



GNSS Firmware v5.2

(GR-5, Sokkia Atlas, GCX3, B111 OEM)

Release Notes

March 2018

©Copyright Topcon Positioning Systems, Inc. 2018.

All contents in this document are copyrighted by Topcon. All rights reserved. The information contained herein may not be used, accessed, copied, stored, displayed, sold, modified, published, or distributed, or otherwise reproduced without express written consent from Topcon.

Table of Contents

SUPPORTED PRODUCTS	3
SYSTEMS	3
OEM BOARDS.....	3
FEATURES AND CHANGES	3
COMPATIBILITY NOTES	4

Supported Products

Systems

- Topcon GR-5+
- Sokkia Atlas, GCX3

OEM Boards

- B111

Features and Changes

- Support for Topcon R4T-BT and Sokkia R4S-BT external radios
- Broadcasting MSM correction data for all tracking signals, including new MSM IDs 5, 24, 11, 16, and 20 for Galileo.
- "X" GNSS signals support added to support generation of raw measurements based on combined signal components following RINEX standards. "X" GNSS signals supported:
 - GPS: 5X;
 - QZSS: 1X, 5X;
 - BEIDOU: 2X, 6X, 7X;
 - GALILEO: 1X, 5X, 6X, 7X, 8X;
- New GNSS signal tracking support (GR-5+/Sokkia Atlas only):
 - IRNSS L5
 - SBAS L5
- Improved QZSS L2C quarter cycle compatibility when working with non-Topcon base stations.¹
- Implemented RTCM committee recommendations for application of BeiDou ½ cycle bias for Geo-stationary satellites.²
- Extend SBAS PRN range to up to 158 to support SDCM.
- DION Improvements
 - Optimized smoothing algorithm for all solution types (except RTK "fixed")
 - Update to output extrapolated solutions when not enough satellites available.
 - Smoothing of RTK float and fixed solutions with DION is turned on by default.
 - DION adaptive filtering is turned on by default.
- Updates to DGNSS solution engine to handle cases of data without corrections (also applies to SBAS).
- Improved positioning performance for smoother transition during leap second events.
- Optimized weight scheme in Stand-alone and DGPS solution engines.
- New reference receiver classes introduced for Trimble, NovAtel and Sokkia receivers to better support GLONASS biases in positioning solution. New classes include:
 - SKA - for Topcon Sokkia receivers.

¹ For consistent application of QZSS L2C cycle offset, it is recommended that Topcon base and Topcon rover receivers run the same version of GNSS Firmware. Mixing GNSS FW 5.2 with versions prior to 5.1p6 firmware could result in poor positioning performance when QZSS L2C is included in positioning solutions.

² BeiDou bias can be turned on or off using command in order to maintain compatibility with other versions of FW.

- 2NOV - for NovAtel receivers with NovAtel FW released after September 2016.
- 2TRIMBLE - for Trimble receivers with Trimble FW from 5.11 (2016) onward.
- All previously supported classes are still supported.
- Added support for NMEA version 4.1 and 4.2.
- Output of full covariance matrix output (SP, SV, AP messages) is enabled for the following position types:
 - Standalone
 - DGPS
 - RTK Float and fixed
 - Variable RTK float and fixed
- Added ability to use mix of GPS L2C and GPS P2 corrections simultaneously in RTK.
- Improved acquisition of GPS/QZSS L5 and GALILEO E5 signals (GR-5+/Sokkia Atlas only)
- Improved tracking of L2C codes and SBAS signals.
- New antenna data base version 2.3.6 support.
- PI message was updated to include mmGPS solution indicators.
- Updated velocity filter to augment extrapolation when carrier phases are of poor quality.
- Improved counter-scintillation algorithm to use different detector thresholds if number of scintillated satellites is greater or less than set value (default is 3)
- Optimized internal memory usage and processor loading.
- Added protections during firmware installation which restricts installation of firmware on incompatible hardware.³

Compatibility Notes

GNSS FW 5.2 contains improvements to optimize memory and system resources for GR-5+, Sokkia Atlas, B111 OEM and GCX3 receivers.

The table below lists the receivers shipping with updates to memory architecture. Due to architecture changes; downgrades to a previously released firmware version is not supported on units with serial numbers starting from those listed in the table.

Kits or Assemblies	Receiver S/N
GCX3	1387-11340
GR5 DIG UHF II, 400-470	1117-24759
GR5 DIG UHF II, 400-470 with HSPA	1118-23889
GR5 FH915+	800-21650
B111 OEM	VFBHR18070001

³ During firmware installation, if an incompatibility between firmware and hardware is identified, the firmware installation process will be stopped automatically. A power reset will return the receiver to its previous state.

Receivers with serial numbers prior to those listed in the table are fully compatible with firmware version 5.2 and can be both upgraded and downgraded.

It is recommended that receivers always be upgraded with latest release firmware.