Leica Geosystems
Release Notes

Product   Cyclone REGISTER 360 Version 1.4

Date   17th October 2017

From   HDS Software Product Management

Contents

Introduction

Leica Cyclone REGISTER 360 is an all-new addition to the Leica Cyclone family of products designed with Speed, Scale, and Simplicity in mind. Cyclone REGISTER 360 puts the user at the centre of the project and empowers non-traditional users to enter the world of laser scanning thanks to its streamlined interface, automated processes, quality control built into the heart of the product, and one-click creation of professional deliverables.

Features

- All-new program with a modern UI and featuring Drag and Drop file access
- Muti-threaded support for fast import of digital reality data
- Integrated import fuctionality for the BLK360
- Automatic registration tools to help you register quickly
- Assistant panel with offline videos for easy access to helpful, guided workflows
- Easy to learn and use with visual tools to help guide the process
- Advanced visual Registration Report
- Support for most popular and standard scan formats
- Localised in eight languages

Computer Specifications

Minimum specification:

CPU: Dual core processor running at 2.5GHz
OS: Windows 7 (64 bit) or Windows 10 (64 bit)
RAM: 8GB
Graphics: Support for OpenGL 3.3 or higher with 1GB video memory
Hard drive: At least 1GB of free disk space required for install

### *Recommended specification for Workstation:*

CPU: Latest i7 quad core or equivalent at 3.5GHz or higher
OS: Windows 7 (64 bit) or Windows 10 (64 bit)
RAM: 64GB
Graphics: NVIDIA GTX 900 or 1000 series with 8GB of video memory, or NVIDIA Quadro P5500 or equivalent
Drive: Internal SSD drives. One for writing and one for reading.

Note: To ensure the best performance, it is recommended that you install the latest graphics card drivers from the manufacture's website.
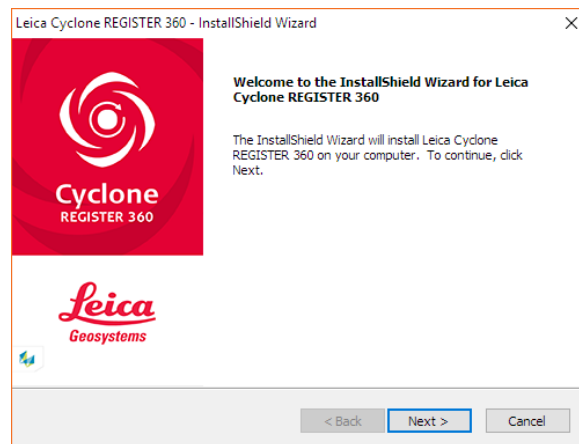
# Installation and Licensing Recommendations

Installation Setup

1. *NOTE* You must have Administrative privileges on your workstation to correctly install and license Cyclone REGISTER 360.
2. Right-click on the Cyclone REGISTER 360 Setup File and select "run as administrator."
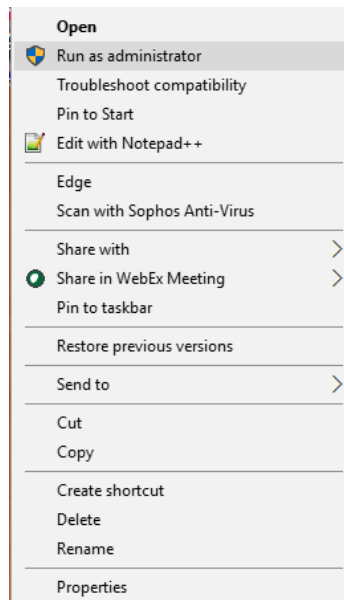
3. Follow the directions in the InstallShield Wizard

4. Select the Storage folder location.
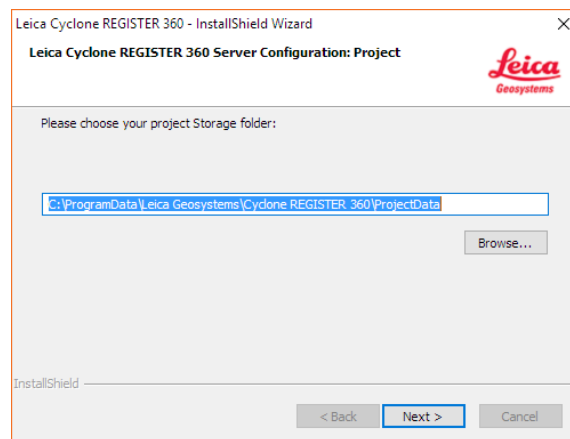
Note: The storage folder for REGISTER 360 should not be the same folder as the JetStream Storage folder if JetStream is installed on the same computer.

5. Complete the installation by selecting "Finish".

Licensing Setup

1. *NOTE* Leica Cyclone REGISTER 360 is only supported by the latest version of the Leica Client License Manager (CLM), version 1.6.2 or newer.
2. *NOTE* You must have an Internet connection to enable your license. If you do not, please review our "Leica Cyclone and CloudWorx Client License Management System" document that goes over setting up an EID (i.e. license) off-line.
3. Once you have installed Cyclone, open the Client License Manager for **Floating** Licenses.
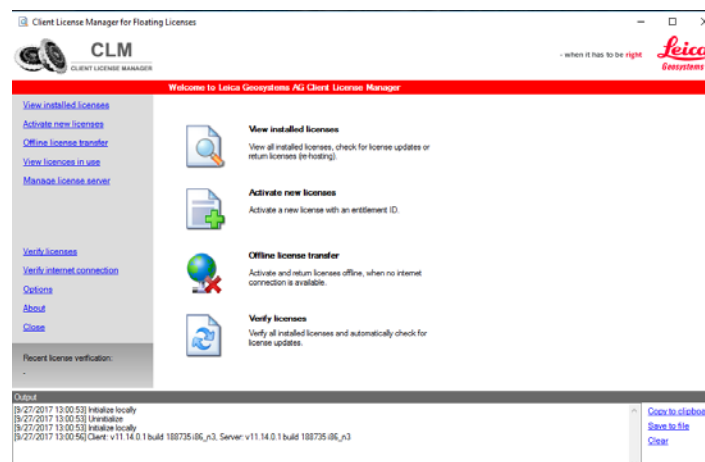
4. Located here: Start Menu/All Programs/Leica Geosystems/Client License Manager
5. *NOTE* Be sure to choose the **Floating** option (there are two CLMs and the Nodelocked CLM **will not** activate your license)

6. Choose the "Activate new licenses" option.
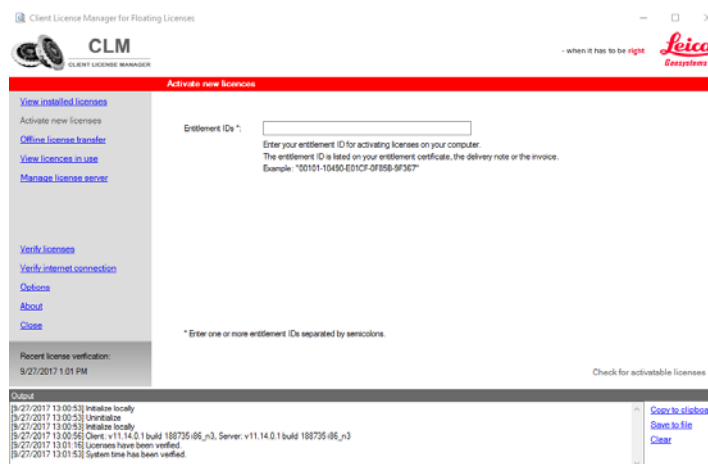
7. Enter your Entitlement IDs (EID) in the open field. To enter multiple EIDs separate them with a semicolon ";"
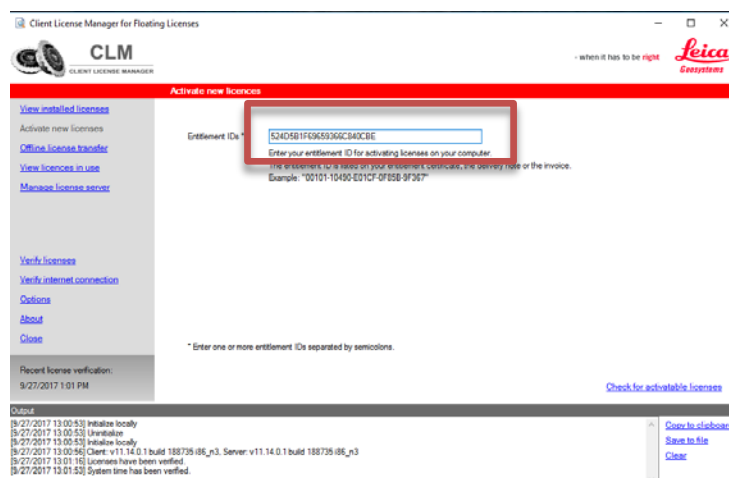
8. After you have entered your EID choose the "Check for Activateable licenses" link in the bottom right of the page

9. Once your licenses are activated you can start using Cyclone REGISTER 360.

CLM 1.6

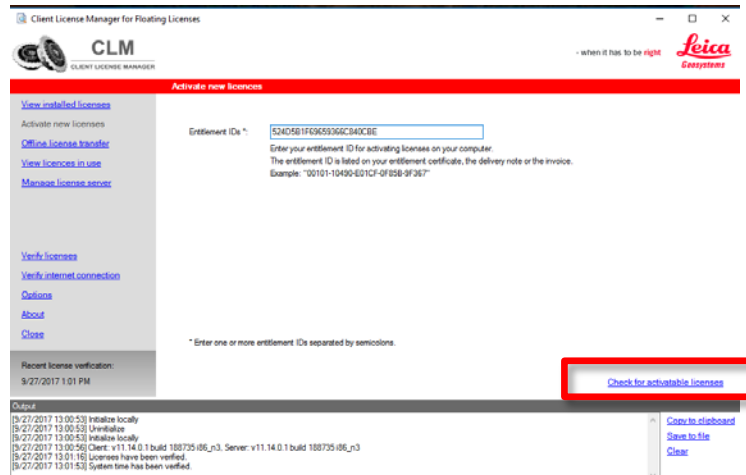| Client OS		Licensing Server (Both Local and Remote)	
OS	**Supported**	**OS**	**Supported**
Windows 7 (64bit)	Yes	Windows 7	Yes
Windows 8 (64bit)	Yes	Windows 8	Yes
Windows 10 (64bit)	Yes	Windows Server 2003 / 2003 R2	No
		Windows Server 2008 SP1 SP2 (32bit / 64bit)	No
		Windows Server 2008 R2 (Only 64bit available)	Yes
		Windows Server 20012 / 2012 R2 (Only 64bit available)	Yes
		Windows 7	Yes

Although both Windows XP and Vista are not supported by CLM 1.6, users are not blocked from installing Cyclone REGISTER 360 on these machines as clients. A side effect of running the installer on Windows XP is that the user will be prompted with a series of dialogs when license components begin to install as shown below (four prompts for 32bit and eight for 64bit operating systems). The user must click though each of these dialogs when installing on Windows XP. Licensing issues that result from installing on these operating systems will not be addressed since they are not officially supported by the CLM licensing system.
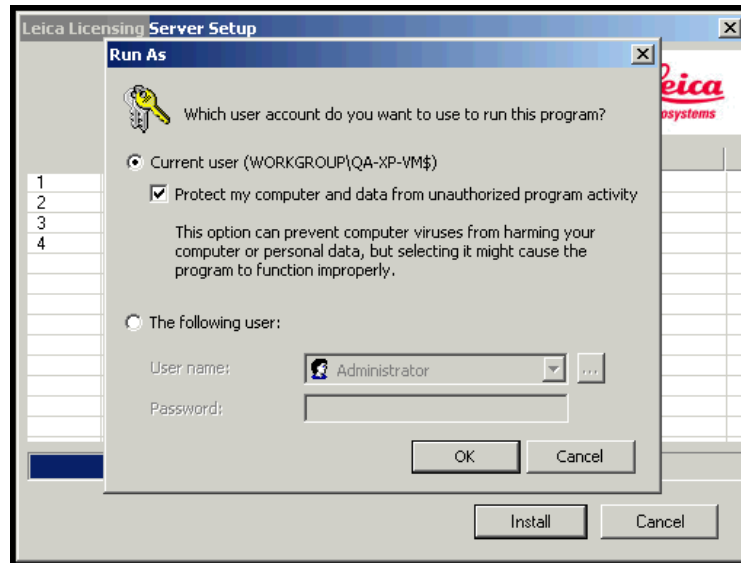
Licensing information

Leica Cyclone REGISTER 360 requires one (1) of the following licenses:

- Permanent Cyclone REGISTER 360 license
- TimeLimited (weekly interval) Cyclone REGISTER 360 license
- EnterpriseElite Cyclone REGISTER 360 license
- Active Cyclone REGISTER 360 subscription
- Permanent Cyclone REGISTER license with active (current) CCP
- TimeLimited (weekly interval) Cyclone REGISTER license
- Active Cyclone REGISTER subscription

Publishing to JetStream Local or JetStream Enterprise requires one (1) of the following licenses:

- Permanent Cyclone JetStream PUBLISHER license
- TimeLimited (weekly interval) Cyclone JetStream PUBLISHER license
- EnterpriseElite Cyclone JetStream PUBLISHER license
- Active Cyclone JetStream PUBLISHER subscription
- Permanent Cyclone PUBLISHER Pro license
- TimeLimited (weekly interval) Cyclone PUBLISHER Pro license
- EnterpriseElite Cyclone PUBLISHER Pro license
- Active Cyclone PUBLISHER Pro subscription

Publishing to TruView Local or TruView Enterprise requires one (1) of the following licenses:

- Permanent Cyclone TruView PUBLISHER license
- TimeLimited (weekly interval) Cyclone TruView PUBLISHER license
- EnterpriseElite Cyclone TruView PUBLISHER license
- Active Cyclone TruView PUBLISHER subscription
- Permanent Cyclone PUBLISHER Pro license
- TimeLimited (weekly interval) Cyclone PUBLISHER Pro license
- EnterpriseElite Cyclone PUBLISHER Pro license
- Active Cyclone PUBLISHER Pro subscription

Publishing to TruView Cloud requires*:

- Active subscription to TruView Cloud

    *TruView Cloud can also import *.tvg files created by Cyclone TruView PUBLISHER or Cyclone PUBLISHER Pro*

Leica P-Series and C-Series ScanStation support and 3rd party scan data

- Traverse or field setup editing is not supported.
- Support for the setup workflow (including traverse, known backsight etc.) is as follows:
    - Setups will import into the software as bundles and the setup positions will be according to the setup parameters, the coordinate system will still be in scanner coordinates.
    - Moving the bundle (any bundle) will move the bundle's coordinate system unless it has control applied within Cyclone REGISTER 360.
    - Known Coordinates are not supported. The transformation of the setups will be correct, but the coordinate system information is not imported, so the bundle formed will be in scanner coordinate not the coordinate system of the Known Corrdiates files
- Level data
    - Setups with dual-axis compensation on while captured have a level indication in the property panel of the setup
    - A weight is chosen to keep the upright direction of the setup within the rated accuracy of the scanner (P-Series or C-Series).
    - If the setups upright position is moved during link formation, the upright position will move back to the original position when connecting links are removed.
    - The setup's upright position can move up to the stated accuracy of the scanner for P-Series and C-Series data.
    - For scan data other than P-Series and C-Series, the upright (Z) constraint is constrained from moving more than 3 degrees from the original upright position, so during link formation the upright direction for each setup is constrainted and will not move more than 3 degrees.

General Registration Information

- Cyclone REGISTER 360 requires 3 matching targets between setups to form a target link.
- Cloud to Cloud links can be used to join setups with less than 3 matching targets.
- Setups included in separate Sitemaps in the Import area will be registered into separate bundles.
- The maximum amount of auto-detected\shown links is 50. This applies to links found after Visual Alignment, Split View, and shown suggested links.
- You must have a least one Sitemap which has all setups in one bundle to proceed to the Finalize area.
- The bundle must be optimized successfully (no dotted Link lines) to proceed to the Finalize area.
- The minimum screen resolution supported is 1280x800.

Basic Workflow

Cyclone REGISTER 360 guides the user through the registration process. At the top of the software you will see a bar that includes four steps:

   (1) **Import**
   (2) **Review and Optimize**
   (3) **Finalize**
   (4) **Report**

These will be the four major stages of your project. Below, we will walk you through a basic end-to-end workflow within Cyclone REGISTER 360. This is not intended to be exhaustive. You should refernce the built-in assistant panel and help files for more guidance. If you need more information about any tool, hover over the button and press F1 to be sent to the glossary or command index entry for the button within the helpfile.

Launch

1. To begin, launch Cyclone REGISTER 360.
   1.1. The software will open on the Project Explorer Window.
2. Either open an existing project or click "Create New Project"
   2.1. Enter a project name and click "OK"

Import

3. You will now find yourself in the **Import** stage. You will notice on the left that there are three ways to bring data into Cyclone REGISTER 360.

3.1. Cyclone REGISTER 360 can accept the following types of scan, image and text files:

File Types	Supported Formats
Binary Point Clouds	.e57 .ptg
Control File (*.txt)	Point number Northing Easting Elevation Comment
Imagery	.bmp .jpeg .png
FARO TLS data	.fls .fpr .fws FARO Raw
Leica HDS scanner data	BLK360 C-Series P-Sereis
Text	.ptx
Z+F	.zfc .zfs .zfprj

3.2. Different file types do not need to be added separately; they can all be added and imported together.

3.3. "Drag files here" allows you to drag-and-drop individual files, or a folder containing files, into the software.
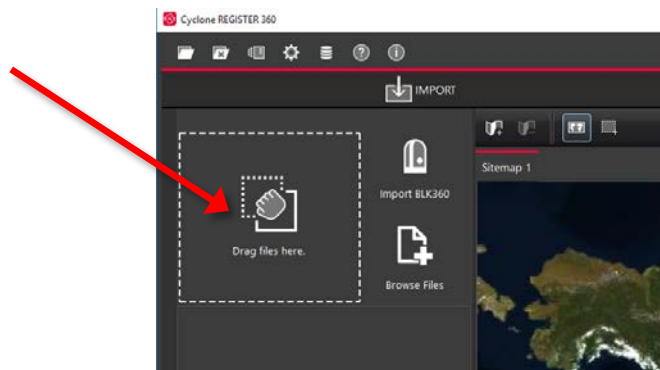
3.4. "Browse Files" will launch a Windows File Exploer window through which you can navigate to the files to be imported.
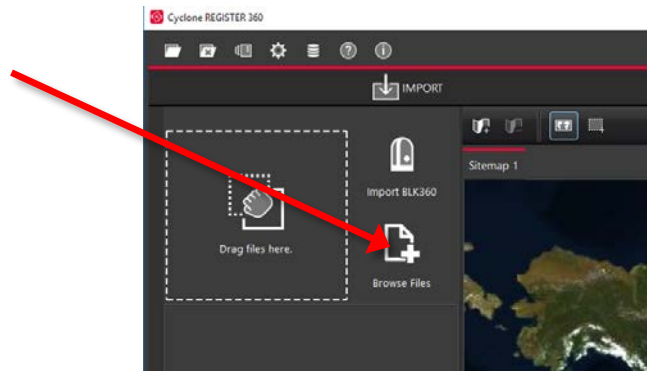
3.5. "Import BLK360" will launch a new Cyclone REGISTER 360 window that will allow you to connect to a local BLK360 Imaging Scanner and select individual files to import.
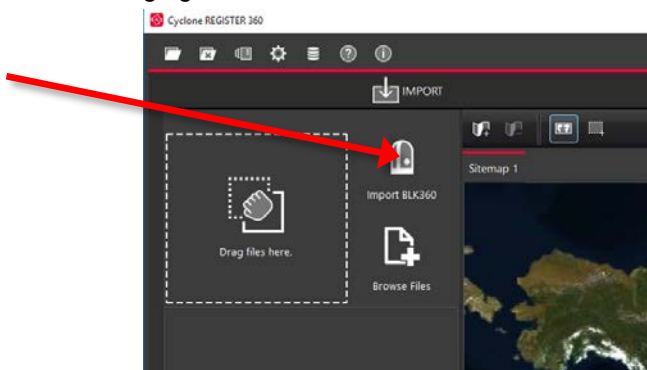

3.5.1. You must be connected to the BLK360's native WiFi via the computer to "Find & Connect" to the BLK360.
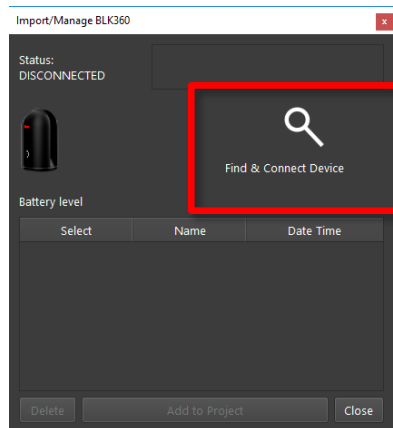
3.5.2. You can click the checkboxes next to the scans you wish to import and click "Add to Project".
3.5.3. You may also delete scans from your BLK360 from within this window.

4. You will also notice on the right that there are three options for how to register the data you are bringing in.
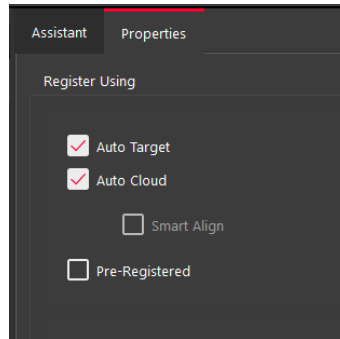
4.1. "Auto Target" should be used when Black and White targets are present within the data set. Cyclone REGISTER 360 will automatically search for these targets and register the setups based on those shared targets. Targets do not need to be picked, labelled or matched. Cyclone does it all automatically.

4.2. "Auto Cloud" should be used when importing unregistered data that does not contain targets. This setting will conduct a preliminary cloud-to-cloud alignment and register the setups based on shared geometry between scans. Again, you do not need to pick. Cyclone does it all automatically.

4.2.1. "Smart Align" is a tool that will aid the Auto Cloud search by lowering the number of links to search by only searching the links specified by the user. All setups not identified by the user will be compared to all other setups. Once Smart Align is selected, links can be created between setups by time, distance, or by manually dragging one setup to another.

Note: The Smart Align option will not be enabled unless a background image is in use
(blank is fine) and setups have been dragged into the Sitemap area.*

4.3. "Pre-Registered" should be used for data that has already been registered in another application. This setting will maintain the alignment and transformations present within that data set and generate the link objects unique to Cyclone REGISTER 360.

4.4. If no options are checked, Cyclone REGISTER 360 will import the files but will not attempt to form any links.

5. The last section of the import stage is the map tool. This map can be used to acquire a satellite image to serve as a sitemap for the project. (Optional)

5.1. You must be connected to the internet to use the map.
5.2. You can scroll to a known location or enter a sreet address, city name, or ZIP code. You must then click "Lookup" to search the map.

5.3. Once you are satisfied with the positioning of the image on screen, click "Get Image" to save the screen and automatically set it as your sitemap background image.
5.4. If you wish to use your own image as a sitemap, you can add that image via the "Drag files here" or "Browse Files" options.
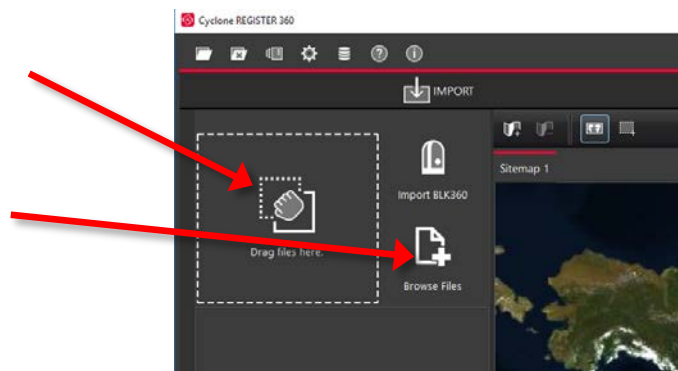
6. Once you are satisfied with the data that has been added and made the appropriate selections regarding registration options, click the large, red "Perform Import" button in the lower right corner of the screen.


Review and Optimize

7. Once the import is complete, the user will be placed within the **Review and Optimize** stage. Here, they can QA and refine the registration and produce assets to include within the final Registration Report.
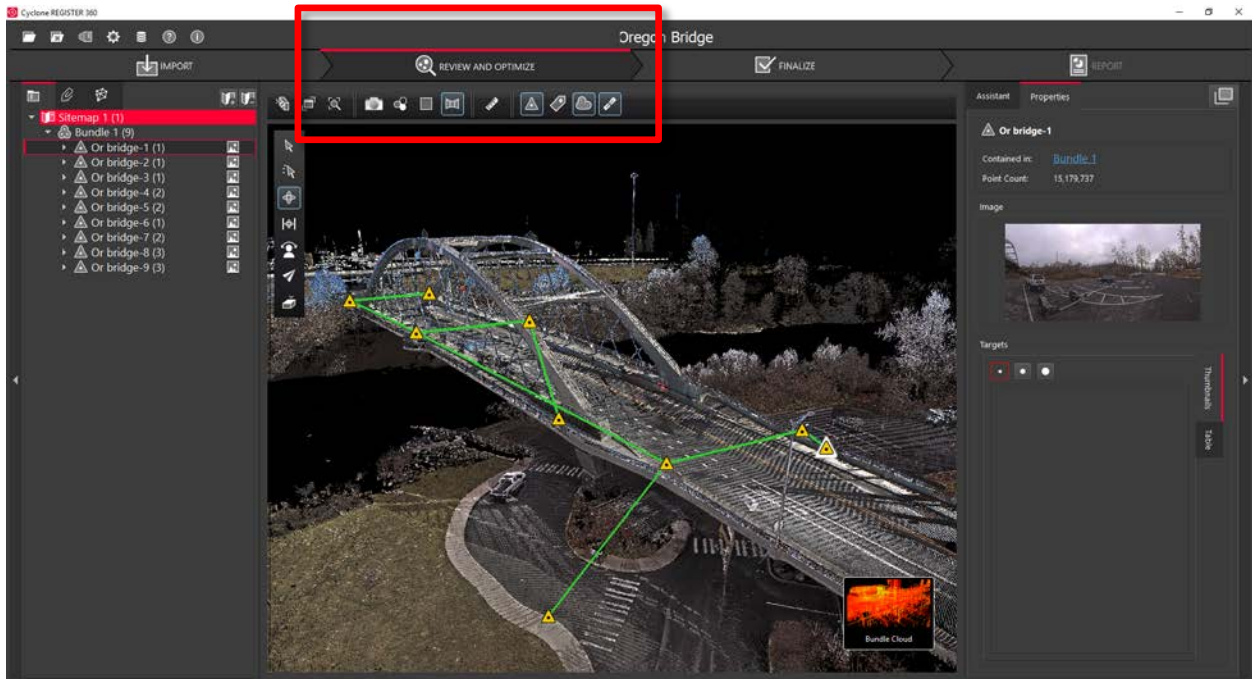

7.1. On the left-hand side, you will see a complete directory of all data within the project clustered under three tabs: "Project" which contains sitemaps, bundles, setups, and links, "Assets" which includes all image assets both imported and those created via the "Capture Screen" button, and "Controls" which includes any imported .txt files containing survey control information.
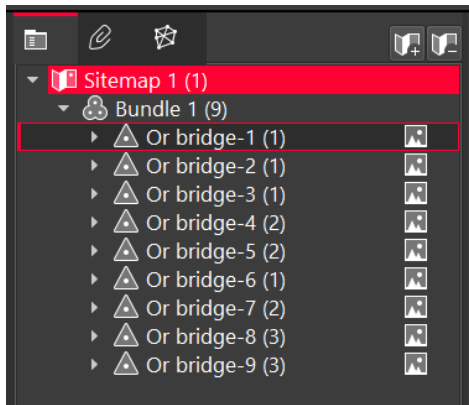
7.2. The user can access the properties for an object by selecting that object in the project panel and viewing the "Properties" panel on the right-hand side of the screen.
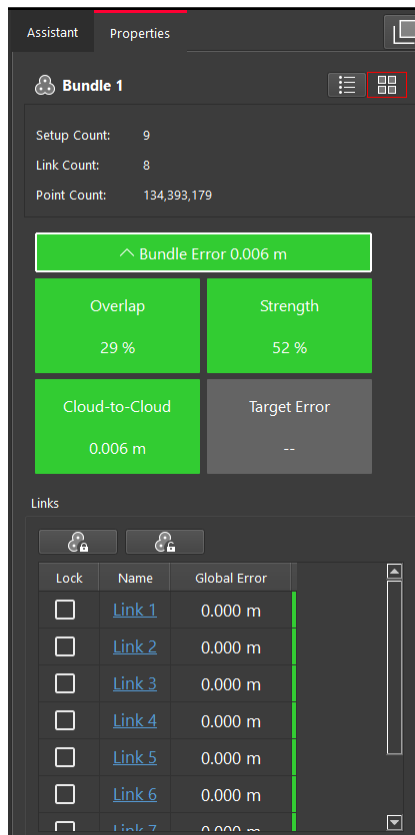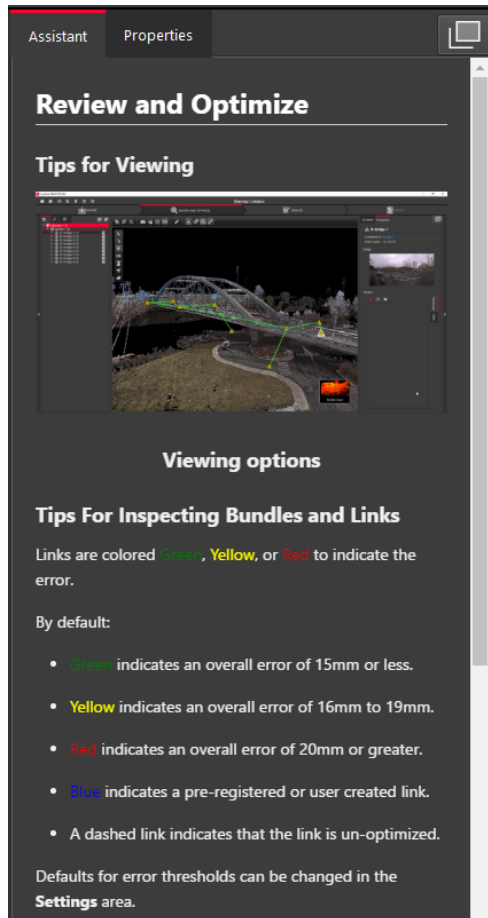

7.3. The "Properties" panel can be viewed with "Advanced Mode" On or Off depending on whether the user wishes to see a more graphical or more tabular summary of their data. The Advanced mode also offers additional link options.
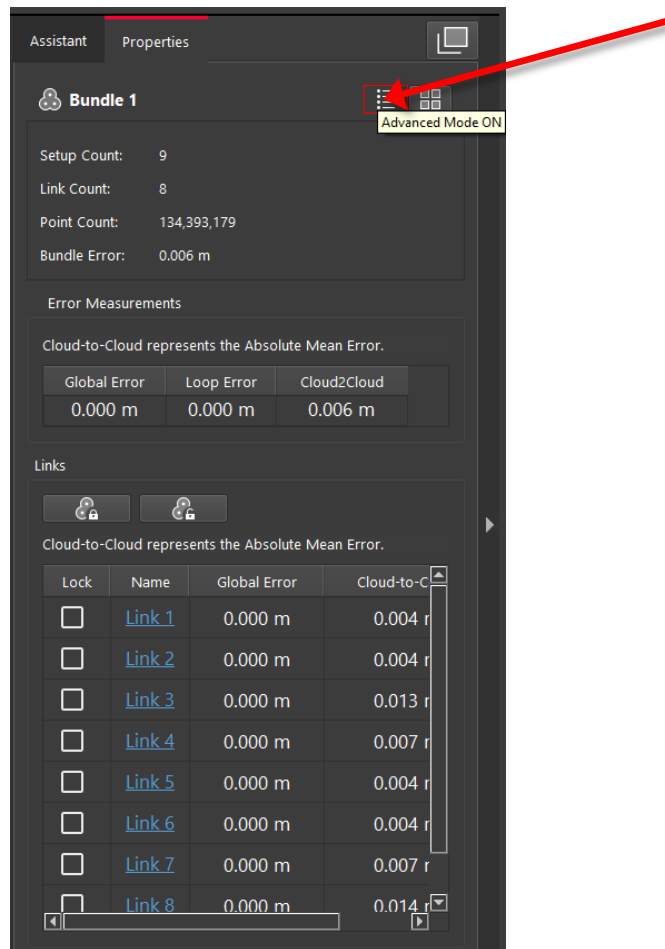
7.4. Next to the "Properties" panel, the "Assistant" panel contains specific advice and information pertaining to each stage of the registration.

Review and Optimize

Tips for Viewing

Viewing options

Tips For Inspecting Bundles and Links

Links are colored Green, Yellow, or Red to indicate the error.

By default:

- Green indicates an overall error of 15mm or less.
- Yellow indicates an overall error of 16mm to 19mm.
- Red indicates an overall error of 20mm or greater.
- Blue indicates a pre-registered or user created link.
- A dashed link indicates that the link is un-optimized.

Defaults for error thresholds can be changed in the **Settings** area.

7.5. Within the Reviw and Optimize stage, the user may refine their registration through a variety of tools.

    7.5.1. The user can delete setups and links and re-form them.

    7.5.2. The user may also refit targets at this stage to improve the registration.

    7.5.3. The user can set a unique User Coordinate System to orient their project for better viewing.

7.6. The user may view their project either as a "Sitemap" (2D, top-down) view, or as 3D cloud by hovering over the icon in the lower right-hand corner of the workspace and selecting the appropriate viewing option.
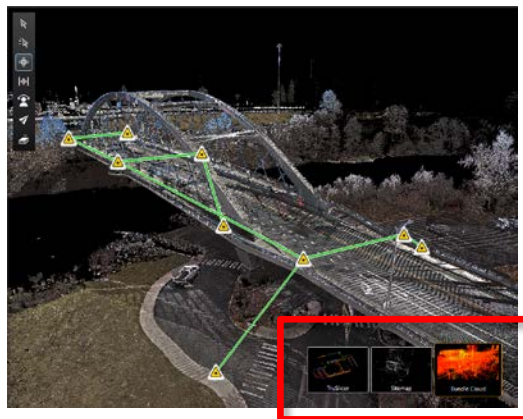
7.6.1. The user should use the "TruSlicer" view to QA their regsiration. The point clouds from each setup will be colored differently. A good alignment will show a thorough intermixing of colored points and matching geometry in areas of overlap. The user can control the thickness and location of the slice via the sliders at the top left of the workspace.
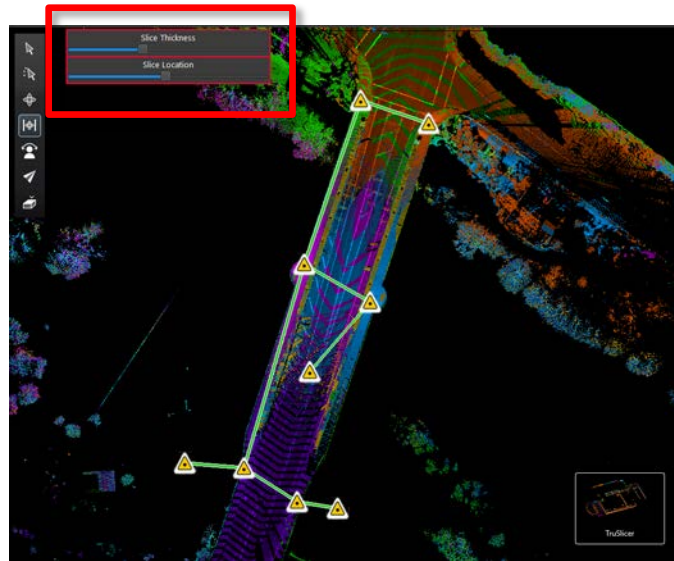

7.7. Depending on the user's selection, a "Navigation" bar may appear in the top left of the workspace or an "Action Bar" at the bottom that will enable different tools that are only accessible with the user's present selection.
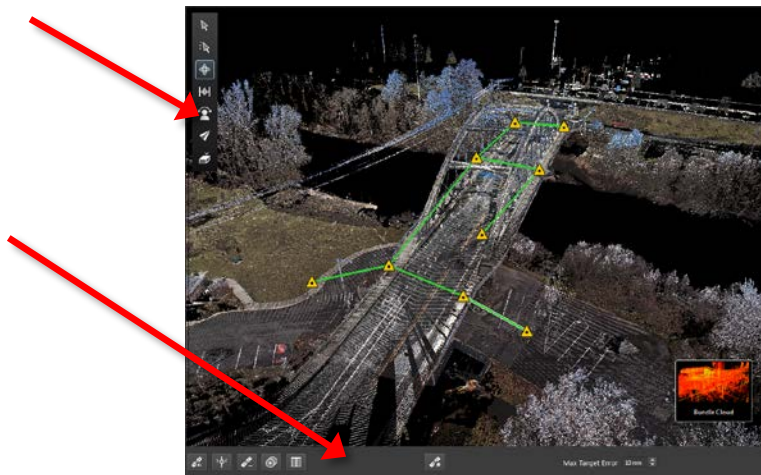

7.8. At any point, the user may access their "Settings" by clicking on the gear icon at the very top left of the screen to change units and set the error threshold for green, yellow and red links.
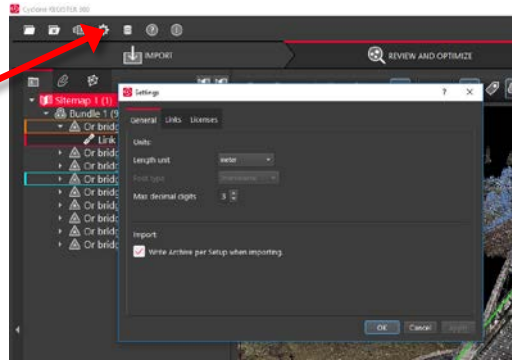
7.9. At any point, the user may click the "Capture Screen" button (shaped like a camera) to save an asset which they can chose to include in their final Registration Report. These assets will appear in the "Asset" tab in the project panel at left.
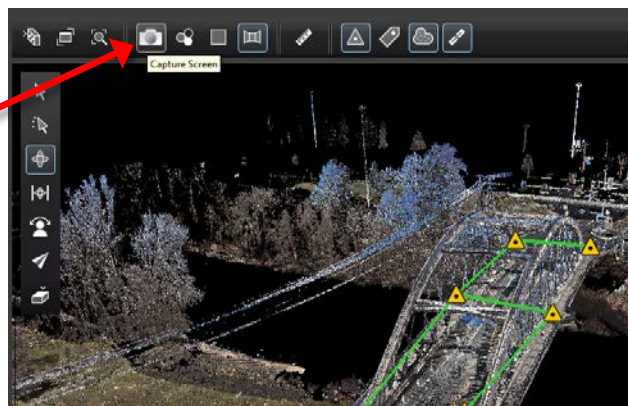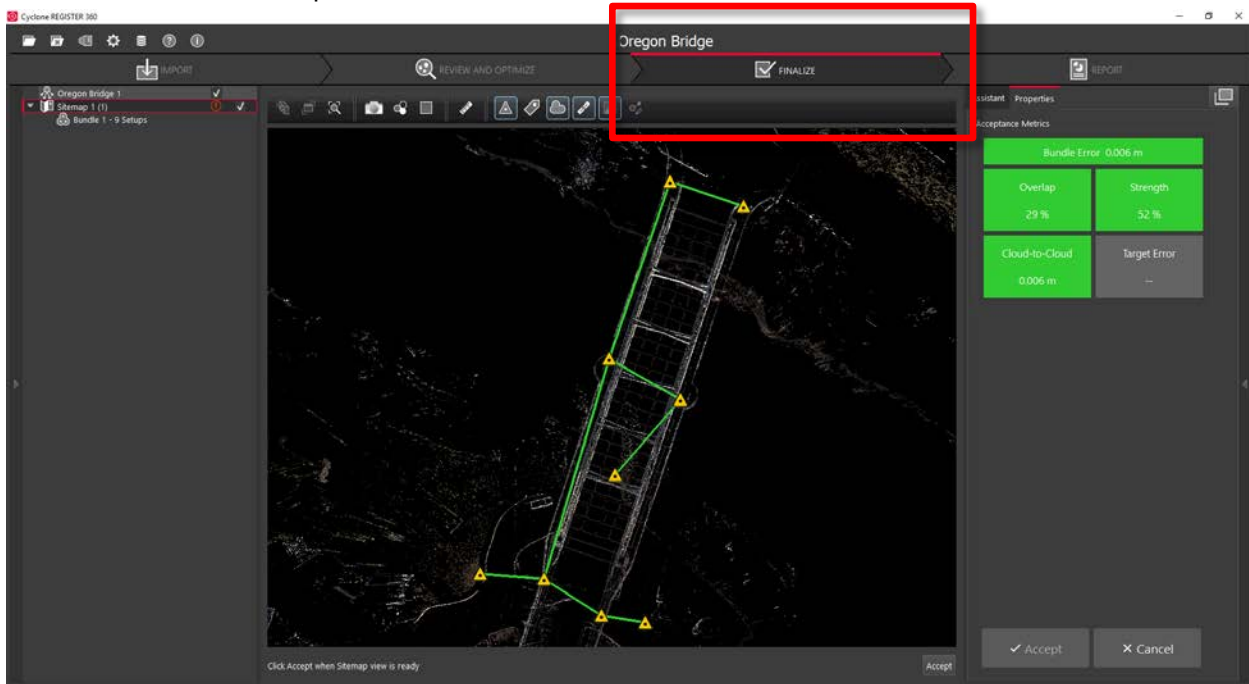

7.10. To increase working space, the user may collapse either or both side panels by clicking the arrow at the sides of the panel.
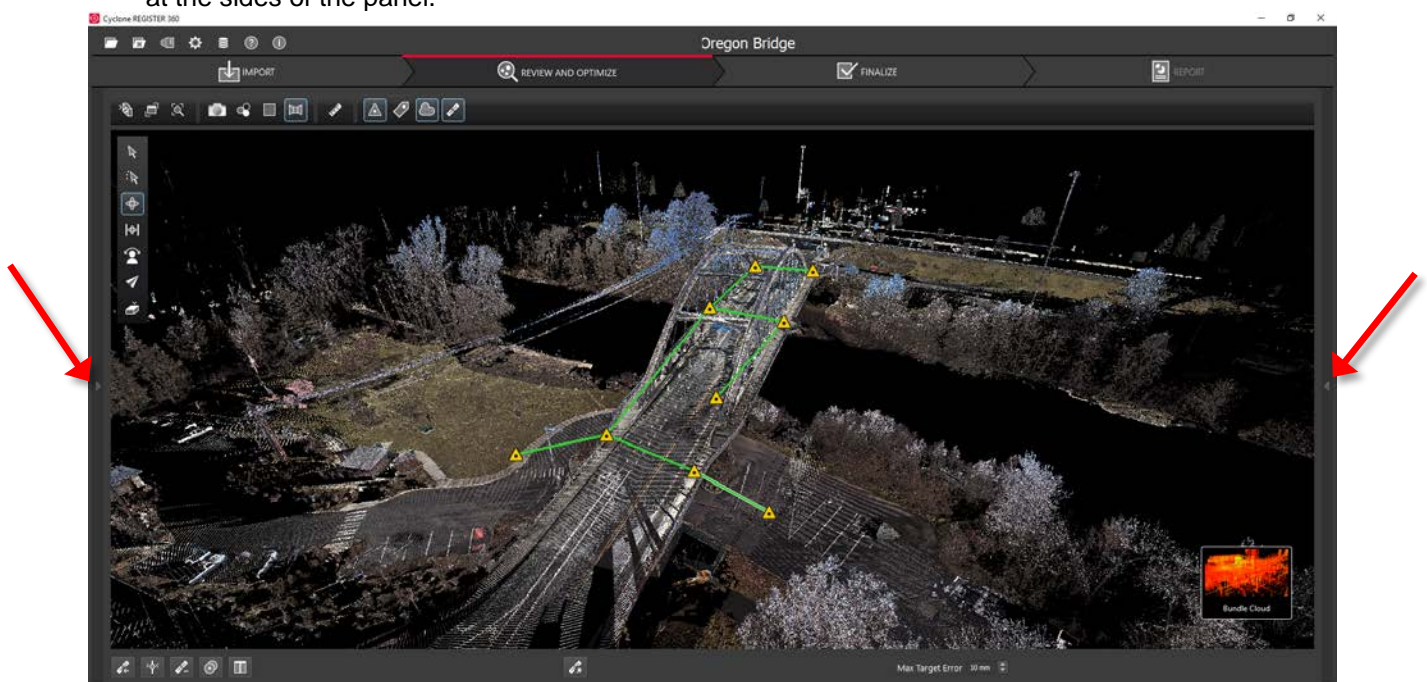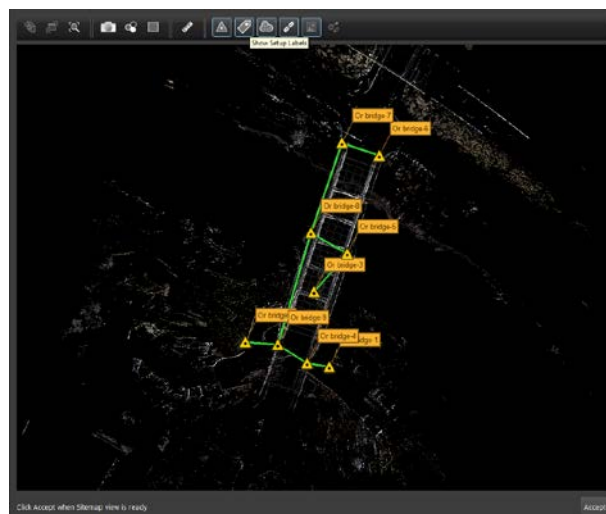
Finalize

8. Once the user is satisfied with their registration, they may move on to the **Finalize** stage by clicking the "Finalize" bar at the top of the screen.

8.1. Within the "Finalize" stage the user can make final adjustments to the presentation of their project by turning On or Off the point cloud, setups, links, sitemap, and setup labels.

8.2. When the user is satisfied with the presentation of the image, they may click "Accept" in the Action Bar. This will freeze the image on screen to serve as the Registration Report cover image. They should then click the large, red "Accept" button in the Properties panel to advance to the Report stage.
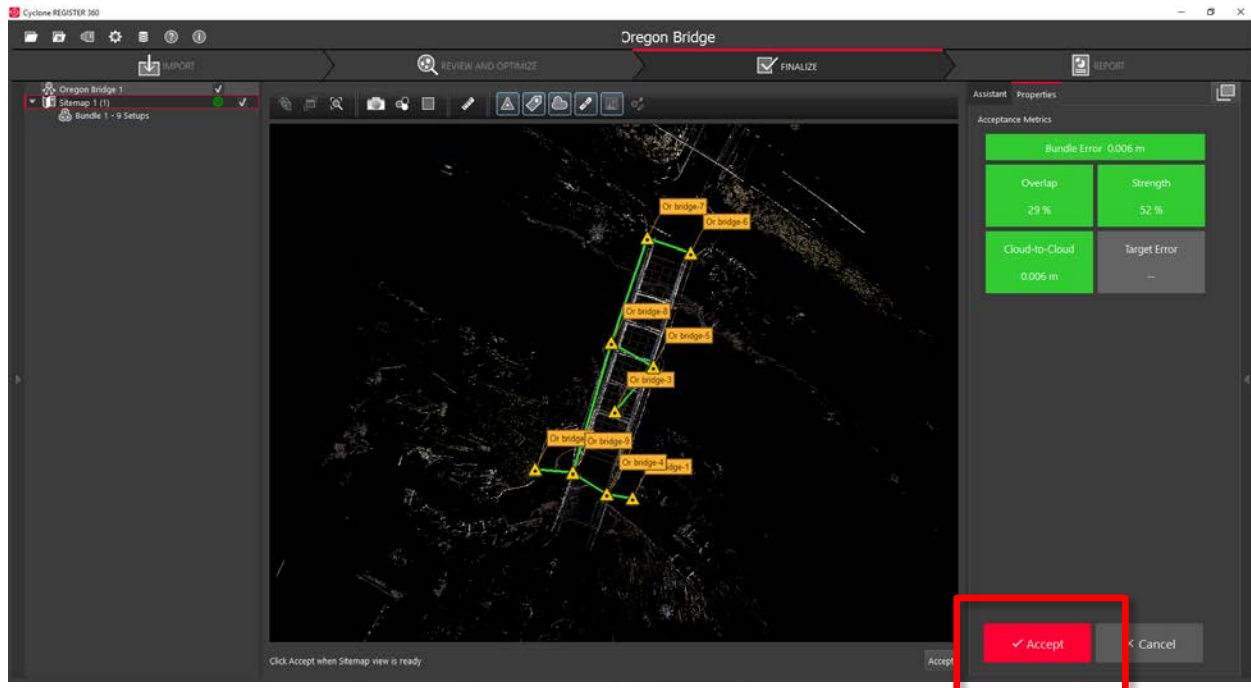
Report

9. Within the **Report** stage, the user will have many customization options.

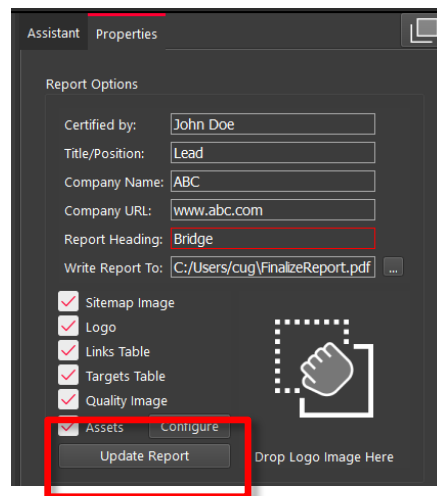   9.1. They may enter their name under the "Certified by" line as well as their Title or Position, Company Name, and URL as well as a Heading for the Regsitration Report. To update the Report with this information, click "Update Report."

    9.2. The user may also select what they want to include within their report by checking or unchecking the boxes for the sitemap image (the large image captured in the Finalize stage), a logo (which they can add via Drag-and-Drop next to the check boxes, the Links Table, Targets Table (histogram of errors for links displayed as a matrix of setups), and Assets. To select or deselect individual assets for inclusion, the user may click "Configure."

Check the desired options here.

9.3. Lastly, the user has many publishing options for how they wish to share their project. The Registration Report will always be created as a .pdf, however the user can choose to optionally publish their project to TruView Local or Enterprise if they have a Cyclone TruView PUBLISHER or Cyclone PUBLISHER Pro License, TruView Cloud if they have a TruView Cloud subscription, JetStream Local or JetStream Enterperise if they have a Cyclone JetStream PUBLISHER or Cyclone PUBLISHER Pro License, or as an.e57 file.

Desired Data Destination	Required License	Requierd Product
Cyclone	Cyclone REGISTER **or** Cyclone MODEL **or** Cyclone SURVEY	Cyclone 9.2 or newer
TruView Local	Cyclone TruView PUBLISHER **or** Cyclone PUBLISHER Pro	TruView Local (ActiveX plugin for Microsoft Internet Explorer)
TruView Enterprise	Cyclone TruView PUBLISHER **or** Cyclone PUBLISHER Pro **Creates *.tvg files for upload	TruView Enteprise *TruView Enterprise 3.0 or newer is required for support of Cyclone REGISTER 360 Projects with multiple sitemaps.
TruView Cloud	Active TruView Cloud Subscription	TruView Cloud Subscription service *TruView Cloud 3.0 or newer is required for support of Cyclone REGISTER 360 Projects with multiple sitemaps.
JetStream Enterprise	Cyclone JetStream PUBLISHER **or** Cyclone PUBLISHER Pro	JetStream Enterprise 1.4 or newer **and** desired compabile viewer/plugin (JetStream Viewer, CloudWorx or MultiWorx product)
JetStream Viewer	Cyclone JetStream PUBLISHER **or** Cyclone PUBLISHER Pro **Creates *.jsv files for viewing point clouds and imagery in JetStream Viewer	JetStream Viewer 1.4 or newer
E57	No additional license required	E57 compatible products of users' choice

9.4. The user should select all of the publication outputs they wish to produce from this list and then click the large, red "Publish" button in the properties panel. This will allow for single, batch publishing of all your selected outputs.
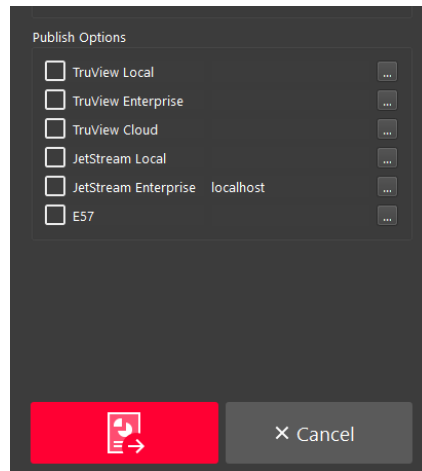
9.5. All of the outputs will be created and saved to the location designated by the user.

Known Issues

- Virtual Machine (VM) environements are not supported.
- Remote Desktop is only supported if Cyclone REGISTER 360 is opened in the remote computer first. Trying to open Cyclone REGISTER 360 through remote desktop is not supported.
- Cyclone REGISTER 360 will not detect the dedicated graphics card on computers with multiple graphics cards. Users must manually set the dedicated card for use with Cyclone REGISTER 360. This is done with the Nvidia Control Panel for Nvidia graphics cards, or with the Catalyst Control Center for ATI\AMD graphic cards
- Importing data over a network can cause issues, especially on Windows 10. The workaround is to copy the scan data to a local disk.
- If memory issues arise check and make sure that the virtual memory size is set to the same size as RAM.
- Automatic image matching of imported panoramic images may not always be correct.
- Deleting points with the fence tool shows a low-density version of the deleted cloud after deletion. Moving the view will remove these points.
- Leica ScanStation P16 and C10 data MUST have archive files enabled during the import step to export to e57.
- The zoom scale bar will be captured in the image in the import area using the on-line map.
- Leica ScanStation P16 and P30 data is marked as P40 data in the import area.
- Project thumbnails (the image shown in the project selector) are not preserved in the *.raf export file.
- F1 contextual help will not work with Microsoft Edge browser as the default browser. The workaround is to use Chrome or Firefox as the default browser.
- The auto extraction of Black & White targets will not extract targets from detail scans. The extractor works on the main scan only. The targets can be manually extracted from the detail scans after import.
- e57 export does not support image export.

- Files written to the temp folder at C:\Users\(user name)\AppData\Local\Temp\Register360, will be deleted after the program closes. These files will NOT be deleted if the program freezes or crashes.
- In rare cases the bundle will show an optimized state, but there is still an unoptimized link in the bundle (not shown with a dotted line). Optimize the bundle to resolve the issue.
- The Sitemap name cannot have non-Latin (Japanese, Chinese, etc) characters for publishing to TruView Enterprise or TruView Cloud to work. The currently active Project should not be re-named from the Projects & Storage settings. You should close the project before renaming it.
- After editing the tone map image, the project needs to be re-opened to see the edited image.
- FARO data (*.fls), with no RGB color burned on the points, imports into REGISTER 360 showing the points rendered with a black color (it may look like there are no points at all). The workaround is to switch to Greyscale or Hue rendering.