AUTODESK®
RECAP™ PRO

Instruction Manual

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Revision 2

3sixtyedge

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Table of Contents

Introduction

ReCap (stands for Reality Capture) is an Autodesk program used for working with native point clouds derived from laser scans. It is typically used by laser scanning Operators to merge their scan data into one cohesive point cloud. But ReCap is so much more.

ReCap also provides a set of tools that allows you to measure, markup, and communicate accurate site data with collaborators from the comfort of your office. And while basic measurements and notes are available across all tiers of ReCap, you'll get other advanced tools with the subscription-based ReCap Pro version.

Disclaimer: I am not affiliated with ReCap or Autodesk. I am a laser scanning provider and former Engineering Consultant who happens to be a fan of the product and can see the potential this technology has as a great productivity and collaboration tool.

The following is intended to help the end user get the most out of ReCap. This is not meant for Laser Scanning Professionals as there are no sections dedicated to Registering or Indexing scanned data.

Setup

The first step in using Autodesk ReCap Pro is downloading the free 30-day trial here:

https://www.autodesk.com/products/recap/free-trial

After 30 days, the user can keep using ReCap Pro by subscribing or to downgrade to the free version of ReCap.

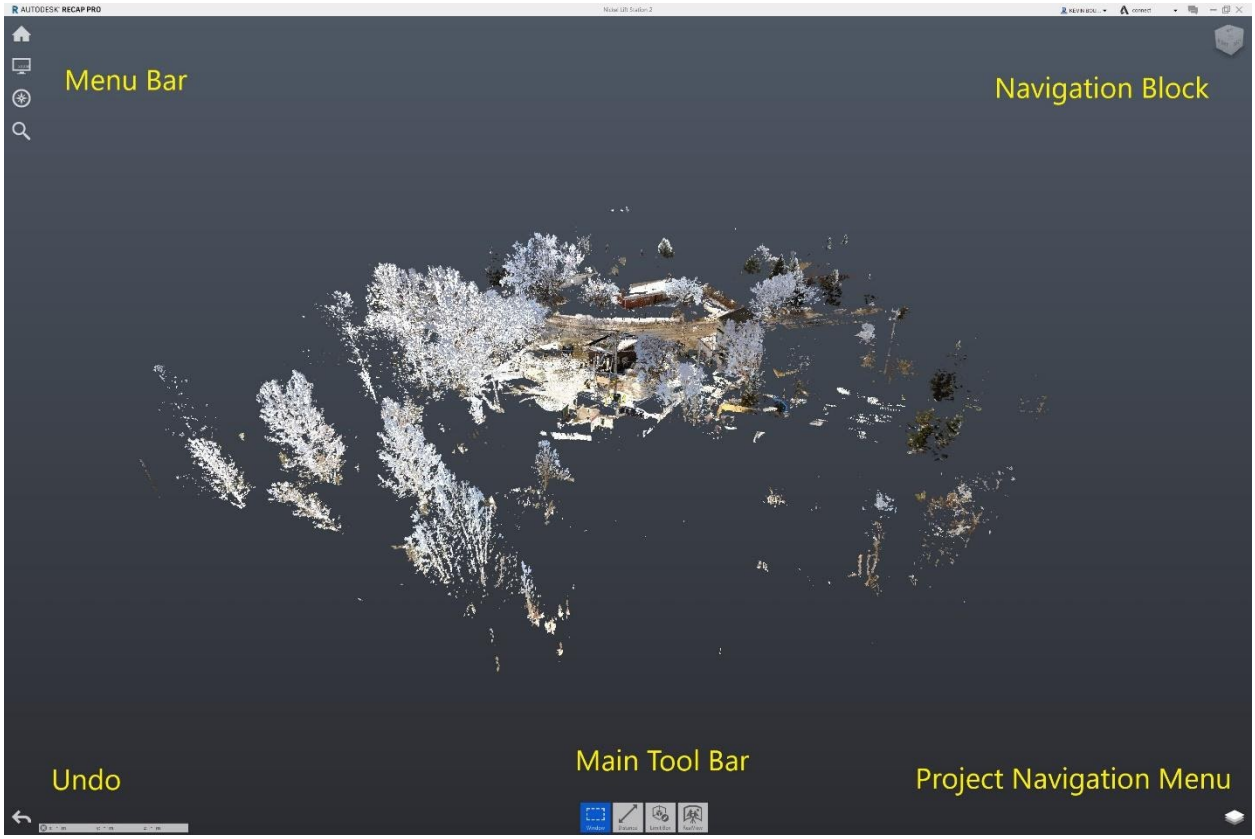
Point clouds can come in a variety of sizes. Larger point clouds can be very demanding on a computer's video card. To get the most out of your video card, make sure ReCap is set to *High Performance*. For Windows 10 users; this can be accomplished by going to *All Settings* / System / Display. Scroll to the bottom and click on *Graphic Settings*. Go to the *Choose an App to Set Preference*, and choose *Classic App*. Click *Browse* and find *ReCap* under the *Autodesk* folder which should be in the *Program File* folder located on the c: drive. Once ReCap appears on the list, click on it and choose *Options*. Once the *Graphic Specifications* window appears, choose *High Performance*.

The ReCap font often appears too small on some monitors. This can be resolved by going to All Settings / System / Display. Choose *200% (recommended)* from the *Change the Size of Text, Apps, and Other Items* drop down menu.

Controls

ReCap has three control buttons. The left and right mouse buttons and center scroll wheel. The left mouse button is used for selection purposes, the right button is used for navigation purposes, and the center scroll wheel is used to pan when pressed, and to vary *Fly* navigation speed when scrolled. Navigation is further explained in the *Navigation Menu* section.

Main Screen



The Main Screen can be broken down into six categories:

- The main viewing area;
- The Main Tool Bar;
- The Menu Bar;
- The Navigation Block;
- The undo Button; and
- The Project Navigation Menu.

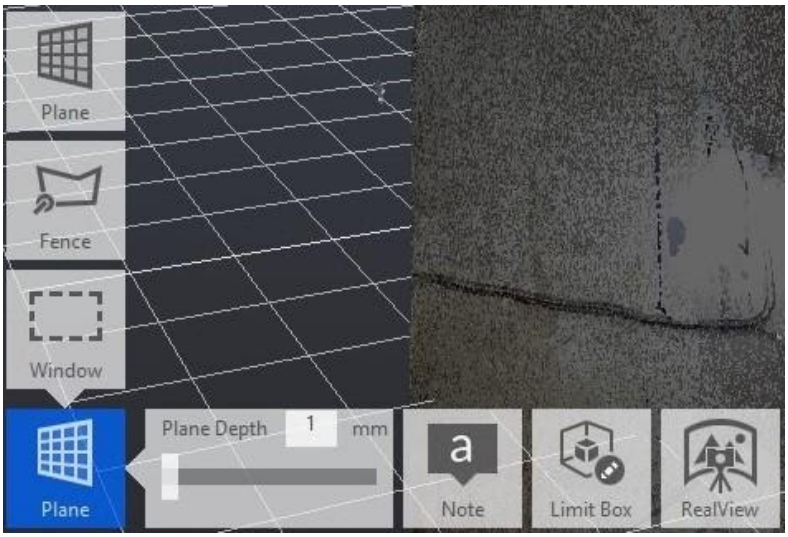
We will be focusing on the Main Tool Bar, Menu Bar, and Project Navigation Menu in this document.

Main Toolbar

Once a project has been opened, you'll find the main toolbar at the bottom of the screen. This toolbar can be seen in the image below. It is divided into four categories:

- Selection Tools;
- Annotation Tools;
- Limit Box; and
- RealView.

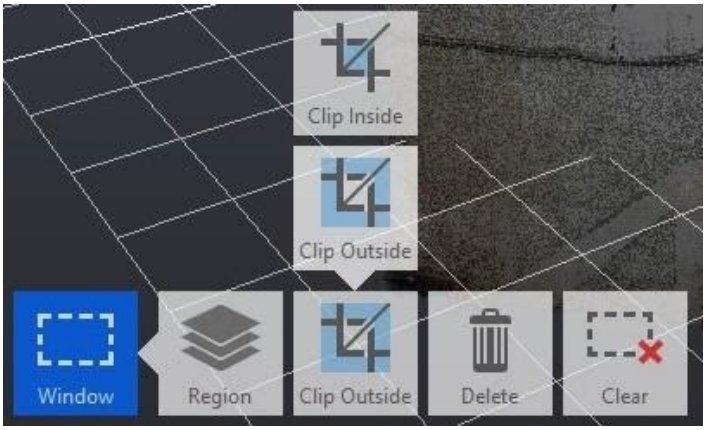
Selection Tools



The *Window* tool is a rectangular selection tool used to select everything within its boundaries. Once you click on the *Window* tool, a sub tool palette opens showing other selection options such as *Fence* and *Plane*.

The *Fence* tool allows for a custom selection shape and the *Plane* tool allows for a plane to be selected. The depth of the plane can be determined using the slider seen in the above image.

Once items are selected, other tools appear in the toolbar.



The user has the option of clipping items inside or outside of the selection window, deleting them or creating regions. Regions are used to save different clipped areas that can be toggled on or off individually. This way you can simply hide unwanted sections instead of deleting them. Some point clouds are very large and can be cumbersome to work with. Hiding regions makes large point clouds a lot easier to work with.

Annotation Tools

The Annotation Tool is divided into two major sections:

- Distance and
- Note.

The *Distance* tool opens a sub tool menu that includes *Freehand*, *Ortho*, and *Surface* measuring tools.

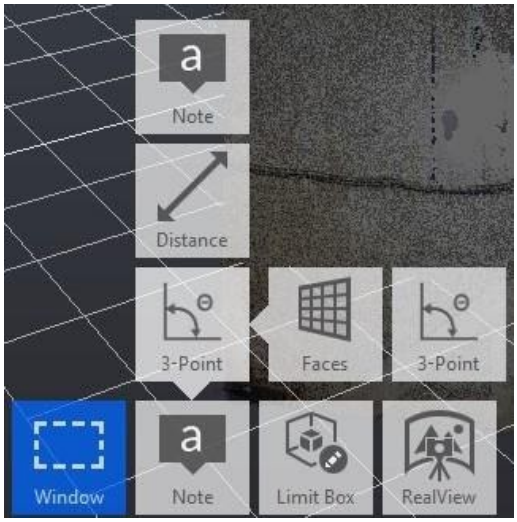
The *Freehand* distance tool defines the linear distance between two points. You can toggle through the *Distance* menu by pressing the *Shift* key to define your endpoint with a different tool (eg, to measure distance to the center of a pipe or select an endpoint orthogonal to the *x* axis).

The *Ortho* measuring tool is used to provide a measurement of two points along the *x*, *y*, or *z* axis. The *shift* key can be used to toggle between the *x*, *y*, and *z* axis.

The *Surface* tool is used to determine the distance between two surfaces.

The *Pipe Snap* tool can be used to measure the circumference and the diameter of cylindrical objects such as pipes and tanks. It can also be used to snap to the centre or edge of the cylindrical objects.

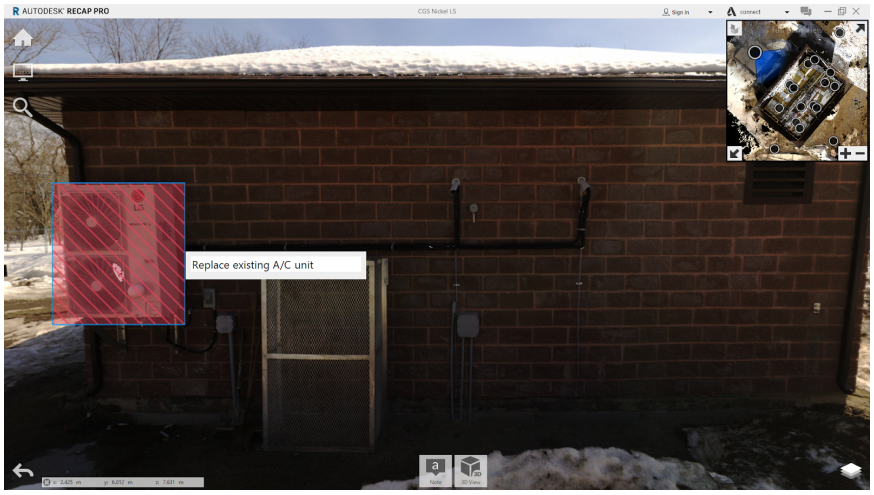
Other measurement tools include *3-Point* and *Faces*. The *3-Point* tool can be used to determine the angle between three points and the *Faces* tool measures the angle between two surfaces.



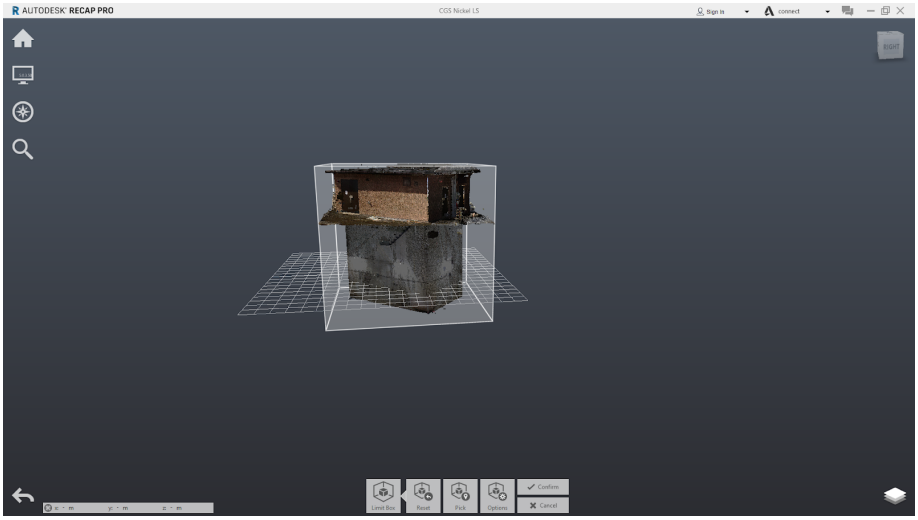
It should be noted that working in 3D space can be tricky. Be sure to view these measurements from different viewpoints to make sure you have snapped to the correct points.

The *Note* tool is very handy when it comes to planning and collaboration. Notes can be complemented with images to relay even more information as seen below.

Another *Note* feature that can be used for planning and collaboration is the *Markup* tool. Areas of interest can be highlighted or hatched as shown below. This is handy for identifying items or sections that are to be removed or demolished. Screenshots can be used to complement scope of work documentation. Please note that the *Markup* tool is only available while in *RealView*.



Limit Box Tool



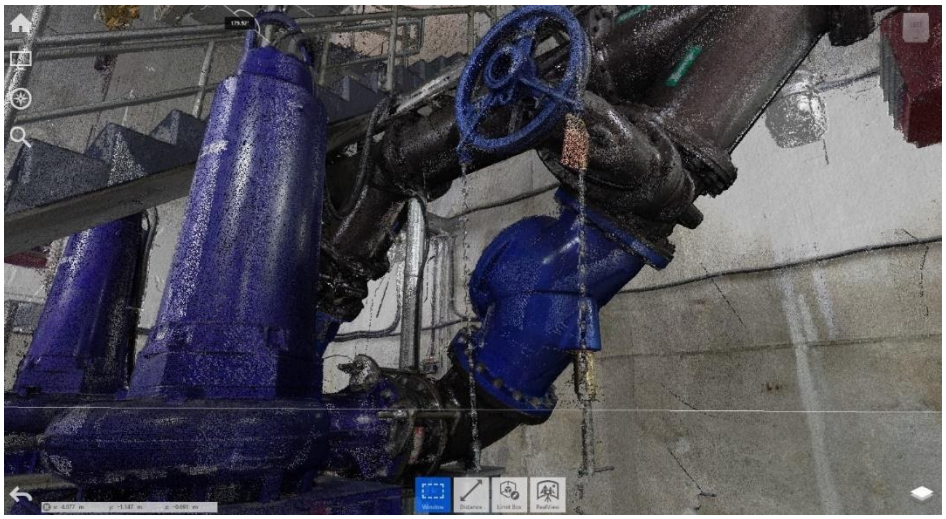
The Limit Box tool can be used to control how much of the point cloud is displayed at any one time. This is another useful tool used to narrow your field of view to make working with point clouds easier and less cumbersome. This tool allows for more flexibility and enables section views and floor plans to be created.

If the Limit Box is not lined up with the point cloud like shown in the image above, simply press *Ctrl* while clicking on one of the edges of the Limit Box with the left mouse button and dragging the mouse, lining up the box in the correct orientation.

Once the box is lined up correctly, click on any of the four sides with the left mouse button to cut through the point cloud. Once you are done, click on the *Confirm* button.

To get the best section view, toggle off *Perspective* view located in the *View* sub menu which can be found in the *Display Menu*. This will create an orthographic view. Refer to the Display Menu section for more information.

RealView Tool



Most modern laser scanners are equipped with colour capture technology that produce coloured point clouds. They also have the ability to produce high quality HDR images. Images are easier to work with than point clouds and can be accessed either by clicking on the *RealView* tool or mirror balls which appear at every scan location. The two images above show the difference between *RealView* and point cloud or *3D View*.

Menu Bar

Next, we take a look at the Menu bar which is located at the top left corner of the screen. It is divided into four categories:

- Home Menu;
- Display Settings Menu;
- Navigation Menu; and
- Search

Home Menu

The Home menu includes self explanatory items such as:

- *Save;*
- *Open Project;*
- *About;* and
- *Exit.*

It also includes:

- *Recover Deleted Points*;
- *Upload;*
- *Export;*
- *Data Report;* and
- *Preferences.*

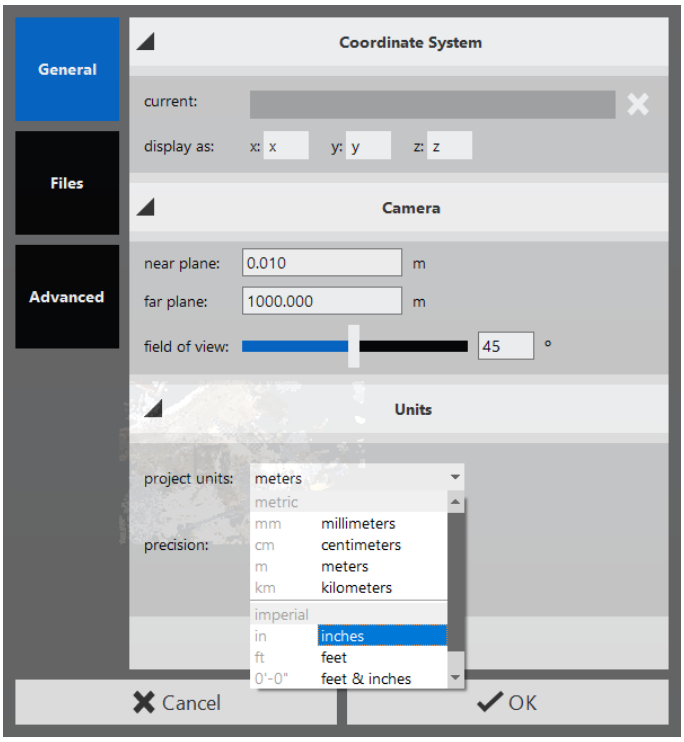
The *Recover Deleted Points* menu item brings back all points that were previously deleted. This can be used if important information gets accidently deleted and it's too late to use the *Undo* function.

The *Upload* tool allows the user to upload the project to a web portal and share with colleagues. The user chooses whether the colleagues can view only, download, or download and update. The originator can then sync the project and allow everyone to have the most up-to-date copy. The great thing about this feature is that the colleagues only need to download the free version of ReCap to work with the shared project. They will be limited to the basic tools and features; however, the basic features are generally more than enough for collaboration purposes.

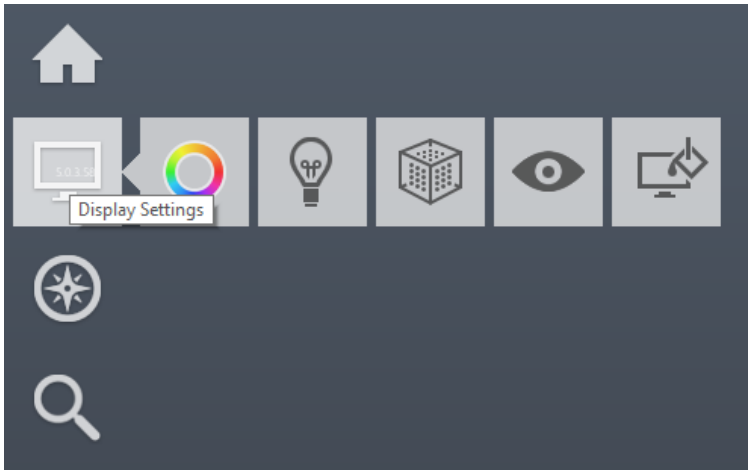
Export is used to export the project as a different file type to make it compatible with other software. The default file type is .rcp. This file type is compatible with all Autodesk products but is not compatible with most third-party software. Other types include .rcs, .e57, and .pts.

The *Data Report* tool gives the user a report of how well the different scans have been merged together. This tool is useful to the scanning Operator; however, it is not that useful to the average user.

The *Preferences* menu can be used to modify camera settings and choose between metric and imperial project units. See image below.



Display Settings Menu



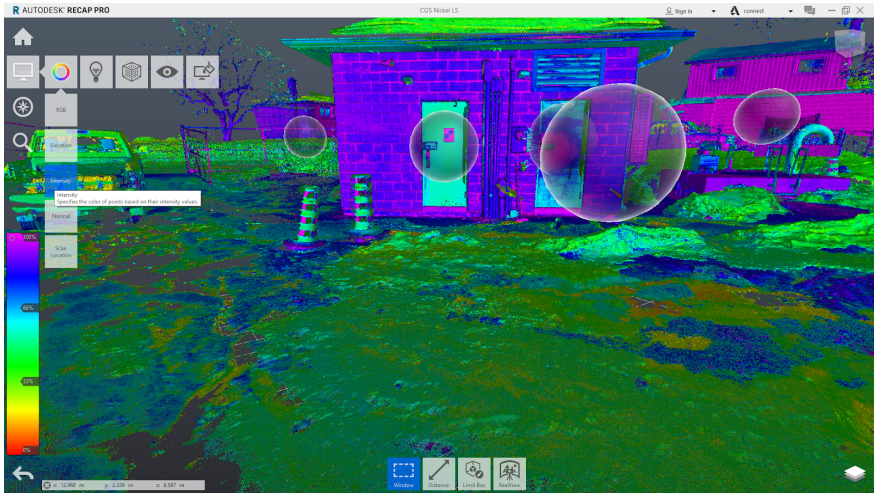
The *Display Settings* menu includes:

- *Colour Mode;*
- *Lighting Settings;*
- *Display Points;*
- *View;* and
- *Background.*

The *Colour* option allows the user to choose between:

- *RGB*;
- *Elevation;*
- *Intensity;*
- *Normal;* and
- *Scan Location.*

The image below is set at the Intensity colour option. This is a user preference. I prefer the *Intensity* option as it brings out more detail.



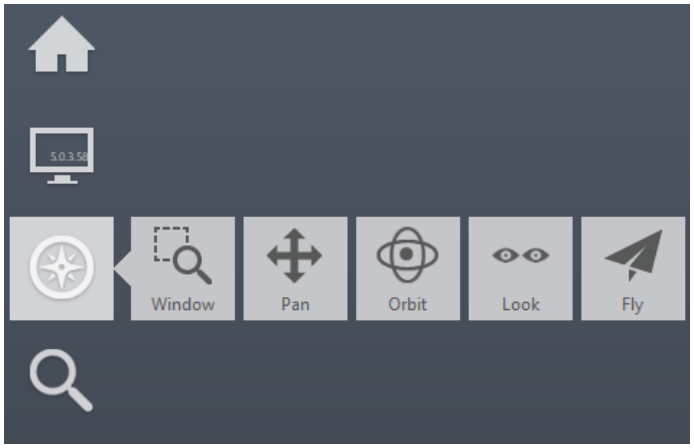
The *Lighting Settings* option controls the lighting angles of the point cloud.

The *Display Points* option allows the user to define the size of points shown. Typically, the default level is recommended. Increasing the size of the points may make the picture blurry and decreasing the size makes the cloud more transparent.

The *View* option allows the user to hide the mirror balls and annotation such as notes, markups and measurements. It also allows the user to toggle between perspective and ortho view modes. Ortho is useful for looking at sections and plan view.

The *Background* option simply allows the user to change the colour of the background.

Navigation Menu



The Navigation menu gives you different ways to navigate through the point cloud as seen above. This only works in 3D view. You can also learn keyboard shortcuts by hovering over the different icons.

The following are the main navigation functions with their respective shortcuts:

- Fly: Shift + right mouse button. Use scroll wheel to vary speed;
- Look Around: Ctrl + right mouse button;
- Orbit: Right mouse button;
- Zoom: Scroll center mouse wheel; and
- Pan: Press mouse center wheel.

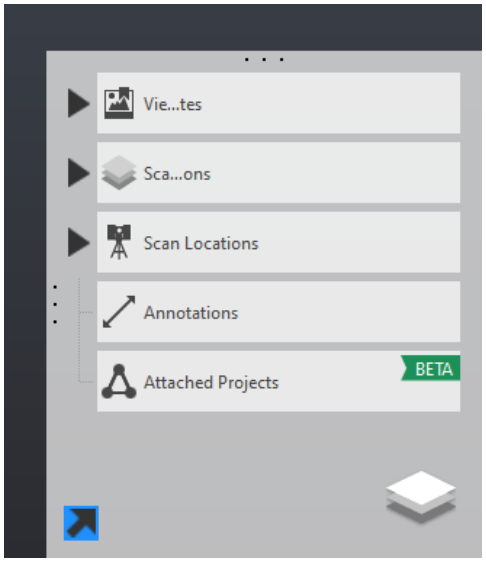
Perspective view must be toggled on to use the different navigation options. This can be done by going to *View* in the Display Settings Menu. If the Perspective box is highlighted blue, it means that it is on.

Another navigating option is the *Navigation Block* located on the top right of the main screen. This block can be used to orbit or to quickly go to one of the six sides of the 3D point cloud.

Search Feature

The search tool allows you to look up notes, markups, and individual scans. This can be helpful on large projects and to identify scan locations.

Project Navigation Menu

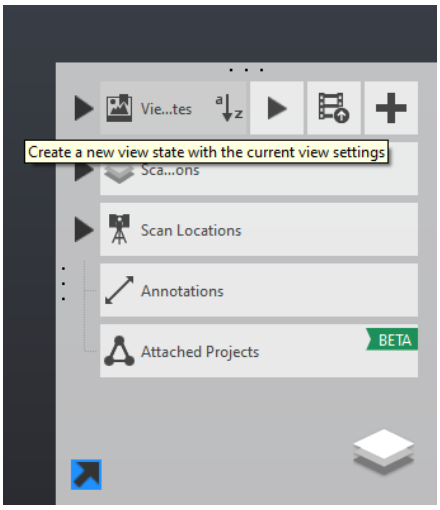


The Project Navigation Menu is comprised of five sections:

- *View States;*
- *Scan Regions;*
- *Scan Locations;*
- *Annotations; and*
- *Attached Projects*.

View States

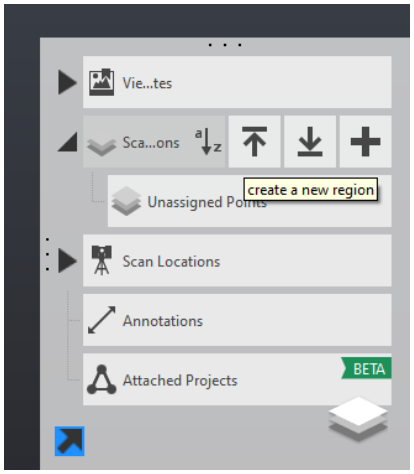
View States allows you to create views using clipping boxes. Refer to the *Clipping Box Tool* section for instructions on how to use this feature.



Once the *Clipping Box* has been confirmed, orient the view as you would like it to appear and press the + symbol seen in the image above. Rename it if needed and press enter. Multiple *View States* can be added. These *View States* can be exported to standalone .rcp files using the *Export* function found in the Home Menu.

Scan Regions

Scan Regions can be used to isolate items such as walls, floors, and objects. These items can be set to different colours or hidden when not needed.



Regions can be created by clicking the + symbol. These regions can also be exported as standalone .rcp files using the up arrow.

Scan Locations

When the point cloud file is made up of individual files, The *Scan Location* feature allows you to hide certain scans or even delete them from the project. If your point cloud file has been unified, which is done to eliminate overlapping points thus reducing the file size, this option will not be useful as the individual files have been combined into one. Most projects are delivered as such.

Annotations

The Annotations feature is used to either import or export annotations to or from .csv files.

Attached Projects

The Attached Projects feature allows you to attach Navisworks files such as tanks and equipment into the *RealView* mirror balls to get a visual representation of what a project might look like.

Conclusion

Point clouds can be a great planning and collaboration tool if used correctly. ReCap Pro is a great and cost-effective tool that can be used to take advantage of this emerging technology.

You can also go to the Autodesk Knowledge Network at: https://knowledge.autodesk.com/support/recap/learn?sort=score to learn more about ReCap's features.

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