

NEW FEATURES AND IMPROVEMENTS

SURVPC 7

February 3, 2023



32 AND 64 BIT VERSIONS

- Use the new x64 version for improved performance, as well as the new BIM Module and Esri Online features.
- Use the legacy 32 bit version (x86) for Esri MXD files
- Both versions include native support of
 - DXF 2022
 - DWG 2022
 - DGN V8

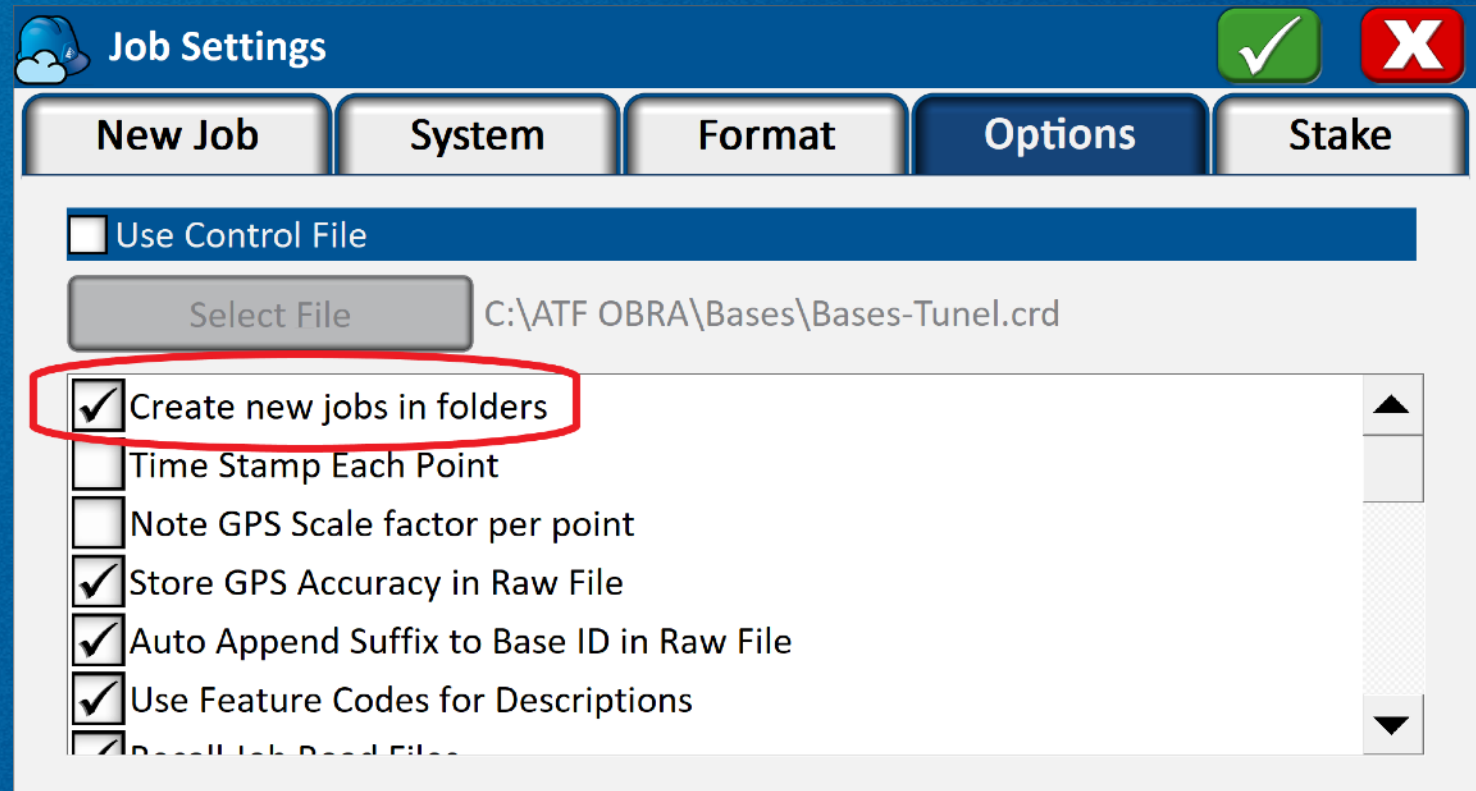
Different Installation Locations:

64 Bit: C:\Program Files\Carlson SurvPC

32 Bit C:\Program Files (x86)\Carlson SurvPC

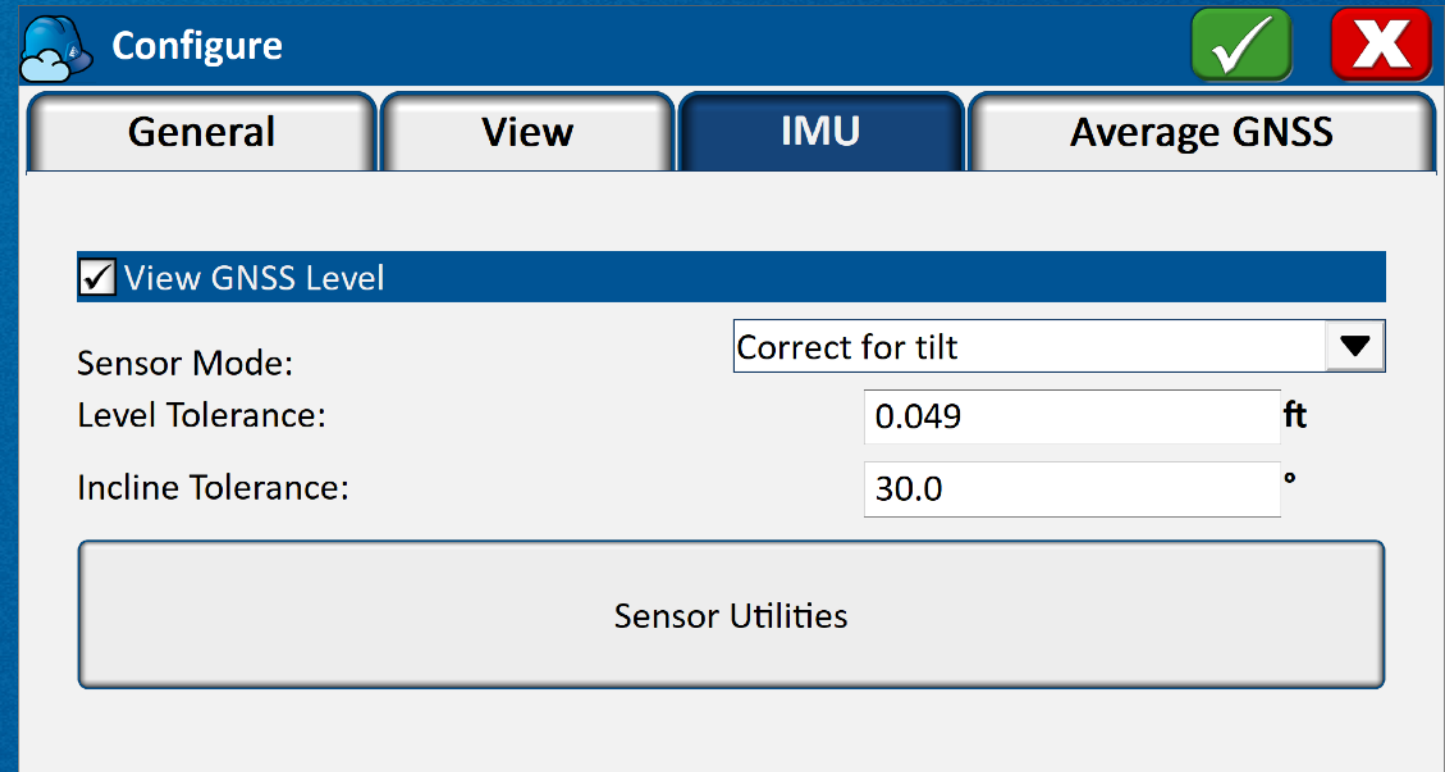
STORING JOBS IN FOLDERS

By default, new jobs will now be created in folders and all associated files will be added to the folder. This simplifies manual transfer of jobs. This setting can be disabled under Job Settings->Options if it is not preferred.



IMU SETTINGS MOVED

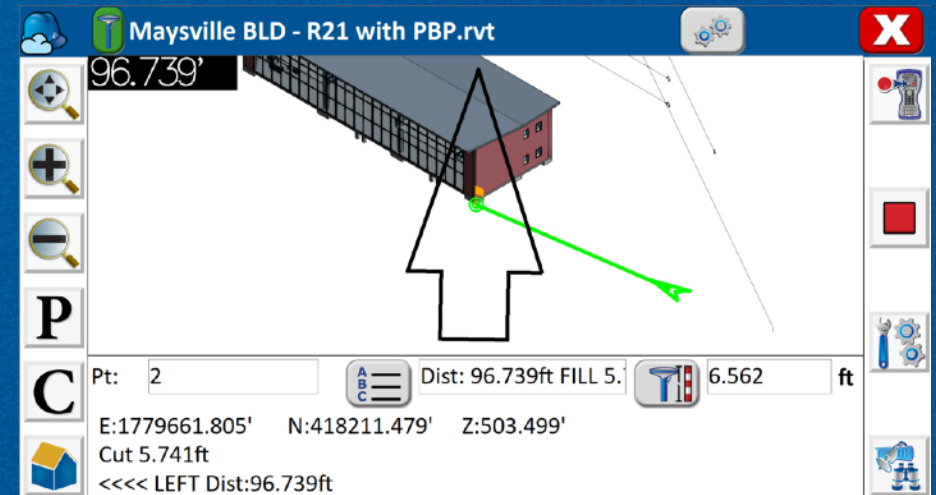
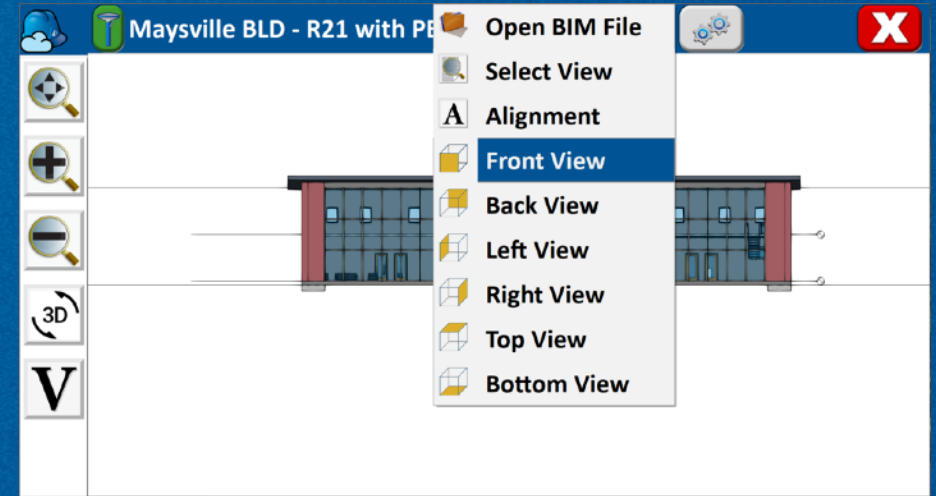
IMU Settings have now been consolidated under the Equip->Configure button for easy access. It is no longer necessary to go through equipment configure to disable IMU. Sensor Utilities is accessible from the same screen, and includes a handy compass test tool to test out the internal compass of the data collector.



BIM SUPPORT

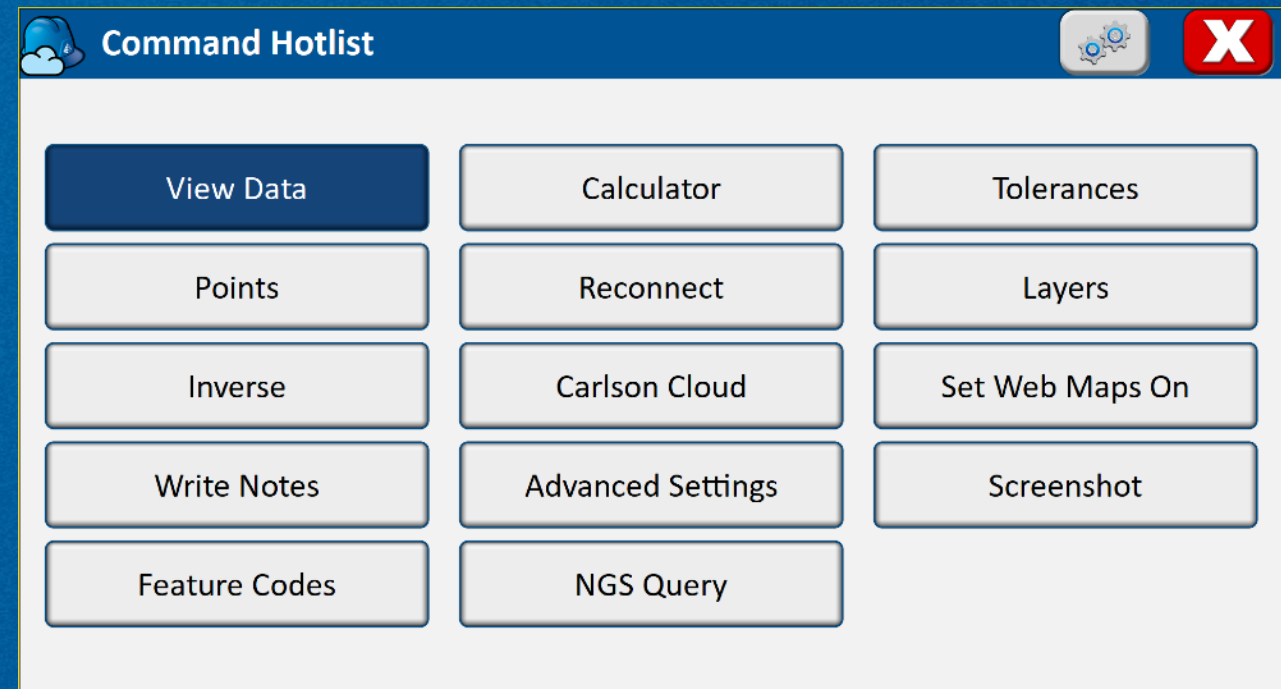
With the purchase of the new BIM module, users can now use IFC and Revit files for field work. Models can be visualized with full category and view mode accessibility. Points can be stored to the CRD file by snapping, or users can stake directly from the BIM drawing in both 1st and 3rd person modes.

The BIM module is available for demo by selecting any button on the BIM tab.



CUSTOM USER HOTLIST





A quick access user hotlist is now available by double tapping in the top bar. A selection of handy shortcuts come preinstalled with the software, and the user can customize the hotlist using the gear icon in the top bar. Advanced users can even create their own hotlist items using python scripting!









ENHANCED POINT LIST

The point list now includes columns for date/time, rod height, and point source, represented by an icon.

The point list now functions as a full featured raw data explorer and editor.

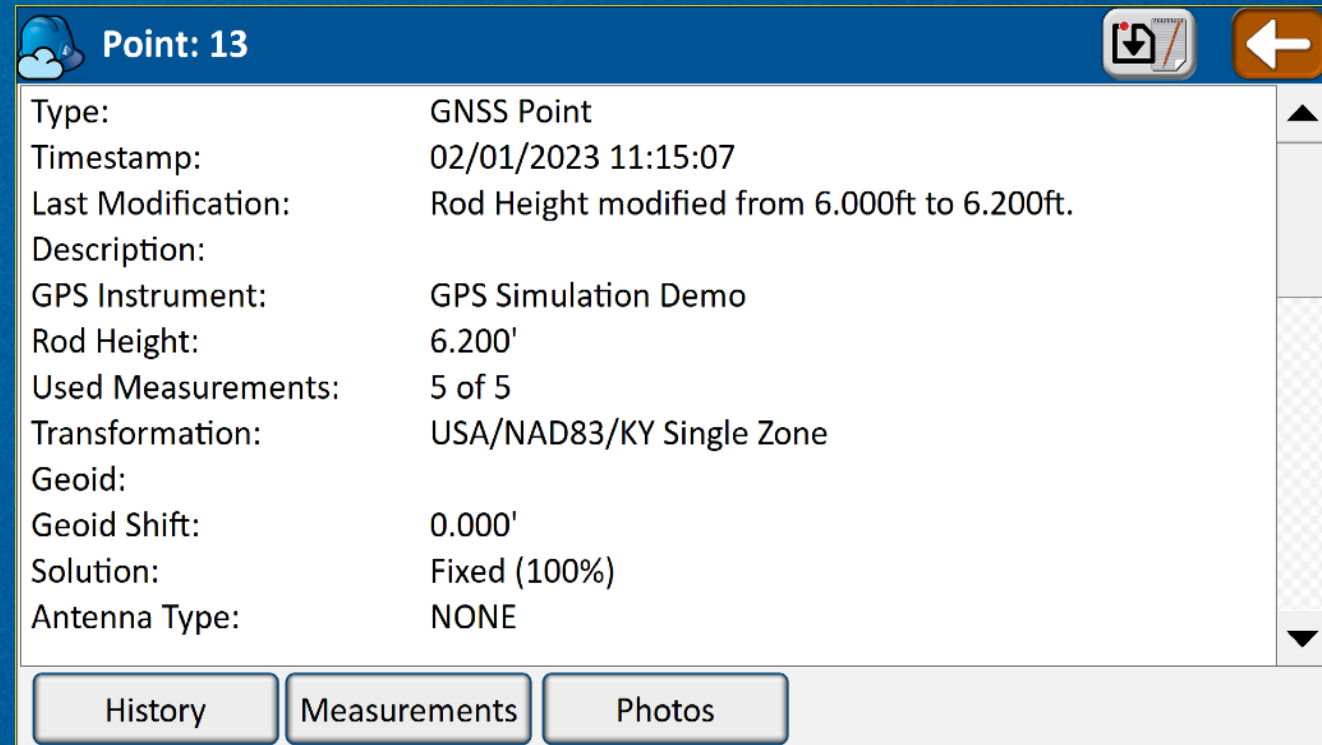

Pts:6 <= 302




PTID	NOR(ft)	EAS(ft)	ELV(ft)	DSC	Date	HT(ft)
 1	4129605.175	5488928.980	390.500		02/01/2023 08:15:21	6.755
 2	4129611.031	5488921.276	390.504		02/01/2023 08:15:28	6.755
 4	4129705.175	5488928.980	386.500		02/01/2023 08:18:09	
 300	4129613.938	5488912.978	391.280		02/01/2023 08:15:47	6
 301	4129613.938	5488912.978	350.000		02/01/2023 08:16:44	
 302	4129627.833	5488918.415	390.500	CORNER	02/01/2023 08:18:32	0

Info Edit Add Find Delete

IMPROVED POINT INFO

The Point Info screen is now much more detailed and includes full source information including statistics, measurement count, point adjustments, photos, modification notes, and access to point history. Pressing the measurements button dives deeper into the detailed information of the individual measurements used to calculate if the point is an average. Historical versions of a point can be restored to a new point ID from within point history.



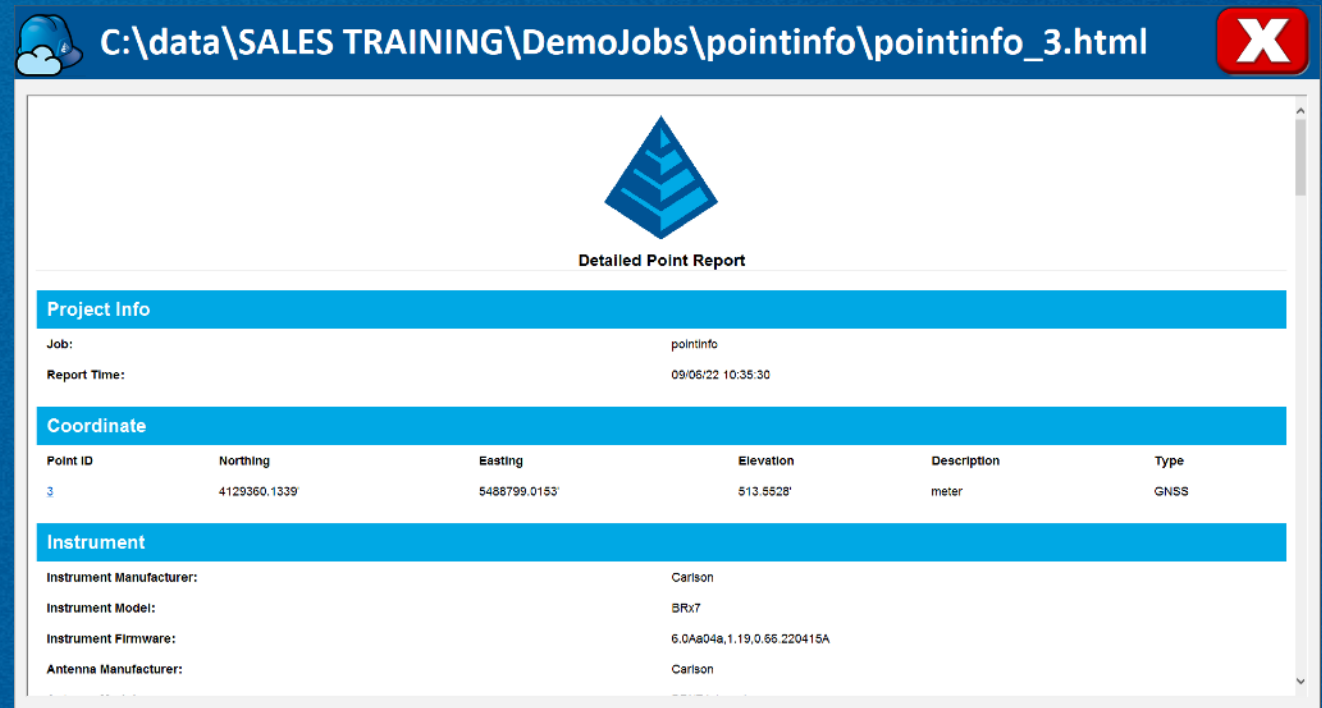
Point: 13

Type:	GNSS Point
Timestamp:	02/01/2023 11:15:07
Last Modification:	Rod Height modified from 6.000ft to 6.200ft.
Description:	
GPS Instrument:	GPS Simulation Demo
Rod Height:	6.200'
Used Measurements:	5 of 5
Transformation:	USA/NAD83/KY Single Zone
Geoid:	
Geoid Shift:	0.000'
Solution:	Fixed (100%)
Antenna Type:	NONE

History Measurements Photos

POINT REPORT

The report icon at the top of point info now generates a PDF or HTML point report with user selectable logo and options for session and measurement details. Report template can be fully customizable by editing the template file.



The screenshot shows a web browser window with the address bar displaying 'C:\data\SALES TRAINING\DemoJobs\pointinfo\pointinfo_3.html'. The page content includes the Carlson logo and the title 'Detailed Point Report'. The report is organized into three main sections: Project Info, Coordinate, and Instrument.

Project Info

Job:	pointinfo
Report Time:	09/06/22 10:35:30

Coordinate

Point ID	Northing	Easting	Elevation	Description	Type
3	4129360.1339'	5488799.0153'	513.5528'	meter	GNSS

Instrument

Instrument Manufacturer:	Carlson
Instrument Model:	BRx7
Instrument Firmware:	6.0Aa04a,1.19,0.65,220415A
Antenna Manufacturer:	Carlson

ROD HEIGHT MODIFICATION

Rod height can now be edited from the Point Info->Edit screen. The software will offer to modify the rod height of the current point only, or reprocess the file. In a full reprocess, all points measured with the selected rod height will be adjusted, as well as cascading updates to all dependent points. A modification report will be presented, and modifications will be tracked in point history.

Point ID: 1

Northing: 4129530.1816 ft

Easting: 5488714.6413 ft

Elevation: 410.2711 ft

Rod Height: 6.562 ft

Description:

Input/Edit GIS Edit Notes

Rod Height modified from 6.562 to 6.640.
Would you like to change only point 1
or all points associated with this rod height?
Associated Points: 1,2,3

Only Point 1

All

C:\data\Dec30_report.txt

Reprocessed "Dec30_reprocess" on 12/30/21 at 08:46:51

Software Version: SurvPC Version 6.90.29

Replaced point 1. Delta N 0.000' Delta E 0.000' Delta Z -0.078'

Replaced point 2. Delta N 0.000' Delta E 0.000' Delta Z -0.078'

Replaced point 3. Delta N 0.000' Delta E 0.000' Delta Z -0.078'

Replaced point 3. Delta N 0.000' Delta E 0.000' Delta Z -0.078'

IMPROVED REPORTING

New HTML/PDF reports are available for coordinate lists, stake reports, volume calculations and full job details. Reports support email output and have fully customizable templates.

Example: Stake report including company logo



Project Info

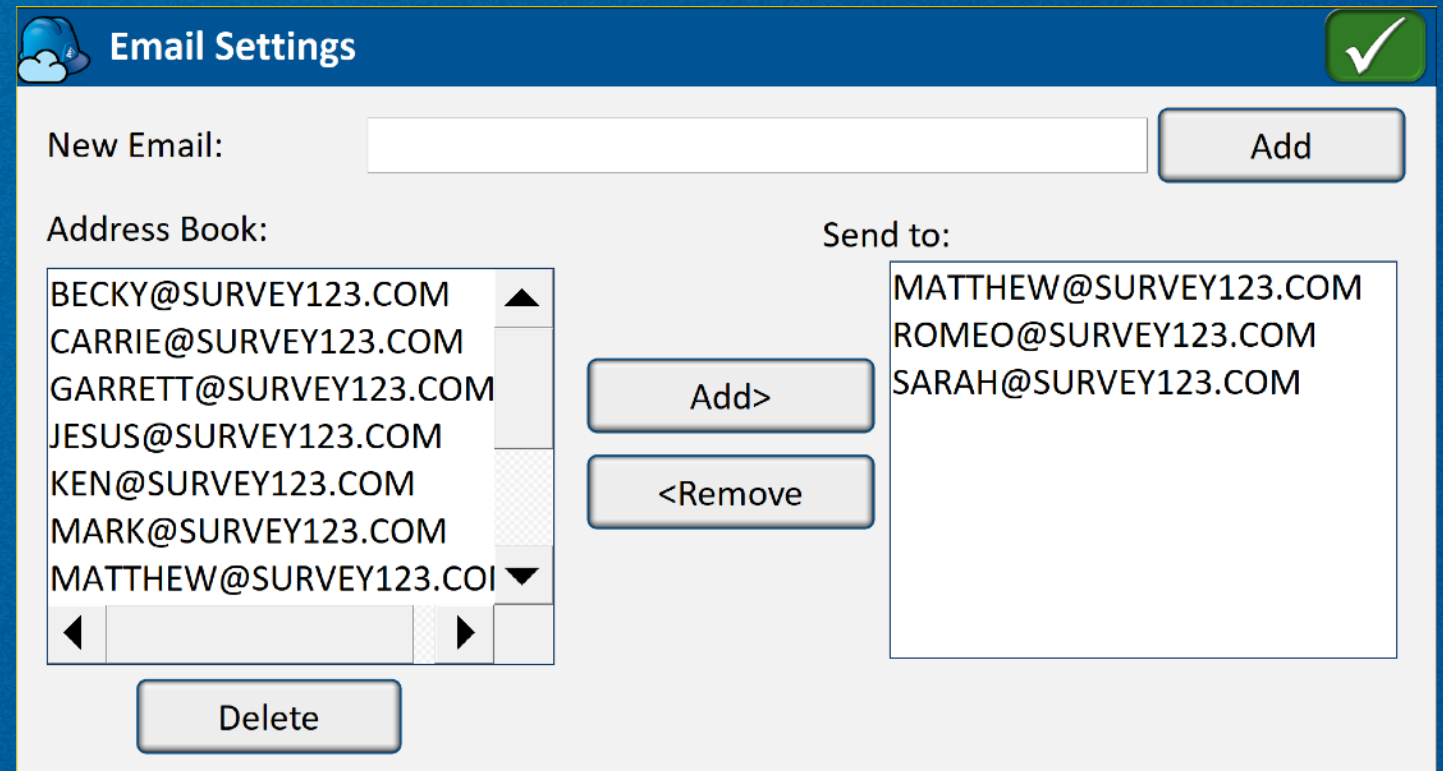
Job: Dec30
 Date: 12/30/21
 Time: 09:00:19

Design ID	Northing	Easting	Elevation	Description	Stake ID	Northing	Easting	Elevation	Description	Delta N	Delta E	Cut	Fill
1	4129930.590	5488841.924	420.522	Tree	4	4129930.590	5488841.924	501.244	8"K1 Tree Disc 0.010R CUT 102	0.010	0.002	102.242	
2	4129605.818	5488836.233	420.501	Fence	5	4129606.819	5488835.233	501.936	8"K2 Fence Disc 0.010R CUT 10	0.001	-0.303	102.320	

Other new export

EMAIL OUTPUT

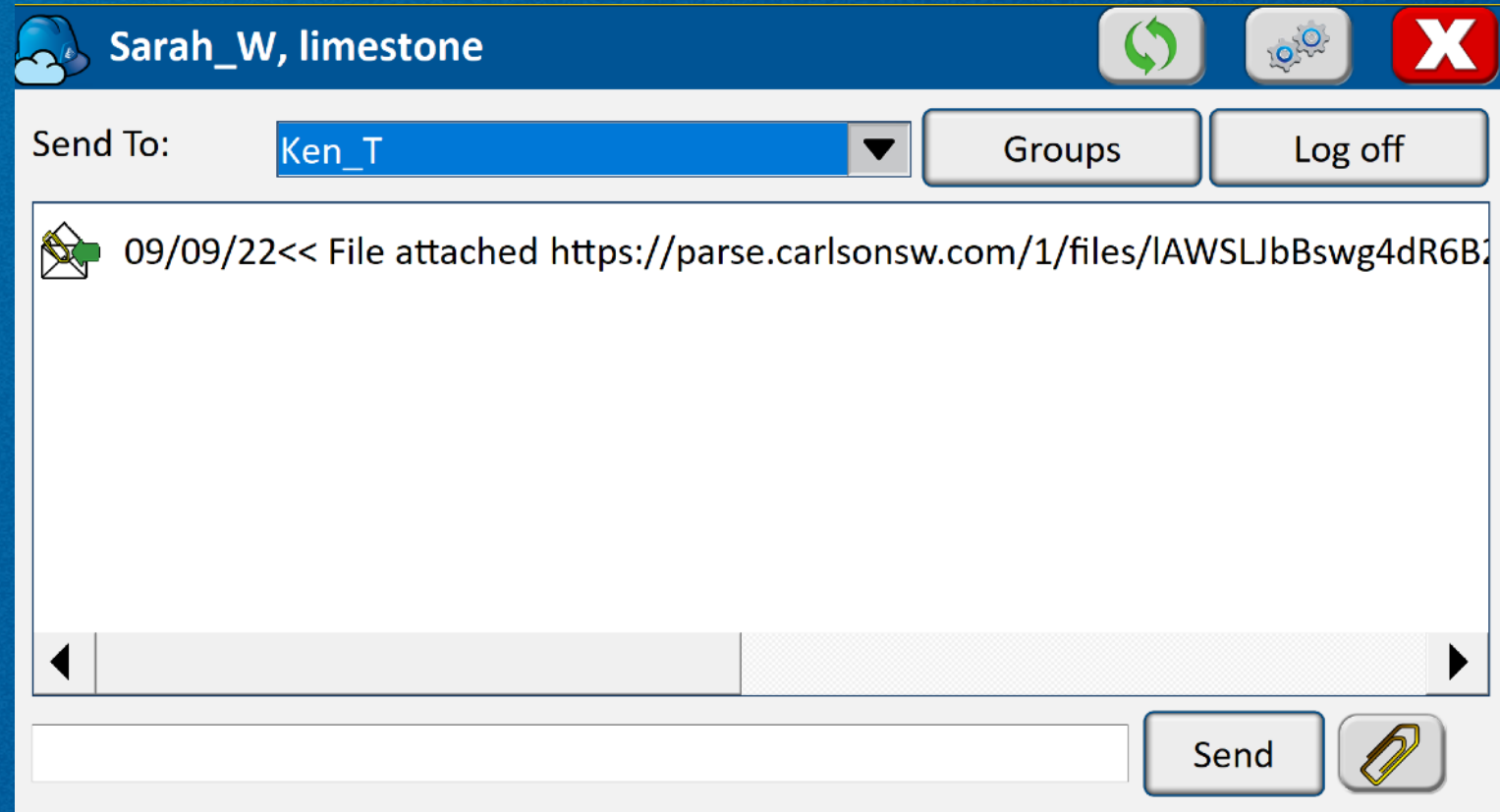
Email output is now available for reports, exports, and more throughout the software. Use the address book to store frequently used addresses.



The screenshot shows the 'Email Settings' dialog box with a green checkmark in the top right corner. It features a 'New Email:' field with an 'Add' button. Below this is an 'Address Book' list containing several email addresses: BECKY@SURVEY123.COM, CARRIE@SURVEY123.COM, GARRETT@SURVEY123.COM, JESUS@SURVEY123.COM, KEN@SURVEY123.COM, MARK@SURVEY123.COM, and MATTHEW@SURVEY123.COM. To the right of the list are 'Add>' and '<Remove' buttons. Below the list is a 'Delete' button. On the right side of the dialog is a 'Send to:' field containing the addresses MATTHEW@SURVEY123.COM, ROMEO@SURVEY123.COM, and SARAH@SURVEY123.COM.

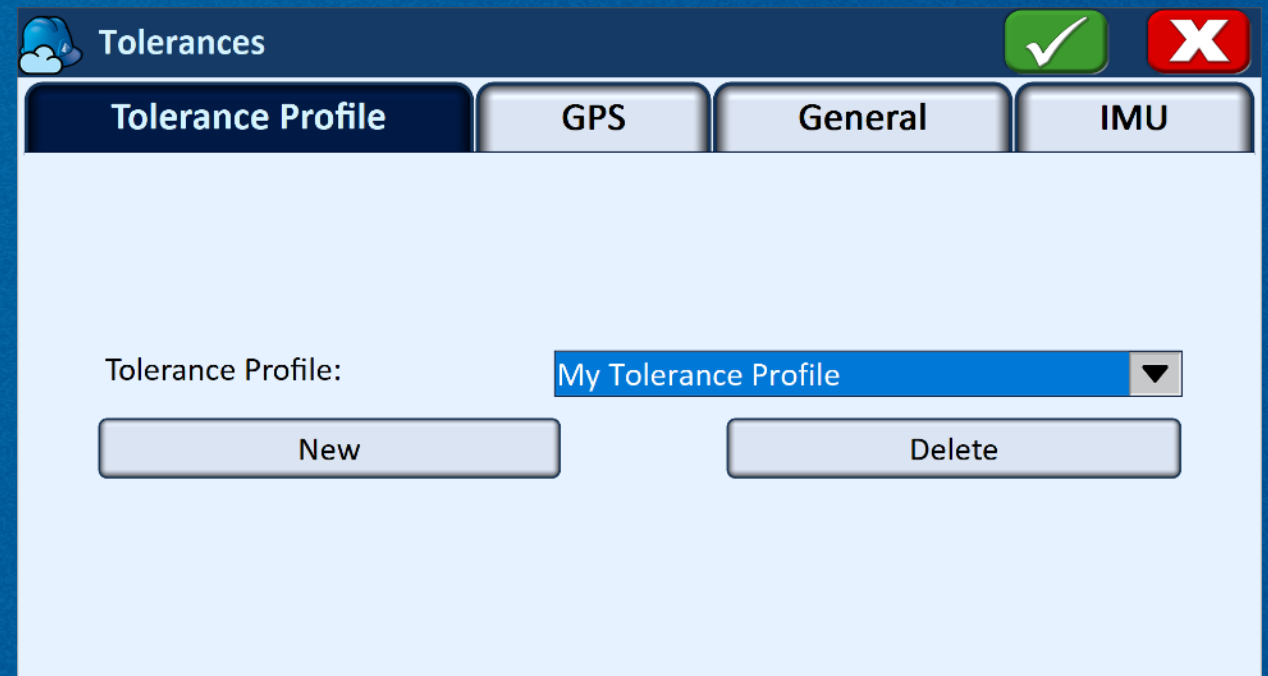
ENHANCEMENTS TO CARLSON CLOUD

- Automatic login at startup
- Helmet indicates login status
- Online users now indicated in the user list
- Define user groups
- Send company or user-group wide announcements
- Separate chat windows for each conversation
- New user options for notifications
 - Unobtrusive helmet icon
 - Immediate screen popup (current method)
 - No notification



TOLERANCE PROFILES

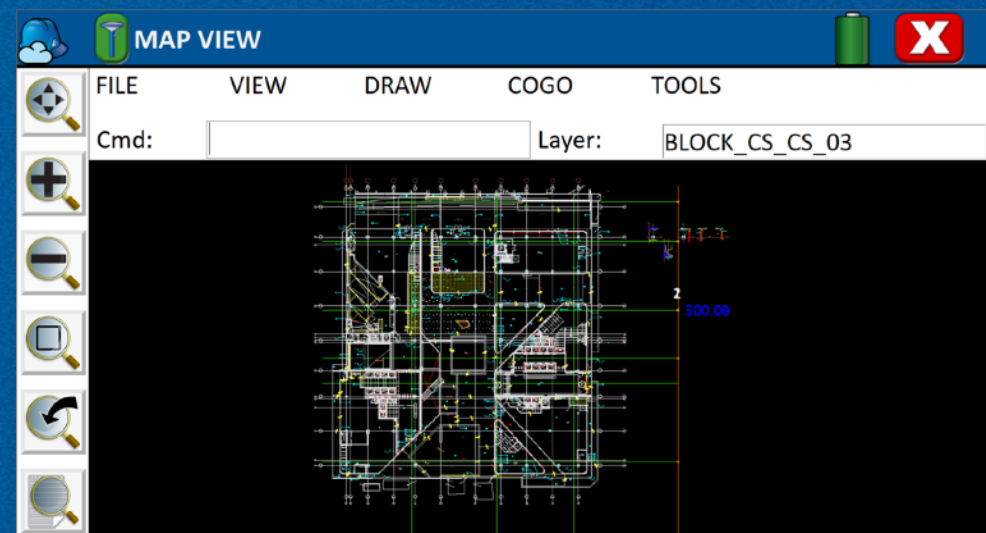
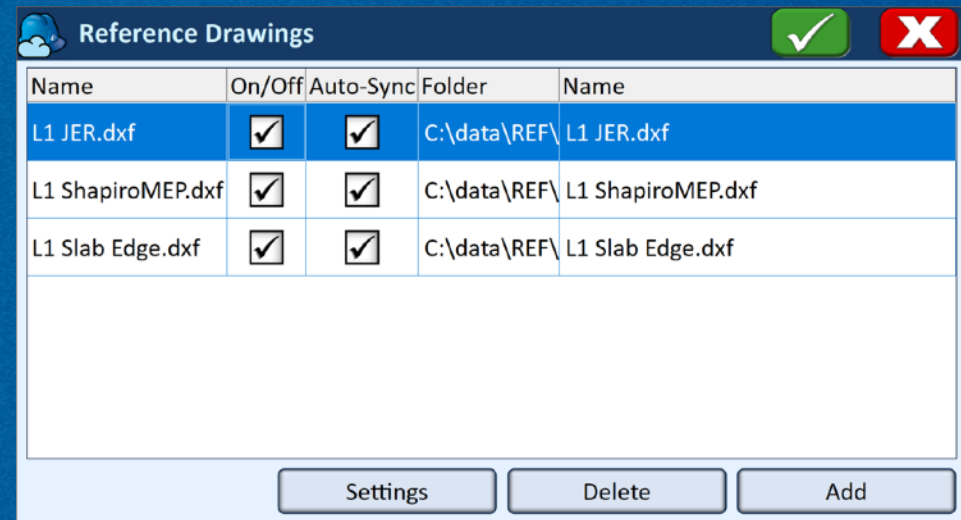
Tolerance profiles allows saving and switching grouped tolerance settings for canopy, topo, control, and other survey conditions.



REFERENCE DRAWINGS

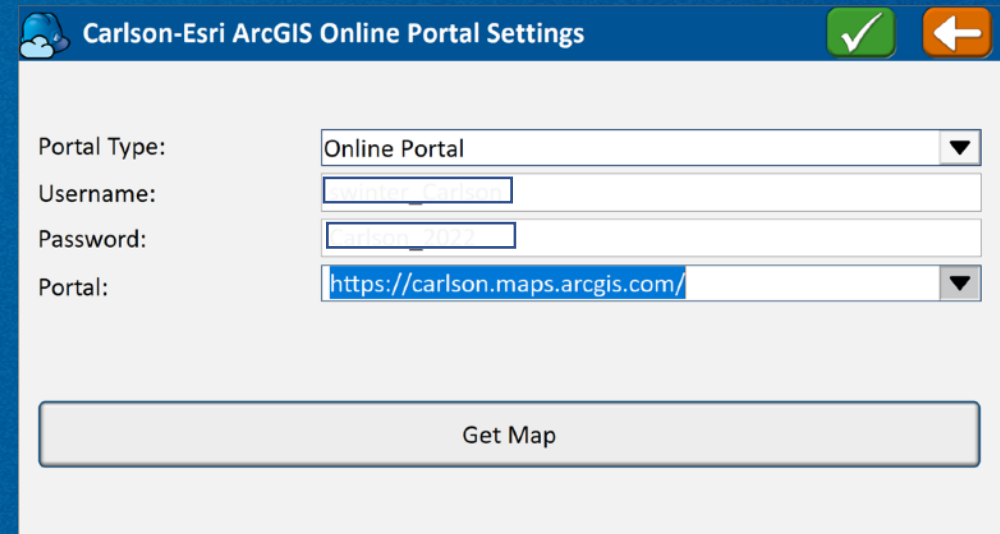
Load Multiple Read-Only reference drawings

- Access under Map->File
- Auto-sync using timed update or Carlson Cloud
- Snap and stake to reference files
- Full layer control including show/hide of entire drawing or individual layers
- Available for DWG/DGN/DXF



ESRI ARCGIS ONLINE INTEGRATION

Login using your Esri credentials to update and add to Esri maps through SurvPC. Update Esri position to RTK accuracy with any receiver in the Carlson driver library. Feature attributes will prepopulate with updated GPS position and accuracy information, and all measurements will simultaneously be stored in the Carlson CRD file for full survey integration.



Carlson-Esri ArcGIS Online Portal Settings

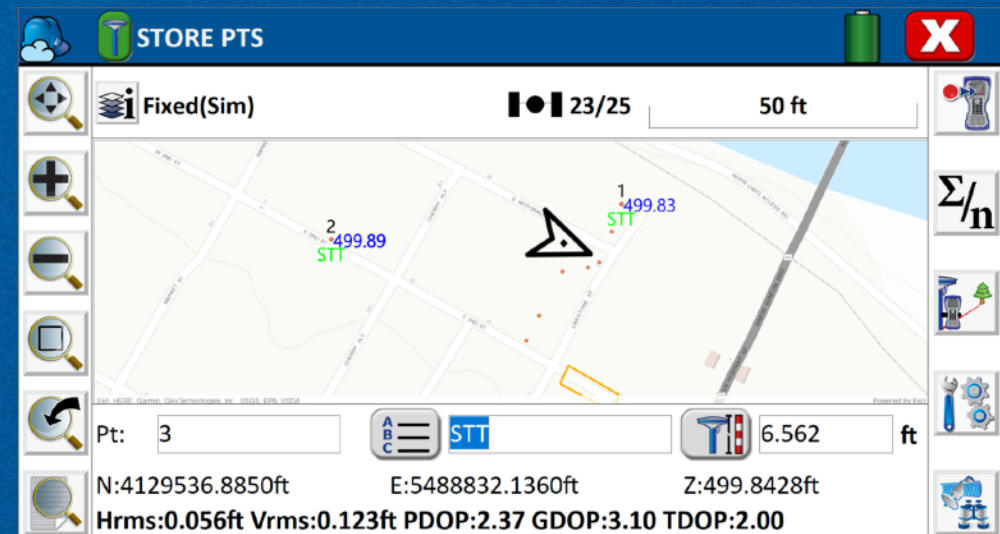
Portal Type: Online Portal

Username: carlson_carlson

Password: carlson_2022

Portal: https://carlson.maps.arcgis.com/

Get Map



STORE PTS

Fixed(Sim) 23/25 50 ft

Pt: 3

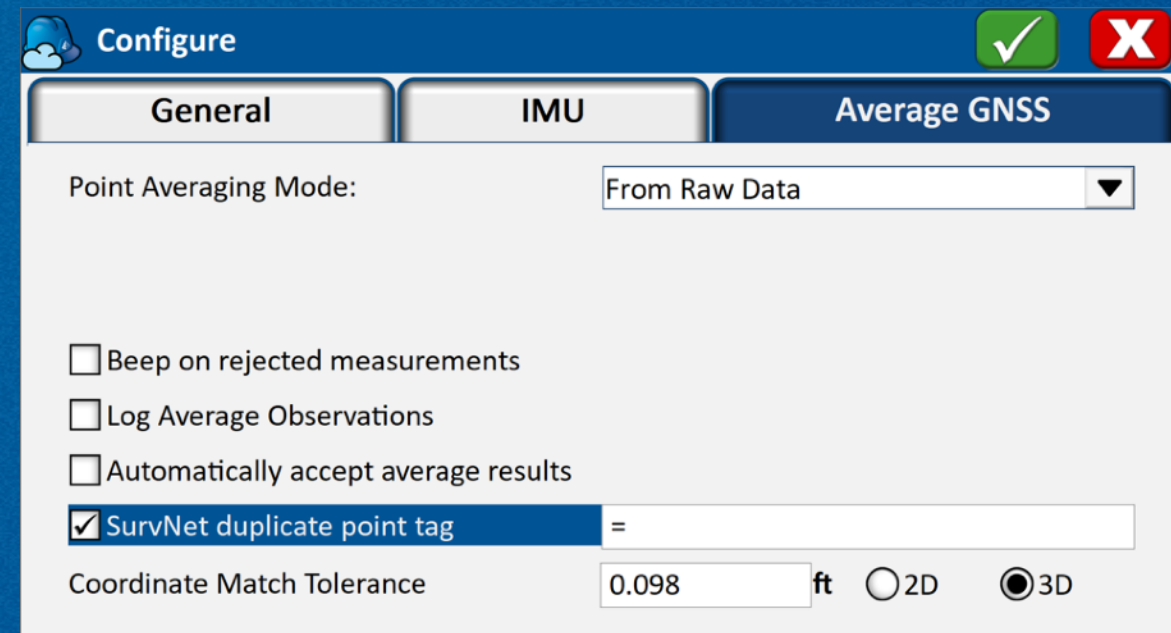
N:4129536.8850ft E:5488832.1360ft Z:499.8428ft

Hrms:0.056ft Vrms:0.123ft PDOP:2.37 GDOP:3.10 TDOP:2.00

REDUNDANCY NOTATION AND BLUNDER DETECTION

Average multiple measurement sessions automatically by using the same point ID. Configure a 2D or 3D coordinate match tolerance for blunder detection. Review session statistics to enable/disable measurements before storing the point, and access full details later in the point info screen.

Users who prefer the legacy “=” method of tagging points using the description field now have an option for auto tagging based on position. Using this method, when a measured position matches an existing point within the set tolerance, the description field will be replaced with the duplication tag of the user’s choice automatically. In addition, positions manually tagged as being equal will be flagged as a potential blunder if positions do not match within tolerance.



NEW AVERAGING OPTIONS



GNSS Average now allows the selection of multiple requirements for average completion. Customize minimum measurement count, time, and required standard deviation between measurements.

The new redundancy sessions option allows for unattended measurement redundancy. Simply configure the required time delay and the software will perform repeated averages with RTK resets.

The screenshot shows the 'Average GNSS' window with the following configuration:

- Window Title: Average GNSS
- Status: SATS:23/25 Status:FIXED(Sim) Hrms:0.067ft Vrms:0.111ft
- Section: Average Requirements
 - Min. Measurement count: 10
 - Time in minutes: 30.000
 - Standard Deviation: H: 0.020 V: 0.030
- Redundancy Sessions: 1
- Time Delay: 20 Minutes
- Buttons: Configure, Tolerances, Monitor/Skyplot

GRAPHICAL AVERAGE

Average GNSS
✓
✗

Status: FIXED(Sim) Hrms: 0.043ft
 Latency: 1.0 Sats: 23/25 PDOP: 2.4 Vrms: 0.100ft

33 of 60 measured ✓ HDev < 0.040
 36 Seconds ✓ VDev < 0.040

Average

N: 4129529.809 ft
 E: 5488714.546 ft
 Z: 411.287 ft
 H Range: 0.073 ft
 Z Range: 0.062 ft
 HDev: 0.017 ft
 VDev: 0.017 ft

Z
0.05ft
0.00
-0.05ft

HI -0.06ft 0.00 0.06ft

Pause

Session 1 of 1
✓
✗

Status: FIXED(Sim) Hrms: 0.064ft
 Latency: 1.0 Sats: 23/25 PDOP: 2.4 Vrms: 0.109ft

35 of 60 measured ✓ HDev < 0.020
 35 Seconds ✓ VDev < 0.030

Average

N: 4129532.934 ft
 E: 5488714.589 ft
 Z: 410.715 ft
 H Range: 0.074 ft
 Z Range: 0.064 ft
 HDev: 0.018 ft
 VDev: 0.018 ft

Z
0.05ft
0.00
-0.05ft

1 34

Incline: 0°00'00"

Pause

- Real time measurement positions are graphed for immediate feedback on precision
- Error ellipses (1 sigma and 2 sigma) drawn dynamically, or tap on the map to display live elevations
- Previous occupations of the point are indicated with blue crosses
- Pause/Resume at any time
- Graphical indicators for out of tolerance or unmet average requirements
- Point Info and reports will contain information for all sessions taken on a given point as well as detailed average results

REMOVE OUTLIERS BEFORE STORING

Measurements

✓
✗

	H	H Res	HRMS	V	V Res	VRMS	PDOP	Incline	latency	Type
1	<input checked="" type="checkbox"/>	0.012	0.004	<input checked="" type="checkbox"/>	-0.005	0.008	1.346	0°11'25"	2.0s	FIXED
2	<input checked="" type="checkbox"/>	0.010	0.004	<input checked="" type="checkbox"/>	0.021	0.008	1.346	0°11'25"	2.0s	FIXED
3	<input checked="" type="checkbox"/>	0.012	0.004	<input checked="" type="checkbox"/>	0.027	0.007	1.346	0°10'55"	1.0s	FIXED
4	<input checked="" type="checkbox"/>	0.006	0.005	<input checked="" type="checkbox"/>	0.014	0.009	1.292	0°11'25"	2.0s	FIXED

Average	Range	Std Deviation
N: 4129530.3369ft	0.0384ft	0.0060ft
E: 5488714.4228ft	0.0486ft	0.0055ft
Z: 550.0721ft	0.1341ft	0.0179ft

Enable All
Filter

SURVNET LEAST SQUARES ADJUSTMENT

SurvNet least squares adjustment is now available in SurvPC for GPS boundary survey certification. Access the feature through File->Raw data. Compute results and create and email HTML and PDF relative point accuracy reports without leaving the field. Simplified output screens allow quick assessment of survey quality. Easily modify settings and recompute, remove points, or resurvey data if necessary.

Results: floodwall080922

Solution converged in 2 iterations
Failed the Chi-Square test at the 95.00 significance level (pessimistic)
23.654 <= 17.422 <= 58.120 (Auto-calculated Vector Std. Err. Factor 0.000)

Total Observations: 54
Degrees of Freedom: 39
Number of Control Coordinates: 15
Total Unknowns: 15
Examined Vectors: 49

Recalculate

Change Settings

Save the report

Results: park020122_sessions

10 Connections Examined. All passed at tolerance of 0.070 + 100 ppm.
Worst connection (passed) at 0.0062 + 100ppm.

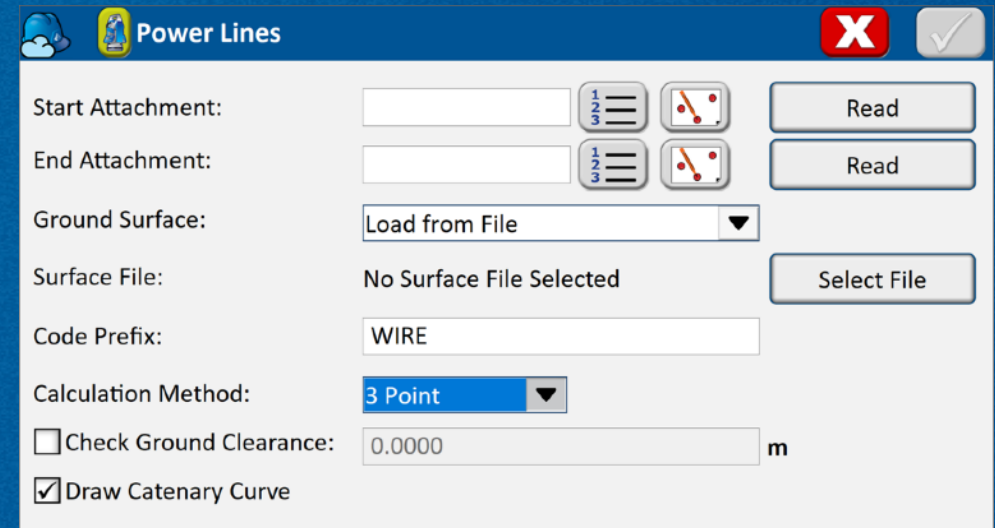
St. 1	St. 2	Result	Distance	Calculated Err.	Actual Semi-major	Allow Semi-major	
3	4	✓	149.2186	0.0062 + 100ppm	0.0211	0.0849	▲
2	4	✓	251.2695	-0.0046 + 100ppm	0.0205	0.0951	
1	2	✓	107.7709	0.0064 + 100ppm	0.0172	0.0808	
2	3	✓	162.2257	0.0021 + 100ppm	0.0183	0.0862	▼

CATENARY SURVEY

The new Catenary Survey routine allows easy measurement of power lines and other wires. Measure Left and right attachments, then measure angle only to the wire to project points onto the vertical plane at defined intervals.

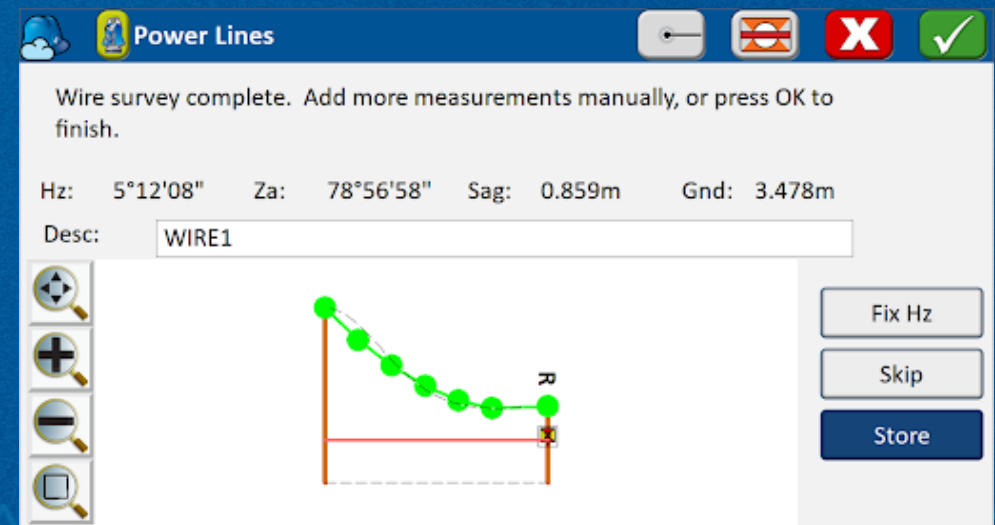
Define the ground plane using a DTM or PRO file and set allowable ground clearance distance. The software will warn if measurement breaks tolerance.

Save and email a complete report of the results and environmental conditions.



The screenshot shows the 'Power Lines' software interface with the following fields and controls:

- Start Attachment:** [Empty text box] [List icon] [Diagram icon] [Read button]
- End Attachment:** [Empty text box] [List icon] [Diagram icon] [Read button]
- Ground Surface:** [Load from File dropdown] [Dropdown arrow]
- Surface File:** [No Surface File Selected] [Select File button]
- Code Prefix:** [WIRE text box]
- Calculation Method:** [3 Point dropdown]
- Check Ground Clearance:** [0.0000 text box] [m unit]
- Draw Catenary Curve**

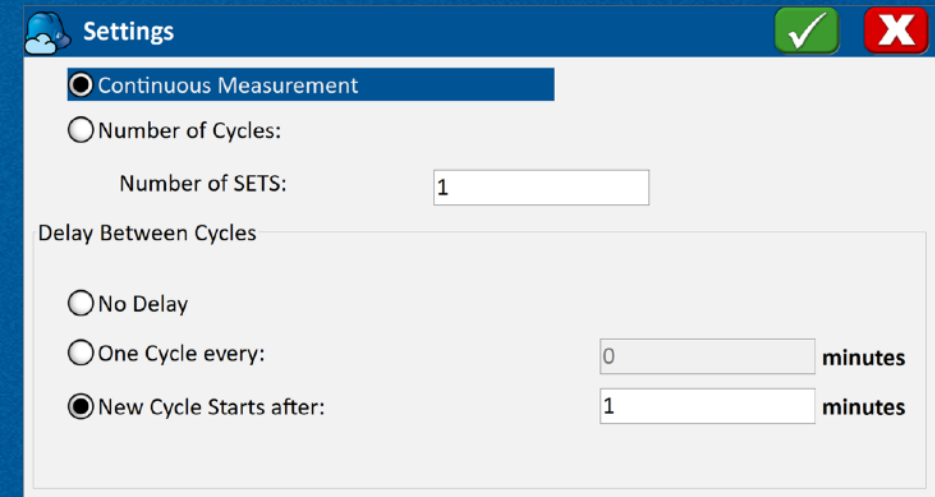


ROBOTIC MONITORING

The new monitoring routine offers a single-station system for deformation control of bridges, buildings, walls, etc. The software will continuously measure to defined targets and report deviation from previous measurement and total deviation.

Monitoring cycles are user configurable for permanent setup. Email alerts send automatically when motion tolerances are exceeded. Results can be logged to a COMM or file in real time.

The monitoring module is available to try in demo mode under Survey->Feature Survey.



Settings [✓] [✗]

Continuous Measurement

Number of Cycles:

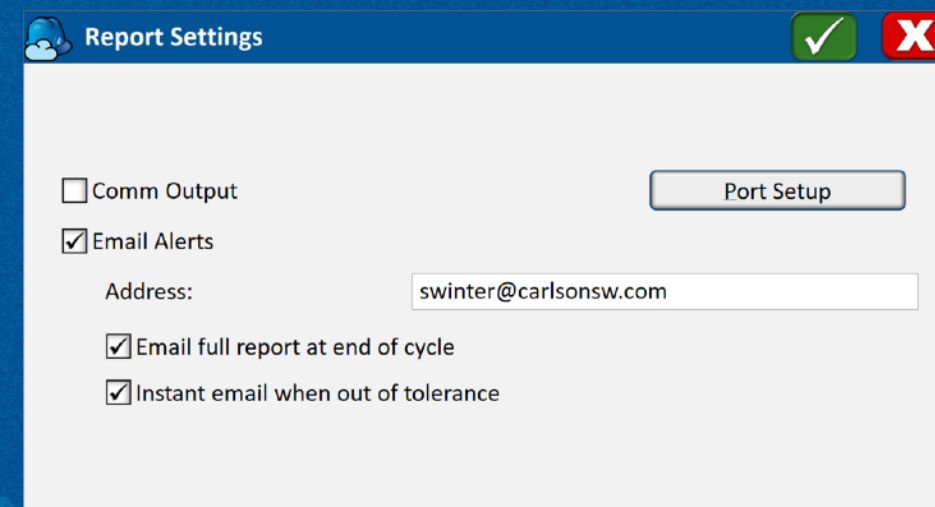
Number of SETS:

Delay Between Cycles

No Delay

One Cycle every: minutes

New Cycle Starts after: minutes



Report Settings [✓] [✗]

Comm Output Port Setup

Email Alerts

Address:

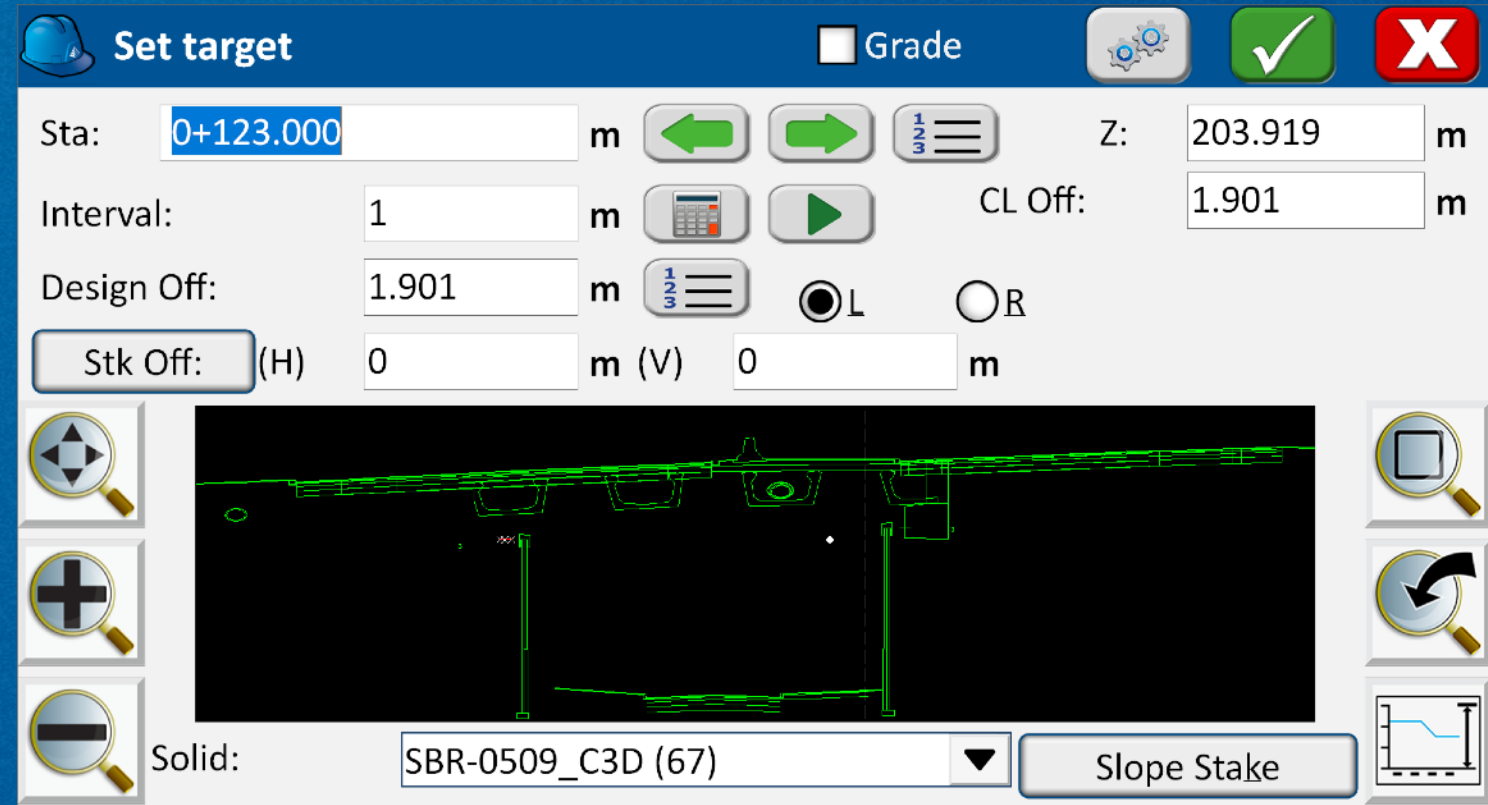
Email full report at end of cycle

Instant email when out of tolerance

CIVIL DESIGN STAKE FROM BIM SOLIDS

The full power of SurvPC staking is now available using BIM models. Load any BIM file to create solid models using the BIM->Extract Solids feature. The resulting solids can then be loaded as a group into the stake roads routine for an incredible stakeout experience for roads, bridges, tunnels, and structures. View and stake any detail of the BIM model at any station, and in any direction with real-time sectioning. No information will be lost, no office preparation is needed, and design files will not be manipulated or contaminated.

This feature requires the BIM and Roding models.



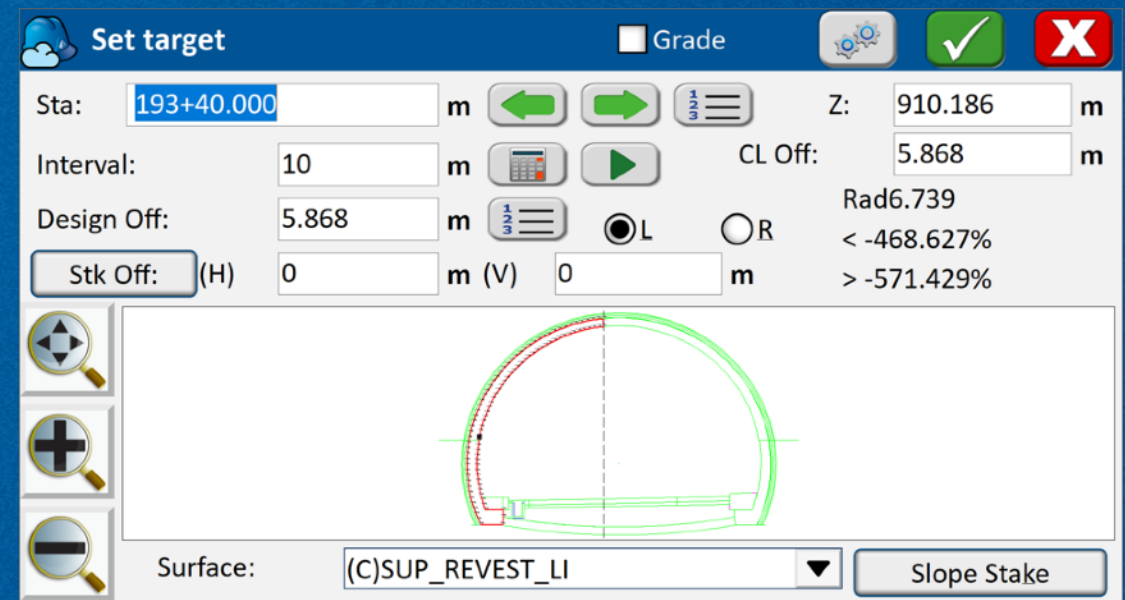
STAKE ROAD FROM SURFACE FILES

The Stake road routine now allows staking using digital terrain models. Load one or multiple DTM (design) files and the software will section on the fly for staking of any road element or layer at any station.

NEED NEW SCREEN
SHOT

TUNNEL STAKEOUT

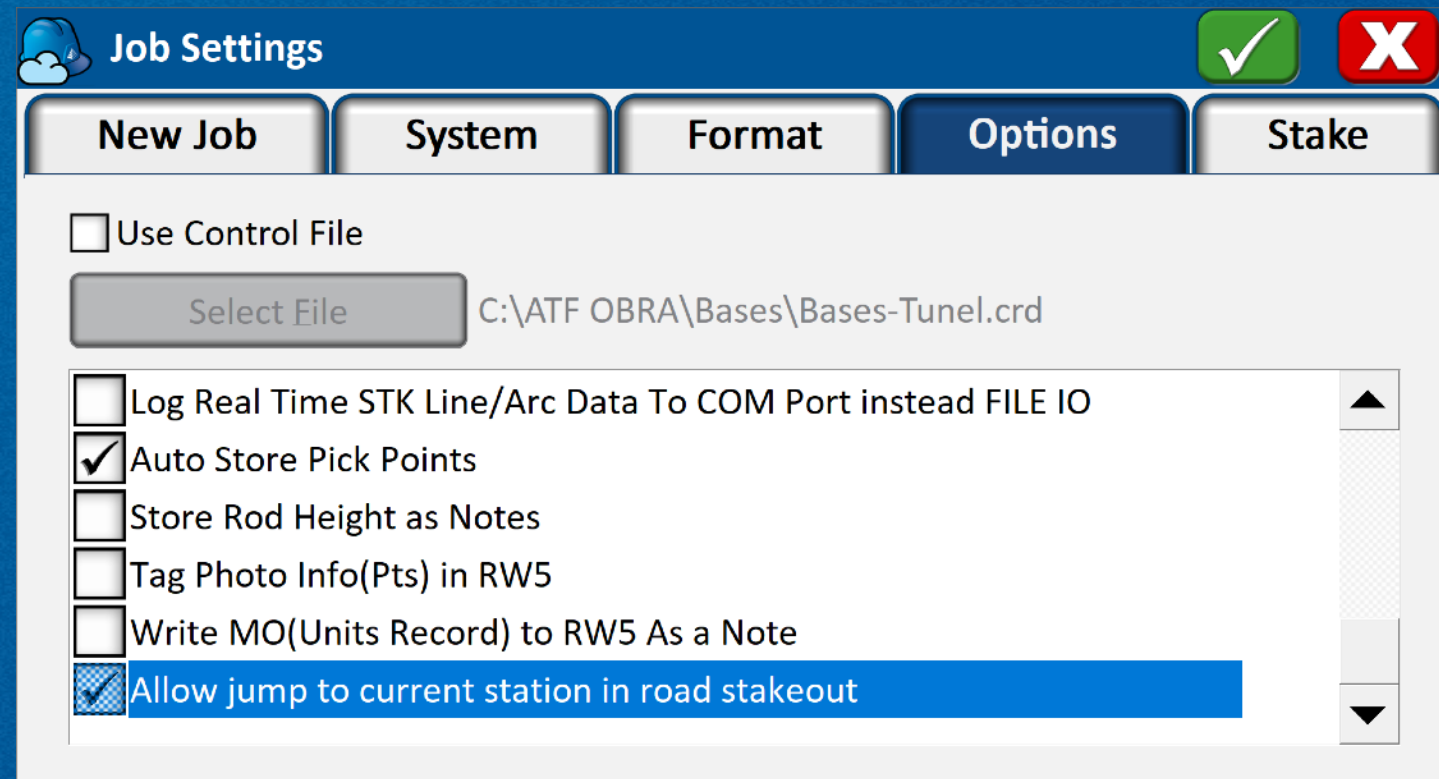
Tunnel stakeout is now possible with the new Tunnelling module. Load designs from both as-built sections or BIM solids from LandXML or IFC/Revit files. Stake any road surface or the tunnel dome for under/over excavation measurements to compare against design and laser scans in real time.



JUMP TO CURRENT STATION

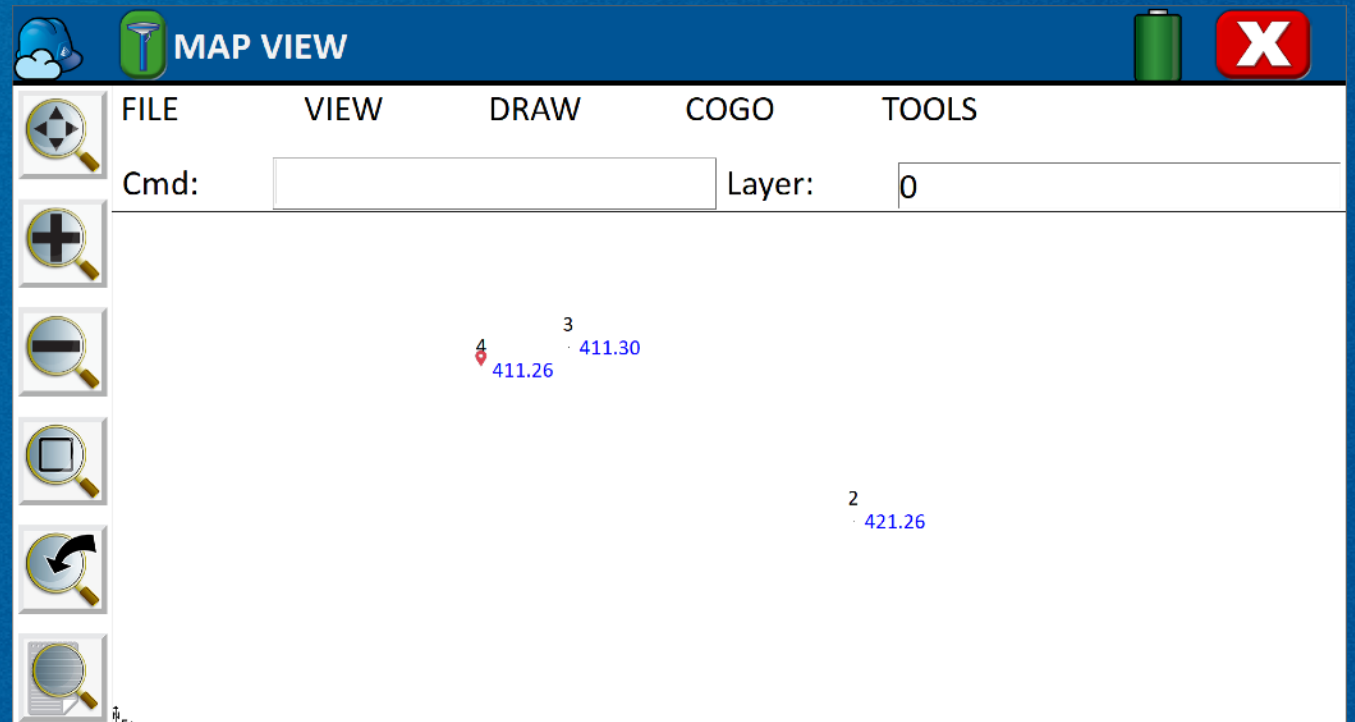


Enable the “Allow Jump To Current Station In Road Stakeout” option to add a new option for road stakeout. When pressed, the software will recompute the cross section based on your current position. No need to return to the menu to manually change the design



USER POSITION IN MAP SCREEN

A snapshot of the last user position is now noted in the map screen with a red icon. The new marker is also available in all point selection screen for quick reference to current position.



STAKEOUT SETTING CONSOLIDATION

Stake settings have been consolidated on the Configure->Stake screen for easier modification.

Configure Stakeout Info

General Stake IMU Average GNSS

Style: Legacy

Direction Method: In-Out & Left-Right Tolerance: 0.100 ft

Ref. Object: Base Station

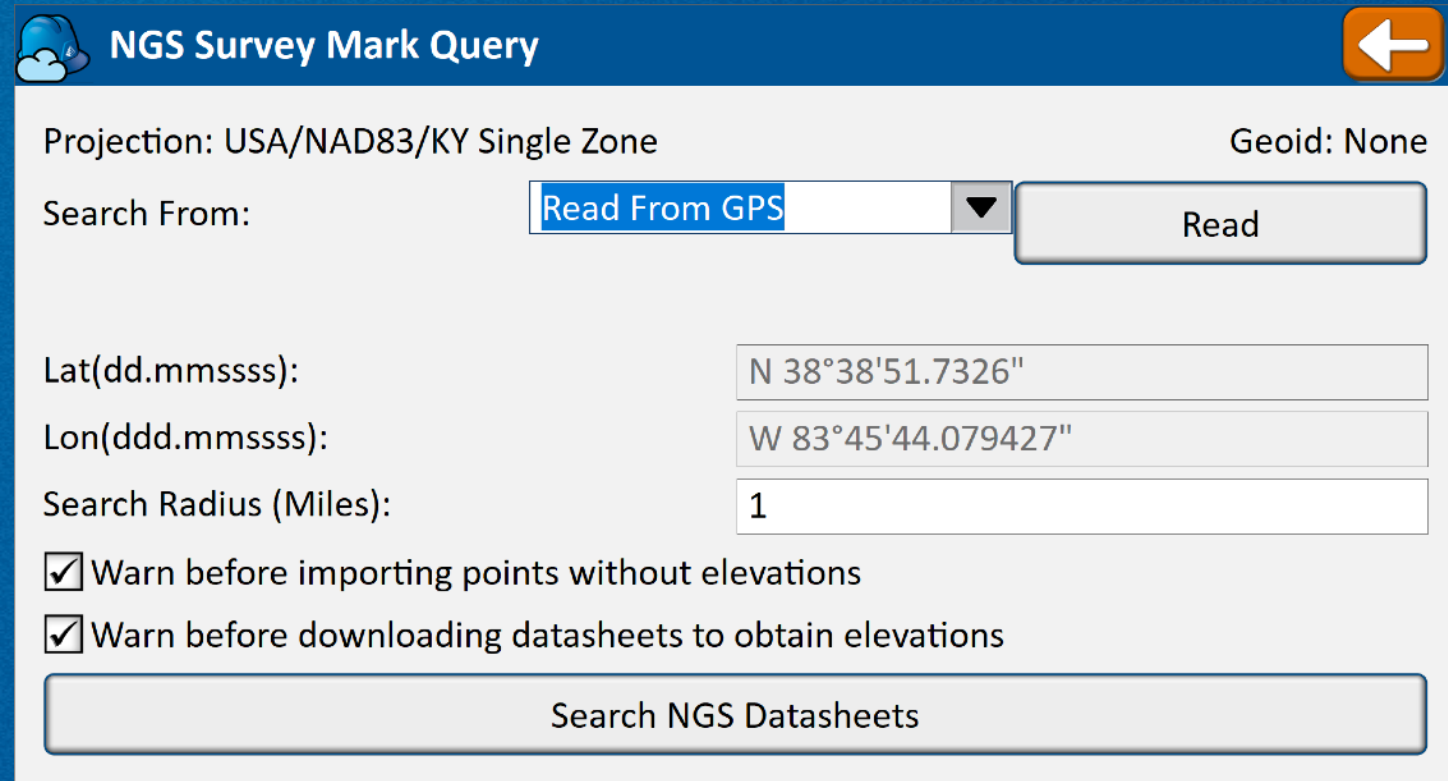
Use CL for Ref. Object (when applicable)

Move Relative To: Ref. Object

Minimized View: Position

NGS SEARCH IMPROVEMENTS

NGS Search now has settings to control warnings displayed. The list of monuments found can be sorted by field. The distance from search center is displayed in the monument list. The user can extend the waiting time if the network is slow or a large search radius is specified. Lat/Lon display has been improved.

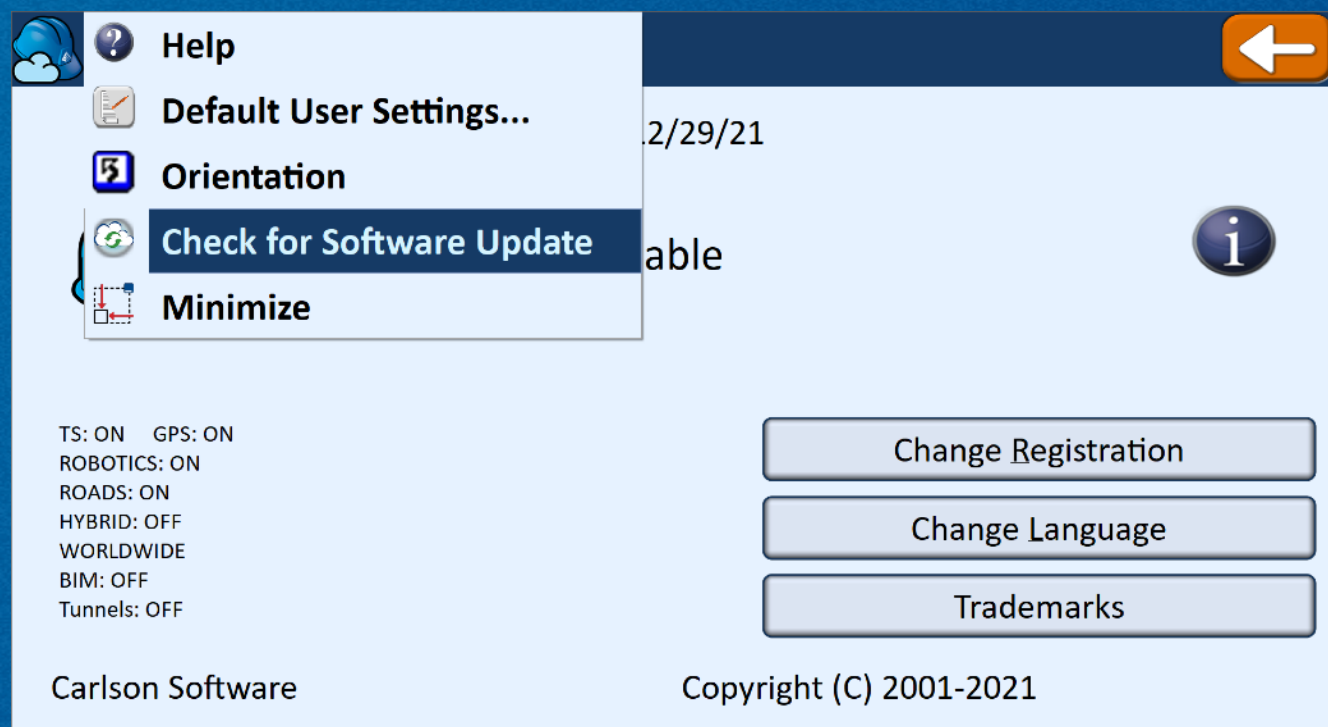


The screenshot shows the 'NGS Survey Mark Query' window. At the top left is a cloud icon, and at the top right is a back arrow icon. The window contains the following fields and controls:

- Projection: USA/NAD83/KY Single Zone
- Geoid: None
- Search From: A dropdown menu with 'Read From GPS' selected and a 'Read' button.
- Lat(dd.mmssss): A text input field containing 'N 38°38'51.7326''
- Lon(ddd.mmssss): A text input field containing 'W 83°45'44.079427''
- Search Radius (Miles): A text input field containing '1'
- Two checked checkboxes: 'Warn before importing points without elevations' and 'Warn before downloading datasheets to obtain elevations'.
- A large 'Search NGS Datasheets' button at the bottom.

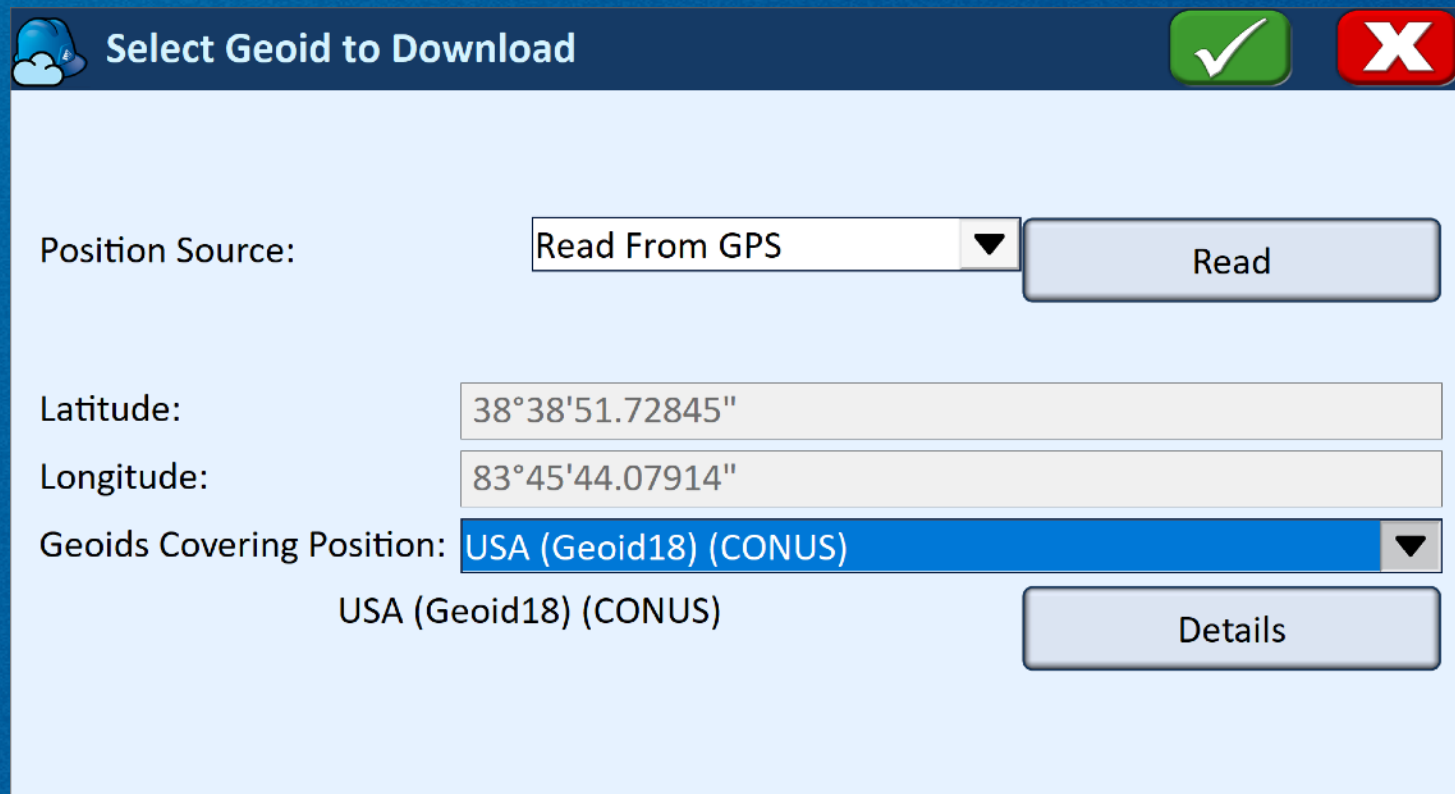
SOFTWARE UPDATE IN THE FIELD

Stay current by checking for software updates from the About screen under the helmet. Auto update, and view the latest release notes.



GEOID DOWNLOAD IN THE FIELD

Use any position to search for and download available geoids from the geoid selection screen.



The screenshot shows a software window titled "Select Geoid to Download". The window has a dark blue header bar with a cloud icon on the left, a green checkmark icon, and a red 'X' icon on the right. The main content area is white and contains the following fields and controls:

- Position Source:** A dropdown menu set to "Read From GPS" with a downward arrow, followed by a "Read" button.
- Latitude:** A text input field containing "38°38'51.72845".
- Longitude:** A text input field containing "83°45'44.07914".
- Geoids Covering Position:** A dropdown menu set to "USA (Geoid18) (CONUS)" with a downward arrow. Below the dropdown, the text "USA (Geoid18) (CONUS)" is displayed, and a "Details" button is located to the right.

HELP IMPROVEMENTS

User help now allows easy access to the manual and knowledge base, as well as instrument specific help for some models. The help screen also allows easy access to take a screenshot and email it. Screenshots will capture the screen under the help dialog.

