PIKSI® MULTI FIRMWARE 1.3 RELEASE

December 21, 2017

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

Overview

Swift Navigation is proud to release the third firmware upgrade to Piksi® Multi. Firmware Version 1.3 provides users with with increased functionality and improved performance as defined below.

Firmware Version 1.3 (Build 1.3.10) for the Piksi Multi GNSS Receiver follows Swift's previous release, Firmware Version 1.2 from October of 2017. 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.

With this release, we are now providing the Swift Console program, Version 1.3.7, which can be downloaded here.

New Features

Improved RTK Fixed Mode Reliability - Improvements have been made in the RTK fixed mode initialization reliability. In prior firmware versions, some users experienced very infrequent and short periods of false RTK fixed mode solution that took the form of a small position jump during RTK fixed mode operation or a handful of epochs with larger than centimeter-level error. RTK fixed initialization reliability has been improved in this v1.3 release. Real-world testing shows RTK fixed initialization reliability exceeds 99.9%.

Improved L2C Tracking Capability - Version 1.3 firmware provides combined GNSS L2CL and L2CM tracking channels which both increase the signal-to-noise ratio for L2 GNSS measurements and improves the time to carrier phase lock for the L2 channel. In the positioning engine, this feature reduces the time required to achieve high precision navigation outputs after an antenna occlusion or when the receiver first powers on.

New UDP Client and Servers - In a continuous effort to improve the Input/Output capability of the receiver, Swift has provided two fully configurable UDP clients and two fully configurable UDP servers. UDP communication may be preferred in some

applications including sending base station correction information to many rover on a local network.

Raw Magnetometer Output - The Piksi Multi hardware includes a Bosch BMM150 magnetometer. With this release, the raw magnetometer data is available over our proprietary Swift Binary Protocol (SBP) along with complete with precision GNSS timestamping. Coupled with the GNSS solution, the GNSS measurements, and raw IMU data, the raw magnetometer output is intended for use by downstream estimation and control systems.

Changes from Firmware 1.2

IMU Axes Definition Fixed - To provide raw navigation measurements consistent with the silkscreen markings on Piksi Multi, the axes definitions have been swapped internally on the device. The former x axis is now the y axis, the former y axis is the x axis and the z axis has been negated. This same transformation applies to both the linear acceleration measurements aligned with the axis markings as well as the gyroscope rate measurements about the axes markings according to the right hand rule.

NTRIP Client Feedback - In the case that the NTRIP client has been configured but is unable to receive a datastream, a generic debugging message has been added and will appear in the Swift Console and in the SBP protocol. Details of the NTRIP connection failure are available in the Piksi system logs on the linux core of the device.

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

- Satellite health logic improvements
- RAIM algorithm improvements and recovery
- Disable unused telnetd interface to onboard Linux system
- Removed deprecated tracking and CN0 estimation settings

Swift Console No Longer Supported on MacOS Versions Below 10.12 - Due to changes in MacOS libraries, Swift no longer supports Yosemite or El Capitan versions of MacOS for the latest versions of the Swift Console.