RELEASE NOTE

February 4th, 2018

SP90m V3.61 Firmware Release

Introduction

This document is the firmware release notes of the SP90m V3.61.
This version is a minor release with new features, improvements and bug fixing.

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 V3.61 by following this procedure:

1- Copy the file sp90m_upgrade_v3.61.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 V3.61 by following this procedure:

1- Copy the file sp90m_upgrade_v3.61.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_v3.61.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 V3.61 by following this procedure:

1- Copy the file sp90m_upgrade_v3.61.tar to your computer.
2- Connect the SP90m to the computer with the USB cable

3- Run the software Spectra Precision Loader, select the COM port corresponding the USB cable and press the button Upgrade
4- Select the file sp90m_upgrade_v3.61.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

Note that receiver has to be under warranty period to be upgraded.

Firmware list and versions

General version number: V3.61 – 2/4/2018

OS: 4.1.15 #971
U-Boot: 0.10
PVT: SP82V24
DSP: SC82V24
SL: SS82V26
WEB Service: SW82V19
HTML Pages: SH82V24
PMU: 1.3
GSM: 3.001
XDL: V01.14(2)

The software compatible with SP90m V3.61 are:

- FAST Survey: not compatible yet
- Survey Pro: 6.2
- Trimble Access: not compatible yet
- RINEX Converter: 4.7.1
- Survey Office (64-bits): 4.0
- USB Serial Emulation: 1.1
- Spectra Precision Loader: 7.1.0
- Spectra Precision File Manager: 1.4.0

New Features (since the version 3.51)

No new features

Improvements (since the version 3.51)

1. **CAN Bus/NMEA2000**: the receiver supports the output of NMEA2000 messages through the CAN bus
2. **GSOF**: the GSOF messages output can be now activated with $PASHS,GSF command and with the Web UI
3. **GSOF**: the message GSOF 8 VELOCITY DATA is supported
4. **GSOF**: the message GSOF 27 ATTITUDE INFO is supported
5. **Dithered RTK**: the option [d] Dithered RTK 10/10 is supported

6. **UDP/IP**: the port I and J can be configured in UDP/IP mode
7. **RTCM3.3**: the message MT1042 (Beidou ephemeris) is supported (output only)
8. **RTCM3.3**: the message MT1046 (Galileo ephemeris) is supported (output only)
9. **GALILEO**: the mode GALILEO only is now supported ($PASHS,PGS,GAL is also supported)
10. **Sessions**: the receiver supports now the automatic recording sessions. Two batches of sessions can run in parallel. The session files can be pushed automatically to a FTP server.
11. **RINEX**: the receiver contains a RINEX converter. It can convert automatically the session files and it can be run manually to convert a single G-File. The supported RINEX formats are 2.10, 2.11, 2.12, 3.00, 3.01, 3.02 and 3.0.3
12. **Ring File Memory**: the receiver can delete automatically its oldest files in order to record files continuously
13. **G-File duration**: it is now possible to set the maximum duration for the G-Files. When it is set, a new G-File is created at regular interval in order to have only G-File with the specified duration. The same feature exists also for the ATL log.
14. **Web UI**: a status bar is now displayed in the Web UI in order to have always visible some key values of the receiver
15. **Power sleep mode**: it is possible to configure the receiver to be automatically turned on after a specified duration or at a specified time. When the sessions are used, it is possible to automatically switch off the receiver between 2 sessions. This feature does not work properly in version 3.61 (see known issues below).
16. **Script**: the receiver execute automatically at each startup the commands included in the file uploadconfig.cmd located in the internal memory
17. **NTRIP**: a new setting is added to the NTRIP parameters in order to enable or disable the automatic NTRIP connection at startup. The auto-connection setting in $PASHS,ETH,PAR become obsolete. The auto-dial setting in $PASHS,MDM,PAR is used now only for CSD mode.
18. **Direct IP**: a new setting is added to the Direct IP parameters in order to enable or disable the automatic Direct IP connection at startup.
19. **Phone Numbers**: the phone numbers used for alarm and anti-theft notification can now be configured with the Web UI.
20. **Emails**: the Email Notifications page is now in the Network tab, and the way to enter an email address has been improved
21. **RTK Bridge:** the RTK bridge is now configurable with the Web UI
22. **DynDNS:** the DynDNS is now configurable with the Web UI
23. **HTTP Port:** the HTTP port (80 by default) is now configurable with the Web UI
24. **External UHF:** with the OLED display, it is now possible to forget the external radio.
25. **External UHF:** With the OLED display, it is now possible to force the read of the external radio settings. It allows updating the radio settings displayed by the receiver when they have been modified directly with the radio user interface.
26. **Internal UHF:** the SP90m does not send any data to the internal UHF transmitter if the receiver does not receive at least 4 satellites. It should prevent the user from damaging the GNSS antenna which would be connected to UHF connector by mistake.
27. **Web UI:** the size of left part and the right part of the Web UI can be modified by moving the orange line between these both parts.
28. **TCP/IP:** when a TCP/IP port requires authentication, it accepts the login/password in a $GPUID message or in a $PASHS,TCP,UID message. Only $PASHS,TCP,UID was accepted in previous version.
29. **Float RTK:** maximum age for float RTK fast solution was changed from 300 up to 600 seconds by default

30. **Fixed RTK:** maximum age for fixed RTK fast solution was changed from 30 up to 60 seconds by default
31. **L3 Option:** the command $PASHS,GL3 is removed and the associated option [S] L3TRACKING becomes obsolete. Beidou B2 and GALILEO E5b are now linked to L2TRACKING, GLONASS G3 is now linked to L5TRACKING.
32. **Tracking Mode:** the tracking mode set by the command $PASHS,OBS is now available in the Web UI.
33. **Battery Charger:** it is now possible to disable the internal battery charger by command, Web UI or OLED.
34. **Web UI Passwords:** The management of the passwords in the Web UI is modified. By default, the Web UI does not get any password from the receiver and does not display password. When needed and not anonymous, a button allows getting and display the password.
35. **Anti-theft**: the default password for anti-theft is now password (instead of spectra).
36. **G-File**: The G-File contains now by default only ATM,RNX ATM,NAV ATM,ATR and ATM,OCC. The Web UI allows modifying the content of the G-File with the following choices:
    - standard (default configuration)
    - extended (ATM,PVT ATM,DAT ATM,ANG ATM,STA,OSS are added to standard)
    - customized (the end user selects manually the messages he wants to record in the G-File)
37. **QZSS**: the satellite L1SAIF is not considered anymore as a SBAS satellite and it is removed from the command $PASHS,DIF,SBA and $PASHQ,DIF,SBA.
38. **QZSS**: the number of QZSS satellites in the command $PASHQ,SQZ $PASHS,QZS,USE and $PASHQ,QZS is now 10 (it was 5 before). The number of channels for QZSS tracking is now 4.
39. **SBAS**: the number of SBAS satellites in the command $PASHQ,SSB $PASHS,SBA,USE and $PASHQ,SBA is now 39 (it was 44 before)
40. **Web UI**: a button Delete All Files is added.in the File Manager
41. **Web UI**: in the panel which shows the list of the alarms, there is now a button "Acknowledge Alarms" which acknowledges all the alarms.
42. **WiFi**: After a firmware upgrade, the WiFi settings were reset and so the receiver was not accessible remotely if connected to Internet though WiFi. This problem is now resolved, the WiFi settings are not reset by a firmware upgrade.
43. **Base Position**: The command $PASHQ,POS,REF supports now a parameter to select which base position between ARP, PC1 and SPT.
44. **Web UI**: The base position was always displayed for the ARP even if you entered SPT or PC1 base position. Now it displays SPT or PC1 if you enter SPT or PC1.
45. **Web UI**: the online help is now localized in several languages
46. **Update rate**: the default update rate is now 10Hz (instead of 20Hz)

Resolved Problems (since the version 3.51)

1. **Modem**: The way to initialize the modem has been improved. The operator selection is now always automatic, and the band selection, 2G or 3G, is done separately.
2. **Web UI**: When the primary GNSS time was GLONASS or BEIDOU, the GPS time was displayed in the Position/Position Web page. Now it displays GLONASS time or BEIDOU time.
3. **DCOL**: The break signal did not work on SP90m serial ports. Now it works and the DCOL message 6Eh BREAKRET is returned.

4. **DCOL**: The SP90m modem was unreachable via DCOL. The problem is fixed and the port for the modem in SP90m is set to 17.
5. **Firmware Upgrade**: During the SP90m upgrade with Web UI or SP Loader, the OLED screen may remain off instead of displaying the different step. This problem is resolved.
6. **Web UI**: When the Web UI was opened through the Ethernet connection and you turned on the modem, then the Web UI was not accessible anymore. This problem is resolved.
7. **Modem**: It was not possible to enter an international phone number in the receiver, by $PASHS command or by Web UI. It is now possible to enter an international phone number started by 00 or +
8. **PPS**: PTT message was sometimes output twice with the same time stamp quickly in a row. This problem is resolved.

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 USB cable with SP Loader.
2. **GALILEO**: the Galileo measurements E5a/E5b recorded in the G-File are not processed by Spectra Precision Survey Office
3. **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.
4. **Internal UHF receiver:** the XDL micro version 1.34 does not work well when the speed is greater than 5 kph. It is recommended to use the version 1.14 if you are in this situation.
5. **IRNSS:** the IRNSS tracking status can be seen only via proprietary messages. NMEA and RTCM do not support IRNSS data. RINEX 3.02 (which is supported by Spectra Precision RINEX converter) does not support IRNSS.
6. **IRNSS and RTK:** use of IRNSS in RTK is not possible because there is no standardized protocol which transmit IRNSS reference data
7. **Trimble RTX:** this service is not available in the version 3.61
8. **SBAS:** SBAS ranging was disabled for baseline processing because of detected incompatibility with 3rd party receivers
9. **Power Sleep Mode:** it may happen that the automatic wake up does not work. We do not recommend using this mode with the version 3.61.

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. **Ionosphere activity**: Today we are at the peak of ionosphere activity which can affect/degrade receiver performance. 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.
3. **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.

4. **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
5. **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 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 a benefit 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 RTCM-3.2 (MSM) differential data
   - Using 3rd party services supporting RTCM-3.2 (MSM) data generation
   - Using Trimble bases/services generating CMRx data

   It is recommended to use ATOM or RTCM3.2 as source correction when it is possible.
6. **NTRIP:** When working with Ntrip service, user is recommended to select VRS mount point over MAC and FKP (today MAC and FKP support only GPS+GLONASS while VRS can generate usually data for up to 6 constellations, IRNSS excluding). In general with wide variety of different mount points, always try select GNSS points.
7. **RINEX:** when converting receiver raw data to RINEX it is desirably to generate RINEX-3.02 (latest released version) data as legacy RINEX-2.11 does not support many of GNSS signals SP90m tracks.
8. **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 automatically the driver. The driver is also available on Spectra Precision web site.
9. **USB device:** the USB memory or USB hard drive must be formatted in FAT32 to work with the SP90m. NTFS is not supported.
10. **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.