	0	1:04:36	19	0/
		Station Id		0013	SBAS	136	20	218	4/				45		1:04:40	19	0/
		Time elapsed sind	e receivi	001	GAL	19	40	152	48				48(EDa)		1.02.10	19	0/
		Received message	es	12910	IRINSS	2	24	100					50	, i	1:23:18	19	
		Satellites 24 (: GPS - 7 (7) GL	L 4) .O - 7 (7)	GAL - 1 (0) QZSS	- 0 (0)	BDS - 0 (I)) SBA	S - 6 (0)	IRNSS -	3 (0)						

Receiver Main Tile

Receiver Info



Receiver info

Receiver *Main tile* provides the following information:

- Image of the receiver.
- Receiver Id Receiver's identifier.
- Model The model of the receiver, e.g., TRIUMPH1
- Vendor JAVAD GNSS.
- Serial Number a number assigned to the receiver on the factory.
- Firmware Version
- Board Version www.javad.com

- UpTime Time elapsed since last receiver reboot.
- Memory (Used/Total) Used /Available Memory.
- *Number of files* **number of files in the receiver memory and record**-ing status.
- Communication interfaces indicates whether the following communication interfaces are available and enabled:
 - B Bluetooth
 - W Wi-Fi
 - G GSM
 - U UHF / FH
 - C Communication Board (for TVS)
- *Reference station* reference station ID, distance, position and GPS validity are displayed if corrections are received.

• *Connections* – amount and type of not locked connections. Connections are locked for the file transferring, manual mode, daisy chain, real time logging. Locked connections cannot be closed and displayed in the status bar (dark blue for the file transferring, red for others).

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

Measurements

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

Latitude	55°47'55.168443"N
Longitude	37°31'14.138332"E
Ellipsoidal height	429.1000399 m
Position SEP	16.7441100 m
Velocity 2D	0.0251008 m/s
Position RMS	16.7441072 m
Velocity RMS	0.0237989 m/s
Stand Alone	
PDOP	1.5726275
HDOP	0.9007885
VDOP	1.2890840
Receiver Date	2017:1:18 (GPS)
Receiver Time	07:51:40
Clock Offset	-0.0003325 s
Osc. Offset	-0.0029594 ms/s

Measurements

Navigation information

- Latitude, Longitude, Ellipsoidal height geodetic coordinates1
- Position SEP Spherical Error Probable
- Velocity 2D Geodetic Velocity (m/s).
- Position RMS position RMS error2 (m).
- Velocity RMS velocity RMS error (m/s).
- Solution type Standalone / DGPS /RTK float / RTK fixed
- PDOP Position dilution of precision.
- *HDOP* Horizontal dilution of precision.
 - *VDOP* Vertical dilution of precision.
- *Receiver date* the "date" part of the full receiver time representation ([RD] message).
- Receiver time shows the receiver's current time within day. This val-

2~ More precisely, this is the square root of the trace of the position error variance-covariance

ue is taken from the message [~~]. For more information about [~~]. Note: Currently the message [~~] reports the time within day in the GPS time scale only.

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

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

Links



Links

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

For each link the following fields are shown:

- *Link Id* Corresponding stream;
- Decoder Id RTCM / RTCM 3.0 / CMR / JPS / SISNeT;
- Station Id Reference station identifier;
- *Time elapsed since...* Time [in seconds] elapsed since receiving last message (maximum value = 999). Estimated with an accuracy of ±1 second.
- Received messages The number of the received messages (be-

 $^{1\ \}text{These}\ \text{geodetic}\ \text{coordinates}\ \text{are}\ \text{computed}\ \text{in}\ \text{WGS}\ 84\ \text{regardless}\ \text{of}\ \text{the}\ \text{current}\ \text{value}\ \text{of}\ /\text{par/pos/}\ \text{datum/cur.}$

tween 0001 and 9999). If no message has been received, this data Satellite Table field contains zero.

• Corrupt messages - The number of corrupt messages (between 0001 and 9999). If no corrupt messages have been detected, this data field is set to zero.

• *Link quality (%)* - The data link quality in percent (0-100)

Number of Satellites

 Satellites 2 	2 (14)				
GPS - 10 (9)	GLO - 6 (5)	GAL - 2 (0)	QZSS - 0 (0)	BDS - 0 (0)	SBAS - 1 (0)

Number of Satellites

Number of satellites **pane 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)

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

▲ Satellit	es						
a 23 (10)	GPS - 13 (5)	GLO - 10 (5)	GAL - 0 (0)	QZSS - 0 (0)	BDS - 0 (0)	SBAS - 0 (0)	IRNSS - 0 (0)
b 20 (0)	GPS - 11 (0)	GLO - 9 (0)	GAL - 0 (0)	QZSS - 0 (0)	BDS - 0 (0)	SBAS - 0 (0)	IRNSS - 0 (0)
c 23 (0)	GPS - 13 (0)	GLO - 10 (0)	GAL - 0 (0)	QZSS - 0 (0)	BDS - 0 (0)	SBAS - 0 (0)	IRNSS - 0 (0)
d 18 (0)	GPS - 10 (0)	GLO - 8 (0)	GAL - 0 (0)	QZSS - 0 (0)	BDS - 0 (0)	SBAS - 0 (0)	IRNSS - 0 (0)

Multi Antenna Number of satellites

Sate	ellites	sky Plot											
Sys	▼ Num	El	Az	CA	P1	P2	L2C	L5	L1C	Track Tin	Status	Cont.T	*
	Select All						33	43		00:00:16	0	16 /	
	GPS				12	12	40	47		00:00:43	0	43 / 16	
् 🗸 (GLO						19	38		00:00:24	23	0 /	
	SBAS GAI									00:00:05	0	4 /	
I 🚺	RNSS							39		00:04:54	19	/	
	19 (Apply	Clear	Cancal						00:06:02	0	43 /	
GPS_	22	Apply		41						00:00:24	0	24 /	
GPS	23	46	234	33						00:00:03	23	2/	
GPS	25	14	36	20						00:00:00	23	0 /	Ξ
GPS	31	46	78	43	16	16	35			00:00:35	0	35 / 28	
GPS	32	6	64	34			29	38		00:00:13	0	12 /	
GLO	4/6	31	84	33			30			00:00:02	0	2/2	
GLO	5/1	78	16	30	33		30			00:00:28	23	2 / 21	
GLO	6/-4	31	282	24			22			00:00:00	23	0 /	
GLO	15/0	34	124	29	29		26			00:00:04	23	4/3	
GLO	21/4	41	286	36	35		29			00:01:04	0	60 / 40	
GLO	22/-3	18	342	36	35		26			00:00:11	0	11/11	
GLO	26/-5	26	232	40				45(G3)		00:00:18	19	0 /	
SBAS	123	26	188	34				36		00:00:43	19	0 /	
GAL	9	62	264					40(E5a)		01:53:43	19	/	
GAL	22	23	320	44				46(E5a)		00:00:56	19	0 /	Ŧ

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 PRN SV PRN / SV Frequency Number for GLONASS. If the character "*" is shown next to PRN in the column, this means that almanac data are unavailable for the corresponding satellite
EL	Elevation angle in degrees.
AZ	Azimuth in degrees

CA	Signal-to-noise ratio [dB*Hz] C/A – GPS, QZSS L1 - SBAS E1 (B + C) – GALILEO CA/L1- GLONASS B1-1 - BeiDou (COMPASS)
Р1	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 minutes or, if the symbol ":" is specified in the column, in seconds.
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

Each column of the table can be sorted. *Sys* and *Num* columns can also be filtered by value.

The *Satellite* table for multi antenna receiver has also antenna column supporting sorting and filtering.

Satelli	tes S	sky Plot	Orienta	tion									
Ant. 🖙	Sys	Num	El	Az	CA	P1	P2	L2C	L5	L1C	Track Tin	Status	
√ Se	lect All	13/-2	8	12	40	38	37	38			03:05:01	30	
🗸 a					46	46	41	41			01:37:52	55	
V b					38	38	30	32			80:00:00	55	
v⊂ V d					43	42	42	43			02:46:58	30	
	GLO	21/4	- 38	276	50	49	44	45			02:22:23	55	
	GLO U	Apply	Clear	Cancel	47	46	43	44			00:49:08	30	
	GLO	26/-5	18	228	46	46	42	44			02:35:41	30	
	GPS	1	33	188	50	41	41	49			00:06:34	4	1
	GPS	3	84	182	53	45	45	49			00:06:33	4	
,	GPS	4	7	100	42	28	28				00:03:06	4	
, ,	GPS	9	13	244	42	25	25	43			00:04:42	4	
,	GPS	11	7	192	40	23	23				00:06:35	4	
	GPS	14	25	66	46	31	31				00:06:32	4	
,	GPS	17	16	278	40	29	29	43			00:06:33	4	
)	GPS	22	68	138	52	42	42				00:06:34	4	
,	GPS	23	53	236	52	40	40				00:06:33	4	
,	GPS	25	14	30	45	33	33	44			00:05:11	4	
,	GPS	31	44	70	51	43	43	48			00:06:33	4	
,	GLO	4/6	25	90	54	53	43	45			00:45:35	4	

Multi Antenna Satellite Table.

Sky Plots

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



Sky Plots

Each concentric circle represents the elevation angle above the horizon. The external 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. Satellite info is shown when mouse is over it.

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

The Multi Antenna sky plots are provided by the antenna filter.



Multi Antenna Sky plots

Orientation, Angels and Base Lines

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



Orientation tab

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

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

[mr] ([BL])- 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.

Multi-RTK

RTK Engines tab is available if Multi Rtk Mode is on and RTCM3 corrections are receiving.

evices	Reports * Actions * Update Optio	ons • Update Firmwa	we *				*
1 2	Main						
NOMEGA- X	ID Model Serial No Board Kernel	OMED2A8284F837897 OMEGA Vendor 3 00009 4.0.02+b0-210120-175 OMEGA_5 4.9.146-javad-4 But	7383F089D8 AVAD GNSS 5-cb92 Id 14		UpTime Memory (Used/Total) Number of files 20 Otog01298 Communication Inter Reference Station 10	0d20h11m16s 617.83 MB / 11.13 GB flaces B- W- G- U- C- 0 324~(10.97 km 55*42*0.29*N	X dev/usb/a
	Measurements Service Encountry	Satellites Sky	Plot RTK En	gines RTPK			
	Longitude 37'31'15.091355'E Ellipsoidal bainht 382.3568776 m	RTK 1 Float	8%	RTK 2 Fixed	1 - 100%	RTK 3 Fixed — 10	0%
	Position SEP 0.0136791 m	GPS 5	QZSS 0	GPS 5	QZSS 0	GPS 6 QZSS 0	
	Position RMS 0.0136791 m	GLO 2	BDS 0	GLO 4	BDS 0	GLO 5 BDS 0	
	Velocity RMS 0.0152907 m/s HRMS 0.0081004 m	SBAS 0	IRNSS 0	SBAS 0	IRNSS 0	SBAS 0 IRNSS 0	
	VRMS 0.0110227 m	GAL 0		GAL 0		GAL 0	
	RTK fixed (Phase diff) PDOP 1 2759363	Rms 0.3732		Rms 0.0204		Rms 0.0173	
	HDOP 0.7645336 VDOP 1.0215190	Weight 0 Epochs 44		Weight 11 Epochs 44		Weight 16 Epochs 44	
	Receiver Date 2021:1:29 (GPS) Receiver Time 13:24:21						
	▲ Links	RTK 4 Fixed	- 100%	RTK 5 Fixed	100%	RTK 6 Fixed - 10	0%
	Link Id /tcpcl/a Decoder Id RTCM 3.0	GPS 7	QZSS 0	GPS 10	QZSS 0	GPS 10 QZSS (0
	Station Id 0324	GLO 6	BDS 0	GLO 7	BDS 0	GLO 7 BDS	
	Received messa 7363	SBAS 0	IRNSS 0	SBAS 0	IRNSS 0	SBAS 0 IRNSS 0	
	Corrupt messages 0000 Link quality (%) 100.00,0.05,1.00	GAL 0		GAL 0		GAL 0	
		Rms 0.0158		Rms 0.0131		Rms 0.0131	
		Freechs 44		Fronchs 44		Freight 21	
	Satellites 60 (17) GPS - 10 (10) GLG	D - 8 (7) GAL - 7 (0)	QZSS - 1 (0) 8)S - 22 (0) SBAS - 1	9 (0) IRINSS - 3 (0)		
	Parameters C* Files C*	GNSS Spectra	Modem 2	Options	Output	Greis Commands	Real-Time Log
	* Sattings Tatal 20	lat Interfere	6 6 In	IT Actual	· Dorte Massage		

RTK Engines tab

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

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

RTPK

RTPK - Real Time Postprocessed Kinematics (RTPK) solution - is available for firmware beginning with 4.0.2.0 and requires the RTPK option.

Short description of RTPK

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

Current requirement is availability of suitable RTCM3 corrections.

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

RTPK Option

evices

eceiver

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

Option Current Purchased Leased Date Reserved (LIM) 7 511 511 3/12/20 RTCM Input (RTMI) 5 511 511 3/12/20 RTCM Input (RTMO) 3 511 511 3/12/20 RTCM Input (RTMO) 3 511 511 3/12/20 RTCM Output (RTMO) 3 511 511 3/12/20 RTCM Joutput (RTMO) 3 511 511 3/12/20 RTCM Output (RMO) 3 511 511 3/12/20 RTK distance (r100m (511-unlimited)) (I 511 511 511 3/12/20 RTK distance (r100m (511-unlimited)) (I 511 511 511 3/12/20 Serial Port A (Kbps) (R5,A) 460 511 511 3/12/20 Serial Port B (Kbps) (R5,B) 460 511 511 3/12/20 Serial Port D (Kbps) (R5,D) 460 511 511 3/12/20 Serial Port D (Kbps) (R5,D) 460 511 511 3/12/20					Hadata E	ladata Ontinas 💌	· Artises ·	Passate
Options Current Purchased Leased Date Reserved (LIM) 7 511 511 3/12/20 RTCM Input (RTMI) 5 511 511 3/12/20 RTCM Output (RTMO) 3 511 511 3/12/20 RTCM Output (RTMO) 3 511 511 3/12/20 RTCM Output (RM30) 3 511 511 3/12/20 RTK distance (x100m (511-unlimited)) (f 511 511 3/12/20 RTK distance (x100m (511-unlimited)) (f 511 511 3/12/20 RTK distance (x100m (511-unlimited)) (f 511 511 3/12/20 Serial Port A (Kbps) (R5,A) 460 511 3/12/20 Serial Port B (Kbps) (R5,B) 460 511 511 3/12/20 Serial Port D (Kbps) (R5,D) 460 511 511 3/12/20 Serial Port D (Kbps) (R5,D) 460 511 511 3/12/20 Serial Port D (Kbps) (R5,D) 460 511 511 3/12/20 Spectrum (SPE				mware -	Update Fi	poate Options	Actions	Reports
Option Current Purchased Leased Date Reserved (LIM) 7 511 511 3/12/20 RTCM Input (RTM0) 3 511 511 3/12/20 RTCM Input (RTM0) 3 511 511 3/12/20 RTCM Joutput (RTM0) 3 511 511 3/12/20 RTCM3 Unput (RM30) 1 511 511 3/12/20 RTCM3 Unput (RM30) 3 511 511 3/12/20 RTK distance (x100m (511-unlimited)) (f 511 511 3/12/20 RTK distance (x100m (511-unlimited)) (f 511 511 3/12/20 Serial Port A (Kbps) (R5_A) 460 511 3/12/20 Serial Port B (Kbps) (R5_C) 460 511 511 3/12/20 Serial Port D (Kbps) (R5_C) 460 511 511 3/12/20 Serial Port D (Kbps) (R5_C) 460 511 511 3/12/20 Serial Port D (Kbps) (R5_C) 1 511 3/12/20 Spectrum (SPEC) 1 511 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>S</th> <th>Option</th>							S	Option
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RTK distance [x100m (511-unlimited]) (f. 511 511 511 3/12/20 RTK mode (Hz) (PDIF) 100 511 511 3/12/20 RTPK (RTPK) 0 0 511 3/12/20 Serial Port A (Kbps) (RS_B) 460 511 511 3/12/20 Serial Port A (Kbps) (RS_B) 460 511 511 3/12/20 Serial Port C (Kbps) (RS_C) 460 511 511 3/12/20 Serial Port D (Kbps) (RS_D) 460 511 511 3/12/20 Serial Port D (Kbps) (RS_D) 460 511 511 3/12/20 Spectrum (SPEC) 1 511 511 3/12/20 Spoofing Detection (_SPF) 0 0 511 3/12/20	2021	1 3/12/2021		511		3	3 Output (RM3O)	RTCM
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Serial Port C (Kbps) (RS_C) 460 511 511 3/12/20 Serial Port D (Kbps) (RS_D) 460 511 511 3/12/20 Spectrum (SPEC) 1 511 511 3/12/20 Spooling Detection (SPF) 0 0 511 3/12/20 To CI (CFC) 1 511 3/12/20	2021	1 3/12/2021		511		460	Port B (Kbps) (RS	Serial
Serial Port D (Kbps) (RS_D) 460 511 511 3/12/20 Spectrum (SPEC) 1 511 511 3/12/20 Spoofing Detection (SPF) 0 0 511 3/12/20 Torcit up of the section (SPF) 0 0 511 3/12/20	2021	1 3/12/2021		511		460	Port C (Kbps) (RS	Serial
Spectrum (SPEC) 1 511 511 3/12/20 Spoofing Detection (_SPF) 0 0 511 3/12/20 TOC (_TCC) 1 511 511 3/12/20	2021	1 3/12/2021		511		460	Port D (Kbps) (RS	Serial
Spoofing Detection (_SPF) 0 511 3/12/20 Tool group 31 511 - 511 - 511 - 2/32/20	2021	1 3/12/2021		511		1	rum (SPEC)	Spectr
TCCI (TCCI) 21 511 511 2/12/20	2021	1 3/12/2021		0		0	ing Detection (_SI	Spoof
SI S	2021	1 3/12/2021		511		31	TCCL)	TCCL (
TCP Connections (_TCP) 5 511 511 3/12/20	2021	1 3/12/2021		511		5	onnections (_TCP)	TCP C
Main F? Parameters F? Files F? GNSS Spectra F? Modem F	F? Levels Compass F?	odem r?	tra r.Z	GNSS Spec	Files r.2	rameters r?	r?	Main

RTPK Option

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

RTPK Tab

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





The following functionality is provided:

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

To start new RTPK type name to the Name textbox or leave auto name and click Start button near desirable free file-port (a,b,c,d,e).

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



RTPK-File log0129c is recorded on the port b. It is available for the processing

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

♂ Net View & Modem - 2.2.5.3				– 🗆 X	
JAVAD	Connect : 🤝 Receiver	Andem 🖸 Terminal		Help	
	M OMEGA- OMEGA OMED2/	8284F837897388F089D8		×	Devices
Devices	Reports • Actions • Update Opti	ons • Update Firmware •		× + ↑	
Receiver 1	Main		11.7	× totat	Receiver 1
• N OMEGA- X	Comparing the second seco	OMCD/202249931997/269040040 OMCD/20224993197260045 200050 200050 200050-210126-175-6892 OMEGL5 4.8.146-jened-4 Build 14 Satellites Sky Piot RTPK Start RTPK File Name actusions RTPK File log0126; port b · · · · · · · 78	Control (March 2014) Control (March 2014)	87'31'4502'(25192 m.)	• N OMEGA- X
	VRMS 0.0106867 m RTK fixed (Phase diff) PDOP 1.2814974 HDOP 0.7585464 1000				
	VUOP 1.0328810 Receiver Date 2021:1:29 (GPS) Receiver Time 13:21:21 A Unks 13:21:21				
	Link Id /tzpcl/a Decoder Id RTCM 3.0 Stasion Id 0224 Time elapsed sin 001 Received messa 5869 Corrupt messages 0000 Link quality (%) 100.00,0.05,1.00				
	Satellites 60 (17) GPS - 10 (10) GU	O - 8 (7) GAL - 7 (0) QZSS - 1 (0) BDS - 22 (0	I) SBAS - 9 (0) IRNSS - 3 (0)		
	Parameters 📑 Files	GNSS Spectra	ptions 🗗 Output 📑 Greis Commands 🖻	Real-Time Log	1
	X Settings Total 21 0 0	₩ Interfere S K K i	Actual Ports Message		
	a Connected dev/usb/a	 KIPK Processing 			

RTPK-File processing

Reports * Actio	ns * Update Option	ns • Update Firmware •		
Main				
	ID Model Serial No Firmware Board Kernel	OMEDA8284F637697384769008 OMEGA Vendor JWAD GNS5 00009 4.0024-0510720-175-cb92 OMEGA_5 GA146-jwrad-4 Build 14	UpTime 0d20H09m18s Memory (Used/Total) 616.77 M8 / 11.13 G8 Number of Files 20 log0129a log0129c Communication Interfaces 8- W- G- U- C-	× deviu
			Reference Station ID 324~(10.97 km 55*421	3.29"N 37"31'45.02"E 251.92 m.) Downi
 Measurements 		Satellites Sky Plot RTPK		
Longitude Ellipsoidal height	37*31*15.091413*E 382.3675935 m	Start RTPK File Name: auto name Cont	tinue 🔘 log0129a 🕴 🔕 log0129c (RTPK) 🔘	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Position SEP Velocity 2D Position RMS Velocity RMS	0.0132453 m 0.0076247 m/s 0.0132453 m 0.0152134 m/s	RTPK File log0129c port b · · · · · 140 epoch	RTPK Report rtpk-log0129cjson * NumFixed 25	rtpk-log0129c.json 🗰 Result 0
HRMS	0.0078702 m	4	55 708/75018	Version 1.73.3.46
VRMS	0.0106535 m	no error. Last RTPK run was successful and	Bih 37.520858437	File Janssilog/log
RTK fixed (Phase d	in)	generated report.	382.336678849	Roverinfo
PDOP	1.2801800			AntennaHeight 0
VDOP	1.0296800			DE 0
Receiver Date	2021-1-29 (GPS)			DH 0
Receiver Time	13:22:24			HeightType 0
A Links				AntennaDescrip
Link Id	/tcpcl/a			BaseInfo
Decoder Id	RTCM 3.0			ARPX 2857033.1
Time elaosed sin.	001			ARPT 2194590.737 ARPZ 5245904.903
Received messa	6391			AntennaHeight 0
Corrupt message	0000			ITRFYear 0
Link quality (%)	100.00,0.05,1.00			RefStID 324

RTPK-File processed. No error information, BLH and raw report

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

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

31: "RTPK tool does not exist or is not executable";

32: "input file for RTPK does not exist or is not readable";

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

40-50: "exit code of RTPK tool";

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

Configuring the Receiver

Graphical user interface for working with the receiver parameters

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

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

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

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

Reports • Actions •	Update Options Update Firmware
Main 🖸	Parameters
Info Measurements	General Log-files TriPad Positioning Base Rover Ports Networking Event Advanced
Files ☐ Total: 1 Spectra ☐ Collecting Modem ☐	General parameter is edited Elevation Mask Power Management Elevation Mask for SVs Locking 5 Battery Charging Mode Elevation Mask for SVs Locking 5 Elevation Mask for SVs Locking 5 Elevation Mask for SVs Locking 5 Elevation Mask for SVs Locking 5 Elevation Mask for SVs Locking 5 Elevation Mask for Position 100 Image: Power Output 1 Image: Power Output 1 Antenna applyed due the error Antenna Lorrent Input ext Sleep Mode Sleep Mode off Sleep Mode off
Greis commands Greis commands Greis commands Real-Time Logging F /dev/usb/a	Status of External Anternal gift Unage read-only parameter External Power Voltage 11.26 Battery Voltage 1 12.6 Description Receiver Board Voltage Battery Voltage 2 Receiver Board Voltage Description Receiver Board Voltage Descres Read only Charger Output Voltage<
	Parameter description Configuration
	CTRL to ON/OFF the tips.

Parameters Tile

Depending on the type of the parameter, a new value can be typed to text box, selected from the drop-down or checked. Edited parameter is

marked by the *-sign and it is not set to the receiver until Apply button clicked. Apply action sets all edited parameters of all tabs to the receiver. If the receiver is not able to set new value error response is displayed under the parameter. Some settings come into effect after restarting. The confirmation dialog appears in this case. If it is confirmed receiver resets and reconnects.

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

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

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

The Parameter tabs

Each parameter tab is detailed described below. The references to corresponding chapters of the GREIS Manual are given for each group of parameters.

General

The General tab shows the most common settings.

General	Log-files	TriPad F	ositioning	Base	Rover	Ports	Networking	Event	Advanced		
Genera	l —					Power	Management				Temperature (Celsius c
Elevat	tion Mask —					⊂ Mod	es				Receiver Board Tempe
Elevat	tion Mask for	SVs Locki	ing -1			Batte	ery Charging M	ode au	ito	•	
Elevat	tion Mask for	Position	. 5			Enab	le Power Outp	ut		~	
Anter	nna					Low	Power Mode	or	ı	•	
Anter	nna Input		ext	•		Powe	er Off	or	ı	•	
Anter	nna Current In	nput e	ext			Sleep	o Mode	of	f	•	
Status	s of External A	Antenna d	off			Volta	ages				
						Exter	mal Power Volt	age 1	1.72		
						Rece	iver Board Volt	age 8.	79		
						Batte	ery Voltage a	8.	21		
						Batte	ery Voltage b	8.	24		
						0			00		

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 $^\circ,$ 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	Position	ning I	Base	Rover	Ports	Networking	Event	Advanc	ed		
-File a -							File b)					·
Current	Log-file						Curre	ent Log-file					
Numbe	r of Messag	jes Enabl	ed for	0			Num	ber of Messag	es Enabl	ed for	0		
Output	Epochs Co	unters		0			Outp	ut Epochs Cou	unters		0		
Implicit	Message C	output Pe	eriod	1.00			Impli	cit Message C	utput Pe	riod	1.00		
Elevatio	n Mask for	Measure	ments	5			Eleva	tion Mask for	Measure	ments	5		
Satellite	s Number l	Mask for		0			Satel	lites Number I	Mask for.		0		
File Nar	me Prefix			log			File N	Jame Prefix			log		
Manage	e by AFRM/	TriPad		у		•	Mana	age by AFRM/	TriPad		n	•	
AFRM						-	listory L	ogging				Initi	al Dynamic Mode
File Rot	ation Mode	•	off		•	• L	ogging	Period		30.00		Initia	al Dynamic Mode static 🔹
File Rot	ation Runni	ing Coun	ter 0			0	output S	tream to be N	onitored	/dev/n	ull 👻		
Force Fi	ile Rotation		off		•	•							
Enable	Oldest Log-	file Rem	oval off		•	-							
Sched	luling Paran	neters											=
File ro	tation cour	iter 0											
File Ro	otation Peri	od 360	0										
File Ro	otation Pha	se O											
- FTP Pus	sh					- N	lemory						
File Pus	h Mode	off	•	·		N	lemory	to Use for Dat	a Storage	int		•	
File Pus	h Reset	off	•	•		N	lemory	Currently in U	e for Dat	a int			
File Pus	h Timeout	600											
FTP C	onnection												
File Pu	ush Host or	IP Addre	ess "1	' ?.1									
File Pu	ush IP Port		21										
File Pu	ush User		"ano	nymous	s"								
File Pu	ush Passwoi	rd											
File Pu	ush Working	g Directo	ry "filep	ush"									
													Ψ

The following parameter groups are available:

- *File a, File b* setting for configuring the output to File A (File B) [2, Existing Files, Current Log-files, Masks and Counters, Implicit Output Parameters].
- *AFRM* the settings for the automatically rotating the log-files according to the user-defined schedule. [2, Automatic File Rotation Mode (AFRM)].
- *History Logging* the settings for thehistory 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

The *TriPad* tab provides the parameters for configuring the TriPad user interface of the receiver.

<fn> Push Behavior <fn> Push Action Turn Data Recording On at Startup off Appending Data to a Specific File <fn> Click Behavior <fn> Click Action Initial Dynamic Mode</fn></fn></fn></fn>	eneral Log-files TriP	ad Positic	ning	Base	Rover	Ports	Networking	Event	Advanced	
<fn> Push Action Turn Logging Turn Data Recording On at Startup off Appending Data to a Specific File <fn> Click Behavior <fn> Click Action led Initial Dynamic Mode static</fn></fn></fn>	Function key <fn> Push Behavior</fn>									
Turn Data Recording On at Startup off Appending Data to a Specific File FN> Click Behavior FN> Click Action led Initial Dynamic Mode static	<fn> Push Action</fn>		Turr	n Loggi	ng 🔻					
Appending Data to a Specific File FN> Click Behavior FN> Click Action led Initial Dynamic Mode static	Turn Data Recording (On at Startu	off		•					
<fn> Click Behavior <fn> Click Action led Initial Dynamic Mode static</fn></fn>	Appending Data to a S	Specific File								
<fn> Click Action led Initial Dynamic Mode static</fn>	- <fn> Click Behavior -</fn>									
Initial Dynamic Mode static	<fn> Click Action</fn>	led	•							
	Initial Dynamic Mode	static	•							

TriPad parameters

• Function key - [2, 4.4.29 TriPad Parameters].

Log-File parameters

Positioning

The *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 Positio	oning Base	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	od on off on off	• • •	Position Elevatio PDOP N	n Masks n Mask for Pos 1ask	sition	5 30.00	Positions Systems GPS V GLO V GAL V SBSS V QZSS V COMP I IRNSS V
Satellite Management SBAS(WAAS, EGNOS) QZS GPS GPS Ext. GPS Lock* Use? Health* Ura? Alm 1 V V 0 12 V 0 2 V V 0 12 V 0 3 V V 0 12 V 0 3 V V 0 12 V 0 3 V V 0 12 V 0 4 V V 0 12 V 0 5 V V 15 V V 0 6 V V 0 12 V 0 0 8 V V 0 19 V 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SS BeiDd GLONASS 1 23 V V 24 V V 24 V V 25 V V 26 V V 27 V V 28 V V 29 V V 30 V V 31 V V All E E		IRNSS ALILEO	Meas. U Measure	sed :ments T	Type to Use	ca p1 p2 l2c l5 ionofree all
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 mit Mode mit for Manual	l Mode	on manual 555.6	• •

Positioning parameters

The following parameters can be queried and changed:

- *Enable Solution* to configure the position computation.- [2, Generic Positioning Parameters].
- *Position Masks* the elevation mask for satellites and PDOP limited the position computation. [2, Generic Positioning Parameters].

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

• Satellite Management – the set of the similar tabs for each GNSS system. The tabs contain check boxes for enabling/disabling

- *Lock* locks 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* to excluding satellite number N from position computation when the satellite is unhealthy. - [2, Generic Positioning Parameters].
- Ura to exclude satellite number N from position computation when URA value exceeds the limit specified by URA mask parameter. [2, Generic Positioning Parameters].
- *Alm* the 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- the 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

The *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.

General 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 Phase Center Position (APC)	Antenna Reference Point Posit	ion (ARP)	Reference Position Averaging Interval	180	
Lat. 55 ° 47 ' 54.533009 " N 🔻 W84 🔻	Lat. 55 ° 47 ' 54.533009	"N • W84 •			
Lon. 037 ° 31 ' 15.111982 " E 🔻	Lon. 037 ° 31 ' 15.111982	• E. •			
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		
Antenna type (for RTCM 2.x and 3.0) ACCG8ANT_3A4TB1 NON	E 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 A	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			Satellite Constellation for RTCM 2.x	{on,on}	
North Offset of ARP 0.0000			RTCM 2.x Base Station Health	good	-
			Use Smoothed Pseudoranges in	off	•
RTCM 3.x Settings	MR Settings				
RTCM 3.x Reference Station Identifier 0 C	MR Antenna Type	0			
/par/rtcm3/base/l2c n C	MR Reference Station Identifier	0			
R	eceiver Motion State for CMR	unknown 🔻			
Т	pe of CMR Message to Use for	3			
Si	ubstitute P/L1 for CA/L1 in CMR	off 🔹			
D	ata for CMR Message Type 2	{``.``.``}			

Base parameters

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

• *Reference position*-the coordinates for L1Antenna 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 Get from Receiver button. The APC coordinates will be filled using ([PG] –message but this way should not use for real Reference Station. The RTCM 2.x message 24 as well as RTCM 3.x standard requires that APC and ARP coordinates to be transmitted from reference station to rover receivers.

• Reference Position Averaging - settings automatically calculating

and setting reference position when precise position is unknown. [2, Reference Position Averaging].

• *Reference Antenna Parameters* – the settings of the antenna and the vector components between a surveyed point (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

The *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 Positio	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	· ·				+

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

The *Ports* tab contains the nested tabs for configuring all 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* the periodic output. The messages can be selected from the predefined sets of messages (see Appendix 1. Predefined

sets of messages. The list of the messages in the set is displayed when mouse is over the item of drop-down. If ordered output does not match any set it is shown as *User Defined*.

Most of the interfaces require additional settings. The nested tabs are following:

Serial tab

The *Serial* tab contains the 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	cmd 🔻		Input Mode	cmd 🔻	
Output	None	 Period (sec): 	1 Output	None	 Period (sec): 1
Baud Rate	115200 •		Baud Rate	115200 -	
RTS/CTS Handshake	off 🔹		RTS/CTS Handsha	ike on 🔻	
Serial c			Serial d		
Input Mode	cmd 🔹		Input Mode	cmd 🔻	
Output	None	 Period (sec): 	1 Output	None	 Period (sec): 1
Baud Rate	115200 🔹		Baud Rate	115200 🔹	
RTS/CTS Handshake	off 🔹		RTS/CTS Handsha	ke off 🔹	

Serial ports parameters

USB tab

The USB tab allows setting input/output for the available USB ports.

General Log-	files TriPad Positioning Base Rover Ports Networking Event Advanced
Serial USB	Bluetooth TCP TCPO CAN
USB a	A
Input Mode	cmd 🔻
Output	None Period (sec): 1
	None
	DGPS RTCM /1 31 33
	DGPS RTCM (9.34.3)
	DGPS RTCM (41.3)
	RTK RTCM {18,19,22,3}
	RTK RTCM {20,21,22,3}
	RTK RTCM {18,19,23,24}
	RTK RTCM {20,21,23,24}
	RTK RTCM3 GD min
	RTK RTCM3 GD full
	RTK RTCM3 GGD min
	RTK RTCM3 GGD full
	RTK CMR (10,0,1)
	RTK IPS min
	RTK JPS max
	RTK RTCM3 MSM
	· · · · · · · · · · · · · · · · · · ·

USB port parameters

Bluetooth tab

The *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 Bas	e Rover Ports	Networking Event	Advanced		
Serial USB Blue	tooth TCP TCPO CAN]				
Bluetooth a Input Mode	cmd 🔻		Bluetooth b Input Mode	cmd 🔻		*
Output	None 🔻	Period (sec): 1	Output	None	▼ Period (sec): 1	
Chan Address	00000000000		Chan Address	00000000000		
Current Address	"unknown"		Current Address	"unknown"		
Hardware Setting Address "00:19:6 FCCID U9R-W IC 7089A- Mode on Name "TRIUM PIN "1234"	15 18:07:6D:A3" 2CBW003 W2CBW003 IPH1 00015"					



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 T	СР ТСРО С	CAN					
TCP a					ТСР Ь			
Input Mode	cmd	•			Input Mode	cmd	•	
Output	None	•	Period (sec):	1	Output	None		 Period (sec):
TCP c					TCP d			
Input Mode	cmd	•			Input Mode	cmd	•	
Output	None	•	Period (sec):	1	Output	None		 Period (sec):
TCP e					TCP Client a			
Input Mode	cmd	•			Input Mode	cmd	•	
Output	None	•	Period (sec):	1	Output	None		 Period (sec):
TCP Client b					TCP Statistic			
Input Mode	cmd	•			Porta 172	17.0.229:3	3207	
Output	None	•	Period (sec):	1	Port b			

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

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

eneral Log-files TriPad Positioni	ng Base Rover	Ports Networking Event Advanced
Serial USB Bluetooth TCP TCPC	D CAN	
TCPO a 8010		ТСРО Ь 8011
Output None 🔹	Period (sec): 1	Output None Period (sec): 1
ТСРО с 8012		TCPO d 8013
Output None -	Period (sec): 1	Output None Period (sec): 1
TCPO e 8014		
Output None -	Period (sec): 1	
	TCPO p	orts output settings

CAN tab

The *CAN* tab allows setting the parameters for configuring CAN ports of the receiver to establish connections via CAN interface. [2, 4.4.30 CAN Ports Parameters].

CAN a			CAN b			
nput Mode	cmd 🔹		Input Mode	cmd	•	
Dutput	None	 Period (sec): 1 	Output		•	Period (sec):
CAN Baud Rate	125		CAN Baud Rate	125		
irst SID for Input CAN Messages	0x700		First SID for Input CAN Messages	0x700		
he Number of SIDs for Input CAN	8		The Number of SIDs for Input CAN	8		
irst SID for Output CAN Messages	0x700		First SID for Output CAN Messages	0x700		
he Number of SIDs for Output	8		The Number of SIDs for Output	8		

CAN ports settings

Networking

The *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

The *LAN* tab – contains LAN DynDNS and DNS parameters described in [2, 4.4.25 Network Parameter].

General Log-files TriPad Positioni	ng Base Rover	Ports Networking Event Advanced	
LAN WLAN Server Client PPP			
IP		DDNS	
Receiver IP Address	172.17.254.41	DynDNS Receiver DNS Name (Alias)	"use 💪 Ins.or
Default Gateway	172.17.0.1	DynDNS Mode	off
Network mask	255.255.0.0	DynDNS Password	"passwd"
Maximum Transmission Unit (MTU)	1500	DynDNS State	off
MAC Address	"00:1 7f:2f"	DynDNS User	"user"
DHCP		by norto osci	use.
Switch DHCP client on/off off	v		
Current IP Address	172.17.254.41		
DNS Default DNS Server 172.18.0.11			



The 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].
- $\ensuremath{\textit{DNS}}$ addresses of the DNS server to use by default and the DNS

server used at the moment. [2, DNS Parameters].

WLAN tab

The *WLAN* tab provides parameters to configure the receiver to be a 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 AN WLAN Server Clier	Positioning Base	Rover Ports	Networking	Event	Advanced	
Mode		IP				
WLAN Error "n	ione"	WLAN Receive	er IP Address		192.168.0.51	
WLAN Mode o	n 🔻	WLAN Default	Gateway		192.168.0.1	
WLAN Connection State	sociated	WLAN Networ	'k mask		255.255.255.0)
		WLAN Maxim	um Transmissic	n Unit	1500	
		WLAN MAC A	ddress		"00100 i ;af;2	9:57"
		DHCP				
		Switch DHCF	client on/off	off	•	
		Switch DHCF	server on/off	off	•	
		Current IP Add	dress		192.168.0.51	
Access Point		Info				
WLAN Access Point ID	"00:00:00:00:00:00"	" /par/net	/wlan/inf/fccid	U9R-W	2CBW003	
WLAN Access Point SSID	"JANSS"	/par/net	/wlan/inf/ic	7089A-	W2CBW003	
works if WLAN Access Point	ID is 00:00:00:00:00:					
WLAN Access Point RSSI	172					
WLAN AP Mode	wpa 🔻					
works if WLAN Access Point	SSID is filled					
WEP WI ANI Key NI ********						
	_					
WLAN Key N						
WLAN Key N						
WPA						
WLAN WPA Passphrase	******					

WLAN parameters

The following parameters configure the WLAN:

- *Mode* mode (on, off, adhoc) and statuses.
- Access Point ID access point identifiers, received radio signal pow-

er 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: The light gray tips appear under the parameters, if necessary.

Server tab

The 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].

AN WLAN Server Client PPP					
TCP/FTP		HTTP		NTP	
TCP Port	8002	HTTP Port	80	NTP Error	NONE
TCP Connection Timeout	600	HTTP Connection Timeout	10	NTP Port	123
TCP Server TLS/SSL Mode	off ×	HTTP Server TLS/SSL Mode	off ×	NTP Requests	0
TCP Output Base Port	8010			NTP Replies	0
TCP Output Connection Idle Timeout	600			1	
FTP Port	21				
FTP Connection Timeout	2147483647				
TCP/FTP Password	"a"				

Server parameters

The following servers can be configured:

- TCP/FTP parameters allows
 - *TCP clients* to establish bidirectional connections to receiver. [2, TCP Server Configuration].
 - *FTP-standard clients* to download files (for example). [2, FTP Server Configuration].

• *HTTP* - parameters allows external program running in a WWW browser (see [4]) to establish bidirectional connections to receiver

on top of HTTP protocol. [2, TCP Server Configuration].

• *NTP* – parameters of the Network Time Protocol (NTP) for receivers that support it. [2, NTP Server Configuration].

Client tab

The *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.

General	Log-f	iles T	riPad	Positi	oning	Base	Rover	Ports	Networking	Event	Advanced
LAN V	VLAN	Server	Clier	nt PP	Ρ						
Client	_										
Mod	le							Raw TC	P Client		
TCP (Client N	lode		0	ff		~	Host Na	ame of Raw TC	P Server	r
TCP (Client C	onnec	tion Sta	ate o	ff			IP Addr	ess of Raw TCF	Server	172.17.0.65
TCP (Client Ti	imeou	t	rc	v			IP Port	of Raw TCP Se	ver	9091
TCP (Client E	rror		n	trip		1	Login fo	or Raw TCP Ser	ver	"bfa09aeb0eec" Y
				n	trips			Passwo	rd for Raw TCP	Server	"51949421716e"
				SI	snet		·	TCP-clie	ent RAW mode		off ~
NTRI	IP Clien	t						NTRIP	Server		
Host	Name	of NTR	IP Cas	ter "	•			Host N	lame	•	
IP Ad	ddress o	of NTRI	IP Cast	er 0	.0.0.0			IP Add	ress of NTRIP	Caster (0.0.0.0
IP Po	ort of NI	TRIP Ca	aster	0				IP Port	of NTRIP Cast	er (D
NTRI	IP User I	Name			•			NTRIP	User Name	•	
NTRI	IP Passw	vord			•			NTRIP	Password	•	
NTRI	IP Mour	nt Poin	t		•		~	NTRIP	Mount Point	•	
NME	A GGA	Period	for NT	rrip 0				NTRIP	Protocol Versi	on i	1
SISN	leT Clier	nt									
Host	Name	of SISN	VeT ""								
IP Ad	ddress o	of SISN	et 0.0	0.0.0							
SISN	et Passv	word									
IP Po	ort of SIS	SNet	0								
SISN	et User	Name									

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 **PPP parameters:**

(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

The *PPP* tab displays the 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)].

State		Details			
PPP Connection State	off	Enable PAP Authenticaion	on	v	
PPP Baud Rate	115200	Enable CHAP Authentication	on	v	
PPP Set Default Route	on v	Enable Van Jacobson Compression	off	v	
PPP Debugging	off ~	Enable Connection-ID Compression	off	v	
PPP Error	none				
Server		IP			
/par/net/ppp/srv/mode	off	Current IP Address 1* 28.213.13	14		
/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/wnds	cr off	1			
		1			

PPP parameters

- *State* the 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.

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	Positio	ning	Base	Rover	Ports	Networking	Eve	ent	Advanced		
PPS a PPS b													
Enable PPS Generation on			on	on 🔻			Enable PPS Generation					•	
PPS Reference Time utc		utc	utc 🔻		PPS Reference Time			utc		•			
Tie PPS to its Reference Time on		on	on 🔻		Tie PPS to its Reference Time			on		•			
PPS Perio	bd		1000	1000		PPS Period				1000			
Milliseco	Milliseconds of PPS Offset 0		0	0		Milliseconds of PPS Offset 0				0			
Nanosec	onds of PP	S Offset	0	0		Nanoseconds of PPS Offset		0					
PPS Refe	PPS Reference Edge rise		rise	se 🔻		PPS Reference Edge		rise		•			
PPS Puls	e Length		2000	2000000		PPS Pulse Length		2000	000				
Period of	f Marked P	PS Pulses	0			Pe	Period of Marked PPS Pulses		ses	0			
Length o	ength of Marked PPS Pulses 300		3000	3000000		Length of Marked PPS Pulses		3000000					
Event a Event b													
Enable E	Enable Event Acquisition			off			 Enable Event Acquisition 		ion		off		•
Event Re	Event Reference Time		L	utc			▼ Event Reference Time			utc			•
Tie Measured Event Time to its		its o	on		▼ Tie Measured Event Time		ïme	to its on		•			
Event Reference Edge		r	rise			Event Reference Edge			rise	rise			
Synchronize Receiver Clock with		vith	h off			 Synchronize Receiver Cloc 		ck with off			-		
Status of the Receiver Clock			off			Status of the Receiver Clo		r Clo	ck	off			
/par/dev	/par/dev/event/a/offs/ns			0			/par/dev/event/b/offs/ns				0		
													Ŧ

Event parameters

The following parameters are available:

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

Advanced

Tab Advanced 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 Measurements Parameters Anti-jamming Parameters].
General Log-files TriPad P	ositioning	Base Ro	ver Ports	s Networking	Event	Advanced				
Anti-Interference Multipath F	eduction	Loop Mana	gement	External Freque	ncy R	aw Data Mana	agement	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 gps	у	•								
										-

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].

l	General	Log-files	TriPad	Positioni	ng Base	Rover	Ports	Networking	Event	Advanced				
	Anti-Inte	erference	Multipat	h Reductio	n Loop N	lanagem	ent	External Freque	ncy R	aw Data Man	agement	Attitude parameters	Asic parameters	
	- Multip CA/L1	ath Reduct Code Mult	ion path Red	uction m	pnew	•								*
	CA/L1	Carrier Pha	se Multip	ath mj	pnew	•								
														Ŧ

Multipath Reduction parameters

Loop Management tab

The Loop Management tab contains tracking loop parameters.

Note: We do not recommended to change them from their default values [2, 4.4.4 Measurements Parameters Tracking Loop Parameters].

Anti-Interference Multipath Reduction	Loop Management	External Frequency Raw Data	Management Attitude parameters Asic param	neters
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			

Loop Management parameters

The following parameters are available:

- CLL Tracking Loops parameters for Code Lock Loop.
- PLL Tracking Loops parameters for Phase Lock Loop.

External Frequency tab

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

General Log-files TriPad	Positioning Base F	Rover Ports Networking Even	t Advanced		
Anti-Interference Multipat	h Reduction Loop Ma	nagement External Frequency	Raw Data Manage	ment Attitude parameters Asic para	ameters
Frequency Input and Outp	ut Parameters	Oscillator Parameters		Calibrator	
Input Frequency Amplitude	off	Oscillator Frequency Offset of	f 🔻	Calibrator Mode	alt 🔻
Input Frequency Value	10			Use Calibrator Measurements	off 🔹
Input Frequency Status	off			Calibrator Measurements Availability	n
Frequency Mode	off 🔹				
Output Frequency Value	20				
					*

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.

seneral leog mes i nin da i rostaonin	ng Base Rover Po	rts Networking Event Advanced		
Anti-Interference Multipath Reductio	n Loop Management	External Frequency Raw Data Man	agement Attitude paramet	ters 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		
		Doppler Smart Smoothing Mode.	off 🔹	
				-

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 configure and calibrate multi antenna receiver (see documentation on Duo and Quattro and [2, 4.4.8 Phase Differential (RTK) Parameters Attitude Parameter].

nti-Interference	Multipat	n Reduction	Loop N	lanageme	ent Exte	ernal Freque	ency R	aw Data Man	agement	Attitude par	ameters	Asic param	neters
Antennas length				Baselin	ne vectors	5			Calibrat	or			
Distance between	A and B	0.001000		X coord	dinate of	vector AB	0.00100	00	Start Sel	f-calibration	off	•	
Distance between	A and C	0.001000		Y coord	dinate of	vector AB	0.0000	00	Use con	straints	on	•	
Distance between	A and D	0.001000		Z coord	dinate of	vector AB	0.0000	00	Angle D	etermination	on	•	
				X coord	dinate of	vector AC	0.0000	00					
				Y coord	dinate of	vector AC	0.00100	00					
				Z coord	dinate of	vector AC	0.0000	00					
				X coord	dinate of	vector AD	0.0000	00					
				Y coord	dinate of	vector AD	0.0000	00					
				Z coord	dinate of	vector AD	0.00100	00					

Attitude parameters

The following parameters are available for the multi antenna 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 the processor clock frequency and displays current DSP (digital signal processor) sampling frequency (4.4.35 Miscellaneous parameters).

General	Log-files	TriPad	Positioning	Base	Rover	Ports	Networking	Event	Advanced				
Anti-Int	erference	Multipa	th Reduction	Loop	Managen	nent	External Freque	ncy f	Raw Data Man	agement	Attitude parameters	Asic parameters	
Freque	ency												*
ASIC F	requency	7	70.0	•									
ASIC C	urrent Freq	uency 7	0.0										
													Ŧ

Asic parameters

Save / Load Configuration

All parameters from all tabs can be saved to the *tcl*-script (see Appendix 2. TCL-script example). And then the saved parameters can be loaded to this or another receiver,

To save configuration click button *Configuration* > *Save* and select file

for saving.

arameters										K
General Log-files T	riPad Positio	oning Base	Rover	Ports	Networking	Event	Advanced			
General Elevation Mask				- Pov	ver Manageme lodes	ent				^
Elevation Mask for	SVs Locking	-1		Ba	attery Charging	Mode	auto	¥		
Elevation Mask for	5		En	nable Power Ou	utput	off	¥			
Antenna			1	Lo	w Power Mod	e	on	¥		
Antenna Input	int	~		Pc	ower Off		on	¥		
Antenna Current In	put int]	Sle	eep Mode		off	Ŷ		
Status of External A	ntenna off			Vo	oltages					
				Ex	ternal Power V	/oltage	11.19			\sim
Apply								C	onfiguration	•
									Save	
		CTRL to ON/	OFF the f	tips,				•	🗧 Load	
										~
										~

General Log-files IriPad Positioning base Rover Ports Networking Event Advanced General Power Management Elevation Mask Modes Elevation Mask for SVs Locking -1 Battery Charging Mode auto Elevation Mask for Position... 5 Enable Power Output off Antenna Low Power Mode on Antenna Input int Power Off on Antenna Current Input int Sleep Mode off Status of External Antenna off Voltages External Power Voltage 11.15 Apply Save Configuration Script Asic parameters is saving Configuration -4

Saving the configuration

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

🗸 Open						×
$\leftarrow \ \ \rightarrow \ \ \checkmark \ \Lambda$	🔮 « N ⁻	'kina → Documents	~ Ū	Search Documer	nts	م
Organize 🔻	New folder				= - [
💻 This PC	^	Name	^	Date mod	ified	Туре
📃 Desktop		3W10.tcl		1/18/2017	1:59 PM	TCL File
撞 Documen	ts					
🕂 Download	ls					
👌 Music						
Pictures						
📑 Videos						
🏪 Local Disk	: (C:)					
🛖 media (\\f	fs-2.qn 🖌 🔞	۲				>
	File <u>n</u> ar	ne: 3W10.tcl	~	Tcl script		\sim
				<u>O</u> pen	Can	cel

Load configuration from script

After the board compatibility is checked the script will be loaded to the

Save / Load Configuration menu

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

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

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

receiver.

The result will be displayed in the Manual Mode pane.

Cheking receiver			
Correct board: TRIUMPH_3			
Setup receiver configuration			
Setup General			
> %/par/lock/elm%	OK		
> %/par/pos/elm%	OK		
> %/par/ant/inp%	OK		
> %/par/pwr/charge/bat%	OK		
> %/par/pwr/out/ab%	OK		
> %/par/lpm% OK			
> %/par/power% OK			
> %/par/sleep% OK			
Setup Log-files			
> %/par/log/a/sc/period%	OK		
> %/par/out/elm/cur/file/a%		OK	
> %/par/out/minsvs/cur/file/a%		OK	
> %/par/cmd/create/pre/a%		OK	
> %/par/log/imp/0%	OK		
> %/par/log/b/sc/period%	OK		
> %/par/out/elm/cur/file/b%		OK	
> %/par/out/minsvs/cur/file/b%		OK	
> %/par/cmd/create/pre/b%		OK	
> %/par/log/imp/1%	OK		
> %/par/log/rot/mode%	OK		
> %/par/log/rot/force%	OK		
> %/par/log/rot/rmold%	OK		

Configuration tcl-script loaded

Limited Manual Mode Pane

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

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

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



Manual Mode pane. Command input

The Manual pane consists of the following elements:

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

set/par/ant/inp,ext		🖌 🗋 🖌						
%print_dev/blt/a:on% /par/dev/blt/a={rate=115200,rtscts=off,rts=on, cts=off,bits=8,parity=N,stops=1,ir=off, oframe=_fine;id=11001apottb=1000 print_par/base/:on print_dev/blt/a={rate=115200,rtscts=off,rts=on, print_par/base/:on print_par/base/:on p								
delay=0.000},	print, dev/bit/a.on							
<pre>imode=cmd,omode=std,echo=/dev/hull,eoff="#OFF#", ewrap=off,wsize=128,dup=/dev/hull, ins=(</pre>								
0={mode=none,id=-1,skip=y,port=""}, 1={mode=none,id=-1,skip=y,port=""}								
2={mode=none,id=-1,skip=y,port=""}, here {cide=0019704026 million", news"								
rssi=unknown}) OK								
> %print,/par/base/:on% /par/base={ mode={rtcm=off,cmr=off,jps=off,rtcm3=off,								
gbas=off)} OK								
> %set/par/ant/inp.ext% OK		~						

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.

Operations with the files

The NetView & Modem software provides a 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, download file from the receiver or delete it.

× TR1 TRIUMPH1 3W10... Reports - Actions - Update Options - Update Firmware ĸ Main Files Info Measurements Name Size Modified log0119v 4.42 MB (4632638) 1/19/2017 6:31:11 PM arameters ★ Settings log1214d 3.12 MB (108127760) 12/14/2016 8:37:49 AM log1216b 7.71 MB (8084952) 12/16/2016 1:59:42 AM pectra log0113k 8.04 MB (8430857) 1/13/2017 3:59:41 PM Collecting. log01131 7.72 MB (8093125) 1/13/2017 4:59:41 PM Modem log0113e 5.46 MB (5721138) 1/13/2017 9:59:41 AM 8 log1216p 8.28 MB (8681692) 12/16/2016 3:59:42 PM Options log0114q 7.21 MB (7560353) 1/14/2017 4:59:41 PM Actual log0113g 7.92 MB (8303698) 1/13/2017 9:59:41 PM -Greis Commands 7.92 MB (8204728) 1/15/2017 7.50.41 AM log0115h o ----Download log0112e 8.57 MB (8 ₹ O Cancel File Transfer Real-Time Logging 7 log0115o 6.91 MB (7 -6.97 MB (7 🗙 Delete /dev/usb/a log0115v log0116a 7.07 MB (7413759) 1/16/2017 12:59:41 AM = log0114u 7.33 MB (7688551) 1/14/2017 8:59:41 PM 1.78 MB (1862013) 1/13/2017 7:59:41 AM log0113c log0116c 6.51 MB (6824113) 1/16/2017 2:59:41 AM Ţ A log0119v (a) **B** () X Delete All Memory (Free/Total) 132.87 MB / 1.83 GB Total files 219 New File Settings Free Event Name: Site name Elevation mask(°): 5 C Recording interval(s): 1.00 C Antenna Height, m: 0 🗘 📃 Slant Send Antenna Free Event # Connected dev/tcn/a File list undating

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

File window.

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

Name

• Size

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

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

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

Start/Stop File Recording

Under file list the pane for file recording is located.

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

To configure a new file:

- Type file Name or leave the field empty to get default name.
- Specify the *Elevation Mask*, the parameter for excluding the satellites whose elevation angles are less than the specified value.
- Specify the Recording interval of output.
- Check the Antenna Free Event if desire to send the following free events when file is starting:
 - " DYM=STATIC"
 - "_ANT="
 - " ANH="
- The values for _ANT and _ANH can be specified on the Free Event pane.

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

Iog0119u	X Delete All Memory (Free/Total) 86.37 MB / 1.83 GB
New File Settings Stop File A	Free Event
Name:	Site name:
Elevation mask(°): 5 - Recording interval(s): 1.00 -	Antenna 👻
Send Antenna Free Event	Height, m: 0 🗘 🔲 Slant

File recording

Click the *Start* button next to the red circle A or B to start *log-file* a or *log-file* b.

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

Files														Ľ
	Name	•	Size		Modi	fied		Rec	S	tate				^
	test		6.46 MB (5769002)	12/30	/2016 2:22:18	PM		₹				×	
	msur1211n	n.jps	1.47 MB (1540096)	12/16	6/2016 5:21:34	PM		₹				×	
	msur1021e	e.jps	256.00 KB	(262144)	12/16	6/2016 1:32:38	PM		₹				x	
	log1230b		1.61 MB (1686836)	12/30	/2016 1:23:14	PM		₹				x	
	log1230a		41.92 MB (43	3957895)	12/30	/2016 6:09:27	PM		₹				×	
	loa1216a		8.78 MB (9201419)	12/16	/2016 4:59:42	PM		₹				×	
🗸 St	art File		-		\times	2016 3:59:42	PM		₹				x	
	Filet	test is	s already exist	ts.		2016 1:59:42	PM		₹				x	
	Arrend		0	C	-1	2016 12:59:42	2 PM		₹				x	
L	Appena		Overwrite	Cano	ei .	2016 10:59:42	2 AM		₹				x	
	log1216i		8.05 MB (8	8438803)	12/16	6/2016 8:59:42	AM		₹				x	
	log1216h		7.65 MB (8	8017639)	12/16	/2016 7:59:42	AM		₹				x	
	log1216g		7.05 MB (7390740)	12/16	/2016 6:59:42	AM		₹				×	,
<													>	
۵	log0119v	۲	0 🕑			Total files 223	(🗙 Delet	e All	Memory (Free	e/Total) 82.9	99 MB / 1	1.83	¢
Ne	w File Settin	ngs						Free Eve	nt					
Na	ame: test							Site nar	ne:					
F	levation ma	ck(0).	5	Recording	, inten	(a)(c): 100	9	Antenn	a		-			
		isk().		Recording	Jinten	/ai(s).		Height	m: 0	Slant				
	Send Ante	enna	Free Event					neight,		y Sidiri				
														_

Existing file is started

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

Download Files

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

Files									ĸ
	Name 🔹	Size	Modified	Rec		State		Info	^
	test	6.46 MB (6769002)	12/30/2016 2:22:18 PM		₹		×		
	msur1211m.jps	1.47 MB (1540096)	12/16/2016 5:21:34 PM		₹		×		
	msur1021e.jps	256.00 KB (262144)	12/16/2016 1:32:38 PM		₹		×		
	log1230b	1.61 MB (1686836)	12/30/2016 1:23:14 PM		₹		×		
	log1230a	41.92 MB (43957895)	12/30/2016 6:09:27 PM		₹.		×		
	log1216q	8.78 MB (9201419)	12/16/2016 4:59:42 PM		₹		×		
	log1216p	8.28 MB (8681692)	12/16/2016 3:59:42 PM		₹		×		
	log1216n	8.50 MB (8915858)	12/16/2016 1:59:42 PM		\odot	Waiting	×	C:\Users\I kina\Desktop	
	log1216m	8.39 MB (8800525)	12/16/2016 12:59:42 PM		\odot	Waiting	×	C:\Users\I ina\Desktop	
	log1216k	8.65 MB (9067889)	12/16/2016 10:59:42 AM		\otimes	Downloading 68% (5.94 MB)	×	C:\Users\Montheta orkina\Desktop	
	log1216i	8.05 MB (8438803)	12/16/2016 8:59:42 AM		₹	✓ Downloaded (/dev/tcp/a - 442.93 KB/s.)	×	C:\Users\Iorkina\Desktop	
	log1216h	7.65 MB (8017639)	12/16/2016 7:59:42 AM		₹		×		
	log1216g	7.05 MB (7390740)	12/16/2016 6:59:42 AM		₹.		×		\sim
۵	log0119v 🖲	0	To	otal files	223	X Delete All Memory (Free/Total)	82.7	4 MB / 1.83 GB	
Ne	ew File Settings			Free B	vent				
N	lame: test			Site	name				
		E Presedie	- internal (n): 100 *	Ante	nna	· ·			
			g interval(s):	11-1-		0 Clant			
	Send Antenna	Free Event		Heig	nı, m	0 - Starre			
ev/tcp	/a File	Transferring log121	6k (/dev/tcp/a)						

Download files

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

Delete Files

Select the files you want to delete and click the *Delete* button in the line or in the context menu. The confirmation message will be displayed. Click *Yes*. The selected file will be deleted.

Name 🔹	Size	Modified	Rec		State				Info	
test	6.46 MB (6769002)	12/30/2016 2:22:18	M	Ŧ				×		
msur1211m.jps	1.47 MB (1540096)	12/16/2016 5:21:34 F	м	₹				×		
msur1021e.jps	256.00 KB (262144)	12/16/2016 1:32:38	M	₹				×		
log1230b	1.61 MB (1686836)	12/30/2016 1:23:14	м	₹				×		
log1230a	41.92 MB (43957895)	12/30/2016 6:09:27	м	₹				×		
log1216q	8.78 MB (9201419)	12/16/2016 4:59:42 P	м	₹				×		
log1216p	8.28 MB (8681692)	12/16/2016 3-59-42	м	-				×		
log1216n	8.50 MB (8915858)	12/ Confirmation				\times	- 672.92 KB/s.)	×	C:\Users\NDvorkina\Deskte	0
log1216m	8.39 MB (8800525)	12/					- 691.53 KB/s.)	×	C:\Users\NDvorkina\Deskto	c
log1216k	8.65 MB (9067889)	12/' 🔊 Do y	ou really wan	t to del	ete 4 files from receiver?		- 542.63 KB/s.)	×	C:\Users\NDvorkina\Deskte	c
log1216i	8.05 MB (8438803)	12/					- 442.93 KB/s.)	×	C:\Users\NDvorkina\Deskto	c
log1216h	7.65 MB (8017639)	12/						×		
log1216g	7.05 MB (7390740)	12/			Yes No			×		
log0119v 🖲	0 🕑		iotar nies	. 223		ivier	nory (Free/Total)	81.6	2 MB / 1.83 GB	
ew File Settings			Free	Event						

Delete files

While deleting the files window is disabled. The removal of a large number of files can take some minutes. To remove all files just click the button Delete All without selecting the data.

GNSS Spectra

The *Spectra* tile allows collecting, displaying and storing measurements of the GNSS interference.



GNSS-spectra for SIGMA receiver in process (GpsL1)



GNSS-spectra for TRE-3 finished (W5)

The number of spectra depends on 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 the 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

- Enter the Title;
- Specify the Samples to Average Time Interval of Incoherent Spectrum Data Accumulation;
- Specify the Mode (mean, min, max) Spectrum Averaging Mode;
- 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 button Stop.

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
- Double click to open plot in the separate window.



GNSS-spectra plot zooming and panning



GNSS-spectra plot in separate window

The plots can be processed for analyzing the different aspects of the interference. Expand the Plot Settings group, specify processing settings and click *Apply*.

Plot Settings are the following:

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

Click the *Clear* button to return to the original plot.



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

easurements Sky plot Spectra Radio Spectra Metrics Orientation Options Base/Rover Settings GpsL1 GpsL2 GpsL5 GloL1 GloL2 GloL3 Summary Test_1 ext 10 mean -1* 3% 50 /- 8+ W. G- U- C 10/29/2015									
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				

GNSS Spectra Summary

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

formation to the particular file.

- Save all Saves all spectra to the selected folder.
- *Save Plots* Saves the plots (all bands) as png-files to the selected folder.

Spoofing Detection

Spoofing detection is available for firmware beginning with 4.1.0.0 and requires the Spoofing Detection (_SPF) option.

User interface is provided in NetView & Modem 2.2.7.0 or higher.

Short description of spoofing/jamming detection algorithm

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

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

Spoofing Option

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

otions								Ŀ
Option	▲ Current	Purchased	Leased	Date				
(TK mode (Hz) (PDIF)	100	511	511	3/12/2021				
TPK (RTPK)	1	0	511	3/12/2021				
erial Port A (Kbps) (RS_A)	460	511	511	3/12/2021				
erial Port B (Kbps) (RS_B)	460	511	511	3/12/2021				
erial Port C (Kbps) (RS_C)	460	511	511	3/12/2021				
erial Port D (Kbps) (RS_D)	460	511	511	3/12/2021				
pectrum (SPEC)	1	511	511	3/12/2021				
poofing Detection (_SPF)	1	0	511	3/12/2021				
CCL (TCCL)	31	511	511	3/12/2021			_	
CP Connections (_TCP)	5	511	511	3/12/2021				
CP Output (TCPO)	5	511	511	3/12/2021				
LS/SSL Encryption (_TLS)	1	511	511	3/12/2021				
DPO (UDPO)	5	511	511	3/12/2021				
IHF (UHF)	511	511	511	3/12/2021	_			Ŧ
in 🗗 Paramet	ers 🗗 Files	GNSS Spectr	a 🛃 Spoof	ing 🖸	Modem	ď	Levels Com	ipass 🗗
nfo 🗙 Measur 💥 Setti	nos Total: 8	M Interfere.			0 0	W	Q	3 11.62

Spoofing	Option
----------	--------

Detail spoofing detection information can be obtained on Spoofing Tile.

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

Information about spoofing mode is presented on the main tile.

Spoofing Tile

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

The following settings configure spoof detecting:

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

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

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

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

The table contains available signals for each satellite system.

Obtained data fill the table.



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

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

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

• Noise Deviation. It is red if greater than 100. It means that signal is jammed and dark yellow "J!" appears near the signal header.

Expand system to see satellites information.

poofing										
Disable Spoofing De	rtails 📕		Mod	e 🗌 Use spo	ofed in position 🖌 Dep	pendent Lock Last Mes	sage 3/19/2021 9:48:27 AM	Collapse All		
GPS	21	255	63	2/565						
GPS	23	140	77	16422					159 72	143
GPS	24	171	63	-48680						
GPS	28	456	66	-32258						
GPS	30	411	80	-15835						
GPS	32	117	104	4105						
 GLONASS (11) 		Satellite Noise	CA/L1 es: 11 S Mean: 79	poofed: 1 Dev: 85	PI	P2	CAVL2	B		
GLO	-7	525	52	46379						
GLO	-4	275	58	-71624						
GLO	-2	218	55	-8806						
GLO	-1	524	50	-88649						
GLO	0	1285	39	-25244						
GLO	1	610	64	29941						
GLO	2	481	135	-26418						
GLO	3	270	53	-126810						
GLO	- 4	499	41	-65166						
GLO	5	878	51	-27592						
GLO	6	259	50	-112720						
 SBAS (WAAS, EGN 	OS) (2)	Satellite Noise	LI J! ss:2 S Mean: 86	poofed: 0 Dev: 108				15		
WAAS	130	109	86	-22873						_
WAAS	185	139	70	26392						
			E1		65	E50	56	ESA		

Detail satellites info. GPS and SBAS are expanded. GPS/CA – spoofed and jammed, SBAS/L1 – jammed

Spoofing table contains the following columns:

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

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

Main Tile

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

	ID Model Serial No Firmware Board Kernel	H3CD437E87 TRIUMPH3 00001 4.1.00+b0-21 TRIUMPH3_3 4.9.146-javad	941F100 Vendo 0310-03	E208009 r JAVAD 3-9266 uild 16	23 9 GNSS		U M N C Re	pTime lemory (U umber of log0310 ommunica	sed/Total) files 13 ation Inter ation ID	2d19h3 1.20 / 1 faces B- 4095~(1	7m21s 11.13 GB W- G- U- 0.99 km 55	C- Spoof *42'0.29'N 37*	ing Mod 31'45.02"	e 🖌 Us E 246.64 n	e in pos.
 Measurements 		Satellite	s Sk	Plot	RTK End	ines	RTPK								
Latitude	55*47'55.248521*N 37*31'14.329932*F	Svs	Num	FI	Az	SNR						Track Time	Status	Health	Cont.Tr
Ellipsoidal height	377.1290983 m	4 GPS : (13)			CA	P1	P2	L2C	LS	LIC		- Latos		
Position SEP	0.0119226 m	GPS	5	8	230	39	32	32	37			02:49:25	57	1	8099 /
Position RMS	0.0119226 m	GPS	7	14	102	34	30	30	40			06:05:07	30	1	21907 /
Velocity RMS	0.0108393 m/s	GPS	8	17	36	39	23	23	39	42		03:09:48	30	1	8980 /
HRMS	0.0073723 m	GPS	11	12	210	44	26	26				00:19:06	29	1	1146/-
VRMS	0.0093701 m	GPS	13	68	244	47	38	38				01:40:16	30	1	6006 /
RTK fixed (Phase of	siff)	GPS	14	76	120	49	42	42	53	51	51	03:06:52	57	~	10044 /
PDOP	0.8791682	GPS	15	42	294	39	33	33	46			00:29:22	57	1	1762 /
HDOP	0.5419648	GPS	20	15	320	46	27	27				00:03:23	30	1	204/
VDOP	0.0922307	GPS	21	9	62	39	25	25				00:36:19	30	~	2109 /
Receiver Date	2021:3:19 (GPS) 07:43:47	GPS	23	15	328	45	27	27	42	44	44	01:06:03	30	1	3313 / 3
Clock Offset	0.0000135 s	GPS	24	10	284	35	21	21	41	43		00:22:35	30	1	1150 /
Osc. Offset	0.0000793 ms/s	GPS	28	77	146	44	35	35				02:49:45	30	1	6031/-
 Links 		GPS	30	50	104	48	48	48	48	48		04:50:45	57	1	17432/
Link Id	/tcpcl/a	- GLO : (9)			CA	P1	P2	L2C	B					
Station Id	4095	10	£ /4	77	200	40	*0	47	40			03.64.44	50	1	10401 /
Time elapsed sin. Received messa	. 000 688109										Spoofed	Jamm	ned 📃	Spoofer	d and Jan

Spoofed and Jammed flags in the main satellite table.GPS/CA jammed, 21-st satellite also – spoofed.

Configuring the Modem

Expand the *Modem* tile to configure an internal modem or pair an external one.

The *Modem* tile has the toolbar for selecting driver, pairing and daisy chaining and also spectra and parameters tabs.

TR1 TRIUMPH1 3W10
Reports • Actions • Update Options • Update Firmware •
Main Diver Vectors Options Pair Vectors Daisy Chain Vectors Vectors
Output Power 30 Model unknown Frequency 44000000 Configuration • CTRL to ON/OFF the tips. • • • • • • • • • • • • • • • • • • •

Modem Tile

The toolbar contains:

- The Driver drop-down list allows selecting the modem driver.
- Port displays the port which is assigned to the selected driver.
- *Mode* displays the selected driver mode.
- The *Pair* drop-down list and the button allow selecting the modem from the list of the available ones and start to pair via Bluetooth.
- The Daisy Chain drop-down list and button allow selecting the www.javad.com

channel and start daisy chaining.

External Modem via Bluetooth

NetView & Modem provides the possibility of interfacing between modems and receivers. So external modem and receiver can be paired via Bluetooth. Connected modem is available in the Pair drop-down if it is not paired yet.

Devices	S TRIUMPH2 00003	3 TRIUMPH2 04EO	×
▲ Receiver 2	Reports + Actions +	Update Options + Update Firmware + Start pairing	
• 🖘 TR1 TRIUMPH1 3. 🗶	Main Info Measurements	Modem Driver b Pair AW900BT RADIO Driver b Daisy Chain	8
TRIUMPH2 00003 1 X	Parameters	Port_dev/bit/b_Mode_off	-
Modem 1	Files 🖸	Info Parameters	
o 🧼 AW900BT RADIO 🗙	Spectra	General Auto	*
	Collecting	Modem Mode off • Prefer L-Band Receiver • Current Mode Prefer UHF Receiver •	E
	Actual	Receiver Port the Modern is /dev/blt/b ID unknown	
	Greis Commands 🔊	Modem Control State off Model unknown Last Detected Modem Error none	

Select modem for pairing

Follow the next steps to pair modem to the receiver:

- Select the Driver;
- Set Port to dev/ser/blt/a (b);
- Set Mode to off;

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

- Select the modem from *Pair* drop-down list;
- Click Pair to start.

Devices	STRIUMPH2 00003 TRIUMPH2 04EO	×
▲ Receiver 2	Reports + Actions + Update Options + Update Firmware +	
• 🖘 TR1 TRIUMPH1 3. 🗙	Aain 🖪 Modem	
• - TRIUMPH2 00003	Info Messurements Driver b Pair Pair Pair Driver D Driver D Pair Pair	8
▲ Modem 1	X Settings Unpair	
• AW900BT RADIO X	Josab 5 Modem a Wodem B General Auto	A
	Let Collecting Modem Mode off Prefer L-sand keever	
	Actual Receiver Port the Modern is /dev/blt/b ID unknown	

External Modem via Bluetooth paired

Paired modem is displayed under the Pair drop-down list and followed

by the Unpair button. It can be unpaired by the same procedure.

Daisy Chaining

An internal modem can be accessed by daisy chaining. To start daisy chaining select the channel from the *Daisy Chain* drop-down list and click the *Daisy Chain* button.

🤝 TR1 TRIU	MPH1 3W10	Click for drive chairing
Reports 👻 Actio	is ▼ Update Options ▼ Update Firmware ▼	Click for adisy-chaining
Main	Modem	
Info Measureme	nts Driver c Y Pair	✓ Ø Daisy Chain dev/tcp/c ✓ 𝒞
Parameters	Port dev/ser/d Mode uhf	Connect in
Files	Info Parameters	
Total: 232	Modem c Modem a Modem b Modem d	

Daisy chain via tcp/c

After connecting full info about the modem will be displayed and firmware updating will be available.



Internal Modem connected by daisy chain via tcp/c

Internal modem window contains the Log pane which displays all com-

mands which were send to the modem and responses. Content of the Log pane is also stored to the log file.

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

Modem Firmware update

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

Updating from a file

Click From File and choose firmware file using Open File dialog window.

Updating from Internet

Click *From Website*. The firmware file will be downloaded from the site and checked.

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



Internal Modem Firmware updating confirmation

The status bar at the bottom of the window shows the process progress.

Internal Modem Firmware updating

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

Radio Parameters

The Parameters tab - contains up to four sub-tabs called *Modem c*, *Modem a*, *Modem b*, and *Modem d*. All 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.

Note: 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 corresponding tabs.

The *Parameters* tab is arranged like *Parameter* tile (see Configuring the Receiver chapter)

The *Configuration* button saves/loads all radio parameters to the tcl- Pairing process is described below. script.

Moder K Driver c 🗸 × 8 Pair Ø Daisy Chain Port dev/ser/d Mode uhf Info Parameters Modem c Modem a Modem b Modem d Genera Auto Modem Mode Prefer L-Band Receiver off Prefer UHF Receiver on Current Mode master ID unknown Prefer UHF Receiver slave Receiver Port the Modern is.. /par/modem/c/auto/prefer/uhf Model unknown gprs Modem Control State Access: Read & Write access cdma Default Value: on Last Detected Modem Error uhf Type: boolean Values: on.off fh UHF Radio FH Radio Cellul Receiver Beacon Receiver Prefer UHF receiver when UHFSSRX board is dete lband Mode TX heacon Output Power 30 auto unknown Frame Counter 0 440000000 Frequency 0 Product ID unknown Byte Counter Protocol Type simrx 0 Serial Number unknown Current Bytes Call Sign "unknown unknown Hardware revision Temperature Software version "unknown" Output Power unknown BootLoader version "unknown Power Supply Voltage unknown FCC ID unknown RX IC ID UHF RSSI unknown unknown Apply Configuration --ਦ 🗋 🛃

The Limited Manual Mode pane is also provided.

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 the button for pairing with an external modem

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

Current Mode	uhf				
Receiver Port the Modem is	/dev/ser/c				
Jodem Control State	ready				
ast Detected Modern Error	none				
Auto	none				
Prefer L-Band Receiver	~				
ID 28					
Model IMF	1400				
Linit		External Modem via E	Bluetooth		
JHF Radio FH Radio Cellu	ular module L-Band	Receiver Beacon Recei	iver		
Mode		Info		ТХ	
UHF Modem Output Power	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	simrx	Hardware revision	"Ver. 2.0"	UHF RSSI -146	dBm
	simtx	Software version	"Ver. 3.2 Rev 04 B17"	UHF BER 0E-0	l de la constante de
	simrtr	BootLoader version	"Ver. 3.0 Rev 01"	-Sean	
	tmotx	MCU firmware version		Start frequency	40600000
	tmotr	FCC ID	WJ4LMR400	Stop frequency	47000000
	trmtx	IC ID	3504A-LMR400	Frequency step	12500
	trmtr tt450shwrx =			Mode	
	tt450shwtx			Timesut	1500
	tt450shwtr trmm3rx			Timeout	1300
	trmm3tx			Go to Spectra	
Simplex (Javad) Protocol	trmm3tr trmm2rx Pr	otocol Trimtalk 450S Pi	rotocol TT450S(HW) Pro	otocol Trimmark	3 Protocol Trimmark II/IIe Protocol Satel Protoco
Settings	trmm2tx				
Modulation Type	stirx				
Channel Bandwidth	stitx				
	1200				

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)

Levels and Compass calibration

JAVAD receivers can be equipped with internal compass and levels that allows controlling device orientation parameters. Currently, TRIUMPH-2 and TRIUMPH-1M models are shipped with internal compass and levels. Levels and Compass should be calibrated for proper operation. You can check calibration and calibrate those using NetView & Modem. For this launch NetView & Modem and connect to the receiver via Bluetooth. If the receiver is equipped with internal levels and compass the "Levels Compass" tile will appear.

eiver 1	Reports * Actions *	50 TRIUMPH2 03 Update Options •	V44M5AU6Y0336KJY Update Firmware •	SSK6TU96										1
TRIUMPH2 X	Parameters C	Main												
	¥ Settings		ID		*** D336K	JYSSK6T	U96		UpTim	e	2:001	100m39s		Connections 1
	Files C [*]	Inco	Model	TRJUMPH2					Memo	ry (Used	(Total) 73.00	0 M8 / 2.01 G8		× dev/bit/a
	Total: 79	Contraine 1	Serial No	OL										
	GNSS Spectra		Firmware	3.7.5 Dec,06	2018				Comm	unication	Interfaces	R+ W+ G- 15-0		
	₩ Interfere		Board	TROOMPTIZ,					Com		in ander tooles			
	Modem r2	 Measureme 	Satelliter	Sky	Plot									
		Latitude	55"47"55.213408"N 37"31"14.263995"F	Sys 🔺	Num	B	Az	SNR					Track Time	Status
	Canada Canada and	Ellipsoidal height	381.7593297 m	# GPS :	(10)			CA	P1	P2	L2C	LIC		
		Position SEP Velocity 2D	2,4997360 m 0,0080174 m/s	GPS	3	8	12	40	15	15	39		00:28:28	3
	V 129109	Position RMS	2.4997358 m	GPS	6	48	90	53	39	39	48		00:44:07	3
	Options 🖸	Velocity RMS	0.0258849 m/s	GPS	12	82	278	56	43	43	50		01:03:08	3
	III Actual	Stand Alone		GPS	14	20	314	43	23	23			00:07:54	3
	Output C?	PDOP	1.1171408	GPS	17	12	58	46	23	23	40		01:03:07	3
	Ports Message	HDOP	0.6634251	GPS	19	33	62	51	36	36			01:03:41	3
		VDOP	0.8988163	GPS	24	38	186	43	25	25	42		01:03:28	3
	Greis Commands	Receiver Date	2019:3:21 (GPS)	OPS	25	45	284	50	39	59	49		01:02:49	3
	0	Clock Offset	0.0003359 s	OPS .	29	10	232	50	32	52	44		003644	3
	Real-Time Log	Osc. Offset	0.0000338 ms/s	4 610 1	34	20	299	61	33 P1	33 P2	4/		00.34.30	3
	0	 Links 		GIO	6/-4	7	304	35	33		-		00:01:41	1
	1 m			GLO	7/5	17	352	40	40	39	40		00:53:19	6
				GLO	15/0	82	288	48	47	46	46		01:03:42	3
				GLO	16/-1	27	314	40	38	43	44		00:02:27	3
				GLO	17/4	62	190	46	45	46	46		01:03:03	3
				GLO	18/-3	13	208	39	40	38	40		00:25:44	3
				GLO	23/3	14	36	37	37	33	34		01:03:06	3
				GLO	24/2	60	52	43	42	36	37		01:03:26	3
				4 COAC .	(4)			CA.						

Levels Compass tile

Green check marks on the bubble and compass icons mean that the device considers it as calibrated. Otherwise, red x-sign will be displayed. The number next to the compass icon is a heading value. To check the calibration or calibrate Levels and/or Compass, maximize the tile.

Calibration check procedure

If Levels and Compass are already calibrated, make sure that calibration is still proper.

Levels

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

Compass

Heading value is the correct direction. You can use another compass to check this. Ideally, the compass should be calibrated before every usage due to a change in the magnetic environment.



Levels Compass are calibrated

Removing Levels Offsets

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

Calibration

If Levels and Compass are not calibrated, you will see the pictures with the calibration invitation. The Pitch, Roll, Heading values are not available. Note, the Levels should be calibrated firstly.

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



Levels Compass are not calibrated

Levels calibration

After *Levels Calibration* is started six edges should be calibrated in the proper order. The controls with the current edges become available one by one.

Place the receiver on the flat horizontal surface as shown at the picture and click *Start*. Don't move or shake the receiver during the calibration. After current edge calibration is finished the next edge become available. The same way the next side will be calibrated. Put the receiver on every side following the pictures and calibrate all. Please be careful since pictures for TRIUMPH-2 show the real receiver

position, but in other cases, it will be the view from above. If the receiver is placed wrongly, the error message appears.



The first edge is ready for calibration

s Compass		Levels × Not calibrated Calibrate		c
els × Not calibrated E Calibrate	Compass X No			
Current Edge 1		Place the receiver on the side 2 and press St	art	
Edge 1 Edge 2	Î	Edge 1	Edge 2	Î
		III III Tooma	PMARTALL ÎÎĴÎÎÎÎÎÎ	
545		✓ Calibrated	Start Edge 4	
		0	000	
rix Offsets M T*C	Matrix	Matrix Offsets	M T*C	
		100101 000	1020 50	1

The first edge is calibrated. The second one is ready

Levels X Not calibrated Calibrate	2	Compa
Place the receiver on the side 3 and press	Start X Calibration Error Wrong Edge	1
III III TRANKS	PHARONA IIIIIII	
✓ Calibrated	✓ Calibrated	
Luge 5	Luge W	
	040	
Start		*
Matrix Offsets	M T°C	Matrix

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

When all sides are calibrated, the levels calibration is complete. Wait for a moment until the calibration matrix is calculated. Afterwards the *Pitch/Roll* **plot** and the computed values will be displayed.



Levels calibration is finished successfully

The Levels calibration matrix shows the results. If first, fourth and sixth values are more than 0.9, and less then 1, the calibration is proper. You can save the results to the NVRAM by clicking the Save button or use those only in the current session by clicking Cancel.

The Offsets are the real values offsets, *M* is magnitude. *T* is device temperature.

If it is necessary, click *Level Offsets* to reset the offsets as described above.

Compass calibration

Calibrate the Compass after Levels

To start the compass calibration click *Calibrate*. Rotate the receiver along each axis, following the pictures, until calibration is finished. The rotation directions should be changed six times.



Rotate the receiver along the three axes

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



Compass calibration is complete

The compass calibration matrix shows the results of the calibration. If first, fourth and sixth values are more than 0.8 and less than 1, the calibration is proper.

You can save the results to the NVRAM by clicking the *Save* button or use those only in the current session by clicking *Cancel*.

The $\it Offsets$ are the real values offsets, $\it M$ is magnitude. $\it T$ is device temperature.

VarnB is the scatter of acceptable values. It takes an amount from 30 to 50. You can play with VarnB to improve the calibration results.

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 Protocol
Settings						
Modulation Type	dqpsk 🔹					
Channel Bandwidth	25000 🔹					
Scrambling	255					
Forward Error Correction	on 🔻					
Mode						
Base RtrNum 0						
Rover Source auto	•					
RTR Echo a	•					

Simplex (Javad) protocol parameters

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

Transparent w/EOT protocol parameters

Simplex (Javad) Protocol	Transparent w/E	OT 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						

Trimtalk 450S protocol parameters

Simplex (Javad) Prot	ocol	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) •						

TT450(HW) protocol parameters

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

Trimtalk3 protocol parameters

S	implex (Javad) Prot	ocol	Transparent	w/EOT Protocol	Trimtalk 450S Protocol	TT450S(HW) Protocol	Trimmark3 Protocol	Trimmark II/IIe Protocol	Satel Protocol
м	lodulation Type	gmsk	•						
C	hannel Bandwidth	25000) -						

Trimtalk II/IIe 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	4fsk ▼						
Channel Bandwidth	25000 🔹						
Forward Error Correction	on 🔹						
Clock Correction	on 🔻						
Compatibility	3as 🔹						

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						
Vodem Mode	auto 🔻					
lease change just to "OFF"						
urrent Mode	fh					
eceiver Port the Modem is	/dev/ser/c					
odem Control State	ready					
st Detected Modem Error	none					
Auto						
Madel El	015					
Model	1910	External Moden	n via Bluetooth			
IHE Radio EH Radio Ce	Ilular module	Receiver Beacon	Receiver			
7000			TY			
	Model	FH915	Byte Counter 0	USA, AUS, zo	nes EU zone	
usa	Deadwet ID	41		Settings		
aus	Product ID	41	RX	Power 30)	
eu	Serial Number	63341	FH RSSI -140.7 dBm	Protocol si	mrx •	
	Hardware revision	"3"	FH BSP 0	FRule 0		
	Firmware version	"3.1.16"	FH RSP 0	Simpley (In	(ad) 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			

FH Radio parameters, USA, AUS zone

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

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.

Commence			
Common			
Modem Mode		gprs	•
please change just to			
Current Mode		aprs	
Receiver Port the M	lodem is	/dev/ser/c	-
necenter rore and m	loucin isin	/def/sel/e	_
Modem Control Sta	ite	connect	
Last Detected Mode	em Error	none	
Auto			
Prefer L-Band Reco	eiver	Ŧ	
ID	unk	nown	
Model	unk	nown	

UHF Radio FH Radio Cellular module L-Band Receiver Beacon Receiver

Settings		Info			
SSM Hotstart Mode	off 🔹	Device			
SIM Card Number	1	Vendor '	Sierra Wireless, Incor	"porated"	
PIN Code	"0000"	Model	'MC7710"		
Registration Mode	auto 🔻	Revision '	SWI9200X_03.05.24.0	00ap r5792 carmd-en-10527 2013/05/	02 13:35:47"
5		Serial Number	358178042463192"		
		FCC ID	N7NMC7700		
		IC ID	2417C-MC7700		
		Network			
		Cellular Operato	r Name "Beeline"		
		Cellular coverag	e gprs		
		Signal Quality	"-81 dBm"		
CSD 3G/2G					
PPP		GPRS		PDP	
PPP Connection Sta	ate connected	GPRS Dial Nun	nber "*99***1#"	GPRS PDP Context Identifier	1
PPP Baud Rate	460800	GPRS User Nar	me ""	GPRS PDP Access Point Name	
		CDDC Deserves			

Cellular module parameters, 3G/2G mode.

Dial AT+CBST	
Service Word Reneat Period 2	
Service Word Repeat Feriod 2	nnection Element 1
Data Wait Timeout 5 AT+CBST Be	arer Service Name 0
Dial Number "" AT+CBST Da	uta Rate 71

Cellular module parameters, CSD mode.

- L Band Receiver [2, LBAND Receiver Parameters]
 - Mode the settings configuring L-Band 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 i	s /dev/ser/b					
Modem Control State	ready					
Last Detected Modem Erro	r none					
Auto						
Prefer L-Band Receiver	on 🔻					
ID 3	6					
Model L	-BAND/BEACON					
UHF Radio FH Radio C	ellular module L-Band	Receiver Beacon Re	eceiver			
Mode		Info		Rx		
Channel map	* +	Model	L-BAND/BEACON	RSID	N/A	
153500000 1535000000	3 X ^	Product ID	36	RSSI	-133 dBm	
0 1539882500	Ľ ×	Serial Number	00000000066	SYNC	0	
	53 🗸 🗙	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 Switcher	on 🔻					

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)

lodem Mode	auto		•			
ease change just to "OFF"						
urrent Mode	beacon					
eceiver Port the Modern is.	/dev/ser/	Ъ				
fodem Control State	ready					
ast Detected Modern Error	none					
Auto						
Prefer L-Band Receiver of		•				
ID 36						
Model L-I	AND/BEAC	e L-I	Sand Receiver Beacon R	eceiver		
Model L-I IHF Radio FH Radio Cel Mode Channel map	AND/BEAC	ON e L-I	Sand Receiver Beacon R	L-BAND/BEACON	Rx RSSI	
Model L-I IHF Radio FH Radio Cel Mode Channel map 0 283500	AND/BEAC	e L-I	Band Receiver Beacon R	L-BAND/BEACON	Rx RSSI SYNC	600
Model L-I IHF Radio FH Radio Cel Mode Channel map 283500 © 283500 © 284500	AND/BEAC	e L-I	And Receiver Beacon R Info Model Product ID Serial Number	L-BAND/BEACON 36 00000000066	Rx RSSI SYNC Current Frequency	@00 284.500 kHz
Model L-I IHF Radio FH Radio Cel Mode Channel map 283500 284500	Iular moduli	0N	And Receiver Beacon R Info Model Product ID Serial Number Hardware revision	L-BAND/BEACON 36 00000000066 "Ver. 5.1"	Rx RSSI SYNC Current Frequency Frequency Offset	©00 284.500 kHz 0 Hz
Model L-I IHF Radio FH Radio Cel Mode Channel map 283500 284500	Iular modul Iular modul I X I X	0N e L-I	Band Receiver Beacon R Info Model Product ID Serial Number Hardware revision Software version	L-BAND/BEACON 36 00000000066 "Ver. 5.1" "Ver. 1.8 Rev 05 B11"	Rx RSSI SYNC Current Frequency Frequency Offset Current Symbol Rate	©00 284.500 kHz 0 Hz 100.000
Model L-I IHF Radio FH Radio Cel Mode Channel map 283500 284500 Link Rate	Iular modul Iular modul III x II x 100	0N e L-I	And Receiver Beacon R Info Model Product ID Serial Number Hardware revision Software version Bootloader version	L-BAND/BEACON 36 00000000066 "Ver. 5.1" "Ver. 1.8 Rev 05 B11" n "Ver. 3.0 Rev 04"	Rx RSSI SYNC Current Frequency Frequency Offset Current Symbol Rate	©00 284.500 kHz 0 Hz 100.000
Model L-I IHF Radio FH Radio Cel Mode Channel map 283500 284500 Link Rate Antenna Beacon Connecto	Iular moduli	e L-I	And Receiver Beacon R Info Model Product ID Serial Number Hardware revision Software version Bootloader version	L-BAND/BEACON 36 00000000066 "Ver. 5.1" "Ver. 3.0 Rev 04"	Rx RSSI SYNC Current Frequency Frequency Offset Current Symbol Rate	©00 284.500 kHz 0 Hz 100.000

Beacon Receiver parameters



Radio-spectrum (FH) collecting

Radio Spectra

The *Spectra* tab allows collecting, displaying and storing the measurements of the radio interference.

To start the spectrum values collecting, select *Modem Driver* and click the *Start* button. Your receiver detects the modem (UHF or FH) automatically and gets spectrum from modem cyclically until the *Stop* button click.



Radio-spectrum (UHF) stopped

The status of the process is shown in the status bar filed *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.
- Y axis 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 the needed driver from the *Driver* drop-down list box. To change the scanning parameters, select the corresponding tab of the *Modem Parameters* and set the desired values to the *Scan* group.

rt dev/ser/d Mode uhf		Pair	× 8	Daisy Ch	nain	× 8
fo Parameters						
lodem c Modem a Mode	em b Mo	dem d Sottware version BootLoader version FCC ID IC ID	"unknown" "unknown" unknown unknown	Outpl Power RX UHF F UHF E Start fro Stop fro	at Power r Supply Voltage RSSI unknown BER unknown equency 406000 equency 470000	Unknown
				Mode Timeou	scan it 1500	v
TT450S(HW) Protocol		Trimmark3 Protocol	Trimmar	k II/IIe Pro	otocol	Satel Protocol
Simplex (Javad) Pro	otocol	Transpar	ent w/EOT Protocol		Trimtalk 4	450S Protocol
Modulation Type Channel Bandwidth	dqpsk 25000	v				
Scrambling	255					

Radio Spectra 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 the *Filter Mode* and *Resolution* and click *Apply*. To return to the original plot click *Clear*.



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 plots as png-files to the selected folder.

Options

To see actual options expand the Options tile.

Reports 👻 🛛 Actions 👻	Update Options 👻 Update Firmware 👻	(LIICK to get o	ptions fron	i the rece	iver
Main [Options					
Info Measurements	Option	 Current 	Purchased	Leased	Date	^
Parameters [1-PPS Timing Signal (_PPS)	0	0	0		
★ Settings	Authorization (AUTH)	60	0	60	8/1/2017	
Files [BeiDou System (COMP)	1	0	1	8/1/2017	
Total: 220 🙆 log0119w	Bluetooth (_BLT)	1	1	0		
Spectra [CAN Ports (_CAN)	-1	0	0		
Collecting	CANopen Interface (COPN)	-1	0	0		
Modem	Carrier Phase (_CPH)	1	0	1	8/1/2017	
	CMR Input (CMRI)	1	0	1	8/1/2017	
	CMR Output (CMRO)	1	0	1	8/1/2017	
Greis Commands	Common Tracking (COOP)	-1	0	511	1/17/2017	
0	Corrections inputs (CORI)	63	0	63	8/1/2017	
Real-Time Logging	Datums support (_DTM)	1	0	1	8/1/2017	
/dev/usb/a	Devices (DEVS)	0	0	0		
	DGPS mode (CDIF)	1	0	1	8/1/2017	
	E5B Band (_E5B)	1	0	1	8/1/2017	
	E6 Band (_E6_)	-1	0	1	8/1/2017	
	Ethernet Port (ETHR)	1	1	0		
	Event Markers (EVNT)	0	0	0		
	Freq. Lock and Output (_FRO)	-1	0	0		
	Frequency Input (_FRI)	-1	0	0		
	FTP Connections (_FTP)	1	0	1	8/1/2017	
	Galileo (_GAL)	1	0	1	8/1/2017	
	GBAS Input (GBAI)	0	0	0		
	GBAS Output (GBAO)	0	0	0		\sim

Options Tile

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

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

Output

Output window contains Ports and Message Sets tabs. Message stream can be configured and enabled or disabled for the each available receiver port.

Select Output tile

It contains Ports and Message Sets.

Ports tab

The *Ports* tab provides information about current output on the all available ports. It allows enabling and disabling output on the selected port or all ports.

Receiver 1	TR1 TRIUMPH1 3	V10		
• TR1 X	Reports - Actions - Up	date Options - Update Firmware -		*
	Main 🗗 Para	meters 🚰 Files 🚰 GNSS Spectra 🚰 Modem 🚰 Options 🚰	Greis Commands	
	i Info 🗙 Measur 🛠	Settings Total: 75 🗠 Interfere 💊 💊 🗠 🖽 📰 Actual	0	
	Output			
	Ports Message Sets			
	Port Outro	rt Messanes	em	dm
	dev/ser/a jps/RI jps/RI	<pre>clio0.000(0.000) jps/GT=(1.00,0.00,0.00) jps/NT=(1.00,0.00,0.00), jps/SI=(1.00,0.00,0.00), [10.00,000(0.00), jps/cF=(1.00,0.00,0.00), jps/Zr=(1.00,0.00,0.00), jps/Zp=(1.00,0.00,0.00), [10.00,000(0.00), jps/FT=(1.00,0.00,0.00)</pre>	Message Set 👻	1
	dev/ser/b		Message Set 🗸 🗸	
	dev/ser/c		Message Set Set on the	essage port
	dev/ser/d		Message Set	
t is used by	🗯 dev/tcp/a		Message Set 🔹	
View & Modem	dev/tcp/b rtcm/ (10.00	10=(1.00,0.00,0,0x0), rtcm/21=(1.00,0.00,0,0x0), rtcm/23=(10.00,0.00,0,0x0), rtcm/24= 0.00,0,0x0)	Message Set 🗸 🗸	Ш
	dev/tcp/c		Message Set Disable	message
	dev/tcp/d		Message Set •	port
	dev/tcp/e		Message Set +	
	dev/http/a		Message Set 👻	
	dev/tcpcl/a		Message Set 🔶	
	dev/tcpcl/b		Message Set 🗸 🗸	
	dev/udp/a		Message Set 👻	
	dev/udp/b		Message Set 🔹	
	dev/udp/c		Message Set 👻	
	dev/udp/d Get output info		Message Set -	
	from the receiv	er		

Output Ports tab

Receiving actual output info

Click *Refresh* to get actual info about output from the receiver.

Disabling output

Click *Disable* to stop output on the selected port and confirm your action.

Click *Disable All* to stop output on all the ports and confirm your action.

	-			·					
 Receiver 1 	TR1 TRIUMP	H1 3W10							×
• 🔹 TR1 🗙	orts - Actions -	 Update Option 	• Update Firm	ware 🕶				8	\checkmark \downarrow \rightarrow
Mair	n 🖸	Parameters	Files	GNSS Spectra	Modem	Options	Greis Commands		
i Info	o 🗙 Measur	★ Settings	Total: 75	∠ Interfere	S S E	⊻ I≡ Actual			
Outr	out								, L
Po	orts Message	e Sets							
	Port	Output Messages					em	dm	
	dev/ser/a	jps/rc={1.00,0.00,0 jps/rc={1.00,0.00,0 jps/BI={1.00,0.00,0	0x0}, jps/G1={1.00, 0x0}, jps/cp={1.00, 0x0}, jps/ET={1.00,0	,0.00,0,0x0}, jps/N1={1.00 0.00,0,0x0}, jps/2r={1.00,0 0.00,0,0x0}	1,0.00,0,0x0}, jps/2 1.00,0,0x0}, jps/2p	st={1.00,0.00,0,0x0}, s={1.00,0.00,0,0x0},	Message Set	• 11	
	dev/ser/b						Message Set	•	
	dev/ser/c						Message Set	-	
	dev/ser/d						Message Set	•	
1	dev/tcp/a						Message Set	•	
	dev/tcp/b	rtcm/20={1.00,0.00 {10.00,0.00,0,0x0}	1,0,0x0}, rtcm/21={1	.00,0.00,0,0x0}, rtcm/23=	{10.00,0.00,0,0x0	}, rtcm/24=	Message Set	• 11	
	dev/tcp/c	Confirmati	on			×	Message Set	•	_
	dev/tcp/d						Message Set	•	
	dev/tcp/e	?	Do you really want	to disable output messag	es on the port "d	lev/tcp/b"?	Message Set	•	
	dev/http/a						Message Set	•	
	dev/tcpcl/a			ſ	Yes	No	Message Set	•	
	dev/tcpcl/b						Message Set	-	
	dev/udp/a						Message Set	•	
	dev/udp/b						Message Set	•	
	dev/udp/c						Message Set	-	
	dev/udp/d						Message Set	•	~
	0								
\$ C	Connected de	ev/tcp/a	Disable Me	ssages					

Confirmation of output disabling

Enabling output

Click *Message Set* drop-down and select the desired message set to enable output on the selected port.

The *Message set* list contains receiver predefined message sets, base correction predefined set and custom sets. They can be edited on the *Message Sets* tab.

			/msg/rtk/jps/max
eceiver 1 🤝	TR1 TRIUM	PH1 3W10	DGPS RTCM {1,31,3}
TR1 X Repo TR1 X Main infr infr Cutp Pc	Actions	Update Options Update Firmware Parameters P	 DGPS RTCM (9.34.3) DGPS RTCM (41,3) RTK RTCM (18,19.22.3) RTK RTCM (20,21,22,3) RTK RTCM (20,21,23,24) RTK RTCM (20,21,23,24) RTK RTCM 3G D min RTK RTCM 3 GD full RTK RTCM 3 GD full RTK RTCM 3 GD full
	dev/ser/a	Unput messages jps/RT=(1.00,0.00,0,0x0), jps/GT=(1.00,0.00,0,0x0), jps/NT=(1.00,0.00,0,0x0), jps/SI= (1.00,0.00,0x0), jps/rc=(1.00,0.00,0,0x0), jps/cP=(1.00,0.00,0,0x0), jps/2r=(1.00,0.00,0,0x0), jps/2p=(1.00,0.00,0,0x0), jps/BI=(1.00,0.00,0,0x0), jps/ET=(1.00,0.00,0,0x0)	RTK RTCM3 GGD full RTK RTCM3 GGD full eph RTK RTCM3 3.0
	dev/ser/b		RTK CMR {10,0,1}
	dev/ser/c		 RTK UMR+ {10,0,9} RTK JPS min
0	dev/ser/d		 RTK JPS max
1	dev/tcp/a		 RTK RTCM3 MSM Full RTK RTCM3 MSM Short
	dev/tcp/b		 RTK RTCM3 MSM GPS+GL0
	dev/tcp/c		NMEA GGA
	dev/tcp/d		Message Set 🔷 👻
	dev/tcp/e		Message Set 👻
	dev/http/a		Message Set 👻
	dev/tcpcl/a		Message Set 👻
	dev/tcpcl/b		Message Set 👻
	dev/udp/a		Message Set 👻
	dev/udp/b		Message Set 👻
	dev/udp/c		Message Set 👻
	dau/uda/d		Message Set

Enabling output

Deferred output

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

Re	port	ts 🕶 Actions	✓ Update Options ✓ Update Firmware ✓		*
M i	ain Info	Cí 🗙 Measur	Parameters [7] Files [7] GNSS Spectra [7] X Settings Total: 75 [2] Interfere	Options □	
0	utpu Por	ut rts Messag	e Sets		
		Port	Output Messages	em	dm
		dev/ser/a	jps/RT={1.00,0.00,0.x0}, jps/GT={1.00,0.00,0.x0}, jps/NT={1.00,0.00,0.x0}, jps/S1={1.00,0.00,0.x0}, jps/rc={1.00,0.00,0.x0}, jps/cp={1.00,0.00,0.x0}, jps/2r={1.00,0.00,0.x0}, jps/2p={1.00,0.00,0.x0}, jps/B1={1.00,0.00,0.x0}, jps/ ET={1.00,0.00,0.x0}	Message Set	• II
		dev/ser/b		Message Set	-
		dev/ser/c		Message Set	•
		dev/ser/d		Message Set	•
	\$	dev/tcp/a	Deferred: /msg/def	Message Set	- 🗙
		dev/tcp/b		Message Set	•
		dev/tcp/c		Message Set	•
		dev/tcp/d	rtcm/9={1.00,0.00,0,0x0}, rtcm/34={1.00,0.00,0,0x0}, rtcm/3={10.00,0.00,0,0x0}	Message Set	• II
		dev/tcp/e		Message Set	•
		dev/http/a		Message Set	•
		dev/tcpcl/a		Message Set	•
		dev/tcpcl/b		Message Set	•
		dev/udp/a		Message Set	-

Deferred output on the current port

Message Sets tab

The Message Sets tab contains editable message sets.

1. Predefined message sets are

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

They can be edited and stored in the receiver.

< TR1	TRIUMPH	H1 3W10								×
Reports 🔻	Actions 👻	Update Options 👻	Update Firm	ware 🔻					*	←↑ ↓→
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Ports	Message	Sets	message set							
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jps /M	IF:{ <mark>0}</mark> jp	is /PM :{ 0 } jps /EV :{	0 } jps /XA :{	0} jps /XB :{ 0 }	jps /RT :{ 1 }	jps /	RD:{1} jps/SX	:{1} jps/SI :{1}		
jps /N	N:{1} jp	os /EL :{ 1 } jps /FC :{	1 } jps /prr :{	1} jps/cp:{1}	jps /cc :{ 1 }	jps /dr	rr:{ 1 } jps /CE:{	1} jps/TC:{1}		
jps /F	l:{1} jps	;/1r:{1} jps/1p:{1	} jps /c1 :{ 1.	} jps/1d:{1} jp	s/1E:{ 1 } j	ps /F2 :	[1} jps/2r:{1.	} jps/2p:{1}		
jps /c2	2:{1} jps	; /2d:{ 1 } jps /2E:{ 1	} jps/F3:{1.	} jps/3r:{1} jp	s/3p:{1} j	ps /c3 :	[1} jps/3E:{1.	} jps/3d:{1}		
jps /F	5:{1} jps	;/5r:{1} jps/5p:{1	} jps /c5 :{ 1.	} jps/5E:{1} jp	s /5d:{ 1} j	ips /Fl :{	1} jps /ir:{ 1	.} jps/lp:{1} jps	/cl :{ 1 }	
jps /IE	:{1} jps	/ld:{1} jps/SS:{1.	} jps /SE:{ 1	} jps/PV:{1} jp:	;/ST:{ 1 } j	ps /DP :	{ 1 } jps /TO :{ 1	} jps/DO:{1}		
jps /U	0:{1} jp	os /IO :{ 1 } jps /NU :{	1} jps/GE:{	1} jps /NE :{ 1}	jps /GA :{ 1	} jps/	'NA:{1} jps/W	E:{1} jps/WA:{1	}	
jps /W	/U:{1} j;	ps /EN :{ 1 } jps /EA :	{1} jps/EU:{	1} jps/QE:{1}	jps /QA :{ 1	} jps	/QU :{ 1 } jps /Q	!!:{1} jps /CN :{1	.}	
jps /C	A:{1} Ap	ply changes /CI:(1	Cancel char	iges jps /IA:{1} jp	s /IU:{ 1} j	ps /ll :{	1} jps /LO :{ 1	}		
/msg/	rtk/jps/min	. 🔽 🧖	o Reset to	o Init value Edit me	ssage					
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jps /2	r:{1} 🔎	jps /2p:{ 1 } 🦸 jp	s /BI :{ 1}	jps /ET :{ 1 } 📝						
+	Ad	d message		> Delete messag	e					
/msg/	rtk/jps/max	1								
jps /R	Г:{1} jp:	s /GT :{ 1 } jps /NT :{ '	1} jps/SI:{1	} jps/rc:{1} jp	s /cp :{ 1 }	jps /DC	:{1} jps/EC:{1	1} jps/2r:{1}		
jps /2	p:{1} jp:	s /D2 :{ 1 } jps /E2 :{ 1	1} jps /BI :{ 1.	} jps/ET:{1}						
Custom	Message	Sets								
										1
S Connect	ted de	v/tcp/a	 Get Parame 	ters						
			D I	C						

Predefined messages sets

Editing predefined message set

Click *Edit* (blue pen) in the header. The *Edit* button will be replaced by *Apply, Cancel* and *Reset* buttons.

- *Apply* saves changes to the receiver.
- *Cancel* receives actual message set from the receiver. All changes are lost.
- *Reset* resets predefined message set to the initial value. All changes are lost.

Editing message

Click Edit near desired message. Output Interval, Phase, Count became www.javad.com

available for the changing.

Delete – deletes message from message set.

The edited message will be signed by blue star.

Adding message to the message set

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

նութերութը նույթութը նույթութը նույթութը նույթը հայտել այլ իթնութը նույթը հայտերութը նույթըութը նույթութը նույ
/msg/tk/jps/min 🔽 🖸 🖸
jps/RT={1.00,0,0,0x0} x jps/GT={1} / jps/NT={1} / jps/SI={1} / jps/c={1} / jps/cp={1} / jps/2r={1} / jps/2r={1} /
jps/Bi;{1}} ≠ jps/ET;{1} ≠ jps/RX;{1,} ≠ rtcm/6;{1,} ≠ nmea/GSV;{1,} ≠
 jps
A rtcm Tri 31 IG 191 F51 F61 F181 F191 [201 [211 [221 [231 [24] [311 [32] [34] [65] [36] [411 [42] [44]
rtcm3
binex ChSS Stabilizer in Views
Urvs3 satellites in view

Adding of a message

2. Custom message sets

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

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

orts Message Sets																						
/msg/rtk/jps/min 🙎																						
jps /RT :{ 1 } jps /GT :{ 1 }	jps /NT :{ 1 }	jps /SI :{ 1.	} jps/r	c:{1}	jps /cp :	{1}	jps /2	er:(1)	jps /2	p:(1	n) jr	os /BI :{ `	1}	jps /E	et :{ 1	}						
/msg/rtk/jps/max 🏾 🌶																						
jps /RT :{ 1 } jps /GT :{ 1 }	jps /NT :{ 1 }	jps /SI :{ 1.	} jps/r	c:{1}	jps /cp :	{1}	jps /E	DC :{ 1	} jps/	EC:(1.	} j	ps /2r :	(1)	jps/	/2p:(1	}	jps /Da	2:{1	.) jr	os /E2 :	(1)	
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Position_Velocity [ST] [PO] [Po] [VE]	(DO) (BP) (i	GT] [GO] [N Pg] [VG] [S	NT] [NO] 5G] [r GL	(EO) (WO	Receive	[CO] er Time	(Io) (e Offset	UO] [W	U] (EU) R] (PS]	(QU) (PT)	[CU]	[IU]	[NU]									L
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Image Image <th< td=""><td>(DO) (BP) ([PV] (PG) ([EL] (AZ) ([2m] (3m) ((2P) (3P) (</td><td>GT] [GO] [N Pg] [VG] [S RX] [RC] [R 5m] [im] [C 5P] [IP] [c</td><td>NT] [NO] SG] [r GL R1] [R2] SC] [C1] SD] [1D]</td><td>[EO] [W0 ONASS to [R3] [R5] [C2] [C3 [2p] [3p]</td><td>0] (QO) Receive (RI) (C5) (5p)</td><td>(CO) er Time (rx) (CI) (ID)</td><td>[Io] [e Offset [rc] [[cc] [[cf] [</td><td>UO] [W t]] [m r1] [r2 ic1] [c2 11] [21</td><td>U] (EU) R] (PS] I (r3) I (c3) I 31</td><td>(QU) (PT) (r5) (c5) (5f)</td><td>[CU] [rl] [cl] [lf]</td><td>[IU] [CR] [PC] [DX]</td><td>(NU) (1R) (P1) (DC)</td><td>[2R] [P2] [D1]</td><td>[3R] [P3] [D2]</td><td>[5R] [P5] [D3]</td><td>[IR] [PI] [D5]</td><td>[cr] [pc]</td><td>(1r] (p1) (drr)</td><td>[2r] [p2] [0d]</td><td>[3r] [p3] [1d]</td><td>ļ</td></th<>	(DO) (BP) ([PV] (PG) ([EL] (AZ) ([2m] (3m) ((2P) (3P) (GT] [GO] [N Pg] [VG] [S RX] [RC] [R 5m] [im] [C 5P] [IP] [c	NT] [NO] SG] [r GL R1] [R2] SC] [C1] SD] [1D]	[EO] [W0 ONASS to [R3] [R5] [C2] [C3 [2p] [3p]	0] (QO) Receive (RI) (C5) (5p)	(CO) er Time (rx) (CI) (ID)	[Io] [e Offset [rc] [[cc] [[cf] [UO] [W t]] [m r1] [r2 ic1] [c2 11] [21	U] (EU) R] (PS] I (r3) I (c3) I 31	(QU) (PT) (r5) (c5) (5f)	[CU] [rl] [cl] [lf]	[IU] [CR] [PC] [DX]	(NU) (1R) (P1) (DC)	[2R] [P2] [D1]	[3R] [P3] [D2]	[5R] [P5] [D3]	[IR] [PI] [D5]	[cr] [pc]	(1r] (p1) (drr)	[2r] [p2] [0d]	[3r] [p3] [1d]	ļ
IP (MF) (~-) (RD) 4 Position_Velocity (ST) (Po) (VE) 4 Satellite_Measurements (SX) (SX) (AN) (NN) [S7] [Po] [Po] (Po] (VE) (SX) (SX) <td>(DO) (BP) ([PV] (PG) ([EL] (AZ) ([2m] (3m) ([2P] (3P) ([EC] (E1) (</td> <td>GT] (GO] (N Pg] (VG] (S RX] (RC] (R 5m] (Im] (C 5P] (IP] (c E2] (E3] (E</td> <td>NT] (NO) SG] (r GL R1] (R2) CC] (C1) SP] (1p) E5] (E1)</td> <td>[EO] [WG ONASS to [R3] [R5] [C2] [C3] [2p] [3p] [CE] [1E]</td> <td>Receive (RI) (C5) (5p) (2E)</td> <td>(CO) er Time (rx) (CI) (IP] (3E)</td> <td>[Io] [e Offset [rc] [[cc] [[cf] [[5E] [</td> <td>(UO) [W t]] [m (r1] [r2 (c1] [c2 (1f] [2f (E] [s0</td> <td>U) (EU) R) (PS) I (r3) I (c3) I (31) I (s1)</td> <td>(QU) (PT) (r5) (c5) (5f) (s2)</td> <td>(CU) (rl) (cl) (lf) [s3]</td> <td>[IU] [CR] [PC] [DX] [55]</td> <td>(NU) (1R) (P1) (DC) [si]</td> <td>[2R] [P2] [D1] [j0]</td> <td>[3R] [P3] [D2] [j1]</td> <td>[5R] [P5] [D3] [j2]</td> <td>(IR) (PI) (D5) (J3)</td> <td>[cr] [pc] [D1]</td> <td>(1r] (p1) (dm] (i)</td> <td>(2r) (p2) (0d) (FC)</td> <td>[3r] [p3] [1d] [F1]</td> <td></td>	(DO) (BP) ([PV] (PG) ([EL] (AZ) ([2m] (3m) ([2P] (3P) ([EC] (E1) (GT] (GO] (N Pg] (VG] (S RX] (RC] (R 5m] (Im] (C 5P] (IP] (c E2] (E3] (E	NT] (NO) SG] (r GL R1] (R2) CC] (C1) SP] (1p) E5] (E1)	[EO] [WG ONASS to [R3] [R5] [C2] [C3] [2p] [3p] [CE] [1E]	Receive (RI) (C5) (5p) (2E)	(CO) er Time (rx) (CI) (IP] (3E)	[Io] [e Offset [rc] [[cc] [[cf] [[5E] [(UO) [W t]] [m (r1] [r2 (c1] [c2 (1f] [2f (E] [s0	U) (EU) R) (PS) I (r3) I (c3) I (31) I (s1)	(QU) (PT) (r5) (c5) (5f) (s2)	(CU) (rl) (cl) (lf) [s3]	[IU] [CR] [PC] [DX] [55]	(NU) (1R) (P1) (DC) [si]	[2R] [P2] [D1] [j0]	[3R] [P3] [D2] [j1]	[5R] [P5] [D3] [j2]	(IR) (PI) (D5) (J3)	[cr] [pc] [D1]	(1r] (p1) (dm] (i)	(2r) (p2) (0d) (FC)	[3r] [p3] [1d] [F1]	
[JP] [VAP] (~~) [RO] 4 Position_Velocity [ST] [PO] [Po] [VP] [VP] 4 Satellite_Measurements [SX] [SN] [AN] [NN] [SX] [ST] [CN] [CN] [CN] [CN] [CN] [SX] [S1] [S0] [CP] [P] [2d] [Sd] [Sd] [P] [2d] [3d] [Sd] [F2] [F3] [F3] [F3] [F3] [F3] [F4]	(DO) (BP) (I [PV] (PG) (I (EL) (AZ) (I (2m) (3m) (I (2P) (3P) (I (EC) (E1) (I (ec) (e1) (I	GT] [GO] [N Pg] [VG] [S RX] [RC] [F 5m] [Im] [C 5P] [IP] [c E2] [E3] [E e2] [e3] [e	NT] [NO] SG] [r GL R1] [R2] CC] [C1] SP] [1p] S5] [E] 25] [qc]	[EO] [WG ONASS to [R3] [R5 [C2] [C3 [C2] [3p] [CE] [1E] [q1] [q2]	Receive Receive (RI) (C5) (5p) (2E) (q3)	(CO) er Time (rx) (CI) (IP) (3E) (q5)	[io] [e Offset [rc] [[cc] [[cf] [[5E] [[TC] [(UO) [W t]] [m r1] [r2 rc1] [c2 r1f] [2f r6] [s0 r55] [D	U) (EU) X) (PS) (73) (7))	(QU) (PT) (c5) (c5) (5f) (s2) (vr)	(CU) (rl) (cl) (lf) [s3]	(IU) (CR) (PC) (DX) [s5]	(NU) (1R) (P1) (DC) [si]	[2R] [P2] [D1] [J0]	[3R] [P3] [D2] [[1]	[5R] [P5] [D3] [j2]	(IR) (PI) (D5) (J3)	(cr) (pc) (Di) (j5)	(1r) (p1) (drr) (i)	(2r) (p2) (0d) (FC)	[3r] [p3] [1d] [F1]	
[IP] [MP] () [RO] 4 Position Velocity [ST] [PO] [Po] [VE] 4 Satellite, Measurement [SS] [AN] [NN] [SG] [AN] [NN] [SG] [SG] [AN] [NN] [SG] [CP] [PO]	(DO) (BP) ((EL) (AZ) ((2m) (3m) ((2P) (3P) ((2P) (3P) ((EC) (E1) ((ec) (e1) (ris	GT] [GO] [N Pg] [VG] [S RX] [RC] [F 5m] [Im] [C 5P] [IP] [c E2] [E3] [E e2] [e3] [e	NT] [NO] SG] [r GL R1] [R2] CC] [C1] CD] [C1] CD] [E] ES] [E] ES] [qc]	(EO) (WG ONASS to (R3) (R5) (C2) (C3) (2p) (3p) (CE) (1E) (q1) (q2)) (QO) Receive (RI) (C5) (5p) (2E) (q3)	(CO) er Time (rx) (CI) (IP) (3E) (q5)	(io) [e Offset [rc] [[cc] [[cf] [[5E] [[TC] [(UO) [W t] [m (r1) [r2 (c1] [c2 (1f] [2f (1f] [s0 (SS] [ID	U] (EU) R] (PS) (73) (7))	(QU) (PT) (c5) (c5) (5f) (s2) (vr)	(CU) (rl) (cl) (lf) [s3]	(IU) (CR) (PC) (DX) [s5]	(NU) (1R) (P1) (DC) [si]	[2R] [P2] [D1] [j0]	[3R] [P3] [D2] [j1]	[5R] [P5] [D3] [j2]	(IR) (PI) (D5) (J3)	(cr) (pc] (D1) (j5)	(1r) (p1) (dm) ())	[2r] [p2] [0d] [FC]	(3r) (p3) (1d) (F1)	
[P] [PAF] [PA] 4 Position Velocity [ST] [PO] [PO] [VE] 4 Satellite, Measurement: [SX] [SX] [SX] [SS] [PO] [PO] [PO] [PO] [PO] [SS] [PO] [PO] [PO] [PO] [PO] [PO] [SS] [PO]	(DO) (BP) ((PV) (PG) ((EL) (AZ) ((2m) (3m) ((2P) (3P) ((2P) (3P) ((EC) (E1) ((ec) (e1) (ris (IA) (NA) (GT] [GO] [N Pg] [VG] [S RX] [RC] [R 5m] [im] [C 5P] [IP] [C E2] [E3] [E e2] [e3] [e WA] [GE] [E	NT] (NO) 5G] (r GL R1] (R2) 5C] (C1) 5D] (1p) 55] (E) 55] (qc) EN] (QE)	(EO) (WG ONASS to (R3) (R5, (C2) (C3) (2P) (3P) (CE) (1E) (q1) (q2) (CN) (NE	P] (QO) Receive ([RI] ([C5] ([5p] ([2E] ([43]] [WE]	(CO) er Time (rx) (CI) (IP) (3E) (q5) (IE)	(io) [e Offset [cc] [[cc] [[cf] [[TC] [[gd] [UO) [W t]] [m r1] [r2 c1] [c2 [1f] [2f [16] [s0 [SS] [ID [s0] [ID	U) (EU) R) (PS) (r3) (c3) (3f) (s1) (s1) (m) (WD)	(QU) (PT) (c5) (c5) (5f) (s2) (vr) (ED)	(CU) (rl) (cl) (lf) (s3) (cd)	(IU) (CR) (PC) (DX) [s5]	[NU] [P1] [DC] [si]	[2R] [P2] [D1] [j0]	[3R] [P3] [D2] [j1]	[5R] [P5] [D3] [j2]	(IR) (PI) (D5) (j3)	(cr) (pc) (Di) (j5)	(1r] (p1) (dm) (i)	[2r] [p2] [0d] [FC]	(3r) (p3) (1d) (F1)	
[P] [MP] [AD] 4 Position, Velocity [ST] [PO] [VE] 4 Satellite, Measurement [SS] [SI] [NI] [SG] [P] cm] [Im] [SG] [Im] [SG] [P] cm] Im] [SG] [Im]	(DO) (BP) ((PV) (PG) ([EL] (AZ) ([2m] (3m) ([2m] (3m) ([2P] (3P) ([2P] (3P) ([EC] (E1) ([ec] (e1) (ris [IA] (NA) ([IA] (NA) ([IA] (NA) ([IA] ([IA] (NA) ([IA] (GT] [GO] [N Pg] [VG] [S RX] [RC] [F 5m] [Im] [C 5P] [IP] [c E2] [E3] [E e2] [e3] [e WA] [GE] [E	NT] (NO) SG] (r GL R1] (R2) CC] (C1) CD] (10) CD] ([EO] (Wi ONASS to (R3) [R3] (R5) [C2] (C3) [2p] (3p) [CE] (1E) [q1] [q2] [CN] [NE	P] (QO) Receive [[RI] [[C5] [[5p] [[2E] [[q3]] [WE]	(CO) er Time (rx) (CI) (IP) (3E) (q5) (IE)	(io) [e Offset [rc] [[cc] [[cf] [[TC] [[gd] [(UO) (W t] (m (r1) (r2 (c1) (c2 (1f) (c7 (1f) (c7 (1f) (c7 (1f) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7) (c7)	V) (EV) R) (PS) (r3) (c3) (3f) (s1) (rr) (WD)	(QU) (PT) (c5) (c5) (5f) (s2) (vr) (ED)	(CU) (rl) (cl) (s3) (cd)	(IU) (CR) (PC) (DX) (s5) (id)	[NU] [1R] [P1] [DC] [si]	[2R] [P2] [D1] [J0]	(3R) (P3) (D2) (j1)	[5R] [P5] [D3] [j2] Add	(IR) (PI) (D5) (J3)	(cr) (pc) (Di) (j5) mes	(1r] (p1) (drr) (i)	[2r] [p2] [0d] [FC]	(3r) (p3) (1d) (F1)	
[C] [MF] [AD] 4 Position Velocity [ST] [PO] [VE] 5 stelliteMeasurement: [SX] [SX] [SX] [SX] [SS] [S]	(DO) (BP) ((PV) (PG) ([EL] (AZ) ([2m] (3m) ([2m] (3m) ([2P] (3P) ([2P] (3P) ([2P] (3P) ([2P] (3P) ([2P] (3P) ([2P] (1)	GT] [GO] [N Pg] [VG] [S RX] [RC] [R 5m] [Im] [C 5P] [IP] [c E2] [E3] [E e2] [e3] [e	NT] (NO) SG] (7 GL R1] (R2) CC] (C1) SP] (1p] S5] (B1) S5] (QC] EN] (QE)	[EO] (Wi ONASS to (R3) [R3] (R5) [C2] (C3) [2p] (3p) [CE] [1E] [q1] [q2] [CN] (NE	P] [QO] Receive [[RI] [[C5] [[5p] [[2E] [[q3]] [WE]	(CO) er Time (IX) (CI) (IP) (3E) (Q5) (IE)	[Io] [e Offset [[rc] [[cc] [[cc] [[cf] [[5E] [[TC] [(UO) (W r1) (r2 (c1) (c2 (1f) (c7 (1f) (c7 (1f) (c7 (1f) (c7 (c7)	U) (EU) R) (PS) (31) (31) (31) (31) (1) (1) (1) (1) (1) (1) (1) ((QU) (PT) (c5) (c5) (s2) (vr) (ED)	(CU) (rl) (cl) (lf) [s3] (cd)	(IU) (CR) (PC) (DX) [s5] (id]	[NU] [1R] [P1] [DC] [s1]	[2R] [P2] [D1] [J0]	[3R] [P3] [D2] []1]	[5R] [P5] [D3] [j2] Add	(IR) (PI) (D5) (J3)	(cr) (pc) (DI) (j5) mes	(1r] (p1) (dm) (ji) sage	[2r] [p2] [0d] [FC] set	(3r) (p3) (1d) (F1)	
[J] [MP] [MP] [MP] 4 Position (vleocity [ST] [PO] [Po] [VE] 5 Statellite, Measurements [SX]	(DO) (BP) (I (PV) (PG) (I (EL) (AZ) (I (2m) (3m) (I (2P) (3P) (I (2P) (3P) (I (EC) (E1) (I (ec) (e1) (I (IA) (NA) (I	GT] (GO) (N Pg) (VG) (S RX) (RC) (F 5m) (Im) (C 5P) (IP) (C E2) (E3) (E e2) (e3) (e WA) (GE) (E	NT] (NO) SG] (7 GL R1] (R2) CC] (C1) SP] (1p] S5] (B1) S5] (QC) EN] (QE)	(EO) (WO ONASS to (R3) (R5, (C2) (C3) (2P) (3P, (CE) (1E) (Q1) (Q2) (CN) (NE	P] (QO) Receive [[RI] [[C5] [[5p] [[2E] [[q3]] [WE]	(CO) er Time (IX) (CI) (IP) (3E) (45) (IE)	[io] [e Offset [rc] [[cc] [[5E] [[TC] [[gd] [UO] [W 1] [m (r1] [r2 (r1] [c2 (r1] [c2 (r2] [c2 (U) (EU) R) (PS) (r3) (23) (37) (S1) (WD) (WD)	(QU) (PT) (c5) (c5) (s2) (vr) (ED)	(CU) (rl) (cl) (lf) (s3) (cd)	(IU) (CR) (PC) (DX) (s5) (id)	(NU) (1R) (P1) (DC) [si]	[2R] [P2] [D1] [J0]	[3R] [P3] [D2] []1]	[5R] [P5] [D3] [j2] Add	(IR) (PI) (D5) (J3)	(cr) (pc) (Di) (j5) mes	(1r] (p1) (drr) (ji)	[2r] [p2] [0d] [FC] set	(3r) (p3) (1d) (F1)	
[C] [MF] [AD] 4 Position (velocity) [ST] [PO] [Ve] 5 Stellite, Measurements [SG] [SG] [AN] [MH] [S5] [PO] [PO] [Ve] [SG] [SG] [SG] [AN] [MH] [S5] [S6] [SG] [CP] [PI] [ad] [SG] [CP] [PI] [ad] [SG] [CP] [PI] [ad] [SG] [CP] [ad] [SG] [CA] [CA] <td>(DO) (BP) (I (PV) (PG) (I (EL) (AZ) (I (2m) (3m) (I (2P) (3P) (I (EC) (E1) (I (EC) (E1) (I (EC) (E1) (I (IA) (NA) (I</td> <td>GT] (GO) (N Pg) (VG) (S Sm) (m) (C SP) (P) (C E2) (E3) (E E2) (E3) (E WA) (GE) (E</td> <td>NT] (NO) SG] [r GL X1] [R2] CC] [C1] EP] [19] E5] [E] E5] [qc] EN] [QE]</td> <td>(EO) (WO ONASS to (R3) (R5, (C2) (C3) (2P) (3P, (CE) (1E) (q1) (q2) (CN) (NE</td> <td>) (QO) Receive (RI) (C5) (5p) (2E) (Q3) (WE)</td> <td>(CO) er Time (CI) (IP) (3E) (q5) (IE)</td> <td>[io] [e Offset [rc] [[cc] [[cf] [[TC] [[gd] [</td> <td>UO] [W r1] [r2 c1] [c2 (1f] [27 (1f] [2</td> <td>U) (EU) R) (PS) (r3)] (c3) (3f) (s1) (rr) (WD)</td> <td>(QU) (PT) (c5) (c5) (s7) (s2) (vr) (ED)</td> <td>(CU) (ri) (ci) (s3) (co)</td> <td>(IU) (CR) (PC) (DX) (s5) (id)</td> <td>(NU) [1R] [P1] [DC] [SI]</td> <td>[2R] [P2] [D1] [j0]</td> <td>[3R] [P3] [D2] [[1]</td> <td>[5R] [P5] [D3] [j2] Add</td> <td>(IR) (PI) (D5) (J3)</td> <td>(cr) (pc) (Di) (j5) mes</td> <td>(1r) (p1) (drr) (ii)</td> <td>[2r] [p2] [0d] [FC] set</td> <td>[3r] [p3] [1d] [F1]</td> <td></td>	(DO) (BP) (I (PV) (PG) (I (EL) (AZ) (I (2m) (3m) (I (2P) (3P) (I (EC) (E1) (I (EC) (E1) (I (EC) (E1) (I (IA) (NA) (I	GT] (GO) (N Pg) (VG) (S Sm) (m) (C SP) (P) (C E2) (E3) (E E2) (E3) (E WA) (GE) (E	NT] (NO) SG] [r GL X1] [R2] CC] [C1] EP] [19] E5] [E] E5] [qc] EN] [QE]	(EO) (WO ONASS to (R3) (R5, (C2) (C3) (2P) (3P, (CE) (1E) (q1) (q2) (CN) (NE) (QO) Receive (RI) (C5) (5p) (2E) (Q3) (WE)	(CO) er Time (CI) (IP) (3E) (q5) (IE)	[io] [e Offset [rc] [[cc] [[cf] [[TC] [[gd] [UO] [W r1] [r2 c1] [c2 (1f] [27 (1f] [2	U) (EU) R) (PS) (r3)] (c3) (3f) (s1) (rr) (WD)	(QU) (PT) (c5) (c5) (s7) (s2) (vr) (ED)	(CU) (ri) (ci) (s3) (co)	(IU) (CR) (PC) (DX) (s5) (id)	(NU) [1R] [P1] [DC] [SI]	[2R] [P2] [D1] [j0]	[3R] [P3] [D2] [[1]	[5R] [P5] [D3] [j2] Add	(IR) (PI) (D5) (J3)	(cr) (pc) (Di) (j5) mes	(1r) (p1) (drr) (ii)	[2r] [p2] [0d] [FC] set	[3r] [p3] [1d] [F1]	
[C] [MF] [AD] Position velocity [ST] [PO] [VE] Satellite, Measurement: [SX] [SX] [SX] [SX] [SX] [SX] [SX] [SX]	(DO) (BP) (((PV) (PG) () (EL) (AZ) (((2m) 3m) () (2m) 3m) () (2m	GT] (GO) [N Pg] (VG) [S RX] (RC] [F Sm] [II] [C Sm] [II] [C E2] [E3] [E E2] [E3] [E e2] [e3] [E	NT] (NO) SG] [r GL R1] [R2] CC] [C1] EP] [1P] E5] [E1] E5] [QC] EN] [QE]	(EO) (WO ONASS to (R3) (R5 (C2) (C3 (2p) (3p) (CE) (1E) (q1) (q2 (CN) (NE) (QO) Receive ([RI] (C5) (5p) (2E) (Q3) (WE)	(CO) er Time (rx) (CI) (IP) (3E) (q5) (IE)	[io] [e Offset [rc] [[cc] [[cf] [[TC] [[gd] [UO] [W t]_] [m r1] [r2 r1] [c2 r1] [c2	V) (EV) ([73] [(73]] (23] [(37]] [s1]] [m]] [WD]	(QU) (PT) (c5) (51) (s2) (vr)	(CU) (rl) (cl) (rl) (s3) (cd)	(IU) (CR) (PC) (DX) [s5]	(NU) (1R) (P1) (DC) (si)	(2R) (P2) (D1) (0)	[3R] [P3] [D2] [[1]	[5R] [P5] [D3] [2]	(IR) (PI) (D5) (J3)	(cr) (pc) (DI) (j5) mes	(1r) (p1) (dr) (ji)	[2r] [p2] [0d] [FC]	(3r) (p3) (1d) (F1)	

Custom Messages Set

Editing custom message set

Click *Edit* (blue pen) in the header. The *Edit* button will be replaced by *Save, Cancel* and *Delete* buttons. New message set is shown in the editing mode.

- Save saves changes to the NetView & Modem.
- Cancel receives last saved message set. All changes are lost.
- Delete deletes custom message set
- Name box allows to change message set name.

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

Manual Mode

The *Manual Mode* window is designed for 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 the *Greis Commands* tile of the receiver to go to the *Manual mode* window.

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Main Image: Constraint of the system of	Greis Commands
Sonnected dev/usb	/a dev/tcp/a dev/ser/a

Manual Mode window

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

Select one to capture for the manual mode and click the $\it Capture$ button.

This connection becomes unavailable for another functionality of the NetView & Modem software. If the connection is the only communication with the receiver is carried out manually only.

After connection is established, all elements of the user interface are enabled.

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



The following controls are used for the manual operation:

- The *Input line* for the GREIS commands. As you type a hint is shown with a list of available commands.
- The Output window displays receiver responses.
- The *Last Commands* list allows select one of the previously sended commands. Up to 50 commands are stored.

- The *Send* button sends command to the receiver (equivalent to Enter in Input Line)
- The Stop Messages button disables messages.
- The Clear button clears the Output Window
- The *Load Script* button sends a set of the commands from the selected file to the receiver. Only ordinary scripts are supported (tclscripts can be loaded using Parameters window).

• The *Start Logging (Stop Logging)* button saves the receiver output to the selected file. After starting the button name changes to *Stop Logging*. The log file path is displayed at the bottom.

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(UQ)QQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQ	14 AVWARAA'rSAAAA+A-AAF\A7A
1999993999999999989,599900 8588#88888888888888888888888888888888	0001W000000=000000000000000000000000000
000k0050030	
₽ • • • •	
]S�@zS����u���A��ĸ⊡S��C�a�	000k000S00#0a0040k000S00#00n000g900
00 050000000x0500#000000f	00050000\0j0'=0
₿₿₺₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽	
\$F%3\$ \$AD\$\$\$\$C\$\$\$\$\$\$\$	SAAcAA9AAB7
>>032	
V02ADDD��\$��킑	
♦ > M	
>>01FF101/000@#9/@@J#9/@F@31 >>1556S14D GPSVST 11/22.05.021/30.23.23	1001/2513274/38252544511001/1253273
54 44 44 47} 00} {06 33 122 {51 41 41 50 55} 0	0} {02 16 156 {42 25 25} 00} {19 59 075 {52 43 43} 00} {17 42 060.
52,43,43,49},00},{15,04,210,{41,22,22,33},16},{	24,67,218,{55,46,46,52,58},00},{28,01,090,{42,20,20},16},
03,05,036,{40,25,25,41,46},00},@BB16	
>>00DE::005HAA36	-

Manual Mode window. Output and logging the stream of messages

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You can finish the manually operation in two ways:

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

Real-Time Logging

NetView & Modem software 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 for which the internal memory is unavailable. In fact Real-Time Logging in NetView & Modem is just a wrapper on the console application *RealTimeLogger* which is available on JAVAD GNSS site [5].

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



Real-Time Logging window

Follow these steps to start logging:

• Select from the drop-down list one of the connections, which is

used by the NetView & Modem for the communication with the receiver. Net View & Modem will use the selected connection for Real-time logging exclusively.

• Specify the folder for logged files saving by typing or using the *Browse* button.

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

Connection: //dev/ser/a	Stop		
SaveTo: D:\RT_03V1 File Type: Jps * Interval , s: 1 File Rotation: 15 min * 900	File Prefix: log	Browse	
Status: -r US8:03V1CU9G86LGD00RN2Z4	11G0TM -d "D:\RT_03V1"	-t 900 -s 1 -p log 0 comp	olete files logge
Connecting to US8:03V1CU9G86LGD00 Receiver information: Port: /dev/usb/a Model: SIGMA Board: TRE_G3TH_8 Firmware: 3.6.3 Jul01.2015 ID: 03V1CU9G86LGD00R Real Time Logging information: Log Rotation Time: 900 GNSS Message List: //m Log Directory: D:\RT_03V11 12:42:28 Log file started: ~log_2015_11 12:42:38 Stream check: OK (10 epochs; 12:42:48 Stream check: OK (10 epochs; 12:42:58 Stream check: OK (30 epochs; 12:43:09 Stream check: OK (30 epochs; 12:43:30 Stream check: OK (63 epochs; 12:43:41 Stream check: OK (63 epochs; 12:43:52 Stream check: OK (64 epochs; 12:43:52 Stream check: OK (15 epochs; 12:44:33 Stream check: OK (15 epochs; 12:44:34 Stream check: OK (126 epochs; 12:44:34 Stream check: OK (126 epochs; 12:44:34 Stream check: OK (126 epochs; 12:44:42 Log file closed: log_2015_11_1 12:44:45 Stream check: OK (3 epochs; 20)	N2Z4M1G0TM sec ig/def:1) 11_12.42.28 93 msgs, 37986 bytes, 45 033 msgs, 65339 bytes, 44 901 msgs, 118487 bytes, 4 901 msgs, 118487 bytes, 4 901 msgs, 12824 bytes, 4 456 msgs, 24733 bytes, 4 638 msgs, 224733 bytes, 4 638 msgs, 224733 bytes, 4 638 msgs, 276917 bytes, 4 897 msgs, 301621 bytes, 5 341 msgs, 328785 bytes, _09.42.46 11_12.44.42 8 msgs, 17608 bytes, 65 m	msg/epoch) 3 msg/epoch) 2 msg/epoch) 40 msg/epoch) 40 msg/epoch) 40 msg/epoch) 40 msg/epoch) 40 msg/epoch) ,40 msg/epoch) ,43 msg/epoch) msg/epoch)	
Save statistic D:\RT_03V1\RealTimeL	gging_03V1.txt		Browse

Real-Time Logging is going on

 ${\it Statistics} window displays the statistics received from {\tt RealTimeLogger.} exe.$

Logged files are located in the selected folder.

		A 0 1 07 0014	
PC	► Local Disk (D:) ► R1_03V1	C Search R1_03V1	بر ر
^	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
	log_2015_11_11_10.15.00.jps	11/11/2015 2:29 PM	JPS File
	log_2015_11_11_10.30.00.jps	11/11/2015 2:44 PM	JPS File
	log_2015_11_11_10.45.00.jps	11/11/2015 2:59 PM	JPS File
	log_2015_11_11_11.00.00.jps	11/11/2015 3:14 PM	JPS File
	log_2015_11_11_12.15.36.jps	11/11/2015 1:15 PM	JPS File
	RealTimeLogging_03V1	11/11/2015 3:24 PM	TXT File
~	<	_	
			8==

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 & Modem restores the connection and uses it as usually.

Modem

NetView & Modem provides functionality for interacting with the modems.

Switch the connection mode to *Modem* and connect to the modem as described in Getting Started chapter.

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



Modem Page

The *Modem* page provides the information about a modem, log of the commands and toolbar for updating modem firmware and paring modem with the available GNSS receivers.

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

The *Close* button in the header disconnects the modem and closes the page.

Update Firmware

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

Updating from file

Click From File and select the firmware file using Open File dialog.

Updating from Internet

Click *From Website*. The firmware file will be downloaded from the site and checked.

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



MCU Firmware updating confirmation

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

AW900BT RADIO				×
From File SFrom Website	From File SFrom Website	Pai	r: 🔉 TR1 TRIUMPH1 👻 a 👻	
AW	/900BT RADIO (FH915)			
MCU Product ID: 51 Hardware: Ver. 1 Software: Ver. 1.0 Rev 03	S/N: 00011 Hardware RF: Ver. 2 B27 BootLoader: Ver. 1.0 Rev 2 B7 MDMRT_SER_R5232	7	Log MDMSER @00 In : jIroute MDMBT @00	^
Radio Product ID: 41 S/N Hardware: 4 Han Firmware: 3.1.16 Boo	: 1238817 dware RF: tLoader: 4.03		In : #### @00 In : jIroute MDMSER @00	
			In : #### @00 In : xmod image Firmware Flash Erased Starting to Download \$	
 Mcu Updating 	48.88 / 103.64 (KB) jlink	k_1_0	03_b28.mcu	

MCU Firmware updating

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

Pair Modem and GNSS Receiver via Bluetooth

NetView & Modem software provides the possibility of interfacing between modems and receivers. So an external modem and a receiver can be paired via Bluetooth. Connected receivers are available in the *Pair* drop-down if it is not paired yet.



Select receiver for pairing

Follow the next steps to pair modem to the receiver:

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

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

Otherwise, an error window will be displayed and pairing process won't start.

Devices	AW900BT RADIO		
▲ Receiver 3	From File SFrom Website	From File SFrom Website	🖉 🤜 TR2 TRIUMPH2 👾
● ◆ TR1 TRIUMPH1 3W101 ¥ ● ● TR2 TRIUMPH2 00L3E8 ¥	AW	900BT RADIO (FH915)	Unpair
AW900BT RADIO	MCU Product ID: 51 Hardware: Ver. 1	S/N: 00011 Hardware RF: Ver. 2	Log In : jldev ser SER

External Modem via Bluetooth paired

The paired receiver info is displayed instead of *Pair* drop-down list box and followed by the *Unpair* button.

It can be unpaired by the same procedure.

Terminal

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

Switch the connection mode to Terminal and connect to the device as described in Getting Started.

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



Terminal window

The following controls serve the terminal operation:

- The *Input* line. As you type press enter key to send command to the device.
- The Output window displays receiver responses.
- The *Last Commands* list allows select one of the previously sended commands. Up to 50 commands are stored.

- The *Load Script* button sends a content from the selected file to the device.
- The *Start Logging (Stop Logging)* button saves output to the selected file. After starting the button name changes to *Stop Logging*. The log file path is displayed at the bottom.
- The Clear button clears the Output window.
- Insert end of line flag adds "\r\n" to the end of the typed line.
- Escape sequence converts user's input of "\\\\","\\0","\\0","\\b","\\ f","\\n","\\r","\\t","\\v" to the corresponding Unicode characters.

🗈 Serial: COM7 (USB->SER)	×
Image: Stop Logging Image: Stop Logging Stop Logging Stop Logging Image: Stop Logging Image: Stop Logging Image: Stop Logging Image: Stop Logging	v
□ Φ n Φ IS Φ Φ □ ¹ Φ 5 H □ Φ 0 □ S Φ Φ □ Φ Φ I Φ □ S Φ Φ □ ¹ □ J □ S Φ Φ □ Φ Φ Y Φ 0 □ S p Φ ? S Φ C □ C Φ ~ G Φ P 0 S Φ Φ Φ Φ Φ Φ Φ Φ Φ B N S Φ # Φ Φ Φ D Φ D S Φ # Φ h X Φ 8 I Φ 8 & φ s Φ 0 T Φ S Φ Φ C Φ S Φ Φ α Φ S Φ Φ Φ Φ S Φ Φ Φ Φ S Φ Φ Φ Φ	^ ••
□i	
Logging C:\Users\f TTSS\Desktop\Log.log Started 1/20/2017 6:07:33 PM	~

Terminal Output and Logging
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) (Phase diff) Fixed	RTK fixed	18, 19, 22(10), 3(10)
RTK RTCM {20,21,22,3}	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	20, 21, 22(10), 3(10)
RTK RTCM {18,19,23,24}	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	18, 19, 23(10), 24(10)
RTK RTCM {20,21,23,24}	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	20, 21, 23(10), 24(10)
RTK RTCM3 GD min	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	1006(10), 1008(10), 1033(10), 1003
RTK RTCM3 GD full	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	1006(10), 1008(10), 1033(10), 1004
RTK RTCM3 GGD min	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	1006(10), 1008(10), 1033(10), 1003,1011
RTK RTCM3 GGD full	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	1006(10), 1008(10), 1033(10), 1004, 1012
RTK RTCM3 GGD full eph	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	1006(10), 1008(10), 1033(10), 1004, 1012, 1019, 1020
RTK RTCM3 3.0	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	1003 , 1011, 1005 (10), 1007 (10), 1033 (10)
RTK CMR {10,0,1}	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	10, 0, 1(10)
RTK CMR+ {10,0,9}	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	10, 0, 9(10)
RTK JPS min	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	RT, GT, NT, SI, rc, cp, 2r, 2p, BI, ET
RTK JPS max	RTK float (Phase diff) (Phase diff) Fixed	RTK fixed	RT, GT, NT, SI, rc, cp, DC, EC, 2r, 2p, D2, E2, BI, ET
RTK RTCM3 MSM	RTK float (Phase diff) (Phase diff) Fixed	RTK 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 $115200^{\prime\prime}$

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
- 2. GNSS Receiver External Interface Specification
- 3. JAVAD GNSS update page
- 4. NetBrowser
- 5. Real-Time Logger
- 6. Kvaser



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