Carlson SurveyGNSS v 2.2.1.0 Release Notes

Currently users should manually check for product updates as they become available at http://www.carlsonsw.com/support/software-downloads/?product=SurveyGNSS, including service patches and language support.

Enhancements

- Enhanced support for template based automated report content generation via additional command **File...Report...Project** and **File...Report...Positions**. (Default) Sample templatesproject-report.html and positions-datasheets.html are bundled with the product install in the reports subfolder. Project report contents are based on the availability/row selection of various data displays. By default the commands will prompt users to select all rows. The default report templates may also be copied to a user/organization specific folder and modified for customization. The layouts for each report printed page is generally designed to fit on a US letter/A4 in portrait layout, but there are limitations. Added support for detection and correction of erroneous RINEX INTERVAL set to zero by some RINEX converters.
- Additional RINEX 3 (through 3.04) support. Abandonment of the need to transparently revert certain RINEX 3 files to an interim format. Wherever possible the redistributed RINEX converters and associated scripts have been updated to yield RINEX 3 upon **File...Open** of proprietary receiver binaries. Users expecting to process GNSS observations from receivers capable of tracking constellations beyond GPS/GLONASS/SBAS should prefer RINEX 3.
- Added support for **NAv**igation with **I**ndian **C**onstellation, also known as the **I**ndian **R**egional **N**avigation **S**atellite **S**ystem (**IRNSS**). As noted above RINEX 3 is required for data including constellations in addition to GPS, GLONASS, SBAS.
- Upon startup in Online mode, the program checks for an available update package. If available it is downloaded, unpacked into the product install folders, and a message dialog entitled 'Application updates were installed' with message 'Please consult the Release Notes. You may wish to exit and restart.' is displayed. In this way certain support files, reference data and subprocess binaries can be delivered, reducing the need to manually acquire and install occasional product patches.
- Added footer area to print/html report from **Positions** tab. Footer includes assigned spatial reference name and geoidal model (as shown in status bar). If localized the applied scale, rotation, and translation is also appended.
- Incorporated an automated package update manager. Certain product updates are automatically checked for upon product startup in online mode. If available they are transparently downloaded and installed. An information box will be displayed together with an updated version of these Release Notes as well detailing the nature of the updates.
- Implemented an "**As Kinematic**" checkbox override check box in the "**Instantaneous Vector Processing**" area of the "**Vector Calculation Options**" dialog of the "**Compute/Recompute Vector with Options...**" commands. The default is always disabled. If enabled, the dependent (rover) observation is processed in kinematic mode, the individual epoch solutions for which are tabulated in the existing vector processing Summary tab. Static session(s) within the rover are ignored, and the **Name** column depicts epoch time stamps as with typical kinematic rover processing. Users may then sort this table on column to identify problematic observation epochs or (perhaps better yet) "Save as OpenGIS KML" to capture, map, and view individual epoch solutions as a guide to enabling other conventional vector reprocessing options.
- Added more complete Windows shell (File Explorer) integration with SurveyGNSS project (.sgp) files. SurveyGNSS project (.sgp) files are depicted in File Explorer with a Type of “Carlson SurveyGNSS Project” and display a SurveyGNSS product icon. Double clicking or (shell context menu) right clicking on a SurveyGNSS project (.sgp) file will also start the product with that project restored.

- Implemented a **Preferences...General** 'Subunits' control to allow users to display certain expected ('small' generally < 1m/ft) quantities as before (cm/0.01ft née 'hu') or as 'Master' (m/ft) units as dictated by currently defined Spatial Reference.
- Implemented a **Preferences...Adjustment** 'Relative Accuracy Criteria' control to allow users to define a target adjustment accuracy criteria. Modified the Adjustment Summary report tab to change 'A Posteriori Network Accuracy' to 'A Posteriori Relative Positional Accuracy', reporting same in both SI and FPS if dictated by currently defined Spatial Reference. Also extended the Adjustment Confidence Regions report tab to include Relative Accuracy Criteria and Status columns indicating the computed criteria and Pass/Fail comparison status of the computed criteria versus the semimajor axis value of each relative confidence region.
- Deprecated *Dutch Permanent GNSS Array (DPGA)* reference network service in favor of replacement *Nederlandse Samenwerking Geodetische Infrastructuur (NSGI)*' consisting of the former *(renamed Actief GNSS Referentie Systeem [AGRS])* and newer *Netherlands Positioning Service (NETPOS)*. Modified service to reference alternative host servers maintained by 3 participating Dutch government authorities.
- Changed **Search...Published Space Segment** menu command name to **Precise Ephemeris/Iono Model**. Note that in addition to searching for available precise ephemeris with longest latency (Ultra Rapid, Rapid, Final), the command also continues to search for a published global ionospheric model ('TEC Map'), clock corrections, and other metrology associated with GNSS Space Segment required when **Edit...Preferences...Vectors...Use Precise Ephemeris** and/or **Use Global Ionosphere Model** are enabled, or **Compute...Autonomous Precise Point Position(s)** command is used. Upon command hover the more detailed description displayed in lower left status bar displays 'Obtain published ephemerides and other metrology for selected observations'. Changed **Search...Published Observations** menu command name to **Published Reference Network**. Upon command hover the more detailed description displayed in lower left status bar has also been extended to display the Operator and Name of the selected referenced network.
- Updated Great Britain OS Net reference network service to support changed content .and successfully open requested data in project.
- Updated/augmented (default) US National Geodetic Survey (ngs14.atx) and International GNSS Service (igs14.atx) ANTEX antenna definitions for ITRF14 to latest versions as of this date. Included GPPNULLANTENNA in both. The ITRF08 antenna definitions (ngs08.atx/igs08.atx) continue to be included. The International GNSS Service (IGS) adopted the IGS14 reference frame on 29 January 2017 (GPS Week 1934). Please ensure use of the appropriate file(s) or acquire another for the ITRF epoch of the data to be post processed.
- Updated Septentrio binary (*.sbf) RINEX converter to version 13.4.5.
- Updated u-blox binary (*.ubx) RINEX converter from http://rtkexplorer.com/download/demo5-b33c-binaries dated 2020.02.05. This is the RINEX converter version currently recommended by u-blox to support their multi frequency F9 series receivers but continues to support u-blox series 4-8 receivers as well. Users should note that depending on data collection software the critical RINEX header labels **REC # / TYPE / VERS** and **ANT # / TYPE** may **not** be set correctly. The **REC # TYPE** field is critical to setting the GLONASS inter frequency biases for the receiver, for which the prefix **UBL** currently sets this to -0.028 for L1 and L2. It is not editable in the SurveyGNSS **Edit...Observation Details** dialog. **ANT # TYPE** is critical to applying the NGS/IGS antenna calibration phase center offsets and is editable in the SurveyGNSS **Edit...Observation Details** dialog. For more information please see for example https://portal.u-blox.com/s/question/0D52p00009TayQJCAZ/how-to-setup-receiver-type-sn-antenna-type-sn-during-convert-ubx-to-rinex.
  Also note convbin.exe also claims support for Swift Navigation (*.sbp), SkyTraq S1315F (*.stq), CMR/CMR+ (*.cmr), and Tersus (*.trs) receiver binaries, but Carlson Software cannot vouch for their correctness. Users who wish to integrate support for these receivers within SurveyGNSS **File...Open** should edit file <install path>/bin/sup/RINEX/convbin.bat comma delimited list of **File...Open** dropdown entries to append the appropriate manufacturer and binary extension desired as indicated in item 1. of the comments indicated therein (eg for Tersus **SET _FileOpenStringList=NVS Technologies [Carlson MINI2] Receiver (*.nvs),u-blox Series 4-9 Receivers (*.ubx), Tersus Receiver (*.trs)**).
- Replaced Hemisphere/Carlson BRx RINEX converter (née 'RinexSLX2', 'RinexSLX3') with 'Hemi2Rnx_0.1.5x4' [December 22, 2020] originally developed in December, 2019 to address

conversion failures with data collected with HGNSS 321/Carlson BRx6 receivers operating at < 1Hz with firmware possibly at/below version 5.9Aa08. This replacement only supports RINEX 3.

Bug Fixes

- Modified angular conversion to fold minutes and seconds overflow if necessary within seconds mantissa significant digits.
- Modified logic to correct issue with **File...RINEX...Merge** where by modified RINEX merge utility failed to merge all selected files(typically first two).
- Modified service supporting **Search...Published Precise Ephemeris/Ionosphere Model** (née **Space Segment**) to search additional online resources for ionospheric models and clock corrections with potentially less latency.
- Updated and corrected reference network display service (cloud button at extreme right of option **Edit...Preferences...Reference Network**).
- Corrected interpretation and rewrite of required RINEX 3 observations header records **SYS / PHASE SHIFT**, **GLONASS COD/PHS/BIS**, and (optional) **LEAP SECONDS**.
- Corrected issue whereby **File...Save Adjustment** of certain adjustment solutions can cause the **Vector** tab values to vanish.
- Replaced online geoid service to avoid certain non geoidal and recently posted unknown binary file formats but with **'.grd'** extension hosted by Carlson at its current 'Carlson Geoids' URL. The service now caches and returns the target binary .gtx format directly.
- Corrected issue where Observation tab antenna height units not updated correctly if spatial reference change implies FPS to SI.
- Added Position Name test and conversion option in **File...Save As** Carlson CRDB to detect and optionally conform arbitrary (RINEX/user assigned) names to CRDB requirements. In general CRDB disallows any non alphanumeric characters in any Position name, including commonly used space ' ' and dash '-'. When such a name is detected, the product now replaces any non alphanumeric characters with an underscore '_' and issues a warning indicating the SurveyGNSS and replacement CRDB name which will be assigned. If dissatisfied or concerned, users may elect to cancel the command. Alternatives include manual renaming of SurveyGNSS Position names to conform to CRDB requirements, or reporting/exporting selected Positions tab grid rows and columns to a character delimited text file and importing the results using the target CRDB client application.
- Corrected issue where instantaneous Vector option time or range keyins could fail depending on certain Windows regional date/time settings.
- Addressed issue with **File...Opening** multiple proprietary receiver binary files from a single folder with non-unique RINEX four (4)character file name prefixes. Please see “Note Regarding Source Receiver File/Point Naming and Reoccupation” atop these Release Notes.