RELEASE NOTES

SPECTRA GEOSPATIAL

September 14th, 2022

SP90m V5.21 Firmware Release

Introduction

This document is the firmware release notes for the SP90m V5.21. This version is a minor release .

Upgrade Procedure

The upgrade procedure can take up to 5 minutes. The receiver beeps when the upgrade is complete. Please do not turn off and do not remove the power during the upgrade.

During the upgrade, if the receiver screen is turned on, the step 1 to 5 are displayed. Between the step 4 and 5, the screen and the power led may be turned off during 1 minute approximately.

Below are described 3 ways for upgrading the receiver:

With USB key and front panel display:

The customers can upgrade the receiver with the version V5.21 by following this procedure:

1- Copy the file sp90m_upgrade_v5.21.tar to a USB key
2- Insert the USB key to the SP90m
3- With the right-arrow, go to **Advanced Settings**, then with the down-arrow go to **Upgrade firmware?**
4- Press OK and confirm the upgrade
5- Let the receiver proceed with the upgrade. Do not turn off the receiver while the upgrade is in progress.

With the Web Server:

The customers can upgrade the receiver with the version V5.21 by following this procedure:

1- Copy the file sp90m_upgrade_v5.21.tar to your computer
2- Open the Web Server of your receiver
3- Go the Configuration tab and select Firmware Upgrade
4- Select the file sp90m_upgrade_v5.21.tar located on your computer
5- Press Upload

6- Let the receiver proceed with the upgrade. Do not turn off the receiver while the upgrade is in progress

With SP Loader:
The customer can upgrade the receiver with the version V5.21 by following this procedure:

1- Copy the file sp90m_upgrade_v5.21.tar to your computer.
2- Connect the SP90m to the computer with the USB cable
3- Run the software Spectra Geospatial Loader, select the COM port corresponding the USB cable and press the button Upgrade
4- Select the file sp90m_upgrade_v5.21.tar
5- Press the button Update and wait for the complete receiver upgrade. Do not turn off the receiver while the upgrade is in progress

Firmware list and versions

General version number: V5.21 – 09/09/2022

OS: 4.1.15 #1290
U-Boot: 0.19
PVT: SP92V11
DSP: SC92V11
SL: SS92V09
WEB Service: SW92V11
HTML Pages: SH92V18
PMU: 1.7
GSM: 3.001
XDL: V02.04(3) or V2.10(3)
RINEX converter: 2.19

The software compatible with SP90m V5.21 are:

- Survey Pro: 6.5
- RINEX Converter: 5.0.8
- Survey Office: 5.30
- USB Serial Emulation: 1.1
- Spectra Geospatial Loader: 9.8.0
- Spectra File Manager: 1.8.3

Improvements (since version 5.11)

RTX beam update:

a. Mexico: the new **RTXME** satellite (1555.8155 MHz, 1200 bps) replaces the current RTXMX satellites (1555.7825 MHz,600 bps)

b. CIS, India,Western China: the new **RTXIR** satellite (1545.5050 MHz, 1200 bds) replaces the current RTIO satellite (1545.5300 MHz, 600 bds)
c. Africa, Middle East: the new **RTXAF** satellite (1546.21 MHz, 1200 bds) replaces the current RTXEA satellite
d. Europe: the **RTXEU** satellite replaces the current RTXEA satellite. Only the name and the coverage are modified

RT27: in the message 57h RAWDATA type 6, the field Pseudo-IODE was filled only for the GPS and SBAS constellations. It is now filled for all the constellations.

New features (since version 5.11)

- **No new feature**

Resolved problems (since version 5.11)

Dithering: when the option [3] 30-30CM was installed and the option [J] RTKROVER was not installed, the RTX and OmniSTAR position accuracy was only 30cm. The RTX and OmniSTAR accuracy is now centimetric and not impacted by the dithering options.

Known Issues

- **Firmware Upgrade**: it is not recommended to upgrade the firmware with SP Loader using the serial cable. It is recommended to use the USB cable with SP Loader.
- **External UHF transmitter:** when an external UHF transmitter is connected to the SP90m, the settings of the transmitter are displayed on the SP90m display. If you modify the radio settings directly on the radio, then the settings displayed by the SP90m are not correct anymore.
- **SBAS:** SBAS ranging was disabled for baseline processing because of detected incompatibility with 3rd party receivers

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 during 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. **Ionosphere activity**: Days and areas with increased ionosphere activity can demonstrate worse than usual RTK/RTX performance..
3. **Base Matters**: Users must realize that often 3rd party reference data providers are equally responsible for performance degradation because of generating much less correcting data compared to quiet ionosphere conditions. Users are recommended also contacting Network data providers in case of RTK problems.
4. **ATL log**: We recommend end users in case of receiver performance problems to record atl.log and share it with Tech Support. W/o atl.log file, the ability to help the end user will be much less.
5. **7 GNSS**: While SP90m 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
6. **7 GNSS**: While SP90m can track and use the observables from all 7 GNSS, for differential (RTK rover) operation it can be possible only if the 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 SP90m cannot take advantage of other signals. Only the following 3 cases can allow effective RTK usage of all tracking signals:
   - Using own SP90m base generating either ATOM or CMRx or RTCM-3.2 (MSM) differential data
   - Using 3rd party services supporting RTCM-3.2 (MSM) data generation
   - Using Trimble bases/services generating RTCM-3.2 (MSM) data

   It is recommended to use ATOM or RTCM3.2 as source correction when possible.
7. **NTRIP:** When working with Ntrip service, users are recommended to select VRS mount point over MAC and FKP (today MAC and FKP support only GPS+GLONASS while VRS can usually generate data for up to 6 constellations, IRNSS excluding). In general with a wide variety of different mount points, always try to select GNSS points.
8. **RINEX:** when converting receiver raw data to RINEX it is desirable to generate RINEX-3.04 data as legacy RINEX-2.11 does not support many GNSS signals SP90m tracks.
9. **USB Driver:** the first time you connect the SP90m to your computer with a USB cable, it is recommended to have an internet connection available on your computer in order to install the driver automatically. The driver is also available on Spectra Precision web site.
10. **USB device:** the USB memory or USB hard drive must be formatted in FAT32 to work with the SP90m. NTFS is not supported.

11. **USB hard drive:** The SP90m is USB2.0. If you use a hard drive USB3.0 compatible USB2.0 and the hard drive is powered by the SP90m, it is possible that it does not work because the SP90m cannot provide enough power.