# **Release Notes**

CIVIL CONSTRUCTION
17 APRIL 2024

## TRIMBLE SITEWORKS SOFTWARE VERSION 1.72



This document contains late-breaking product information, updates, and troubleshooting tips additional to the Trimble® Siteworks Software documentation.

- Introduction
- New features and functions
- General improvements

- Known issues
- Firmware and operating system compatibility
- Legal notices

#### Introduction

Trimble Civil Construction is pleased to announce the release of version 1.72 of Trimble Siteworks Software. Version 1.72 is available at no charge to all March 31, 2024 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 <a href="install.trimble.com">install.trimble.com</a> 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 controllers via TIM (note that license transfer is not available from SiteMobile devices or for SCS900 v2.X). Please contact your SITECH® distributor for license transfers.



Siteworks version 1.72 is available for operation on the following Trimble site controllers running **Windows 10**:

- Trimble TSC7 Controller
- Trimble Site Tablet 10
- Trimble T7 Tablet

- Trimble T10 Tablet
- Trimble T100 Tablet
- Trimble Panasonic Toughpad FZ-M1

Siteworks Mobile v1.72 for Android $^{\text{TM}}$  is also supported on the following **Android** Tablets running Android 8.0 (Oreo) or above:

- Trimble TDC600 Controller
- Trimble TSC5 Controller
- Trimble TDC6 Controller
- Samsung Galaxy Tab Active Pro
- Samsung Galaxy Tab S3
- Samsung Galaxy Tab S4
- Samsung Galaxy Tab S7
- Samsung Galaxy S10+ Smartphone

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 the target 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. Any total station features are not available in Siteworks SE.

## **Layer Support for Measured Data**

Users with the Advanced Measurement Module (AMM) and using a Feature Code Library FXL that has feature codes on defined layers will now be able to toggle the display of the layers that the feature coded measured data are on. Siteworks now reads and lists the layers that are defined in the FXL file in the Layer Manager of the Map Options. Any measured points or lines associated with a feature code that has a layer assigned will be placed onto that layer, and the layer visibility of that measured data can then be controlled via the Layer Manager. A new column for layer type has





been added on the left in the Layer Manager to visually indicate whether the layer is from the design file or the FXL file. Layers from the FXL file and measured layers are indicated by a "FXL" and layers from the design file in indicated by a small surface icon: .

The layers in the Layer Manager can be sorted alphabetically based on any column title, including the visibility checkbox column and the new layer type column. It is possible to change the layer of a measured item by changing the associated FXL code; it is not possible to change the layer of an object without changing the object's FXL code.

Measured data that is not associated with a FXL code is listed in the layer manager as "Siteworks Measured Data". Stakeout points, including any design points that are created when using the stakeout surface command or when staking a line will be placed onto the "Siteworks Stakeout Data" layer. This Stakeout Data layer will include points that are created when staking a location that does not have an existing point at it. For example, when staking a line Siteworks has always created both a "design point" and a "stakeout point" at the selected location. In cases where there is no preexisting point at the stakeout location, both the newly created design point and stakeout point will be placed onto the "Siteworks Stakeout Data" layer. This enables the toggling of stakeout points. Note that stakeout flags will only get toggled by the Stakeout data layer when the design point is on the Stakeout Layer, i.e., if a design point is existing or on another layer then the stakeout flag will still be visible when toggling the Stakeout Data layer. For design points that are on the Stakeout Data layer, those flags will be toggled by the Stakeout layer visibility. As with prior versions of Siteworks, all Stakeout flags can be turned off/on by the checkbox for *Stakeout Flags* in the *Design* tab of *Map Options*.

Siteworks reads the layers that are present in the FXL file and will load them into the Project. This enables the layers from the FXL to persist even if the FXL file is removed or changed. Changing the FXL file to a different one will then add the layers from the second FXL, while also retaining the layers from the first FXL. Therefore each time a new or modified FXL file is used on a project the layers in the FXL will be added to the Project. If a FXL is removed from the Project the layers present in the FXL will persist, and remain in the Layer manager. It is not possible to delete layers in Siteworks once they are added. Therefore it is recommended to ensure that the layers in the FXL are configured properly before using the FXL in Siteworks.

When creating a new feature code within Siteworks with the AMM it is also now possible to assign the new code to an existing layer from the FXL file or to create a new layer. A new item in the FXL Group Code Filter for "Siteworks" has been added that when selected will only show those layers that were created in Siteworks and were not originally present in the FXL file.

This layering feature is not available in Siteworks SE Starter Edition since Siteworks SE does not support FXL files or the AMM.

https://community.trimble.com

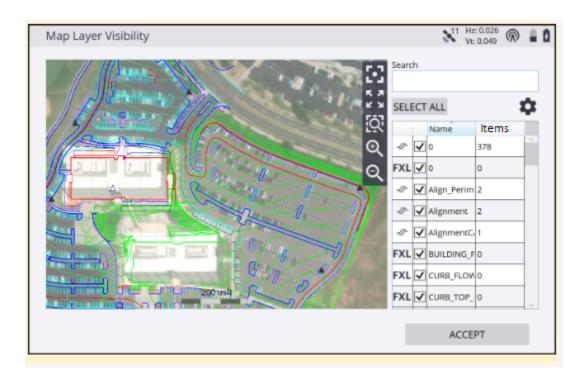
Trimble.

## **Additional Layer Management Enhancements**

A new more fully featured layer manager has been added to Siteworks that is accessible from the

main plan view map, cross section and profile views. Tapping on the layer manager icon the right side map toolbar will bring up the new *Map Layer Visibility* split screen as shown below. This screen allows users to toggle measured and design layers in a searchable, sortable and filterable list on the right side, where the layer display will update in real time in the preview map window on the left. Please see the descriptions below for the details of the new search bar, toggle column, and layer object type filter. Note that the original existing Layers "tab" of the Map Options,

accessed through the Map Options icon on the main map screen is not a split screen, like the new Map Layer Visibility window, although it does contain the new search, filter, and toggle columns.

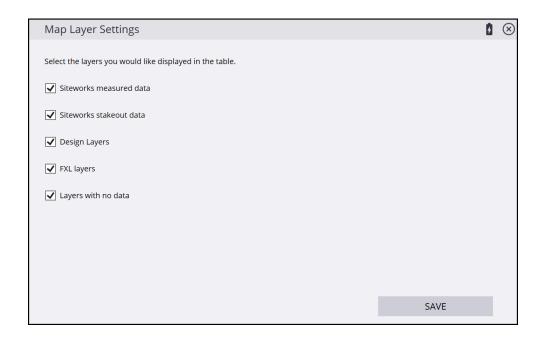


A **search bar** has been added to the layer manager screens that enables real time searches for any portion of a layer name. Typing in this field will filter the list to those layer names matching any



portion of text entered into the search window. For example entering "AR" will filter to display any layer names containing those letters such as "Area" or "Parking". The filter is not case sensitive.

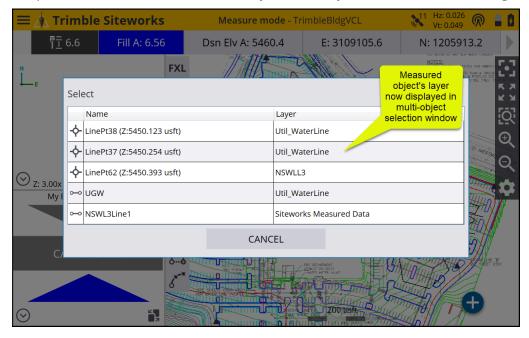
A **new layer object type** filter also has been added. Tapping the gear icon in the upper right of the layer manager screen will bring up the window shown below where the checkbox for different layer types can be selected. The options include *Siteworks Measured Data, Siteworks Stakeout Data, Design Layers, FXL Layers*, and *Layers with no data*. "Design Layers" are those layers that are present in the currently loaded DXF, DWG or VCL design file, "FXL layers" are those layers in the Project's FXL file or created in Siteworks, and "Layers with no data" are those layers that do not contain any objects. The "Count" will be updated to display the number of layers displayed in the table. Note that these checkbox options do not turn the respective layers off or on in the map view, they only control if they are displayed in the layer table screen where they can then be toggled off or on.

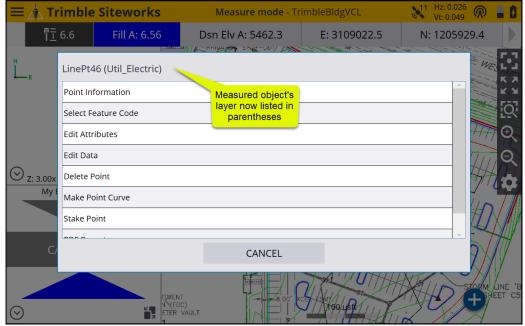


Measured object's layers are now also displayed in the tap and hold popup both in the multi-object selection screen. The object's layer is listed in the displayed layer column, and also in the individual

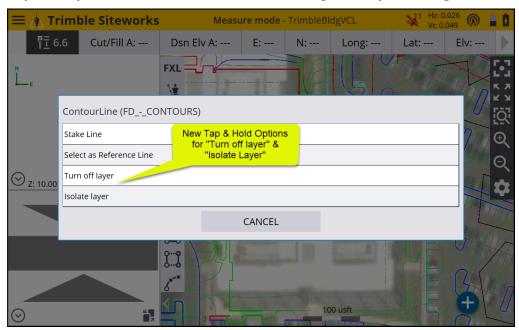
6

object's pop up where the layer name is displayed in parentheses, as is currently done for design CAD objects. In prior versions of Siteworks the layer was only identified for CAD design data.

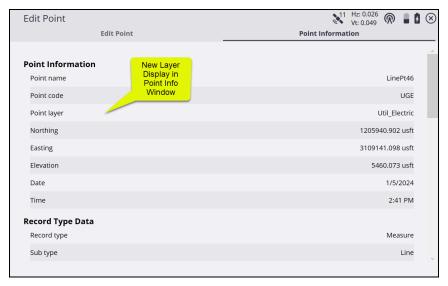




New options to toggle layer visibility are now also available when selecting an item in the tap and hold popup. A new option to "Isolate" the object's layer to turn off all other layers but the object's layer is present. It is also now possible to turn off just that object's layer in the tap and hold pop-up menu by selecting the new "Turn off layer" option. Choosing the "Turn off layer" option will also deselect the object. Layers are to be turned back on through the layer manager screen.



The layer that measured points and lines are on is also now indicated in the Point or Line Information screen by a new row in the point or line information section.





# Updated and Enhanced Excavator Measureup in Siteworks Machine Guidance

A completely new, simpler, and more accurate measureup and commissioning routine in the Siteworks Machine Guidance module has been added. This new measureup does not require the precise alignment of the GNSS bracket on the excavator stick to the pivot point, or require the GNSS, Pivot Point and cutting edge to all be in a vertical plumb line during the commissioning process. Existing measureups performed in earlier versions of Siteworks are compatible with



Siteworks v1.72 and no new measure-up is required after the update. Please see the updated Siteworks Machine Guidance commissioning guide available to SITECH distributors on the Partners community for more information.

### .PRO File Support on Android Devices

It is now possible to use .PRO design files on Android devices. Support for corridors, alignments, and nodes are identical to Windows systems. Note that Key-In-Corridor functionality and the export of .PRO files from the Key-In-Corridor workflow is still not supported on Android devices.

### **Enhanced VCL Linestring Support**

Version 1.72 added several enhancements to Linestrings present in a VCL design file. Siteworks is now using the native Trimble Business Center VCL libraries to obtain the linestring's elevation and other information along the linestring. Siteworks' linestring behavior will now more closely match TBC with respect to elevations along the linestring. Note in the discussion below that "VPI" refers to those elevation values entered into the "Vertical" tab in the Linstring editor in TBC, while "nodes" are those elevations entered in the "Horizontal" tab. These enhancements are currently only for VCL LineString data.

In prior versions of Siteworks if a linestring had any missing or null horizontal node elevations it would be treated as a 2D line in staking and COGO operations. Now Siteworks supports linestrings with any number of null nodes and VPI values as full 3D lines as long as one node or VPI is populated. Siteworks will linearly interpolate the elevation between any null elevation nodes based on the adjacent VPI or node elevations. If a linestring has only one node or one VPI elevation then the linestring will be treated as a constant elevation line based on the one elevation value. For elevation projections beyond the end of linestrings, such as when staking a line beyond its endpoints, Siteworks will project the linestring's "instantaneous slope" (as would be displayed in the "Explore Object" in TBC) from immediately before the end node. Siteworks also now treats all linestrings as if the "Extend Vertical" option is set to True in the linestring's properties in TBC.

Note that any VPI's present beyond the ends of the linestring are ignored in all cases unless there is a missing node elevation at the linestring's end. In that case Siteworks will use the VPI beyond the endpoint as an elevation point to linearly interpolate between the last elevation node or VPI on the line and the VPI that is off the line. Also note that if a node and a VPI have the same station value



but different elevations then the VPI's elevation takes priority. These behaviors are all consistent with TBC's treatment of Linestrings; Siteworks should now be replicating TBC's linestring behavior with respect to elevation data.

The new added VCL linestring functionality offers the following specific benefits:

- Full support for Linestrings in COGO. Users can now select and create offset points from linestrings with "No Curve" VPI data. When creating an offset line from a linestring that contains VPI points, those VPI points will be added to the offset line as tangent points. Previously users could not create offset lines from linestrings that had any VPIs.
- Support for linestrings with missing node elevation values. Now a linestring only needs a
  single VPI or horizontal node elevation to be recognized and usable in Siteworks as a 3D line.
  The linestring's elevation will be interpolated across any missing node elevations by using
  adjacent node or VPI elevation values. In prior versions of Siteworks any linestrings that had
  nodes or VPI's with a missing or null elevation would be treated as 2D lines at zero elevation
  in Siteworks.
- Improved projection of a linestring's elevation beyond the linestring's endpoints. Siteworks now will project the endpoints "instantaneous slope" value beyond the end of the linestring instead of the segment's slope. If there is a VPI point defined for the end segment then the slope created by that VPI will be used to project the linestring's slope beyond the endpoint.
- Improved compute distance values. Siteworks can now include the VPI data when computing the total slope distance for a selected linestring in the COGO Compute Total Distance tool.
- Linestring direction is now a shared setting. The direction of a linestring will be remembered until a design is reloaded. If the user reverses the linestring direction during a staking operation or during a COGO operation Siteworks will use the new reversed direction by default. Note that to prevent issues with staking direction the user cannot reverse the direction of a linestring actively being staked when outside the staking feature, such as if a COGO operation were to be performed on the actively staked linestring.
- Consistent design elevations between TBC and Siteworks. Now Siteworks will better match
  precise elevations of linestrings at any given station. Previously there may have been small
  discrepancies between Siteworks and TBC. Now in smooth curve segments between
  Siteworks and TBC there should be no differences. Also because Sitworks and TBC differ in
  the offset algorithms there may be some slight elevation differences around sharp corner
  points.
- Siteworks now supports non-zero begin station values for linestrings that have a "double underscore" as a prefix to the name of the linestring. In TBC if you put a double underscore at



the start of the LineString's name you get the option to define the line's start station value. Siteworks will look for this and use it as the default start station when using that line.

#### Several Limitations exist to be aware of:

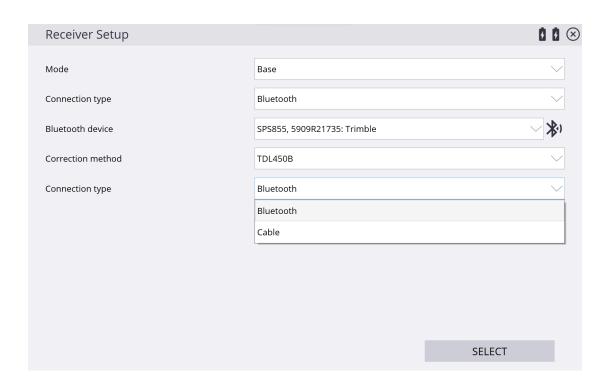
- When using the COGO Offset Line Command only horizontal node elevations are used. VPI values are not considered when performing an offset line. If a line to be offset contains VPIs then it will be treated as a 2D line of constant elevation and the user will have to select what type of elevation value to apply to the line. The limitation is when the LineString has parabolic or arc VPI data. If the LineString has node and 'no curve' VPI data we can create an offset line that matches the original line by creating new line nodes at the 'no curve VPI' station. If the LineString contains parabolic or arc VPI data, we can't replicate the line's elevation so we treat it as a 2D line. Selecting a LineString that has Parabolic or Arc VPI data, Siteworks will display an error message telling the user it will be treated as a 2D line.
- Determining the elevation of a point at a line intersection will only use horizontal node elevations in the line calculation. VPI elevations are not supported for extracting elevations.
- Siteworks will only use the start and end node elevation of the selected line segment when projecting the line segment to the intersection point. Any VPI data between those nodes will be ignored.

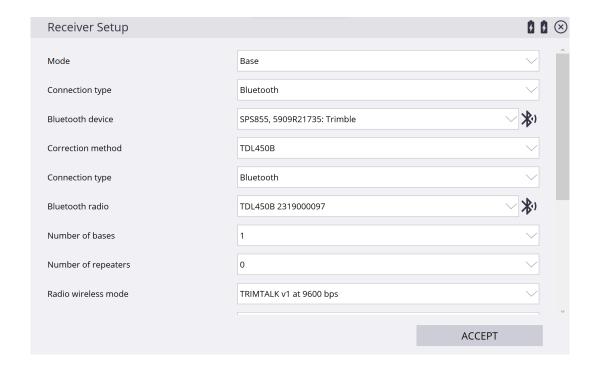
### **Support for the TDL450B External Radio**

Enhanced support for the TDL450B radio has been added whereby the external radio can be configured as if it was an internal radio to the GNSS. This Managed External Radio (MER) support is available with the R780, R750, R580, SPS986, and SPS855 when those receivers have been updated to the latest firmware of v6.25 or higher. All other receivers or receivers running firmware 6.24 or below will continue to operate with the TDL450B as before, i.e. the radio must be configured outside of Siteworks.

To use the TDL450B as a MER simply select TDL450B as the "Correction method" after connecting to the supported GNSS receiver. Then configure the connection type to the radio (Bluetooth or Cable) and number of bases, etc., as would be done for any internal 450MHz radio.





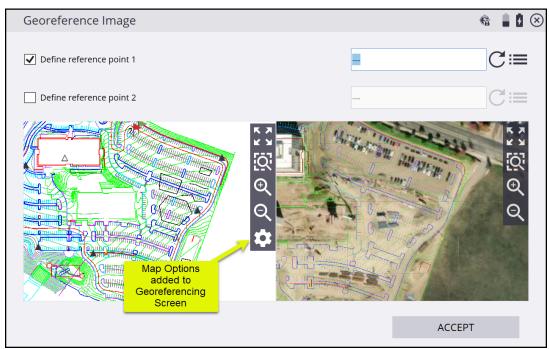


### **New Utility Locator Model Support**

Siteworks v1.72 now supports the Vivax vLoc3-Pro and Radiodetection RD8200 models. Note that all types of RadioDetection locators require bluetooth pairing in the device's operating system prior to launching Siteworks. Also on RadioDetection locators only data format 1 is supported. Please see the Siteworks user guide for more information on configuring and using Utility Locators within Siteworks. Utility Locator use in Siteworks requires the Advanced Measurement Module and is not available in Siteworks SE.

## Map Options added to Background Image Georeferencing Screen

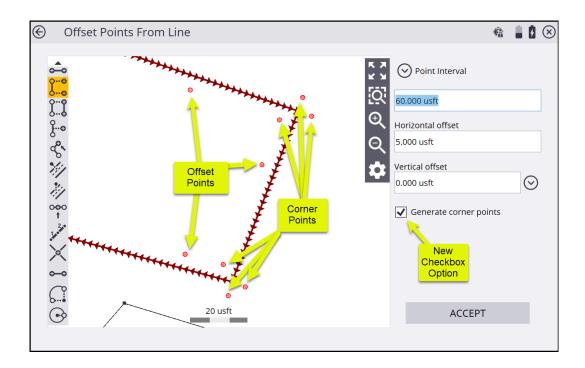
The map options "gear icon" has been added to the left side georeferencing screen when performing the two point georeferencing procedure. This enables users to access all the map options to turn off and on things like layers, coverage grid, point names etc. Any changes made in the map options while performing the georeferencing will be reflected in the plan view map when returning to the main screen.





#### **New Option to Toggle Offset Corner Points in COGO**

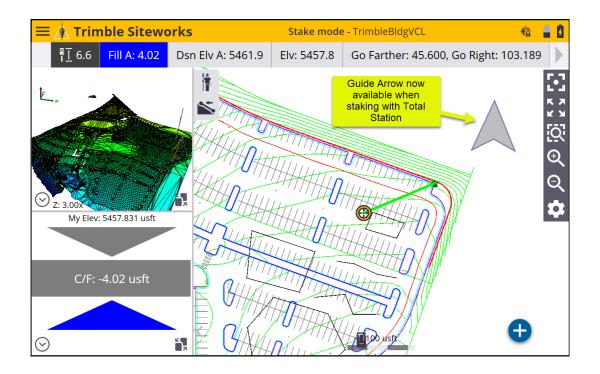
A new checkbox option has been added in the "Create Offset Points From Line" COGO feature to toggle the generation of corner points when using the "Line Nodes and Interval" setting. This option is not available for the "Line Nodes Only" option. In prior versions of Siteworks corner points were always generated; this new option allows for turning those points off. When the new "Generate Corner Points" option is checked Siteworks will behave as in prior versions and create corner points on the "outside" of corners, and the inside if the offset points are . When the box is unchecked Siteworks will not create the corner points.



## **Total Station Staking Guide Arrow**

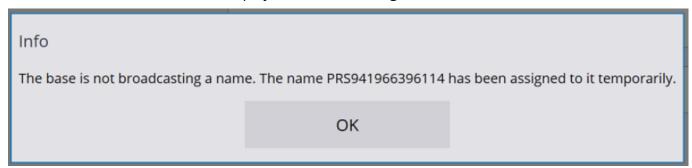
When using a total station to stake a fixed station on a line or a point or a guide arrow will be visible directing the user towards the selected location. This behavior now matches the GNSS guide arrow when at distances greater than two meters from the location. Once within two meters of the point the fine stakeout guidance bullseye will appear, as it always has. This guide arrow can be toggled off/on in the "Guide Arrow" checkbox in the Map Options Design Tab.





## **Better Support for third-Party Base Station Correction Messages**

It is now possible to connect to third-party base stations that do not broadcast a base name in the correction message. If Siteworks does not detect a base name during a rover setup, it will assign a temporary base name internally to enable the connection. Note that no changes are made to the base station via Siteworks; the temporary base name is just internal to the rover setup in Siteworks. When this occurs Siteworks will display the below message:

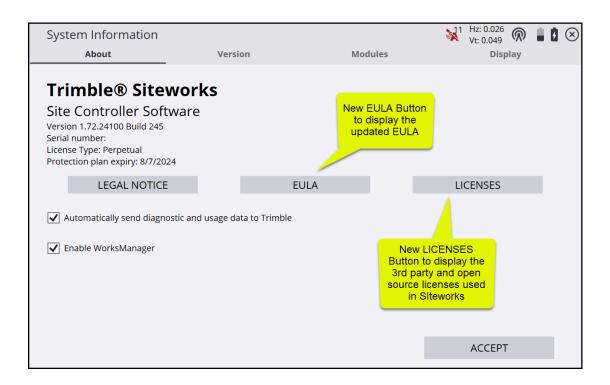


The numbers after the "PRS" are obtained from the base station setup parameters.



#### **End User License Agreement Updates**

The EULA has been updated to reflect a standard Trimble EULA. Also it is now possible to display the EULA in the *About* tab of the *System Information* Page by tapping the "EULA" button. An additional "Licenses" button has also been added listing the other Open Source licenses used with Siteworks.



## **General improvements**

- Total station pressure and temperature values are now stored to the tasklog.
- Arcs are now included when performing COGO area computations. In prior versions of Siteworks Arcs were chorded which resulted in inaccurate area calculations for lines that had arc segments. This update also now allows for the calculation of the areas of circles.
- Performance increase on Android to save approximately 10 seconds at startup.
- Updated light green stakeout lines to a darker green to improve visibility in sunlight.
- It is now possible to configure a MPS566 receiver as a base station in Siteworks.



- Fixed an issue introduced in v1.71 on Android devices where photos taken by Siteworks were not exposed correctly.
- Fixed an issue where a Tilt Compensated receiver may not have been in the correct mode when switching measure modes.
- Fixed a bug in Create Offset points where the user-entered vertical offset was not being applied at offset points at a corner node.
- A text-wrapping issue in PDF reports was fixed where long names were not wrapped correctly.
- Fix made for Works and Works Plus Subscription licenses that could not connect to Total Stations. Now any Works and Works Plus licenses will be able to connect to Total Stations.
- Fixed an issue using published coordinate systems that had commas in their names.
- A bug was fixed that could cause Siteworks to display the incorrect sign of the offset value when staking a 2D linestring beyond the end of the linestring.
- Crash fixed when entering a "\*" character into the VRS or IBSS password field during rover setup.
- Design Selection Fixed bug in Siteworks where the wrong VCL surface was being selected when
  changing work orders. Siteworks now correctly populates the "Surface" selection box for the selected
  design when changing work orders.
- Tap and Hold fix When switching the active measured line using the Tap and Hold menu, Siteworks will now correctly close the line that was previously being measured.

#### For more information

For more information contact your local Trimble regional account manager.



## Firmware and operating system compatibility

Version 1.72 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 earlier version release notes for details on Siteworks prior to v1.43. 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

	v1.43	v1.44	v1.50	v1.60	v1.70	v1.71	v1.72
Trimble Protection Plan Expiry	JAN 2022	JUN 2022	ОСТ 2022	APR 2023	JUL 2023	NOV 2023	MAR 2024
SNPCOM Server	R5.0.31.46	R5.0.31.46	N/A	N/A	N/A	N/A	N/A
Minimum Controller OS	Win10 Pro v1709+ Android v8.0						
R780	Not Supported	v6.13	v6.16	v6.20	v6.21	v6.23	v6.25
R750	v6.13	v6.13	v6.16	v6.20	v6.21	v6.23	v6.25
R580	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	v6.23	v6.25
SPS855	v5.53	v5.53	v5.56	v5.60	v5.61	v5.63	v5.65
SPS986	v6.13	v6.13	v6.16	v6.20	v6.21	v6.23	v6.25
SPS785	v4.20	v4.20	v4.31	v4.31	v4.31	v4.31	v4.31
SPS985	v5.53	v5.53	v5.56	v5.56	v5.56	v5.56	v5.56
SPS985L	v5.53	v5.53	v5.56	v5.56	v5.56	v5.56	v5.56
SPS585	v5.48	v5.48	v5.56	v5.56	v5.56	v5.56	v5.56
MPS865	v4.20	v4.20	v5.21	v5.21	v5.21	v5.21	v5.21



	v1.43	v1.44	v1.50	v1.60	v1.70	v1.71	v1.72
Trimble Protection Plan Expiry	JAN 2022	JUN 2022	ОСТ 2022	APR 2023	JUL 2023	NOV 2023	MAR 2024
DA2	Not Supported	Not Supported	Not Supported	Not Supported	v1.55	v1.55	v1.55
SPSx20	M3.9.9	M3.11.1	M3.11.1	M3.12.8	M3.12.8	M3.12.8	M3.12.8
SPSx30	C10.9.8	C10.11.1	C10.11.1	C10.12.8	C10.12.8	C10.12.8	C10.12.8
SX12	Not Supported	Not Supported	S2.16.14	S2.7.8	S2.7.8	S2.7.8	S2.7.8
SX10	Not Supported	Not Supported	S2.6.5	S2.6.5	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**

#### **Contact Information**

Trimble Inc., Civil Infrastructure Solutions 10368 Westmoor Drive Westminster, Colorado 80021 USA 800-361-1249 (toll free in USA) +1-937-245-5154 Phone +1-937-233-9441 Fax

www.trimble.com

#### **Copyright and Trademarks**

© 2024, Trimble, Inc. All rights reserved.

Trimble, the Globe & Triangle logo are trademarks of Trimble, Inc., registered in the United States and in other countries. AutoBase, RTX, SiteNet, TRIMMARK, TSCe, VRS, and xFill are trademarks of Trimble Inc. Microsoft and Windows Mobile are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. The Bluetooth word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by Trimble, Inc. is under license. All other trademarks are the property of their respective owners. Android is a Trademark of Google LLC.

#### **Release Notice**

This is the **April 2024** release of the Trimble Siteworks Site Controller Software Release Notes. It applies to Version 1.72 of the Trimble Siteworks Site Controller software.



