Altus NR2 Firmware Package v1.1.0
Release Notes

On June 15th 2015, Altus-PS completed its merger into Septentrio to create a global leader in the provision of GPS/GNSS positioning systems. As a consequence, the APS-NR2 product has been renamed Altus NR2 (Altus being a product line within the Septentrio portfolio). Note that some parts of the firmware still refer to APS-NR2 for interface compatibility.

These Release Notes describe version 1.1.0 of the Firmware Package used with the Septentrio Altus NR2 (based on SSRC9). This Firmware Package, possibly delivered on a Companion USB Flash Drive, contains components of the Altus NR2 firmware and the relevant manuals.

Release References

Firmware Package version:	1.1.0
Applicable Product:	Altus NR2
Supported Receiver Platform:	SSRC9
Release Date:	23 September 2015
Altus NR2 Firmware version:	1.1.0
Buildroot Failsafe version:	1.6
Buildroot OS version:	1.10
Control Firmware version:	1.1.0
SSRC5 Bootloader version:	2.5
Upgrade Firmware version:	1.0.4
GNSS Firmware version:	3.6.0
Antenna Information version:	2.2.1
GSM Firmware version:	H24_U_0C.33.86R
WiFi Firmware version:	6.3.10.0.141
Bluetooth Firmware version:	7.6.15
Altus NR2 User Manuals:	
Command and Log Reference Card for Control Firmware version:	1.1.0
Reference Guide for Control Firmware version:	1.1.0

Deliverables

One Altus NR2 Firmware Package v1.1.0 Companion USB Flash Drive, or an equivalent `cd-Altus NR2-FWP-1.1.0/` directory, containing:

1. `RelNotes.pdf`, these Release Notes
2. `License.txt`, the license for the Altus NR2 firmware
3. `Copyright.txt`, the copyright for the Altus NR2 firmware

4. gpl.txt, the GNU Public License, version 2
5. Directory manuals/ containing the receiver manuals:
   5.1. Altus NR2 Firmware v1.1.0 Command And Log Reference Card.pdf, a Reference Card showing all the commands, SBF and NMEA messages supported by the Altus NR2
   5.2. Altus NR2 Firmware v1.1.0 Reference Guide.pdf, the Reference Guide explaining the details of the Altus NR2 Command Line Interface, the Septentrio Binary Format and other aspects of the firmware
6. Directory firmware/ containing:
   6.1. Altus NR2-firmware-1.1.0-full.suf, an integrated firmware upgrade file for Altus NR2, in SUF format, containing the Buildroot OS v1.10 kernel and root filesystem, the Control Firmware v1.1.0, the GNSS Firmware v3.6.0 and the Antenna Information v2.2.1
   6.2. Subdirectory failsafe/ containing:
      6.2.1. Altus NR2-firmware-1.1.0-OS_failsafe.suf, a firmware upgrade file for Altus NR2, in SUF format, containing the failsafe image of Buildroot Failsafe v1.6. The failsafe image is a standalone kernel with integrated root filesystem and is used as a fallback whenever serious problems hamper the booting of the firmware.
   6.3. Subdirectory antinfo/ containing:
      6.3.1. ant_info.atx, the antenna information source v2.2.1 in ATX format, providing absolute antenna offsets and phase centre variations for various antennas
7. Directory drivers/ containing:
   7.1. USB_driver_2.12.1_Installer.exe, the installer for version 2.12.1 of the USB drivers, in EXE format. The executable installs the Thesycon CDC/ACM Driver, which is a Windows driver providing a serial port link via USB, and the RNDIS Driver, which is a Windows driver providing a virtual Ethernet link via USB. Note that the installer is also a component of the root filesystem of version 1.10 of Buildroot OS.
   7.2. USB_Driver_License.txt, the license for the USB drivers, in TXT format.

(All files whose names end with .pdf are Adobe PDF documents, which can be read and printed with Adobe Reader and other programs. All files whose names end with .txt are plain text files.)

Altus NR2 Firmware

Installing the Altus NR2 Firmware

In order to upgrade the firmware to version 1.1.0, the following steps should be taken:

1. Upgrade the failsafe image using the Altus NR2-firmware-1.1.0-OS_failsafe.suf file that is located in the firmware/failsafe/ directory.
2. Upgrade the kernel, root filesystem, Control Firmware, GNSS Firmware and Antenna Information by means of the Altus NR2-firmware-1.1.0-full.suf file that is located in the firmware/ directory. Note that Altus

`NR2-firmware-1.1.0-full.suf` will be rejected if the failsafe image has not yet been upgraded.

Differences with previous versions

Differences between v1.1.0 and v1.0.0

Version 1.1.0 brings the following new features:

1. The nominal cold-boot time of the receiver has significantly been improved to around 30 seconds.
2. Bluetooth and WiFi connection stability have been improved.
3. The quality and robustness of DGNSS, SBAS and Standalone positions have been improved by better error modelling, resulting in higher position accuracies and fewer outliers.
4. Uncorrected GLONASS satellites are now used in the SBAS PVT computation, increasing the availability of a solution in more challenging environments.
5. The receiver can be configured both as a WiFi access point or a WiFi client. When configured as a client, data can be streamed to the receiver from a WiFi network instead of streaming the data through the receiver's modem.
6. The Altus NR2 now has WiFi hotspot functionality which allows sharing its connection with other mobile devices.
7. IPR and IPS connections are now possible in the Altus NR2. This allows to make Base/Rover connections using the GSM or a different network communication mechanism of the receiver.
8. The IP address assigned by the Mobile network provider is shown in the Cellular widget information tab. The same information is also available using the lif, ipparameters command.
9. The user now has the possibility to manually choose between 2G or 3G mode for the cellular connection. This allows the user to force the use of 2G in areas where there is no good 3G coverage.
10. The web interface menus have been re-arranged to support the Base configuration among other newer functionality of the receiver (it is recommended to refresh your web browser cache to be able to visualize properly the new web interface of the NR2).
11. The NMEA sentences now support the reporting of datum-transformed and projected positions when the proper RTCM messages are received from the base station (1021-1027).
12. Projected coordinates are now shown in the GNSS Status page when the receiver gets the relevant RTCM transformation messages (at least either MT1021 or MT1022) from the Base station Differential Corrections.
13. The receiver can now handle RTCM 1021,1022,1023 and 1025. For RTCM 1025 the projections TM (Transverse-Mercator) and (CS) Cassini-Soldner are supported. A proprietary NMEA message $PSSN,TFM has been implemented to report which RTCM messages have been used in the position calculation.
14. The NMEA sentences LLK and LLQ can now be generated.
15. PinPoint-GIS Web (Esri ArcGIS Online data collection) has been implemented in the Web Interface which allows for user sign in/out, base map selection, user map selection, feature service for data collection (points, lines and polygons) and storage directly into Esri ArcGIS Online.

16. PinPoint-GIS Web allows a maximize screen functionality ideal for mobile devices. This view allows you to visualize position and accuracy information as a fixed layer on top of the Esri map.
17. PinPoint-GIS Web allows support for ArGIS portal connections.
18. The RTCM message 1029 is now supported.
19. The NMEA sentence GGQ (Real-Time Position with Coordinate Quality) can now be generated.
20. Text messages contained in RTCM 1029 are forwarded in NMEA sentence $GPTXT.
21. The following proprietary NMEA messages have been implemented: $PSSN,SNC reports the NTRIP client status, $PSSN,SCL reports the cellular status, $PSSN,SBT reports the battery status.
22. The snp and gnp commands have been added to command interface for being able to configure the precision and compatibility of the NMEA output.
23. The following advanced commands are now possible in the command line of the receiver and can be stored in the boot configuration when needed: setDiffCorrUsage, setDiffCorrMaxAge, SetElevationMask, setGeoidUndulation and setNMEAVersion
24. RTCM3 message MSM 1 to MSM 7 can now be generated by the receiver.
25. An SBF block called NtripClientStatus can now be generated.
26. The CmdCount field has been added to the ReceiverStatus block. This field allows integrator applications to detect configuration changes in the NR2.
27. The baseline length is now shown on the web interface.
28. The version of the WiFi and the Bluetooth is now added into the About box of the NR2.
29. Double quote, single quote, dollar sign, ampersand and comma can now be used in passwords and commands. Please refer to the manual for more information.
30. RTCM messages MSM1 to MSM7 are now supported for the receiver in a rover configuration. Non-clocksteered MSM messages are not supported.
31. The expert console of the web interface now offers a command history.

Version 1.1.0 brings the following improvements (bug-fixes):

1. The receiver is now robust against leap second updates. Glonass tracking remains stable after a UTC leap second jump
2. The NMEA precision has been increased to 3 extra digits by default . This allows to get high accuracy solution from the standard NMEA connection. If your NMEA application does not support the extra digits please use the NMEA precision configuration in the NMEA advanced settings.
3. PinPoint-GIS Web allows to access Esri organization maps (on top of your own personal maps)
4. The NMEA talker field is now correct in all messages.
5. Unexpected resets of the unit are no longer present when switching or removing batteries. This happened mainly when having the external power supply connected to the unit.
6. The Ntrip client can now resolve unqualified names.
7. Improvements in the upgrade functionality of the receiver.
8. The SBF Reference Guide, Firmware User Manual and Command Line Interface Reference Guide are now combined into a single Altus NR2 Reference Guide.

Known Issues and Limitations of v1.1.0

1. The detection of a missing SIM card inside the unit may take more than a minute before it is shown in the status information. Typically the SIM card is detected within 5 seconds.
2. When unblocking the SIM-card using the PUK code, the user might need to try several times before the command is accepted by the modem.
3. When entering Ntrip mount point names the user must exactly match the case or the receiver will not find the mount point.
4. It is recommended to clear the cache of your web browser to be able to properly visualize the new web interface of the receiver.
5. The supplied USB drivers cannot be used on computers running Windows 10. Stability issues have been observed on some computers. An updated USB driver that fixes this issue will be made available in a next release.
6. Replies from the GNSS receiver board (AsteRx-m) to forward commands will be truncated if they are longer than 50kB.
7. When disabling Wi-Fi on the client device without disconnecting the Wi-Fi connection first (e.g. unplugging a USB Wi-Fi adapter), the web interface may display the client as still connected for several minutes.
8. When logging NMEA to disk at 5 Hz while streaming at 2 Hz over Bluetooth, only the ZDA message is streamed at 2 Hz, the remainder of the messages being streamed at 1 Hz.
9. Loading of user map is slow when navigating away and back from the PinPoint-GIS Web Esri page. Please wait a few seconds once you are back in the PinPoint-GIS Web panel so that the User maps can be loaded.
10. When the user attempts to pair a second Bluetooth device while the receiver is streaming data to an already connected device, the data stream may interrupted during the pairing attempt. The receiver will remain connected to the already connected device.
11. The editing of features (collected items) might not work properly when multiple features overlap in a very close position of the map.
12. The collection form for PinPoint-GIS Web might take a couple of seconds before it appears on the screen (this might vary depending on your internet connection). Please wait until the form is displayed after clicking on the Collect button.
13. When a new battery is inserted, it may take a few seconds before the actual charge level is displayed.
14. When the receiver is operating at high CPU load, it is not possible to enable or disable Bluetooth or Wifi.
15. The new Base functionality of the NR2 requires a special permission file. If you would like to get the Base functionality activated and bought an Altus NR2 C before September 15th 2015, please contact orders@septentrio.com. Base functionality is since then included by default in all orders of Altus NR2 C models.
16. View selection of map services is not supported in PinPoint-GIS Web (they are always visible when loading a User map). However changing the basemap of a loaded user map containing a map service will cause the map service to disappear.
17. PinPoint-GIS Web might indicate that the user map is collectable while this is not the case.
18. Auto-populated GNSS fields in PinPoint-GIS Web will not show the whole accuracy for double values but when saved they will keep the full accuracy. Only when the values are edited then the accuracy might be dropped.

19. After a complete reinitialization of the system, the NMEA ZDA message may be time-tagged with GPS time instead of UTC time until the leap second information is received from the ephemeris.
20. The health status for GPS/GLONASS satellites is reported in the ChannelStatus SBF block separately for L1 and L2 signals. Only the health status value reported for L1-CA must be used as a valid health flag for a given satellite, while the health status flag provided for L2 can be ignored.
21. The web server on the receiver has been tested with Chrome (version 40), Firefox (version 36) and Internet Explorer (version 11). In some web browsers (e.g. Chrome), access to FTP might not be supported. If you experience any problems with your browser, please use a different client application.
22. When the cell connection is slow, the receiver may fail to load the Ntrip mount point table.
23. Cellular Roaming is allowed by default. Please make sure you disable the modem should you intentionally want to avoid roaming charges.
24. It is not possible to upgrade over COM1 with RxUpgrade. The upgrade will start but will fail during the process.

Legal Notice

Septentrio does not authorize the use of its products as critical components in devices or systems intended for safety-of-life applications or in devices or systems, of which the failure may endanger life or cause injuries, unless written approval is given.

All the firmware and documentation delivered with the Altus NR2 Firmware Package is licensed, as explained in the `License.txt`, `Copyright.txt` and `gpl.txt` files.

Contact

Europe
Greenhill Campus
Interleuvenlaan 15G
B-3001 Leuven
Belgium
Tel: +32 16 300 800

Americas
23848 Hawthorne Blvd.
Suite 200
Torrance
CA 90505
USA
Tel: +1 310 541 8139

Asia/Pacific
Level 901
The Lee Gardens
33 Hysan Avenue
Causeway Bay
Hong Kong
Tel: +852 3959 8680

e-mail: support@septentrio.com
Web: http://www.septentrio.com