Advanced Positioning

GNSS SERIES RECEIVERS

This document describes the latest improvements made to the Trimble® Alloy and NetR9™ reference receivers.

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Introduction

These release notes describe the improvements made to the Alloy and NetR9 reference receivers.
With this release, the above products can use version 5.37 firmware.

To use firmware version 5.37, you must have a valid firmware warranty. To load this firmware, the receiver must have firmware dated June 1, 2017 or later. If necessary, contact your Trimble dealer to purchase a warranty. Before you perform a firmware upgrade, ensure you download and backup any files or configuration settings.

NOTE – The firmware warranty dates only apply to the NetR9 receiver. The Alloy receiver has lifetime firmware upgrades.

NOTE – While many improvements listed are available on both the NetR9 and Alloy receivers, some improvements are only available on Alloy receiver. This is because the Alloy receiver has more powerful hardware architecture that supports new capabilities. The supported features depend on the receiver model and options installed.

Version 5.37
Revision A
October 2018

⊘·Trimble

Alloy and NetR9 common features and changes

Tracking and data formats

- Addressed RINEX issues of missing Galileo observables and GPGA field when using the on-board convert to RINEX utility.
- Modifications to RTCM MSM messages when using RTCM decoders to correct mix-ups when using MSM 4 and MSM 7.
- Refinement and improvements with the RINEX 3.02 header when using combined ephemeris.
- Improvements to QZSS health handling of tracking satellites with the ability to omit bad signal data.
- Updated BINEX for Galileo and Beidou ephemeris.

Security improvements

- Corrected SFTP — Secure File Transfer Protocol data transfer used to hang when sending files from the receiver to a server. This issue has now been fixed.
- Updated security password plain text encryption when using third-party packet analyzers with the receiver's IBSS/NTRIP servers.

Web interface

- Added additional third-party antennas to the Antenna drop-down list in the web interface.

Alloy features and changes

Tracking and data formats

- The Alloy receiver can now track the new signals that are part of the third generation of Beidou satellites (B1C and B2A). B1C is on frequency 1575.42 MHz and B2A is on frequency 1176.45 MHz. The Beidou tracking option is required for this improvement. If you already have the Beidou upgrade for the Alloy receiver, please contact support (RTNS_Support@trimble.com) to get a new key to track the Beidou Gen 3 B1C signal. B2A is already supported.

  See table below for details.

| Frequency	BDS Gen II	BDS Gen III	Receiver
B1I	✓	✓	NetR9/Alloy
B1C		✓	Alloy
B2I	✓		NetR9/Alloy
B2A		✓	Alloy
B3I	✓	✓	NetR9/Alloy

NOTE – Due to CPU limitations, NetR9 is unable to track B1C and B2A signals.

NOTE – The NetR9 receiver also supports B1I, B2I, and B3I signals.

Security improvements

- GNSS signal spoofing is an increasing concern. The latest Alloy firmware implements various mitigation techniques to detect and eliminate spoofing. The detection techniques are a combination of signal processing and navigation filter updates. If the receiver detects it is tracking a spoofed signal, it attempts to find the correct signal from the satellite and relock the channel. If the receiver cannot identify the correct signal, it sets the RAIM flag for the satellite in the streamed data observable data and eliminates it from the position solution. *Disclaimer: While the new GNSS anti-spoofing feature is a vast improvement, no anti-spoofing feature can guarantee full protection of spoofing or location hacking*.

To enable anti-spoofing on the receiver, go to the web interface. Select **Receiver Configuration / Position**. In the **Autonomous/Differential Engine** option, select the Kalman filter.
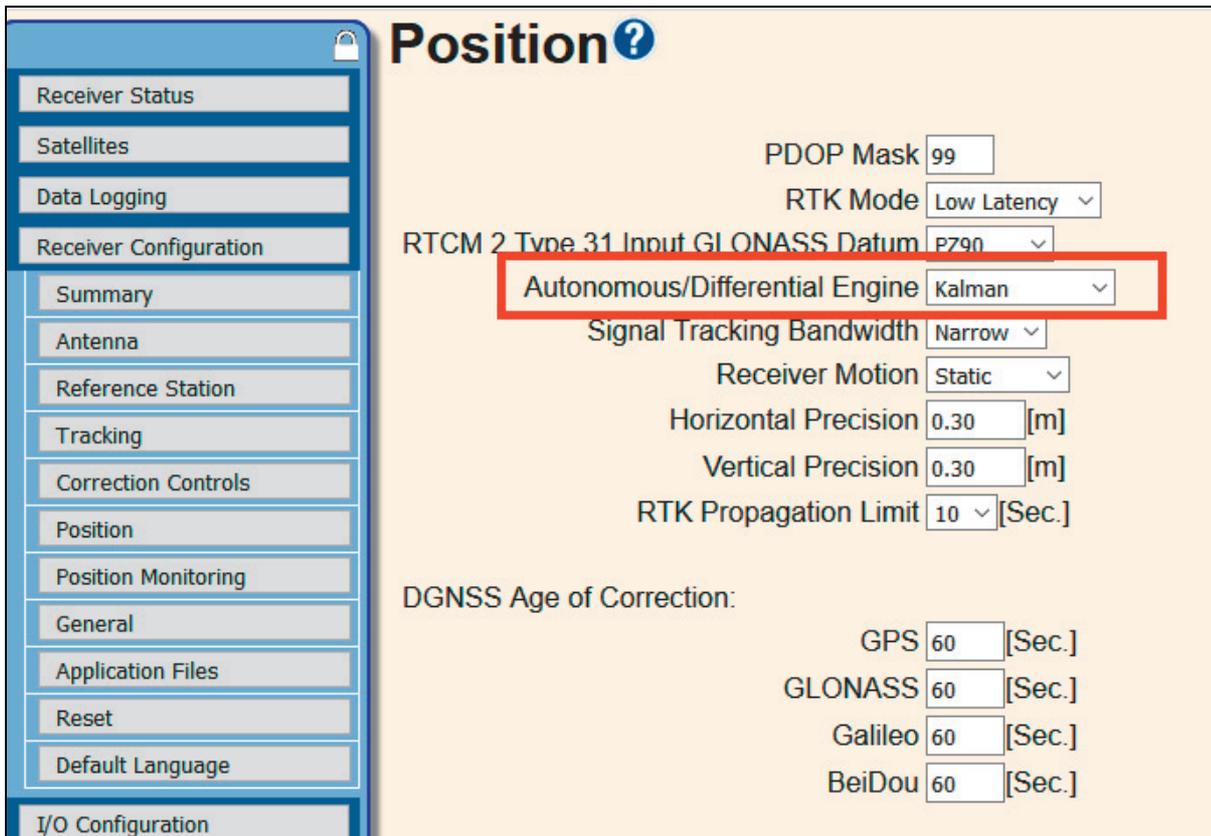
For additional anti-spoofing alerts, if you have the RTX option installed on the receiver, then you can enable Sentry alerts to notify you if/when the receiver locations may have been spoofed. Please note that not all position changes are caused by spoofing.

Web interface

- The Alloy spectrum analyzer has several improvements:
  - Now supports faster update rates up to 5 Hz.
  - Improvements in y-axis display (power in dB) scaling.
  - The FFT (Fast Fourier Transform) can now better detect more external pulse interference with reduced noise without requiring filtering.
- IP Quality of Service is now included with the Alloy receiver. The NetR9 receiver currently has this feature.

Feature comparison table

Tracking and data formats	Alloy	NetR9
Beidou Generation 3	Full	Partial
QZSS tracking improvements	✓	✓
RINEX Galileo GPGA fixes	✓	✓
RTCM MSM modifications	✓	✓
RINEX header 3.02 improvements	✓	✓
Updated BINEX	✓	✓
Security		
Anti-spoofing	✓	✗
NTRIP security encryption improvements	✓	✓
SFTP fixes	✓	✓
Web interface		
Third-party antenna support	✓	✓
IP Quality of Service	✓	✓
Spectrum Analyzer improvements	✓	✗

Upgrade procedure

Ensure that the receiver firmware warranty date is June 1, 2017 or later. To upgrade, use one of the following methods:

- *Before upgrading the firmware, ensure that you back up and save the receiver configuration.*
- If using the WinFlash utility: Use the latest version that is available with the version 5.37 Web package.
- If using the receiver web interface: Download and install the version 5.37 *.TIMG file.

Legal notices

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Release Notice

This is the October 2018 release (Revision A) of the Advanced Positoning GNSS Series Receivers Release Notes. It applies to version 5.37 of the Alloy and NetR9 reference receivers.