

Autodesk Infrastructure Masterclass 2017

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Technical Masterclass:
Making the Most of Point Cloud – ReCap 360 Pro

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Making the Most of Point Cloud – ReCap 360 Pro

Autodesk ReCap 360 is Autodesk's flagship Reality Capture software. ReCap 360 is available in most Design Suites and ReCap 360 Pro is available on desktop subscription. ReCap 360 Pro takes the functionality of ReCap 360 to the next level with the ability to register scans and create accuracy reports. Eliminating the need to prepare scan files in proprietary manufacturer's software before we can reprocess the scans in ReCap to later include in other Autodesk design applications. This Masterclass will introduce users to common workflows and tools to *Import, Register, Edit* and *Share* Point Cloud Models.

Objective of the session:

- ✦ Creating a Project and Importing Data
 - ✦ Creating your project
 - ✦ Importing individual scan files or folders
- ✦ Registering your Scans
 - ✦ Registration Modes
 - ✦ Accuracy Reports
- ✦ Editing Scan Data
 - ✦ Creating Regions
 - ✦ Taking Measurements
 - ✦ Data Services – Project Cleanup
- ✦ Sharing Point Clouds
 - ✦ Publish to ReCap 360
 - ✦ Attaching Point Cloud to Civil 3D





Geoff Woodhead

Infrastructure Specialist

Meet the Presenter

Geoff has been in the Construction Industry since leaving school. He was initially employed at Jacobs Babbie as a Trainee Civil Engineer; he then spent a number of years working for many of the country's Blue Chip Engineering Consultancies on both major projects and maintenance works.

Throughout his career he has centred his attention on Automation, Best Practice, Drawing Standards and Process Development. This focus allowed him to take up his last role as CAD & BIM Technical Leader at Catsurveys Group Ltd. In this role he was responsible for developing 3D services, implementing and maintaining company CAD standards and resource libraries, the training and development of a team of over 20 CAD technicians and the continual development of business processes affecting the Design Team.

Geoff is part of our experienced team providing pre and post sales technical support, training, and on-site consultancy.

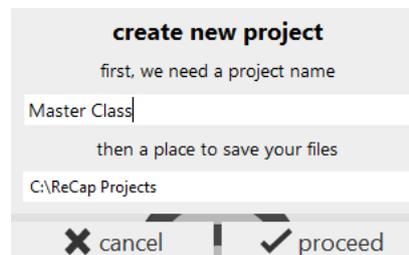


Guidance notes:

Creating a Project and Importing Scan Data

Upon opening ReCap we are presented with a fairly simplistic welcome screen. In the upper left hand corner is the *Scan Project* button, this is where we'll start our journey. Having selected the *Scan Project* button we are presented with a dialog box requesting the project name and a file saving location as shown in fig. 1 below, the project name is typed in the dialog while the save location can be changed by placing a click on it.

Fig. 1



When we are happy with the details entered we can choose Proceed. We are now presented with the screen shown in fig. 2 where we can select files or folders to import, for ease and speed if registering a number of scans we can also drag items into the application window from windows explorer. When the first file has been added the screen changes to display files that have been selected to be indexed in this project. We are still free to drag additional files into the application window or alternatively use the plus and folder icons that have been relocated to the left hand side of the screen as shown in fig. 3. When we have selected all of the files we would like to index in this project we can proceed to the next step. If we would like to filter the data or modify any scanner related settings we can do so by selecting the scanner icon in the top right of the screen as shown in fig. 3, alternatively we can choose to skip straight to the indexing process by selecting the rocket icon in the top right corner or the blue index scans button at the bottom right corner of the screen.

Fig. 2

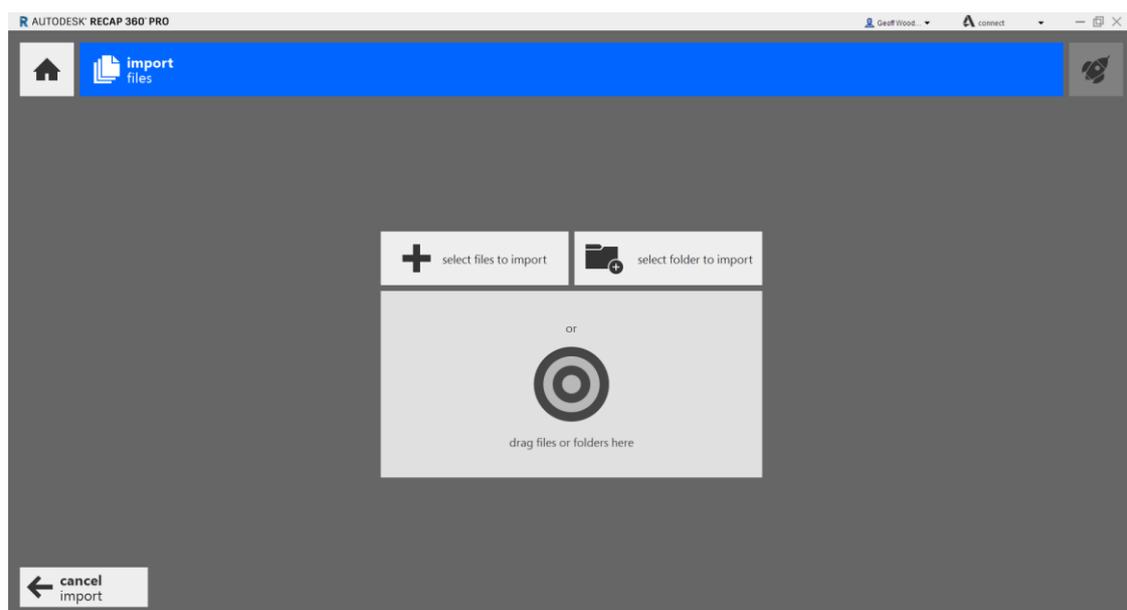
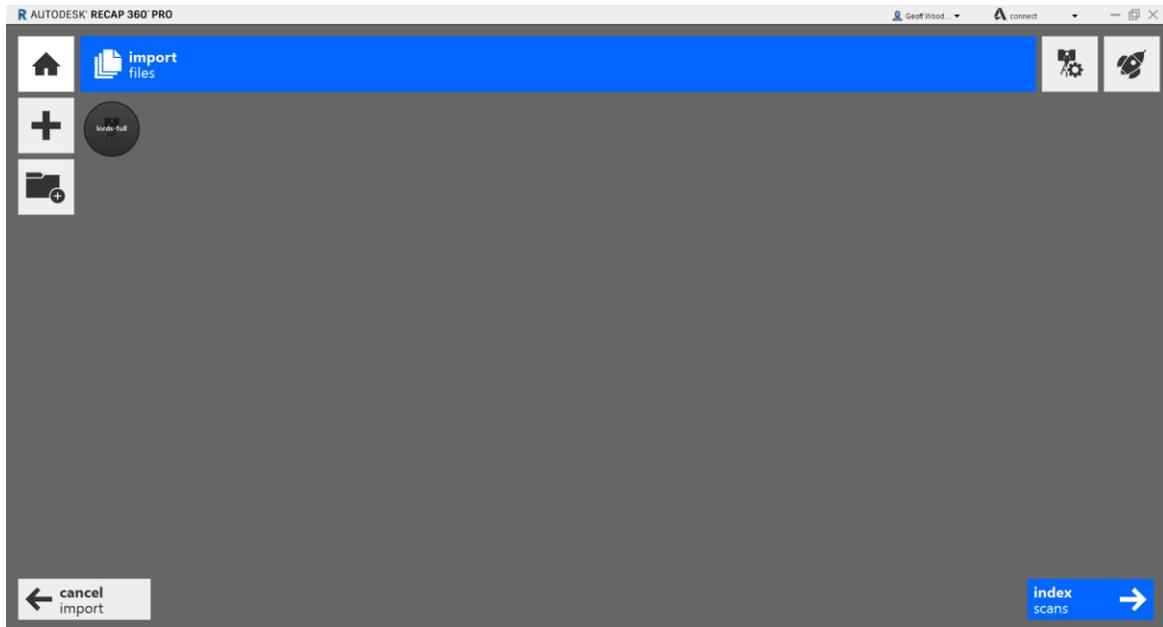
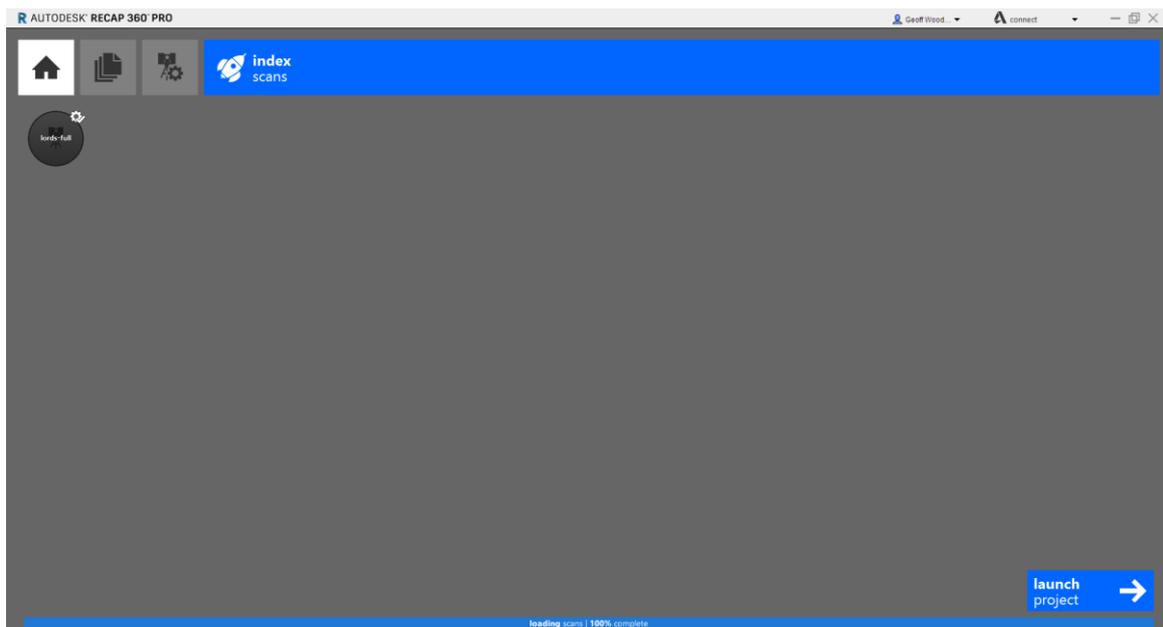


Fig. 3



Having asked the software to index the scans another screen will be displayed as shown in fig. 4. A status bar at the bottom of the screen reports the total progress indexing the scans. A cogwheel symbol will appear on the name of any scans that are still processing. Once a scan has been indexed the cogwheel symbol will move to the upper right corner of the scans symbol and will gain a tick mark indicating that it is complete. During this process an rcp file is created for the project and an rcs for each scan file you loaded into the project, these are saved in the location you specified when initially creating the project.

Fig. 4

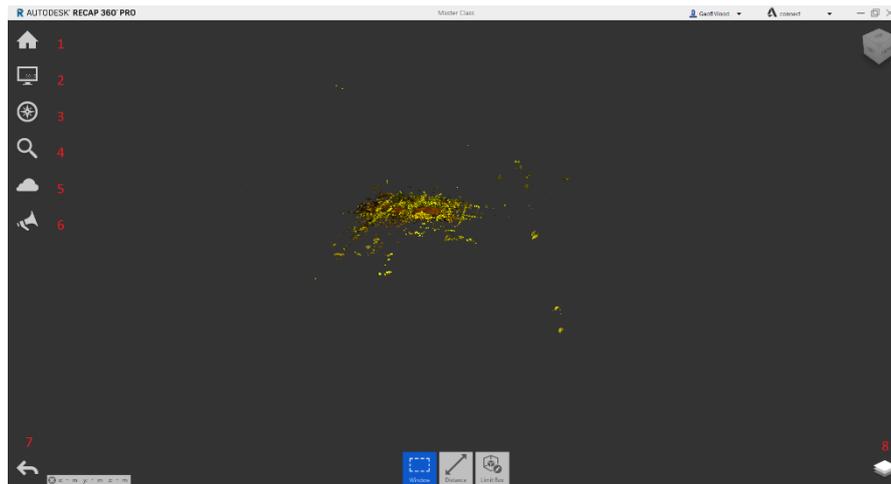


When all the scan files have been indexed we can launch the project with the button shown in the bottom right corner.

About the Interface

Having indexed our scans and chosen to launch the project we will be provided an initial view similar to that shown in fig. 5. ReCap uses an interface unlike those utilised in Autodesk's other product offerings with the closest similarity being Infraworks with its Immersive UI. I have numbered each item shown on the homescreen, their functions are detailed below fig. 5.

Fig. 5

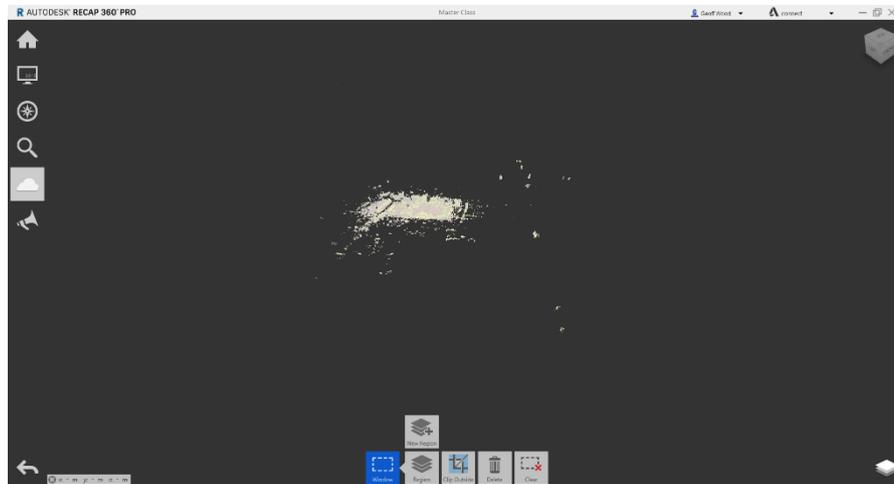


1. **Home** – This menu item allows you to access the open, save, import, export and application preference functions.
2. **Display Settings** – This menu item allows you to customise the way you view the point cloud including the way points are styled, the size they are drawn at, how they are lit and the origin point of the model.
3. **Navigation** – This menu item allows you to access the navigation tools, hovering your cursor over it displays the navigation shortcuts information box.
4. **Search** – This menu item allows you to search your ReCap Project for scan files or regions.
5. **ReCap Data Services** – This menu item provides you with access to the data services currently available for ReCap 360, the two current data services are Project Cleanup and Mesh.
6. **Feedback** – This menu item allows you to submit feedback on the application to Autodesk.
7. **Undo** – This menu item allows you to access the undo and redo functions.
8. **Project Navigator** – This menu item allows you to access view states, colour and control regions and interrogate scan files. Clicking on this icon will pin the menu open.

Regioning the Scan

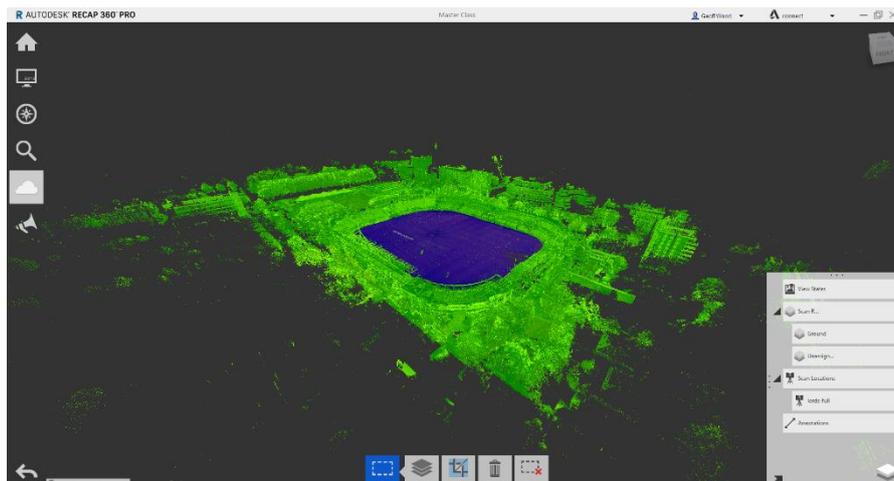
The process of breaking a scan file down into smaller, more relevant or manageable areas is referred to as regioning. It works by selecting points and assigning these to a region that we create and name. We can then export specific areas or objects to separate rcs files. When a project is created it is done so with no regions assigned, if we overlook and just create a region for the points of interest then it can be rather difficult to export just the points we are interested in. Therefore the first step I take when preparing a point cloud is to select every point in the project and create a region called UNASSIGNED_POINTS. This is done by drawing a window around all of the points in the model, when selected they have a white wash applied as shown in fig. 6. I then move my cursor down to the Region button that has appeared at the bottom of the screen and select *New Region*, on the resulting dialog box I enter the name I desire. You can specify a colour for the display of this region in the project navigator though it is worth noting that these colours are only displayed when the points are selected.

Fig. 6



As a Civil Engineer, generally speaking, I am only interested in the ground captured in the point cloud. My next step is to select any points that represent the ground and assign them to their own region so that I am able to export them separately from the other points in my project. Other selection methods can be accessed by hovering your cursor over the Window button in the bottom centre of the screen, the other available methods are fence and plane. I will be utilising the plane tool to select a plane that is 100mm thick from points that I specify on screen. When using the plane tool I have found that it works best by only selecting three points before pressing enter to select the plane, if you need to select additional points to add to your current selection you can do so by holding shift while selecting the points and then pressing enter to confirm the additional selection. This process can be repeated as necessary until you are happy that you have selected all the points you are interested in. My two regions are shown in fig. 7 below with all points selected.

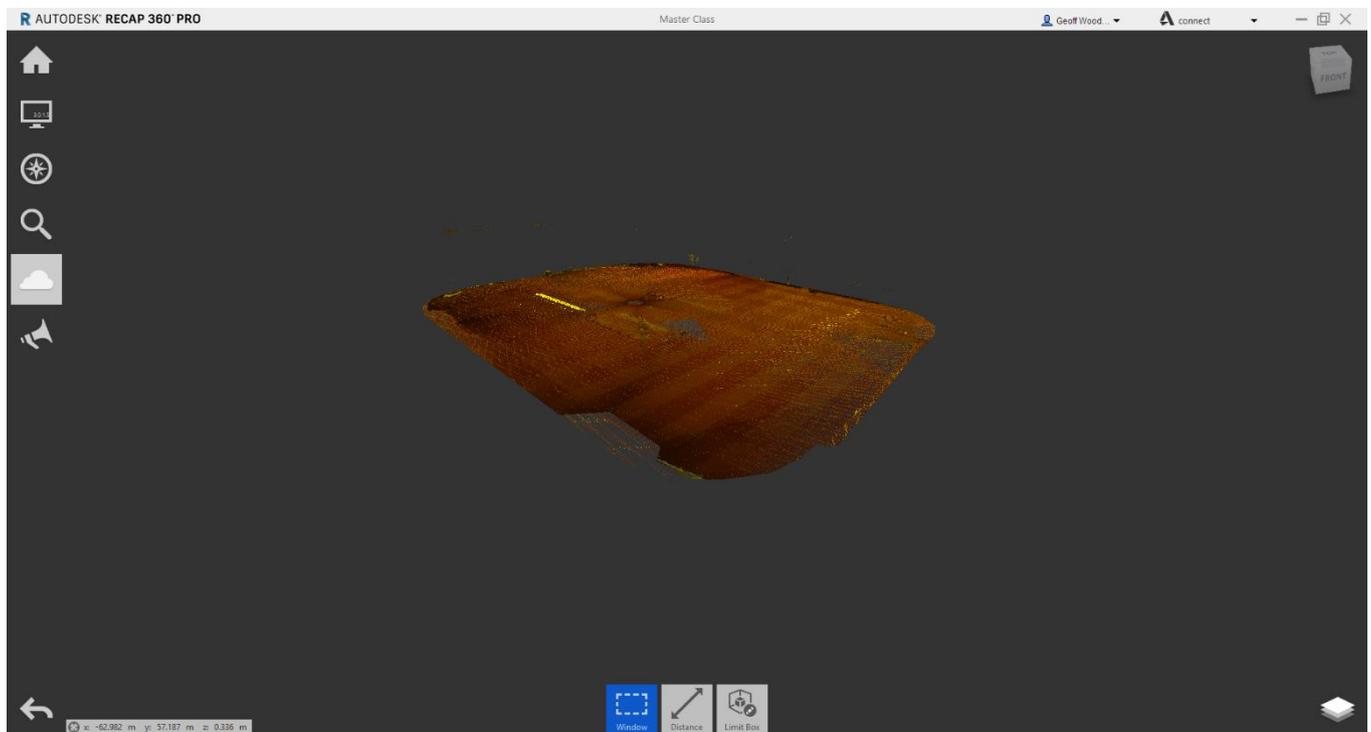
Fig. 7



Exporting a Unified Scan

The export process in ReCap is linked to items that are currently being displayed. This means that if we do not wish for a specific region of points to be carried through to our exported file all we need to do is set any regions that we do not want to see in the export file to not display. This can be done by clicking the eye symbol next to the relevant region(s) in the Project Navigator. When we can only see the points that we wish to export we move our cursor over the Home menu and some additional functions will be displayed, we then move our cursor to the Import icon and finally down to click on the export icon. On the resulting dialog box we are required to give a name and specify a location for the rcs file to be exported to. Having done this we are shown a message stating that a single unified scan file will be created, we also have one last chance to refine the grid of the point cloud we are exporting. Selecting 'let's go! Unify my project scans' starts the process, a status bar is displayed in the middle of the screen for the length of the process. Fig. 8 below shows just my exported scan file having been loaded back into ReCap.

Fig. 8



Reference and Links:

Cadline Community – www.cadlinecommunity.co.uk

ReCap Product Page - <http://www.autodesk.com/products/recap-360/overview>

Autodesk Reality Computing - <http://forums.autodesk.com/t5/reality-computing/bg-p/151/label-name/autodesk%20recap>