RELEASE NOTES

TRIMBLE REALWORKS SOFTWARE
VERSION 10.3

System requirements

New Features and Changes

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Introduction

Trimble RealWorks (TRW) software is an integrated software suite for surveyors and engineers that takes advantage of point cloud data sets. Trimble RealWorks is full-featured software that enables you to visualize, explore, register and manipulate an as-built scene of point cloud data. It incorporates a set of useful tools and empowering functions that are particularly suited to civil survey, building, heritage, forensic, plant and other applications. It also allows surveyors and engineers to produce compelling 2D and 3D deliverables for direct output or export to AutoCAD® and MicroStation®.

Trimble RealWorks software is available in a selection of formats ranging from a base version, which includes standard registration and contouring functionalities, to a full function version including all editions. The software allows surveyors and engineers to offer enhanced deliverables in both 2D and 3D format, which clients can then, for example, visualize, manipulate, print, or partially edit.

With Trimble RealWorks Advanced, users have access to advanced registration features and can also leverage the powerful 2D/3D inspection tools as well as cross-section, ortho-projection and profiling features to produce compelling civil survey deliverables.

Trimble RealWorks Advanced-Modeler edition provides a fast and intuitive 3D modeling capability. It is particularly suited to civil engineering surveys and applications such as site refurbishments where modeled and textured structures enhance or complete the impact and scope of a surveyors' or engineers' final deliverable.

The Trimble RealWorks Advanced-Plant edition, which includes all modeling functions, provides powerful tools for various tasks specifically related to the power, process, plant and related environments.

The Trimble RealWorks Advanced-Tank edition includes all features included in Advanced-Plant plus additional tools specifically for the storage tank inspection and calibration market.

To further enable surveyors and engineers to communicate their results to clients and stakeholders, and to reach new levels of success, RealWorks offers its Publisher capability. With Publisher users can prepare self-contained packages that enable final clients, colleagues, and partners to visualize and explore projects in 2.5D, extract 3D information as well as measure and annotate. Trimble continues to also provide the RealWorks Viewer utility for visualization and analysis of 3D data with Trimble RWP files.

System requirements

- Operating system: Microsoft® Windows® 7,8 and 8.1,10 - 64-bit
- Processor: minimum 2.8Ghz (Quad-Core) or higher, (additional cores with Hyper-Threading support strongly recommended)
- RAM: minimum 8GB (16GB and higher recommended)
- VGA card: OpenGL 3.2 compatible with minimum 1GB VRAM (3GB or higher recommended)
- 3-button mouse

Other requirements:

Solid State Drive (SSD) for maximum performance (pref. 500GB) – strongly recommended.

Data Processing			
Description	**New or changes**	**Feature**	**Benefit /comments**
Improved color blending of Trimble TX series scans	Enh	When opening TZF scans acquired by the Trimble TX6 or the Trimble TX8 with images, the transition between overlapping images is now smoother, making the color information more homogeneous across the entire scan.	Better data quality. This results in a better visualization in Scan Explorer as well as on the extracted point clouds in the application's 3D view.
Auto-Classify Indoor: detection of floor (concrete vs grated), ceiling and walls	New	New fully automatic classification of point clouds of indoor environments. Auto-Classify Indoor is a new tool in Production configuration, available from the Cloud panel of the Edit tab. This tool automatically classifies point clouds of an indoor environment into several classes: Floor, Grated Floor, Ceiling, Walls, and Remaining. This tool is intended to work on point clouds containing a single floor. In case of multiple floors, you must first manually separate each floor, e.g., using Scan-based Sampling.	Better data analysis, improved productivity. Enhanced handling of classified datasets.
Auto-Classify Outdoor: power line detection	New	The existing Auto-Classify tool, renamed Auto-Classify Outdoor, now offers a new option of 'Power Line' class. When selected, the function creates a single cloud with all found power lines, in the 'Wire - Conductor (Phase)' layer. In the LAS Export, point clouds in this layer are exported using the LAS ID #14.	Better data analysis, improved productivity. Power line extraction is useful to visually inspect vegetation encroachment in transmission/distribution corridors. It can also be used in conjunction with the Catenary Drawing tool to produce CAD models of existing electrical lines.
Improved performance of target-based registration tool	Enh	Matching targets between station groups is now much faster on projects with hundreds of stations and thousands of targets. The new optimized algorithm uses parallel processing to yield the same result in a shorter computation time.	Improved productivity. Take benefit of your computer's multi-core processor.

Visualization and Navigation

Description	New or changes	Feature	Benefit /comments
Magnifier mode	New	A new efficient way to visually inspect details in the point cloud is now available. To quickly view the area just around the cursor, press and hold the N key to activate the Magnifier mode. This will set the viewpoint, and only display the points in the immediate vicinity. You can pan, rotate and pick points while in this mode. Use the + or – button on the numerical keyboard to increase or decrease the size of the viewing area. Use the * key to reset to the default size. To change the default size, go to 'Preferences > Navigation > Magnifier Mode'. The preferences dialog also contains an option to move the mouse cursor location to the center of the screen when using the magnifier mode. The magnifier mode is ideal for quickly inspection specific areas of the point cloud or for picking and ensuring the correct point is picked.	Improved navigation, visualization and scene understanding. When inspecting details in a large environment, the Magnifier mode enables an efficient interaction because you avoid frequently zooming in and out: you can stay at an overall viewing distance, switch to a close view when needed by pressing the N key, then go back to the initial view just by releasing the N key. You may even use this mode while in Station-based mode: you will then be able to turn around objects while the magnifier mode is active, which yields a very intuitive and powerful way to navigate the data.
Point cloud rendering: Visibility and Shading groups	New	Several new point cloud renderings have been made available in this version aimed at improving the way to visualize and interpret the scan data. These renderings have been grouped in two drop-down lists: Visibility and Shading, now accessible in the display/navigation vertical toolbar. The Visibility group contains modes for displaying only what you would like to see: No filters, Hide Background, See Inside (new), Outline (new). The Shading group contains modes that highlight details depending on the data content: No Shading, Ambient Shading (new), Normal Shading. Combine the Visibility, Shading, Color and Point size options to best match the specific visualization needs of your datasets.	Improved visualization and easier scene understanding. With all the options available, it is now possible to get realistic views in various contexts: data with no normal information (e.g., handheld or mobile scan data), data with poor laser intensity, etc.

Point Shading: Ambient Shading	New	This mode shades each point relative to the amount of ambient lighting it receives. This shading reveals the details. Since it applies on all datasets - it doesn't require normal information or intensity or color - this is the recommended mode for most situations, combined with your favorite color and visibility options.	Improved visualization and easier scene understanding. This innovative rendering mode is particularly useful when no normal information is available.
Point Visibility: See Inside	New	This mode hides the points acquired from behind. This is useful when looking at indoor scans from an outside viewpoint: the first wall will be hidden to let you view the inside. This mode requires points to have normal information.	Improved visualization and easier scene understanding.
Point Visibility: Outline	New	This mode hides all the points on surfaces facing the current view. This is particularly useful for indoor environments. This mode requires points to have normal information.	Improved visualization and easier scene understanding. For structured environments, you can quickly visualize a 2D plan type view simply by using the Outline mode and viewing from the top.

Media

Description	New or changes	Feature	Benefit /comments
Video Creator high quality option	Enh	You can now create videos of significantly higher image quality. When ticking the 'High Quality' option in the Video Creator tool, the produced video now shows more point cloud details and less visual artifacts - flickering and aliasing are highly reduced. This is especially visible when the point clouds consist of several scans acquired from different stations. Note that this option can be combined with all the point cloud color, visibility and shading modes, including the new modes introduced in this version, for obtaining results that best fit your needs. You can still use the 'Quick Processing' option for generating a video more quickly, e.g., for producing a first draft version.	Improved communication, better visuals.

Improved Screen Capture	Enh	Like the Video Creator, 'Screen Capture (High Res)' now produces an image of higher quality. The aliasing effect related to point clouds is highly reduced. Note that since the created image is larger than the screen, you may want to increase the point size to get a visually similar result.	Improved communication, better visuals.

Data Exchange

Description	New or changes	Feature	Benefit /comments
Direct link to AutoCAD®	New	Trimble RealWorks can now directly send point clouds to Autodesk AutoCAD® for an intuitive and productive combined workflow. All you need to do is to start AutoCAD® from RealWorks (go to 'AutoCAD® > Open AutoCAD®' in the Home tab in Production), select the desired point clouds, and press 'Export to AutoCAD®'. This creates point clouds, in RCP format, directly in the open session of AutoCAD®. The exported scan points may contain color, laser intensity, and surface normal information. This feature is compatible with versions 2015 (R20.0), 2016 (R20.1) and 2017 (R21.0) of AutoCAD®. Autodesk Recap® Pro needs to be installed, with a proper license, to be able to use this feature.	Productivity. Efficient workflow by simultaneous use of Trimble RealWorks and AutoCAD®. AutoCAD® and AutoCAD Civil3D® users can efficiently extract small segmented areas of interest and produce deliverables from them.
Publish using all scan points	Enh	Share full resolution scan data with your customers. When running Media>Sharing>Publish, in 'Data File', there is now a new option 'Full, no sampling'. This creates a published project in which each scan has the same resolution as the TZF Scans in the original project.	Better data interoperability. When applicable, share the full data with your customers.
FLS import: luminance correction option	Enh	The FLS import dialog has been enriched to enable you to choose to apply luminance correction when converting the data to a TZF Scan. This way, you can compensate for a too bright or too dark laser luminance.	Better data quality.

LAS/LAZ export: survey feet and US Survey feet	Enh	You can now choose units (meters / survey feet / US survey feet) when exporting clouds or scans to LAS/LAZ format.	Better data interoperability. Useful when working with third-party software solutions that read the data without taking units into account.

CAD Drawing and Surfaces

Description	New or changes	Feature	Benefit /comments
Smart picking for curb and gutter	New	Automatic detection of accurate curb / gutter points from rough user picks. In the picking toolbar, two new options have been added: 'Face of Curb' and 'Gutter'. These two new picking modes enable you to precisely define a point on the top of the curb or on the flowline. Roughly pick a point near the edge of the sidewalk, the software will automatically compute the best curb/gutter point in the neighborhood. These picking modes may be used in the Polyline Drawing tool, the Feature Set tool and the Measurement tool. To check the results without having to zoom in, you can use the new Magnifier mode - by pressing the N key.	Productivity, accuracy / quality of deliverables. Quickly draw a curb or gutter line without having to frequently zoom in and out.
Improved projection-free mesh creation	Enh	In the Mesh Creation tool, the algorithm has been improved when using the 'No Projection' option. The new algorithm now gives results of better quality. Based on parallel processing, it is also much faster than the previous algorithm. When the input points have normal information, this information is used in the computation for yet better results and efficiency.	Enhanced productivity and data quality.
Mesh shading	New	In View > Rendering, the 'Smooth meshes' option has been added. When selected, the existing smooth normal shading is used for meshes. When unselected, flat shading is used: every triangle is shaded using its surface normal only.	Improved visualization and easier scene understanding. The flat shading may be useful when performing a visual inspection, in particular triangles in a mesh.

Improved performance of mesh visualization	Enh	The performance of the mesh rendering has been improved for recent graphics cards. Displaying meshes with a few million points is smooth on such setups.	Improved visualization performance.

Inspection

Description	New or changes	Feature	Benefit /comments
Alignment stationing in Inspection Map Analyzer	Enh	If you add stationing information to an alignment, and use this alignment as 3D path for an inspection map, every position along the path is referenced with respect to the stationing. In particular, in Inspection Map Analyzer > Sections and Shifts, you can now define the position of the slider by typing the distance along the alignment as defined by the stationing, using the current stationing display format. This information will appear in the 2D plot view in the Map Analyzer tool as well as in the name of the created or exported sections.	Enhanced usability. Better interoperability. Better compliance to standards.
Alignment stationing display format	Enh	The labels of the stations along an alignment can now be viewed using different formats: No formatting (1000.00), 2 digits (10+00.00), 3 digits (1+000.00). To change this, go to Preferences > Unit > Alignment Stationing.	Enhanced usability. Better compliance to standards.
Floor Flatness: improved map	Enh	For clarity, the generated map in Floor Flatness Inspection tool doesn't use the scientific notation any more.	Enhanced usability.

User Interface			
Description	**New or changes**	**Feature**	**Benefit /comments**
Vertical navigation/display toolbar	New	A new vertical toolbar has been added to the user interface, next to the 3D view. It contains the most commonly used navigation/display commands: limit box mode, navigation type, projection type, zoom extents, zoom on selection, standard views, hide all, show station, show station labels, point color, point size, point visibility, point shading. These frequently used commands have been removed from all tabs except View for improving clarity in the ribbon.	Enhanced usability. Quicker and easier access to the command you need when navigating - specific tabs in the ribbon are now more lightweight.
Better default Quick Access Toolbar	Enh	Segmentation and Sampling are now by default in the Quick Access Toolbar, at the top of the application. This provides quick access to these commands at any time, always from the same location. Please note that the quick access toolbar is customizable.	Enhanced usability. Quicker and easier access to the commands you need.
Improved interaction with Scan Explorer	Enh	It is now possible to open Scan Explorer from the main Trimble RealWorks window without the need to first save the project. The interaction in Scan Explorer is also more direct: there is no longer the need to set the focus on it to navigate.	Enhanced usability. You can now use Scan Explorer at any time.

RESOLVED ISSUES

LAS Import unit improvement: some cases were not handled
DotProduct import: some files didn't import correctly
Display: fixed instability on all AMD Firepro graphics cards (W7100, W5100) with driver 16.Q4 and newer.
Display: the amount of available VRAM on the graphics card was sometimes incorrectly read
Sampling tool>Scan-based: fixed UI issue with plus and minus buttons
Surface to Model Inspection: fixed issue in the first column of the inspection map when using tunnel projection
Surface to Model Inspection: some maps were incomplete when using the 'vertical' option in step 1
Inspection Map Analyzer: fixed some inconsistencies in the plot view caption when using alignment stationing
Tank Inspection: fixed case where 'Measure Tank' didn't work
Camera Matching tool: markers were hidden when using the Limit Box
Installer: fixed conflict with Faro DLL
Picking: Lowest/Highest picking option did not work properly on some data sets

END