INERTIAL EXPLORER™ VERSION HISTORY

What's new in Inertial Explorer 8.60?

Available: December 2014 [release]

Processing and Smoothing

- Full support for BeiDou in GNSS-only and GNSS+INS data processing
- ARTK has been updated to OEM060510RN0000. This version provides improved results on long baselines and in challenging GNSS signal conditions. This version also fixes BeiDou carrier phase ambiguities.
- PPP TC processing now with much improved results for urban\challenging GNSS applications. This processing mode can be used when no GNSS base station is available.

- PPP/PPP TC processing option to "Allow processing without precise files". This allows a survey to be processed immediately after data collection, before any precise clock or orbit correction files are available. This allows a user to verify that all data is collected properly and processes reasonably prior to leaving the site. It also allows Inertial Explorer to maximize the availability of GNSS signals should multiple constellations be available but precise products not be available for each constellation.
- After smoothing position movement during Zero Velocity Updates (ZUPT's) is now much reduced than in previous versions
- Improved smoothing further reducing the likelihood of discrete position jumps in challenging GNSS signal conditions

- We have added the lever arm states as well as the accelerometer and gyroscope bias states to our backsmoother
- Additional checks have been implemented to reject false Zero Velocity Updates (ZUPTs) which can cause large GNSS/INS processing errors
- More robust kinematic alignments: Version 8.60 tracks metrics following alignment in order to detect whether the accepted initial position, velocity and attitude were affected by gross errors. This often only becomes obvious several seconds or minutes after the alignment has been accepted if GNSS signal conditions are challenging. If a gross error is detected a new alignment will be automatically computed.

- Improved outlier detection in high multipath conditions (when code RMS is high)
- Less dependence on broadcast ephemeris data. Unlike previous versions, version 8.60 will not require that a broadcast ephemeris be present for GPS and BeiDou satellites if a precise ephemeris file has been added to the project. Usage of GLONASS data still requires that broadcast orbits be available, however.
- Support for a new binary PVA file format for the application of external position, velocity and/or attitude updates in Inertial Explorer. This format allows the entry of an unlimited number of external updates.

- The DMI measurement standard deviation, option to detect ZUPTs from DMI measurements and initial DMI scale factor can now be saved and retrieved from a processing profile
- Fixed a bug applying high rate GNSS updates (> 1 Hz) when raw IMU data is also output at the top of the second and on even intervals. This is the case with SPAN CPT systems operating with firmware more recent than v6.22.

- When processing PPP and selecting to process without first adding any precise clock or orbit products to the project, we will now automatically download two concurrent sets of precise products if your survey ends within 15 minutes of the end of the GMT day. This is to ensure no missing processed output due to the coverage of the precise ephemeris file which ends 15 minutes prior to the end of the GMT day.

Output

- Export to SBET format now directly supported under the Output
- Export to RIEGL POF/POQ format now directly supported under the Output menu

GUI

- "Solve Lever Arm" function accessible under "Process" button on IMU processing dialogue. The solved lever arm is reported at the end of processing.
- Vehicle profile manager allows storage of the primary lever arm, body to IMU rotation, IMU to gimbal lever arm and GNSS heading offset for individual vehicles. This helps avoid manual data entry on the LC and TC processing dialogues.
- Added "OK" and "Cancel" buttons to the "Computing Coordinates Using PPP" dialogue. This allows a user to easily accept or reject a PPP derived coordinate when using the "Compute from PPP" feature for base station data.

- "GNSS Heading Offset" variable has been added to the IMU processing dialogue. This is applied in kinematic alignment to account for any large intentional misalignments between the vehicle and IMU frames.
- New "GNSS" tab which provides more control over GNSS pre-filtering options including standard deviation, DOP, GNSS quality number and the option to require fixed ambiguities.
- More sensible units are now displayed for spectral density values when viewing error models

- Removal of the Fixed Static tab as Waypoint's former fixed static solution is no longer supported. We now use ARTK in static mode to resolve ambiguities for static sessions.
- Removal of the Ionosphere/Troposphere tab. These options are now found in the Measurement tab.
- Project Overview is now accessible under the "Save Settings" pull down menu in the IMU processing dialogues

- Added a summary of the constellations available (GPS, GLONASS and BeiDou) within the project overview
- Improved automatic antenna detection if the scanned radome of the antenna does not exactly match an NGS antenna profile
- Fixed tab order in LC processing dialogue

- We now support the loading of up to 31 characters when loading external camera event files
- Added "Yaw-COG" to processing window. This is a useful parameter to monitor during processing as it will help indicate any unintentional mismatch between the GPS COG and the IMU azimuth due to the IMU installation.

Leica Workflow

- A new "System Conversion" button on the IMU processing dialogue helps transition between IPAS TC workflow and Inertial Explorer workflow.
- Real Time Navigation (RNV) files are only extracted if the option to "Create trajectory files (*.fsp) for supported records" is engaged within the NovAtel OEM/SPAN conversion options.
- Fixed an issue where the Raw GNSS Conversion utility would crash if filenames of longer than 80 characters were in the same directory as the data to be converted

Antennas

- Users can now create or customize antenna profiles by creating a "User.atx"

Raw Data Format

- A new GPB format (V3) has been created to best support BeiDou and all other current and future GNSS constellations and signals. The Raw GNSS Data Converter in version 8.60 will write to this format. Inertial Explorer will maintain backwards compatibility with V2 GPB files which were used by versions 7.80 to 8.50.

Plotting

- A new "Raw IMU Data Amplitude Spectrum" plot has been added. This plot can be used to show the signal strength in designated frequency bands. This can be used to profile expected frequencies for specific vehicles and operating environments which may be helpful in troubleshooting problematic data.
- If processing with the "Apply Heave" processing option (marine applications) the heave compensated ellipsoidal height will be displayed together with the computed ellipsoidal height in the "Height Profile" plot
- Plotting improvements resulting in improved clarity when GNSS conditions are challenging. Affected plots include the Combined Separation, C/A RMS, L1 RMS, Doppler RMS, PDOP, DD DOP, IMU-GPS misclosure and others.

- Week crossover bug fixed in the DMI Analysis Tool
- MMR files are now supported within the "File Data Coverage" plot
- The float/fixed ambiguity status plot now distinguishes between "Forward Fixed" and "Reverse Fixed" when only one direction returns a fixed integer solution

- Added BeiDou to Number of Satellites (Line) plot and the Satellite Sky Plot
- Fixed a bug computing statistics from Multi-base plots
- More detailed statistical summaries when computing statistics from plots
- Removed all support for digital elevation model (DEM) plots as this is no longer a supported feature

Utilities

Download Service Data Utility

- The "Add Closest" tab now features two search modes; a GPB file based search and a fixed position search.
- When selecting "Plot in Google Earth" after using the file-based search mode an unprocessed trajectory is plotted together with the CORS stations returned by the search to support better decision making when choosing which stations to download and add to your project.
- When using the GPB file search mode, each unique station is only returned once in the list even if it is available on more than one service. If the data is available on multiple services, each service is attempted until the data is successfully downloaded or they all fail.

- The utility keeps FTP connections open until all downloading is complete. This reduces the time the utility takes to download from multiple sources.
- Auto downloading of precise clock and orbit products now checks for GLONASS and BeiDou data in the project and attempts to download from the appropriate source. Previously, the auto-download function always downloaded GPS-only products.
- Improved support for downloading hourly data. Specifically, no additional hourly files will be attempted to be downloaded after the time requested which could result in a failure if they were unavailable.

NovAtel/SPAN Decoder

- RANGECMP2 is now supported (required if logging BeiDou)

- BDSEPHEMERIS is now supported (required if logging BeiDou)
- BESTLEVERARM2 is supported and will be written to the decoded HMR file header for automatic importing to Inertial Explorer. Note that the secondary lever arm will also be written to the HMR file if SETIMUTOANTOFFSET2 was used to store the secondary lever and IMUTOANTOFFSETSB was logged

- BESTGNSSPOSB is now supported
- IMU data gap messages are now displayed in red for increased visibility
- INSPVAX message now supported and will be written to a Waypoint readable trajectory if detected
- Added support for IMURATEPVA/IMURATEPVAS records

GPBViewer

- New GPB Viewer to best support version III of the GPB format
- The Novatel OEM4/V/6 receiver model is now displayed within the "Data Information" section provided a VERSIONB log is detected

Concatenate, Slice and Resample Utility

- Input of start and end week numbers are now supported when using the "Copy GPS Time Range" option under the "Time Interval Options"

Preprocessing

- Preprocessing now considers the detection of other file types (HMR, DMR, MMR) in determining the processing environment
- The pre-processor now considers the GNSS processing interval before prompting to resample base station data, should the base station(s) be logged at a lower rate than the remote.

- The GPB preprocessor checks for very poor Doppler measurements in data converted from specific receiver types. If large discrepancies are detected the values are automatically recomputed from the C/A measurements during data conversion.
- Improved identification/reporting of problematic GLONASS L1, L2 and L2P signal tracking

Software Update Utility

- A link to the version history document is now directly accessible within the update utility in order to better inform customers of what has changed in minor releases

Export Wizard

- UTC offsets are no longer tied to individual export profiles. Rather the UTC offset will be read from a manufacturer file and the correct UTC offset will be applied based on the age of the data being processed.
- Added "Marine Heave Ellipsoidal Height" and "Marine Heave Orthometric Height" variables to the Export Wizard. These variables output heave compensated height when processing with the "Apply Heave" processing option (marine applications)
- Attitude covariance can now be output from the Export Wizard

- Fixed a bug where the signed heading and unsigned heading were outputting the same value. Signed and unsigned heading values are now output correctly.
- Added vertical datums to Canadian and American geoids (WPG files). The height datum will now be reported in the Export Wizard header.

GrafNet

- BeiDou fully supported
- Fixed static solution has been replaced with ARTK's static engine. The fixed static processor was GPS only; ARTK currently supports GPS+GLONASS+BeiDou. The new method has been tested to have a much lower failure rate on baselines over 30 km.
- Redesigned GUI following the removal of the former fixed static processor and the addition of BeiDou support

- After creating a new project, GrafNet will automatically launch the "Add Observation" dialogue
- Redesigned "Add Observation" dialogue which provides access to import options (previously these were only available under the processing options after a project had already been created)
- Export to STAR*NET format now directly accessible under Output menu

- Default processing direction has been changed to "Both"
- Fixed issue where long station names (>31 characters) in station file were causing a software crash
- Fixed issue to make "Enter Grid" button on master coordinate dialogue compatible with ECEF coordinates

What is new for 8.50.4923?

Available: September 2014 [update]

Processing

- Fixed a round-off issue when processing GNSS data at 5 Hz that caused the filter to ignored some GNSS updates

Utilities

- Added conversion profiles for SPAN KVH1750
- Fixed bug in the download service utility where resampling more than 3 days of data would result in wrong week number
- Increase the number of character allocated for decoder to display, as pointing to a folder with file names that are greater than 80 characters would lead decoder to crash

What is new for 8.50.4320?

Available: March 2014 [update]

SDK/WPGCMD

- Added support for forward slashes within file names, Thales B-File and Thales Real-Time in SDK / WPGCMD

Processing

- Fixed a bug affecting the application of the ARP to L1 phase center in loosely-coupled processing when the remote antenna height was measured to the ARP
- Fixed an issue affecting the success of kinematic alignments when the GNSS update rate is > 1 Hz

Export Wizard

- Added "Apply Daylight Savings Time" option for exporting local time
- Fixed a bug where slope distance was not being output correctly when vehicle was near stationary

Leica Workflow

- Fixed an issue affecting usage of NovAtel base station data within Project Wizard when using Leica Workflow

Decoding

- Added RAWIMUSX support for NovAtel SPAN LCI100C, HG1900, HG1930, ADIS16488, STIM300 and KVH1750 IMU's within NovAtel decoder
- Added support for P1 float phase record in Javad decoder
- Improved the decoding of the tracking status bit within the Javad decoder
- Added support for extracting the week number to GPB files when decoding Navcom data

Processing profiles

- Added processing profiles for NovAtel SPAN KVH1750 systems
- Changed the DMI variance factor to 20 from 3 in all SPAN ground vehicle profiles order to lessen the likelihood of false rejections

What is new for 8.50.4120?

Available: January 2014 [update]

Processing

- Fixed an issue reading GLONASS ephemerides for data collected after the 14th January, 2014

Utilities

- Fixed an issue in the satellite rejection routine used within single point computations which would lead to a crash on some data sets during conversion
- Fixed bug in HOSE2GPB converter where zeroed bytes in raw data would lead to bad epochs

What is new for 8.50.3210?

Available: December 2013 [update]

Interface

- Fixed an issue affecting base station resampling to the remote file interval for receivers with very large clockshifts. This option is accessed through View | GNSS Observations -> Master -> Resample/Fill Gaps using -> Remote File Times.

Pre-processing

- Fixed an issue where the base station antenna selection would be lost if the pre-processor resampled data that did not have an associated station (*.sta) file.
- Fixed the "Master Data Gap" pre-processor warning to work over the week crossover
- Fixed a problem where the pre-processing checks applied after conversion were detecting a false time reversal in specific instances where a very large time jump would occur

Processing

- Modified all marine processing profiles to guarantee no Zero Velocity Updates (ZUPTs) will be applied
- Modified kinematic alignment thresholds in all ground vehicle processing profiles to decrease likelihood of failed kinematic alignments in challenging GNSS signal environments
- Increased ARTK quality acceptance criteria to Q4 for all ground vehicle processing profiles to reduce likelihood of an incorrect ambiguity fix in challenging environments
- Improved alignment for low dynamic surveys when processing loosely coupled

Utilities

- Fixed an issue affecting computed GLONASS Doppler measurements during conversion from RINEX. This affected data downloaded from the download service utility.
- Fixed JAVAD conversion bug where a crash would occur if the message size was greater than 255 bytes (maximum size should have been 260)
- Fixed an exporting problem affecting a survey collected with 5 Hz GNSS updates and 200 Hz IMU data

What was new for 8.50.2923?

Available: September 2013 [update]

Pre-processing

- Fixed an issue where the re-sampling of user collected base station data would result in any user entered base station coordinates being ignored and the average base station coordinates would be applied instead

- Single frequency data files will no longer trigger a “failure to track L2” warning from the pre-processor, this warning is only meant for dual frequency receivers that fail to track L2

Leica Workflow

- Improved performance of the “Apply IPAS lever arm correction for old FCMS/FlightPro” option within Settings | Preferences

Utilities

- Fixed a bug in the GPB to RINEX converter affecting the output of P2 GLONASS measurements when GPS L2C measurements are present
- Concatenate, Slice and Resample will now preserve the processing environment in the header when it is used to combine GPB files
- Fixed a bug affecting the resampling of base station data when the receiver clock bias is invalid
- Added dll support for specific Malaysian datum transformations

What was new for 8.50.2722?

Available: July 2013 [update]

Interface

- Added Leica workflow option to "Apply IPAS lever arm correction for old FCMS/FlightPro versions" within the “Solution” tab of Settings | Preferences

Pre-processing

- Raw GNSS files will now be automatically decoded entirely in kinematic mode if the detected processing environment is Airborne, Ground Vehicle or Marine
- The PPP processing option to engage dual Kalman filter states for the code and carriermeasurements (necessary for Trimble receivers) is now correctly set by the pre-processor
- Pre-processor will now issue a warning if a data gap is detected in the base station data

Processing

- Fixed an issue where the “Maximum RMS” ARTK option was being rounded to the nearest millimeter
- Fixed a bug applying heading updates (HMR files)

Utilities

- Fixed bug when downloading current CORS files (available hourly)
- Fixed the display of the distance separation plot after loosely coupled processing
- Cleaner plots when comparing the combined DGPS and PPP trajectory within the IE interface
- Modified DMI Ticks/s functionally (Please note that: DMI Analysis Tool’s requirement is time-tags must be within 0.1 seconds of the even seconds)
- Fixed an Export wizard bug affecting the export of UTC time for users within the UTC+2 (Harare, Pretoria) time zone

What was new for 8.50.2604?

Available: June 2013 [update]

New Feature

- Added support for GPB files that have periods within their filenames (prior to the extension)

Pre-processing

- Fixed a problem where the pre-processor would zero base station coordinates when automatically resampling base station data (specific to multi-base projects)

Processing

- Fixed a bug affecting manual ARTK engagements

Utilities

- Meteorological (.13M) files will no longer be "Auto-detected" as RINEX files by the Convert Raw GNSS utility
- Fixed an issue related to the display of the Download Utility with some graphic cards

What was new with Version 8.50?

Available: April 2013 [release]

Licensing

- Support for both USB and FlexNet (keyless) licensing

IMU Processing

- Leica workflow option for IPAS-TC and IPAS-PRO users
- Improved variance factor testing methods used in accepting and rejecting GNSS updates. The new method produces better results with high GPS update rates (greater than 1 Hz) and challenging GNSS conditions. It can also help a solution recover more quickly in the event of a poor alignment
- New thresholds for automatically detecting ZUPTs, resulting in significant improvement for MEMS sensors such as the ADIS16488
- Improved lever arm estimates. We have implemented a default (but user configurable) minimum velocity for solving lever arms which helps prevent diverging lever arm estimates

GNSS Processing

- Support for absolute antenna models.
- New advanced ARTK options, providing a high degree of control if preprocessing is needed
- Improved multi-base GLONASS data handling when mixing receiver types
- Support for moving baseline station processing (previously this functionality existed only in GrafMov)

Diagnostics

- DMI Analysis tool that displays DMI computed velocity vs GPS/INS post-processed velocity. This tool can be useful for optimizing input DMI parameters and troubleshooting

Interface:

- New option to enable smoothing automatically after processing within the solution tab of Settings | Preferences
- "Compute from PPP" button on master coordinate dialogue provides quick access to check or survey base station coordiantes with Waypoint's Precise Point Processor
- Support selecting a default datum within the "Solution" tab of Settings | Preferences
- Automatic setting for the tropospheric error state within the Ionosphere/Troposphere tab
- Any pre-processing warnings are displayed prior to processing. Examples include a check of the base station sampling rate vs the remote sampling rate, insufficient base station coverage relative to the remote file, gross base station coordinate data entry errors, and other checks
- Improved automatic antenna selection when adding base station data converted from RINEX. The radome (if provided) is now automatically extracted and used to choose the antenna model.

- When selecting base station coordiantes from favourites, you can now choose whether to apply station velocities
- Simplification of processing options within "Measurement" tab of the GNSS processing options Check for software updates through the Help Menu.
- Full control over items plotted to the map window within the "Display" tab of Settings | Preferences. You can choose to turn on/off text, epochs, feature marks, ARTK marks, base stations and static sessions.
- Improved Google Earth Plotting. A time slider animation bar is now available, as well as a velocity and elevation profile

Utilities

- Support for the NavCom Sapphire data format within Raw GNSS Conversion utility
- Improved search for download sites when using "Position from GPB" option within "Add Closest" tab. The search is performed at regular intervals along the trajectory (instead of the average position in the file) and the minimum distance is returned to each station.
- A calendar has been added to the mission planner and the download utility to help more easily select dates
- Support for South Africa's Trignet service in our download utility

What is new for 8.40.5121?

Available: January 2014 [update]

Processing

- Fixed an issue reading GLONASS ephemerides for data collected after the 14th January, 2014

What was new with Version 8.40.3116?

Available: November 2012 [update]

Processing

- Improved support for Coordinate Updates (CUPT). Users can now specify a standard deviation for each CUPT.

Utilities

- SPAN CPT status bit now used to check validity of raw measurements prior writing to disk
- Improved support for Ashtech's dual frequency GLONASS receivers in HOSE2GPB.DLL

Bug Fixes

- Fixed a base station resampling issue affecting GLONASS Doppler measurements that was occasionally causing biased velocity measurements.
- Fixed problem computing GLONASS orbits in reverse processing over week crossover
- Fixed problem of occasional repeated records when exporting at 1000 Hz or greater
- Fixed problem where GPS week number was sometimes not properly computed in fine alignment

What was new with Version 8.40.2827?

Available: August 2012 [update]

Processing

- Fixed issue with satellite rejection when using precise ephemerides

Bug Fixes

- Trace value now computed correctly for *Estimated Position Accuracy* plot
- Improved undulation computation for points near geoid boundaries
- Fixed plotting issue when comparing trajectories with two different data rates
- Improved GUI in *Favourites Manager* to accommodate longer group/datum names

What was new with Version 8.40.2717?

Available: July 2012 [update]

Processing

- Fixed issue where nominal dt was being used in inertial filter instead of computed dt, which occasionally led to spikes in solution
- Fixed bug in PPP-TC processing where Doppler-derived cycle slips were not being handled properly
- Made improvements to auto-align feature when GPS data is poor
- Fixed issues with roll/pitch angle output in the *Export Wizard* when values approached +/- 180º

What was new with Version 8.40.2523?

Available: May 2012 [update]

Processing

- Improved handling of data with large clock-shift values in tightly-coupled processor

Utilities

- Added support for TrigNet service (South Africa) in the *Download Service Data* utility

Bug Fixes

- Improved support for compressed RINEX data

What was new with Version 8.40.2504?

Available: May 2012 [update]

Processing

- Improved reliability of automated zero-velocity (ZUPT) detection, which drastically improves the results of some urban surveys
- Tropospheric states can now be used during TC processing

Bug Fixes

- Removed warning messages related to lever arm for IMU-only processing
- Fixed bug where only features would be printed when attempting to print *Map Window*
- Fixed issue where new projects created via *Project Wizard* would copy some settings from previous project
- Added support for auto-selection of "Features" as output source in *Export Wizard*

- Fixed bug where downloading SP3/CLK files in GrafNet would fail

Utilities

- Fixed bug in OEM42GPB.DLL where some GLONASS ephemeris records would be ignored if GLOCLOCKB was not logged
- Improved handling of RINEX 3.00 navigation files in RIN2GPB.DLL

What was new with Version 8.40.1522?

Available: March 2012 [update]

Processing

- Fixed issue during reverse PPP processing where a crash would occur if insufficient satellites were present at the end of the file
- Fixed error messaging in tightly-coupled processing to more clearly communicate any processing failures
- Improved error message when adding an empty GPB file to a project
- Fixed issue affecting correct handling of covariance information for newly acquired satellites in tightly-coupled processing. This occasionally led to position jumps after smoothing.

Export/Reports

- Improved auto-selection of source (epochs/features/static sessions) in *Export Wizard*
- Fixed "sequence number" output in *Export Wizard*
- Fixed a week numbering issue for INS-only processing which caused a problem during export
- Now outputting correct baseline distances of first and last epochs in *Processing Summary*
- Fixed issue with CurveFit values to clearly show they are not available for GNSS/INS export

Utilities

- Added a tool tip to auto-update tool in order to more clearly display changes in new builds
- Improved handling of very long GNSS outages (>20 minutes) in smoother
- Added full support for new SPAN models (HG1900, HG1930, LM20 and LM40)
- Improved handling of D-files in HOSE2GPB.DLL

What was new with Version 8.40.1408?

Available: February 2012 [update]

Bug Fixes

- Fixed smoothing issues where epochs were sometimes dropped from forward or reverse solutions when using GNSS update rates greater than 1 Hz
- Fixed issue during forward PPP processing where a crash would occur if insufficient satellites were present at the beginning of the GPB file
- Improved week number support for camera mark files

What is new with Version 8.40.1214?

Available: January 2012 [update]

Bug Fixes

- Fixed issue in Inertial Explorer where GPS outages greater than 600 seconds were not being handled properly
- Improved PPP /PPPTC performance in challenging conditions
- Fixed issue in GrafNet where printing was disabled
- *Master Coordinates* window now displays average values when coordinates in STA file are zero
- Improved profile-detection in pre-processing checks
- Fixed issue in RINEX decoder concerning Version 3.00 navigation files

What is new with Version 8.40?

Available: November 2011 [release]

New Features

- Improved variance propagation in RTS smoother to eliminate small jumps during GNSS updates. This is especially important for LIDAR and road profiling applications.
- Users can now generate high-rate plots within Inertial Explorer. This can be useful for solution analysis.
- Body frame velocities and accelerations are now computed and available for export and plotting
- IMU to GNSS lever arms can now be entered to the antenna reference point or the phase center
- *Waypoint Updates* feature will notify customers of new software updates and patches and willdownload them
- *Waypoint News* feature will keep customers up-to-date regarding Waypoint software releases,training seminars, and other important announcements
- GLONASS data is now supported in the Precise Point Positioning (PPP) module
- GLONASS base station data can now be resampled
- GLONASS data can now be used in the ARTK engine to improve single frequency performance
- ARTK reliability has been improved in challenging conditions by implementing a stricter acceptance criteria
- New profile selection feature will attempt to automatically determine your application in order to select the most appropriate processing profile
- Improved ARTK performance for multi-base projects that have different start or end times for each base station
- Added option to limit the distance at which dual frequency ARTK will engage
- *Export Wizard* can now filter output based on Quality Number and/or standard deviations
- New "Combined Separation with Fixed Ambiguity" plot shows forward/reverse separations only where both solutions are fixed. This helps identify problem areas/incorrect ambiguity resolution.
- Precise ephemeris and clock files are now automatically downloaded when clicking the "Process" button for Precise Point Processing (PPP). It is no longer necessary to download the files as a separate step prior to processing.
- Added option to only accept ARTK fixes from closest baseline (for multi-base projects)
- Cache memory setting has been implemented for more efficient handling of very long and/or high rate projects
- Issues when setting the static coarse and fine alignment times have been fixed

- Issue where datum conversions were not always reversible has been fixed
- ECEF coordinates can now be used when entering base station coordinates
- Units can now be changed on many plots
- Orthometric heights are now computed using a Lagrange interpolation instead of a nine-point polynomial
- The "User" and "Description" fields in the processing dialogs can be modified and will be saved to the *Processing History*
- Improved message filtering ensures only the most important error and warning messages are output to the processing window
- HTML reports output by software now work in Google Chrome

Raw GNSS Data Converter

- Pre-processing checks are now performed during data decoding to automatically solve common conversion issues and set the static/kinematic flag
- RINEX Version 3.0 is now supported
- IMU Auto-detection for NovAtel SPAN data has been improved
- NovAtel decoder now supports SITEDEFB logs. This ensures your static sessions are preserved and that an event is written to the STA file.
- NovAtel decoder now computes a rough estimate of velocity when writing BESTPOSB trajectories to FSP file in order to allow the file to be used as the source of updates in loosely coupled processing
- Leica System 1200 decoder now supports the Antenna Record (ID #108)
- Javad decoder now supports L2C records
- Trimble Real-Time decoder now supports dual frequency measurements for the expanded logs
- Bug where Septentrio decoder was flagging GLONASS observations as containing L2C measurements has been fixed. Multi-antenna decoding has also been improved.
- Default L2C offset for RINEX decoder has been set to zero in order to accommodate downloaded data from Trimble base stations, which commonly have the offset removed

Download Service Data Utility

- Users can now download broadcast GPS and GLONASS orbits in EPP format. This is useful for projects with missing or incomplete ephemeris data.
- New option added to download precise GLONASS orbits and clock products for PPP
- Added support for rapid precise clock and orbit service (SGU). This service typically has products available at a latency of 4 to 6 hours.
- The maximum number of days for which data can be downloaded been increased to seven
- Support has been added for the ERGNSS, ITACyL, CATNET and BARD reference networks

What was new with Version 8.30.2105?

Available: January 2011 [update]

New Feature

- Manufacturer file has been updated with new GPS almanac source for Mission Planner. Previous source is no longer available.

Bug Fixes

- Fixed issue with RIN2GPB where data collected in 2011 would not convert

- Issue concerning high-rate output of angular rate data is now fixed

What was new with Version 8.30.1123?

Available: November 2010 [update]

Bug Fixes

- Fixed bug where DMI window was unresponsive when adding DMR data to project
- Fixed bug where multiple menu items were disabled for IMU-only projects
- Automated detection of Doppler units in SYS12002GPB
- Improved support for L2C measurements in Download.exe and Gpbcat.exe
- RIN2GPB now computes valid Doppler measurements for RINEX files where D1 data is zeroed
- Improved ability to modify one/multiple/all features in *Feature Editor*

What was new with Version 8.30.1007?

Available: October 2010 [update]

New Features

- Added support for NovAtel SPAN LCI and NovAtel SPAN μIRS systems
- NovAtel SPAN users can filter list of processing profiles based on the IMU

Bug Fixes

- Fixed bug in loosely-coupled processor when doing kinematic alignment during week cross-over
- Improved data handling within ARTK when used in multi-base mode with invalid baselines
- Code-only single point processor now works without precise orbit files
- RIN2GPB now handles epochs containing more than two lines of PRNs
- Fixed bug in JPS2GPB where GLONASS satellites were being assigned wrong PRN in the absence of ephemeris data. Also, decoder now handles ephemeris records of multiple sizes.
- Fixed bug in static processor where covariance matrix would become contaminated during satellite outlier detection
- Improved handling of epochs without valid ephemeris data in fixed static processor

What was new with Version 8.30.0623?

Available: June 2010 [update]

New Features

- Added support for heading updates from dual-antenna systems
- Added heave output variable to *Export Wizard*

Bug Fixes

- Improved auto-alignment for datasets with poor Doppler measurements
- Fixed bug where DMI data would be ignored during processing
- Fixed bug where GrafMov would use ARTK instead of KAR when loading a processing profile
- Fixed bug in GrafMov where ionospheric corrections were always being applied
- *Copy User Files* has been updated to properly transfer user files from previous installations

- RIN2GPB now supports RINEX data with epochs containing more than 24 satellites

What was new with Version 8.30.0331?

Available: April 2010 [release]

New Features

- Automated alignment option scans data and automatically performs static or kinematic alignment, thus eliminating the need for user intervention
- Precise point positioning (PPP) now available for use with tightly-coupled processing for users who do not have base station data
- Differential tightly-coupled processing can now be run in multi-pass mode for improved attitude convergence over short surveys
- Processing settings have been simplified and the GUI has been made more intuitive
- Distance-dependent output now available through *Export Wizard*
- NovAtel SPAN decoder now automatically sorts IMU data to remove time reversals
- New *ReadWPG* utility reads most of Waypoint's binary data files, including IMR, DMR and high-rate trajectory files
- Smoother has been improved for datasets where scale and non-orthogonality states are used (i.e. SPAN-CPT)
- Float/fixed solution weighting has been improved for tightly-coupled processing
- Range updates have been implemented to improve accuracies during periods with poor GNSS data availability
- Solving routine for GNSS-IMU lever arm has been improved
- Improved support for tightly-coupled processing in local datums
- New version of AdVance™ RTK (ARTK) offers improved carrier phase ambiguity resolution, particularly for single frequency data
- Fixed static processor now supports L2C measurements
- PPP filter has been improved
- Improved support for GLONASS processing when mixing receiver types
- Processing profiles have been improved
- Ionospheric corrections automatically enabled/disabled depending on baseline distance
- Software will warn users who attempt to proceed with averaged coordinates at base station(s)
- Inertial solution automatically loaded upon opening of project. Previously, only the GPS solution was loaded.

Bug Fixes

- Fixed bug in RIN2GPB converter where GLONASS phase measurements would occasionally be flagged as L2C
- Fixed bug in "Move-to-Static" option where features would be deleted
- ARTK fixes now displayed properly on *Map Window* when forward solutions is loaded
- *Distance Separation* plot now displays correct baseline distance after tightly-coupled processing
- ECEF covariance information for positions now available through *Export Wizard*
- Fixed bug where antenna heights were being rounded to nearest centimeter
- Fixed bug in *Signal Strength* plot when re-scaling Y-axis
- Improved *Gyro Drift* and *Accelerometer Bias* plots

What was new with Version 8.20.0522?

Available: May 2009 [update]

Bug Fixes

- *General* tab of the IMU processing options menu now automatically fills in *Start* and *End* times
- IMU processor now properly handles large changes in the values from the DMR file
- Software now handles spaces in the mount (*.*mmr*) and heading (*.*hmr*) filenames
- Better error message returned when IMU auto-detect fails for NovAtel SPAN datasets
- RIN2GPB.DLL was not loading on some computers, leading to problems with the *Raw GNSS toGPB* and *Download Service Data* utilities. This issue has been resolved.
- Problem where *Export Wizard* would not output in any grid except UTM is now fixed
- Support for compressed RINEX format has been updated to incorporate newest changes to format
- Fixed issues surrounding the launching of baselines from GrafNet or GrafNav Batch into GrafNav

What was new with 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