Carlson SurveyGNSS 2016 v 2.1.1 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.

Highlights

- Added support for RINEX 3.02 allowing the .RNX file extension
- Added GLONASS post-processing support (interfrequency biases) for receiver brands: Spectra Precision (SP80), Stonex and Satlab
- Support for a new online reference network; UNAVCO active reference networks
- Added new map display to show all available stations for the selected reference network

See below a full list of bug fixes and enhancements.

Bug Fixes

- Corrected issue with erroneous RTK/Stop+Go RINEX observation conversion/validation. This resulted in valid conversion and indexing, but caused observation file not to open due to validation error. Subsequent**File...Open** on resultant RINEX observation did however succeed.
- Added OpenSSL install for target hosts which did not have system OpenSSL installed.
- Corrected Antenna Reference Point [ARP] antenna heights derived from Carlson SurvCE .RW5 and injected into RINEX observation files for RTK/Stop+Go rovers. Until now SurveyGNSS relied on SurvCE/RW5 **LS** records for determining ARP or Antenna Phase Center [APC] heights. See also special note on antenna heights below.
- Corrected issue with various grid pane context menus erroneously being displayed when the grid is empty.
- Corrected issue whereby certain receiver binary conversions (Topcon .tps vis Topcon TPS2RIN, possibly others) do not yield predictable/known RINEX file names, disallowing SurveyGNSS to **Open** the resultant **Observation**. In such cases subsequent **File...Open** commands ceased working. Users may now manually **File...Open** generated RINEX files not found by the conversion process, and the command continues to function normally when this occurs.

Enhancements

- Added GLONASS interfrequency bias calibration for Spectra (SP80), Stonex, SatLab
- Updated tecq RINEX conversion/file utility binary to April, 1, 2016 release. Users please note that in general Carlson highly recommends use of manufacturer supplied and supported RINEX conversion utilities. To date teqc only supports RINEX 2.11. which technically does not support BeiDou or Galileo observations.
- Added support for RINEX 3.02+ standard file naming conventions (.RNX file extensions).
- Relaxed RINEX validation of RINEX 3.x observation file encoding of BeiDou first frequency (1561.098 MHz). This has frequency number 2 in RINEX 3.01, 1 in RINEX 3.02, 2 in RINEX 3.03. In RINEX 3.02 and 3.03 many RINEX software producers use the wrong frequency number. SurveyGNSS understands and now allows either frequency number 1 or 2 independent of the RINEX version. Note in future BeiDou's first frequency will be shifted to 1575.42 MHz (like NAVSTAR GPS, Galileo). Presently, this future signal

is not defined in RINEX 3.x and no frequency number has been allocated, but we expect it to be 1 which will make correct interpretation of 3.x RINEX files containing BeiDou signals on 1st frequency more difficult.

- Added online reference network support for UNAVCO active reference networks. As of 2016.06.23. This collaborative global reference network currently consists of some 2600 GNSS receivers and includes the EarthScope Plate Boundary Observatory (PBO), NASA's Global GPS Network (GGN) and activities of the International GNSS Services (IGS) Central Bureau, COCONet Caribbean Network (Continuously Operating Caribbean GPS/GNSS Observational Network), TLALOCNet Mexico Network (Mexican GPS-Met Observational Network), POLENET Polar Observations and LARISSA - Larsen Ice Shelf active reference networks.
- Added a "View Reference Network" button ("cloud" icon) adjacent to the Edit...Preferences...General...Reference Network dropdown control when SurveyGNSS is in online mode. This will display a map of the available stations in the selected Reference Network in the user's default browser. At larger zoom scales the icons are labeled with station names. Users may click on any to display the current reference network data sheet and view equipment, coordinates, and other relevant data published by the provider.

Note Regarding Antenna Heights

The basis for reduction of antenna heights to the ground to yield 'mark-to-mark' **Vectors** has been the source of some confusion. Carlson SurveyGNSS relies solely on the interpretation and content of (1) the RINEX **Observation** files and (2) the current setting **Edit...Preferences...General...Antenna Definitions** (enabling or disabling the application of ANTEX antenna calibration values) to make such reductions. There are essentially two distinct antenna heights SurveyGNSS will reduce to ground; they are the Antenna Reference Point [ARP] and Antenna Phase Center [APC]. The ARP is defined consistent with the United States National Geodetic Survey definition found here and "*is preferably an easily accessible point on the lowest non-removable horizontal surface of the antenna. Typically, the ARP coincides with the axis of attachment of the antenna to a monument or surveying instrument.*". The APC on the other hand is generally an *inaccessible* point within the antenna cavity which for multiple frequency receivers has multiple locations. In the most desirable situation for reduction to accurate ground heights, the RINEX **ANT # / TYPE Observation** records contain *valid* ANTEX calibration entries and **Edit...Preferences...General...Antenna Definitions** are enabled such that the **Vector** processor will treat antenna heights as ARP values and make appropriate reductions from the APC(s) through the ARP to the ground on each calibrated frequency involved. If **Antenna Definitions** are enabled but no *valid* ANTEX calibration entry can be found associated with the RINEX **ANT # / TYPE Observation** records, the **Vector** processor will emit an error. If **Antenna Definitions** are *disabled*, antenna heights are treated as APC values to reduce to the ground, the accuracy of which is entirely dependent on the accuracy with which the APC antenna height was determined.