SCENE

Version 2018

The following third-party products are referenced in these Release Notes.

- 3DConnexion SpaceMouse®
- Autodesk ReCap
- HTC VIVE
- Intel® Core™ i7
- Intel® Xeon®
- NVIDIA Quadro®
- NVIDIA® 1080 GTX and 1060 GTX
- Oculus Rift
- OpenGL®
- SteamVR®
- Windows™ 7
- Windows™ XP

FARO does not support these products. Contact the manufacturer for support.

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Introduction

FARO is pleased to announce the release of

SCENE 2018

SCENE LT 2018

SCENE Capture 2018

SCENE Process 2018

We would like to thank the users who gave valuable input for the improvement of the release. With this release, we deliver a new version of the FARO Laser Scanner software that will improve your productivity, your mobility, and ease of use.

Differences Between the Members of the SCENE Software Family

SCENE

The complete workspace creation and manipulation tool. Contains all functionality of SCENE LT, and in addition the functions required for scan registration and export to SCENE WebShare Cloud.

SCENE LT

The free viewer that enables you to view existing FARO scans and workspaces. SCENE LT can import CAD models in VRML format to compare them with the scan points. It also allows for exporting scan points into various file formats, and to SCENE WebShare Cloud. SCENE LT does not allow you to filter scans, create objects for scan registration, or to perform scan registration.

SCENE LT offers the On-Site Compensation functionality, which allows you to test and improve the angular accuracy of the FARO Laser Scanner Focus^S 70, Focus^S 150 and Focus^S 350.

SCENE Capture

SCENE Capture provides everything you need to record your scans with the FARO Freestyle scanner. It is designed to run on a tablet computer and is pre-installed on the tablet computer included in the Freestyle Objects kit. The scan data is stored on a microSD card, which makes it easy to transfer the data to another computer.

Other features:

- Scanner calibration (does not replace factory calibration)
- White balance
- Capturing data
- Processing data
- Easy scan view
- Measure between points

SCENE Process

SCENE Process provides everything you need to process and finalize your entire Freestyle^{3D} scan project. Record your scans with the tablet computer and SCENE Capture, transfer the data and continue working with SCENE Process.

Because processing 3D data is a heavy operation for a computer, we recommend installing SCENE Process on a workstation or on a notebook PC with sufficient performance.

Other features:

- Easy registration functionality
- Level functionality
- Split scan functionality
- Meshing functionality

SCENE WebShare Cloud

SCENE WebShare Cloud is a secure cloud-based solution for storing and sharing scanning data with different project partners.

Scan data published with SCENE WebShare Cloud must be prepared with the respective SCENE features.

SCENE WebShare 2Go 2.0

WebShare 2Go 2.0 is a portable version of SCENE WebShare Cloud.

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64-Bit Support

Because the amount of data created by 3D laser scanners and the processing capacity to achieve a fluent workflow requires a powerful 64-bit computer, SCENE versions from 5.3 are only available for 64-bit Windows systems.

Windows XP

SCENE versions from 5.30 on do not support Windows XP.

Online Help and Video Tutorials

FARO's Knowledge Base provides a variety of laser scanner hardware and SCENE software tutorials on the web. Access them from the Help menu within SCENE or with the following link:
https://knowledge.faro.com/Software/FARO_SCENE/SCENE

Visit the FARO Customer Service area on the Web at www.faro.com to search our technical support database, which is available 24 hours a day, 7 days a week. The link to the technical support database is also accessible from the Help menu in SCENE.

New Features

This is a list of the most important new features of SCENE 2018. For detailed information, refer to the SCENE 2018 User Manuals.

Laser Illuminated HDR

Conventional High Dynamic Range (HDR) images are created by merging several photographs that were taken at different exposures. This can produce an image that has more visible details than any one of the source images.

With version 2018, SCENE introduces *Laser Illuminated HDR* (LI-HDR). With LI-HDR, a photograph of a scanned area is combined with information about the amount of laser light that was reflected by surfaces during scanning. Because the laser provides the illumination, details in areas that are completely over or underexposed in the photograph can nevertheless be added to the LI-HDR image, as shown in this example:

The laser light does not provide color information, so areas illuminated only by the laser are grayscale.

NOTE: This feature is not documented in the SCENE 2018 user manual. To create LI-HDR images, use the following instructions:

1. Open your scan project. (Scans made with the Photon Scanner are not supported for LI-HDR.)
2. Click the processing tab.
3. Click the Process Scans icon and select the scans for which you want to produce LI-HDR images.

4. Click Configure Processing.

5. Under colorization, select Laser Illuminated HDR:
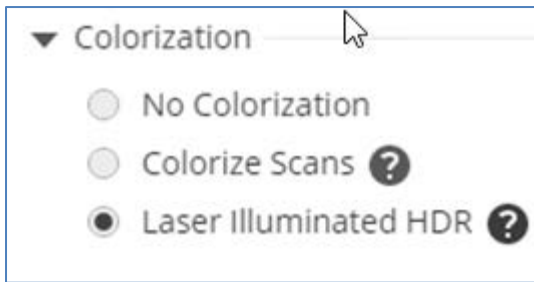
6. Click Start Processing. When processing is complete, the LI-HDR image is visible in the Planar View and the Quick View.

7. If you always want to use LI-HDR when processing scans, you can set this in Settings, Processing, Colorization.

Support for Scan Groups

Some versions of the FARO Focus Laser Scanner can create scan groups. A scan group is one scan grouped together with one or more detail scans that were taken using the scan group function. The scanner records fixed spatial relationships among all the scans in the group.

In SCENE 2018, scan groups represented as a group and are automatically registered. For more information about scan groups, see the June 2018 version of the FARO Laser Scanner User Manual.

Bug fixes and Improvements in 2018

SCENE 2018 provides many bug fixes and improvements. You can read about the most important changes below.

Bug fixes

Issue: If a scan is empty or corrupt, creating an overview map fails with the error message "60037: The Overview Map creation failed."

Resolution: Corrupt or empty scans are now ignored when creating an overview map.

Issue: In some rare cases, automatic sphere detection causes SCENE to crash.

Resolution: This issue has been fixed.

Issue: When double-clicking in the 3D view, SCENE hangs for a few seconds.

Resolution: This issue has been fixed.

Issue: HDR colorization of full resolution scans fails.

Resolution: This issue has been fixed. The scan gets colorized, but no LDR images are saved.

Issue: Sometimes SCENE would take more than 5 minutes to start if there were problems contacting some FARO servers.

Resolution: This issue has been fixed.

Issue: Some Chinese translations were incorrect in the SCENE WebShare Cloud Export dialog box.

Resolution: This issue has been fixed.

Issue: After applying a transformation to a mesh, its bounding box has an incorrect position.

Resolution: This issue has been fixed.

Issue: During angular compensation, SCENE could crash.

Resolution: This issue has been fixed.

Issue: SCENE hangs during RCP export.

Resolution: This issue has been fixed.

Improvements

- The default sphere radius in SCENE has been adapted to 0.0695m and 0.0994m to match the spheres currently sold by FARO.

- FARO scan files now save up to 50% faster.

- Auto adjust large coordinates on imported data

- Correspondence View: The scan manipulator handles are now automatically scaled initially to fit the screen.

SCENE WebShare Cloud

- The SCENE WebShare Cloud export now creates a scan point cloud only if required. When not required, this speeds up the export by up to 75%.

- Quick View now immediately stops compensation computation when the view is closed.

Virtual Reality (VR)

- Improved visualization for teleporting.

- Improved wall detection to eliminate problems with teleporting into walls.

- Reduced movement speed in fly mode.

- Added accelerator button (Oculus: stick, VIVE: trigger + thumb button).

- SCENE now supports Microsoft Mixed Reality Headsets. Note that this requires Windows 10 patch 1709 and Windows Mixed Reality for Steam VR.

- Mesh textures from an imported VRML model are now rendered in VR.

- Viewpoints are now saved when creating screen captures and the user can fly to them.

- Viewpoints created from SCENE are listed in a tab on the VR tablet and the user can fly to them.

- Creating a screen capture now adds it as a picture in the project tree and saves a viewpoint at the same time.

API

- Create and export compensated panorama images with full color resolution (works for HDR and normal color scans)

- FLS files can now be exported without loading the scan data first.

Known Issues

Saving Projects

In some rare cases, saving a project multiple times could result in a scan that cannot be opened.

With SCENE 2018, a new error message is displayed if invalid scans are detected while opening a project. The corrupt scans are named in the error message. The corrupted scan can be removed from the project and the original raw scan can be imported, or an earlier version of the project can be loaded.

Clipping Boxes

Clipping boxes are not rendered correctly with layout plans.

Problems with Intel graphics cards

We recommend using NVIDIA or AMD graphic cards.

If you use the Intel graphics card, use vendor-specific graphics driver and not the standard Microsoft driver.

Project Point Cloud

If a scan project was processed with pre-SCENE 6.1 versions, all scans must be processed with SCENE 6.1 to create a mesh in this project. The recommended workflow for processing in SCENE 7.1 is as follows:

- Switch to new SCENE 7.1 User Interface.
- Process all FARO Laser scans and imported scans by recreating the scan point cloud using the process task in the "Processing" tab.
- Ensure "Create scan Point Clouds" is checked.
- Process all Freestyle scans by opening the scan's context menu and selecting **Operations** > **Process scan**.
- Delete project point cloud.
- Build project point cloud.

ReCap export

Freestyle scans are not exported. In addition, scans imported in E57 format might be problematic and raise an error during the export.

- **Workaround for a project**: Create virtual scans of the Freestyle[3D] data and the E57 scans. Exclude the E57 scans from the export.
- **Workaround for a single scan**: Export the data into E57 format and import those files into ReCap.

SCENE WebShare Cloud Export

SCENE WebShare Cloud export fails for projects in a path with Unicode characters.

Export

When trying to export a project located at a path that contains special Unicode characters, the export currently fails with an out of memory error.

Geo Referencing

Geo referencing of scan projects may introduce very large translations for each individual scan of the project. For example, a scan may be translated thousands of kilometers along the X and/or Y-axis, as shown in the following screen shot.

These translations may lead to problems with 3D visualization. This can also affect SCENE WebShare Cloud overview maps and the export of scan points. The export of scan points with very large translations might be inaccurate.

To avoid problems with the 3D visualization, we strongly recommend avoiding such large translations on individual scans.

If you need large translations, the best way is to apply them to the workspace (or at least to a scan cluster which is as far up in the project hierarchy as possible).

To transfer large translations away from individual scans, use **Operations** > **Registration** > **Move clusters** to Center of scans from the context menu of the workspace (or a scan cluster that is far up in the project hierarchy). This function computes the barycenter of all scans below the selected object and transfers the translation of the barycenter into the selected object. The global position of the individual scans will stay the same while local translations will be reduced to a necessary minimum, so visualization problems are also reduced.
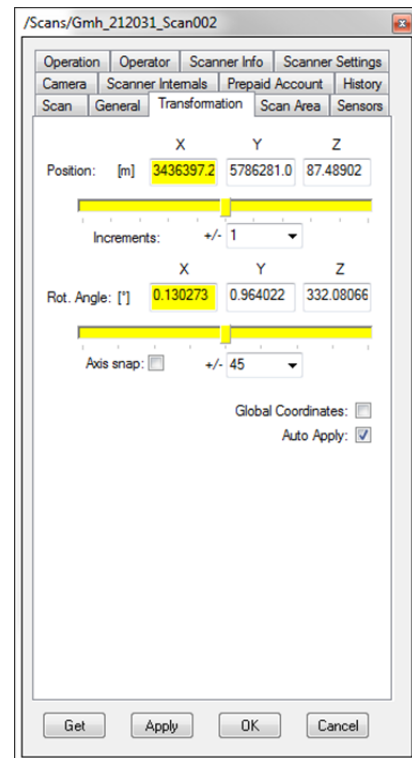
3D View

- After switching from SCENE to another Windows Program and back with e.g., Alt + Tab, the frame rate in the 3D View drops by about 50%. The frame rate can be restored by changing the point size in the view options and clicking ok.

- SCENE might suffer from instability issues on systems with some AMD/ATI graphics cards when opening one or more 3D views and the *Advanced Textures* option is enabled:
  This option is disabled by default and can be found under **Tools** > **Options** > **View**. You may enable it, but if you experience problems when opening 3D views, disable it again. Stereoscopic view is now working even if Advanced Textures is disabled. NVIDIA users should enable *Advanced Textures* without any problems.

- Rendering performance with NVIDIA Quadro graphics processors:
  On systems equipped with NVIDIA Quadro graphics processors, rendering performance in 3D view may be slow or intermitted. To improve rendering performance, start the NVIDIA Control Panel application (available in the Windows Control Panel) and select the global preset 3D App – Game Development under **3D settings** > **Manage 3D settings** > **Global Settings**.

- When a 3D View is opened out of a Planar View, it is not possible to create a virtual scan.

Point-to-Point Measurements in SCENE

When a scan or scan folder is rotated, existing point-to-point measurement objects are not updated, which might lead to incorrect distance measurements for these measurement objects. We therefore recommend not to make point-to-point measurements until scan registration is complete.

SCENE Process: scans may be lost

If processing starts on a scan and is stopped before 3D data are shown, this scan may be lost. Workaround: wait until the 3D data is shown, then stop processing.

Computer System Recommendations

- Processing scan data is a demanding task for both the software and the computer system. To allow SCENE to act as a high-performance system, the computer hardware needs to comply with these requirements.

- SCENE 2018 works with Windows 7 SP1, 8, 8.1, and 10.

- FARO recommends the following hardware specifications:

Minimal system specifications

- Processor: 64-bit (x64) with at least 2-gigahertz (GHz) (For example, Intel Core i7)

- Dedicated Graphics Card: OpenGL 4.1, or higher, at least 2GB Memory

- For VR Rendering:

    o NVIDIA 1060 GTX or similar

    o Oculus with Oculus Touch Controllers, or HTC VIVE

    o SteamVR

- Main Memory: At least 16GB

- Hard Disk: 256 GB Solid State Drive

- Display: 1366 x 768

- Operating System: 64-bit Windows 7 SP1 or higher

Recommended system specifications:

- Processor: Intel Core i7/Xeon, 8 physical cores

- Graphics Card: Dedicated graphics card, Open GL 4.1 or higher, at least 4 GB Memory, optional for stereo rendering: NVIDIA Quadro

- For VR Rendering:

    o NVIDIA 1080 GTX or similar

    o Oculus with Oculus Touch Controllers, or HTC VIVE

    o SteamVR

- Main Memory: At least 64GB

- Hard Disk: 512GB Solid State Drive + Regular HDD

- Display: 1920x1080

- Operating System: 64-bit Windows 7 SP1 or higher

To make use of the stereoscopic 3D viewing capabilities, a NVIDIA Quadro graphics card, a 3D monitor or 3D projector as well as the suitable 3D goggles are required.

To make use of the SpaceMouse support, a 3DConnexion SpaceMouse device with the latest drivers is required. The User Manual describes how to do the settings.

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