# PIKSI MULTI FIRMWARE 1.5 RELEASE

May 8, 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 1.5 adds Satellite Based Augmentation Systems (SBAS) support for improved Single Point Positioning (SPP) accuracy, time-to first fix improvements for all positioning modes and improved Real Time Kinematics (RTK) performance.

Firmware Version 1.5 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

**SBAS satellite tracking and corrections**—Firmware version 1.5 supports four regional SBAS constellations—the United States-based Wide Area Augmentation Systems (**WAAS**), the pan-European Union-based European Geostationary Navigation Overlay Navigation System (**EGNOS**), the Japanese Multifunctional Transport Satellites (MTSAT) Satellite Augmentation System (**MSAS**) providing coverage for Japan and Australia and the GPS-Aided GEO Augmented Navigation (**GAGAN**) regional system operated by the Indian government. These four regional satellite systems are used to improve the overall performance of global navigation satellite systems (GNSS) such as GPS and GLONASS, both of which are supported by Swift's receivers.

Use of SBAS corrections for Single Point Positioning in open-sky conditions improves horizontal accuracy to under 1 meter Center Error Probable (CEP).

## Changes from Firmware 1.4

**Time-to-First-Fix Improvements**—Acquisition engine and RTK engine improvements in firmware version 1.5 improves time to first fix for all positioning modes. The average improvement in time to first fix is listed below for the various positioning modes

- SPP: average SPP TTFF SPP reduced by 8 seconds
- Float RTK: average Float RTK TTFF reduced by 14 seconds
- Integer RTK: average Integer RTK TTFF reduced by 25 seconds

**Time to Re-acquire Integer RTK Improvements**—RTK engine and measurement engine improvements in firmware version 1.5 improves time to re-acquire integer RTK fix after an outage by an average of 2 seconds.

**Fixes**—Various performance improvements and bug fixes in navigation, measurement and system behavior have been included

- Increased number of satellites used in RTK engine
- Ephemeris and almanac bug fixes
- Improved system boot time
- Outlier detection improvements

**Known Issues**—It is mandatory to update the Swift Console software to Version 1.5 to read and display SBAS solutions; without updating the console the software will report a "KeyError" in SBAS mode and will not update the solution plot.