Starling 1.4 Release Notes

Version 1

June 28, 2021

Introduction

Swift Navigation is proud to share the latest major release for Starling, Swift's receiver-agnostic precise positioning engine. Starling version 1.4 adds several major performance enhancements in diverse environments, new configuration options and various bug fixes.

Important Note

STMicroelectronics has released a new TeseoV Firmware, version 5.8.15. Swift Navigation strongly suggests updating to version 5.8.15 on any TeseoV based platforms as it provides significant performance improvements. Starling will still support version 5.8.14 for now but with degraded performances compared to the new firmware. Please contact a Swift Navigation Support representative for further details.

Enhancements

Improved performances in all environments—Tuning of various models and parameters in the Starling engine to boost performance in all environments.

Improved velocity estimation in urban environments—Velocity estimation in urban environments has been improved by integrating the measured Doppler information from supported GNSS receivers (currently only supported for STM TeseoV in L1/L5 configuration and u-blox M8 Series). This also improves the positioning performance of the sensor fusion algorithms in Starling.

Self detection of unexpected behaviors—The Starling engine now has improved detection of unrealistic results (for instance a velocity greater than 270 km/h (170 MPH)), which will trigger a reset of the fusion engine, resulting in faster recovery of valid positions.

New optimized setting profiles—To add flexibility and to better leverage newly introduced modelling optimizations, the list of supported pre-configured Starling setting profiles is extended and now includes pre-configured settings fine tuned for the measurement engine's characteristics for the Piksi Multi, TeseoV L1/L2 and L1/L5, u-blox M8L and F9. Starling still supports other generic L1/L2 and L1/L5 measurement engines.

SBP messages configuration—Any output that uses the *SBP* protocol can now include a new setting to control the output messages. This feature can be used to reduce the amount of data being streamed out to only include the specific messages needed by the application.

Changes from Starling 1.3

- For SSR customers, the Starling *.atx* file was updated from *igs14_2060.atx* to *igs14_2132.atx* and must now be renamed *igs14.atx*. The new *.atx* file provides an update to the antenna phase center corrections for new GPS and BeiDou satellites, which is needed when using SSR data from Skylark. The new *.atx* file will be shipped with the Starling binary. See the Starling Reference Manual for more details.

Bug Fixes

- Fixed a bug causing "outlier false alarms" to cause Starling to go in Dead Reckoning mode while in open sky.
- Fixed a bug that could result in a crash when observation messages week number is 0.
- Fixed a bug preventing Starling from applying corrections from Skylark when using u-blox devices.
- Fixed a bug where hardware bias changes from the STM TeseoV were not correctly handled.
- Fixed a bug that would occasionally cause the SSR corrections to be applied at the wrong rover location.

Known Issues

- If SSR corrections are received but the *igs14.atx* file is not present the Starling application will exit
- Under high CPU load, there is a possibility for data loss in processing. This will result in degraded performance with warnings similar to:
    - “dropping data”
    - “dropped N messages to allow new messages in input queue”
- Reduced corrected solution availability when the Internet connection is poor. This will result in degraded performance with warning:
    - “Unable to allocate obs buffer”