Engineering Firmware Release Notes Survey

Date: May 14th, 2012

Product: ProFlex 500

Subject: ProFlex 500 V4.0 Firmware Release

Introduction:

This document is the firmware release note of the ProFlex 500 V4.0.

Upgrade procedure

WARNING: The [P] option (L2 tracking) may disappear after the upgrade. Thus, before you proceed with upgrading your receiver, please note and save the [P] option code (you can identify this code using the following command: $PAHQ,OPTION), and then enter this code once your receiver is upgraded.

Example:

If the answer to the following command $PASHQ,OPTION is:

$PASHR,OPTION,0,SERIAL NUMBER,201144002*78
$PASHR,OPTION,K,RTK,2FAF812F88685*68
$PASHR,OPTION,F,FASTOUTPUT,2FAF819A9F5F0*3C
$PASHR,OPTION,Z,MODEM,2FAF80F0B1241*06
$PASHR,OPTION,S,GLONASS,2FAF8224ED792*01
$PASHR,OPTION,P,GNSSL2,2FAF878C55370*4F

Then command to send to activate the [P] option (L2 tracking) is: **$PASHS,OPTION,P,2FAF878C55370**

The procedure to upgrade the receiver is the following:

1- Copy the file p_500_upgrade_V4.0.S759x24.tar.bz2 to an USB memory key.
2- Make sure that there are at least 10Mb of free memory after having copied these files
3- Switch off the ProFlex 500
4- Plug the ProFlex 500 into an external power and make sure that there is also an internal battery
5- Connect the USB memory key to the ProFlex 500
6- Turn on the ProFlex 500 while keeping pressed the button ‘Scroll’ (during about 5 seconds)
7- Wait for the complete upgrade, which should take about 30 minutes.

Firmware list and versions

General version number: V4.0 - S759Gx24

SYS:	S125c
GNSS:	Gx24
RFS:	759
BOOT LOADER:	1.1.5.9
KERNEL:	2.6.19
PMU:	2.31
GSM:	R7.46
Web Service:	047
NTRIP Caster:	1.0.10

The radio firmware compatible with the ProFlex 500 V4.0 are:

-Internal Pacific Crest PDL RXO:	2.58
-External Pacific Crest HPB:	2.58 or 2.42
-External Pacific Crest ADL Vantage:	3.04 (2280)
-External Pacific Crest ADL Vantage Pro:	3.04 (2280)
-Internal U-Link:	1.02
-External U-Link:	1.03 (HW: AD), 1.04 (HW: AE) or 1.09 (With Connector)

The software compatible with ProFlex 500 V4.0 are:

- FAST Survey:	2.9.1
- GNSS Solutions:	3.71
- RINEX Converter:	4.1.1
- Conf Radio:	2.1.0
- Spectra Precision Survey Pro:	not yet compatible with ProFlex500
- Spectra Precision Survey Office:	2.6

New features (compared to ProFlex 500 V3.6)

1. **New antenna supported**. The following antennas are added to the internal antenna table: ASH802147, SPP39105.90, SPP67410_42, SPP67410_44, SPP67410_46, SPP68410_10, TRM59800.00 and TRM59800.80 .
2. **EPOCH 50 Antenna**. The EPOCH 50 antenna is added to the internal antenna table.
3. **Raw Data format**. The format of the raw data recorded in the G-File is now ATOM-RNX while it was ATOM-MES with the ProFlex 500 V3.6. The ATOM-MES is not supported anymore.
4. **Base position**. The receiver raises an alarm when the base position entered with the command *$PASHS,POS* is too far from the computed position. In this case, the base position is not taken into account and the command returns NAK.
5. **Data Link Quality**. The new message *$PASHR,DDS* provides information regarding the data link quality and the received differential messages.
6. **Configuration file**. The ProFlex 500 is able to save/load its configuration to/from a file (*.par). It allows setting several receivers with exactly the same configuration by means of the following serial

commands: *$PASHS,PAR,SAV* and *$PASHS,PAR,LOD*. The configuration can be automatically loaded if the file exists in the USB key when it is plug to the receiver.

7. **Received base antenna parameters**. At the rover, the new command *$PASHQ,ANP,RCV* returns the offsets of received base antenna.
8. **ADL Vantage**. The ProFlex 500 supports the external Pacific Crest ADL Vantage UHF transmitter
9. **ADL Vantage Pro**. The ProMark 500 supports the external Pacific Crest ADL Vantage Pro UHF transmitter.
10. **NMEA GNS Message**. This message is now generated.
11. **ATL File**. It is possible to start and stop ATL recording by using only the OLED screen and the buttons, without sending any command.
12. **SBAS improvement**. Improved algorithm for SBAS ionosphere issue.
13. **External Heading**. When the receiver gets a differential stream from a second receiver, it is possible to compute heading and pitch/roll between those both receivers. The commands *$PASHS,CPD,ARR,MOD/LEN/OFS/PAR* should be used to configure the heading mode.
14. **Heading + RTK**. The receiver is able to compute heading (internal or external) and RTK positions at the same time.
15. **Heading HDT and ATT messages**. The heading is outputted via NMEA HDT message and proprietary Ashtech ATT message.

The *ProFlex500 CORS* contains the following changes:

16. **Meteorological sensor**. Information describing the meteorological sensor (model, accuracy,…) is written in the raw data file (G-File), so when the G-File is converted to a RINEX file, the RINEX header is properly filled. Those information are entered via serial command *$PASHS,RXC,PAR* or by means of the Web Server.
17. **Data Recording Duration**. It is now possible to limit G-File recording duration. G-File is closed automatically once specified duration is reached and a new G-File is created. The duration is set by means of new serial command *$PASHS,DRD*. This feature replaces the previous Ring File Buffer feature.
18. **Ring File Memory**. The ring file memory is now not linked anymore to the sessions, but it is applicable for all the raw data file. With the feature Data Recording Duration, it allows recording continuously raw data without having overfull memory.
19. **Manual RINEX Conversion**. It is now possible to convert manually any G-File recorded in the receiver, not only the G-Files created by the sessions. The command *$PASHS,RXC,RUN* is used to perform manual conversion.
20. **RINEX Converter in Sessions**. The RINEX conversion of the session files is done in real time (on the fly), therefore RINEX files are ready just after the end of a session.
21. **RINEX 3.01**. The embedded RINEX converter supports now the formats 2.11 and 3.01.
22. **RINEX without GLONASS/SBAS**. The embedded RINEX converter can now create RINEX file without GLONASS or SBAS data.
23. **Double RINEX conversion**. The embedded RINEX converter can convert one G-File into two RINEX files with two different rates simultaneously.
24. **Automatic FTP Transfer**. In case of automatic FTP transfer procedure failure, the files are kept in the receiver and once the FTP transfer connection is restored than all the delayed files are transferred.
25. **NTRIP Caster**. It is now possible to set a limit between 1 and 100 to the number of connection with a single login/password.

The **WebServer** contains the following changes:

26. **New configuration pages**. WebServer contains the following new configuration pages:
    - Heading
    - Advanced Setup / Receiver Configuration
27. **New status pages**. WebServer contains the following new configuration pages:
    - Embedded NTRIP Caster/Map
28. **Base Setup/Full Setup**. The new external UHF transmitters ADL Vantage and ADL Vantage Pro are supported.
29. **Base Setup/Transmitter**. The new external UHF transmitters ADL Vantage and ADL Vantage Pro are supported.
30. **Connection/Radio**. The new external UHF radio ADL Vantage and ADL Vantage Pro are supported.
31. **Data Output/NMEA Messages**. The new messages DDS and GNS are supported.
32. **Data Output/Raw Data**. The ATOM MES message is replaced by the ATOM RNX message.
33. **Recording**. Two check boxes were added: *Ring File Memory* and *Split Data Into Preset Duration Files*.
34. **Sessions/Settings**. It contains the following new features:
    - Support of RINEX 3.01
    - Possibility to disable GLONASS or SBAS during RINEX conversion
    - Possibility to set the rate for the RINEX file
    - Possibility to create a second RINEX file with a different rate
35. **File Manager**. It contains the following changes:
    - Added the possibility the convert G-File into RINEX file, and to compress it
    - Removed the button *Delete All Files*.
    - Displaying of the status of any conversion or transfer in progress was added
36. **Embedded NTRIP Caster/Settings**. Added the field *Maximum Simultaneous Connections Per User*
37. **Advanced Setup/RTC Bridge**. The new UHF transmitters ADL Vantage and ADL Vantage Pro are supported.
38. **Receiver Status and Settings**. It contains the following new features:
    - Heading settings
    - Heading status and values, including a compass
    - Overall data link quality
    - Rate and the age of each received differential message
39. **Satellites**. It contains the following changes:
    - Now satellites which are in view but not tracked are displayed with dotted outline

Resolved Problems (compared to ProFlex 500 V3.6)

1. **Received base position and antenna height**: If serial command *$PASHS,CPD,RST* is issued at the rover, the commands *$PASHQ,CPD,POS* and *$PASHQ,CPD,ANT* return zero values until the base position and the base antenna height is received again.
2. **Rate of RINEX file**. It was possible to create a RINEX file with a rate lower than 1second but from time to time it caused troubles in the receiver . Now it is not allowed, the minimum rate is 1 second for the RINEX files created in the receiver. The PC RINEX Converter should be used to create RINEX file with a rate lower than 1 second.
3. **FNC#2690: "***Message RTCM3.1 Type 1023: the sign for horizontal residuals is now correct*". RTCM standard is not completely clear regarding the residual sign. Therefore new serial commands *$PASHS,LCS,HOR* and *$PASHS,LCS,VER* were added. They allow managing the sign (+ or -) for the horizontal and vertical residuals.

4. **FNC#2630**. Impossible to import 24 hour RINEX files (30 sec) into GNSS Solutions PC software.
5. **FNC#2661.** The embedded NTRIP caster failed when a mount point name contained a space.
6. **FNC#2581.** The Web Server was not available when the port I was disabled.
7. **FNC#2847.** Pushing first time a session file started after 23h00 UT was done incorrectly (the file was not posted the right folder).
8. **FNC#2702.** There was an issue with the number of retries for the FTP push in case of connection outage. Now all the files are kept when the FTP connection is not available, and as soon as the FTP connection is restored all the delayed files are transferred automatically.

Known issues

1. When you connect the ProFlex500 to a PC with the USB cable and you delete any files of the internal memory with the Windows Explorer of the PC, the list of files returned by the *$PASHQ,FIL/FLS* commands may be not correct (the same applies to files displayed by FAST Survey). It is necessary to perform a power cycle in order to retrieve a correct list of files.
2. When the command *$PASHS,RST* is issued, the message *GNSS Board not detected* may appear. However after few seconds, the receiver will work properly.
3. ProFlex 500 being feed with CMR or CMR+ corrections generated by Trimble receiver / board may report not stable and high age of corrections. In this case, it is recommended to use RTCM3 format.
4. It is not recommended to keep huge number of files at the root or in a folder inside 128 Mb internal memory. With more than 150 files in a folder, the receiver may have issues with recording of new files. When you need to record huge number of files, it is preferable to use an external USB memory or USB hard disk, or to move the files automatically in sub-folders if you use the sessions.
5. When the tilt sensor is used and the embedded RINEX converter is used, the RINEX meteo file generated by the receiver contain records corresponding to the tilt sensor temperature.

Recommendations

1. User working with 3rd party NTRIP networks should be recommended not to connect to VRS mount points, if others mount points like MAC or FKP) are available. This will guarantee more stable performance.
2. User working with 3rd party bases/networks generating GLONASS reference data is recommended to identify with the network provider the name (brand) of reference receivers. If this brand is known a priori, it can be specified on rover by command $PASHS,RCP,REF,brand,1 (supported brand=TRIMBLE, NOVATEL, SEPTENTRIO, TOPCON). It this case, GPS+GLONASS rover RTK performance can be much better than in a case, when reference receiver name is not known.
3. The reference time used for starting or stopping the sessions is the GPS time, and not the UTC time while the WebServer operates with UTC time only. The difference between scales is 15 seconds currently.

4. It is possible to use a hard disk connected to the USB port in order to record a large amount of data. If the hard disk has not its own power supply, it must be USB certified, else there is a risk that the hard disk will not work properly due to power supply issue.
5. Before using a hard drive with a ProFlex500, the hard drive must be formatted in FAT32 and at least one folder must be created manually.
6. WebServer may have abnormal behavior just after firmware update as your web browser might still use old pages saved in cache memory. It is recommended to exit the web server after any upgrade and to clear its cache memory.