## Firmware Release Notes Survey

Date: August 25th, 2015

Subject: New SP80 Firmware Release

Product: SP80

Version: 2.12

## Introduction

This document is the firmware release notes for the SP80 GNSS receiver. Version 2.12 is a major firmware release with new features, improvements and bug fixes.

## Upgrade Procedure

The customers can upgrade the receiver with the version v1.5 or earlier by following this procedure:

1- Copy the file sp80_upgrade_v2.12.tar to a SD Card (its size must be at least 256Mbytes, and it is preferable to use an empty and recently formatted SD Card)
2- Switch off the SP80
3- Plug the SP80 into an external power and make sure that there is also an internal battery
4- Insert SD Card to the SP80
5- Turn on the SP80 while keeping pressed the button 'Scroll' (during about 5 seconds)
6- Wait for the complete upgrade (it should take about 10 minutes)

## Firmware List and Versions

General version number: v2.12 – 21/08/2015

OS: 2.6.37 #787
U-Boot: 1.32
PVT: LP63V12
DSP: LC63V12
SL: LS63V12
WEB Service: LW63V07
HTML Pages: LH63V10
BT: 7.2.31
PMU: 3.W
GSM: 02.003

XDL: V01.14(2)

The software compatible with SP80 V2.12 are:

- FAST Survey: 4.3.x
- RINEX Converter: 4.6.0
- Survey Pro: 5.6.4
- Survey Office (64-bits): 3.50
- USB Serial Emulation: 1.1
- Spectra Precision Loader: 3.2.0
- Spectra Precision File Manager: 1.0.10

## New Features

1. **Electronic level**: the receiver contains an electronic level. This version makes this level usable though the field software or the receiver screen.
2. **SMS reception**: the receiver is able to receive and process SMS via commands.
3. **Modem**: it is now possible to turn on or off the internal modem with the receiver user interface
4. **CenterPoint RTX**: the receiver is able to compute CenterPoint RTX when it is connected to the RTX caster through IP (modem, WiFi or data collector). A subscription is needed for this feature.
5. **CMRx/sCMRx**: the receiver is able to compute RTK rover position when receiving proprietary Trimble CMRx or (scrambled) sCMRx messages from a Trimble base station
6. **Email**: the receiver is able to send its log file or the content of PAR response by email
7. **Web Interface**: the receiver can be configured through the Web when it connected to the network through WiFi.
8. **RTK Bridge**: the rover which receives differential data through its modem or WiFi is able to broadcast them with its internal UHF transmitter.
9. **Backup RTK**: the receiver is able to compute RTK position with 2 simultaneous independent differential data streams. In this case, it outputs the best position.
10. **Base mode**: it is possible to configure the base to broadcast simultaneous 2 differential data steams (UHF+CSD).
11. **Configuration**: it is possible to save the receiver configuration in the file, and to load this file in the same or other SP80.
12. **Lock mode**: the new lock mode requires sending a password to the receiver at each start up in order to communicate with it.
13. **Receiver validity period**: it is possible to define a validity period in days. When this period is over, it is not possible to communicate with the receiver until a password is entered.
14. **IRNSS**: the receiver is able to track IRNSS satellites and output its observables. The new IRNSS option is mandatory to track IRNSS satellites.
15. **FTP push**: the receiver is able to push a file to an FTP server.
16. **NTRIP V2**: the receiver supports the NTRIP V2 protocol
17. **Central Cloud Correction**: it is now possible to transmit the differential data from the base to the rover through the Spectra Precision Cloud, using the internal modem or WiFi connection.
18. **Warranty Date**: the warranty date recorded in receiver can updated with the date recorded in Trimble Protected by using Spectra Precision Loader.

## Improvements

1. **RTK**: the performances are improved as following:
    a. Availability and reliability RTK fixed solution in super harsh conditions are both equally improved
    b. Float/Flying RTK performance (convergence time and steady state accuracy) for long baselines is improved
    c. RTK fixing performance (availability and reliability) was improved for baselines longer >40 km
    d. RTK precision and accuracy with long static occupations is improved
2. **Display**: a new icon on the screen indicates if the internal radio is on
3. **Reset**: when a reset is performed, a message is displayed on the screen during this reset
4. **Recording**: when you start a raw data recording with the button, the receiver asks you now if it is static or stop&go, and it proposes to start/stop occupations only if stop&go was selected
5. **Radio auto-detection:** the receiver is able to detect automatically the Pacific Crest radio connected to the serial port.

## Resolved Problems

1. **GeoFencing**: The receiver rebooted permanently when it was outside the geofencing zone.
2. **CSD Connection**: sometimes it was not possible to connect the SP80 base in CSD mode.
3. **USB connection:** the USB connection was not available after a power cycle while the USB cable was connected to the PC.
4. **Hard Reset:** during the hard reset, all the G-Files recorded in the internal memory were deleted.

## Known Issues

1. **Firmware Upgrade**: It is not recommended to upgrade the firmware with SP Loader using the serial cable. It is recommended to use the SD Card or the USB cable.
2. **Web Interface**: If you configure the receiver with Web through WiFi and you set a NTRIP connection through the modem, then the WiFi connection with the receiver is lost.

## Recommendations

1. **Beta version**: the official version contains 2 numbers (ex: 1.2). If the receiver contains a version with 3 digits (ex: 1.2.5), it means that it is a beta release and this beta release can used only 90 days after the release date. After 90 days, the receiver will not answer to any command, and the only thing to do is to upgrade the receiver with an official version.
2. **SD Card**: the receiver supports the standard SD Card and the SDHC card up to 32Gb. It does not support the SDXC.
3. **Ionosphere activity**: Today we at the peak of ionosphere activity which can affect/degrade receiver performance. User must realize that often 3$^{rd}$ party reference data provider is equally responsible for performance degradation because of generating much less correcting data compared to quiet ionosphere conditions. User is recommended also contacting Network data provider in case of RTK problems.
4. **ATL log**: We recommend end user in case of receiver performance problem to record atl.log and share it with Tech Support. W/o atl.log file, the ability to help end user will be much less.

5. **NTRIP:** When working with Ntrip service, user is recommended to select VRS mount point over MAC and FKP. In general with wide variety of different mount points, always try select GPS+GLONASS points.
6. **RINEX:** when converting receiver raw data to RINEX it is desirably to generate RINEX-3.2 (latest released version) data as legacy RINEX-2.11 does not support many of GNSS signals SP80 tracks.

## Rescue Procedure

If the receiver is in a state where it reboots continuously and it contains the U-Boot (BL2) 1.28, then the rescue procedure (see below) can be used to repair the receiver. The U-Boot 1.28 exists since the version 1.3. If an upgrade into 1.3 has been tried but failed, it is possible that the receiver contains the U-Boot 1.28 so the rescue procedure can be tried.

The rescue procedure is the following:

1. Unpack the files sp80_rescue1.bin, sp80_rescue2.bin, sp80_rescue3.bin into the empty SD-Card (use root folder, no subfolders). The SD Card size must be at least 256Mbytes.
2. Insert the SD-Card into the SP80
3. Power on the SP80 with pressing the scroll button (Key combination as for regular upgrade start)

4. Observe progress on the SP80 display. After procedure done the SP80 will be powered OFF automatically
5. Collect file rescue.log from SD-Card. It contains diagnostics what was restored during the rescue procedure
6. Remove the SD-Card and power on the SP80

Once this process is done, you must perform a normal upgrade with the file sp80_upgrade_v1.5.tar even if the version 1.3 is displayed on the screen of the SP80.