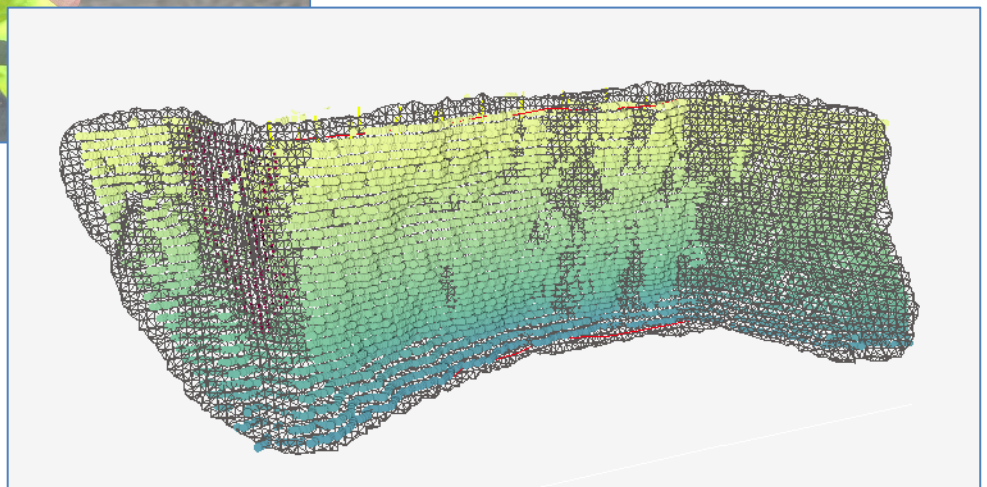


Quarryman Studio

Software user manual

Version 1.01



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1 Customer information

1.1 Carlson Software

Founded in 1983, Carlson Software specializes in CAD design software, surveying hardware, and machine control products for the land surveying, civil engineering, construction, and mining industries worldwide, providing one-source technology solutions from data collection to design to construction.

Quarryman Studio is designed and developed with Carlson's world-class levels of detail, quality and innovation.

Carlson's renowned dedication to customer service is unique in the industry. For any technical support issues related to your software contact us directly or, alternatively, contact your local Carlson-approved support centre.

Quarryman Studio supports Carlson's Quarryman laser profiler which exports data in FSC format.

Quarryman Studio is also available as a module of Carlson's **BlastOPS** software which is a comprehensive blast optimisation package.

Details of all related Carlson products are detailed on our website: www.carlsonsw.com.

1.2 User manual

Quarryman Studio is designed to be user friendly and intuitive to use. However, we strongly recommend that you undergo a training session with a Carlson-approved trainer before using **Quarryman Studio** for a real-world project. This user manual explains the functionality of the software but is intended to support the knowledge acquired in a training course, rather than to act as a substitute for training.

This document has been compiled with care. However, should you discover any errors, we would be grateful if you could contact Carlson directly.

Reproduction of this document in whole or in part, including utilisation in machines capable of reproduction or retrieval, without the express written permission of Carlson is prohibited. Reverse engineering is also prohibited.

For any feedback or comments, or if there are questions about the Boretrak which are beyond the scope of this manual, contact Carlson Software.

1.2.1 Manual version

The document number of this manual is v.1.01, compiled in June 2026.

The manual is based on **Quarryman Studio** version 1.0.

This is the first version of the **Quarryman Studio** user manual. Although every effort will be made to update the manual alongside updates to the software, the information in this manual is subject to change without notice.

1.3 Quarryman Studio

Quarryman Studio software is supplied with Carlson's Quarryman Pro laser scanner. **Quarryman Studio** is used to process raw FSC data from the Quarryman Pro survey, and then to edit, view and export the data.

Many third-party packages will take in FSC data directly from the Quarryman Pro for specialist profiling and volumetric applications. **Quarryman Studio** is intended for customers wishing to use the point cloud from the Quarryman Pro in other packages where there is no option to directly import of FSC data.

Quarryman Studio generates a point cloud for export in LAS, LAZ or CSV format and can also generate surfaces based on the processed point cloud.

1.4 BlastOPS

Quarryman Studio is also available as a module of Carlson's **BlastOPS** software. **BlastOPS** is a complete blast design software package. It can be used in both simple and comprehensive blast designs and can be paired with traditional survey methods – such as the Quarryman Pro – as well as with drone surveys – which might be processed by Carlson Photo Capture – for a complete bench production workflow.

Using **BlastOPS** helps to improve blasts with better rock fragmentation, lessens the risk of fly rock, and lowers operational costs. **BlastOPS** supports the precision and calculation necessary for the utmost blast efficiency. Work with point clouds to develop meshes, create blast pattern layouts, and ensure proper burden and borehole spacing for more productive blasting and project site optimization.

BlastOPS connects pre and post-blast design workflows and provides the tools to map, design, measure, and manage your blasts from planning to ignition.

Contact Carlson Software for further information about **BlastOPS** software.

1.5 Recommended specs

Most modern PCs will run **Quarryman Studio** perfectly well. However, to ensure optimum performance, we do recommend that the machine does meet the following basic specs:

- Run Windows 10 and above
- CPU: Intel i7 / Ryzen 7
- RAM: 16 GB
- GPU: RTX 3050 or equivalent card with at least 6 GB of VRAM

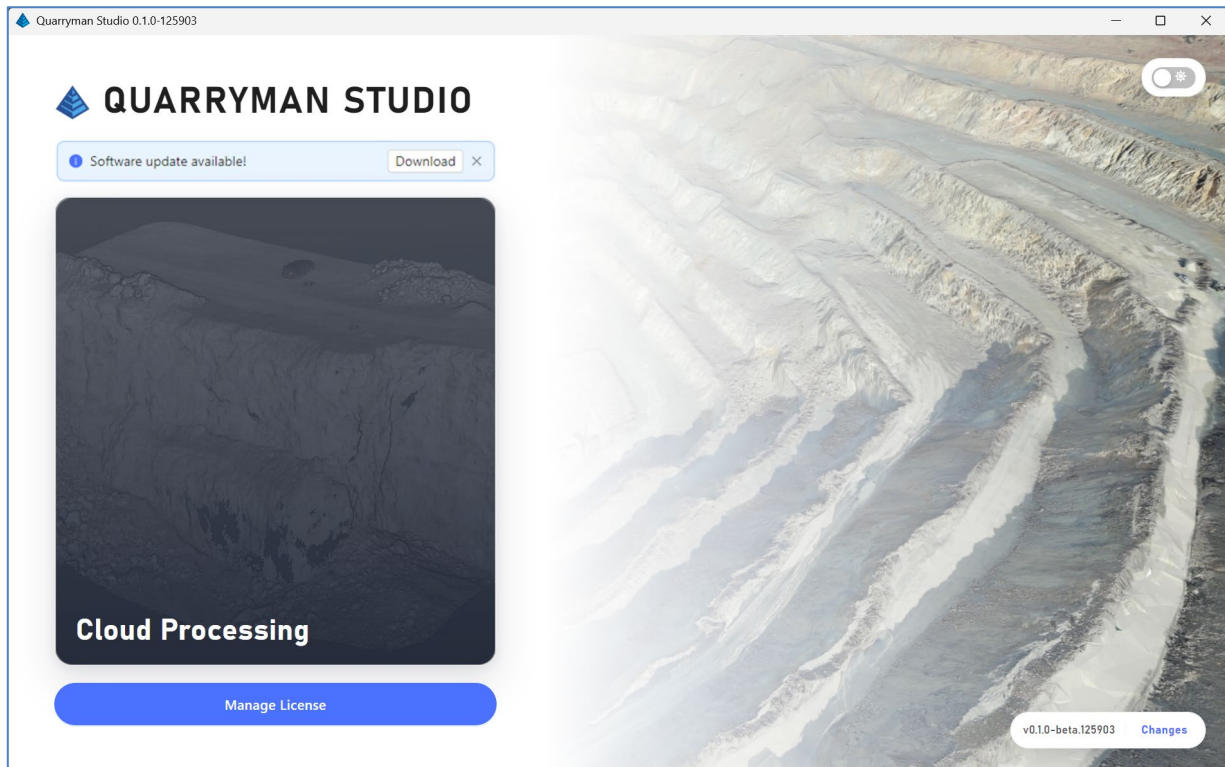
1.6 End User License Agreement

The **Quarryman Studio** End User License Agreement (EULA) is available online from the Carlson Software website.

2 Quarryman Studio introduction

2.1 The Home screen

On starting **Quarryman Studio**, the **Home** screen appears.



2.1.1 Software version

The title bar displays the current **Quarryman Studio** version and build number.

If your computer is connected to the internet, and a new version of **Quarryman Studio** has been released, a message appears: **Software update available!** Click **Download** to download the installer for the new version.

The latest version of **Quarryman Studio** is also available from the Carlson Software downloads web page here:

<https://web.carlsonsw.com/files/updates/updates05.php>

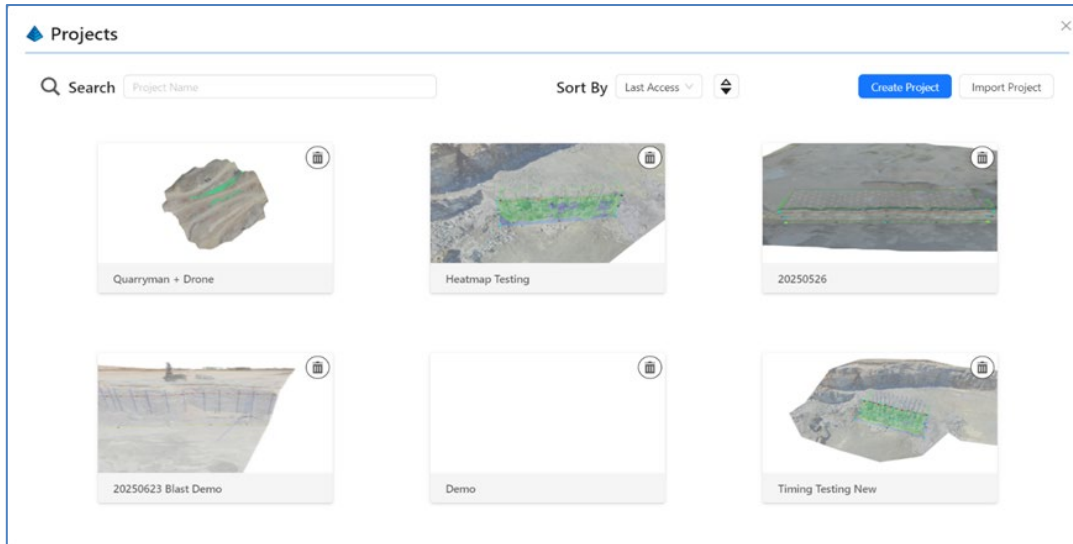
Select **Quarryman Studio** from the drop-down list and download the installer.

A change log outlining the changes made to each version is available in the bottom right of the **Home** screen.

2.1.2 Managing Projects

Click **Cloud Processing** to open the **Project Selection** window.

The **Project Selection** window shows a list of all existing projects with names and thumbnails.



From this window, create, import, open, and delete projects.

Open a project by clicking the project's associated thumbnail.

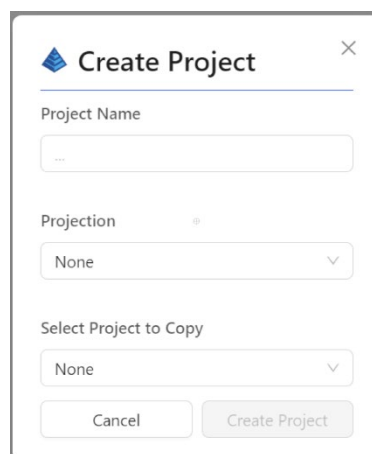
To search for a specific project, write the project's name in the search bar.

By default, projects are sorted by 'last accessed'. To change how the project list is sorted, use the **Sort By** drop-down list to switch between **Last Access** and **Alphabetical**. Click the sorting direction button next to the drop-down list to toggle between ascending and descending order.

Delete a project by pressing the rubbish bin icon in the top right of the project's thumbnail.

On the top right of the window there are two buttons:

- **Import Project.** Click to import a **Quarryman Studio** project zip file from your PC. This is useful when sharing a project between two users.
- **Create Project.** This prompts the **Create Project** window.



Enter a **Project Name** and, if required, a **Projection**.

Optionally, use the **Select Project to Copy** drop down list to select another existing project to copy and use as a starting point for the new project.

Click **Create Project** to create and open the new project.

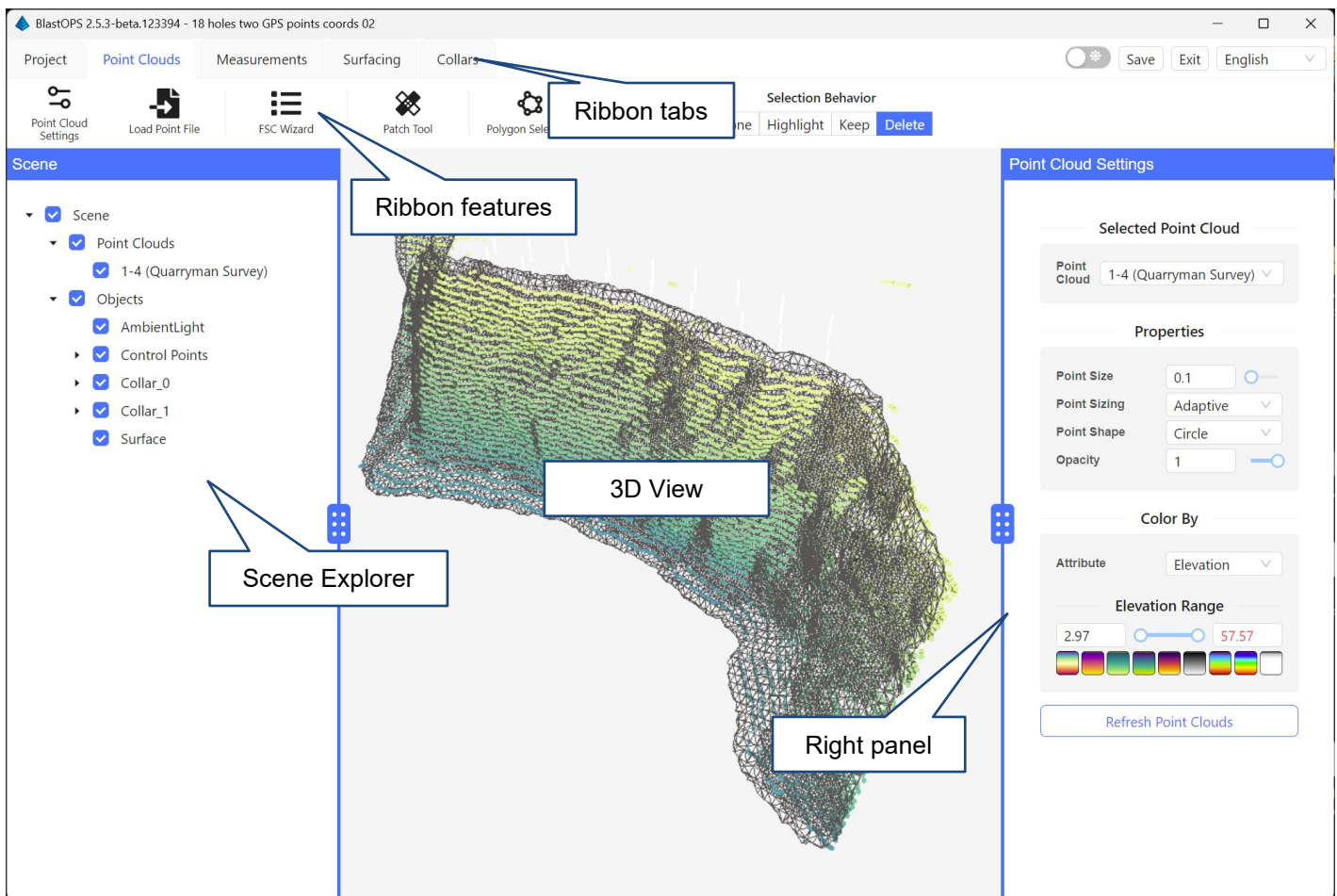
The default location on a PC for **Quarryman Studio** project files is: **C:\ProgramData\BlastCommander\Projects**.

3 Screen Layout

On creation of a new **Quarryman Studio** project, the main window appears.

A standard screen layout is composed of the elements outlined below.

- **Ribbon Tabs:** tabs at the top of the screen, ordered by functionality.
- **Ribbon Features:** the buttons and other controls under the selected ribbon tab.
- **3D View:** the main part of the screen where active data is displayed.
- **Scene Explorer:** collapsible panel on the left side of the **3D View** showing all elements in a project.
- **Right Panel:** collapsible panel on the right side of the **3D View** showing context-dependent functionality.



3.1.1 Ribbon tabs

Ribbon tabs are used to organize **Quarryman Studio** by feature/use case..

On the far right side of the **Ribbon tabs** are additional controls:

- **Theme:** toggle between light and dark mode.
- **Save:** save the project's current state.
- **Exit:** open the **Quarryman Studio Home** screen to open or create another project.
- **Manual:** open this **Quarryman Studio** user manual.
- **Language:** change which language the program uses.

3.1.2 Ribbon features

Ribbon Features are the buttons and other controls under a given tab.

Each tab and its associated features will be covered in depth throughout this manual.

3.1.3 Scene Explorer

The **Scene Explorer** occupies the left panel. The **Scene Explorer** acts as a 'project tree' showing all data in the active project.

Tools in the **Scene Explorer** allow you to navigate the 3D data currently loaded in the **3D View**.

Right-click on items in the list to open context menus with actions specific to the item clicked. Exports of surfaces, lines or point clouds can be generated from these context menus.

3.1.4 Right panel

The **Right panel** shows information about the current selection in the scene.

Both of the side panels can be opened and closed using the blue handle on the associated side. More information about specific panels can be found below.

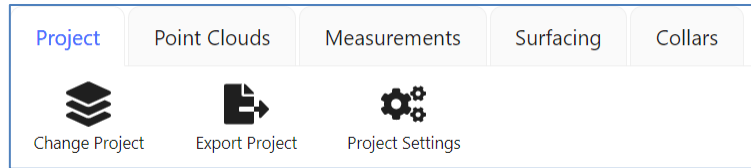
3.1.5 3D View

The **3D View** is the core of **Quarryman Studio**. It is always located in the centre of your screen. This is where all 3D data is displayed.

To facilitate precise viewing of the data in the **3D View**, use the following controls:

- **Zoom in/out:** roll the scroll wheel when on a mouse.
- **Rotate:** click and drag with the left button on a mouse.
- **Pan:** click and drag with the right button on a mouse.

4 Project ribbon



4.1 Change Project

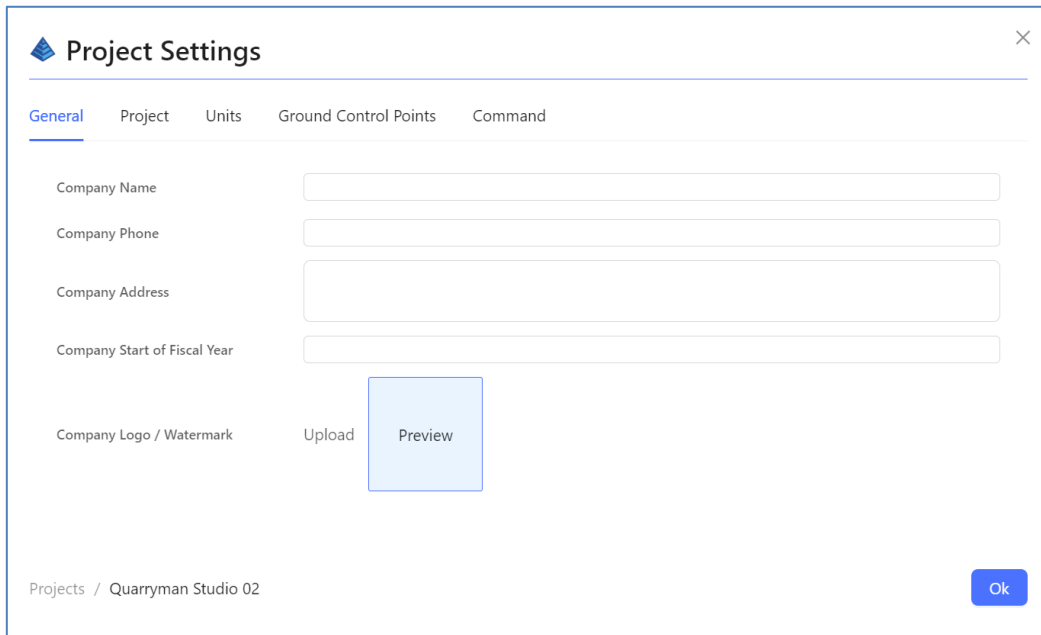
Click **Change Project** to switch **Quarryman Studio** projects.

4.2 Export Project

Click **Export Project** to create a compressed (ZIP) file of the entire project for importing onto other PCs.

4.3 Project Settings

Click **Project Settings** to open the **Project Settings** window.



The screenshot shows the 'Project Settings' window with a close button (X) in the top right corner. The window has a tabbed interface with the following tabs: General (selected), Project, Units, Ground Control Points, and Command. The 'General' tab contains the following fields:

- Company Name:
- Company Phone:
- Company Address:
- Company Start of Fiscal Year:
- Company Logo / Watermark: Upload

At the bottom left, there is a breadcrumb: Projects / Quarryman Studio 02. At the bottom right, there is an 'Ok' button.

Use the **Project Settings** window to configure various project-level settings. The settings are arranged by tabs.

4.3.1 General

Input company information such as name, phone, address, and logo.

4.3.2 Project

Enter site name, operator name, and project notes as required.

4.3.3 Units

Define the **Units** and projection system used by the **Quarryman Studio** for this project only.

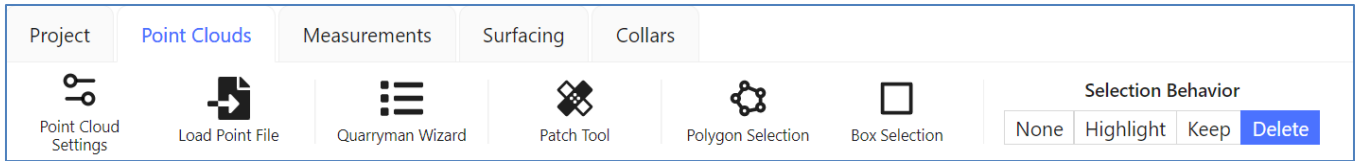
4.3.4 Ground Control points

Ground Control Points are required to process data from a Quarryman unit. These points can be added, imported, edited, and removed using this tab.

4.3.5 Command

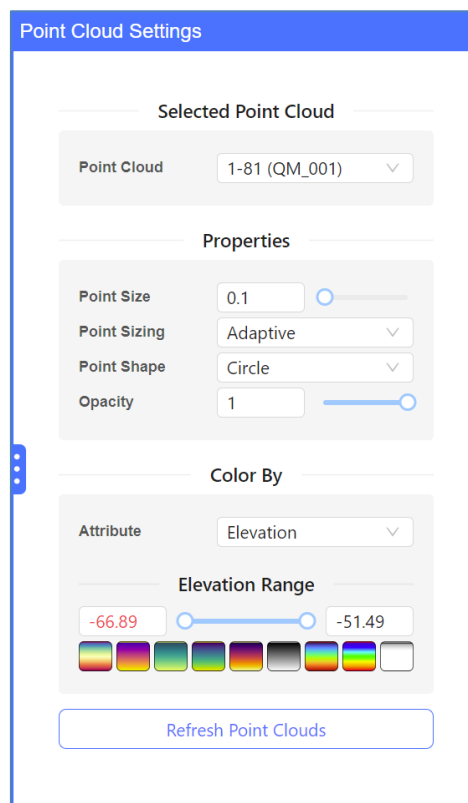
Enter **Carlson Command** login information. This allows a user to connect to **Carlson Command** in order to transfer data between the office and field.

5 Point Clouds ribbon



5.1 Point Cloud Settings

Click **Point Cloud Settings** to open the **Point Cloud Settings** window in the right panel.



5.1.1 Point Cloud

The tools in **Point Cloud Settings** only act on the point cloud selected in the **Point Cloud** drop down list.

5.1.2 Point Size

Increase or decrease the point size.

5.1.3 Point Sizing

Adjust the manner in which point size is displayed in the **3D View**.

- **Adaptive:** when zooming in, the adaptive setting keeps the same relative size.
- **Attenuated:** point size will be small, regardless of **Point Size** property.

- **Fixed:** allows you to adjust the **Point Size**. Zooming in does not affect the relative size.

5.1.4 Point Shape

Choose between **Paraboloid**, **Circle**, and **Square**.

5.1.5 Opacity

Change the transparency of points.

5.1.6 Colour By Attribute

From the drop down list, choose how the point cloud is coloured. Depending on which option is selected, relevant tools on further customising the colouring are offered below **Attribute** drop down.

- **Adjusted Colour:** use the real life colouring of the point cloud (if available). Adjust **Gamma**, **Brightness**, and **Contrast** attributes as required to make the data more readable.
- **Elevation:** colour the points with reference to their **Elevation**.
- **Custom Colour:** set a specific colour.
- **Matcap:** choose a specific material colour.
- **Indices:** colours by the colour index, related logarithmically to intensity.
- **Level of Detail:** colour based on number of nearby points in the current **3D View**.
- **GPS Time:** colour based on GPS time. The point cloud file must have this information in order to be used.
- **Classification:** Colour the point cloud based on classification data (if available).

5.2 Load Point File

Press the **Load Point File** to open the file selection dialog.

Choose a file from your PC to import in **Quarryman Studio**. When a file is selected, a window appears displaying the loading progress. Cancel the import if required.

Note that loading large point clouds can take several minutes to process, please be patient.

Currently supported point cloud file types are:

- **LAS:** LAS file (*.las)
- **LAZ:** LAZ file (*.laz)
- **TXT:** Point cloud text file (*.txt)
- **XYZ:** Point cloud text file (*.xyz)
- **DXF:** DXF file (*.dxf)
- **CRD:** Carlson coordinate file (*.crd)
- **CRDB:** Carlson coordinate database file (*.crdb)

5.3 Quarryman Wizard ☰

Use the **Quarryman Wizard** to import FSC files from the **Quarryman**.

On the left of the **Quarryman Wizard** are displayed all the steps it is necessary to progress through to import, process and output data in a FSC file. On completion of each step, click **Next**. Alternatively, click **Previous** to return to the previous step.

5.3.1 Notes on processing Quarryman data

Quarryman Studio is designed to be as flexible as possible to allow various coding systems and field workflows.

However, for the most efficient processing, note the following points below for coding Quarryman data in the field.

- Your Station ID, as entered in the Quarryman, should be the ID of your station in **Quarryman Studio**.
IE if you identify your Station ID as 02 in the Quarryman, your Station ID in **Quarryman Studio** is also 02.
- When using the Quarryman in the field, code any individual shots to a target according to the ID of that target. This includes:
 - Resection targets
 - GNSS-observed reference points
 - Other existing instrument stations
 - New, previously unoccupied, instrument stations.
- Any **Ground Control Points** (GCPs) created or imported into **Quarryman Studio** should be named using the same ID as the code used in the Quarryman when shooting to the GCP (see section 5.3.2).
- Resection observations should be separated out with each observation given a separate code according to the ID of the station being observed. For example, if you are resecting to GCPs 91, 95 and 97 then take three separately-coded shots to these stations using code IDs 91, 95 and 97. The code used in the field should match the GCP ID in **Quarryman Studio**.
- Some software packages rely on referencing / zeroing the Quarryman's horizontal encoder when it is first powered up, with no requirement to actually take an observation. In **Quarryman Studio**, when back-sighting or referencing to a known GCP or station, always take the observation and identify it with the correct code ID.
- The IDs of all GCPs / stations should be reserved in the **Loading Template** with the **Feature Type** specified as **Target** (see section 5.3.3).
- At the **Alignment** stage, if all guidelines above are followed, and IDs are correctly used in the field and in the **Quarryman Wizard**, leave the drop down list against each station set to **Calculate Direction!** (see section 5.3.4).

Note that once the Quarryman FSC file has been loaded into the **Quarryman Wizard**, tools are available to edit the codes and station numbers retrospectively if mistakes have been made in the field.

5.3.2 Ground Control Points

Add **Ground Control Points** (GCPs) of known coordinates manually or import them from an ASC or CRD file. GCPs are used to position and align the FSC data in later steps.

Quarryman Wizard

1 Ground Control Points

2 Data Import

3 Alignment

4 Render Point Cloud

5 Make Surface

Coordinate System

☒ XYZ
 ☐ NEZ

ID	X	Y	Z	Active	Delete
10	36392.67	49308.40	25.20	☒	Delete
20	36271.30	49346.33	3.77	☒	Delete
30	36339.23	49145.39	-17.27	☒	Delete
40	36234.86	49254.66	-40.64	☒	Delete
50	36352.07	49240.44	-55.49	☒	Delete
60	36244.79	49238.96	-51.39	☒	Delete
			-64.24	☒	Delete

+ Add New Point

Import CRD File

Import Ascii File

Export

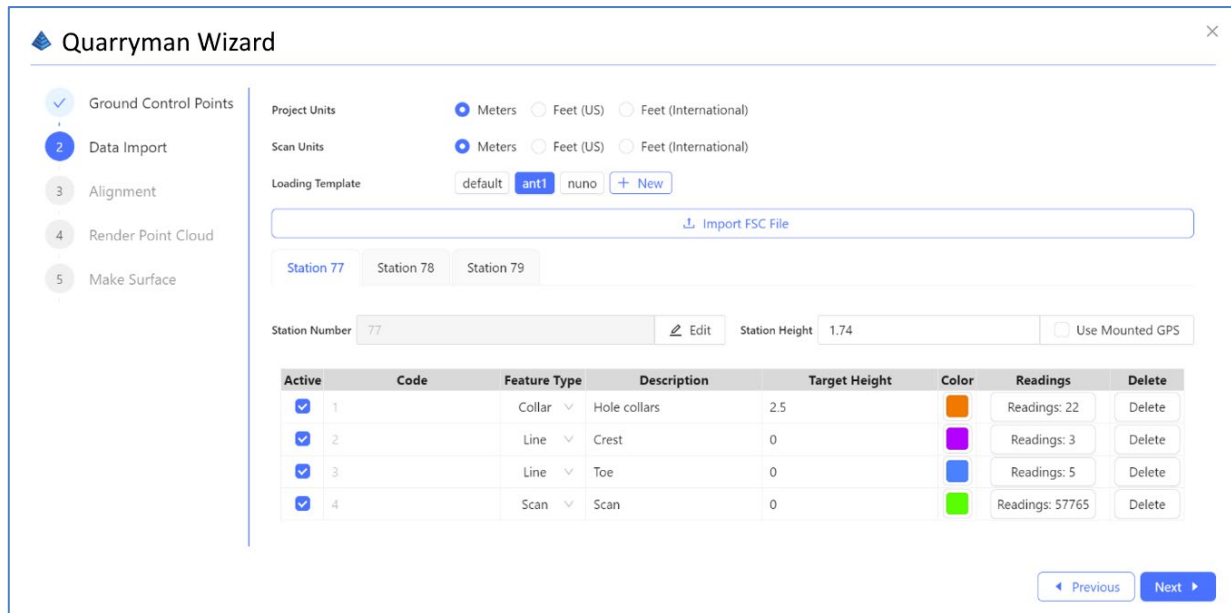
Previous

Next

Use the column of Active check boxes to ensure all GCPs used in the Quarryman processing are used in the project.

5.3.3 Data Import

Import and code data within the FSC file.



Quarryman Wizard

Ground Control Points

2 Data Import

Alignment

Render Point Cloud

Make Surface

Project Units: ☒ Meters ☐ Feet (US) ☐ Feet (International)

Scan Units: ☒ Meters ☐ Feet (US) ☐ Feet (International)

Loading Template: default **ant1** nuno [+ New](#)

[Import FSC File](#)

Station 77 Station 78 Station 79

Station Number: 77 [Edit](#) Station Height: 1.74 ☐ Use Mounted GPS

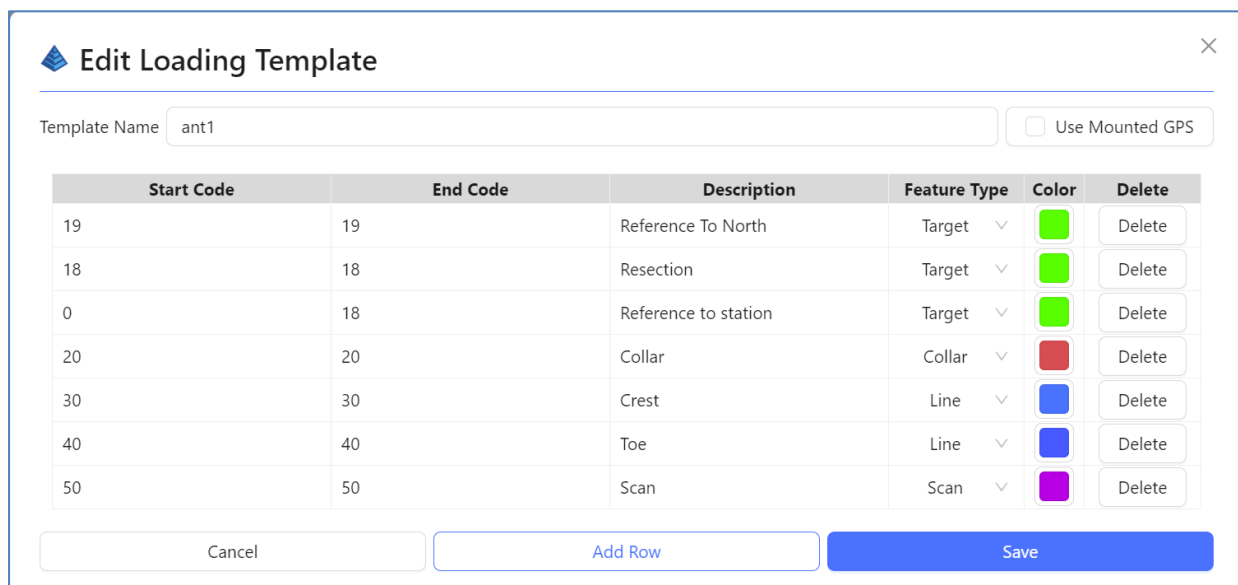
Active	Code	Feature Type	Description	Target Height	Color	Readings	Delete
☒	1	Collar	Hole collars	2.5	Orange	Readings: 22	Delete
☒	2	Line	Crest	0	Purple	Readings: 3	Delete
☒	3	Line	Toe	0	Blue	Readings: 5	Delete
☒	4	Scan	Scan	0	Green	Readings: 57765	Delete

[Previous](#) [Next](#)

- **Import FSC File:** Import an FSC file into the **Quarryman Wizard**.
- **Project units:** adjust the units used in the **Quarryman Studio** project.
- **Scan units:** specify the units used by the Quarryman in the imported FSC file.
- **Loading template:** Select a preexisting template by clicking the template and selecting **Apply**.

A template specifies which datatype is referred to by each code in the FSC file. When an FSC is imported, the selected template is used to automatically group and identify the datatypes within the FSC file.

Add a new **Loading Template** by pressing the **New** button. The **Edit Loading Template** window appears.



Edit Loading Template

Template Name: ant1 ☐ Use Mounted GPS

Start Code	End Code	Description	Feature Type	Color	Delete
19	19	Reference To North	Target	Green	Delete
18	18	Resection	Target	Green	Delete
0	18	Reference to station	Target	Green	Delete
20	20	Collar	Collar	Red	Delete
30	30	Crest	Line	Blue	Delete
40	40	Toe	Line	Blue	Delete
50	50	Scan	Scan	Purple	Delete

[Cancel](#) [Add Row](#) [Save](#)

Manually associate scan code ranges with **Feature Types**, **Colours**, and **Descriptions**. It is recommended that you make a template the first time you import an FSC file. If the same codes are always used in the Quarryman during field operations you can reuse the template for subsequent imports.

In order for data to be processed correctly, **Feature Types**, must be set as below:

- Observations to any named targets / stations / GCPs are set to **Target**.
- A sequence of shots to a crest or toe are set to **Line**.
- Shots to hole collars (or to a target above the collars) are set to **Collar**.
- Scans are set to **Scan**.
- **FSC data**: with a template selected and the FSC imported, the data found in the FSC is detailed at the bottom of the **Data Import** window.

Station 77
Station 78
Station 79

Station Number
77
Edit
Station Height
1.74
☐ Use Mounted GPS

Active	Code	Feature Type	Description	Target Height	Color	Readings	Delete
☒	1	Collar	hole collars	2.5		Readings: 22	Delete
☒	2	Line	crest	0		Readings: 3	Delete
☒	3	Line	toe	0		Readings: 5	Delete
☒	4	Scan	scan	0		Readings: 57765	Delete

The data is arranged by tabs representing the Stations that were identified in the FSC file. If required, use the **Edit** button to change the **Station Number**.

Click on a station and all the coded data collected from that station is listed below.

As required, manually edit the **Feature Type**, **Description**, **Target height** and **Colour**.

Each coded dataset can also be toggled as **Active** or **Inactive**. Alternatively, click **Delete** to clear the dataset from the project.

5.3.4 Alignment

The **Alignment** step is used to position and align the point cloud data.

Note that in order for this step to be successful, the relevant GCPs must have been added (see section 5.3.2) and the imported FSC data must be correctly coded (see section 5.3.3). If these sections are not complete, or are configured incorrectly, the alignment will either not generate a solution, or it will generate data which is positioned or orientated incorrectly.

There are different options to support different Quarryman setups, including multiple stations. See guidelines in section 5.3.1 to ensure the most efficient processing.

- **Calculate Direction**: The most simple option, requiring at least two GCPs with known coordinates.
- **Backsight to Non-Targeted GCP or Target**: Requires the Quarryman station's position as well as the **Number** of the non-targeted backsight GCP.

- **Known Direction to GCP or Target:** Requires at least two GCPs with positions as well as the direction between them.
- **Known Direction of Startup:** Used when only the Quarryman station's position and startup cardinal direction are known.

For each occupied station, an alignment option must be selected and the associated fields configured.

Click **Carry Out Survnet Alignment** to align the data.

The results of the alignment appear on the right of the window. When the alignment is successful, a table and a plot of the adjusted station positions graph appears on the right of the window.

Station 1

✓ GCP 1 found. Position known

X

3000

Y

5000

Z

100

Quarryman Direction

Calculate Direction! ▾

Number

▾

Known Initial Direction

▾

Station 2

✓ GCP 2 found. Position known

X

3023.68

Y

5046.57

Z

113.18

Quarryman Direction

Calculate Direction! ▾

Number

▾

Known Initial Direction

▾

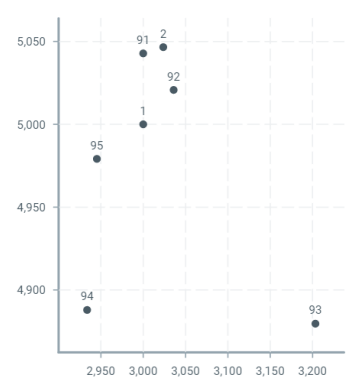
Carry Out Survnet Alignment

Alignment Results

✓ Alignment Successful!

Download Alignment Report

Code	X	Y	Z
1	3000.00	4999.99	100.00
2	3023.66	5046.56	113.17
91	2999.97	5042.79	110.95
92	3035.93	5020.73	111.06
94	2933.72	4887.93	96.69
95	2945.26	4979.12	111.38
93	3203.35	4879.65	114.83

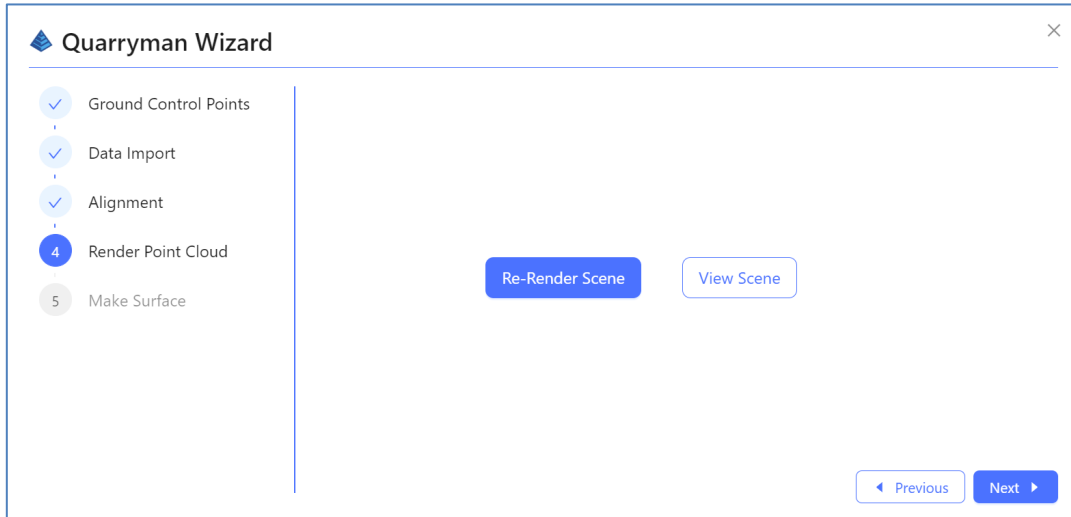


5.3.5 Render Point Cloud

With the Alignment complete, click **Next**. The point cloud is imported into the scene.

Use the **Re-Render Scene** button to refresh the point cloud if an error occurs or if you back track through the previous steps and need to update the scene.

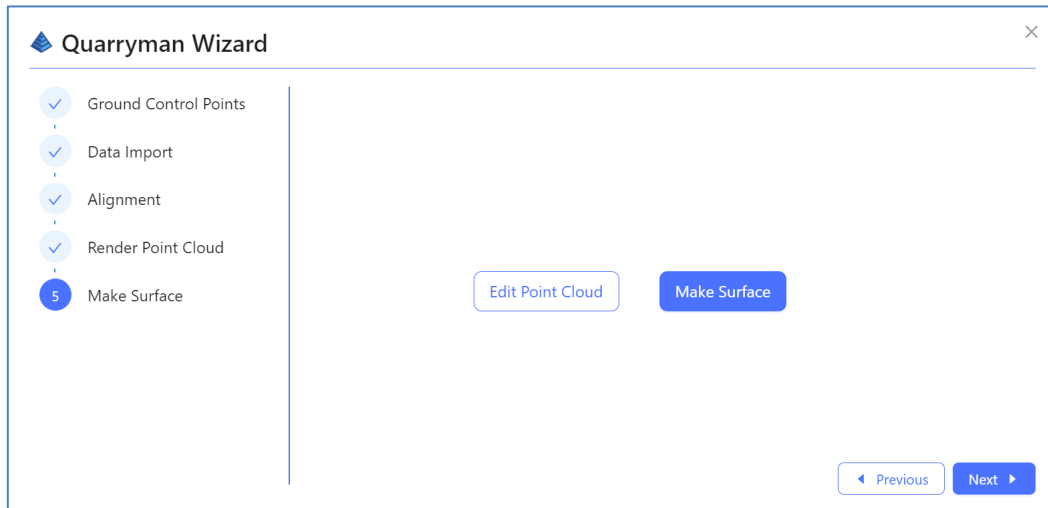
Click **View Scene** to minimize the window. The 3D View opens from where you can inspect the loaded point cloud.



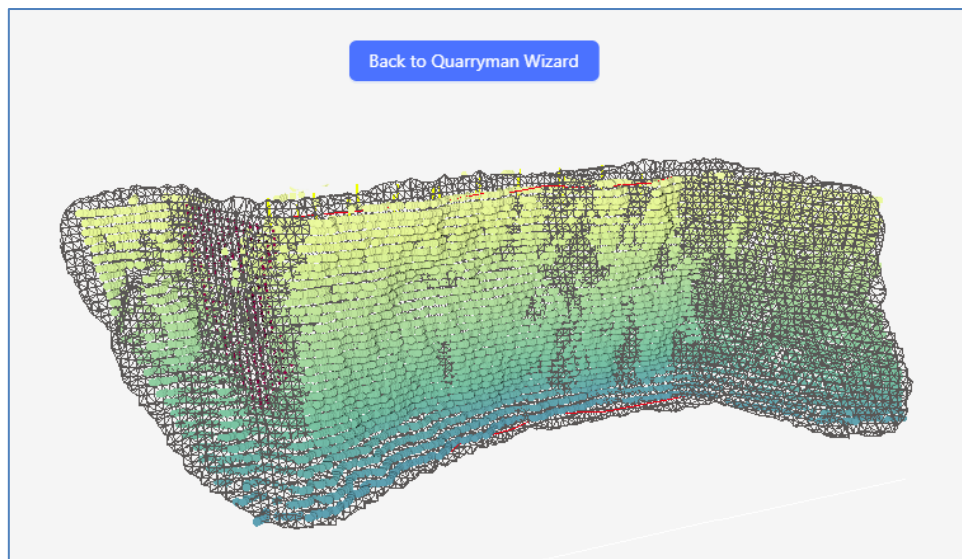
5.3.6 Make Surface

In the **Make Surface** step, click **Edit Point Cloud** to open the **3D View** with the **Point Clouds** tab active. Use the add patches and remove regions tools to edit the point cloud. These functions help to prepare the point cloud before a surface is created. These tools are covered in sections 5.4 and 5.5.

Click **Make Surface** to open the **3D View** with the **Surfacing** tab active. This tab offers tools to generate a surface from the edited point cloud. The surfacing tools are covered in section 7.



While the **3D View** is displayed for editing points or creating a surface, click **Back to Quarryman Wizard** to return to the **Quarryman Wizard** window.



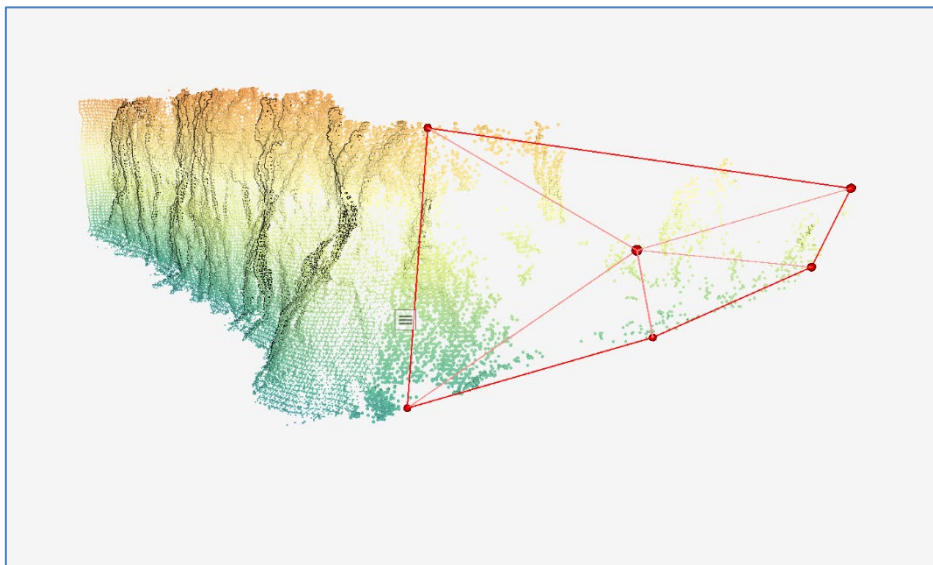
5.4 Patch Tool

If there are holes in the point cloud, these can be sealed over with the **Patch Tool**  before the surface is created. New points are created and used for the surface generation.

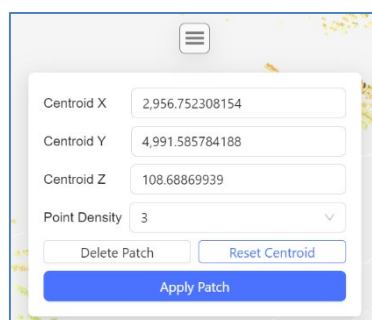
Exercise caution when using this tool. The **Patch** tool is usually used for appending data to the top of the bench to create a coherent surface where a pattern might be added. The **Patch tool** creates interpolated data and cannot determine if, for example, problematic areas of the face are being ignored. If there are large areas where data is missing it might be necessary to carry out a fill-in survey in the field.

Click the **Patch Tool**.

Left-click the extent of the area to fill. Right-click to finish defining the area.

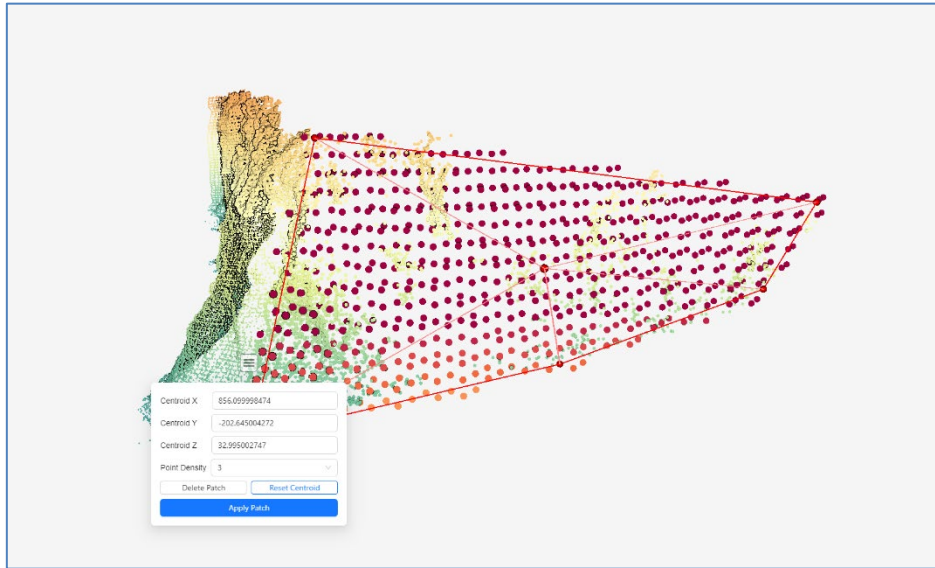


A menu button  appears in the **3D View**. Click the button to open the patch settings.



Centroid X	2,956.752308154
Centroid Y	4,991.585784188
Centroid Z	108.68869939
Point Density	3
Delete Patch Reset Centroid	
Apply Patch	

Select **Apply Patch** to generate the additional points.



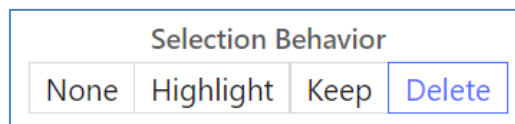
When a patch is created, the patch appears in the **Scene Explorer** under **Measurements**. From here the patch can be toggled ON and OFF in the **3D View** or deleted from the project.

5.5 Selection Tools

When creating a surface from a point cloud, aim to first reduce the point cloud so that it only covers the main areas of interest. Use the **Selection tool** to select sections of the point cloud to delete or retain.

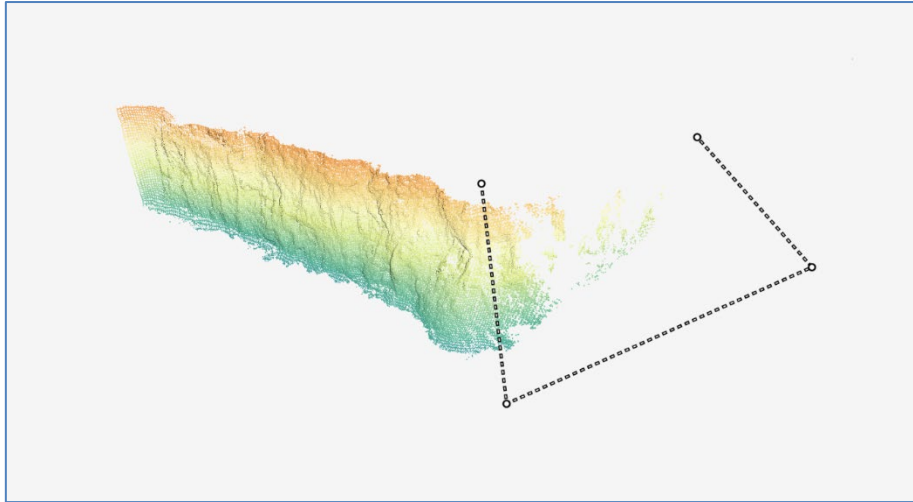
Both the **Polygon Selection**  and **Box Selection**  tools can be used to define the extent of the selected point cloud area.

Use the **Selection Behaviour** tool to toggle the action that is applied to selected points.



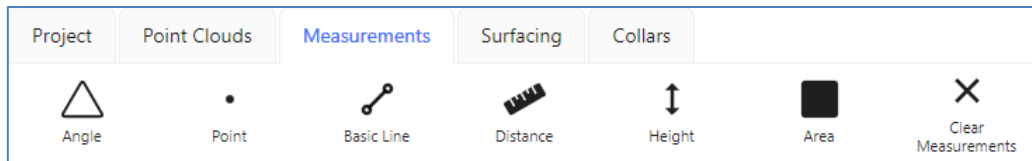
- **Delete:** automatically delete selected points.
- **Keep:** retain selected points and delete all unselected points.
- **Highlight:** highlight selected points onscreen.

When using the **Polygon Selection**, use the left mouse button to draw out a polygon. Use the right mouse button to complete the selection.



When a polygon is created, the polygon appears in the **Scene Explorer** under **Clippings**. From here the polygon can be toggled ON and OFF in the **3D View** or deleted from the project.

6 Measurements ribbon

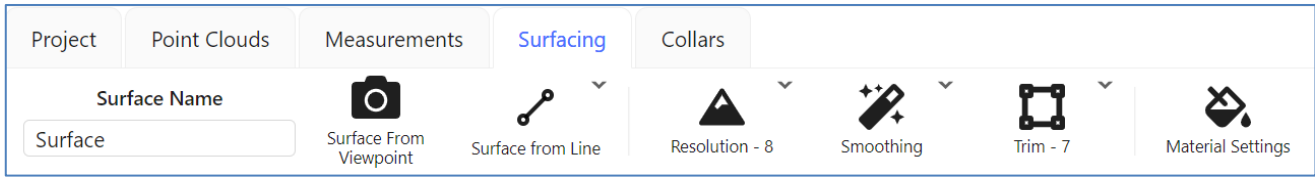


The **Measurements** tab contains a number of different tools for further analysis of a point cloud. This includes tools for adding different measurements and annotations to the point cloud.

Each measurement is added to the **Measurements** container in the **Scene Explorer**.

Use the **Clear Measurements** button to delete all of the current measurements in the scene.

7 Surfacing ribbon



The **Surfacing** ribbon contains all of the tools associated with generating a surface from the current point cloud data.

7.1 Surface Name

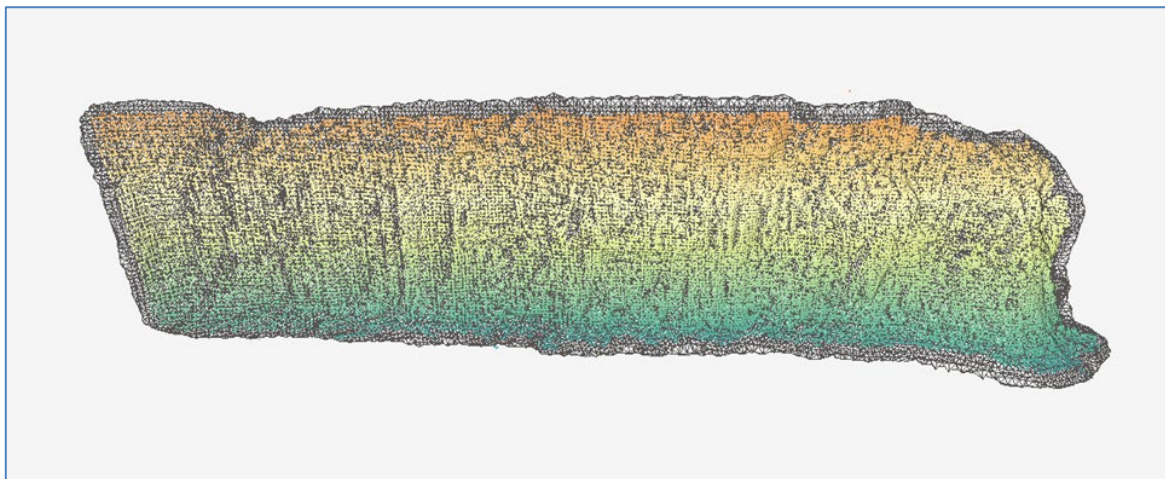
Before creating a surface, enter a name for the surface.

7.2 Surface From Viewpoint

Use **Surface From Viewpoint** to create a surface from the perspective of the view in the **3D View**.

The surface is generated with reference to the edited point cloud. The configured **Resolution**, **Smoothing** and **Trim** settings are applied.

Note: the quality of the generated surface is completely dependent on the viewpoint that has been adopted onscreen. If there is point cloud data for the top bench and bottom bench, the recommended viewpoint is looking from within the quarry bench out, at an upwards angle,



7.3 Surface from Line

Creates a surface from a line that has been created in **Measurements > Basic Line**. This tool is required to make tunnel surfaces. Draw a line through the tunnel and the surface will be created by calculating normals to the line.

The line height field is an offset for the line on the z axis. If the line is drawn along the bottom of the tunnel, set the line height to roughly half the height of the tunnel. This will ensure the surface normals point towards the inside of the tunnel.

7.4 Resolution

Adjust the **Resolution** slider to adjust the number of points used for surface creation. In turn, this adjusts the size of the triangles themselves, which affects the size of the exported surface.

7.5 Smoothing

Toggle **Smoothing** ON and OFF to create a cleaner surface.

- **Drop Sparse Points:** toggle to keep or drop isolated points.
- **Smoothing Search Radius:** controls the distance at which to determine the nearest points to use for the smoothing filter.
- **Surface Complexity:** adjust the complexity of the surface. As the value is decreased, the generated surface becomes smoother.

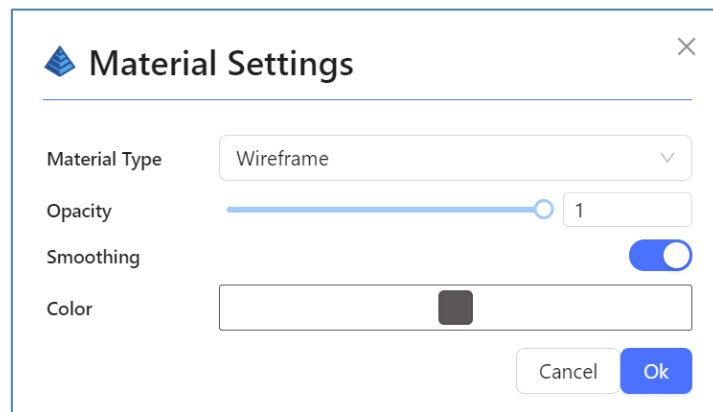
7.6 Trim

Use **Trim** to dynamically adjust how far beyond each grouping of points the surfacing extends. Increase the **Trim** to reduce the 'padding' which is extrapolated beyond the point cloud.

Lowering the **Trim** value too much can produce a surface that lies outside the desired geometry and conversely a higher value can produce gaps within the rendered surface.

7.7 Material Settings

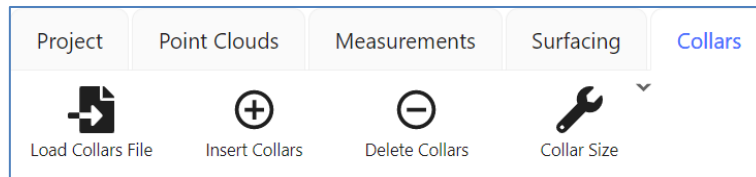
The **Material Settings** tool allows attributes and properties of the surface to be defined.



- **Material type:** change the nature of the surface.
- **Opacity:** change the translucency of the surface.
- **Smoothing:** toggle surface smoothing ON and OFF.
- **Colour:** change the colour of the surface.

The same tools can be accessed by right-clicking on the surface on the **Scene Explorer**.

8 Collars ribbon



The **Collars** ribbon allows the user to locate hole collars after a surface has been created.

This tool is primarily used in conjunction with drone point cloud data, as the colourisation of the point cloud would allow for easy location of the hole collar locations.

8.1.1 Load Collars File

Click **Load Collars File** to import collar files into the **Quarryman Studio** project. Formats supported include: TXT, CSV, DXF and CRD.

8.1.2 Insert Collars

Use the **Insert collars** tool to manually insert holes with a mouse-click on the surface.

8.1.3 Delete Collars

Use the **Delete Collars** tool to manually delete collars created on the surface.

8.1.4 Collar Size

The **Collar Size** tool allows adjustment of the size of the collar in the **3D View**.