INERTIAL EXPLORER™ VERSION HISTORY

What is new with Inertial Explorer Version 8.20.0427?

Available: April 2009 [release]

New Features:

- The new *Project Wizard* allows users to easily step through the process of creating a new project. The *Wizard* automatically detects the user's raw data types, converts them to GPB and, if requested, downloads nearby service station data. The IMU model is automatically detected for NovAtel SPAN users before conversion to IMR.
- New file handling routines effectively remove file size limitations for raw data up to 7 days
- RTS Smoother now smoothes attitude as well as position
- For marine applications, a new option is available to apply heave compensation
- Support for auto-stabilized camera mounts has been added
- External heading updates can now be used
- New plots for raw IMU gyroscope and accelerometer measurements
- Lever arm values can now be read into software (if present in IMR file header)
- EGM2008 geoid now available in WPG format
- New *Trajectory Status* plot is available for NovAtel users logging position records

Improvements:

- IMU settings have been re-organized in a more intuitive fashion
- Processing profiles can now be easily loaded through the IMU settings
- New residual tests help ensure better filtering of position, phase and ZUPT updates
- Maximum number of allowable external coordinate updates (CUPTs) has been increased to 1,000
- Decreased memory consumption means that smoothing IMU data is now faster
- Handling of manufacturer/user files has been modified to better support Windows VISTA users
- *Download Service Utility* now loads much quicker than previously
- Improved satellite rejection and base satellite selection in differential processor
- Improved handling of satellite antenna offset in PPP processor
- Users can now easily add their static PPP solution to *Favourites*
- The *Map Window* and all data plots use new drawing method that provides much better support for high-rate and/or long data sets

Decoders:

- NovAtel OEMV users can create GrafNav-readable trajectory files from 7 different position records
- NovAtel OEM4/OEMV decoder now supports MARK*n*TIMEB and MARK*n*PVAB records
- NovAtel OEM4/OEMV decoder now automatically detects IMU model for SPAN users
- For Leica 1200 receivers, support has been added for the new measurement record (#119)
- Support for the RTCMV3 raw data format has been added
- Improved handling of GLONASS data in GPB2RIN.DLL
- RIN2GPB.DLL now handles L2C data properly

Bug Fixes:

- Fixed bug in *DMI Residual* plot where DMI velocities were being plotted instead of the residuals
- Fixed bug in kinematic alignment where error was returned if GPS data rate was greater than 1Hz

- High-rate data outputted through *Export Wizard* no longer contains position jumps at top of the second
- Bug fixed in *File Data Coverage* plot where gaps in GPS data were not being plotted after IMR file had been loaded
- Fixed bug where *Select From Favorites* would not work if master GPB file did not contain position

What was new with Version 8.10.3124?

Available: December 2008 [update]

Bug Fixes:
- Fixed issue related to high-rate IMU trajectory output through Export Wizard
- Modified tightly-coupled processor to better handle Kalman filter failures
- Fixed a bug that caused auto-update feature to fail for users whose offset from GMT is zero
- Fixed a bug where GLONASS processing would sometimes fail in the reverse direction
- Fixed plotting issues for data collected after GPS week 1500

What was new with Version 8.10.2428?

Available: May 2008 [update]

New Features:
- To ensure maximum PPP solution accuracy for both old and new surveys, start/end dates are now supported for precise clock and ephemeris sources. Final MIT precise ephemeris and clock products are currently the default, whereas CODE files will be given higher priority for surveys prior to November 2006. This ensures that a final high data rate clock will be downloaded for older surveys.
- Improved support for IMU only processing when also using a DMI by now supporting DMI scale factor standard deviations of six decimals

Bug Fixes:
- Corrected bug in PPP processor affecting older files. In some cases, the wrong satellite offset may be applied
- Modified software to support future week numbers more effectively
- Corrected a small bug in the CurveFit model used to smooth coordinates during export
- Corrected bug in fixed static solution for L2 only processing
- Improved Kinematic Alignment Interface

What was new with Inertial Explorer Version 8.10.2313?

Available: March 2008 [release]

Processing Engine:
- Version 8.10 uses NovAtel's Advance RTK^{TM} (ARTK) on-the-fly (OTF) engine that fixes carrier phase ambiguities faster at longer distances than GrafNav's KAR algorithm. ARTK also has fewer failed fixes than KAR and produces a lower separation between forward and reverse trajectories.
- Multi-Pass PPP - Processing accuracy has been improved by up to 40% by refining the solution with an additional pass and by applying higher-order corrections
- Tropospheric bias correction - For high altitude or long distance data sets, much of the tropospheric error can be removed by the addition of a Kalman filter bias state. Such methods have often had problems in differential mode, and we have solved this problem by using GrafNav's PPP processor to compute the tropospheric bias trajectory for each base station. This tool can also be used to check the base station coordinates.
- Improved automatic detection of Zero Velocity Updates (ZUPT)

- In multi-base mode, base stations can be rejected if the base-remote distance is longer than a user-defined tolerance
- Satellites with low C/N0 values can be rejected from the filter

Interface:
- To ensure manufacturer data files such as *Favourites*, download stations, satellite offsets, DCB corrections and antenna models remain current, this version can automatically download these files from NovAtel's server twice per month
- Inertial Explorer data can be automatically displayed in Google Earth™ in an improved fashion
- Users can zoom in/out of the *Map Window* and plot windows using their mouse's scroll-wheel
- The *Map Window* can be displayed with a white background and can be copied to the clipboard
- In GrafNav and GrafNav Batch, users can create groups of plots that can be displayed using one operation. Multiple plots can also be selected.
- For GrafNav, there is now an API/DLL that has many of the same capabilities as the command line interface, but the calling application is provided complete feedback during processing and exporting. In addition, the calling program can halt processing at any time.
- For all plots, time and Y-axis ranges can be transferred from one plot to others
- A variety of HTML reports can now be generated, including from the command line and API
- In GrafNet, the network adjustment can now be executed automatically upon completion of processing
- GrafNet now supports station names up to 12 characters. Previously, only 8 characters were supported.
- *Select from Favorites* has been significantly improved such that nearby stations are shown in a list along with the distance and datum. Furthermore, antenna attributes can be stored and selected.
- Support for stereographic map projection
- GrafNav command-line (and API) permits users to save all processing messages to a single log for later review
- *Export Wizard* has improved time zone selection for local times and ½-hour time zones are now supported
- Processing files can now be deleted recursively in subdirectories from a specified path
- Full support for ITRF2005
- Support for external DLL-based grid conversions
- Improved software registration

Decoders:
- For NovAtel OEMV, BESTGPSPOS trajectory can be exported to a GrafNav-compatible format
- For NovAtel OEMV, MARK2TIME record now supported
- For Leica 1200, better handling of outdated ephemerides
- For Trimble DAT, better handling of station names and more than 12 satellites
- For GPB2RIN, a command-line version is now available and some bugs have been fixed

Bug Fixes:
- Corrected issue where reverse processing could fail if processing through week rollover

What was new with Inertial Explorer Version 8.00?
Available: October 2007 [release]
The major new addition for Inertial Explorer Version 8.00 is tightly-coupled processing. It uses GPS carrier phase to limit errors where satellite tracking is limited or variable (even if only 2 or 3 satellites are visible). Another key improvement is the addition of a new API that allows for much expanded automated processing. The new API provides complete feedback and permits calling applications to stop Inertial Explorer midway. Other improvements include:
- Full support for non-integer data rates

- Improved processing and backsmoothing of low or variable rate inertial data
- Better support in backsmoother and IMU processor for data spanning the GPS week cross-over
- Binary output from processing engine can now be written at a lower rate than processing interval
- Local time can now be exported for ½-hour time zones
- Text names of time zones can be specified
- X- and Y-axis ranges from one data plot can be transferred to others
- Better display of large IMU time gaps in *File Data Coverage Plot*
- Ability to utilize real-time positions (i.e. OmniSTAR, SBAS, RTK, etc) from BESTGPS position record (from NovAtel SPAN) in inertial processor
- Events logged using MARKTIME2 record (from NovAtel SPAN) can be exported to a separate file, permitting for dual event marks
- CUPTs and ZUPTs can now be loaded from a file