Release Notes

TRIMBLE SITEWORKS SOFTWARE VERSION 1.70

This document contains late-breaking product information, updates, and troubleshooting tips not covered in the Trimble® Siteworks Software documentation.

- Introduction
- New features and functions
- General improvements

- Known issues
- Firmware and operating system compatibility
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Introduction

Trimble Civil Construction is pleased to announce the release of version 1.70 of Trimble Siteworks Software. Version 1.70 is available, at no charge, to all users under an active software Trimble Protection Plan with an effective date of July 31, 2023 or later. It is a purchasable upgrade for all users without an active Trimble Protection Plan. Siteworks and its modules are loaded through Trimble Installation Manager (TIM), which can be downloaded at install.trimble.com Siteworks and Trimble SCS900 Site Controller Software Licenses from controllers that have an active software Trimble Protection Plan are able to be relinquished and transferred onto new

https://community.trimble.com

controllers via TIM (note that license transfer is not available from SiteMobile devices or for SCS900 v2.X). Please contact your SITECH® dealer for license transfers.

Siteworks version 1.70 is available for operation on the following Trimble site controllers running **Windows 10**:

- Trimble TSC7 Controller
- Trimble T7 Tablet
- Trimble T100 Tablet

- Trimble Site Tablet 10
- Trimble T10 Tablet
- Trimble Panasonic Toughpad FZ-M1

Siteworks Mobile v1.61 for Android™ is also supported on the following **Android** Tablets running Android 8.0 (Oreo) or above:

- Trimble TDC600 Controller
- Samsung Galaxy Tab Active Pro
- Samsung Galaxy Tab S4
- Samsung Galaxy S10+ Smartphone

- Trimble TSC5 Controller
- Samsung Galaxy Tab S3
- Samsung Galaxy Tab S7

Installation of Siteworks onto any devices not specifically listed above has not been tested for compatibility or performance and installation is at the user's own risk. Siteworks is not supported on the Trimble TSC3 Controller, Site Tablet, Site Mobile, Windows 7 or Windows CE devices.

Trimble Siteworks installation

For supported devices, Trimble Installation Manager needs to be installed and run directly on a device connected to the internet. TIM checks which software options were purchased for the specific controller with this serial number and checks for the latest version of the software that the device is entitled to based on its current Software Protection Plan expiration date. Select the Siteworks Icon in TIM to install the latest available version. TIM is available for Windows and Android devices at: install.trimble.com

This release is available in the following Languages:

- English - UK English
- English - US English
- Chinese (Simplified)
- Czech
- Danish
- Dutch
- Finnish
- French
- German

- Italian
- Japanese
- Korean
- Norwegian
- Polish
- Portuguese
- Russian
- Spanish
- Swedish

Many of the improvements described here were requested by field users. Trimble appreciates this type of feedback and continually improves and evolves the product to meet the needs of contractors in the construction industry. If you have any feature enhancement requests please submit them to your SITECH® distributor who will pass them on to Trimble for consideration.

The Siteworks User Guide and prior versions of release notes are available for further information on the Siteworks webpage at:

https://heavyindustry.trimble.com/en/products/siteworks-positioning-system under *Siteworks Positioning System Downloads > Siteworks Software Documentation*.

New features and functions
Features are available in both Siteworks Standard and Siteworks SE Starter Edition unless noted

Integrated Survey of GNSS and Total Station Measurements

It is now possible to be simultaneously connected to both a GNSS and Total Station and to then rapidly switch between them to take measurements from either device. All currently supported GNSS and total stations are able to be used. Trimble SX12 and SX10 Scanning Total Stations are also fully supported with existing camera and scanning workflows.

Measurements can only be taken from one device at a time, but with one click in the Siteworks status bar the primary positioning device can be swapped. New functionality also has been added that allows for the UTS to "turn to" the GNSS location, thereby streamlining a prism search. Also, it is now possible to measure a new GNSS control point during a UTS setup and then immediately take the UTS measurement to station the instrument. Note that the project must already have a

site calibration completed or be using a published coordinate system to be able to measure a new control point during the instrument setup process. Integrated Survey requires the Advanced Measurement Module (AMM). Integrated survey is not available in Siteworks SE Starter Edition, as total stations are not supported in Siteworks SE.

Integrated Survey Connections

A new connection option for *Integrated Survey* has been added in the connect device options for users with the AMM installed that when selected will prompt the user to first connect to a GNSS and then to a Total Station. All existing connection methods (cable, bluetooth, radio) are supported, including the data collectors internal GNSS.

Selecting "Connect Device" has a new option for Integrated Survey:

Tapping the Integrated Survey button will bring the user into the same existing GNSS setup where all options are available as with a standard GNSS setup. However it is not possible to setup a GNSS base station in the Integrated Survey workflow. To setup a base station you must use the standard GNSS setup workflow. After completing the GNSS setup, the user is brought into the Total Station setup, where again all the options are the same, until the select point workflow for stationing the instrument.

Measure GNSS Control Points During UTS Setup

New functionality has been added to the "Select Instrument" and "Select Point" Screen during the station setup that allows for a new Control Point to be measured by GNSS. To measure a new GNSS Control point, tap on the button on the Select point screen to enter into the Measure Control Point workflow. After selecting the "New Control Point" option the user is taken to the GNSS Static measurement setting window. The user can enter the new control point's name and code, and set the static measurement settings. Note that the GNSS antenna height is not automatically adjusted with an offset from the top of the prism. Therefore careful attention must be paid to the antenna height when measuring Control and performing any static measurements.

Pressing "Measure" will start the static measurement. Once the measurement has been completed the user is returned to the Instrument Setup Point Selection window with the newly measured point selected by default.

Note: The status bar will continue to indicate that the active connection is the total station throughout this workflow. This is because Siteworks doesn't actually change active devices, it just performs a static measurement from the GNSS receiver.

Switching Devices in Integrated Survey Mode

Once the setup of both the UTS and GNSS is complete Siteworks displays a new slider switch in the Status Bar at the top of the screen. The statuses of both the GNSS (e.g. the precisions, number of satellites, and correction status) and the total station status are now displayed as well. These status bar items behave as previously; clicking on them will bring the user to the respective screens, like the Skyplot and Total Station Control Panel. The battery level for both connected devices is also shown, and tapping on the battery icons will bring the user to the battery level display window which shows the current UTS, GNSS, and data collector battery levels.

Tapping on the slider button will switch the primary positioning instrument between the GNSS and UTS. The currently active device will also have its Status Bar items highlighted by a blue box.

UTS as active device:

GNSS as active device:
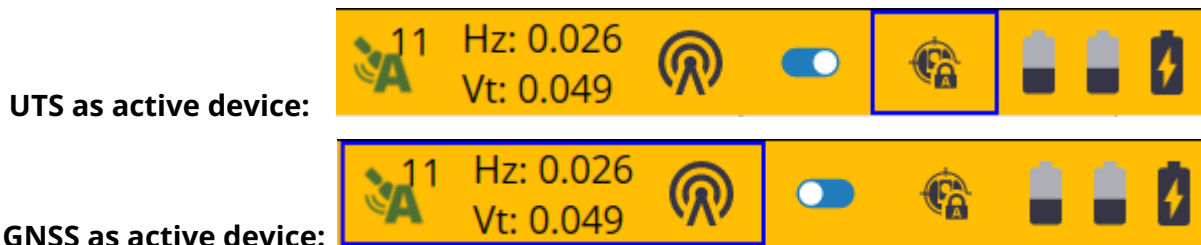
The ability to change active devices is only available while in the plan map. With the exception of measuring new points in a workflow window, the slider button will be hidden in most workflow windows.

Changing devices while staking batter rail locations or the reference stake for a dual stake catch point is not possible. It is possible to change active devices while in the EZ level UI. The user is also prevented from switching to GNSS mode when measuring a point at an offset with the dual measurement option, as that is a total station-only option.

When switching devices the measure mode will always return to "Standing" regardless of the mode that was last used. For example if you are in vehicle mode in GNSS and switch to UTS, the UTS will be in Standing mode, and then when switching back to GNSS it will also be in Standing mode.

Recorded measurements will only store information from the active device. When taking a GNSS measurement, the point info will only contain GNSS information and not contain any UTS information, since the UTS was not used to measure that point.

GNSS Antenna Heights in Integrated Survey

GNSS antenna height options have been updated with a new checkbox option for "Use target height plus offset to receiver" on the GNSS height settings pages for all measure modes (i.e. walking, standing, static, vehicle) and for the supported prisms that have the 5/8" threads at the top: AT360, 360 degree, and MT1000 prisms.
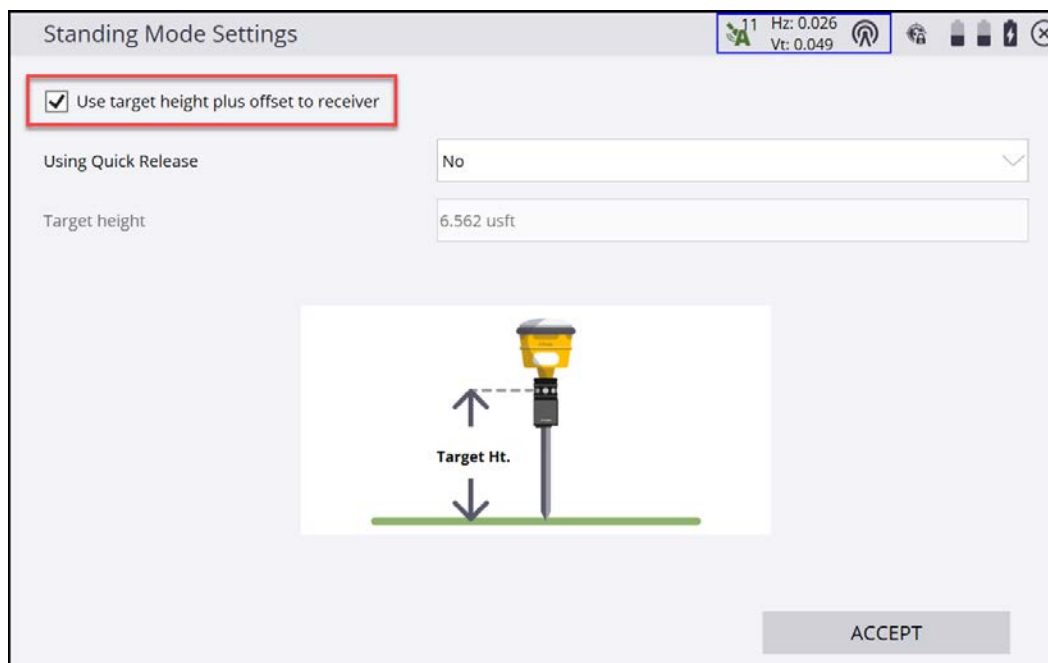
When this box is checked, the GNSS height to the bottom of the receiver will automatically be adjusted based on the specific prism selected in the UTS settings and the entered height of the prism. Also, instead of "Antenna height", "Target height" will be shown. The height in the GNSS setting window is also grayed out and can only be changed in the UTS height window.   The adjusted GNSS height will be displayed in the Info Bar/Panel for the GNSS antenna height on the main screen. Note that the graphic shown in Siteworks will always be of the MT1000 and not update to the prism type in use.

The following offsets are applied to the height of the prism as it is entered in the UTS height settings:.

Prism Type	Offset Value
AT360	0.095m
360 Prism	0.034m
MT1000	0.034m

It is possible to select any prism type available in Siteworks when using integrated survey, even those that do not have threads at the top (e.g. a backsight prism). If any prisms other than the ones listed in the table above are selected, then the checkbox to "Use target height plus offset to receiver" option will not be available in the GNSS height settings, and the Antenna height must be manually entered.

Note: when performing static measurements with the GNSS, including measuring Control Points, the prism offset option is not available, and the user will have to manually adjust the GNSS antenna height by adding the offset values above or measuring the height to the bottom of the antenna.

GNSS Based Prism Search and Turn to GNSS Location

New functionality has also been added to allow for a GNSS based prism search. This has been implemented in the "Turn To" option of the total station search function.
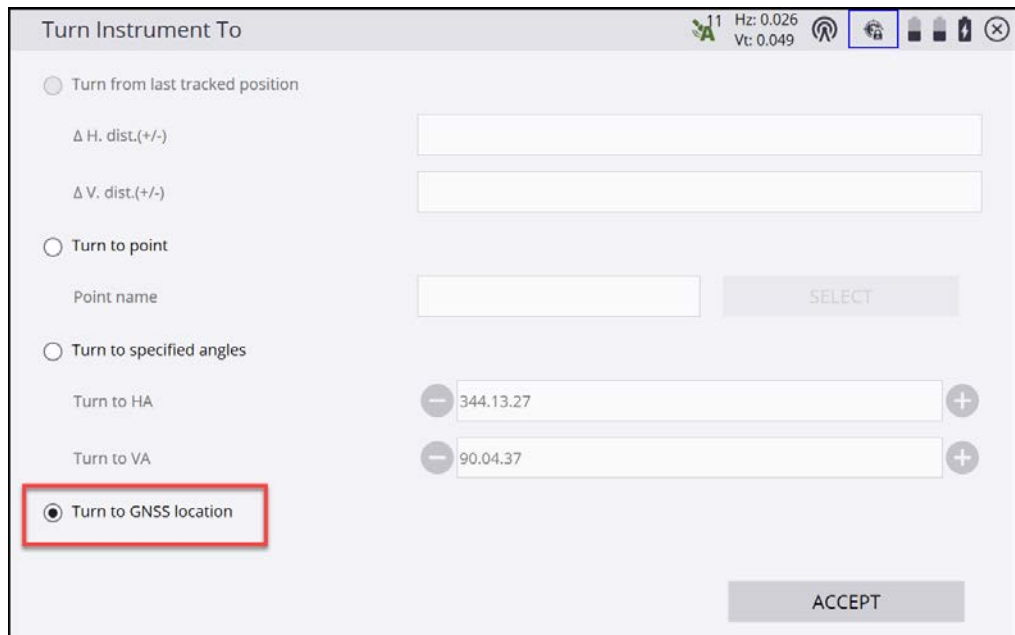
When in the "Search for Target" screen reached from the total station control panel Search button

you can tap on the new icon next to the turn to button to turn the instrument to the current GNSS position.
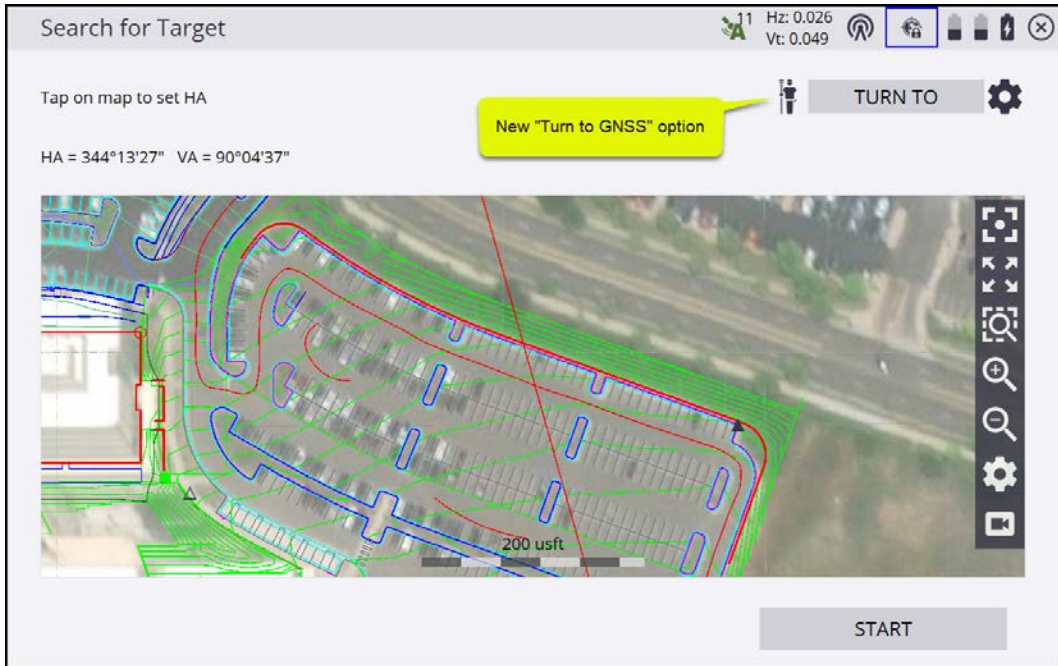
A new option for "Turn to GNSS location" has also been added to the "Turn To" screen that is reached when tapping the Turn To button in the screen above:

Selecting these new GNSS based options will turn the instrument to the current GNSS location and greatly facilitate the reacquisition of the prism by the total station.

It is possible to use a compatible data collector's internal GNSS as the GNSS connection in Integrated Survey. Therefore by selecting the internal GNSS as the integrated survey's GNSS this will allow for the use of the internal GNSS during the new "Turn To GNSS" prism search. For best results, set the GNSS antenna height be the height of the top of the data collector above the ground. Note that the non-differential correction nature of the internal GNSS may not cause the UTS to turn directly to the prism. Also the precision values of the GNSS in the status bar may flash red due the the higher precisions of the internal GNSS compared to a RTK enabled receiver.

Recheck System in Integrated Survey

A new Integrated Survey Measurement option has also been added to the Recheck System workflow that will enable taking both GNSS and UTS measurements over the control point. When the "Integrated survey measurement" box at the top of the Take Measurement screen is checked this will perform the measurements from both devices, starting with the currently active device. Once the measurements from both devices are collected, the Check Control Point Results screen will display the deltas for both instruments as shown below and the values will be saved to the task log.
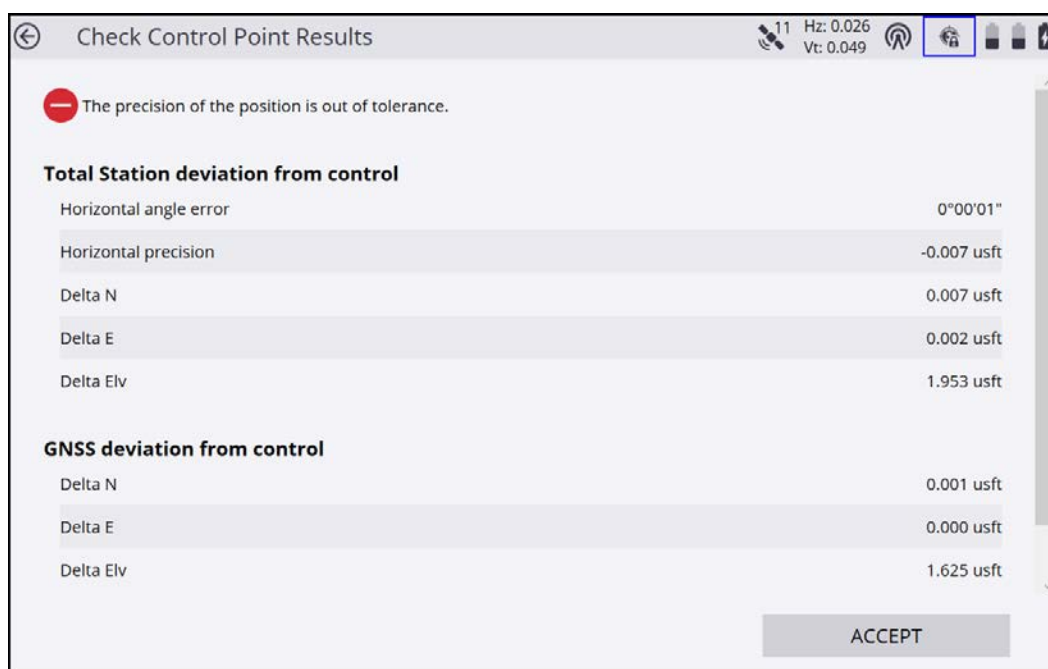
eBubble and Tilt Warning for UTS Measurements

When connected to a GNSS receiver with eBubble capabilities the eBubble remains active in a side panel even when the UTS is selected as the primary positioning device. This will allow for the use of the receiver's eBubble view on the screen to level the survey pole regardless of which positioning device is selected as the primary. It is recommended to perform a eBubble calibration with the receiver mounted on top of the prism when the pole is plumb to ensure the best results. Note the eBubble does not require the IMU or Tilt Compensation option code to use and is standard on SPS986 and R780 receivers.

If the "Enable tilt warning for measurements" checkbox is checked in the eBubble settings window, then if the survey pole is tilted beyond the specified settings, Siteworks will warn the user of excessive tilt when taking either a GNSS or a UTS measurement.

Georeference Background Images in Siteworks

New functionality has been added to enable manual georeferencing of background images, including PDFs from within Siteworks. This eliminates the need for a separate World File created in other software such as Trimble Business Center. The Siteworks georeferencing process involves selecting two control and/or measured points in the currently open Work Order and/or free tap points on the screen, and then selecting the corresponding pixel(s) on the raster image. It is also possible to select vertices along CAD lines in the currently open design as the source points. After selecting the two source and image points the image will be scaled and rotated into position and a World File containing the georeferencing information will be created and saved to the Projects Background Images Folder. Note that any control or measured points must be measured prior to entering the georeferencing workflow. There is no way to measure new points from within the workflow, only free tap points or CAD points.

To perform the georeferencing, enter the *Menu > Settings > Map Display Settings > Images* tab or by

tapping on the Map Settings Icon on the map screen and then the *Images* tab.

Once in the images tab, select the image to be referenced and tap on the georeferencing icon:

 in the Background Image row to enter the georeferencing workflow.

In the Georeference Image Screen, tap a control or measured point, or a vertex of a CAD line in the left window to place a red dot at the reference point. It is also possible to select the point from a

point list by tapping the icon ![icon]. Then tap on the corresponding pixel location on the image in the right panel. Proceed to select reference point two in the left panel and then the corresponding image point two in the right panel. The second set of reference points will be blue. When all the appropriate points have been selected, tap the Accept button to write the world file and return to the main map screen with the newly referenced image displayed.

Note that if this workflow is entered for an existing georeferenced background image that already has a World File that the existing World File will be overwritten if the user completes the manual georeferencing workflow.
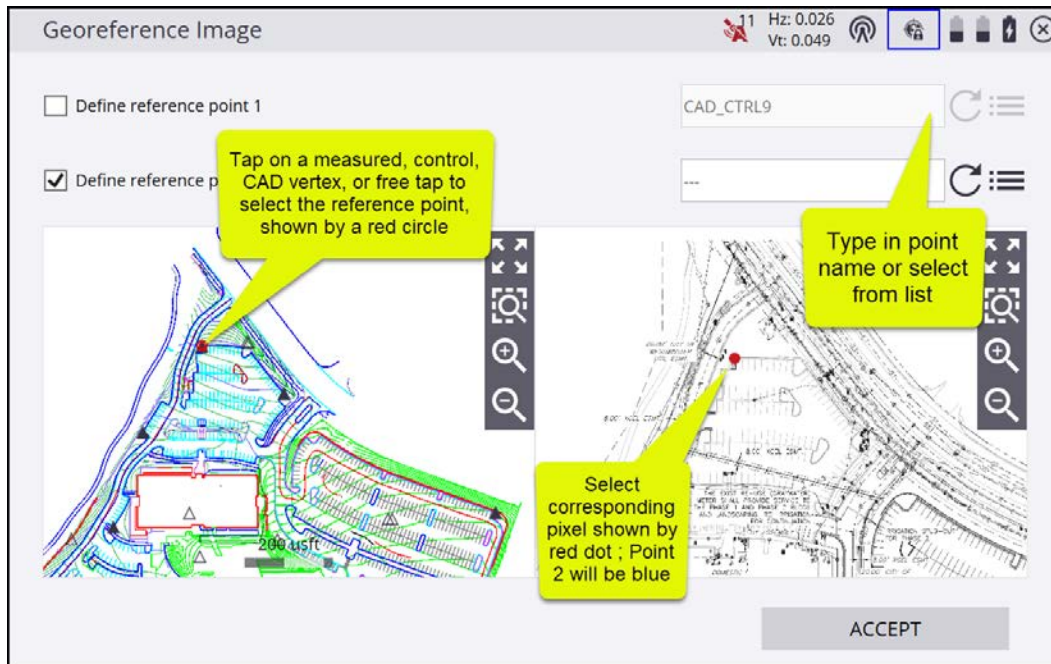

Import PDF Files as Background Images

Support for importing and georeferencing PDF files has been added to the background image import process. Siteworks will rasterize both raster and vector type PDFs and convert them into a BMP format raster image. Vector based PDFs are simply rasterized and converted to a PNG format image. Multi-page PDFs are supported during import by selecting an individual page in a preview window to be imported and converted. Multiple pages from the same PDF are each imported, converted, and manually georeferenced individually.

To import a PDF simply select it as a new background image in the *Map Settings > Images* tab by

tapping the ⊕ button, and navigating to the PDF image on the data collector. This will open the PDF preview window where the resolution of the converted image is selected. For multi-page PDFs the desired PDF page is selected by either typing in a page number or tapping the arrow keys to find and then choose the page. After tapping Import, Siteworks will convert the PDF to BMP format, save the BMP to the Project's Background image folder and then prompt if you would like to perform a georeferencing operation. The georeferencing process for converted PDFs is the same as described above for any non-referenced raster image.
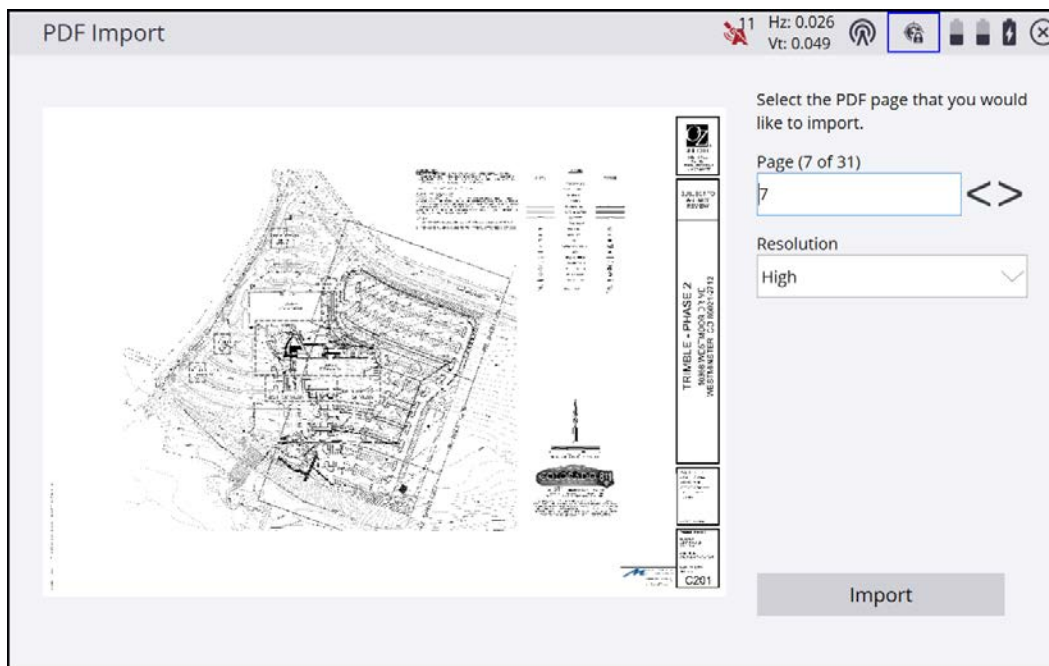
There are selectable options for the resolution of the converted PDF to be used. These settings are hard-coded such that HIGH will produce a converted BMP image that is a maximum of 5200x5200 pixels, MEDIUM will produce a maximum resolution of 3200x3200, and LOW will yield a max resolution of 1920x1920. Siteworks will import the PDF, determine its page size and convert accordingly such that the largest (longest) dimension of the converted image will not exceed the above pixel values. These resolutions are all under the Siteworks maximum of 8192x8192 pixels for an image size, therefore using HIGH should not significantly impact performance, as the resulting image file size should be under 1MB. Users wanting higher resolution converted PDF imagery than 5200x5200 will need to modify the PDF file in external software by cropping it to individual areas of interest.

Support for DA2 in Trimble Works Subscription Precise Rover Bundle

Siteworks now offers support for the use of the Trimble DA2 GNSS Smart Antenna as part of the Trimble Works Subscription Precise Rover Bundle. DA2 functionality is only available in the Trimble Works Subscription offering of Siteworks. Perpetual licenses of Siteworks do not support the DA2; a Trimble Works Precise Rover subscription is required to connect and use the DA2 in Siteworks. The Trimble Works Precise Rover Bundle and therefore the DA2 is not available in the U.S. and Canada at this time.

To connect the DA2 in Siteworks simply search for it via a standard rover Bluetooth search and select the DA2 from the list of available receivers. Once connected to the DA2 Siteworks will prompt for a user login based on the user's Trimble Identity (TID). The user must have a Precise Rover option assigned to their TID via license-manager.trimble.com. If a license is properly assigned then there will be a variety of correction options available for use with the DA2. If the user does not have a properly assigned DA2 license then the only correction option will appear as Autonomous, or a "Failed to Connect" message will appear in Siteworks.

Available correction methods for the DA2 include: IBSS, Internet (ntrip), EM940, EM120-2.4GHz, Trimble Corrections Hub (TCH) - VRS, TCH - RTX via Satellite or IP, or WAAS/EGNOS/MSAS.

Import JobXML (.JXL) File for Site Calibration Information

Siteworks v1.70 introduces the option of now selecting a JXL file when creating a Project to use as the Site Calibration information. This functionality also works when simply copying a JXL file into an existing project structure as a replacement for the DC file. Siteworks will read the necessary transformation parameters from the JXL and use that information in the same way as a DC file.

This functionality will improve interoperability between Siteworks and other Trimble office and field software that produces JXL files such as Trimble Access and Trimble Business Center. Note that only coordinate system information is supported at this time and not any measured or design data.

There may be instances where Siteworks will present an error message of: "Unable to load projection. Make sure the required files are in the Trimble GeoData Folder". In this case a missing geodetic support file (e.g. Geoid file or XML) is missing. To determine the missing files Trimble recommends opening the JXL in a text editor and searching for the names of the missing geodetic files. This can be done by searching for "GGF" or "XML" in the text editor's search function. The necessary files can typically be found on a computer that has had the Trimble Coordinate System Manager or Trimble Business Center software installed at the following path: *C:\ProgramData\Trimble\GeoData.*

For exports to Trimble GCS900 Grade Control System and Trimble Earthworks Grade Control Platform, only a CAL file will be produced. A CFG file is not produced when using a JXL as the

Project's calibration information. Geoid files will not be exported from the data collector for GCS900 exports and must be manually copied when using a JXL.

New Info Bar/Panel Item for Stake Distance

A new "Stake Distance" item has been added to the Info Bar and Panel options. This new Stake Distance will always give a straight line distance from the current user's location to the stake point and not switch to the paired "GO N/S GO E/W" (GNSS) directions when within two meters of the stakeout point or "Go Farther/Come Near Go Left/Right" when using a total station. This new option is displayed as a "GO" distance in the Info Bar/Panel, the difference being that it will not break into the two individual GO distances like the existing "GO" Info Bar/Panel option does. Previously for total stations, the GO distances were only shown in a "Go Farther/Come Near" format .

When further than 2m from the point, the values for the GO and the Stake Distance will match.
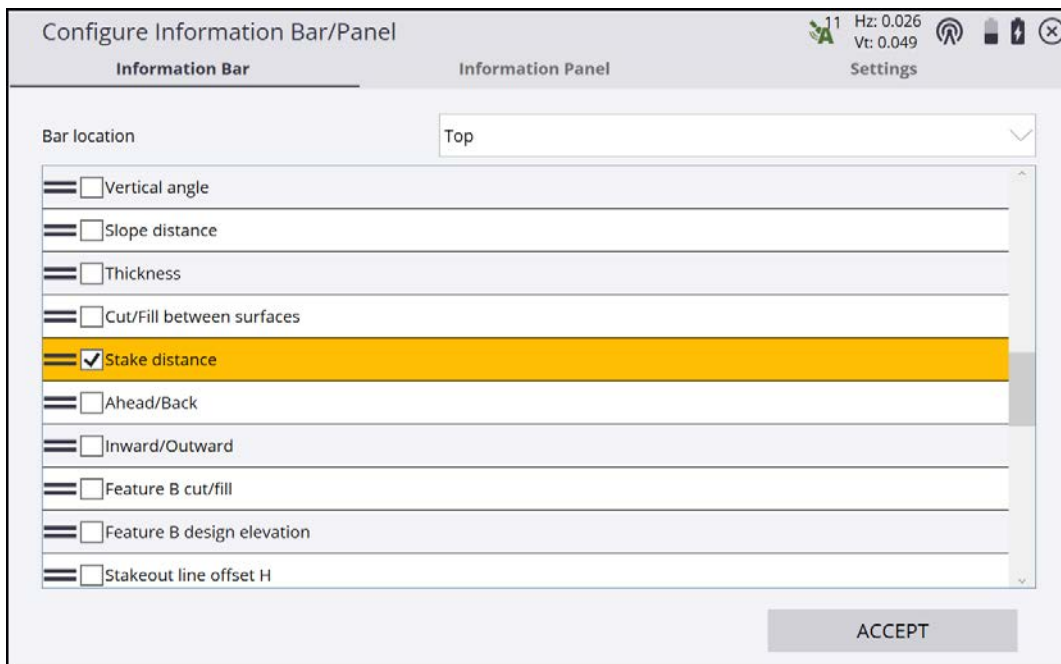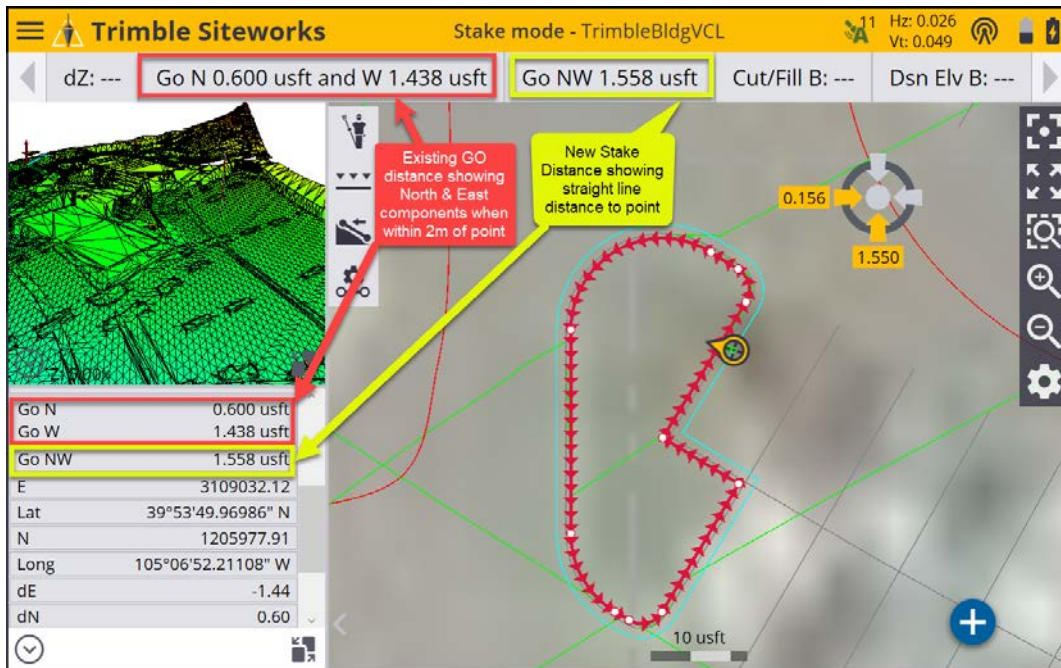
Machine Guidance IMU Icon in Status Bar

A new icon button has been added to the top status bar when in Machine Guidance mode that indicates the status of the connection to the IMU. If the connection to the IMU is lost the icon will have a red strikethrough it. Siteworks Machine Guidance is not available in Siteworks SE Starter Edition.

Tapping on the icon highlighted in the red box below will also open the Machine Guidance Diagnostics Screen. This screen contains information that can be used in troubleshooting and to review what settings are active. Note that the icon is currently only displayed in the status bar on the main map view and will not be visible in workflow windows.

Total Station Height Defaulted to "Slope"

The Total Station Height option has been defaulted to Slope when doing a known point setup. The last used option is also now remembered. When doing an unknown point setup (resection) the

measurement screen still shows vertical height, but by tapping the ⑦ icon a slope height can be entered. In this screen the slope setting will be defaulted to and the last used option also

remembered. This new default slope setting has not yet been applied to the Network Measurement workflow. Clarifying text has also been added to workflow screens to indicate whether the displayed height is slope or vertical. Note that many workflow screens will still display the vertical height, which is automatically converted from the entered slope height. Text throughout the software has been updated to make it more clear when a vertical height is being used.

Total Station Scale Factor Settings Shown during Instrument Setup

A new checkbox option for "Show Corrections at Startup" has been added to the Total Station Corrections screen, where the Project scale factor and Mean Sea Level corrections are entered. The Scale Factor Corrections screen will now always be shown when connecting to a total station unless the option is unchecked. The screen will still appear even after accepting any settings and confirming the "These settings cannot be changed for the project once they are set. Continue?" prompt.

The Ctrl+O option menu item for "Display Scale Factor Option at Connection" has been removed as a result of this change.
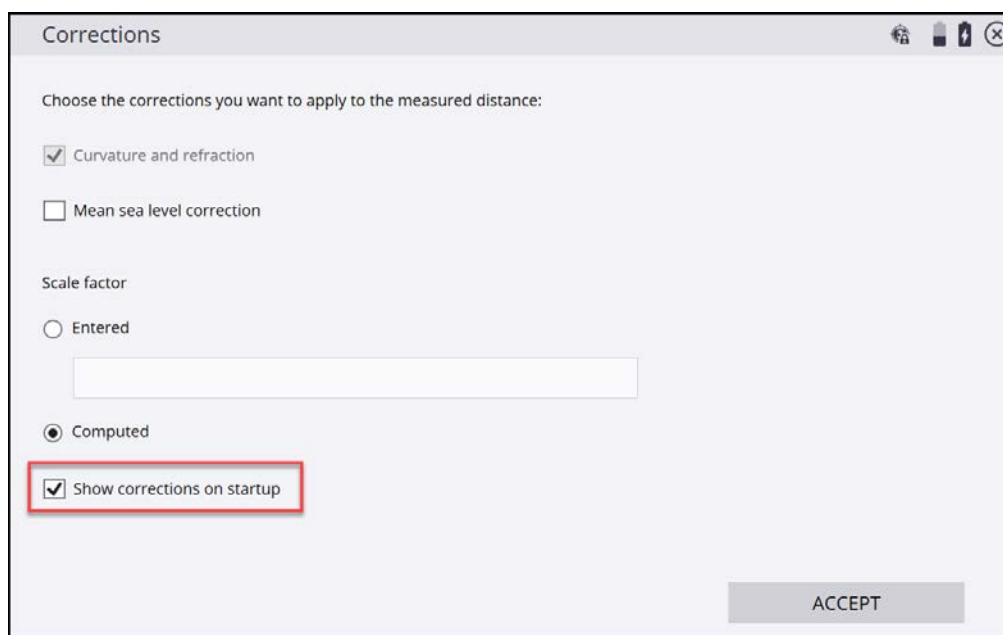
Point Visibility of Design Files now Controlled by Layer

An update has been made to control the visibility of point objects in VCL, DXF, and DWG design files by the layer that the points are on, instead of using the "Stakeout Point" checkbox in the Measure Tab of the map settings. Toggling the visibility of the layer that the points are on in the design file will now turn the points and any other non-point objects on that layer off/on. Stakeout points from CSV files are still controlled by the "Stakeout Point" checkbox in the Measure tab.

Enhanced Machine Guidance IMU Calculations

Dogbone IMU calibration calculations have been enhanced to improve system accuracy for a wider variety of machine dogbone geometries. Users that have already performed an IMU calibration and desire to take advantage of this update will need to perform a new Dogbone Calibration. Alternatively, for those users not wishing to perform a new dogbone calibration, opening the MCFG file located in the *Trimble SCS900 Data Folder* in a text editor and deleting the entire *<Coefficients>* row (i.e. delete everything in the row starting with and including "*<Coefficients>*" all the ensuing numerical values through "*</Coefficients>*" and saving the file will update the dogbone calibration. It is recommended to save the modified MCFG as a new file, or to backup the original prior to performing this operation.

General improvements

- Several higher baud rate options have been added to the pulldown list for selecting the baud rate when setting up external radio connection via a serial cable.
- Coverage grid map setting is now defaulted to OFF and the setting will be remembered at the Project level.
- Background Image transparency display values have been reversed such that 100% transparency is now fully transparent or "invisible", while 0% is fully opaque with no transparency applied.
- Display bug fixed where trunnion values in the UTS leveling screen were getting cut off on smaller screen Android devices.
- Removed any hidden files starting with a period when exporting an Earthworks Project Library to USB to prevent a critical Earthworks crash.
- Added additional information to logging messages sent to Trimble servers for usage and crash analytics.
- VCL Libraries updated to v5.90

Known issues

- Starting with version 1.60 TIFF images are not supported as background images. Users requiring TIFF image support will either need to use v1.50 or below, or convert the images in a third party software to PNG, JPG, BMP, GIF or PDF to be able to import TIFFs into v1.70.

For more information

For more information contact your local Trimble regional account manager.

Firmware and operating system compatibility

Version 1.61 of the Siteworks software supports the following firmware versions in total stations, GNSS receivers, radios, and operating system versions for handheld computers. Trimble cannot guarantee compatibility or support for a device that is not specifically listed in the table below. Please see prior release notes for details on Siteworks prior to v1.41. Note TPP expiry dates are for the end of the month listed.

TSC7, T7, Site Tablet 10, T10, T100, Panasonic Toughpad
TDC600, TSC5, Samsung Galaxy Active Tab, S7, S4, S3, S10+ Smartphone

	v1.41	v1.42	v1.43	v1.44	v1.50	v1.60	v1.70
Trimble Protection Plan Expiry	JUN 2021	OCT 2021	JAN 2022	JUN 2022	OCT 2022	APR 2023	JUL 2023
SNPCOM Server	R5.0.31.46	R5.0.31.46	R5.0.31.46	R5.0.31.46	N/A	N/A	N/A
Minimum Controller OS	Win10 Pro v1709+ Android v8.0	Win10 Pro v1709 + Android v8.0	Win10 Pro v1709+ Android v8.0	Win10 Pro v1709+ Android v8.0	Win10 Pro v1709+ Android v8.0	Win10 Pro v1709+ Android v8.0	Win10 Pro v1709+ Android v8.0
R780	Not Supported	Not Supported	Not Supported	v6.13	v6.16	v6.20	v6.21
R750	Not Supported	v6.12	v6.13	v6.13	v6.16	v6.20	v6.21
SPS855	v5.50	v5.52	v5.53	v5.53	v5.56	v5.60	v5.61
SPS986	v6.10	v6.12	v6.13	v6.13	v6.16	v6.20	v6.21
SPS785	v4.20	v4.20	v4.20	v4.20	v4.31	v4.31	v4.31
SPS985	v5.50	v5.52	v5.53	v5.53	v5.56	v5.56	v5.56
SPS985L	v5.50	v5.52	v5.53	v5.53	v5.56	v5.56	v5.56
SPS585	v5.48	v5.48	v5.48	v5.48	v5.56	v5.56	v5.56
MPS865	v4.20	v4.20	v4.20	v4.20	v5.21	v5.21	v5.21
DA2	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	v1.55
SPSx20	M3.9.9	M3.9.9	M3.9.9	M3.11.1	M3.11.1	M3.12.8	M3.12.8

SPSx30	C10.9.8	C10.9.8	C10.9.8	C10.11.1	C10.11.1	C10.12.8	C10.12.8
SX12	Not Supported	Not Supported	Not Supported	Not Supported	S2.16.14	S2.7.8	S2.7.8
SX10	Not Supported	Not Supported	Not Supported	Not Supported	S2.6.5	S2.6.5	S2.6.5
EM100	v5.47	v5.47	v5.47	v5.47	v5.47	v5.47	v5.47

Legal Notices

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Release Notice

This is the August 2023 release of the Trimble Siteworks Site Controller Software Release Notes. It applies to Version 1.70 of the Trimble Siteworks Site Controller software.