## Firmware Release Notes Survey

Date: April 27th, 2011

Product: ProFlex 500

Subject: ProFlex 500 V3.5 Firmware Release

## Introduction

This document is the firmware release note for ProFlex 500 **V3.5**.

## Upgrade procedure

The procedure to upgrade the receiver from version V3 (S522Gt22) is the following:

1. Copy the file p_500_upgrade_S608Gt23.tar.bz2 to a 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 holding down the “Scroll” button for about 5 seconds,
7. Wait for the complete upgrade, which should take about 20 minutes.

Before upgrading the receiver, it is recommended that you reset the receiver using the $PASHS,INI,3 command.

After upgrading the ProFlex 500 and before connecting to the Web Server, it is necessary to empty the cache memory of the Web Browser and to restart the Web Browser.

## Downgrade procedure

If for any reason you need or want to go back to the previous version (S522Gt22), please perform the same procedure using the **specific “downgrade package”** p_500_upgrade_DowngradeToS522Gt22.tar.bz2 which is also provided with this version.

## Firmware list and versions

General version number: S608Gt23

SYS: S090
GNSS: Gt23
RFS: 608
BOOT LOADER: 1.1.5.9
KERNEL: 2.6.19
PMU: 2.31
GSM: 6.63c or 7.3 or 7.4

WEB SERVICE: 036

The radio firmware to be used with the ProFlex500 V3 is:

Internal Pacific Crest: 2.58
External Pacific Crest: 2.58 or 2.42
External TDEM:
Internal U-Link: 1.01
External U-Link: 1.03

FAST Survey 2.6 and GNSS Solutions 3.60.1 must be used with ProFlex500 V3.5.

## New Features

**This release is a major update of ProFlex 500 V3.1 (S522Gt22).**

**Additional features have been implemented. Some features are brand new; some are MB 500-specific featuresmade available through the ProFlex 500.**

**Summary of the main new features:**

1. **Embedded NTRIP caster**: The ProFlex 500 incorporates an NTRIP caster. The maximum number of mount points is 10 and the maximum number of clients is 100. Two mount points can deliver the differential data generated by the receiver itself. The new option [C] is mandatory to activate the NTRIP caster.
2. **Additional NTRIP connection through Ethernet**: In the former version, it was possible to connect to an NTRIP caster in server or client mode through the modem (port E) or Ethernet (port P). A second connection through Ethernet (port Q) is now available and two connections can now be used at the same time (E+P or E+Q or P+Q). So the ProFlex500 is now able to provide 2 independent streams of differential data to 2 different NTRIP casters or to 2 different mount points of a single NTRIP caster.
3. **Additional Direct IP connection through Ethernet**: In the former version, it was possible to connect to a server in Direct IP mode using the modem (port E) or Ethernet (port P). A second connection through Ethernet (port Q) is now available and 2 connections can now be used at the same time (E+P or E+Q or P+Q). So the ProFlex500 is now able to provide 2 independent streams of differential data to 2 different servers.
4. **"Flying RTK" option**: The new option [R] allows the receiver to work in Flying RTK only. A specific option is now available in the price list and it is no more necessary to have the RTK option [K] to run Flying RTK. This is specifically interesting where decimeter-level accuracy is enough or for very long baselines.
5. **DynDNS**: The ProFlex 500 now supports the DynDNS protocol which allows you to define a hostname for the receiver.
6. **Back-up FTP site for sessions**: It is now possible to define a back-up FTP site. The sessions are posted to this FTP when the primary FTP site is not accessible. It is also possible to post systematically the files on the back-up FTP site.
7. **New NMEA-like messages**: The $PASHR,SGL and $PASHR,SGP messages have been made available to output the L2 SNR as well as the detail of how each satellite is used in the position computation.
8. **ATOM RNX scenario 0**: It is now possible to output this message in base mode. The *$PASHS,RNX,TYP* command must be used to program this message. However it is not recommended to use this message as differential data but only as a complete raw data stream / output for third-party users / applications which have implemented

an ATOM decoder. In the future, RNX scenario 0 is intended to replace the ATOM MES raw data currently stored in G-files for post-processing. Customers looking at raw data streaming are recommended to use this RNX,0 message rather than MES.

9. **Position type for SBAS differential**: It is possible to configure the receiver in order to have specific position mode "9" in NMEA and NMEA-like messages when the receiver is working in SBAS differential mode. This can be set using the new *$PASHS,NPT* command.
10. **Temporary options**: New validity periods, in months (1, 3, 6), are created for the temporary options.
11. **RTCM V3.1 1021,1022,1023 messages**: The receiver decodes and uses the new RTCM messages in order to compute local geographic coordinates. The new *$PASHS,LCS* command is used to enable or disable the use of these messages.
12. **GLONASS biases**: GLONASS biases for a list of predefined receivers (Ashtech and other manufacturers) are stored in the receiver. The *$PASHS,RCP* command allows tou to enter biases for user-defined receivers and the *$PASHQ,RCP* command returns the list of supported receivers.
13. **Reference receiver name**: The new *$PASHS,RCP,REF* command allows you to set the name of the reference receiver. Then the receiver uses the GLONASS biases of this specific receiver.
14. **Display in feet**: The receiver screen displays the altitude in meters or feet. The new *$PASHS,UNT* command is used to select the distance unit you wish to use.
15. **Ring file memory**: Older files are deleted when free memory is less than 20 Mbytes (it was 15 Mbytes in the previous version).
16. **Alphanumeric station ID:** if the *$PASHS,STI,9999* command is sent, then the site ID (*$PASHS,SIT*) is used instead of the station ID *($PASHS,STI*). This results in having an alphanumeric station ID in such messages as DPC and MPC.
17. **DBEN**: The DBEN legacy format is now supported in base mode.
18. **Daisy and Spy**: Daisy ($PASHS,DSY) and Spy ($PASHS,SPY) now support the Block or Raw mode.
19. **Adjust GLONASS biases**: The $PASHS,AGB command is now supported.
20. **Synchronization with GPS time**: The $PASHS,UTS command is now supported.
21. **Log file**: The log file contains more info regarding the sessions and automatic push to FTP server
22. **Log file**: The log file contains more info regarding the direct IP and NTRIP connection
23. **NTRIP Connection**: Additional alarms were added to indicate why the receiver cannot connect to a mount point (wrong mount point name, invalid login/password,…)

The **WebServer** includes the following changes:

24. **Translation**: The WebServer exists in the following languages which have been updated with the new features:
    a. English
    b. French
    c. Spanish

   d. Chinese

25. **New configuration pages**: The Web Server contains the following new configuration pages:
    a. Embedded NTRIP Caster/Settings
    b. Embedded NTRIP Caster/Mount Points
    c. Embedded NTRIP Caster/Users
26. **New status pages**: The Web Server contains the following new status pages:
    a. Embedded NTRIP Caster/Current
    b. Embedded NTRIP Caster/History
    c. Embedded NTRIP Caster/Log
27. **Status bar**: The status bar is completely redesigned and now contains 4 lines.
28. **Web Mission Planning:** A link to the Ashtech Web Missing Planning is available on all the pages.
29. **Base Setup/Full setup**: A second section named *Network 2* is added in order to configure an NTRIP or Direct IP connection on port Q. The possible connection to the embedded NTRIP caster was added.
30. **Base Setup/NTRIP Server**: A second section named *Network 2* is added in order to configure an NTRIP or Direct IP connection on port Q. The possible connection to the embedded NTRIP caster was added.
31. **Base Setup/Transmitter:** Parameters *Scrambler* and *Forward Error Correction* have been added for the Pacific Crest transmitter.
32. **Rover Setup:** It is now possible to configure the rover in Hot Standby RTK mode (back-up RTK).
33. **Base Setup/Rover Setup:** The antenna radius and SHMP values are filled in automatically when the user selects a new antenna.
34. **Connections/Radio:** Parameter *Scrambler* and *Forward Error Correction* have been added for the Pacific Crest radios.
35. **Connections/Ethernet**: Section *DynDNS* added.
36. **Data Output/Differential Data**: DBEN message added.
37. **Data Output/Differential Data:** Description of each of the messages added.
38. **Data Output/NMEA**: The page has been entirely revised. Messages are displayed in a table and the definition of each message is displayed as well.
39. **Data Output/NMEA:** Port Q added. Messages SGL and SGP added.
40. **Data Output/Raw Data**: The page has been entirely revised. Messages are displayed in a table and the definition of each message is displayed as well.
41. **Data Output/Raw Data:** EVT message added.
42. **Data Output/Raw Data:** DPC legacy message added .
43. **Sessions/Settings**: Settings for Hot Standby RTK (back-up RTK) mode added.
44. **Satellites**: The page has been entirely revised and now includes SNR diagrams and a polar view.

45. When you click on the Status or Configuration tab, the Web Server displays the page that was last opened in that tab.
46. **Receiver Status and Settings**: In section *Differential Messages*, the status of the connection is now displayed whatever the type of connection.

## Resolved Problems

**Note**: FNC stands for Field Non Conformity, i.e. issues reported by end users.

1. When a crash of the Service Layer occurred, the receiver was completely blocked. Now the receiver is restarted automatically thanks to a new watch dog.
2. When the GPRS connection was lost, sometimes the automatic re-connection did not work and an alarm relevant to modem power was raised. This problem is now resolved.
3. **FNC2308:** the receiver was not able to retrieve the NTRIP source table properly when the source table was too long. This issue is resolved in this release.
4. **FNC2355**: A moving base that receives differential data can now compute RTK position and to output differential data at the same time.
5. When the RTK computation is not possible due to the [L] option (Limited RTK – range 3Km), an alarm is raised to warn the user that he is too far from the base.
6. **FNC2343**: Using the daisy chain commands to route data received on ports B and F to port A, it worked, but occasionally, data was lost or truncated in the data logging. This issue is resolved with the “Block” mode added to the *$PASHS,DSY* command.
7. The time to receive the answer to a $PASHS command was sometimes too long when the receiver was recording its internal configuration. It caused issues with some third-party software, which expected a shorter response time. This problem is now resolved.
8. **FNC2219**: Unable to connect to “NRCan” (Canadian NTRIP Caster). This problem is resolved.
9. **FNC2292**: The Hot Standby RTK (back-up RTK) did not work after a power cycle. This problem is resolved.
10. **FNC2499**: Missing data in MPC output. This problem is resolved.
11. It was not possible to add the EVT message with the Web Server. It is now possible.
12. Rarely after a power ON the receiver did not compute a position while satellites were received. This problem is resolved.
13. MSAS performance has been improved.
14. In certain circumstances / networks, some FIX/FLOAT transitions were observed without any obvious reasons. This problem is resolved.

## Known issues

1. When the receiver is retrieving a long NTRIP source table through the modem, some mount points may be missing. In this case, a specific alarm is raised to warn the user.
2. When the embedded NTRIP caster is active and more than 6 mount points receive differential data, the automatic RINEX conversion may sometimes fail.

3. When the embedded NTRIP caster is active, the 1-hour session files may not contain 3600 epochs but 3599 or 3601. In this case the missing epoch is in the next session files.
4. Some USB Keys can be corrupted when the key is full. Only observed on one 4Gb USB key branded Dane-Elec, and even on this key the occurrence of this issue is low.
5. The receiver has a limitation for the number of files in one directory (about 200). When this limit is reached, the receiver behaves as if the memory was full. To avoid this limit when recording sessions, it is recommended to store session files in directories that depend on the day number.
6. With some web browsers, when you download a ".Z" compressed file with the *File Manager* of the Web Server, the file extension is changed to .tgz. You must modify it manually into .Z to be able to uncompress it with classic tools.
7. When the 'External Power Output' hardware option is installed and the receiver is powered by an external power supply, it is not possible to power off the internal radio.
8. The $PASHS,INI,0 command may raise the *No GNSS Detected* alarm. There is no consequence. After a few seconds, the receiver will start working normally.
9. When you transfer a file to an FTP server with the *File Manager* of the Web Server, the Web Server does not indicate when the transfer is finished. To have this information, the user must send the *$PASHQ,FTP* command with the *Terminal Window*.
10. The external DC voltage returned by the $PASHQ,PWR command is always 12V and is not the real voltage of the external power supply or the external battery.
11. In GPRS or CSD mode, it may take a while, up to 10 minutes, before detecting that the communication is stopped and automatically re-dialing the server. This is not systematic as it depends on the cause of the interruption.
12. Sometimes, the receiver is disconnected from Ethernet without any reason. It seems that this problem happens when a network hub is used. When this happens, the user must disconnect and reconnect the receiver from/to the network.
13. When you send a command with the Terminal Window of the WebServer, you may see the following answer: *$PASHR,NAK,PF_ACCESS*. This is due to a communication issue between the Web Server and the receiver. When this happens, you must send the command again.
14. The receiver does not support directory names that contain space characters. This causes an error when exploring such directories with the *File Manager* of the Web Server.
15. The scroll bar of the *Terminal Window* may be very slow when lots of data are displayed. It is recommended that you clear the *Terminal Window* when this happens.
16. If the user deletes files through the embedded FTP server, the memory size is not updated on the receiver display and on the Web Server.
17. When the $PASHR,TTT or $PASHR,PTT messages are output or recorded, some GGA messages are missing.
18. The receiver does not support the UDP protocol.

## Recommendations

1. When ProFlex 500 is set up as a CORS recording and pushing RINEX data, it is recommended to limit the number of mount points connected (<5) if at the same time the Caster feature is running.
2. The reference time to start or stop sessions is the GPS time, and not the UTC time while the Web Server only mentions UTC time. The deviation between GPS and UTC times is 15 seconds.
3. Users working with 3rd party NTRIP Networks should be well advised not to connect to VRS mount points, if other points (MAC, FKP) are available. This will guarantee more stable performance.
4. It is possible to use a hard disk connected to the USB port in order to record a larger 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 does not work properly due to power supply issues. There is no such problem when using a hard disk that has its own power supply.,.
5. Before using a hard drive with a ProFlex 500, the hard drive must be formatted in VFAT32 and at least one folder must be created manually.
6. When sessions are running and the RINEX conversion is requested, it is recommended not to record raw data at the same time with a rate faster than 1 Hz. There is risk of missing data in the raw data file.
7. OPUS does not accept RINEX files with GLONASS data. On the other hand, the receiver cannot generate RINEX files without GLONASS data if GLONASS is tracked. So users who want to send data to OPUS must disable GLONASS tracking or convert their G-Files with the PC Rinex Converter, through which GLONASS will be disabled.
8. After a firmware upgrade, the behavior of Web Server may be strange because your Web Browser still uses old pages. It is recommended to exit the Web Server after an upgrade and empty its cache memory.
9. RTCM-2 data with rates higher than 1 Hz should not be used for both ProFlex 500 V3.5 rover and base. If a higher rate of transmission/reception is required, please use RTCM-3, ATOM or CMR/CMR+ protocols.
10. When a ProFlex 500 V3.5 base or rover is configured in L2C mode, using the receiver as an RTK rover is not recommended. In L2C mode, the number of available L2 data is low (L2C constellation is poor) and the rover will only be able to operate in float mode.