



PIKSI MULTI FIRMWARE 1.4 RELEASE

March 13, 2018

Updates to Swift Navigation's Multi-Band, Multi-Constellation Centimeter-Accurate RTK GNSS Receiver

Overview

Swift Navigation is proud to release the latest major firmware upgrade to Piksi® Multi and Duro®. Firmware Version 1.4 provides users with increased functionality and much improved performance, even in difficult environments.

Firmware Version 1.4 (Build 1.4.10) applies to both the Piksi Multi GNSS Receiver and its ruggedized version, Duro. Refer to Section 7 of the Getting Started Guide entitled [Piksi Multi - Upgrading Firmware](#) for detailed instructions on how to upgrade your device. [Firmware release binaries](#) and product support documents are available at support.swiftnav.com.

New Features

GLONASS Ambiguity Resolution - GLONASS support is complete with this release and it is now possible to resolve GLONASS integer ambiguities. This feature dramatically improves the receiver's ability to achieve high levels of accuracy and RTK Fixed solution mode, even in challenging environments. The benefit of this feature will be immediately noticeable to users through improved solution robustness and navigation performance.

The finalization of GLONASS integration in v1.4 completes Swift's initial GLONASS constellation support to the v1.2 firmware release that provided raw measurements and floating point ambiguity resolution. GLONASS RTK requires a correction source such as a Piksi Multi or Duro using firmware v1.4 as a base station, or existing third party corrections infrastructure that provide RTCM messages 1010/1012 (GLONASS observations) in addition to either 1033 or 1230 (receiver hardware bias).

NTRIP Client GGA Upload - Version 1.4 improves the compatibility of Swift's internal NTRIP Client with some RTK corrections infrastructure. The NTRIP Client can be configured to send an NMEA 0183 GGA sentence periodically for compatibility with differential networks that require this information.

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The NTRIP client settings interface now also includes separate username, password and url settings to improve compatibility. Users should verify NTRIP credentials after upgrading if necessary.

Swift Console Save and Write Settings From PC - The Swift Console whose release coincides with this firmware release now includes a helpful feature that allows users to save and write settings .ini files from a computer. This feature should improve the ability for customers to configure devices for specific applications in a robust and repeatable manner. A corresponding open-source command line utility enables customers to automate device configuration in volume applications.

Changes from Firmware 1.3

Measurement Performance Improvements - Swift has improved raw GNSS measurements by reducing time to reacquire carrier phase lock, improving measurement quality and noise. This results in improved single point position (SPP) and RTK solutions as well as improved performance in applications that use raw GNSS measurements.

Improved Monitoring of Corrections Source - In a continuous effort to make Swift receivers easier to use, a health monitor periodically informs users via log messages of connectivity issues and base station compatibility. This periodic warning will help customers integrate Piksi Multi with a corrections source to achieve the best possible navigation performance. If GLONASS is enabled but the corrections source does not provide GLONASS or enough information to use GLONASS measurements, the firmware will send periodic log messages indicating that improved performance is possible with a different corrections source configuration.

Link LED Update - The Link LED on Swift receivers will now be solid when a route to the Internet is detected as a helpful indicator of connectivity. When corrections are delivered via the Internet, the Link LED will momentarily blink indicating that a set of corrections has been received. When Internet corrections are unavailable, the Link LED behavior remains the same and will periodically flash when corrections are successfully received.

Full Covariance Output - Firmware version 1.4 allows advanced users to subscribe to messages that report the full covariance estimate from the receiver rather than only the horizontal and vertical components. This should allow improved

integration into downstream systems and give users an exact representation of the estimated accuracy of navigation solutions. Refer to the corresponding latest libsbp documentation for more details (available at support.swiftnav.com).

Fixes - Various fixes to navigation, measurement and system behavior have been included:

- Addressed L2C navigation data inconsistencies that reduced GPS measurement availability and decreased ability to achieve an RTK Fixed solution. See [v1.3.11 Release Notes](#) for additional information.
- Satellite health, week rollover, elevation mask and navigation data decoding logic improvements
- Improved algorithm efficiency for reduced CPU load
- Improved reliability of RTK Fixed integer ambiguity resolution
- NTP (Network Time Protocol) Client bug fixes
- Duro LED bug fixes

Initial Spectrum Analyzer - The Swift Console and firmware include a beta spectrum analyzer feature to aid integration of receiver and antennas in the face of potential radio frequency interference due to prototype electronics, improper cabling or radio transmitters that can hurt navigation performance.