

# FARO® Scanner Freestyle<sup>3D</sup>

## Quick Start Guide

**FARO**®





## Standard Equipment

- |  |  |
|--|--|
| <b>1</b> Transport and carry case  | <b>6</b> Calibration plate which may also be useful when it comes to placement and measurement |
| <b>2</b> Quick Start Guide   | <b>7</b> Tablet PC   |
| <b>3</b> Freestyle <sup>3D</sup>   | <b>8</b> Tablet hand-holder  |
| <b>4</b> USB stick with the SCENE Capture, SCENE Process and SCENE installation files, Quick Start Guide and the User Manual | <b>9</b> Optical cleaning kit  |
| <b>5</b> Red microSD card to save scan projects, and green microSD card which provides the calibration plate number.         | <b>10</b> USB card reader  |



## That's Freestyle<sup>3D</sup>

- 1** Start/Stop button and status LED light
- 2** USB line with USB3.0 plug
- 3** Infrared cameras
- 4** Infrared projector with class 1 laser
- 5** LED stroboscope light
- 6** Color camera

### Connect Freestyle<sup>3D</sup> to the computer

The blue and the red LED will light up. Once the device is detected by the software, the red LED light will turn off.

### Ready to capture

Blue LED will light up.

### Not ready to capture

Red LED will light up.

### While recording

Blue LED will flash.

### Tracking lost

Red LED will flash. After tracking resumes, the red LED will be turned off, and the blue LED will flash again.



# SCENE Capture

## Starting up

We recommend using the tablet computer which is shipped together with Freestyle<sup>3D</sup>. The SCENE Capture software is already installed on it.

Before you start capturing, insert the microSD card into the tablet computer. Your scan project will be saved to this microSD card.

**!** Keep in mind that the tablet computer (or your own tablet or notebook computer) may be not as ruggedized as Freestyle<sup>3D</sup> and may become damaged under certain environmental conditions. When scanning outdoors or in dirty surroundings, protect both Freestyle<sup>3D</sup> and the tablet computer from liquids and humidity, but also from dust and dirt which may damage the electronic components and the sealings. Temperatures lower than 0°C and higher than +40°C may also influence the performance of both devices.

Tap the SCENE Capture tile to start the software. SCENE Capture starts with the Home screen by default. Its Project Selector presents all the scan projects known at that time.

Plug the Freestyle<sup>3D</sup> USB cable into a USB3 port on your computer. The red Status LED will light up. If the speakers of your computer are switched on, you will hear an acoustic signal as well.

Wait until the SCENE Capture detects Freestyle<sup>3D</sup>. SCENE Capture will show a loading message. As soon as Freestyle<sup>3D</sup> is ready, the red Status LED light will switch off and the blue LED will light up.



## Start Software

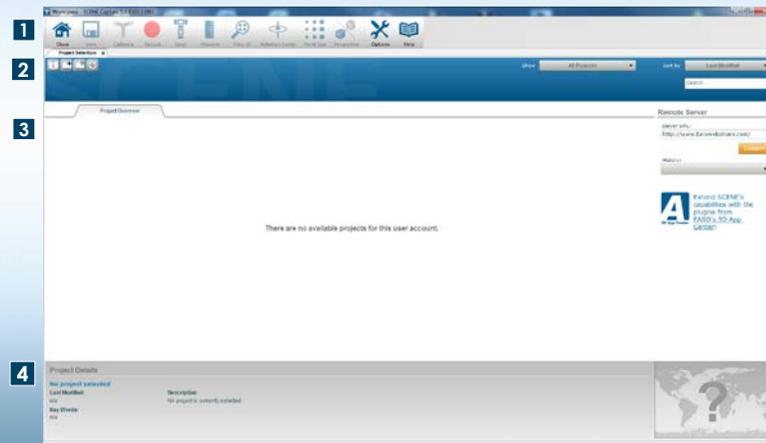
### Home Screen and Project Selector

The software starts with the Project Selector window by default. The Project Selector presents all the scan projects known to the software at that time.

- 1 Toolbar** – provides a quick and easy way to access the features with the mouse or, on tablet computers, by tapping.
- 2 Project selection bar** – contains the dialogs with the project commands.
- 3 Available scan projects** – open an existing scan project by double-tapping on its preview picture.
- 4 Project information** – If the mouse pointer or, on tablet computers, your finger moves over one of the available scan projects, more information to this scan project is displayed here.

### **!** NOTICE

Every time Freestyle<sup>3D</sup> is detected by SCENE Capture, you will be asked whether to calibrate the device. In general, you should perform On site calibration as well as the Device White Balance. Check the Freestyle<sup>3D</sup> User Manual for those two features.



# SCENE Capture Toolbar

## Home



Closes any open scan projects and opens the Project Selector.

## Calibrate

Shows the calibration status. Tap the button to open the Calibration dialog.



## Start or stop capturing



Opens the capturing window.



While capturing, the button looks like this.

## Measure



Opens a measurement function. Measure distances between scan points in a scan. Tap the scan points with the tablet's pen, double-tap to finish measuring. In SCENE Capture, the measurement is not saved with the project.



Abort the function with this button.

## Export Points



Tap this button to export all point clouds of a scan project.

## Help

Shows the User Manual (a pdf file).



## Save



Save the scan project. In addition to that, SCENE Capture saves your work automatically.

## Device White Balance



Device White Balance: is used to adjust the color cameras in Freestyle<sup>3D</sup>.



Abort the function with this button.

## Process



Tap this button to process the entire scan project, a selected cluster, or a scan.

## Options

Check the two tabs for these settings:

Depth Range set the max. scan distance, starting from 0.5m.

**Marker Detection:** activate this if you want to use the markers of the calibration plate for placing the scans or for measurements.

**Follow Camera:** when deactivated, the Point Cloud View does not show the camera movement.

**Flash:** switches the flash-light to automatic, on or off.

 The flash-light is a strobe light and can be hazardous to persons who may be susceptible to epileptic seizures.

In case of doubt, switch the flash-light to OFF.

 **Auto:** Flash-light is switched on if the camera detects that the light is not sufficient. As soon as the light situation gets better, the flash-light is switched off again.



Flashlight is always switched on.



Flashlight is never switched on.

**Saving location:** save to microSD card (default), or tap the button and enter a saving location.

**Project Base Name:** If required, delete the default name and enter a new one. This name must not include spaces or some special characters.

## Commonly used terms

### Frame

The set of three photos, taken at the same time with the infrared projector and the infrared cameras, is called a frame.

### Features

The software detects useful elements like for example corners in the color picture. Those elements are called features.

### Tracking

Following the features from frame to frame is called tracking. With tracking, it is possible to reconstruct the movement of Freestyle<sup>3D</sup> in space, and thereby putting all 3D points of the individual frames in a common 3D context.

### Scan

A set of frames resulting from one capturing sequence is called a scan.



## ! WARNING

**Eye injuries caused by laser beams.** Although Freestyle<sup>3D</sup> is classified as a laser class 1 device, it could be dangerous if the laser beams are pointed towards a person's eyes. Be careful when scanning people or animals. Do not aim at your eyes or somebody else's eyes from a "close-up" distance at anytime.

## ! NOTICE

**Static discharge** - Do not touch the metal rings around the glass covers on the lower side of Freestyle<sup>3D</sup>. Always hold Freestyle<sup>3D</sup> by its handle. Do not grab the device by one of its arms. Freestyle<sup>3D</sup> is a high-precision measuring device. Even the slightest bending of the housing will result in inaccuracies.

## Scan

1. Start capturing by pressing the button on top of Freestyle<sup>3D</sup>, or by tapping the button. After one or two seconds, a split window will show up with the Point Cloud View on the left and the Video View on the right as well as a progress dialog. A message box is shown superimposed in the middle of the window. On the left side, the flashlight button is shown. Tap it to switch the flashlight to on or off. On the right side, the 3D camera button is shown. Tap it to toggle between 3D Point Cloud View on the left and the 2D Video View on the right (default), or only 3D Point Cloud View, or only 2D Video View. The software will create a scan project called Freestyle and save the scan data to the microSD card.

Make sure that the object of interest is within the specified maximum range and that it is not closer than the minimum range of the sensor.

Stable scanning requires objects and environments with enough color structure. Avoid having only plain-colored surfaces in the device field of view. Objects must not move while they are captured.



Move the device slowly and constantly. Avoid jerky movements. Fast and jerky movements may lead to inaccurate data and tracking may be lost. Avoid capturing longer sequences. Try to move the device in circles or loops. Try to finish capturing at the starting place.



If tracking is lost (by too fast movement or few recognized features), you may resume it. Try to move Freestyle<sup>3D</sup> so that the Video View and the view in the small window match. Then, a green and red cross-shaped icon appears in the live video picture. Try to move Freestyle<sup>3D</sup> so that the red and green crosses in the live video picture match. Tracking should then resume automatically.

### Ambient light conditions

In scenes with too bright illumination (close to lights or outdoors), the Freestyle<sup>3D</sup> will produce no 3D data or it may only show with a limited distance range. If the number of features gets critical, try to move the device field of vision to areas with more structures.

2. Finish your scan by pressing the button on the top of Freestyle<sup>3D</sup> again, or by tapping or clicking the button.



SCENE Capture will now need some seconds to prepare your captured data. Freestyle<sup>3D</sup> uses the built-in sensors to level the scan automatically. Once the capturing of a scan is completed, the scan project will be saved and you will get the following structure in the project's workspace:

## Workspace

Folder **Scans**: Contains all scans.  
Folder **Scan-x**: Contains the scan and, subordinated, its scan path.  
In front of the scan name, an icon symbolizes which processing step was already done.

Double-tap a scan. The **3D View** will be shown.

Repeat the steps 1 and 2 as often as required. It could be favorable to capture a view more than one time because it would improve the point density and the coverage of the whole object or scene.



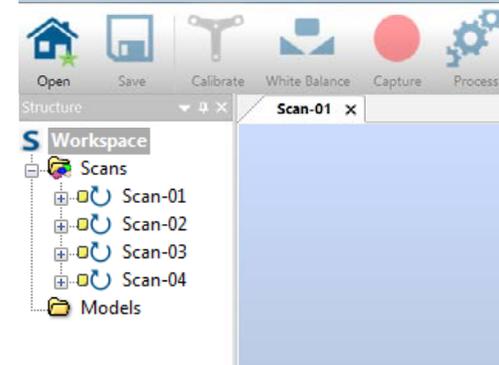
Close the scan project.  
You will be asked to save the scan project.



Close SCENE Capture.

## What's next?

The next step would be processing the scans, and maybe further steps like placement and color adjustments. For this, release the microSD card from the tablet computer and plug it into a workstation with SCENE Process installed. As soon as you open SCENE Process, you will be asked if you wish to open the scan project. All those steps are described in the Freestyle<sup>3D</sup> User Manual.



# Quick Overview

## Buttons and displays

This overview shows the buttons and displays offered by SCENE Capture. SCENE Process offers more buttons and functions which are not explained in this Quick Start Guide. You will find those in the Freestyle<sup>3D</sup> User Manual.

## Buttons



### Home

If a scan project is open: Closes scan project and opens Project Selector.



### Save

SCENE Capture saves automatically. Tap this button to save the scan project whenever you feel the need to.



### Calibration status

Grey: No device detected.  
Red: Device is not calibrated.  
Yellow: Device needs re-calibration.  
Green: Device is calibrated.



### Device White Balance

Is used to adjust the color cameras in Freestyle<sup>3D</sup>.



### Process

Tap this button to process the entire scan project, a selected cluster, or a scan.



### Export Points

Tap this button to export all point clouds of a scan project.



### Measure

Measure distances between scan points. In SCENE Capture, measurements will not be saved with the



### Options

Opens the a dialog with two tabs which offers several settings you should check before or while capturing. You can change the Follow Camera and Flash settings while capturing.



### Manual

Opens the User Manual as a PDF file. Close the PDF by swiping from the top to the bottom of the pdf document. Switch to SCENE Capture by swiping from the left to the right of the pdf document.



## Capture Buttons



Start scanning button.



Stop scanning button.

## Displays while scanning



### Initialization

Move scanner slowly until the sign disappears.



### Movement

Scanner is moved too fast.



### Video blurry

Less features, video image gets blurry.



### Contrast Problems

Problems with contrast in the video.



### Light Problems

Problems with too much / not enough light in the video.



### Tracking is lost



### Low storage space

Finish the scan as intended. You do not need to stop capturing immediately.



### No 3D data

- insufficient 2D or 3D structure, capturing could not be initialized.  
- Invalid device calibration

## FAQ

*An object does not appear in my scan, or is hardly visible.*

### Problem

Not enough distance to the object (< 0.5 m).

### Solution

Need larger distance. Freestyle<sup>3D</sup> cannot capture close-up objects.

### Problem

Large distance (> 3m, depending on light situation)

### Solution

Take several scans of a scenery or an object, but in different distances.

### Problem

Object has cavities like holes, slots, etc.

### Solution

Larger distance in combination with scanning the object from different perspectives may improve the result.

### Problem

Highly absorbing surfaces.

### Solution

Use developer spray (as used for crack detection).

### Problem

Shiny surfaces.

### Solution

Use anti-glare spray.

### Problem

Too much light, especially when scanning outdoors.

### Solution

Avoid scanning in glaring sunlight.

### Problem

Not enough light.

### Solution

Use light sources which produce bright, diffused light.

# General information

## SCENE Software

SCENE is specifically designed for all FARO laser scanners. The software processes and manages scanned data both efficiently and easily by using the automatic object recognition and scan registration.

SCENE is an extremely user-friendly software that allows scans to be automatically combined. The resulting point cloud can be viewed in three dimensions. All the scans are available in color and as high-contrast intensity images.

## SCENE Capture and SCENE Process

- Automated target-less scan registration
- SCENE WebShare Cloud integration
- Super-crisp visualisation
- Easy processing of large scan projects
- Plug-Ins for extended functionality
- Homogenisation of point clouds

**SCENE Capture** provides everything you need to record your scans. It is designed to run on a tablet computer and is pre-installed on the tablet computer included in the Freestyle<sup>3D</sup> kit. The scan data is stored on a microSD card which makes it easy to transfer the data to another computer.

**SCENE Process** provides everything you need to process and finalize your entire 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 you install SCENE Process on a workstation or on a notebook PC with sufficient performance.

## Software Options

Freestyle<sup>3D</sup> and the SCENE software are compatible with the most common CAD software applications and can be used to export scan data to over 50 common software solutions.



## Online Tutorials

Find more information and helpful tips on the use of the Freestyle<sup>3D</sup> and SCENE in the Internet at:

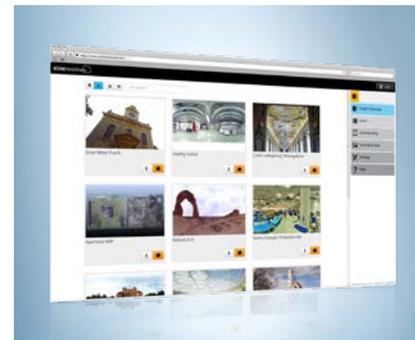
<http://tutorial.faroeurope.com>



## FARO 3D App Center

In the 3D App Center you will find software dedicated to the FARO 3D Documentation world. The shop is divided into two main categories: Stand-alone apps and plug-in apps:

<http://3d-app-center.faro.com>



## SCENE WebShare Cloud

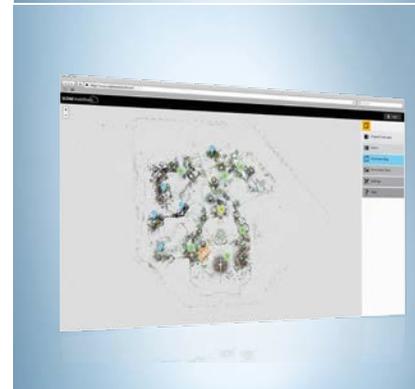
With SCENE WebShare Cloud, FARO offers a comprehensive service to provide users with simple access to 3D documentation. Neither technical training nor specialist skills in 3D laser scanning are necessary to work with the intuitive user interface.

Digital data, such as 3D documentation, often has to be available to many different project partners. Previously, users having their own internet server, could use SCENE WebShare to present their laser scan projects to clients and project partners. Now FARO goes considerably further, offering the SCENE WebShare Cloud solution, a hosting service with various packages at different prices.

- Easy data sharing and collaboration
- Minimal set up and maintenance effort
- Best possible security level
- Persistent measurements & annotations
- Hosting service offered by FARO
- Support for mobile devices

Check it out on our demo server at:

[www.websharecloud.com](http://www.websharecloud.com)



## FARO Webinars

Hear from industry experts on emerging trends in 3D documentation, advancements in 3D metrology and portable CMMs and best practices without ever leaving the office. If you are unable to attend any of our live webinars, they are all recorded and uploaded as podcasts here and are searchable by broadcast date.

[www.faro.com/webinars](http://www.faro.com/webinars)



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