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Software Release Notice

V2.2.9.0 Software Ensemble for Sapphire and SF-3050

Introduction

This software build will only function in the Sapphire GNSS engine and the SF-3050

Important Notes

Update the receiver with a consistent ensemble of software and to use only the latest versions of the StarUtil program included in this release.

Always power cycle the receiver or issue [SHUTDOWN]REBOOT after installing the software.

Always install the new software and software options/licenses with the antenna connected and in an area where the receiver has the ability to track satellites.

Force the Install program to load all versions of software including the GNSS engine and Power/Port driver board (Sapphire engines only require the GNSS software), even if the load boxes are not checked by default.

The receiver controller software may need updating to function properly with this new release and to enable some of the new features.

New Messages and Features

This software ensemble introduces GLONASS correctors for StarFire operation on Sapphire and the SF-3050 by accessing a secondary StarFire correction stream and corrects a number of customer reported issues found in the last release. The Sapphire Technical Reference Manual (TRM) and StarUtil 3000 Guide are updated for this release. The SF-3050 Product Guide, and SF-3050 Quick Start Guide are available from our customer service department and posted on the NavCom's website.

Ensemble Data Management

Create a new folder for this ensemble. This will ensure that: 1) all of the correct software is in one location, 2) there is no mixing of old and new software, and 3) it affords the ability to revert to the previous version.

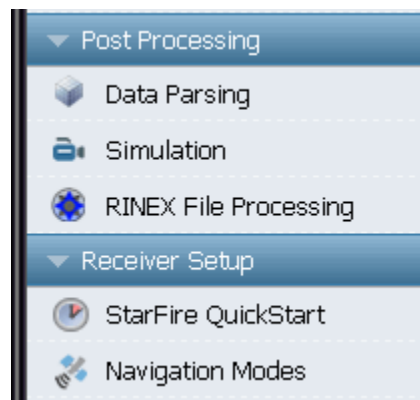
Software “ZIP” File Contents

Two versions of firmware are now available: a Unified File Load, which is designed to ease the upgrade process (and is described in the accompanying Quick Start Guide); and a Individual File load, which is assembled using the former loading method (refer to the StarUtil 3000 Users Guide for instructions).

The Unified File Load “ZIP” file includes the following:

Program	Version/Date	Comments
Release Notes v2.2.9.0 Ensemble.PDF	Dated 20 Jul 2011	Description of improvements and bug fixes (This document)
Readme.TXT	Dated 20 Jul 2011	Update instructions and a list of files
SP_UFL_v2,2,9,0.s19	Version 2.2.9.0	"Navigation"; "Boot 1" GNSS engine, "Boot 2" GNSS engine, "PIO Boot" Comm board, "PIO App" Comm software - Sapphire models
navcomx1c45x3050.inf	Dated 02 May 2009	USB port driver
StarUtil-3000_v1,1,6.exe	Version 1.1.6.2	StarUtil program – Sapphire models
96-312007-3001RevE_Sapphire TRM.pdf	Rev E	Technical Reference Manual (work in progress)
96-310033-3001RevC_Quick Start Guide SF-3050.pdf	Dated 13 May 2010	Software loading instructions

Please note that RinexUtil_v2,0,9.exe which has always been supplied separately, is now embedded within the StarUtil300 program under the “Post Processing” window view.



Documentation

The Technical Reference Manual, Product User Guides, Quick Start Guide, and the StarUtil User Guide have been revised with major changes for this release. The latest versions of the Product User Guides, StarUtil User Guide, and Technical Reference Manual will be available on the [NavCom’s web site](#) once the software is officially released.

Manual	Part Number	Revision	Description
SF-3050 Product User Guide.pdf	96-310034-3001	Rev D	Describes the GNSS receiver capabilities and specification
StarUtil User Guide.pdf	96-310029-3001	Rev C	Describes the Graphical User Interface
Technical Reference Manual.pdf	96-312007-3001	Rev E	Describes the command and response data structure
Quick Start Guide	96-310033-3001	Rev C	Describes first steps to operating a new receiver

Software Changes/Improvements

The following sections describe the changes and improvements to each of the software modules included in the ensemble.

GNSS Engine Software

This GPS Engine release of software provides the following list of changes, improvements, and features incorporated since the previous formal release of v2.0.25.0:

V2.2.9.0:

- Added StarFire with GLONASS corrector features
- Corrected a Code DGPS parsing routine for Beacon receiver applications
- Corrected a RTCM Type 9 time stamp routine
- Added 0xBD, 0xBE message formats StarFire GNSS; of interest to customers who purchase software bundles U and W.
- Corrected an optioning error for L1-only RTK
- Updated Profile list
- Corrected an error in the command [2DNAVMODE]ALWAYS which returns "argument #2 out of range" error
- Improved MBRTK performance
- Corrected auto-switching behavior between GPS only and GPS/GLONASS correction sets
- Changed the xBB hub break reporting

GNSS Engine Bootloader1

This GPS Engine Bootloader release of software provides the following list of changes, improvements, and features incorporated since the previous formal release of v2.0.2.:

V2.1.4:

- Create symbol for Hardware Version Number scale factor in revision number and updated software compatibility number

- Added software recognition for new model type to prevent inappropriate software loads for the incorrect model

GNSS Engine Bootloader2

This GPS Engine Bootloader release of software provides the following list of changes, improvements, and features incorporated since the previous formal release of v2.0.2.:

V2.1.4:

- Create symbol for Hardware Version Number scale factor in revision number and updated software compatibility number
- Added software recognition for new model type to prevent inappropriate software loads for the incorrect model

Power I/O Board Software

This PIOB release of software provides the following list of changes, improvements, and features incorporated since the previous formal release of v2.0.29:

V2.2.9.0:

- Updated Profile list
- Updates for manufacturing

Power I/O Board Bootloader Software

This PIOB release of software provides the following list of changes, improvements, and features incorporated since the previous formal release of v2.0.3.0:

V2.3.1.0:

- Added software recognition for new model type to prevent inappropriate software loads for the incorrect model

StarUtil 3000 Software

This StarUtil release of software provides the following list of changes, improvements, and features incorporated since the previous formal release of v1.0.5:

V1.1.6.2

- Added Battery and Radio windows to support new product
- Added recognition of new StarFire operating modes
- Merged RINEXUtil software into StarUtil 3000
- Add preview to parsing tools
- Improved software update operation

RINEXUtil Software

RINEXUtil software now resides within the StarUtil 3000 program

Known Issues

Single Frequency Performance (StarFire)

- In L1/G1 only mode (user uses tracking mode command to turn this on or user only has L1/G1 software option), v2.2.2.1 performs as followings:
 - If StarFire operates in GPS only mode, the performance will be the same as v2.0.22.0a.
 - If StarFire operates in GNSS only mode, the performance spec is unknown (untested).
 - If StarFire operates in GNSS Primary mode, GPS only position will be output and the performance will be the same as v2.0.22.0a.

3rd Party GLONASS Corrector Compatibility

- The Sapphire receiver is able to use Code DGPS GLONASS corrections from Javad base stations.
- The Sapphire receiver is able to use Trimble base stations since Trimble does not broadcast GLONASS corrections.
- NovAtel updates the RTCM Type 31 Tk every 30s in their GLONASS RTCM DGPS corrections and this requires the rover to use the same ephemeris over this 30s interval. It is not practical in real-time for most receivers as ephemeris validation logic might be different for different GNSS receiver manufacturers. NavCom is currently working to resolve this issue in a future software release.
- This build of Sapphire and SF-3050 code does not support GLONASS RTK corrections received by a 3rd party base receiver. This is a common industry limitation among the various manufacturers due to hardware bias calibration requirements for each manufacturer (make) and each hardware model. For example, If two different Trimble model base receivers use different core GNSS hardware, each receiver type requires a different bias-calibration table. However, If two different Trimble model base receivers share the same core GNSS hardware, one bias-calibration table is typically used for both model receivers. NavCom's method of creating, utilizing, and sharing such tables for competitive GLONASS equipment is still being developed.
- However, the Sapphire board and SF-3050 are capable of operating in a full GNSS solution mode when both the base and the rover utilize NavCom or RTCM correctors.

Internal Data Logging (SF-3050)

- Internal data logging is limited to 25Hz PVT1B and MEAS1B.

- Data files may be corrupted or lost if power to the receiver is lost during the file logging and file extraction exercise.
- Due to hardware speed limitations, file extraction of a 1GB log file requires approximately 1Hr.

MBRTK Usage (SF-3050 and Sapphire)

- Coordinated machines and heading applications require 10Hz minimum update rates to meet performance specifications.

Network RTK

- The use of a UDP interface is currently recommended to stream Ethernet data to the network, when an Ethernet connection is desired. TCP connections, in this application, may interrupt normal operations for port retransmissions when the ISP misses packets due to network loading.
- Ethernet connection does not work reliably with Dynex hub products. No resolution is planned; recommend usage of other high quality hub products.

[TRACKINGMODE]

- When the [TRACKINGMODE] command is used to turn StarFire Off and subsequently back On again, the end user must either power-cycle the receiver or issue a [SHUTDOWN]REBOOT command to reactivate the StarFire receiver.

Reverting to Older Software

- StarUtil does not support reverting to older software than v2.0.22.0a on the USB port

Loading Software via Ethernet

- Loading software via a UDP Ethernet interface is not supported

Significant Bugs

- Downloading new firmware with programs other than StarUtil 3000 may result in the report of an error at the end of the GNSS board updates (boot1, boot 2, then the application program), before transitioning to the PIOB software downloads. To overcome the reporting error, cycle power on the receiver. If the receiver reports the new firmware version for the GNSS board (boot1, boot 2, and the application program), continue with the PIOB program loads. There are two known reasons for this behavior: the first is a timing issue whereby the GNSS board is busy uploading new firmware to the StarFire receiver, the second is a potential loss of communication between the two boards as a result of the GNSS board update. Cycling power re-establishes the inter-board communication.

If you have any questions regarding the installation or use of the software upgrade package please contact NavCom Customer Support at customerservice@navcomtech.com or by phone at +1 310.381.2000.