

J-Star Setup

Version 1.2

November 2023

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1. Introduction

J-Star uses internal algorithms with broadcast satellite orbit and clock corrections to converge on a cm-level position independently without traditional differential corrections. J-Star is a global service and activation only requires the receiver to be turned on.

The J-Star service can be enabled using JMT or NetView software and is available via three modes:

- Auto
- Beam
- NTRIP

An NTRIP account can be provided by contacting support@javad.com.

1.1. Preconditions

Before using J-Star, confirm the following items with NetView software:

- Firmware version is 4.3 (2023-05-26) or newer
- “JAVAD PPP Service” option is enabled
- Subscription expiration date is valid
- Identification number is valid

From Figure 1 below, the firmware version is displayed on the main page (1), JPPP from the Options list (2), expiration date and ID from Parameters->Rover (3 & 4).

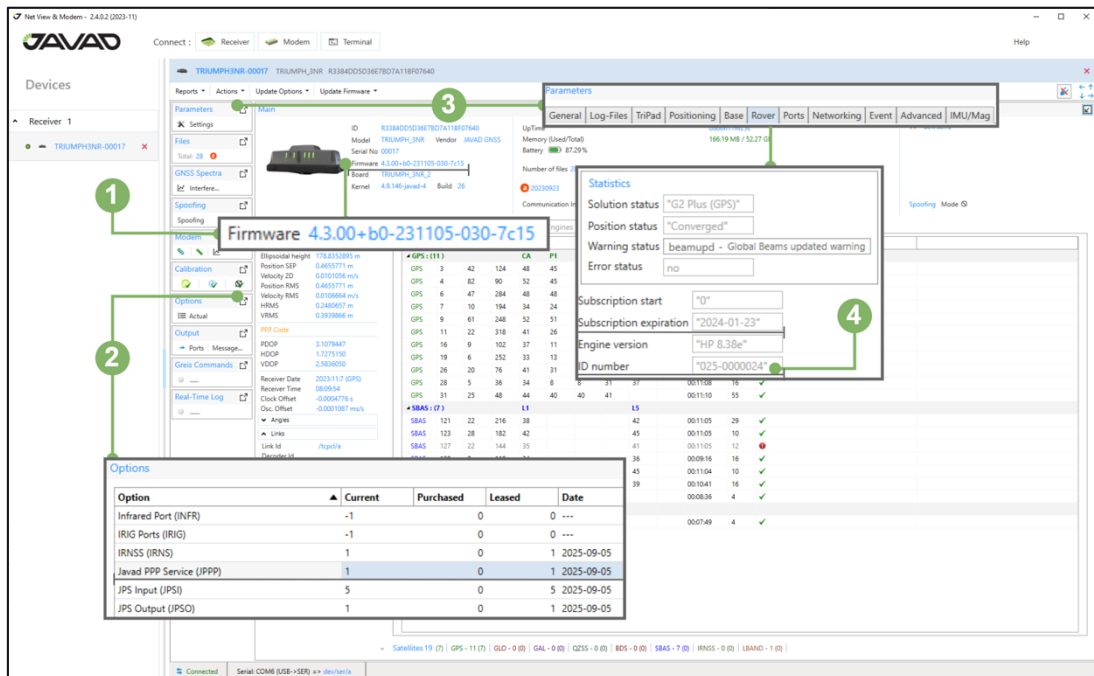


Figure 1: NetView J-Star Confirmation

If the preconditions aren't met, then follow the J-Star subscription procedure described in section 2.

2. J-Star Subscription

Use the following 4-step procedure to subscribe to J-STAR service:

1. Request OAF update for J-STAR service from sales department mentioning **Product Name** and **Serial Number** of the receiver.
2. Check the receiver's ID number (025-0000195 or alike) in the Rover settings with (NetView or JMT-R). If there is no ID displayed, request the **SID** number from Technical Support.
3. Subscribe via NTRIP or BEAM (pages 7-12).
 - a. The NTRIP account login details are requested from Technical Support. A successful NTRIP connection will provide the subscription message to the receiver.
 - b. The BEAM method requires configuration of beam parameters, L-Band beam reception via the GNSS antenna, and a request to Technical Support to send the subscription message via Beam (L-Band).
4. Once the subscription message is received, the J-STAR subscription expiration date will be updated from 2021-03-01 to the actual expiry date matching OAF options.

Table 1 below lists the J-STAR beam parameters.

Table 1: J-Star Beam Parameters

| Beam Name Mount Point | Coverage | Frequency (Hz) | Scrambling vector (hex format) | Data rate (bps) |
|--------------------------|-------------------------|----------------|-----------------------------------|--------------------|
| CONNA | North America | 1555788500 | 5C08 | 1200 |
| AMSAT | North & South America | 1545937500 | 5C08 | 1200 |
| OCSAT | Asia Pacific | 1545875000 | 3041 | 1200 |
| ERSAT | Europe and Africa | 1545950000 | 5C08 | 2400 |
| IRSAT | India, CIS, Middle East | 1546240000 | 5C08 | 1200 |
| AORET | N/A | 1545520000 | 5C08 | 600 |
| WASAT | N/A | 1545835000 | 5C08 | 600 |

3. J-Star with JMT

3.1. J-Star via JMT - Beam Mode

J-Star is included in JMT version 4.8.10 or newer.

The procedure to activate J-Star with the Beam mode using JMT is as follows:

- 1.) Select J-Star Rover and create a 'Correction Source' style within the J-Star main menu.

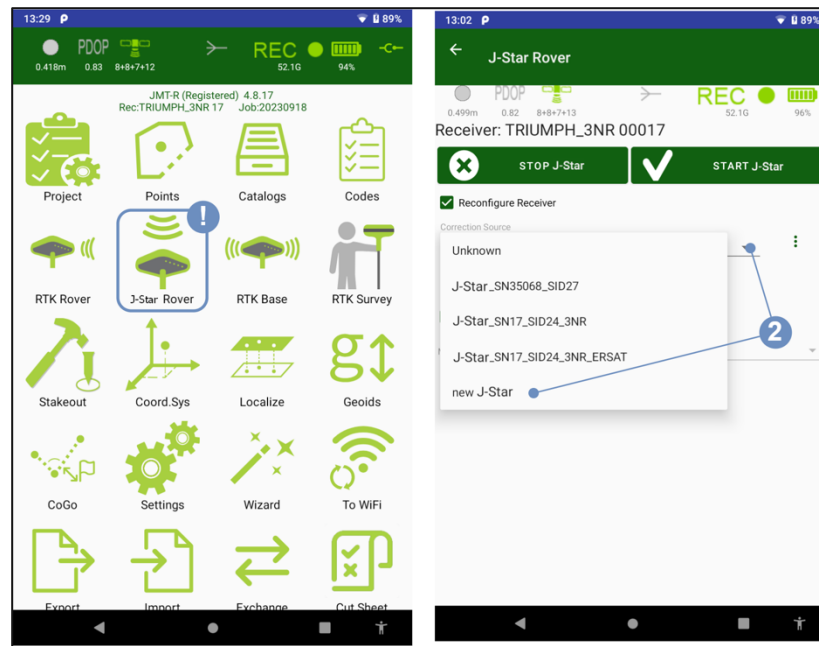


Figure 3: JMT - J-Star Rover

- 2.) Rename the style to a desired name.
- 3.) Choose the Channel for the coverage region as shown in Table 1.
- 4.) Select 'Correction Stream Source' as beam.
- 5.) Save the style by pressing the back arrow on the upper-left.
- 6.) Select the saved style and click 'Start J-Star'.

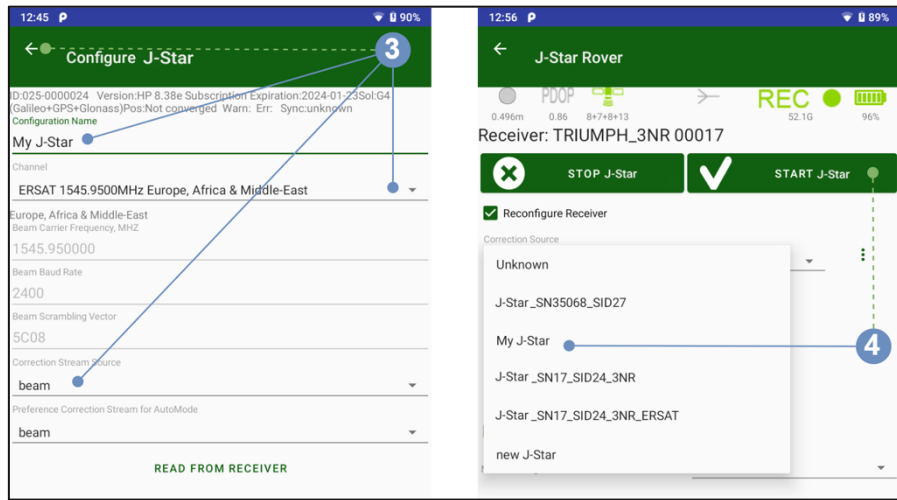


Figure 4: JMT - Configure J-Star

- 7.) Check J-Star status by selecting the correction status icon. With a clear sky view, the receiver will lock onto the beam and the position will begin converging to a fixed solution.

Please note that the 'Warning / Error' field indicates the *last* reported problem and may no longer be relevant.



Figure 5: JMT – J-Star Status

3.2. J-Star via JMT - NTRIP Mode

The procedure to activate J-Star via NTRIP is as follows:

- 1.) Select NTRIP mode via the 'Correction Stream Source'.
- 2.) Enter IP Address: 209.64.123.37 (USA) or 111.223.100.179 (Singapore).
- 3.) Enter Port: 2101 (default value).
- 4.) Select the Mount Point dependent on the location (see Figure 7).
- 5.) Enter the Login & Password received from Technical Support.

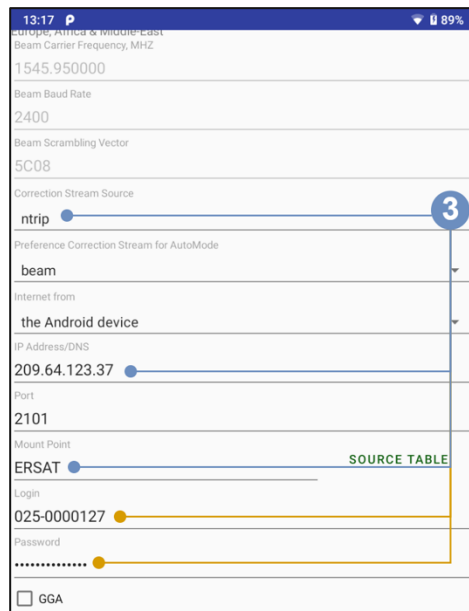


Figure 6: JMT - J-Star NTRIP

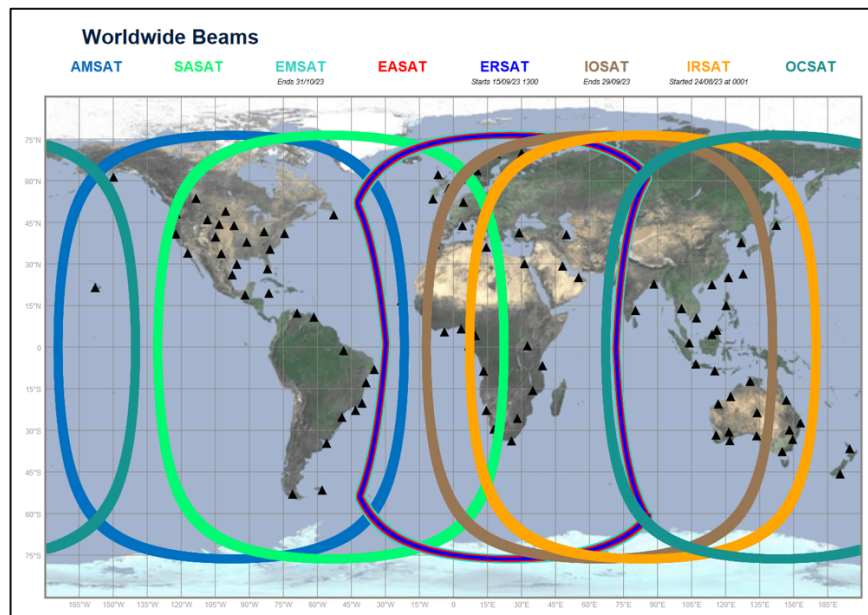


Figure 7: Worldwide Beams (10/23)

To continue:

- 6.) Select the saved style and click 'Start J-Star'.
- 7.) Check J-Star status by selecting the correction status icon. With a clear sky view, the receiver will lock onto the beam and the position will begin converging to a fixed solution.

Please note that the 'Warning / Error' field indicates the *last* reported problem and may no longer be relevant.

4. J-Star with NetView

4.1. J-Star via NetView – Beam Mode

- 1.) To activate a subscription through the L-Band beam, select Rover->Javad PPP Service->Stream settings.
 - a. Select the 'Correction Stream Source' as auto.
 - b. Select the 'Preferred correction stream for Auto mode' as beam.
 - c. Set 'Beam channel' as user.
 - d. Type in the 'Beam Carrier Frequency'.
 - e. Type in 'Beam Data Rate'.
 - f. Type in 'Beam Scrambling Vector' according to the region in Table 1.
 - g. Apply these settings (this will reset the receiver).

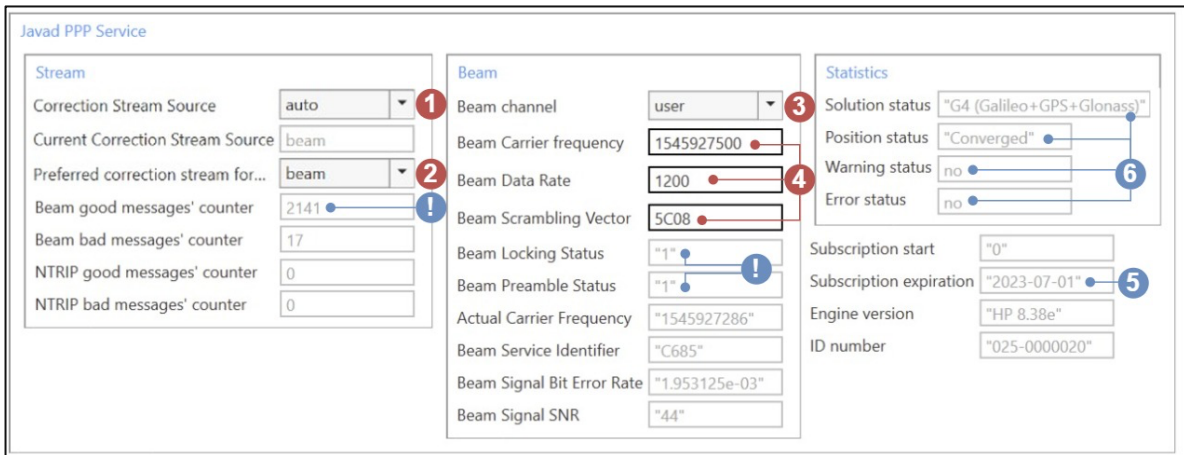


Figure 8: NetView – PPP Service Stream Settings

- 2.) Go to Parameters->Positioning->Main and set the following:
 - a. Set 'Position Computation Mode' is set to pp.
 - b. Set PPP Mode to jppp.

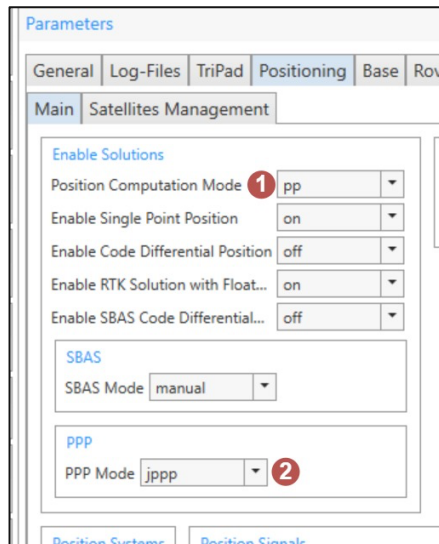


Figure 9: NetView - Positioning/Main

- 3.) The above settings will allow the receiver to lock onto the selected beam and the 'Good Messages' counter will start increasing along with related information.

4.2. J-Star via NetView – NTRIP Mode

- 1.) Go to Parameters->Positioning->Main and set the following:
 - a. Set the 'Position Computation Mode' to pp.
 - b. Set the 'PPP Mode' to jppp.

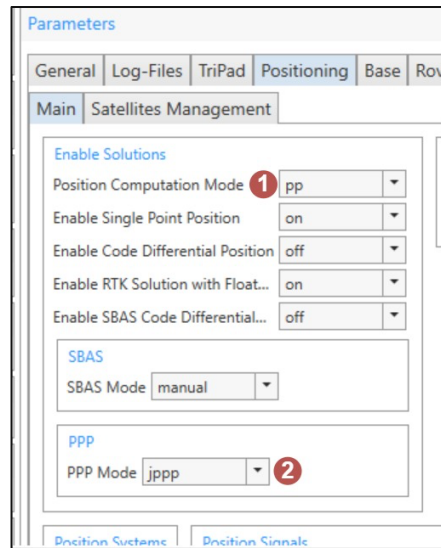


Figure 10: NetView - positioning/main

- 2.) In the Ports – TCP window, set the "TCP Client a" 'Input Mode' to jppp.

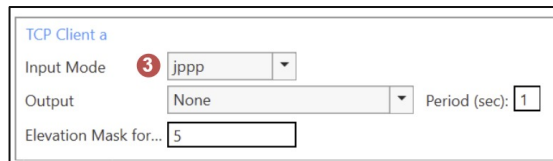
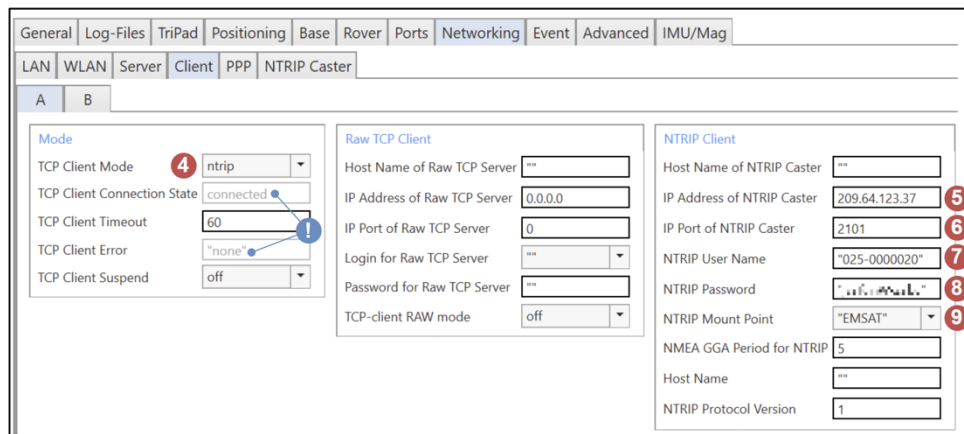


Figure 11: NetView - jppp

- 3.) Go to the Networking->Client->A window:
 - a. Set the 'TCP Client Mode' to ntrip.
 - b. Type in the 'IP Address of NTRIP Caster' (209.64.123.37 for USA / 111.223.100.179 for Singapore)
 - c. Type in 'IP Port of NTRIP Caster' (2101)
 - d. Type in the 'NTRIP User Name'.
 - e. Type in the 'NTRIP Password'.
 - f. Select the 'NTRIP Mount Point'.

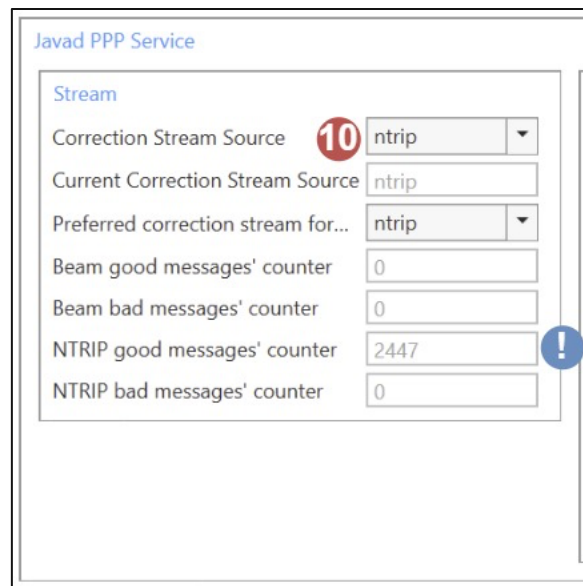


The screenshot shows the 'Client' tab in the 'Networking' section of the JAVAD software. It is divided into three main panels: 'Mode', 'Raw TCP Client', and 'NTRIP Client'. The 'Mode' panel shows 'TCP Client Mode' set to 'ntrip' (marked with a red 4), 'TCP Client Connection State' as 'connected', 'TCP Client Timeout' as '60', 'TCP Client Error' as 'none', and 'TCP Client Suspend' as 'off'. The 'Raw TCP Client' panel shows fields for Host Name, IP Address (0.0.0.0), IP Port (0), Login, and Password, with 'TCP-client RAW mode' set to 'off'. The 'NTRIP Client' panel shows fields for Host Name, IP Address (209.64.123.37, marked with a red 5), IP Port (2101, marked with a red 6), User Name ('025-0000020', marked with a red 7), Password (marked with a red 8), Mount Point ('EMSAT', marked with a red 9), NMEA GGA Period (5), Host Name, and NTRIP Protocol Version (1).

Figure 12: NetView - Networking - Client - A

If the NTRIP Client parameters are entered correctly and the NTRIP account is validated, the TCP Client Connection State will display 'connected' and the TCP Client Error will display "none".

Go to Rover->Javad PPP Service->Stream settings: select the 'Correction Stream Source' as ntrip. Once connected to the NTRIP stream, the 'NTRIP good messages' counter will start to increase.



The screenshot shows the 'Stream' settings within the 'Javad PPP Service' window. It includes fields for 'Correction Stream Source' (set to 'ntrip', marked with a red 10), 'Current Correction Stream Source' (ntrip), 'Preferred correction stream for...' (ntrip), and counters for 'Beam good messages' (0), 'Beam bad messages' (0), 'NTRIP good messages' (2447, marked with a blue exclamation mark), and 'NTRIP bad messages' (0).

Figure 13: NetView - Good Messages Counter