

Vision-RTK 2 Release Notes

Release v2.102.2

NOVEMBER, 2024

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1 Overview

This release consists of the following artifact:

- Image: fp_vrtk2-release-vr2_2.102.2-416.9511d9a709d74f89bb0b785c53ead1a4.swu

At the time of release, the following support documents and code are valid:

- Documentation
 - Release notes (this document): VRTK2_v2.102.2_release notes_v4.pdf
 - Integration manual: VRTK2_integration_manual_v2.3.1.pdf
 - Datasheet: VRTK2_Datasheet_v1.0.pdf
- Support software
 - fixposition_driver-7.0.5: https://github.com/fixposition/fixposition_driver/tree/7.0.5
 - fixposition_gnss_tf-3.0.1: https://github.com/fixposition/fixposition_gnss_tf/tree/3.0.1

For any questions or issues, please contact Fixposition support at support@fixposition.com.

2 Release notes

The changes described here are with respect to the release 2.85.3.

2.1. Positioning

- Improved performance and stability in outage conditions.
- Improved performance and stability in GNSS degraded conditions.
- Improved IMU bias handling for significantly faster Fusion initialization
 - The user can now access the estimated IMU biases (https://docs.fixposition.com/fd/fp_a-imubias)
- Output for FP_A-CORRIMU if IMU bias status greater or equal than warmstarted
- Improved Covariance estimation
- Improved system stability in slow and lawnmower modes
- Added feature to save and load a known pose
 - Perform seamless recovery from the last known location
 - This feature works under any GNSS conditions (including outages)
 - For more information, please refer to Section 3.3 of this document and this guide: <https://docs.fixposition.com/fd/starting-fusion-indoors>

2.2. GNSS

- Improved signal tracking and selection in multipath scenarios.
- Faster GNSS reacquisition after outages.
- Fixed bug that could cause GNSS handler misconfiguration on update
- Improved stability in low velocity operations
- Added Signal power compensation option for select use cases

2.3. Web interface

- Added 'Actions' button to reset fusion, or save/load positions on 'Status > Fusion' page
- Changes to status badges on 'Status > Fusion' page
 - Removed badge 'Fusion Engine'
 - Replaced 'Fusion status' with 'Init status'
 - Added GNSS1 status and GNSS2 status
 - Added Corrections status
 - Added more statuses to IMU convergence
 - Renamed 'Baseline check' to 'Antenna extrinsics'
- Changes to status flags
 - Added 'Fusion init status'
 - Updated Correction status
 - Changed input source for 'GNSS1/2 status'
- Added CANSTR to I/O Status
- Reworked Wheelspeed page and renamed it to Measurements
 - Added tunable trust level for each configured sensor
 - Added preset to support some incremental rotary encoders (experimental)
 - Any velocity vector measurement can be input into the sensor.
 - Finer configuration options to assess the resolution and trust of a measurement.
- Changes to correction data table on 'Status > GNSS' page
 - Added a second badge to indicate the usability of the corrections, see Sec. 3.2 of this document
- Reworked the 'Measurement data' status on the 'System > Info' page
- Added UI for GNSS Signal power compensation selection

2.4. Data interface

- Added UDP support for input and output
- Additions to API:
 - Added backup and restore functionality for the (almost) full configuration
 - Updated recording functionality
 - Added pose Save / Load feature functionality
 - Added GNSS Signal power compensation selection
- Removed configuration for TF frequency, see (i) tooltips:
 - POIPOISH: Fusion output frequency
 - POIMU = IMU frequency
 - All other TF messages: Fixed at 1 Hz
- Added new output messages:
 - FP_A-TP1_GNSS1: Timepulse for the GNSS1 receiver. Output at 1Hz
 - FP_A-ODOMSTATUS: Contains information on the internal status of fusion
 - FP_A-IMUBIAS: Contains the estimated IMU biases. Output at 1Hz.
 - FP_A-EOE_*: Message to mark the end of epoch for a data source, such as Fusion or GNSS1
 - FP_B-MEASUREMENTS: Output the inputted measurements
- NOV_B-INSPVAX: output message continuously
- **Deprecated support** for NOV_B-RAWDMI
- **Deprecated support** for CAN frame ID 0x146 for feeding data via the Fixposition CAN frame. The new frame IDs are 0x147 for the header information and 0x148 for the measurement values. Refer to Section 5.7.2 of the Integration Manual and <https://docs.fixposition.com/fd/fixposition-can-frame>

2.5. Other

- Improved initialization robustness and reduced time
- Reworked profiles of recording functionality

- Include all important data except camera image when recording in profile 'Minimal'
- Improved internal handling of FP_B-Measurements
- Improved recording limitations
- Updated fpltool https://github.com/fixposition/fixposition_utility/tree/main/fpsdk_apps:
 - Extract ROS bags from ".fpl" recordings
 - Read meta-data of fpl file
 - Trim recordings
- Minor visual changes to 'Configuration > I/O'
- Added scripts to demonstrate recording over the network:
https://github.com/fixposition/fixposition_utility/tree/main/record

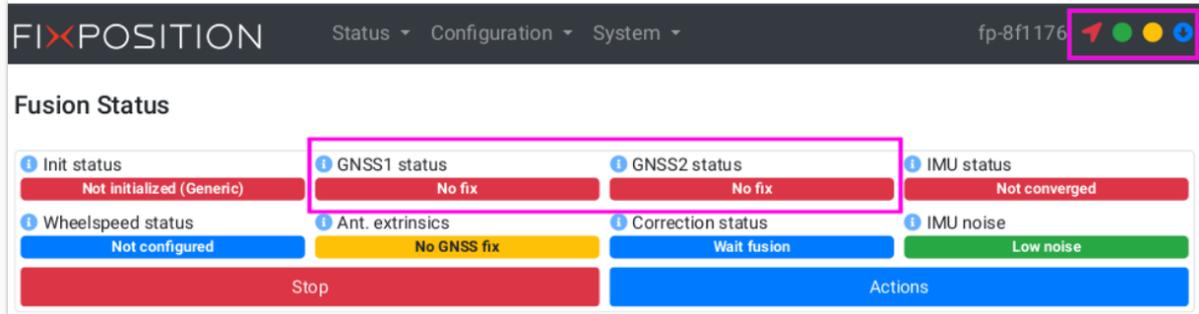
2.6. Known limitations

- Some NMEA messages use talker ID "GP" even though they are multi-constellation and could use talker ID "GN". This also is documented on each affected message (<https://docs.fixposition.com/fd/nmea-messages>)
- As described in our documentation the altitude of the NMEA-GP-GGA refers to the altitude above the respective ellipsoid instead of the orthometric height according to NMEA standard
- Fusion does not detect bad warmstart parameters (after changing config). Reset data on the 'System > Tools' page
- 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 webinterface or API to download the recordings, unmount the disk or shutdown the sensor in order to prevent the data loss.
- With the rework of the status badges and flags, the GNSS status badge will only be indicated after Fusion is initialized. Before that, users can refer to the status flags on top of the webinterface, or see the Status > GNSS page. For more information, see Section 3.1 of this document.
- **Note:** Upgrading to this version from any other version than the last customer release (2.85.3), namely other "Beta" versions, may require a factory reset. If you see anything funny, do a factory reset!
- Upon updating, the priorly saved biases are deleted and users need to converge the IMU (and if enabled wheel odometry) by moving for around 80-100 meters while receiving RTK Fix signals. **Only then**, it is possible to use the new save position feature. Please note that this process is only necessary at first time use when no IMU bias data is available.

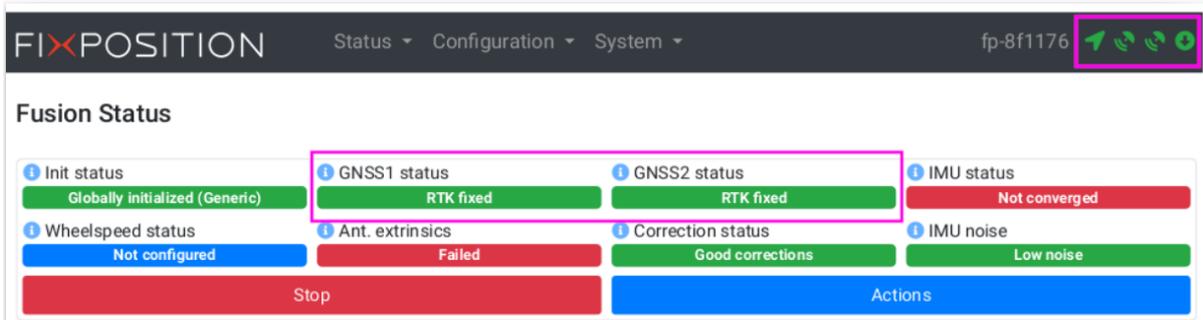
3 Highlights

3.1. New status badges and new status flags

Status flags when Fusion is started but not initialized: At this stage, the GNSS1/2 status badges display “No Fix”, representing the status of GNSS in Fusion, while the status flags on the top bar show “RTK Fix” and “RTK Float” for the receiver status. This is expected behavior when Fusion has not been initialized yet.



Status flags when Fusion is initialized: Status flags and badges are synched and represent the status of GNSS in Fusion.



3.2 Usability badge in correction data table

Correction data connected					
	Evaluation ⓘ	Latency ⓘ	Update rate ⓘ	Data rate ⓘ	Message rate ⓘ
Last 10 seconds	Good Complete	0.7 s (max 1.1 s)	1.0 Hz	0.7 KiB/s	6.6 msg/s
Last minute	Good Complete	0.5 s (max 1.3 s)	1.0 Hz	0.7 KiB/s	6.5 msg/s
Last 5 minutes	Good Complete	0.4 s (max 1.3 s)	1.0 Hz	0.7 KiB/s	6.5 msg/s
Last 15 minutes	Warning Complete	0.4 s (max 5.1 s)	1.0 Hz	0.5 KiB/s	4.9 msg/s
Last 30 minutes	Warning Unusable	0.4 s (max 5.1 s)	1.0 Hz	0.3 KiB/s	2.5 msg/s

For more information on the changes of the new Usability badge, refer to Section 6.2 of the Integration Manual.

3.3 Save / Load positions feature

