# Release Notes

**Stable firmware for Xsens Vision Navigator**
Author: Product Manager
Date: July 2023

## 1   Overview

This document describes a new **stable** release for firmware of the Xsens Vision Navigator.

Image: *fp_vrtk2-release-vr2_2.72.2-259.1bdbf09ebdfc919e06f07000c150276f.swu*

**Table 1: Deliverables**

| Release component | Product applicability | New version | Last stable version | Comments |
|---|---|---|---|---|
| **Firmware** | XVN-090D-1A, XVN-090D-2A | **2.72.2** | 2.63.2 | - |

## 2   Release notes

The changes described here are with respect to release 2.63.2.

### 2.1 Positioning

- Improved stationary performance.
- Improved marginalization process.
- Improved outlier rejection in the feature-tracking process.
- Improved wheelspeed handling inside the Fusion engine.
- Improved wheelspeed convergence flag for non metric measurements.
- Improved performance under RTK-float conditions for "Car" and "Lawnmower" tuning modes.
- Fixed minor bugs in wheelspeed usage and positioning stability.
- Fixed baseline load in the GNSS classifier.
- Changed the warmstart logic and decision. After warmstart, Fusion status will be "IMU Bias Not Converged" for slightly longer to attempt to converge the IMU biases.
- Improved the covariance output values.

### 2.2 GNSS

- No changes.

## 2.3 Web interface

- Added cosmetic changes and solved typos.
- Added support for new wheelspeed parameters.
- Added wheelspeed convergence status flag in the 'Fusion status' page.
- Added indicator on the navigation bar and a detailed alert on 'System status' page for I/O errors.
- Disabled starting a new recording when the time is not synchronized.
- Documented status bar indicator icons.
- Enabled websocket proxying (i.e., SSH tunnel is now possible).
- Fixed baseline warning not showing up.
- Fixed network connection dialog tooltips.
- Fixed color consistency of IMU status badges.
- Fixed loading and saving GNSS advanced options.
- Fixed support for NTRIP passwords with special characters (e.g., @, $, &).
- Fixed the display of basestation located at latitude < 0, longitude < 0 or longitude > 90 (e.g., Australia).
- The GNSS baseline is now always visible.
- GNSS and wheelspeed configuration is now blocked when Fusion is running.
- The "Fusion Status" page now correctly displays standard deviation instead of covariance.
- Fixed signed / unsigned configuration for wheelspeed presets.
- Log (recording) duration field can now display more than 24 hours. Also changed uptime display to the same formatting ([?d] hh:mm:ss)

## 2.4 Data interface

- Added documentation regarding I/O errors.
- Added NMEA-GP-RMC_FUSION GNSS message.
- Fixed the average outputs of the NMEA-GP-RMC_GNSS and NMEA-GP-GGA_GNSS messages.
- Added course over ground and speed over ground to NMEA-GP-RMC_FUSION, NMEA-GP-RMC_GNSS1, NMEA-GP-RMC_GNSS2 and NMEA-GP-RMC_GNSS.

## 2.5 Other

- Ethernet connections can now be edited.
- Improved handling of camera buffer errors.
- Fixed auto-exposure flickering on very bright scenes.
- Fixed an issue where the sensor would choose to do a recovery boot to the previous installation. This happened on newer sensors when using a high supply voltage (18VDC or more).

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- Fixed publishing empty messages to the '/wheels/data' topic when no sensors are configured.
- Fixed default correction source "I/O port" not working (I.e., it was only working after changing it to NTRIP and back again to IO port).
- Enabled GPU for camera processing.
- Improved CPU load.

## 2.6 Known limitations

- The Fusion autostart configuration is not persistent across software updates.
- On early prototype hardware, the camera is sometimes not correctly detected on boot.
- Under load, the time synchronization can still jump from good to bad, although happening much less often than previous versions.
- When recording (to external disk) powering off (by cutting power) or unplugging the USB disk too early may lead to data loss in the recording. Use the web interface to download the recordings, unmount the disk or shutdown the sensor in order to prevent the data loss.
- Time synchronization of the internal system time to GNSS time can lead to interruptions in Fusion data availability when system time adjustments are needed. Fusion data in the output is invalid during these events, which can take several seconds. Users are recommended to wait for GNSS time synchronization before starting Fusion.
- High system load (e.g., when recording using the sensor logging function) can occasionally produce pose outages in Fusion.
- High system load (e.g., when recording using the sensor logging function) can make the web interface unresponsive, slow, or occasionally fail. This is expected as the tuning of the system favors its primary functions, such as Fusion, over secondary ones, such as responding to web interface API requests.
- Wi-Fi client connections might be unreliable with more exotic setups, such as SSIDs with special characters or networks that use the same SSID for multiple bands. For best compatibility, the SSID should only consist of alphanumeric symbols and contain no spaces or punctuation.
- It may take a long time for the sensor to reconnect the Wi-Fi client after losing the connection.
- WPA-PSK ("WPA2") is the only supported Wi-Fi security mode. SAE ("WPA3") or open networks are not supported.
- Wi-Fi client connections are not fully reliable in all situations. Users are recommended to use cable connections (such as Ethernet or UART) for operational use of the sensor.
- The web-interface consumes additional CPU resources, which might impact the sensor's performance. Do not open multiple tabs of the web-interface at the same time.
- ▪ The "Configuration -> I/O -> Output translation and rotation" parameters only apply on sensor restart.

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- The wheelspeed convergence flag is always initiated as "Not Converged", it has no warmstart – will be available in the next release.

## 3   Update instructions

To install the software update image (.swu file):

1. Prepare the sensor for upgrade:
   a. Ensure the sensor has a reliable power supply. A power outage during the firmware update process can render the sensor unusable.
   b. Ensure that a reliable network connection is used. Using an ethernet connection is strongly recommended. Using a Wi-Fi connection is strongly discouraged.
2. Go to the web interface (http://10.0.2.1 in the default ethernet configuration) and go to System -> Firmware.
3. Load the update image (the .swu image file) into the Software Update form (drag and drop, or click to open the system's file open dialogue to select the .swu image file).
4. Wait until the update has installed and the sensor has rebooted.
5. Verify that the Configuration -> Fusion page settings are correct for your setup and adjust them as needed.
6. **Important**: This release resets some configurations, such as the output configuration. Check and update the configuration accordingly.