

July 1st, 2022

SP85 V5.20 Firmware Release

Introduction

This document is the firmware release notes for the [SP85 V5.20](#). This version is a minor release with performance improvements and bug fixing.

Upgrade Procedure

The customers can upgrade the receiver with the version [V5.20](#) by following one of this procedure:

- 1- Copy the file [sp85_upgrade_v5.20.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 SP85
- 3- Plug the SP85 into an external power and make sure that there is also an internal battery
- 4- Insert SD Card to the SP85
- 5- Turn on the SP85 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: [V5.20 – 24/06/2022](#)

OS: [4.9.0#846](#)

U-Boot: [0.26](#)

PVT: [TP90V17](#)

DSP: [TC90V17](#)

SL: [TS90V31](#)

WEB Service: [TW90V14](#)

HTML Pages: [TH90V22](#)

PMU: [4.P](#)

GSM: [03.001](#)

XDL: [V02.04\(3\)](#) or [V02.10\(3\)](#)

The software compatible with SP85 [V5.20](#) are:

- Survey Pro: [6.6.1](#)

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- Trimble Access: [2019.11](#)
- Space: [2.3.4](#)
- RINEX Converter: [5.0.8](#)
- Survey Office: [5.30](#)
- Spectra Geospatial Loader: [9.2.0](#)
- Spectra File Manager: [1.8.0](#)

New features (since version 5.06)

1. **Trimble RTX:** this version supports now the Trimble Center Point RTX through L-Band and IP

Improvements (since version 5.06)

1. **IRNSS:** all IRNSS satellites are now tracked (the PRN greater than 7 were not tracked in previous version)
2. **Galileo:** the E5 AltBOC signal is now tracked
3. **Beidou:** the receiver is now able to track all-in-view Beidou satellites
4. **Beidou:** the signal B2b is now tracked (Rinex name 7D)
5. **GLONASS:** the GLONASS G3 signal is now tracked (RINEX name is 3Q) and observables are output to G-file
6. **RTX:** new GNSS positioning engine for RTX (TITAN). This engine runs advanced RTX processing algorithms, it can use almost all available rover signals (unlike the previous one, it can use GALILEO E5a/E5b) and it can use updated (in early 2021) RTX streams bringing now Beidou phase III corrections, and GPS L5 corrections.
7. **RINEX:** the RINEX files created in the receiver can now be compressed in gzip file
8. **RINEX:** since RINEX 3.02, the RINEX filename contains the country code. It was set to 000 with previous releases, now it is possible to specify it with a \$PASHS command or to enter it in the Web Interface.
9. **RINEX:** the version RINEX 3.04 is now supported
10. **RTK Bridge:** it is now possible to rebroadcast the received corrections over a TCP/IP port (P,Q,I,J). With the previous version, it was possible only over internal UHF radio.
11. **ATOM:** the new message ATOM DAT X98 is supported in output. It contains successfully decoded binary data entering the receiver via one of its ports.
12. **IRNSS:** the RTCM3.2 (MSM) messages for IRNSS are now supported
13. **IRNSS:** the message 1041 (IRNSS ephemeris) is now supported
14. **CMRx:** when configuring the base with the Web UI, it is now possible to enter the station name and the station code which is transmitted through the CMRx correction
15. **GSOFF:** the message GSOFF 40 (L-Band Status Info) is now supported
16. **GSOFF:** the message GSOFF 48 (Multiple page all sv detailed info) is now supported

- 17. **CMRx**: now it is possible to generate/decode Beidou phase III signals using CMRx
- 28. **Battery**: the firmware supports the new batteries 92670-25 and 92670-02 (new discharge curves).

Resolved problems (since version 5.06)

- 1. **Bluetooth**: with some data collectors, after a while the Bluetooth connection stopped automatically and it was not possible to restore the Bluetooth connection without rebooting the SP85. This problem is now resolved
- 2. **NTRIP**: the NTRIP connection failed if the login or password contained a backslash character. This problem is now resolved.
- 3. **RINEX**: the file extension .rnx or .cnx was in uppercase. They are now in lowercase according to the RINEX 3.02/3.03/3.04 standard
- 4. **ATOM**: when ATOM RNX 999 messages were configured to a port, the Web UI displayed ATOMRNX 0 in the I/O page. This problem is now resolved.
- 5. **QZSS**: there are no more limitations with L2 QZSS at the base and at the rover

Known Issues

- 1. **Post-processing**: when using Trimble Access for recording a static G-File at the base, Survey Office prior to version 5.30 detects a dynamic file and does not recognize the site name. In this case, it is needed to force static when importing the file and to enter manually the site name. With Survey Office 5.30, there is no problem.
- 2. **Hot swap batteries**: in some cases, when 2 batteries are in the receiver, the receiver switches off when you remove one of the 2 batteries, and it is not possible to start again the receiver until you remove also the second battery
- 3. **E-Bubble**: after a receiver reset, the receiver may display a alarm 'E-Level not detected'
- 4. **Power supply**: in some cases, the receiver may switch off when you remove the power supply cable while you have battery
- 5. **GLONASS L2**: SNR oscillation for frequency slots -1,3,5

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 be 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**: Days and areas with increased ionosphere activity can demonstrate worse than usual RTK/RTX performance.
- 4. **Base Matters**: User must realize that often 3rd 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.

5. **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.

6. **7 GNSS:** While SP85 can work with different subsets of GNSS (e.g. GLO only, BDS only, GLO+BDS), user must realize that exclusion of any available GNSS system may result in degraded positioning performance

7. **7 GNSS:** While SP85 can track and use the observables from all 7 GNSS, for differential (RTK rover) operation it can be possible only if base provides respective reference data. Today with RTCM-3.1 protocols these reference data can be available only for L1/L2 GPS and GLONASS, so SP85 cannot take a benefit of other signals. Only the following 3 cases can allow effective RTK usage of all tracking signals:

- Using own SP85 base generating either ATOM or RTCM-3.2 (MSM) differential data
- Using 3rd party services supporting RTCM-3.2 (MSM) data generation
- Using SP85 base and any Trimble base generating CMRx or RTCM-3.2 (MSM) corrections

8. **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 GNSS points.

9. **RINEX:** when converting receiver raw data to RINEX it is desirably to generate RINEX-3.04 (latest released version) data as legacy RINEX-2.11 does not support many of GNSS signals SP85 tracks.

10. **QZSS:** Spectra receivers applying f/w version 3.85 and older can have problems in RTK rover mode if RTCM correcting data (from SP85 base or 3rd party base/network) contain QZSS. In such case, we recommend applying command \$PASHS,QZS,OFF on these rovers.