

RiALITY

User Guide

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1.1 INTRODUCTION

Welcome to the RiALITY User Guide. This guide is designed to be a simple tutorial for interacting with the RiALITY app. We hope you enjoy it!

The RiALITY App enables you to visualize point clouds in both traditional 3D and in Augmented Reality (AR). To discover the difference and find out how continue reading.

1.2 TABLE OF CONTENTS

1.1	INTRODUCTION	2
1.2	TABLE OF CONTENTS	2
2.1	BASIC REQUIREMENTS	3
2.2	MODES OF USE	4
2.3	USER INTERFACE	5
2.3.1	<i>MENU</i>	6
2.4	FILE EXCHANGE WORKFLOW	9
2.4.1	<i>RiSCAN Pro Export</i>	9
2.4.2	<i>RiALITY File Import</i>	12
2.5	REFERENCE IMAGES	15

2.1 BASIC REQUIREMENTS

RiALITY utilizes the latest hardware for optimum performance. For this reason, there are minimum hardware requirements.

Minimum Hardware requirements: **3rd generation iPad or newer**

For visualization of the included Demo dataset “Rosenburg Castle” using the traditional 3D Viewing mode, no additional hardware or software is required.

For visualization of the included Demo dataset using the Augmented Reality mode, you will need to download the reference image found on the *RIEGL* website: <http://www.riegl.com/app>.

The ability to import custom datasets is also provided. This will require a licensed version of RiSCAN PRO software, a method of importing files to your iPad and an additional reference image which can also be found on the website listed above. Details on importing custom datasets is provided in this document.

2.2 MODES OF USE

After agreeing to the End User License Agreement, a window for selecting one of the two options for RiALITY usage will be shown (see *Image 1*). The two options are described as follows:

1. Demo Mode, a simple mode of operation where a sample dataset from the Rosenberg Castle in Austria is preconfigured for easy operation. Choose this option to get a feel for using the app.
2. Import Mode, which provides the capability of importing custom datasets. This makes it possible to load and visualize your own datasets in RiALITY. Note: datasets must be in .rxq format which is available in RiSCAN PRO and must be smaller than 2 million points in size.

With just a few minor differences, the two modes are nearly the same.

To use the Augmented Reality feature of *RIEGL* RiALITY in either mode, it is necessary to download one of the reference images from the App website at <http://www.riegl.com/app>. For Demo Mode, please use the Rosenberg Reference Image and for Import Mode, use the "Standard Reference Image" found on the website. These two images can also be found at the end of this document.



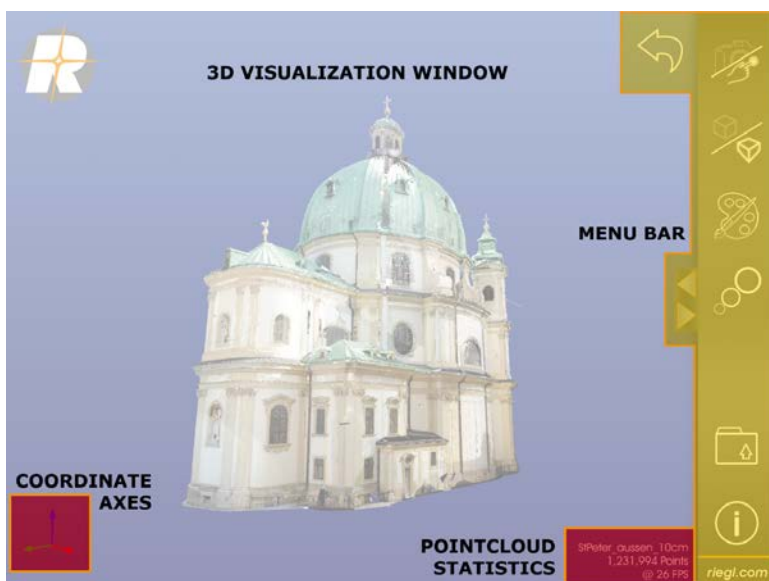
Image 1: RiALITY Mode selection window.

2.3 USER INTERFACE

The RiALITY Main Window is the primary visualization and navigation screen. From this window it is possible to control visualization, change attributes of the view, import, share and view information on loaded ROX point clouds.



Image 2: RiALITY Main Window



Blue: Visualization Window

Orange: Menu Bar

Red boxes: Info Bars

Image 3: Components of Main Window

2.3.1 MENU

To open the menu bar, please touch the Menu bar button on the right side of the screen (box 8 in *Image 4*, below).

The menu bar will automatically disappear after 6 seconds of inactivity, or if the Menu bar button is touched again.

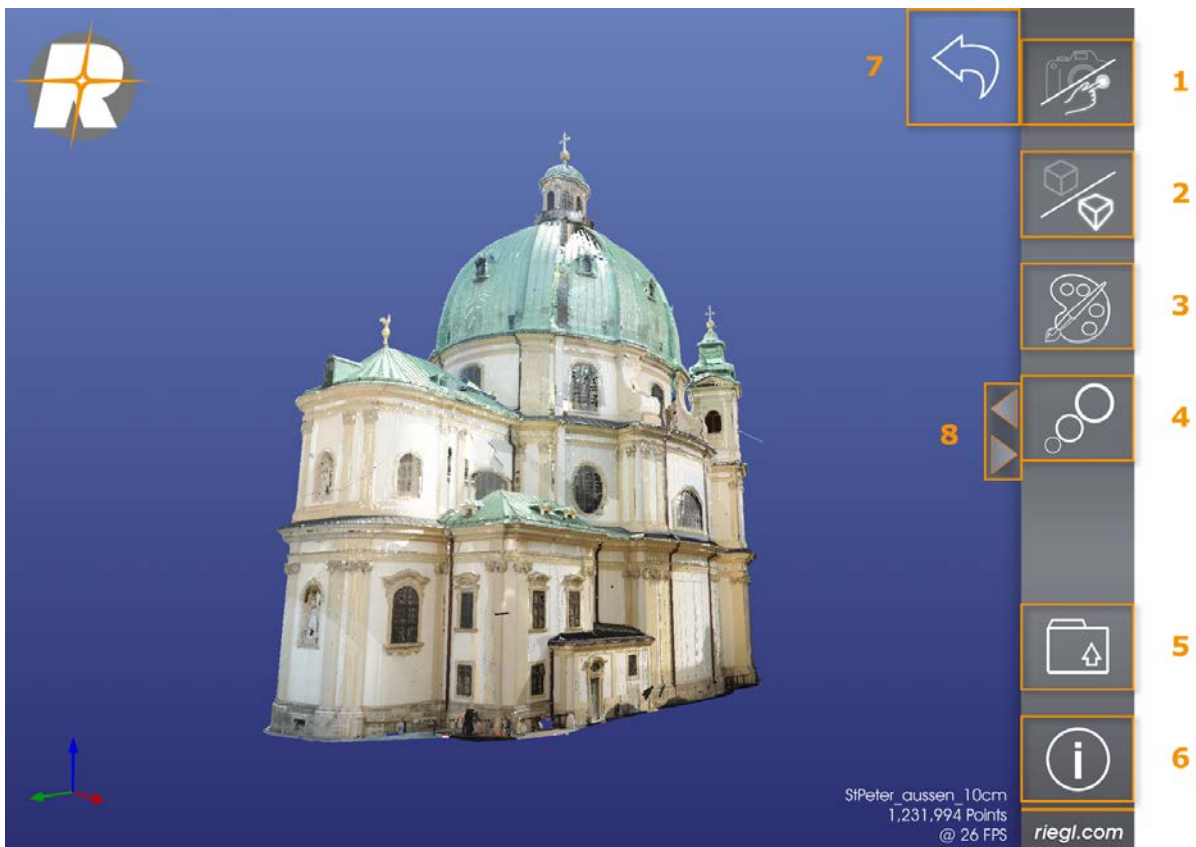


Image 4: Menu Bar

1 **Navigation methods:**

RiALITY offers two different navigation methods which can be toggled using button 1. The available methods are “**Touch**” and “**Augmented Reality**” (AR) navigation.

Touch navigation displays a point cloud within the RiALITY 2D viewspace and enables the user to rotate and translate it using touch navigation (finger swiping on the screen).

In **Touch-mode** the following gestures are available for navigation.



1-finger swipe: Rotate horizontally/vertically around the center of the current view.



2-finger swipe: Move the camera center parallel to the screen-directions.



2-finger pinch: Move the camera forward and backward ("zoom-in", "zoom-out"). The freedom for this movement is limited, so it is not possible to get infinitely close to one point.

In **AR-mode** the camera live image is shown on the screen. Point the camera at the appropriate reference image. Use the "Rosenburg Reference Image" for the Rosenburg Castle Demo or the "Standard Reference Image" for custom imported point clouds. Once the image is recognized, the 3d point cloud will be displayed on the camera display. To navigate through the point cloud in this mode, move the iPad around while keeping the printed image in the camera field of view.

Note: Switching between the two visualization modes will reset the camera position. Switching between modes can be used to return to a neutral camera position in Touch-mode if the points are "lost".

2 Camera types

Change between orthographic and perspective camera types.

Button 2 is only activated during Touch-navigation. In AR-mode the camera will always be perspective to match the viewing angle of the live view background image.

3 Point Cloud color

Button 3 will bring up a color selector in the bottom right corner of the screen (*Image 3*). Touch the color selector area to pick a color. Then press the button "Single Color" to colorize the point cloud in that color. Use the button "True Color" to reset the colors. The window will disappear after 6 seconds of inactivity or as soon as the screen is touched somewhere else.

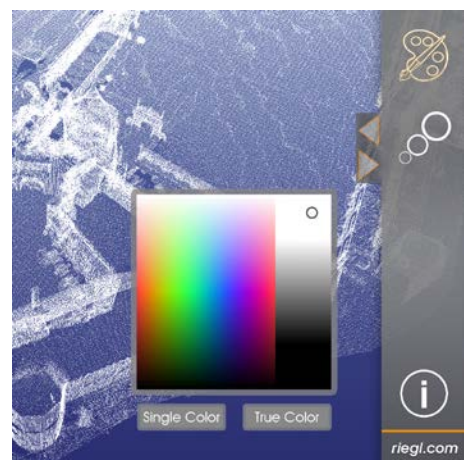


Image 5: Point Color

Note: Setting the color to white can be

useful to better visualize details of the scandata like stairs, arches, etc. that would otherwise be very hard to recognize.

4 Point size

Button 4 will bring up additional control elements to set the size points are displayed (*Image 6*). Setting the slider to a higher Point Size will make the model look denser, but might reduce the visual quality.

If the "Auto" check box is activated, RiALITY will automatically calculate point sizes in real-time.



Image 6: Point Size

5 Custom File Import

Note: only accessible in Import Mode. Button 5 will bring up a list of all valid RQX files available on the device (*Image 7*). You can select one of them and press the "Load" button to load the file in RiALITY. For further instructions on how to get your own dataset onto the device, please go see the next section.



Image 7: Importing Files

6 Info-Button

Button 6 will bring up a window with further information about the scan (Demo Mode) or about the app (Import Mode).

7 Back

Button 7 will bring you back to the previous state of the app. It can be used to get back to the selection screen allowing you to switch between the Rosenberg dataset and the Import Mode.

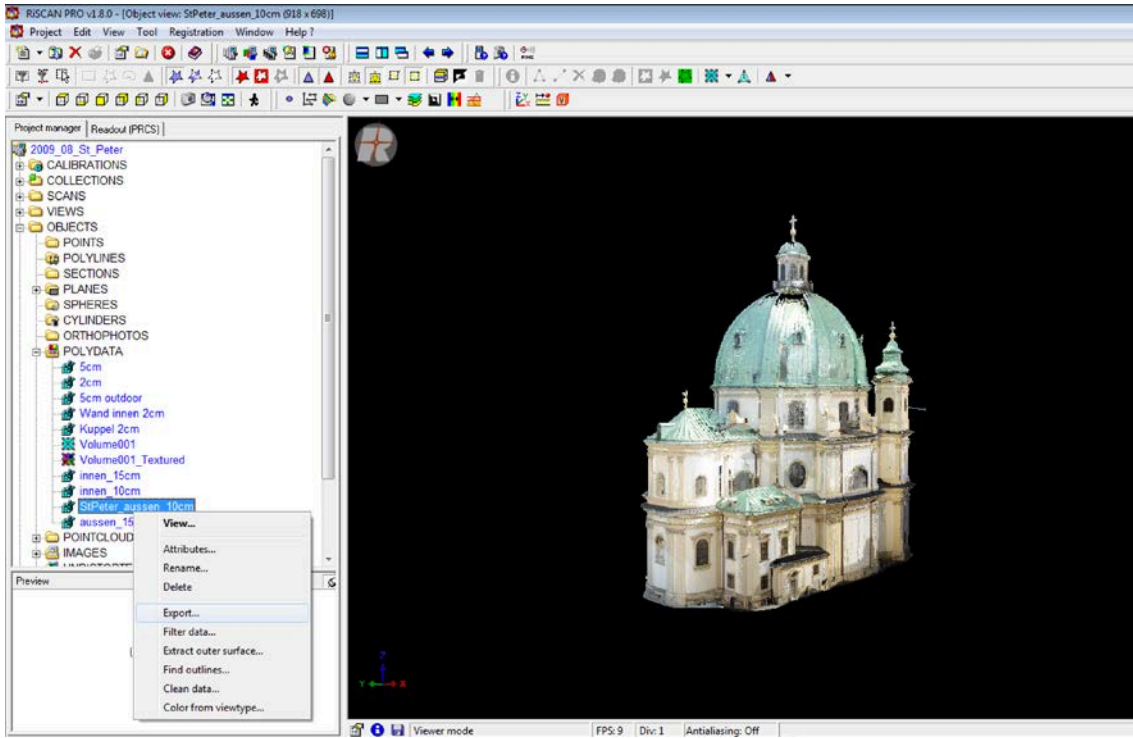
2.4 FILE EXCHANGE WORKFLOW

In RiALITY you can load your own scan data from RiSCAN Pro using the RiALITY Quick Exchange (.rqx) format. The export of this format is supported by RiSCAN PRO v1.8.0 and above.

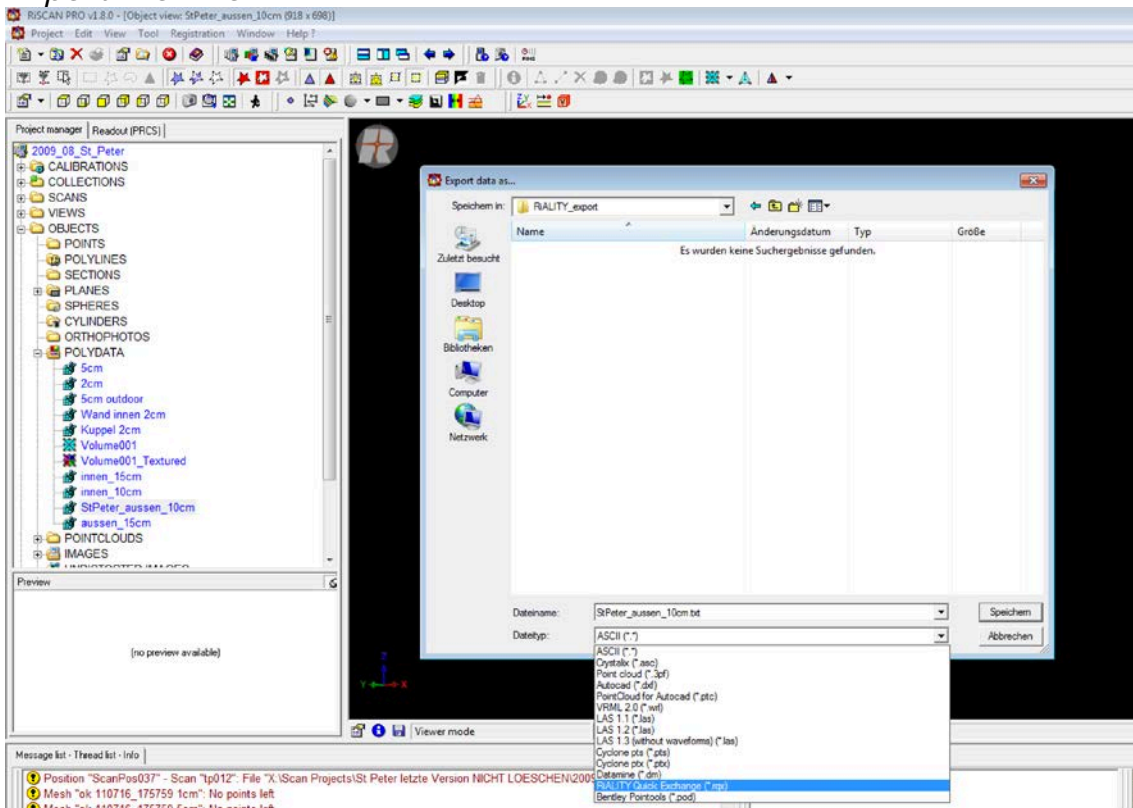
2.4.1 RISCAN PRO EXPORT

The export of a RiALITY Quick Exchange (.rqx) file, available in RiSCAN Pro (v1.8.0 and later) works similar to other formats and can be applied to any 3DD file, single scan or polydata object (*Export Workflow 1-3*). There are, however, some basic principles that should be followed for ideal results in RIEGL RiALITY.

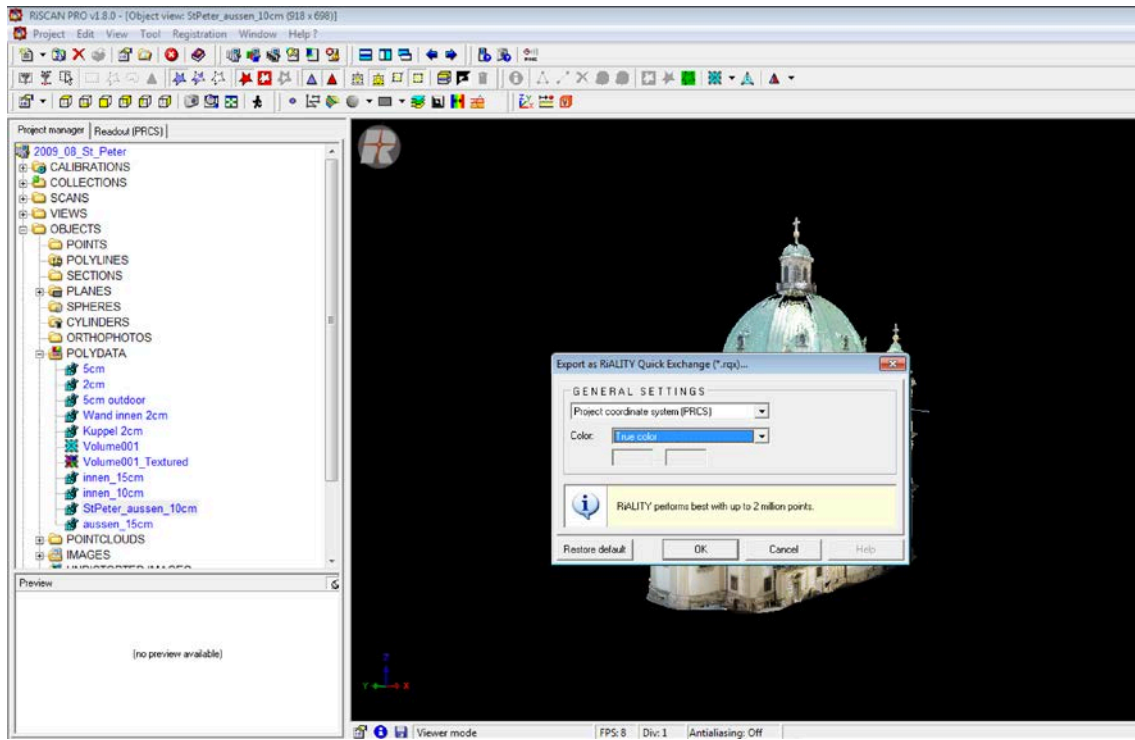
- 1) Interaction and navigation in RiALITY is highly dependent on the bounding box of the imported point cloud. Therefore the point cloud should be cleaned before exporting it. So-called "flying points" should be removed as much as possible.
- 2) RiALITY currently supports the import of point clouds with up to 2.5 million points. While you can export RQX files with more than 2.5 million points, RiALITY will interrupt the import process at that limit and will only visualize a part of the point cloud. For point clouds that exceed this limit, it is recommended to use an octree filter with an appropriate raster size to create a poly object with the desired amount of points.



Export Workflow 1



Export Workflow 2



Export Workflow 3

2.4.2 RIALITY FILE IMPORT

RiALITY is capable of opening .rqx files located on your iPad. The simplest way to open a .rqx file with RiALITY is simply by clicking on it! RiALITY is the default App for the .rqx format and therefore no further configuration is necessary. Files can be imported from Dropbox, email, and any similar method.

For the transfer of RQX files from RiSCAN PRO to your iPad the use of Apple iTunes is recommended.

The process includes the following steps:

On Your Computer (Mac or Windows):

- 1) Connect your iPad to your computer and start iTunes.
- 2) Select your iPad in the list of available devices (*Export Workflow 4*).
- 3) Go to the "Apps" section and scroll down until you see "File Sharing". The list should include RiALITY (*Export Workflow 5*).
- 4) Click on the RiALITY icon in the list.
- 5) Drag and drop your RQX files from the Explorer (Windows) or Finder (Mac) into the field "RiALITY Documents" (*Export Workflow 6*).
When all files appear in the "RiALITY Documents" list, you can disconnect your iPad from your computer.

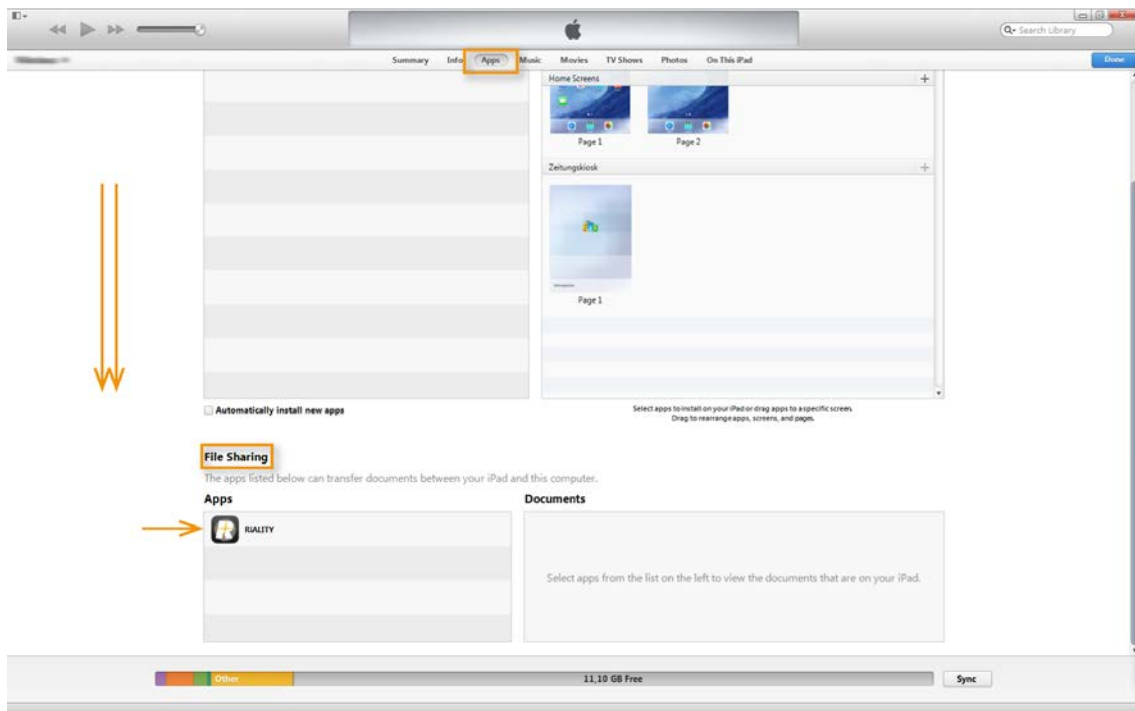
In RiALITY:

- 6) Start RiALITY in Import Mode.
- 7) Activate the "Custom File Import" button (Button 5) from the side menu bar.
- 8) Select the desired file to load from the list.
- 9) Press the "Load" button.

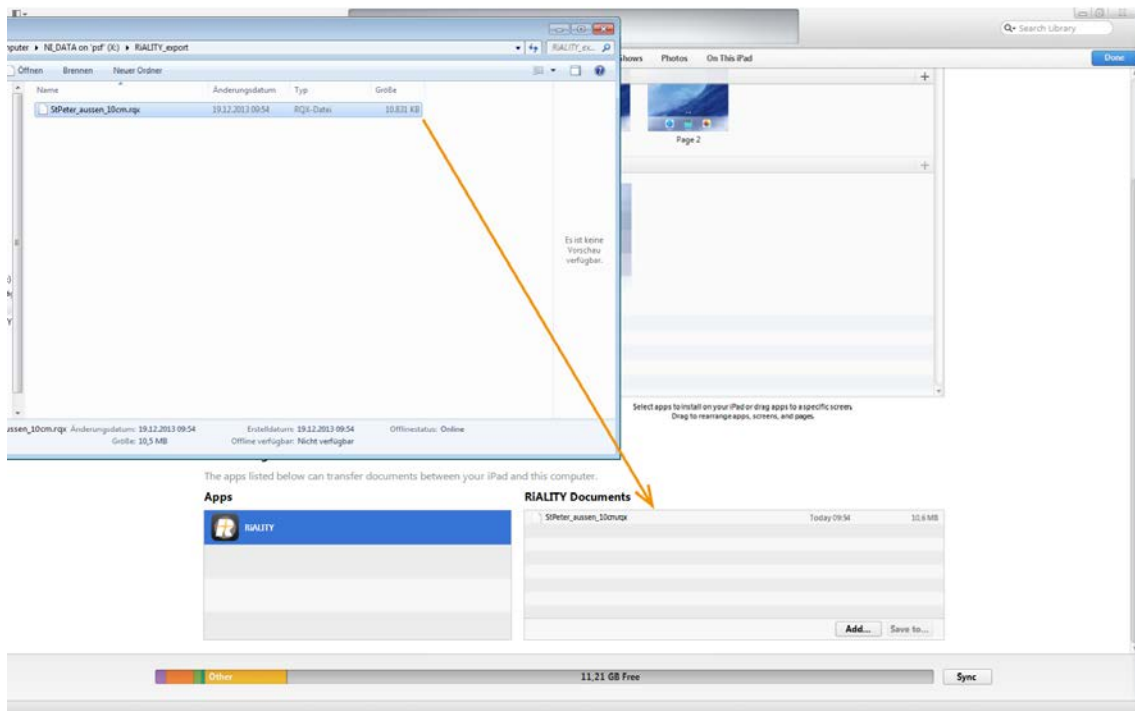
It is also possible to open RQX files directly from e-mails, web-browsers or file-sharing services like Dropbox. Simply use the "Open In" option and select the RiALITY icon. This will automatically add the RQX file to a subfolder ("Inbox") of the above-mentioned "RiALITY Documents" and they can be accessed as described in Step 6-9 above.



Export Workflow 4



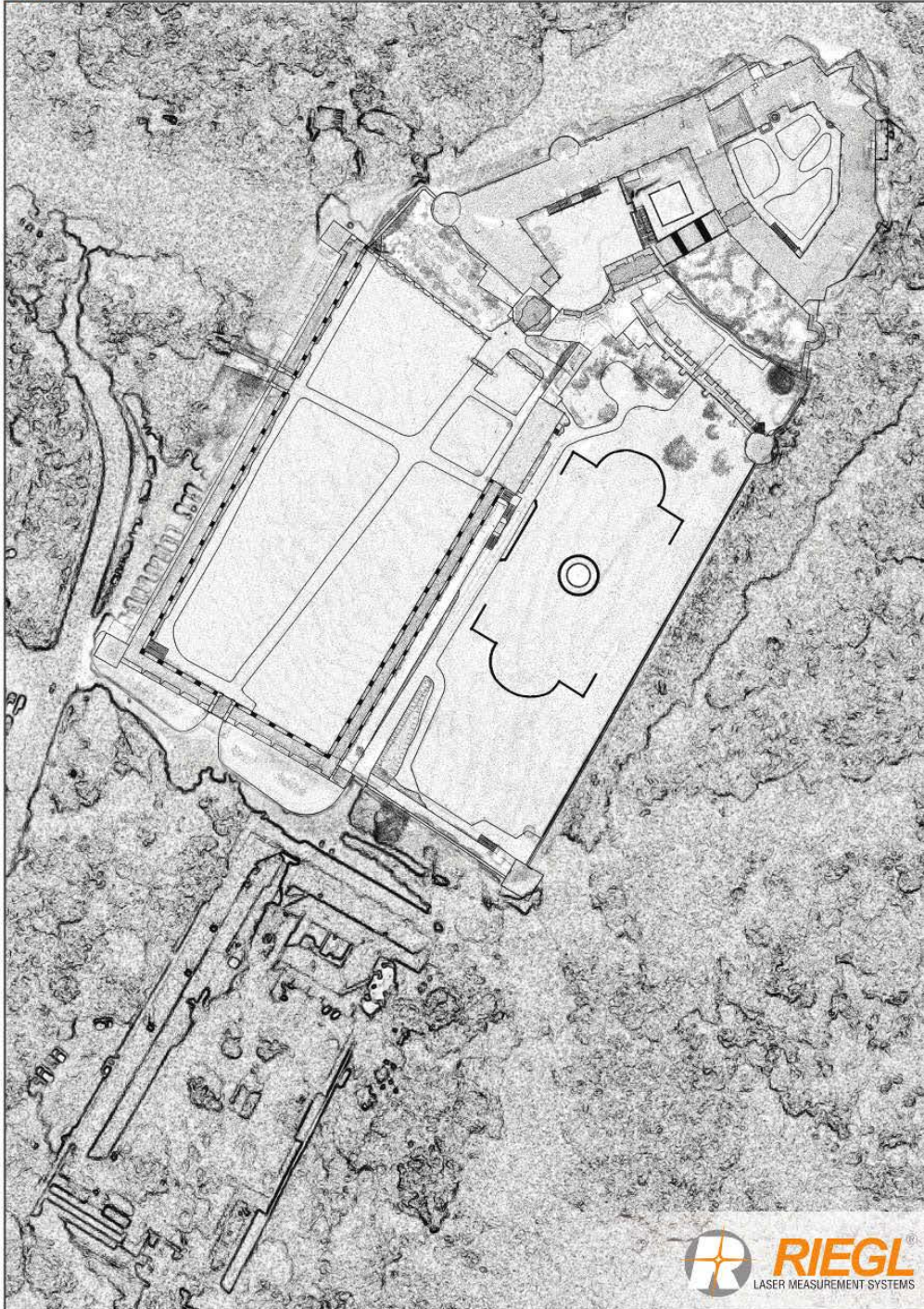
Export Workflow 5



Export Workflow 6

2.5 REFERENCE IMAGES

RiALITY



Rosenburg Castle

Rosenburg Reference Image

 **RIEGL**
LASER MEASUREMENT SYSTEMS
www.riegl.com/app



RiALITY

<http://www.riegl.com/app>

Standard Reference Image