# Trimble RealWorks

## Version 12.X Release Notes

## Introduction

These release notes describe the features and enhancements that are new in version 12.X of the Trimble® RealWorks® software. For further information, visit www.trimble.com/support/.

## System requirements

- Operating system: Microsoft® Windows® 8.1, 10 - 64 bit
- Processor: minimum 2.8 GHz (Quad-Core) or higher, (additional cores with Hyper-Threading support strongly recommended)
- RAM: minimum 16GB (32GB and higher recommended)
- Graphics card: OpenGL 3.3 compatible with minimum 1GB VRAM (3GB or higher and OpenGL4.4 recommended)
- 3-button mouse

**Other requirements**

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

## Upgrade procedure

Install the software from this location **(Internet connection required during installation and license or subscription verifications):** Support and Downloads

http://geospatial.trimble.com

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# Version 12.1

February 4, 2022

# New features and enhancements

## Import and Export

| Type | Description | Feature Overview |
|---|---|---|
| New | Share project via Trimble Clarity | Create a TDZ file to upload to Clarity. 'Home>Sharing>Export Clarity File' and 'Open Clarity'. |
| Enhanced | TZF Scan export with filtering | Filter by min-max range/intensity/spacing. Works with gridded E57 and RCP. |
| Enhanced | RCP export using specific user coordinate system | Define the coordinate frame to be used when exporting to RCP format. |
| Enhanced | LAZ 1.4 export | LAZ 1.4 is now supported, enabling the ability to export data to LAS 1.4 format with optimized compression. Benefits include classes of LAS 1.4, and the ability to export more than 4 billion points. |
| Enhanced | E57 export of leveled stations | When exporting to E57, the tilt is now removed from the stations and applied to the scan points so that the stations have a vertical Z axis. This makes it compatible with external softwares that would not handle leveled stations. |
| New | Import Survey Network from CSV file | CSV files can now be used when importing a survey network file. |
| New | Export station positions to CSV file | You can now export the locations of the stations to a CSV file. |
| Enhanced | JXL Import: Object-oriented stations | Import object-oriented stations created in Trimble Access. These stations are oriented with respect to an object, which does not require any leveling. |
| Enhanced | JXL Import: Improved behavior with scale factor | The control points from the JXL files are unscaled with respect to the center of gravity of the project - and no longer unscaled with respect to (0,0). This means the project is now positioned closer to the ground coordinates stored in the JXL file. |

# Data Management

| Type | Description | Feature Overview |
| --- | --- | --- |
| Enhanced | Extract from TZF Scans: filter by range and intensity | When using Create Sampled Scans, Import and Register, or TSE > Extract Points, you can now filter the extracted points by range and laser intensity. |
| Enhanced | Segmentation: Undo fence | Undo individual vertices when segmenting by using CTRL-Z or the undo button. |

# Annotations

| Type | Description | Feature Overview |
| --- | --- | --- |
| Enhanced | Annotations: Ability to add hyperlinks | In the Annotate tool, you can now include one or several hyperlinks in the text description. |
| Enhanced | Annotations: Pick annotations on Inspection Maps | Create annotations at particular locations of an inspection map by choosing a point in the 3D or 2D viewer. The created annotation will then have a "2D inspection distance" field, storing the value of the inspection map at this particular location. This can be done on all inspection maps - plane, cylinder, tunnel - created in the various inspection tools in the software: Twin Surface Inspection, Surface to Model Inspection, Wall Verticality Inspection, Floor Inspection, and Storage Vertical Tank Inspection (Tank bottom Evaluation). |

# Inspection

| Type | Description | Feature Overview |
| --- | --- | --- |
| Enhanced | 3D Inspection: Ability to filter using min/max distances | Filter the 3D inspection when creating it, directly in the 3D inspection tool, by specifying a min range and/or a max distance. |

## Imaging

| Type | Description | Feature Overview |
|---|---|---|
| Enhanced | Ortho-Projection: Ability to segment point cloud within the tool | Restored functionality to segment the point cloud from within the tool, which was removed when introducing rendering-based ortho-photo computation capabilities. |

## Modeling

| Type | Description | Feature Overview |
|---|---|---|
| Enhanced | Create Pipe: Improvements | You can now modify pipe model extremities manually, using manipulators. T junction modeling is more efficient and can now be edited. Improved elbow curvature handling. Added more keyboard shortcuts to improve productivity. |

# Resolved issues

**KMZ Export:** fixed failure (introduced in version 12.0)

**Cloud-based registration:** fixed crash occurring in some cases after using segmentation

**Segmentation:** fixed crash in specific situations

**Ortho-Projection:** software froze when creating the ortho-image on some projects

**E57 export:** fixed crash when exporting a selection of clouds with 3D inspection clouds

**3D Inspection:** Improved stability when using Sampling and/or Segmentation

**ZFS Import:** compensation parameters were not taken into account

**ZFS Import:** some ZFS files were not imported correctly (introduced in version 12.0)

**Target analyzer:** target extraction failed when TZF scan did not go up to the zenith

**Auto-Classify Tunnel:** fixed instability on some datasets (introduced in version 12.0)

**DWG export:** removed extra point at the middle of the exported line segments

**Trimble Identity (TID):** fixed issue with names having non-ASCII characters

**Feature Set:** labels were not fully displayed nor exported (introduced in version 12.0)

**Annotations:** some non-ASCII characters were not displayed

**License manager:** server name was not editable

**Start page:** project size was wrong when larger than 4 billion points

**Classification:** class names now follow the latest LAS 1.4 (R14) standard

**Software Startup:** Fixed start issue on some computers (issue related to ZFS DLL)

**Software Startup:** Double-clicking a RWP file did not start the software on some computers

**Processing:** Fixed crash occurring during long automatic processings

# Version 12.0

November 3, 2021

# New features and enhancements

## Modeling and Surfaces

| Type | Description | Feature Overview |
|------|-------------|------------------|
| New | Create Pipe Tool | The Model>Piping>Create Pipe tool lets you create full pipe runs with elbows, tee junctions and reducers, from scratch or by connecting pipes from the Auto-Extract Cylinders' command. Pick points on the point cloud to define the sequence of straight elements. The tool creates the full pipe by connecting the straight elements with elbows. The created entities are stored into a pipe group. Elbow angles can be constrained to snap to the closest common angles. The tool can also be used to edit, split or merge existing pipe groups. |
| New | Convert geometries to pipe groups | The Model>Piping>Convert Geometries to Pipe Group command converts imported pipes or pipes previously created in the software. This command converts a sequence of cylinder/torus/cone geometries to the new pipe group. Once a pipe group has been created you can then use the new pipe editing tools. |
| Enhanced | IFC Export | The export of pipe groups to Industry Foundation Classes (IFC) format has been implemented so that elbows are stored as IFCREVOLVEDAREASOLID. Elbows and reducers are mapped to IFCFLOWFITTING entities, while pipe segments are mapped to IFCFLOWSEGMENT entities. All the other geometries are exported as IFCBUILDINGELEMENTPROXY. |
| Enhanced | Auto-Extract Cylinders | The 'Auto-Extract Cylinders' command can now generate the new pipe group objects, which can be further edited in the Create Pipe tool. In addition, we have improved the precision of the geometries extracted. |
| Enhanced | Add Triangles | Surfaces>Mesh Editing>Add Triangles lets you fill holes or redraw existing triangles by manually adding new line segments. |

# Imaging

| Type | Description | Feature Overview |
|------|-------------|------------------|
| New | Convert to ortho image | Imaging>Ortho-Image>Convert to Ortho-Image tool allows you to position and scale an imported image in the 3D environment. |
| Enhanced | Ortho-Image transparency | New capability to adjust the transparency of Ortho-Images displayed in the 3D view. This way, point cloud data and ortho-images can be viewed more easily. |
| Enhanced | Create clouds per scan | In Sampling>Scan-Based Sampling, the 'Split per Scan' option lets you create a list of clouds, one per each scan in the project. |

# Feature Extraction and Segmentation

| | Description | Feature Overview |
|------|-------------|------------------|
| New | Auto-Segment moving objects | Edit>Cloud>Auto-Segment (TZF Based) automatically detects moving objects like cars or people in the point cloud and segments them. |
| Enhanced | Auto-Segment steel beams | Edit>Cloud>Auto-Segment Steel Beams is now more efficient and accurate in segmenting steel beams from the point cloud. |
| Enhanced | Create clouds per scan | In Sampling>Scan-Based Sampling, the 'Split per Scan' option lets you create a list of clouds, one per each scan in the project. |

# Inspection and Comparison

| Type | Description | Feature Overview |
|------|-------------|------------------|
| New | Annotate 3D inspection point cloud | Picking on a 3D inspection cloud when creating annotation points (in Home>Annotation>Annotate) now creates an annotation point with an additional 'Inspection Distance' field, that stores the distance computed in the 3D inspection cloud at this specific point. |
| New | Inspection map empty pixels | The color of empty pixels in the map can now be changed (black or white) in the preferences. |

## Visualization and UI

| Type | Description | Feature Overview |
|---|---|---|
| Enhanced | UI with dark/light themes | Support>Switch Theme to switch RealWorks between a light or dark themed user interface. |
| Enhanced | Start page | Fully redesigned start and welcome screen. |
| Enhanced | Improved 2D labels | Improved support of Asian languages, better performance, transparency options and dark/light themes. |
| New | Fly to navigation | Use shift + left mouse button click to move to an area of interest when using Walkthrough or Examiner mode. |
| New | Point cloud transparency | Visualizing point clouds and modeled geometries at the same time can be challenging, because dense point clouds often block the view of the geometries completely. To help with this issue, a new point cloud transparency mode has been introduced. By clicking the Cloud Transparency button, the amount of transparency can be customized to your needs, between fully transparent to opaque. The transparency only applies when close to geometries. |

**Note**: Please note that RealWorks 12 projects containing annotations or pipe groups are not compatible with earlier versions of RealWorks.

## Resolved issues

**JXL Import**: now supporting path names with non-ASCII characters

**JXL Import from Trimble SX12** : fixed incorrect scan colorization

**LAS Export**: fixed crash when using layer 64 or higher with LAS 1.4

**IFC Import**: fixed crash with some meshes

**IFC export**: improved export - geometries were exported as ifcBeam

**Auto-Segment Steel Beams**: improved estimation of the available VRAM

**Segmentation**: corrected issue - Create button <p> would sometimes not function with very few points

**Sampling**: user can now change the point cloud loading within the tool (useful for spatial sampling or intensity-based)

**Sampling**: a wrong number of points was displayed when cloud had more than 2 billion points

**Limit Box TZF Extraction**: Fixed some cases of missing scans

**Vertical Clearance Measurement** : algorithm made more robust

**Trimble.**

**Cloud-based registration**: improved behavior of rotation manipulators

**Cloud-based registration**: fixed crash when using Registration Visual Check with active manipulators

**Registration**: fixed Cancel behavior in Refine 'Registration using Scans' and 'Auto-Extract Planes and Register':

**Georeferencing**: fixed issue with annotations - some of them were not modified

**Cloud-based Modeler**: fixed UI issue with 'make secant' and 'use given angle'

**Auto-Extract Cylinders**: the process can now be canceled

**2D Easy Line**: fixed random crash

**Mesh Editing**: improved stability and quality when filling holes

**Mesh Editing**: fixed 'reduce mesh' issue on planar meshes

**Mesh Editing**: fixed UI issue when using a limit box - 'reduce' and 'fill holes' were disabled

**3D display**: improved rendering of 'Enhanced Ambient Shading' in parallel projection

**3D Display**: fixed some loading issues with multiple point clouds

**3D Inspection**: fixed some rendering issues on integrated Intel graphics cards

**Image Matching**: Improved transparency slider to make it more visible

**Print**: improved behavior related to ratio of 3D View

# Legal Notices

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## Release notice

This is the February 2022 release of the Release Notes. It applies to version 12.1 of the Trimble® RealWorks® software.