ALPHA
GNSS Enclosure

User Manual
Version 1.1
Mar 25, 2026

Table of Contents

1. INTRODUCTION

Welcome to Your ALPHA User Manual.
This manual is designed to help you get acquainted with your device and to provide you with all the necessary instructions to ensure a seamless experience. Inside, you will find detailed information on how to setup, operate, and maintain your ALPHA effectively.

We strongly recommend reading through this manual before you begin using your device to familiarize yourself with its features and functionalities. This guide includes:

- Setup Instructions: Step-by-step directions to get your ALPHA up and running.
- Operating Guidelines: Clear explanations on how to use all the features of your ALPHA.
- Maintenance Tips: Advice on how to keep your device functioning optimally.
- Troubleshooting: Solutions to common issues you might encounter.
- Customer Support: Contact information for further assistance and warranty details.

To get the most out of your ALPHA, please follow the instructions provided carefully. Should you have any questions or require further assistance, do not hesitate to contact our customer support team.

We hope your ALPHA enhances your GNSS operations and meets all your expectations!

1.1. User Notices

1.1.1. CE Notices

The ALPHA receiver complies with all applicable EU directives, including the Low Voltage Directive (2014/35/ EU), EMC Directive (2014/30/EU), and RoHS Directive (2011/65/EU).

1.1.2. Environmental Compliance

ALPHA receivers are fully compliant with the latest directives:

- WEEE (Waste Electrical and Electronic Equipment)
- RoHS (Restriction of Hazardous Substances)
- REACH (Registration, Evaluation, Authorization & Restriction of Chemicals).

These standards ensure that ALPHA products are manufactured and disposed of in an environmentally responsible manner.

1.1.3. Storage Precautions

- Always clean the instrument after use. Wipe off dust with a cleaning brush, then wipe off dirt with a soft cloth.
- Store in a location with a temperature of -40°C +85°C and no exposure to direct sunlight.
- Use a clean cloth, moistened with a neutral detergent or water, to clean the receiver. Never use an abrasive cleaner, ether, thinner benzene, or other solvents.
- Always make sure the instrument is completely dry before storing. Dry the receiver with a soft, clean cloth.

1.1.4. Safety Information

1. The final disposal of this product must be carried out in full compliance with all applicable national and local laws, regulations, and environmental directives.

2. The power supply unit provided by JAVAD GNSS for the ALPHA receiver (if supplied) must not be substituted with any third-party power source. If an alternative power supply is used, it must feature double insulation and fully conform to the electrical and safety specifications of the original JAVAD GNSS supplied unit.

3. The equipment, along with all supplied accessories, shall be operated solely in accordance with the specifications and usage conditions outlined in the accompanying release notes, user manual, and any other official documentation provided with the receiver.

4. To ensure the safe operation of the receiver, a lightning arrestor must be installed between the receiver and the GNSS antenna.

A lightning arrestor meeting the following specifications is recommended for proper protection:

Minimum Frequency: DC
Maximum Frequency: 3000 MHz
Minimum Input Power: > 2W
Directional Impedance: 50 Ohm (standard for GNSS/RF with Type N connectors)

1.1.5 Support

For initial support inquiries, please contact your authorized JAVAD dealer.

If you experience unexpected behavior from your ALPHA receiver and require technical assistance, please contact JAVAD GNSS Technical Support. To expedite the support process, include a short log file with support data and a Diagnostic Report from the receiver.

Website: https://www.javad.com

Technical Support:	support@javad.com
Sales:	sales@javad.com
Phone:	+1 (408) 770-1770 Main +1 (408) 770-1703 Support 1 +1 (408) 770-1714 Support 2
Address:	JAVAD GNSS 900 Rock Avenue San Jose, CA 95131 USA

2 ALPHA OVERVIEW

The ALPHA receiver enclosure is designed for the TR-2S & TR-3S OEM GNSS boards to provide easily accessible ports for interfaces with external devices, with single and dual antenna options.

GNSS performance is reinforced by patented anti-spoofing and jamming detection for operation in challenging environments together with all constellations tracking and fast acquisition.

JAVAD's NetView software provides a Windows PC application for easy status and configuration with a Graphical User Interface, as well as by traditional line commands or script files for customized use.

2.1 Hardware Specifications

2.1.1 Power Consumption

Power Input: 4.5 to 40 VDC (5-pin ODU)
Typical Consumption: 2W

2.1.2 Key Featuresl

The ALPHA GNSS receiver integrates advanced positioning technologies with robust performance to ensure reliable operation in demanding environments.

This section outlines the key features that enable high-accuracy navigation, strong interference resistance, and flexible deployment across a wide range of applications.

Key Features

- Spoofing Detection
- Advanced Multipath Mitigation
- 874 Channels, All Constellations
- Fast Acquisition
- Up to 200 Hz Output
- S-Band & L-Band
- RAIM
- Single & Dual Antennas

2.1.3 Physical and Enviromental

Dimensions	48 x 48 x 35 mm
Weight	0.37 kg
Temperature Range	-40°C to +70°C (Operating) -40°C to +85°C (Storage)
Humidity	95%
Ingress protection	IP66
Shock	MIL-STD-810H Method 516.8
Vibration	MIL-STD-810H Method 514.8
Compliance	CE, RoHS, REACH, WEEE

2.1.4 Time to First Fix

Cold Start	< 35 s
Warm Start	< 5 s
Reacquisition	< 1 s
RTK Initialization	2 - 6 s

2.2 ALPHA design

The ALPHA enclosure has three main panels for using the device: the front panel, the back panel, and the top panel.

2.2.1 Front panel

The ALPHA Front Panel layout is illustrated in Figure 1.

The ALPHA receiver has the following ports:

ALPHA Front Panel	
PWR (power)	Connection to an external power source
PWR LED	External power status indicator
Port A	Communication between the receiver & external device
USB	For high-speed data transfer and communication
ANT	Connection to an external GNSS antenna

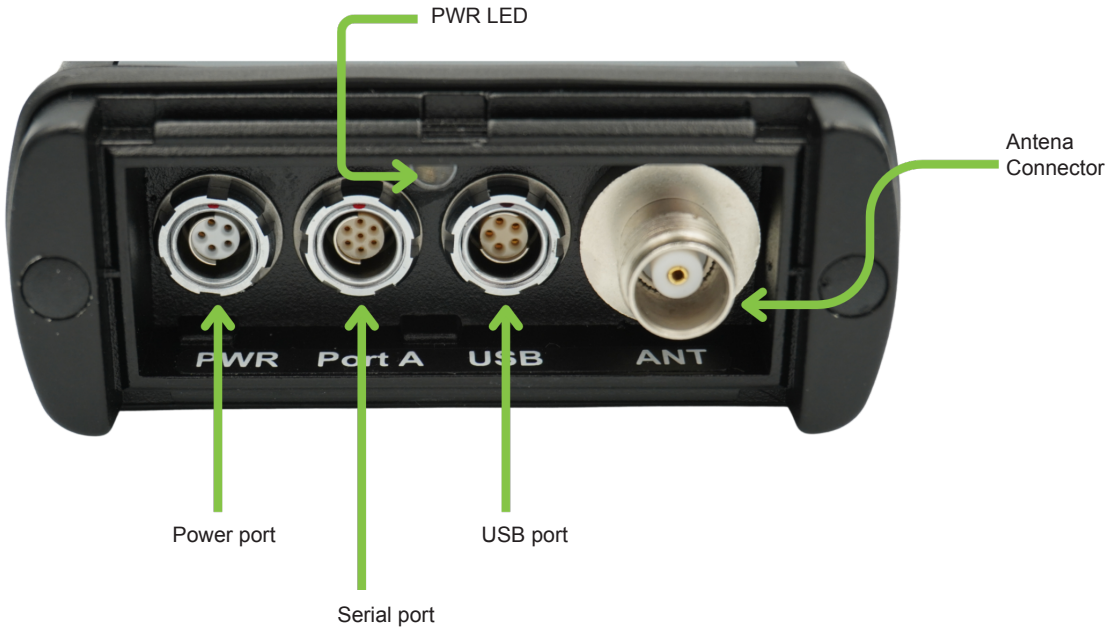


Figure 1: ALPHA Front Panel

2.2.2 Back panel

The ALPHA Back Panel layout is illustrated in Figure 2.

ALPHA Back Panel	
1PPS	Output connector for 1PPS
Bluetooth	Bluetooth Antenna Port
Event Marker	External Event Input

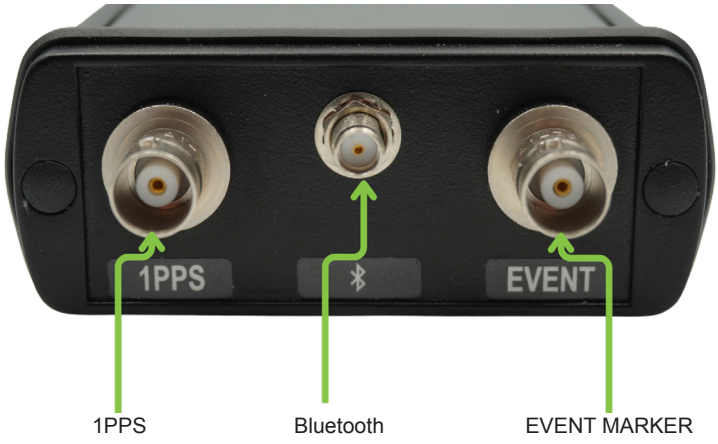


Figure 2: ALPHA Back Panel

2.2.3 Top panel (for the ALPHA-3S only)

The ALPHA Top Panel is shown in Figure 3.

Status LEDs	STAT (Status)	Indicates system status, including power and operational state.
	REC (Recording)	Indicates whether the receiver is actively logging data.
Control Buttons	Power Button	Used to power the receiver on or off.
	Function Button (FN)	Used for user-defined actions, such as starting/stopping logging.

Figure 3: ALPHA Top Panel

2.2.4. Bottom Panel

The ALPHA bottom panel displays the serial number label as shown in Figure 4.

Figure 4: ALPHA Bottom Panel

2.2.5. Power Button

To turn the ALPHA On, push and release the PWR button.

To turn the ALPHA Off, press the PWR button for between 1 and 4 seconds. During this period, the STAT LED (status) remains off.

If the PWR button is pressed for more than 8 seconds, the command is ignored to protect against stuck keys.

2.2.6. FN Button and REC LED

The FN button enables a few functions directly.

- Pressing the FN button during the first second turns the REC LED YELLOW.
- Pressing the FN button between 1 and 5 seconds will Start / Stop raw data recording. Each time data recording is turned on, a new file opens or data is appended to an existing file.
- Pressing the FN button between 5 to 8 seconds will turn Serial Port A to Command Mode at 9,600 baud for an external connection.
- Pressing the FN button for more than 8 seconds has no impact.

The REC LED has 3 color indications:

- REC LED is GREEN or YELLOW during data recording.
    - It blinks each time data is written to internal memory.
- REC LED is RED
    - when memory is full
    - when there is a hardware problem
    - when there is an improper OAF.
- REC LED flashes YELLOW
    - to indicate “not ready” during bootup
    - checking memory availability
    - may take a few minutes depending on the amount of internal memory.

Action	REC LED	Description
Press for < 1 s	YELLOW (for 1 sec)	No action. Button press detected
Press for 1 – 5 s	YELLOW	Starts or Stops Logging
	GREEN or YELLOW (recording)	Blinks Green / Yellow during writes
	RED	Memory Full, HW Failure, Invalid OAF
Press for 5-8 s	YELLOW	Serial Port A to CMD Mode at 9600
Press for > 8 s	NONE	None
Receiver Booting	YELLOW (flashing)	File system initializing, not ready
		< 1 s to several minutes due to memory size & conditions

2.2.7. STAT LED

The STAT LED alternates between two indications for satellite tracking <SAT> and position mode <POS> every 0.5 seconds. The display logic is repeated every 1 second.

- <SAT> Mode = Number of Space Vehicles (SVs) tracked
- <POS> Mode = Position status

GREEN: In the normal state, when receiver tracks enough SVs to compute position, the STAT LED is a steady green followed by short OFF period to indicate receiver is active.

RED or YELLOW: The STAT LED indicates less than optimal conditions with red or yellow colors. When no SVs are tracked (and thus no position is computed), the STAT LED is OFF most of the time and produces short red blinks of every second.

<SAT> Mode Description		
LED Appearance	**Usable SVs, Nu**	**Description**
OFF	0	No satellites tracked
RED	1–4	Low number of satellites
YELLOW	5–7	Moderate number of satellites
GREEN	> 7	Good number of satellites

Nu = # satellites used, Nt = # satellites tracked, Ns = # GNSS with tracked satellites
Nu = Nt - Ns + 1 = Number of usable satellites

<POS> Mode Description		
Indicator	**Condition**	**Description**
Short RED Blink (100ms)	No position fix	No position computed
YELLOW	Position fix	Required position mode is not met
GREEN	Position fix match	Required position mode is met

2.3. Internal memory

The receiver features up to 16 GB of non-removable internal memory for data logging. Logging can be performed in JPS, RINEX, BINEX, NMEA, or RTCM-MSM formats.

2.4. External memory

The receiver does not support data logging to an external memory device.

3. Getting started with the ALPHA

This section provides step-by-step instructions on how to power on the ALPHA receiver, establish physical and wireless connections, and communicate with it using available interfaces such as USB, serial port, or Bluetooth. It also includes guidance on initial setup and troubleshooting common connection issues.

3.1. Powering the Receiver

The receiver can be powered through the following input:

- PWR connector: 1 port, 5-pin ODU, 4.5 to 40 VDC

The receiver can be powered by connecting the standard power adapter to the front-panel power socket, as illustrated in Figure 5.

Figure 5: Front-panel power socket

3.1.1. Power supply requirements

The socket-outlet must be installed near the equipment and be easily accessible.

A single external power supply with a 5 pin ODU connector and a SAE connector is necessary to operate the ALPHA receiver. If the external power supply has only SAE connector, the Receiver-to-SAE power cable is used.

The external power supply needs to be Listed for US and Certified for EU countries. It also needs to be a Limited Power Source and rated for Outdoor Use and have an output rated for +7 to +40 V DC, 3A. This may not be the same range as other JAVAD GNSS products.

CAUTION: Before connecting of the equipment to the supply, make sure that the supply meets local and national safety ordinances and matches the equipment's voltage and current requirements

CAUTION: Never attempt any maintenance or cleaning of the supply while plugged in. Always remove supply from AC power before attempting service or cleaning.

Warning: If the voltage supplied is below the minimum specification, the receiver will suspend operation. If the voltage supplied is above the maximum specification, the receiver may be permanently damaged, voiding your warranty.

Make sure cords are located so that they will not be stepped on, tripped over, or otherwise subjected to damage or stress. Do not operate equipment with a damaged cord or plug – replace immediately. To reduce the risk of damage to the equipment, pull by the plug body rather than the output cord when disconnecting the equipment.

Do not operate the supply if it has received a sharp blow, been dropped, or otherwise damaged. Do not disassemble the supply.

Warning: Before connecting the external power source and the receiver, make sure that the power source matches the receiver's voltage and current requirements.

3.2. Installing NetView

Use the NetView software program for configuring and maintaining the receiver. This software is available on the JAVAD GNSS website. NetViewô is a comprehensive Windows® software product designed for controlling GNSS receivers developed by JAVAD GNSS.

Refer to the NetView Software Manual for full details on installing and using NetView Software.

1. If downloading the program from the website, extract the program files into a folder on your hard drive.
2. Navigate to the location of the NetView program and double-click the Setup.exe icon.
3. Follow the on-screen installation instructions. Click Install to continue. Keep the default installa- tion location or select a new location.
4. If desired, create a shortcut on the computer's desktop for quick access to NetView

3.3. Computer Connection

The NetView software application provides an interface for configuration, monitoring, and management functions for the receiver.

Connect the receiver to a computer using one of the following methods and start NetView:

- Bluetooth®-enabled external device (computer/controller)
- an RS232 cable and a computer/controller
- a USB cable and a computer/controller with the JAVAD GNSS USB driver installed]

Once you have established a connection between the receiver and the computer, you will be able to use NetView to configure the receiver and its components, send commands to the receiver, download files from the receiver's memory, upload new firmware, upload an OAF, and upload configuration files to a receiver.

Figure 6: Connecting to the front-panel USB socket

3.3.1. Option Authorization File (OAF)

JAVAD GNSS issues an Option Authorization File (OAF) to enable the specific options that customers purchase. An OAF allows customers to customize and configure the ALPHA receiver according to particular needs, only purchasing those options needed.

Typically, all ALPHA receivers ship with a temporary OAF that allows the receiver to be used for a predetermined period of time. When the receiver is purchased, a new OAF activates the purchased options permanently. Receiver options remain intact when clearing the NVRAM or resetting the receiver.

For a complete list of available options and details, visit the JAVAD GNSS website (http://www.javad.com) or consult your dealer.

3.4. Connecting an Antenna

The ALPHA receiver can be used with an external antenna (Figure7). Follow the steps below to connect an external antenna to ALPHA and measure its offset.

Figure 7: Front-panel antenna connector

3.4.1. Antenna Height

The location of the antenna relative to the point being measured is very important for both elevation and horizontal location.

Antennas have two types of height measurements:

- Vertical – measured from the marker to the antenna reference point (ARP) located on the bottom of the receiver at the base of the mounting threads.
- Slant – measured from the marker to the lower edge of the antenna slant height measure mark (SHMM) located on both end panels of the receiver.

To determine the coordinates of the station marker, the user must specify the following:

- Measured height of the antenna above the station marker
    - Slant or Vertical
- Antenna Model

3.5. Cabels

The ALPHA receiver package includes standard communication and power cables for configuration and power to the receiver.

AC Power Cable, 3c, C13/C14, SVT (6ft/1.8m) (14-578153-01)	
Extension Cable SAE/SAE (1.8m) (14-578102-01)	
External Power Supply/Charger 90W C14/ SAE (22-570106-01)	
Power Cable, ODU-5/SAE (0.3m) (14-578101-01)	
USB Cable to ODU-5 (1.8m) (14-578104-01)	

4. Connector Specifications

4.1 Power Connector

Rimmed in red, the power connector (Figure 8) is a sealed receptacle, 5 pin, ODU p/n G80F1C-T05QF00-0000.

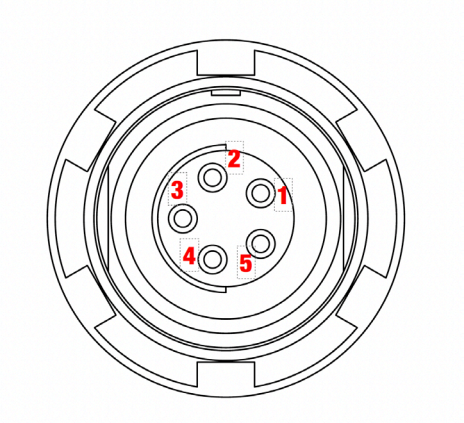


Figure 8: Power Connector

Table 1 gives the power connector specifications.

Number	Signal Name	Dir	Details
1	Power_INP	P	10 to 30 volts DC input
2	Power_INP	P	10 to 30 volts DC input
3	Power_GND	P	Ground, power return
4	Power_GND	P	Ground, power return
5			Not used

Table 1: Power Connector Specifications

4.2. Serial RS-232C Connector

The RS232 connectors (Figure 9) are sealed receptacle, 7 pin, ODU p/n G80F1C-T07QC00-0000.

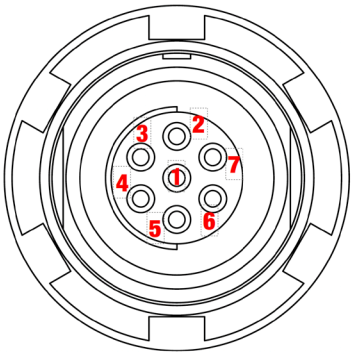


Figure 9: RS-232C Connector

Table 2 gives the RS-232C cable connector specifications.

Number	Signal Name	Dir	Details
1	-	-	-
2	GND	-	Signal ground
3	CTS	I	Clear to send
4	RTS	O	Request to send
5	RXD	I	Receive data
6	TXD	O	Transmit data
7			Not used

Table 2: RS-232C Connector Specifications

4.3. USB Connector

The USB connector is a sealed receptacle, 5 pin, ODU p/n G80F2C-P05QF00-0000 (Figure 10).

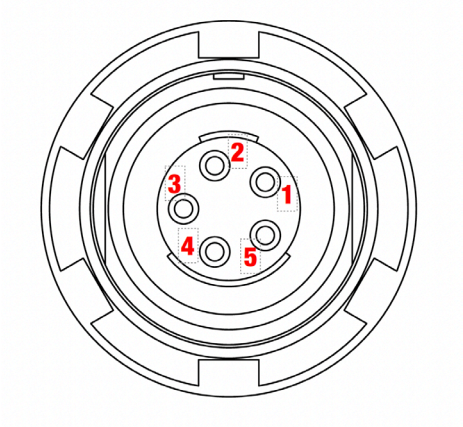


Figure 10: USB Connector

Table 3 gives the USB connector specifications.

Number	Signal Name	Dir	Details
1			
2	USB_PWR	P	Bus power
3	GND	-	Ground
4	USB D+	I/O	Data plus
5	USB D-	I/O	Data minus

Table 3: USB Connector Specifications

4.4. GNSS External Antenna RF Connector

The external antenna connector type (Table 4) is a TNC RF connector with an Applied Engineering Product p/n 6001-7051-003.

Type	Signal Name	Dir	Details
TNC	ANT_IN	I	RF input from LNA, 100 mA at 5.0 volts DC output

Table 4: GNSS External Antenna RF Connector

4.5. EVENT and 1PPS Connectors

The EVENT and 1PPS connectors are coaxial female receptacles of BNC series, Kings Electronics part number KC-79-108. These connectors are optional.

5. Technical Specifications

5.1. GNSS Constellations

Number of Channels	874
GPS	L1 C/A, L1C, P1, P2, L2C, L5
GLONASS	L1 C/A, P1, P2, L2 C/A, L3
GALILEO	E1, E5, E5A, E5B, E6
BeiDou	B1, B1C, B2B, B2, B2A, B3
QZSS	L1C C/A, L1C, L2C, L5, L6, L1S, L1Sb, L5S
SBAS	L1, L5
NavIC	L1, L5, S
L-Band	1525-1560 MHz

5.2. GNSS Accuracy (RMS)

	Horizontal (m)	Vertical (m)
Autonomous (Stand alone)	1.000	1.500
SBAS	0.500	0.850
DGPS	0.250	0.500
JStar (PPP)	0.025	0.050
RTK	0.008 + 1 ppm	0.015 + 1 ppm
Network RTK	0.008 + 0.5 ppm	0.015 + 0.5 ppm
Static/Fast Static	0.003 + 0.1 ppm	0.004 + 0.4 ppm
Heading	**DUO**: < 0.09 deg (2m basline)	

6. Base/Rover

This chapter describes the example of configurationof Base/Rover modes.

6.1. Base configuration

Turn on the receiver and wait for a stand-alone solution. After that:

1. Go to the **Parameters** tab (1) and then to the **Base** section (2);
2. Click on the button **“Get from Receiver”** (3);
3. After the position of the antenna phase center appears, press the button **“APC->ARP”** (4);
4. Then save the changes by clicking on the **green check mark** (5) at the bottom of the window;

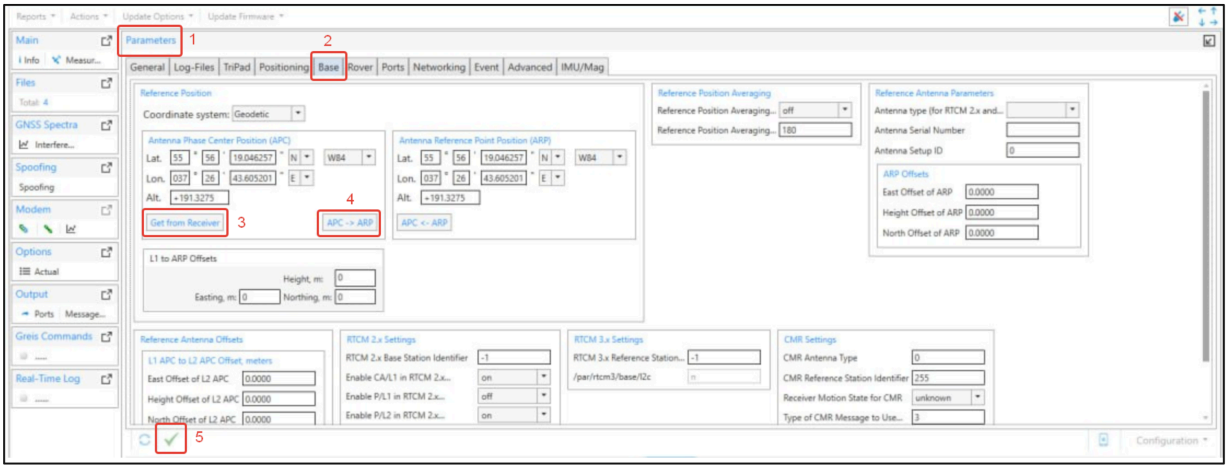


Figure 11: Explanations for steps 1-4

5. After that, go to the **Ports** (6) section and then to the **Serial** tab (7);
6. For the port that will transmit corrections, for example port A, **select the corrections** (8) required to be issued, for example “RTK RTCM3 MSM GPS+GLO+BDS+GAL”;
7. Then save the changes by clicking on the **green check mark** (9) at the bottom of the window.

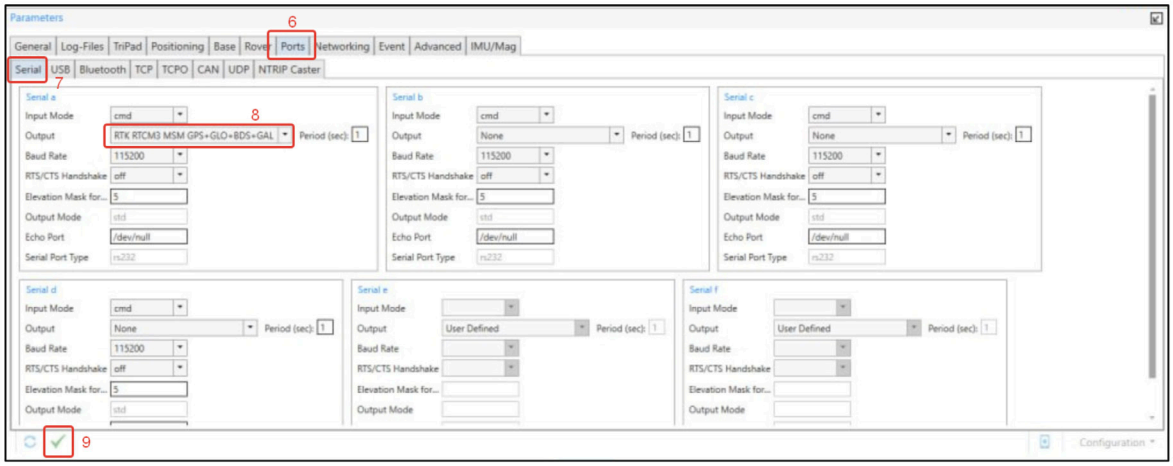


Figure 12: Explanations for steps 5-7

6.2. Rover configuration

Turn on the receiver. After that:

1. Go to the **Parameters** tab (1), then to the **Ports** section (2) and to the **Serial** tab (3);
2. For the port to which the Base is connected, in the Input setting, select “**rtcm3**” (4);
3. Then save the changes by clicking on the **green check mark** (5) at the bottom of the window;

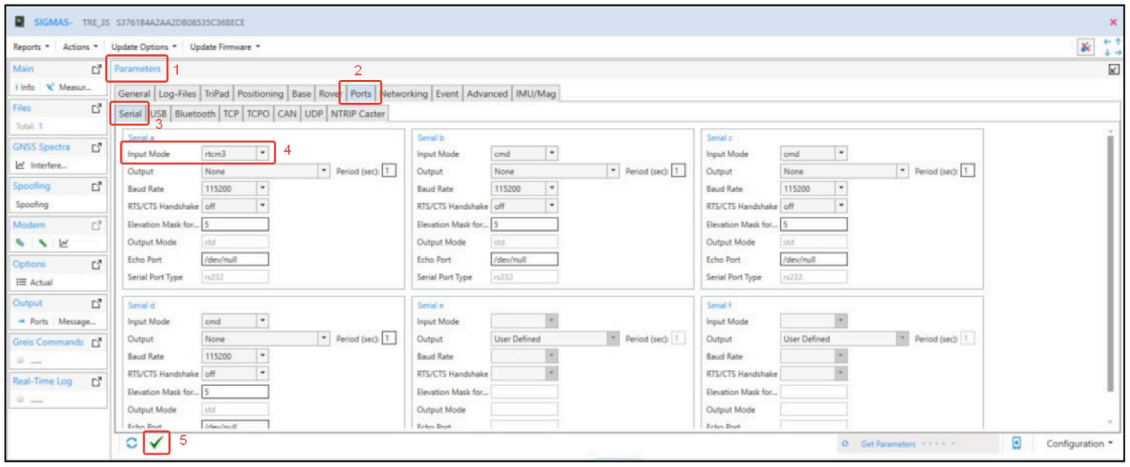


Figure 13: Explanations for steps 1-3

4. Next, go to the **Positioning** tab (6), and then the **Main** section (7);
5. In the *Enable solutions* section, in the *Position Calculation Mode* tab, select **pd** mode (8);
6. Then save the changes by clicking on the **green check mark** (9) at the bottom of the window.

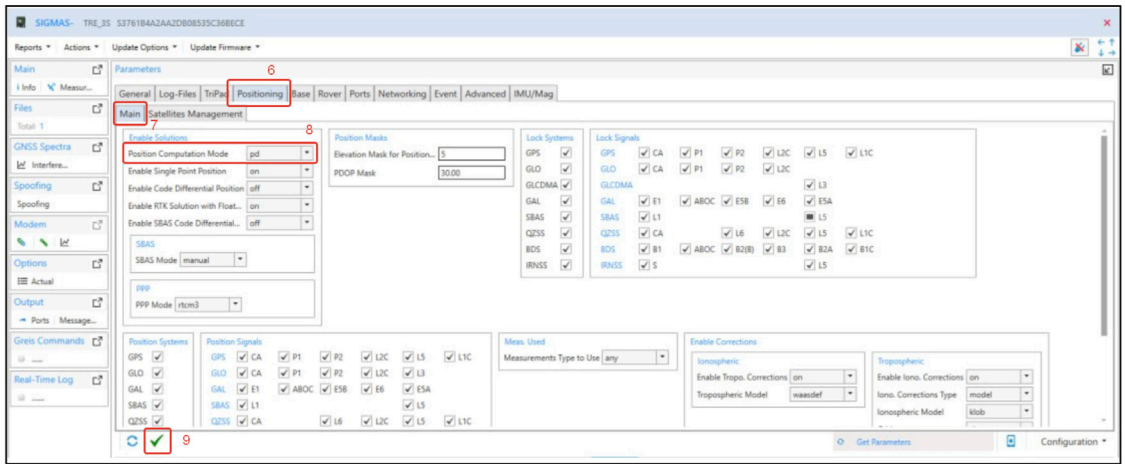


Figure 14: Explanations for steps 4-6

At the end of these stages, the receiver will switch to RTK mode and will issue a high-precision solution.

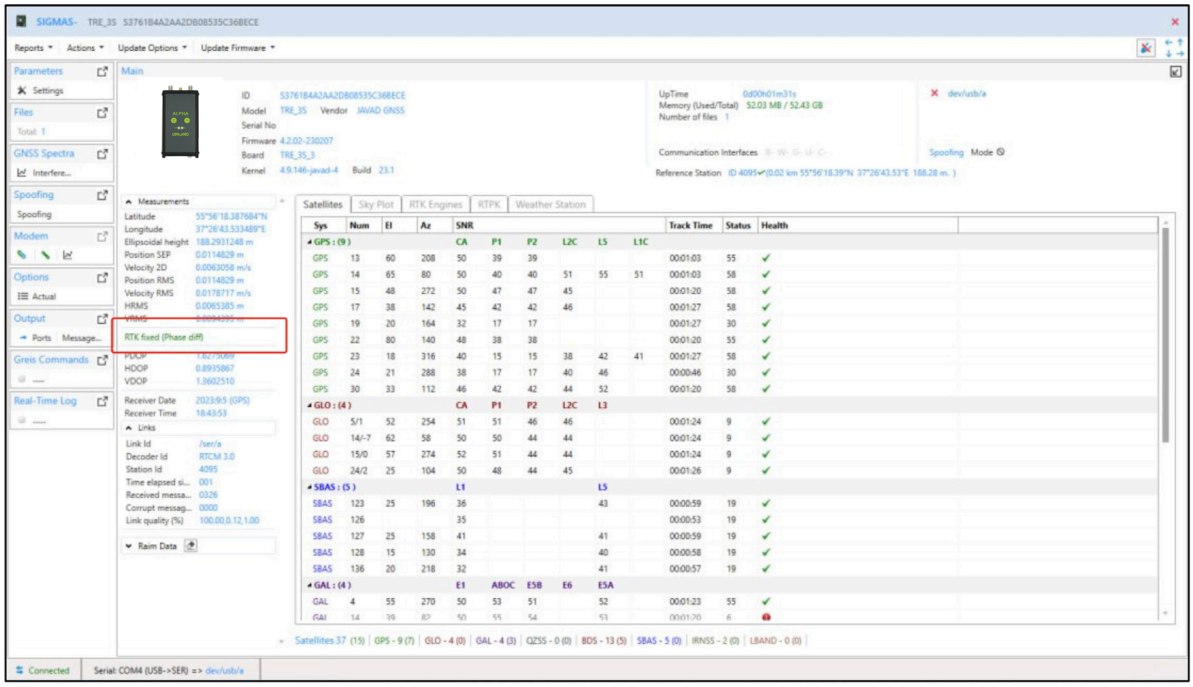


Figure 15: Receiver in RTK mode

7. Data Logging

This chapter describes how log navigation data using GREIS commands or NetView.

7.1. Data Logging By GREIS Commands

1. Remove previous log-file with the same name
   %%remove,data_log

2. Create a new file with the desired name
   %%create,data_log

3. Enable the desired set of messages.
   a. If required It can be like a default set: **%%em,/cur/file/a,def:0.1**

Note: ":0.1" - the period of message output in seconds. If not specified, there will be a default output with a period of 1 second.

   b. And/or messages that are also required for output:
   %%em,/cur/file/a,/msg/jps/{<Required messages separated by commas>}:0.1
   Example: %%em,/cur/file/a,/msg/jps/{RT,PG,VG,ET}:0.1

The messages are given as an example:
- [RT] – Receiver Time - binary GREIS message;
- [PG] – Geodetic Position - binary GREIS message;
- [VG] – Geodetic Velocity - binary GREIS message;
- [ET] – Epoch Time - binary GREIS message.

After these commands, the recording of the log file will begin

4. To stop recording a file, use the command
   %%dm,/cur/file/a

After that, the resulting file can be downloaded to your computer for further processing.

7.2. NMEA Logging By GREIS Commands

1. Remove previous log-file with the same name
   %%remove,nmea_log

2. Create a new file with the desired name
   %%create,nmea_log

3. Enable the desired set of messages.
   %%em,/cur/file/a,/msg/nmea/{<Required messages separated by commas>}:0.1
   Example: %%em,/cur/file/a,/msg/nmea/{GGA,RMC}:0.1

Note: ":0.1" - the period of message output in seconds. If not specified, there will be a default output with a period of 1 second

The messages are given as an example:

- [GGA] – Receiver Time: This message comprises time, position and other fix related data for JAVAD GNSS receiver. (GREIS manual p.163)
- [RMC] – Recommended Minimum Specific: GNSS Data Time, date, position, course and speed data provided by a GNSS navigation receiver. (GREIS manual p.170)

After these commands, the recording of the log file will begin.

4. To stop recording a file, use the command
   %%dm,/cur/file/a

After that, the resulting file can be downloaded to your computer for further processing.

7.3. Data logging with NetView

In this case, start the ALPHA and connect to NetView.

1. In the NetView open **Output Tile** (1), then open the **Message Sets** tab (2) and click on the **pencil icon** (3) next to the desired set of messages to edit or create a new one;

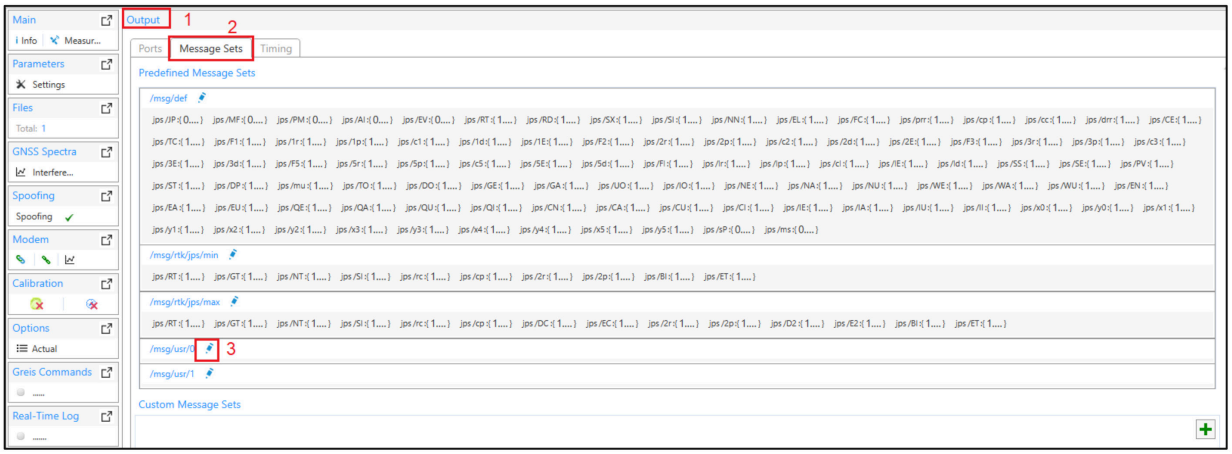


Figure 16: Explanation for Step 1

2. In the **messages tab** (4) that opens, select the required ones (NMEA messages are shown as an example) and then click on the **green check mark** to confirm (5);

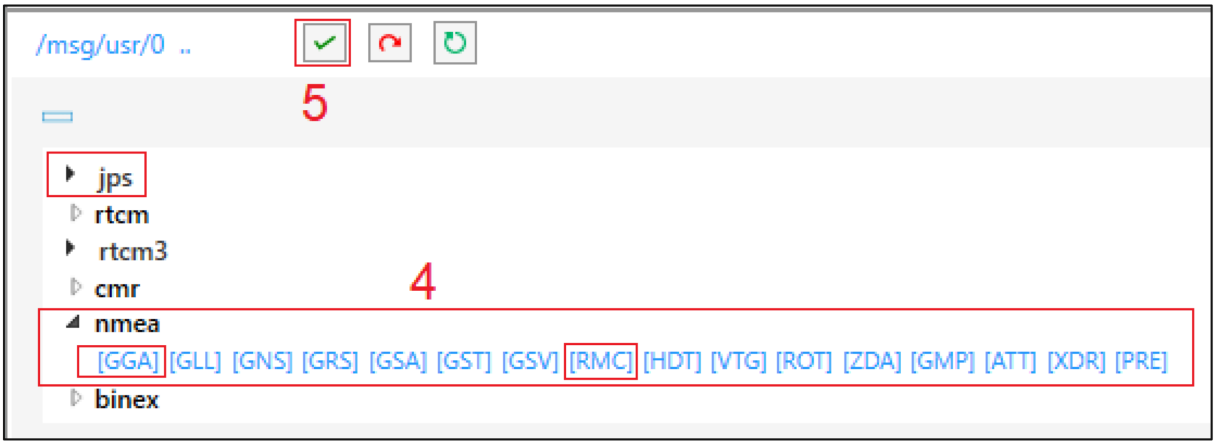


Figure 17: Explanation for Step 2

3. Next, go to the **Files tab** (6), select the previously choose **message set** (7) (in the example, this is usr/0), set the **recording interval** (8) (in seconds), set the f**ile name** (9) and press the **start button** (10) to record the file;

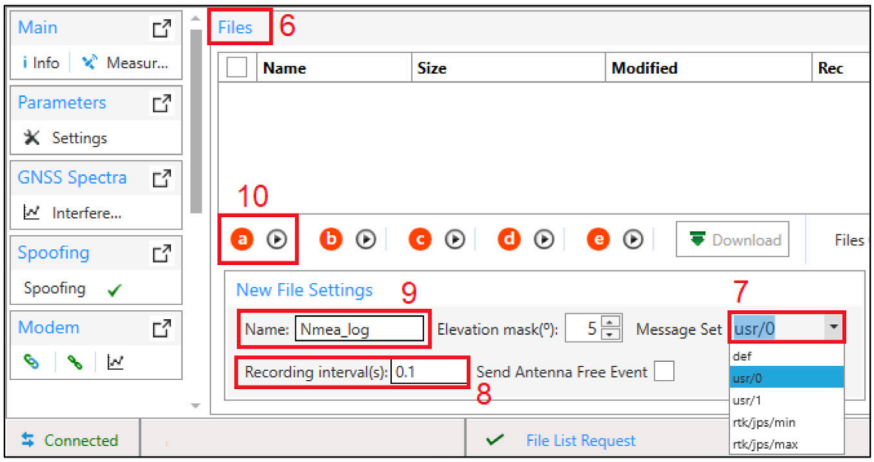


Figure 18: Explanation for Step 3

After these commands, the recording of the log file will begin.

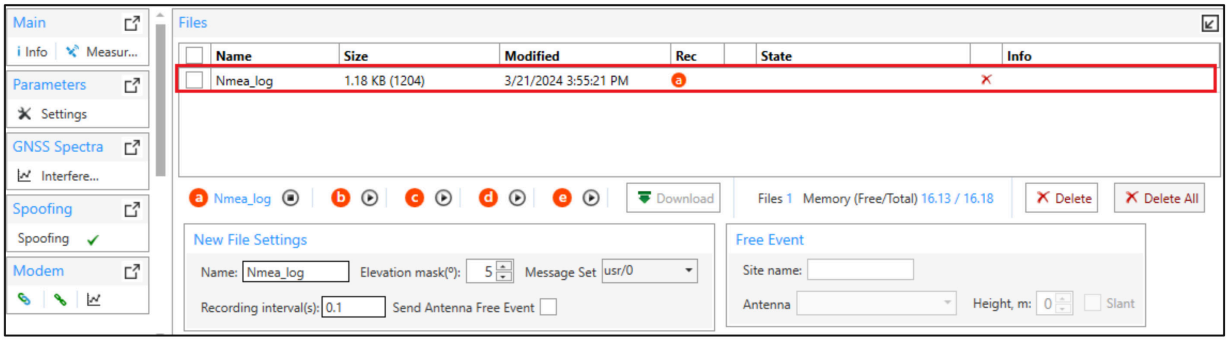


Figure 19: Example of a recording file

To stop recording, click on the Stop File Recording button.

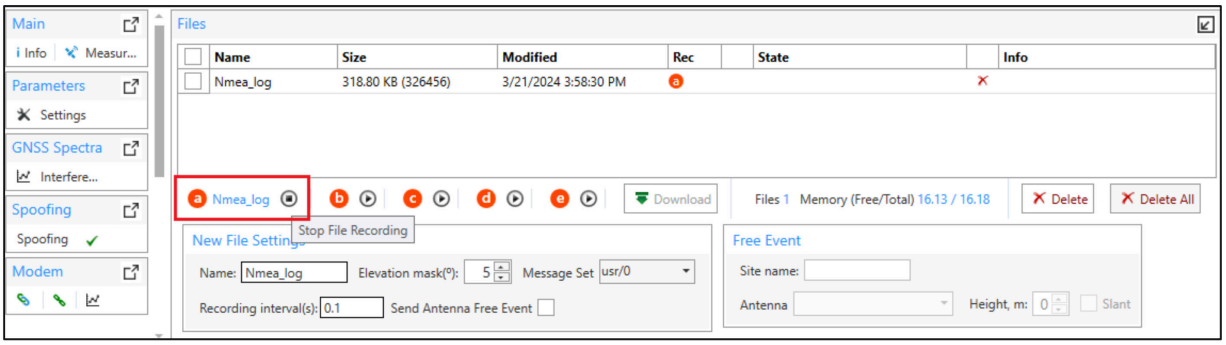


Figure 20:. Example of stopping file recording

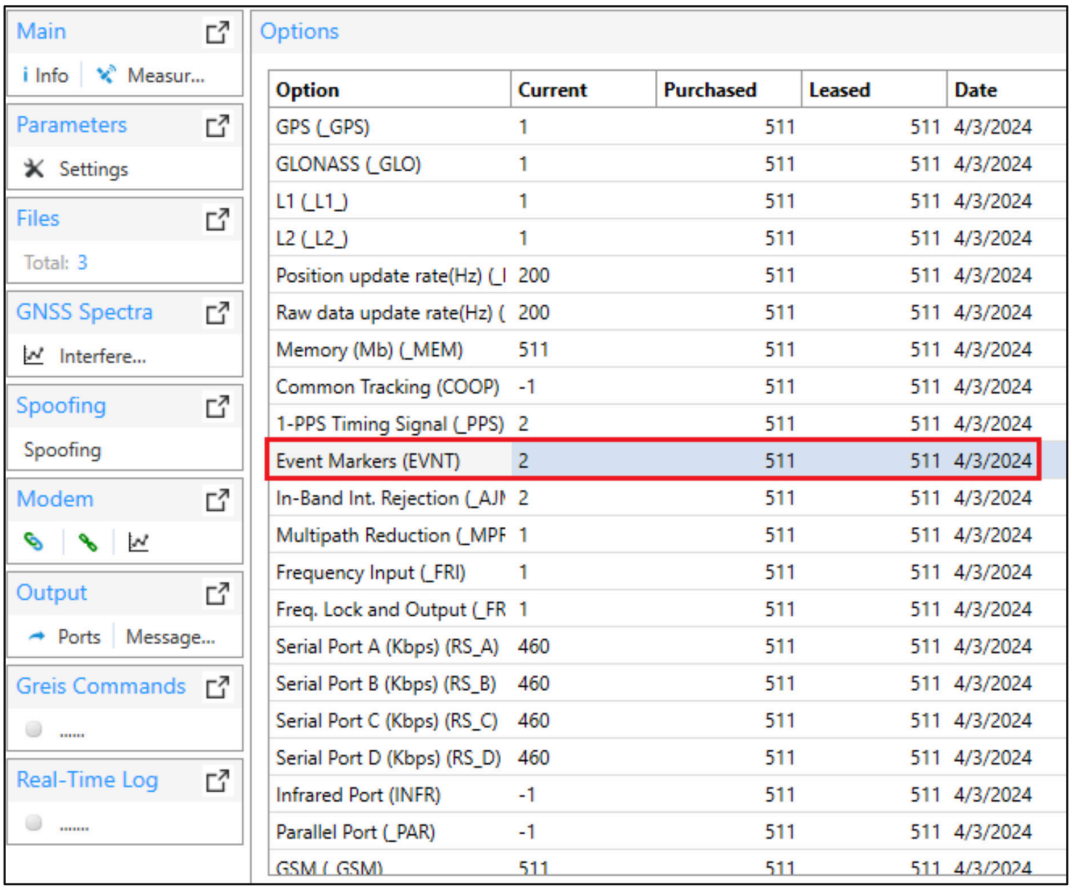
After that, the resulting file can be downloaded to your computer for further processing.

8. Event Markers

This chapter describes how to enable and use Event markers in JAVAD receivers.

Before starting work, check whether the **Event Markers** (EVNT) option is activated on the receiver with NetView.

The option **EVNT** must be activated for configure and using Event Markers. You can check the availability of the desired option in the **Options** tab in the **EVNT** line. If the option is active, its flag in column "**Current**" will be positive integer.



Option	Current	Purchased	Leased	Date
GPS (_GPS)	1	511	511	4/3/2024
GLONASS (_GLO)	1	511	511	4/3/2024
L1 (_L1_)	1	511	511	4/3/2024
L2 (_L2_)	1	511	511	4/3/2024
Position update rate(Hz) (_I	200	511	511	4/3/2024
Raw data update rate(Hz) (	200	511	511	4/3/2024
Memory (Mb) (_MEM)	511	511	511	4/3/2024
Common Tracking (COOP)	-1	511	511	4/3/2024
1-PPS Timing Signal (_PPS)	2	511	511	4/3/2024
Event Markers (EVNT)	2	511	511	4/3/2024
In-Band Int. Rejection (_AJI	2	511	511	4/3/2024
Multipath Reduction (_MPF	1	511	511	4/3/2024
Frequency Input (_FRI)	1	511	511	4/3/2024
Freq. Lock and Output (_FR	1	511	511	4/3/2024
Serial Port A (Kbps) (RS_A)	460	511	511	4/3/2024
Serial Port B (Kbps) (RS_B)	460	511	511	4/3/2024
Serial Port C (Kbps) (RS_C)	460	511	511	4/3/2024
Serial Port D (Kbps) (RS_D)	460	511	511	4/3/2024
Infrared Port (INFR)	-1	511	511	4/3/2024
Parallel Port (_PAR)	-1	511	511	4/3/2024
GSM (_GSM)	511	511	511	4/3/2024

Figure 21: Example of an activated option

If you do not have the required option or if you have any other possible problem, please contact **support@javad.com.**

8.1. Enable Event Marker By GREIS

This chapter describes how to enable and configure an Event using the GREIS commands.

1. Enable Event Acquisition (The example uses events A)
%%set,/par/dev/event/a/in,on

2. Set the Event Reference Edge, by rise or fall (The example uses fall registration)
%%set,/par/dev/event/a/edge,fall

Default: rise
Note: rise – the time of the rising edge of the event signal will be measured;
fall – the time of the falling edge of the event signal will be measured.

3. Set the desired reference time system (GPS time is used in the example)
%%set,/par/dev/event/a/time,gps

Default: utc
Note: utc – select the best from all available UTC time scales.
[ZA] and [ZB] messages will contain identifier of the actual reference time selected for each particular Event. After that, the Event is ready for use.

Note: If some parameters do not need to be configured and default values are suitable, you do not need to enter commands.

8.2. Enable Event Marker By NetView

This section describes how to enable and configure an Event Marker using NetView.
1. Go to the **Parameters** tab (1) and then to the **Event** section (2), there will be an Event Marker settings panel on this page;

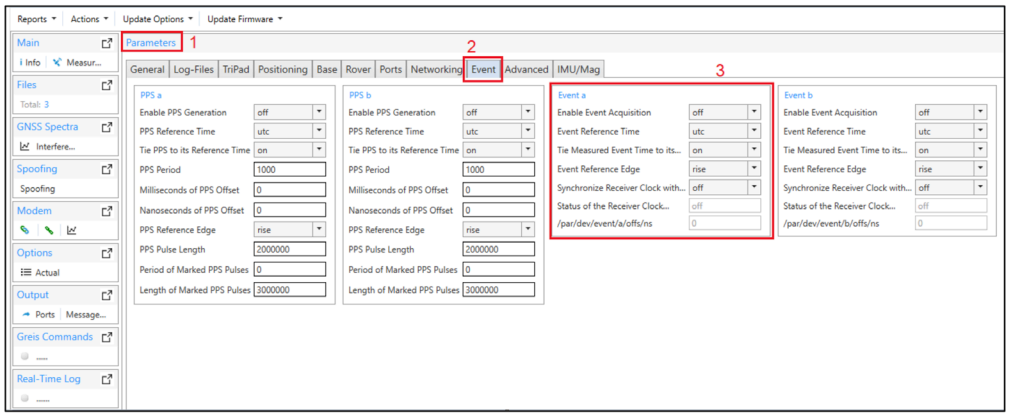


Figure 22: Explanations for step 1

2. In the Event settings panel, follow these steps:
   a. Enable Event Acquisition (a)
   b. Set the desired reference time system (b)
   c. Set the Event Reference Edge (c)

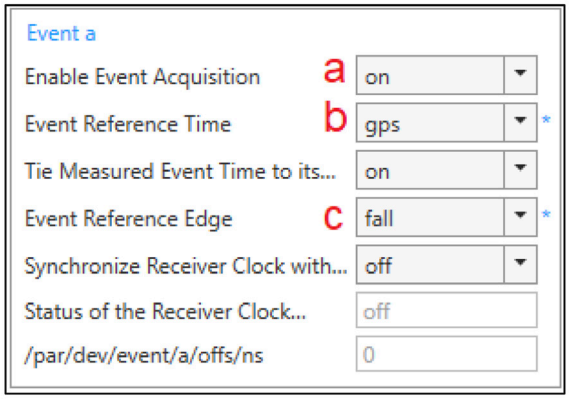


Figure 23: Explanations for step 2

After that, the Event is ready for use.

8.3. Check Event Marker Operation

1. Put a button between the Event entrance and the ground;
2. Go to the Greis Commands tab and click Capture;

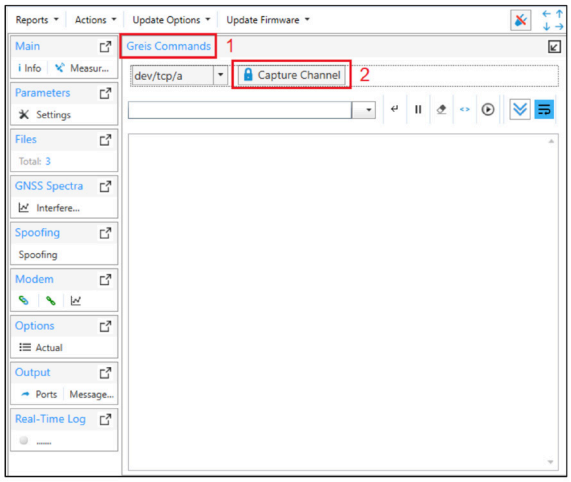


Figure 24: Explanations for step 1

3. Submit commands to check responses:

•

Response example: RE004%on%
•%em%em,/cur/term,/msg/jps/XA
Response example: RE004%em%

4. Press and release your button. For each press & release, a new message should appear on the screen as follows:

Response example: XA00A.....

5. If it works, check the actual device. For example, connect a camera shutter instead of the button and check that the XA message appears every time the shutter is released.

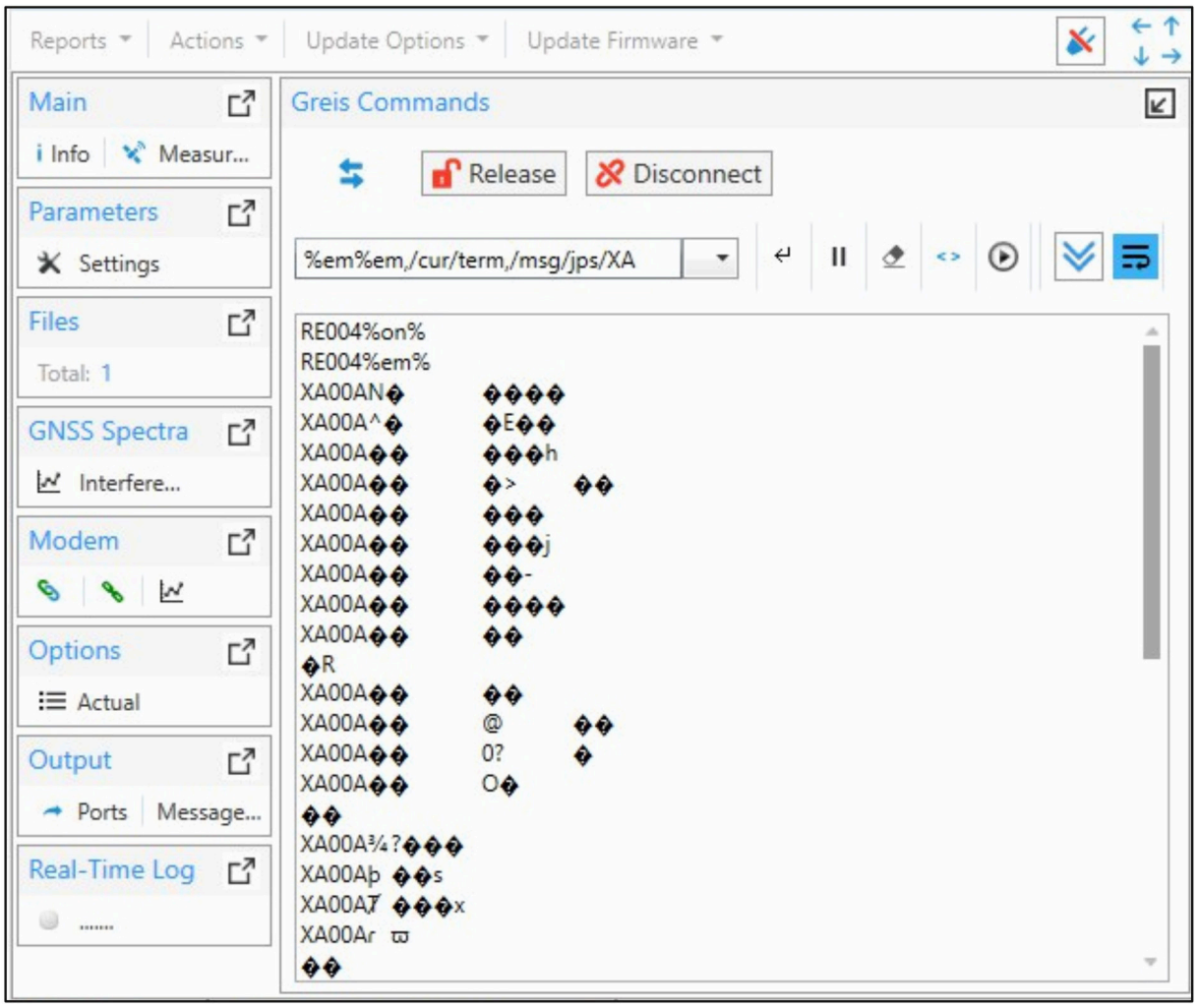


Figure 25: Example of answers of Event Markers

6. Next, you record the measurement file for verification by periodically releasing the camera shutter. And then checks the results.

Refer to the GREIS manual for a description of GREIS commands, parameters, and messages and a general description of command language which is common for any JAVAD GNSS receiver.

9. How to use SPOOFING/JAMMING detection

This chapter describes how to enable and use Spoofing/Jamming detection in ALPHA.

9.1. Spoofing / Jamming Detection Algorithm

The receiver detects possible spoofing by analyzing the number of correlation peaks. In normal conditions, only one peak is present. In the case of spoofing, there should be two peaks: original and spoofed.

If the receiver detects two peaks, it marks the signal as “spoofed”. If the number of spoofed satellites appears to be more than one, that signal for all satellites is flagged as “spoofed”.

Jamming detection is based on an analysis of incoming noise characteristics. In cases of jamming, the “noise floor” increases. Also, the deviation of noise may increase. The receiver measures these parameters, and in the event that at least one is greater than the threshold, the signal for all satellites is flagged as “jammed”.

9.2. Enable Spoofing/Jamming Detection

1. Before starting work, check whether the _SPF option is activated on the receiver. The option _SPF must be activated for Spoofing/Jamming detection. You can check the availability of the desired option in the Options tab in the _SPF line. If the option is active, its flag will be **«1».**

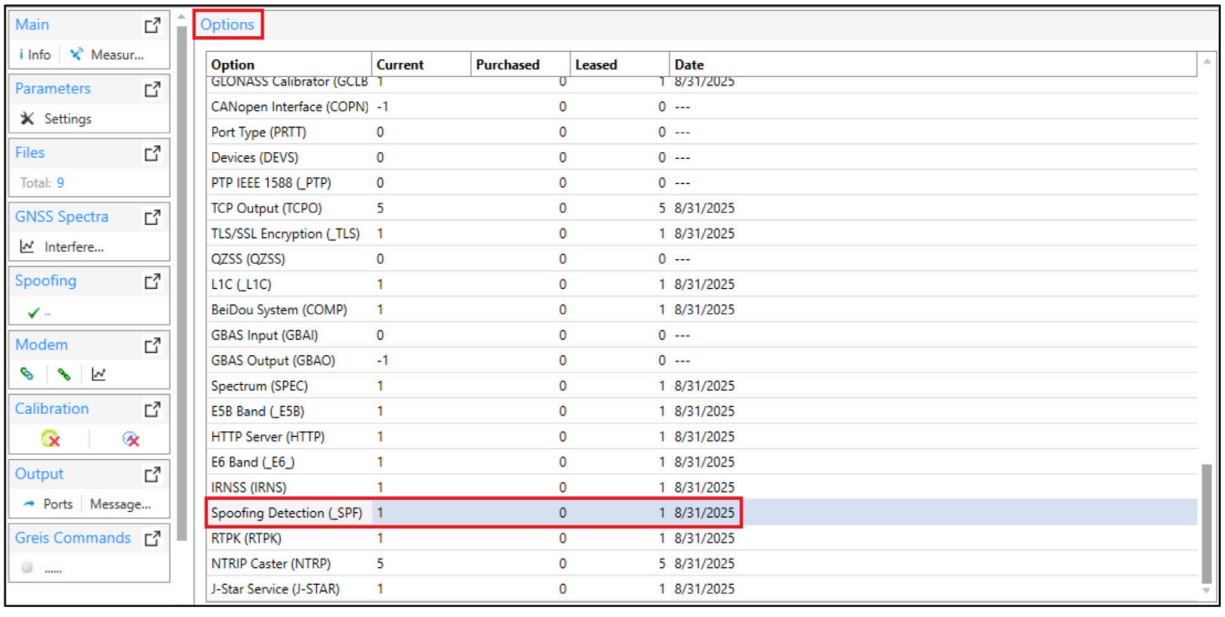


Figure 26: Spoofing / Jamming Option Activated

If you do not have the required option or if you have any other possible problem, please contact **support@javad.com**

2. Next, open the **Spoofing** tab.

The following settings (figure 27) configure spoof detecting:

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

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

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

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

The table contains available signals for each satellite system. 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.

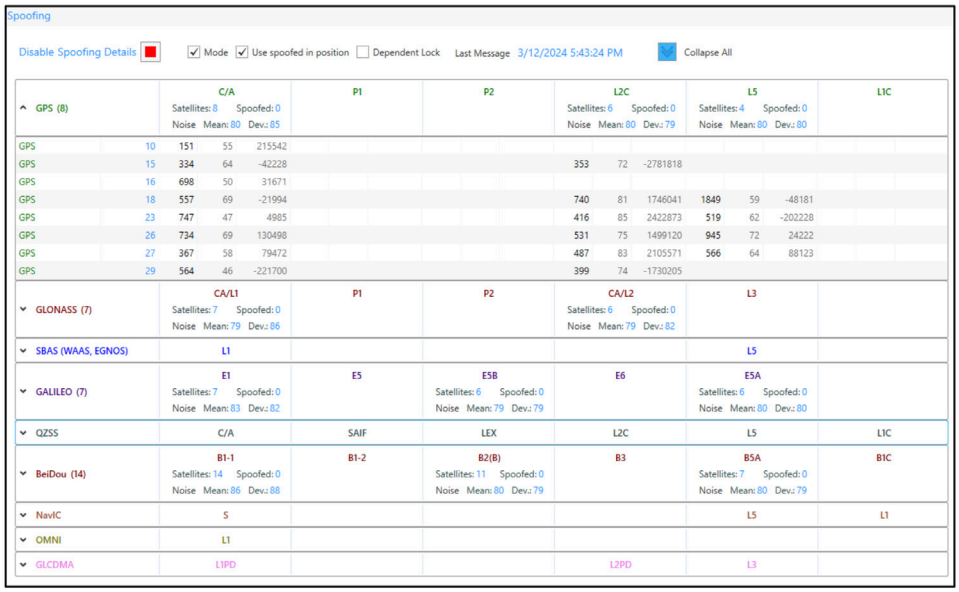


Figure 27: Filled Spoofing Table

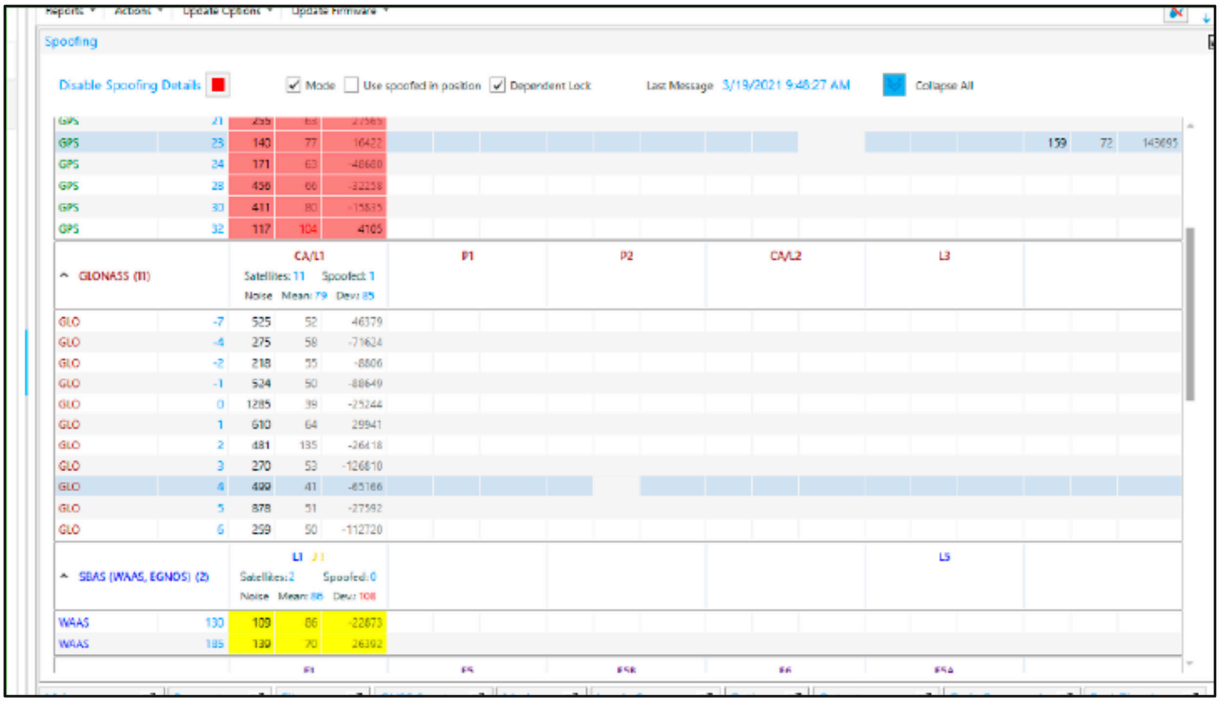


Figure 28: Detail satellites info. GPS and SBAS are expanded.
GPS/CA – spoofed and jammed, SBAS/L1 – jammed

Spoofing details contain the following columns:

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

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

The detection status is color coded. The entire signal is colored as follows:

- orange if spoofed
- dark yellow if jammed
- red if both spoofed and jammed

9.3. Satellite Table

Spoofing detection mode displays the SNR in a colored cell shading to indicate the detection status.
The cell background is dark yellow, orange or red on the SNR value of satellite in the main table if it is jammed, spoofed or both accordingly.

Unaffected signals have SNR on a white background.

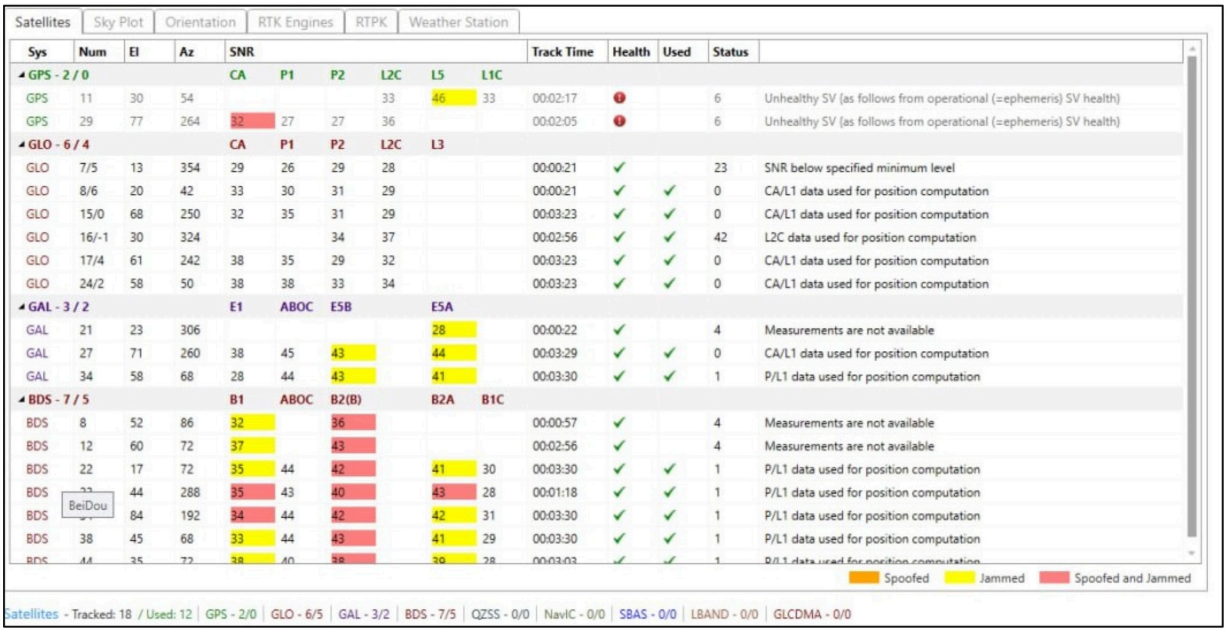


Figure 29: Spoofed & Jammed Signals, NetView Satellite Table

10. TROUBLESHOOTING

This chapter will help you diagnose and solve some common problems you may encounter with your receiver.

Warning: Do not attempt to repair equipment yourself. Doing so will void your warranty and may damage the hardware.

10.1. Check This First

Before contacting JAVAD GNSS support, check the following:

- Check all external receiver connections carefully to ensure correct and secure connections. Double check for worn or defective cables.
- Check all power sources.
- Check that the most current software is downloaded onto the computer and that the most current firmware is loaded into the receiver. Check the JAVAD GNSS website for the latest updates.

Then, try the following:

- Reset the receiver using NetView: Receiver name (on the left panel) ->Actions->Reset.
- Restore default settings using NetView: Receiver name (on the left panel)->Actions->Initial parameters.
- Clear the NVRAM.
- If the problem persists, see the following sections for other solutions.
-

10.2 Receiver Problems

The following are some of the most commonly encountered receiver problems.

10.2.1 Cable specific problems

1. The cable is not properly plugged in.

- Check that the cable connector is attached to the correct receiver port.
- Unplug the cable, then securely and properly reconnect it to the receiver.

2. The cable is damaged.

- Use an undamaged cable. Contact your Dealer to replace the cable.

10.2.2. Generic problems

1. The receiver port used for connection is not in Command mode.

- Connect your receiver and a computer using a free port (see chapter 3.3) and start NetView.
- Change the Input for the port used for connection to “Command”.

2. The receiver does not lock on to satellites for a long period of time.

- Order a new OAF with the desired options activated to enable or extend validity of the corresponding receiver options. Contact your dealer or visit the JAVAD GNSS website for details.
- Refer to the NetView Software Manual for a detailed description of options.

10.2.3 Too few satellites

1. The elevation mask value is too high (above 15 degrees).

- Lower the elevation mask.

2. The measuring is conducted near obstructions (tree canopy, tall buildings, etc.).

3. Check that the Multipath Reduction boxes have been enabled.

- Connect your receiver and a computer using a free port and start NetView.
- Click enable Multipath reduction and click Apply.

4. Move to an area free of obstructions, if applicable.

11. SAFETY WARNINGS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Clean only with a damp cloth.
- Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with a pole, cart, stand, or tripod, specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, or has been dropped.
- Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, shall be placed on the apparatus.

11.1. General Warnings

JAVAD GNSS receivers are designed for measuring and measuring related uses (that is, surveying coordinates, distances, angles and depths, and recording such measurements). This product should never be used:

- Without the user thoroughly understanding operator's manual.
- After disabling safety systems or altering the product.
- With unauthorized accessories.
- Without proper safeguards at the measuring site.
- Contrary to applicable laws, rules, and regulations.

DANGER: THE ALPHA RECEIVER SHOULD NEVER BE USED IN DANGEROUS ENVIRONMENTS. USE IN RAIN OR SNOW FOR A LIMITED PERIOD IS PERMITTED.

Warning: To comply with RF exposure requirements, maintain at least 20 cm between the user and the GSM module. Battery Pack Warnings.

11.2. Power Supply

Connect the supplied adapter to the side of the unit in the slot marked “PWR”. Plug the two-prong end of the power cord to an AC100-240V outlet.

If you have difficulty inserting the plug, turn it over and reinsert it. If the unit will not the used for a long time, disconnect the plug from the outlet.

Note: Before plugging the power cord into an AC outlet, make sure that all the connections have been made.

CAUTION: To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

CAUTION: To avoid the introduction of hazards when operating and installing, before connecting of the equipment to the supply, make sure that the supply meets local and national safety ordinances and matches the equipment’s voltage and current requirements.

CAUTION: Never attempt any maintenance or cleaning of the supply while plugged in. Always remove supply from AC power before attempting service or cleaning.

Warning: If the voltage supplied is below the minimum specification, the receiver will suspend operation. If the voltage supplied is above the maximum specification, the receiver may be permanently damaged, voiding your warranty.

Make sure cords are located so that will not be stepped on, tripped over, or otherwise subjected to damage or stress. Do not operate equipment with a damaged cord or plug – replace immediately. To reduce the risk of damage to the equipment, pull by the plug body rather than the output cord when disconnecting the equipment.

Do not operate the supply if it has received a sharp blow, been dropped, or otherwise damaged. Do not disassemble the supply.

Warning: Before connecting the external power source and the receiver, make sure that the power source matches the receiver’s voltage and current requirements.

11.3. Usage Warnings

If this product has been dropped, altered, transported or shipped without proper packaging, or otherwise treated without care, erroneous measurements may occur.

Note: Do not connect or disconnect equipment with wet hands, you are at risk of electric shock if you do!

The owner should periodically test this product to ensure it provides accurate measurements. Inform JAVAD GNSS immediately if this product does not function properly.

Only allow authorized JAVAD GNSS warranty service centers to service or repair this product.

11.4. Battery Pack Warnings

CAUTION: Risk of explosion if battery is replaced by an incorrect type. Dispose of used battery according to the instructions.

DANGER: NEVER ATTEMPT TO OPEN THE CASING OF THE DETACHABLE BATTERIES! LITHIUM-ION BATTERIES CAN BE DANGEROUS IF MISHANDLED!

DANGER: DO NOT INCINERATE OR HEAT BATTERY PACK ABOVE 212 DEGREES FAHRENHEIT (100 DEGREES CELSIUS). EXCESSIVE HEAT CAN CAUSE SERIOUS DAMAGE AND POSSIBLE EXPLOSION.

DANGER: THE BATTERIES (OR BATTERIES INSTALLED) SHALL NOT BE EXPOSED TO EXCESSIVE HEAT SUCH AS SUNSHINE, FIRE OR THE LIKE.

Warning: Do not attempt to open the battery pack.
Warning: Do not disassemble the battery pack.
Warning: Do not charge in conditions different than specified. Do not use other than the specified battery charger.
Warning: Do not short circuit the battery pack.
Warning: Do not crush or modify the battery pack.

JAVAD GNSS, Inc.
900 Rock Ave, San Jose, CA 95131, USA

LIMITED WARRANTY TERMS AND CONDITION

Last updated on January 6, 2025

PRODUCT LIMITED WARRANTY

Subject to the following terms and conditions, JAVAD GNSS, Inc. ("JAVAD") warrants that the **GNSS OEM, radio, survey and geospatial equipment** purchased from JAVAD ("Covered Product") are designed and manufactured to conform to JAVAD published specifications and that all parts are free from defects in material and workmanship under normal uses for a period of time from the date of shipment directly to the buyer or if through a dealer, then the date of shipment to the dealer. The warranty periods are as follows: **three (3) years for LS+, Triumph 3, Triumph 1M+ and the T3NR and one (1) year for all other OEM, radio and geospatial equipment.** Accessories, such as but not limited to, batteries, chargers, SIM cards, USB devices and cables have **a ninety (90) day warranty**. This warranty extends only to the original buyer and not to any successive buyer, even if a later buyer purchases it from the original owner within the warranty period.

Within the warranty period, JAVAD will repair or replace (up to a total cost limited to the total value of the Covered Product) free of charge, any part proving to be defective in material or workmanship or issue a credit for the Covered Product, so long as the Covered Product is returned to JAVAD under an RMA and qualifies for such, under these warranty terms. All warranty repairs and services must be performed by JAVAD or a designated affiliated JAVAD entity (authorized repair).

A repaired or replaced Covered Product is warranted for 90 days from the date of return shipment to the buyer or for the balance of the original warranty period, whichever is longer. These remedies are the buyer's exclusive remedies for breach of warranty.

All expenses up to the value of the Covered Product which are related to replacing or repairing a defective part under this warranty will be assumed by JAVAD except for the following expenses, which shall be the sole responsibility of buyer:

WARRANTY EXCLUSIONS:

This warranty **does not apply** to any costs, repairs or services for the following:

1. Service calls to correct the set-up or to explain usage of the Covered Product.
2. Repairs necessary due to use that is other than normal use or as described by JAVAD.
3. Damages resulting from misuse, abuse, accidents, alterations, or improper set-up.
4. Corrective work necessary because of unauthorized repairs.
5. Operation outside environmental and other specifications of the Covered Product.

PRODUCT SOFTWARE

Covered Product software, whether built into hardware circuitry as firmware, provided as a standalone computer software product, embedded in flash memory, or stored on magnetic or other media, is licensed solely for use with or as an integral part of the Product and is not sold. If accompanied by a separate end-user license agreement (“EULA”), use of any such software will be subject to the terms of such end-user license agreement (including any differing limited warranty terms, exclusions, and limitations), which shall control the terms and conditions set forth in this limited warranty. All capitalized terms in this paragraph are defined In the applicable EULA. During the limited warranty period, you will be entitled to receive such updates or Fixes to the Covered Product software that JAVAD releases and makes commercially available and for which it does not charge separately, subject to the procedures for delivery to purchasers of JAVAD products generally. If you have purchased the Covered Product from a JAVAD Authorized dealer rather than from JAVAD directly, JAVAD may, at its option, forward the software Fix to the JAVAD Authorized dealer for final distribution to you. Minor Updates, Major Upgrades, new products, or substantially new software releases, as identified by JAVAD, are expressly excluded from this update process and limited warranty. Receipt of software Fixes or other enhancements shall not serve to extend the limited warranty period.

HOW TO OBTAIN WARRANTY SERVICE

In the event repairs are needed, the buyer must contact JAVAD support within 10 calendar days upon discovery of defect, malfunction, or nonconformity.

If JAVAD determines the Covered Product is under warranty and qualifies for repair or replacement, then an RMA is issued for shipment to JAVAD at the buyer’s expense. A return shipment of the repaired or replaced Covered Product will be at JAVAD’s expense. If the warranty does not apply, then the return shipment of the repaired product will be at the buyer’s expense.

All returns should be insured, properly packaged and shipped in a manner that prevents further damages. JAVAD is not liable for lost or misplaced shipments. If the Covered Product is under warranty and no warranty exclusions apply, then JAVAD will loan an equivalent product, if available, free of charge, for the period of time that the repairs are being made, subject to a required signed loan agreement. Otherwise, JAVAD may offer to rent equipment, if available, for use while the product is being assessed and/or
repaired.

LIMITATION OF DAMAGES:

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND, IF APPLICABLE, IMPLIED WARRANTIES UNDER ARTICLE 35 OF THE UNITED NATIONS CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS. IN NO CASE SHALL THE COMPANY BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING DIRECTLY OR INDIRECTLY OUT OF THE OWNERSHIP, USE, OR OPERATION OF THE PRODUCTS, REGARDLESS OF WHETHER SUCH DAMAGES ARE PREDICATED OR BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL THEORY. SUCH DAMAGES INCLUDE BUT ARE NOT LIMITED TO LOSS OF PROFITS, LOSS OF SAVINGS OR REVENUE, LOSS OF USE OF THE PRODUCT OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF ANY SUBSTITUTE EQUIPMENT, FACILITIES, OR SERVICES, THE CLAIMS OF THIRD PARTIES, INCLUDING CUSTOMERS AND INJURY TO PROPERTY. THIS LIMITATION DOES NOT APPLY TO CLAIMS FOR PERSONAL INJURY. SOME STATES DO NOT ALLOW LIMITS ON WARRANTIES OR ON REMEDIES FOR BREACH IN CERTAIN TRANSACTIONS. IN SUCH STATES, THE LIMITS IN THIS PARAGRAPH AND THE PRECEDING PARAGRAPH MAY NOT APPLY.

No employee of JAVAD, or any other party, is authorized to make any warranty in addition to those made in this document. This warranty allocates the risks of product failure between the Company and the buyer.

This allocation is recognized by both parties and is reflected in the price of the goods. The buyer acknowledges that it has read this warranty, understands it, and is bound by its terms. This limited warranty is governed by the laws of the State of California, without reference to its conflict of law provisions or the U.S. Convention on Contracts for the International Sale of Goods.

OFFICIAL LANGUAGE

THE OFFICIAL LANGUAGE OF THESE TERMS AND CONDITIONS IS ENGLISH. IN THE EVENT OF A CONFLICT BETWEEN ENGLISH AND OTHER LANGUAGE VERSIONS, THE ENGLISH LANGUAGE SHALL CONTROL.

THE AUSTRALIAN CONSUMER LAW

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. JAVAD's warranty (set out above) is in addition to any mandatory rights and remedies that you may have under the Australian Consumer Law.

900 Rock Avenue, San Jose, CA 95131 USA

www.javad.com