

User Manual



SCANIFY F3D2001

Version 1.0

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SCANIFY Profile

SCANIFY is a handheld, point-and-shoot 3D scanner built to enable consumers and professionals to 3D scan objects in high-resolution shape and color in a tenth of a second.

- **Software** - SCANIFY comes with **Fuel3D Studio software**, which allows scans to be manipulated and exported to popular file formats for 3D printing and on-screen applications (.STL, .OBJ, .PLY). All versions of Fuel3D Studio are created to be as easy to use as possible, with a simple, intuitive user interface and can be installed on both PC (currently available) and Mac (coming in early 2015).
- **Tech specifications:** SCANIFY is tethered via USB to either a PC or a Mac (coming in early 2015) for convenient indoor scanning. For all versions of Fuel3D Studio, the minimum hardware specifications are: Mac (TBA), Windows 7 or Windows 8 Pro, 2GB RAM, 1GB hard disk space, Dual-core processor.
- **Object specifications:**
 - SCANIFY is the perfect solution for quickly capturing 3D models of:
 - The human form
 - Fabrics
 - Stone and masonry
 - Wood carvings
 - Stone sculptures
 - Plants and trees
 - Ideal objects for scanning include the following characteristics:
 - Gently contoured surface with soft curves
 - Varying color
 - Matte, non-shiny surfaces
 - Opaque
 - Objects with the following characteristics may **not** be suitable for scanning:
 - Cavities or protrusions
 - Very dark
 - Mono-color with no texture
 - Reflective or shiny
 - Transparent
 - Sharp edges and corners



Set-up

Registering your device and locating your serial number

The serial number of your scanner can be found on your SCANIFY box as well as on the back of the scanner itself.

The Serial Number is required to register your SCANIFY on our website and is necessary when downloading Fuel3D Studio. It is important that you keep your serial number easily accessible as it is a unique identifier for your scanner and may be required if you have a support request.

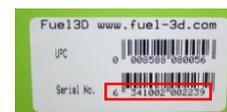
To register your device create an account at: <http://www.fuel-3d.com/register/>. The sign up form will ask you to enter the serial number of your SCANIFY. This will link the specific device to your account and allow you to download the software and access your account dashboard. You can register up to 4 other people to your device/Serial Number.

Find you serial on your scanner:



Example: 6341002002208

Find you serial on your box:



Example: 6341002002239

? Note:

- If you are having problems registering your account please contact support at: fuel3d.zendesk.com.

Setting up your scanner

What's in the box?

Inside your box you will find:

- Fuel3D scanner
- Three (3) tracking targets
- Fuel3D target holders
- USB data transfer cable
- AC power adapter
- International AC adaptor connectors
- Warranty card
- Fuel3D lens cloth
- Quick start guide



Getting connected

The scanner requires two connections (included) to acquire a scan:

- 2.0 Micro USB to USB data cable
- 5V Power adapter



Both connections attach at the bottom of the scanner.



Select the appropriate power adaptor for your region.

Plug the power adaptor into a wall outlet and the other end into the scanner. Plug the USB into the scanner and your PC.

Once plugged into a computer Studio will automatically install the device drivers.

Note:

- Device drivers must be installed before opening Fuel3D Studio, this may take several minutes the first time a new scanner is connected.



Taking a Scan

Selecting a suitable subject

Some subjects may work better than others and we encourage experimenting with a wide variety of items to get an understanding of what scans best.

Below are examples that can help you decide whether a subject is suitable to scan.

Subjects that work well:



Examples that work well:

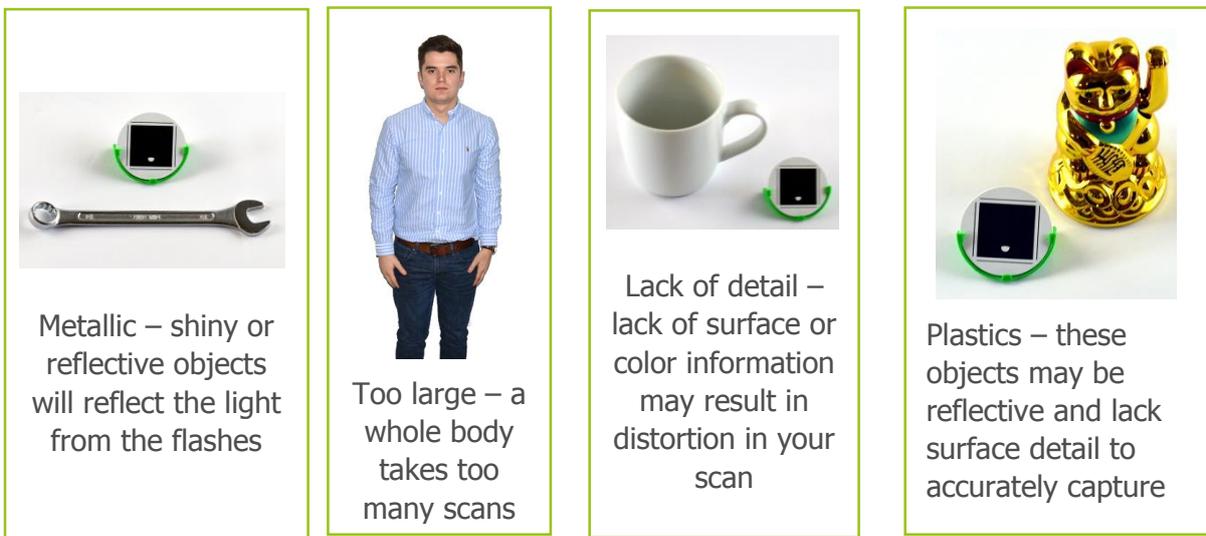


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Subjects that may not work well:



Examples that may not work well:



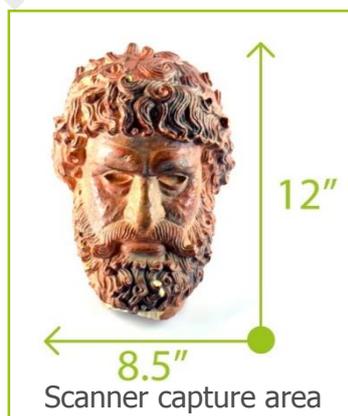
Utilizing the target holders

Placement of the target

It is important to understand the scanner's capture area when selecting a subject and while scanning.

The scanner is able to capture a subject that is around 37cm/14.5" diagonal. If your subject is larger than this, multiple scans may be taken and then stitched together to create a 3D model.

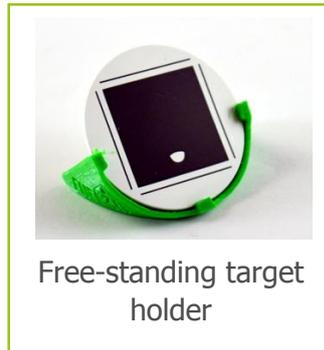
The target also ensures that you are within the correct range of the subject you are scanning.



Included with the scanner are two target holder types:



Handheld target holder



Free-standing target holder

You may want to place the target in different positions depending on what subject you are scanning.

Scanning a live subject:

Place the target so that it is touching the subject. This ensures that the target moves in relation with the subject which will reduce the chance of generating a poor quality scan. When scanning a person's face it is advised to use the handheld target holder and place it against the chin.

WARNING

- Epilepsy Caution: The Fuel3D Scanner incorporates flashing lights which may affect individuals who have photosensitive epilepsy or other such conditions. Users must accept full responsibility.

Scanning an inanimate subject:

The target can be placed on the subject or to the side using, for example, the free standing target holder.

It is important that the target is always facing towards the scanner.

You should not attempt to duplicate the target as this will cause errors when processing your scans.

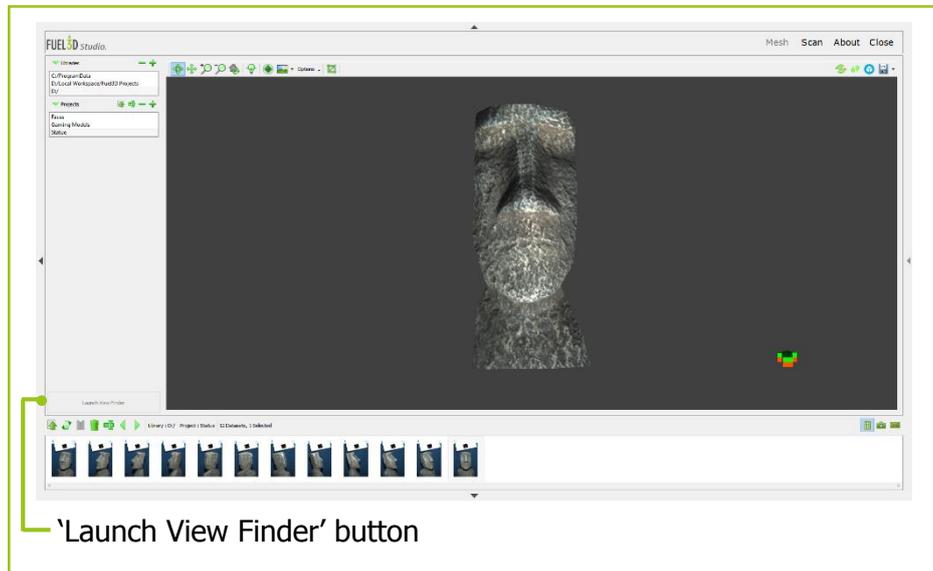
Tip:

- Don't worry if the target blocks part of your scan, you can crop it out later.

Acquiring a scan with Fuel3D Studio

Launching the View Finder

You can open the View Finder by selecting the 'Launch View Finder' button that is located below your list of projects.

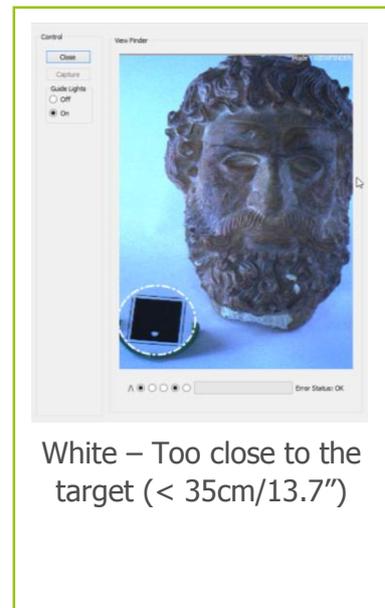
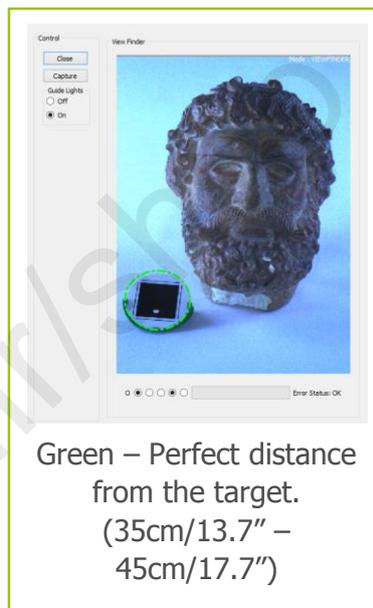
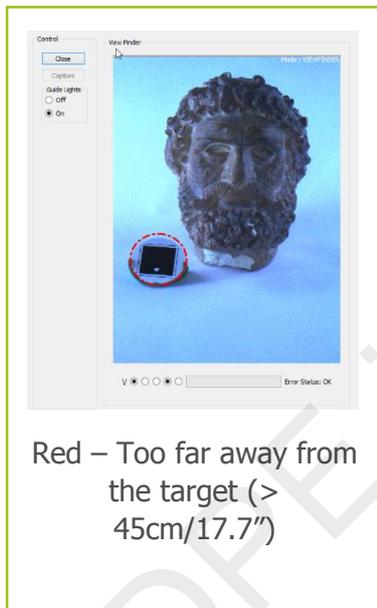


The View Finder will then display a live view from the scanner.

Target tracking in the View Finder

The target is required to take a scan. The View Finder has a tracking capability and displays to you, via a ring around the target, the distance that you are away from the subject.

There are three color modes used while tracking:



Ideal conditions for scanning would be indoors with good lighting. If lighting is too dark you can use the guide lights. These are on by default whilst scanning but can be toggled 'Off' or 'On' within the View Finder interface.



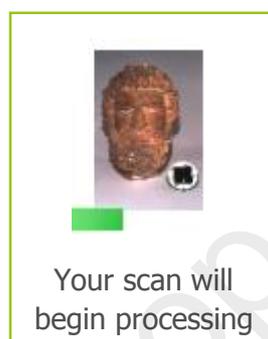
Ensure there are no lights in the scan capture area. Shiny objects, such as jewelry, may also cause problems.

Capturing your scan

A scan can be captured once the scanner is in range of the target. To capture a scan you can depress either of the triggers or click on the 'Capture' button in the view finder.

Once a scan is captured a preview will be displayed in place of the live view. You can then select whether to save or discard the scan.

Selecting 'Save' will begin the processing of the scan and will refresh the live view. You won't be able to view the scan until processing is complete; you can see the progress of the processing via the timer in the lower pane, below the scan preview thumbnail.



Note:

- Once a scan has been taken, it will take 30 seconds for the flashes to cool down before you can take another scan. This is shown by the progress bar at the bottom of the View Finder.



Hardware

Connections

To function the scanner requires two connectors (included):

- 2.0 Micro USB to USB data cable
- 5V Power Adapter



Select the appropriate power adaptor for your region. Plug the power adaptor into a power outlet and the other end into the scanner. Plug the USB into the scanner and your PC.

Once the scanner is plugged-in to your computer it will automatically install device drivers.

Additional connections

1/4-20 UNC internal thread for screw tripod mounting.

Accessories connector (future accessories TBA).

Note:

- The first time the scanner is plugged into your PC the drivers may take several minutes to install.

Flashes

There are three light housings, one in each corner of the scanner. Each housing contains a guide light, which can help illuminate the target and subject, and a flash module which is used during capture and processing.

The three flashes are used to illuminate the subject from three different positions during a capture. This process takes less than 1/10th of a second.

Cameras

The scanner uses a stereo camera set-up located in the center of the scanner.

The central camera is utilized while using the viewfinder.

Tip:

- Ensure that your camera lenses are clean.

The SCANIFY should be held with the cameras and flashes facing towards the subject.

Tip:

- Ensure your hands are not covering the flashes while taking a scan.



Holding the scanner and using the trigger buttons

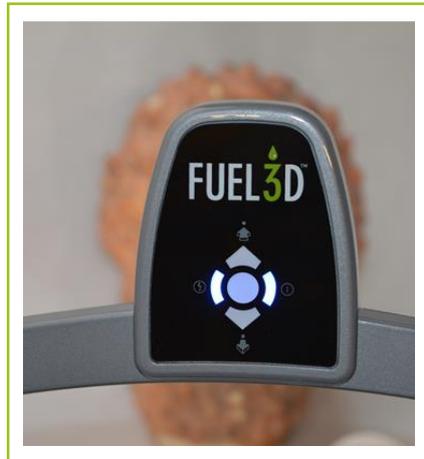
Half press the trigger buttons to prepare for scanning.

Note:

- Only one trigger is required to be pressed to take a scan. It is recommended to use both as this helps to stabilize the SCANIFY and reduce the risk of poor quality scans.

LED indicators

The indicator LEDs face towards you while taking a scan.



The right LED will illuminate while the scanner is receiving power.

The left LED will illuminate when the View Finder is running on the computer.

The top and bottom LEDs can be used to help track the target by providing you with feedback of when the scanner is in range.

To activate the tracking LEDs the trigger buttons must be half-pressed.

As long as the target is in view they will provide guidance on the proximity of the scanner to the target.



If the bottom LED flashes you must move away from the target

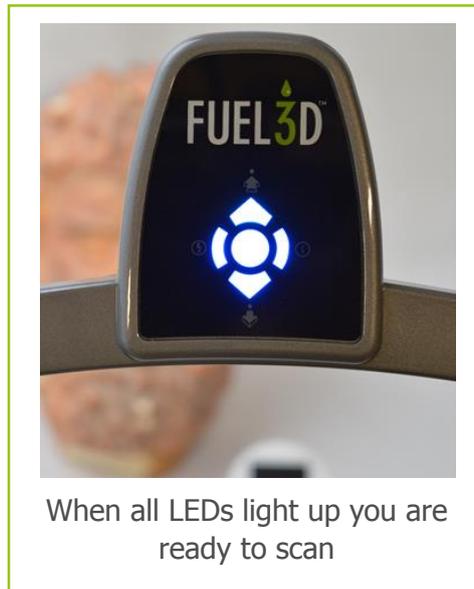


If the top LED flashes you must move closer to the target

When you reach the correct range from the target then all LEDs will light-up.

The left LED indicates if the flash cool-down is active. If will flash rapidly if the flashes are still in the cool down period and the trigger is depressed.

Once the flash cool down period is complete the LED will become solid blue and your scanner will be ready to take the next scan.



Note:

- If the left LED indicator flashes slowly while the target is in range and you are unable to take a scan please contact support at: fuel3d.zendesk.com.

Caring for your scanner

Properly caring for your scanner will ensure that it continues to produce high-quality outputs.

Do not:

- Drop it
- Get it wet
- Scratch the lenses

Scratches on the flash or camera glass may effect the scan outputs and could cause the processing of your scans to fail.

Dirt or smudges on the camera lens glass may also cause issues with processing and result in undesired outputs.



Software

Navigating Fuel3D Studio

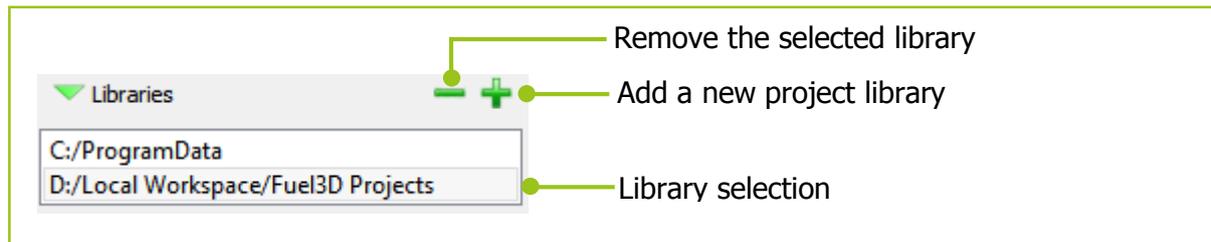
The Fuel3D Studio interface

The screenshot shows the Fuel3D Studio software interface. The main window displays a 3D scan of a human face. The interface is annotated with several labels and lines pointing to specific features:

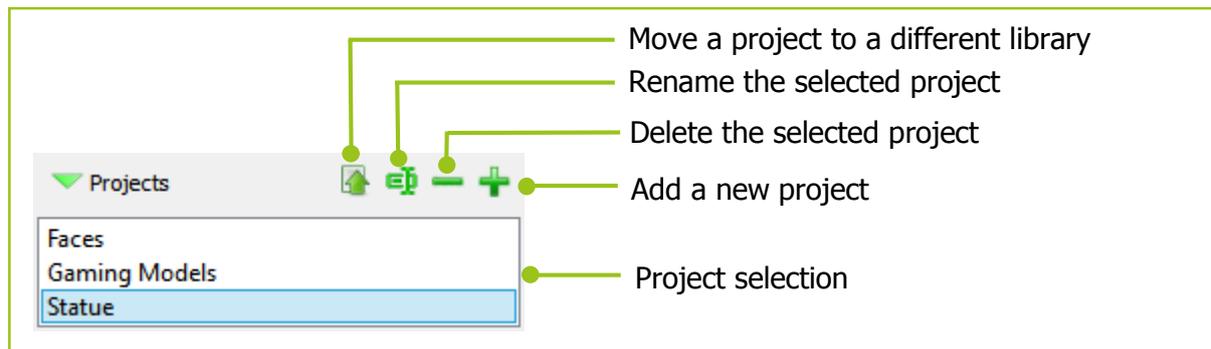
- List of projects**: Points to the top-left sidebar area.
- List of libraries**: Points to the middle-left sidebar area.
- 3D scan viewer control options**: Points to the toolbar above the 3D viewer.
- View menu (note that mesh is currently disabled)**: Points to the 'View' menu in the top-right corner.
- Scan export options**: Points to the 'Scan' menu in the top-right corner.
- 3D scan viewer**: Points to the central 3D viewer window.
- The lower pane contains scans within your selected project**: Points to the bottom pane showing a row of scan thumbnails.
- Scan management options**: Points to the bottom-left area of the lower pane.
- Scan filter options**: Points to the bottom-right area of the lower pane.
- View finder button**: Points to a button in the bottom-left corner of the lower pane.

Creating libraries and projects

Libraries designate the location on your computer where your Projects will be saved.



Your scans are saved within projects. You can create an unlimited number of Projects (dependent on your storage space) within the library you have created.

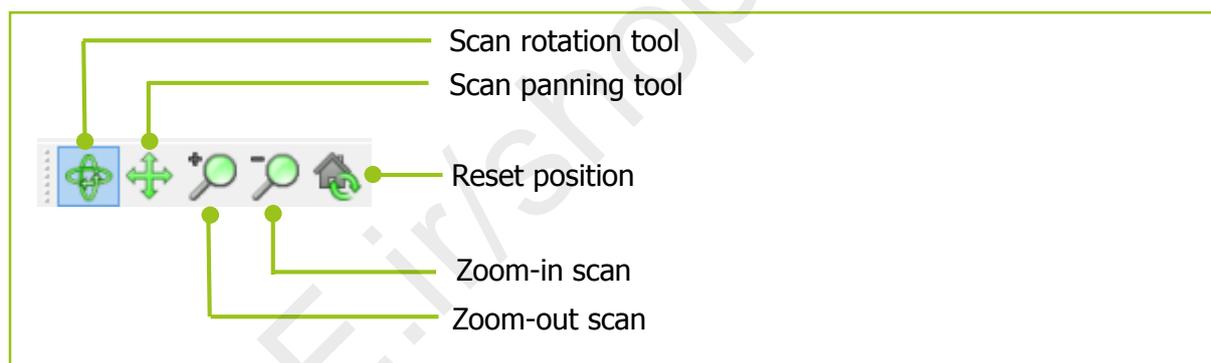


Tip:

- Ensure you have a Library and Project selected otherwise you may not be able to open the View Finder.

Basic controls

The basic controls are rotating, panning and zooming.



You may also use keyboard controls to control the 3D viewer.

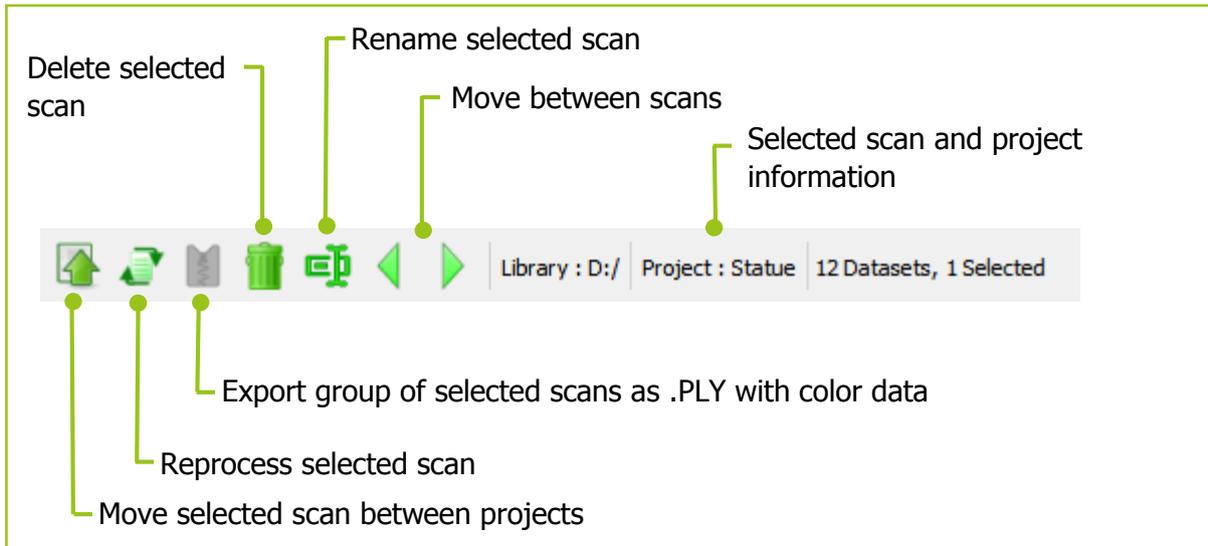
- Shift + ↑ : Zoom-in
- Shift + ↓ : Zoom-out
- Ctrl + ↓, ↑, ←, → : Pan/rotate

Note:

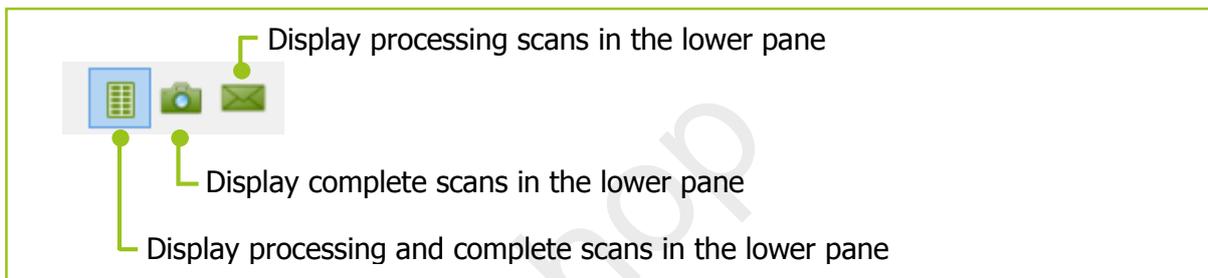
- Rotating your scan in the 3D view will not alter the orientation after exporting from Studio.

The lower pane window

The lower pane is where you can browse and select your scans once you have selected a scan in a project. Once selected they will open in the built-in 3D viewer.



You can filter your scans using the controls on the right side of the lower pane.



Note:

- As software updates are released the scan processing algorithm will improve therefore, reprocessing scans may produce a better output.

Acquiring a scan

To acquire a scan click on the 'Launch View Finder' button.

In the view finder, once the target is locked on and highlighted green, you can capture a scan.

This is accomplished by pressing either one or both of the trigger buttons or by clicking the 'Capture' button in the View Finder.



Once a scan has been taken it will take 30 seconds for the flashes to cool down before you can take another scan. This is shown by the progress bar at the bottom of the View Finder image.

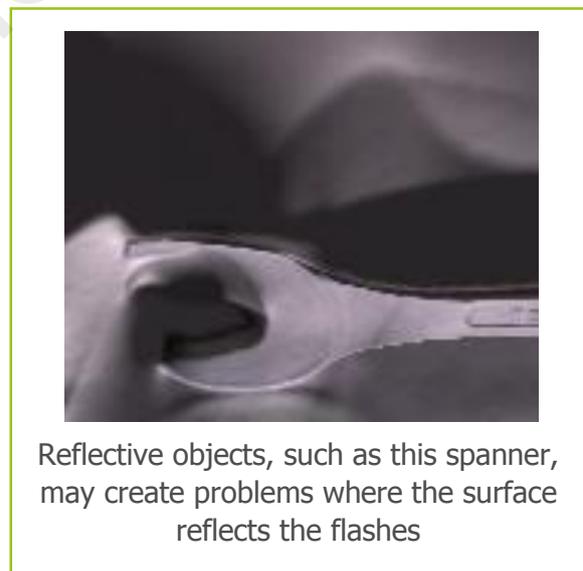
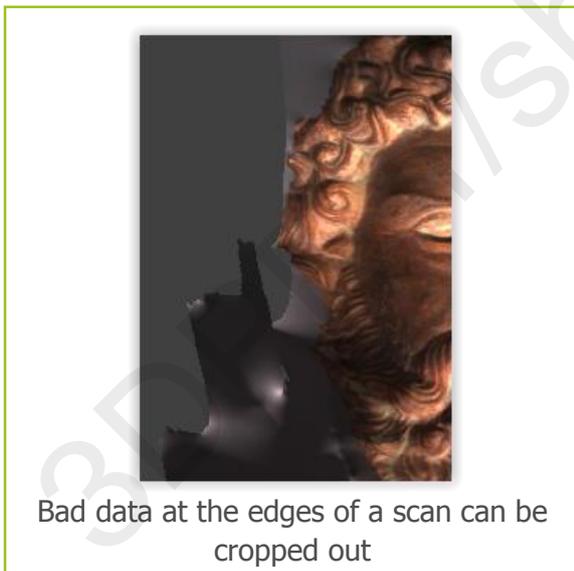
Inspecting your scan

Good vs bad data

When reviewing a scan you may find some bad data that you want to remove.

Rotate the scan and locate the data you wish to remove. Bad data will visibly appear incorrect. It may appear raised, rough or overly smooth and generally will not be comparable to the subject which was scanned.

This bad data is typically found around the edges of your scan or in areas which were not visible when acquiring the scan.



The mono-color view mode may help you identify which areas are bad.

This data may be removed using the cropping tool.

Spotting movement and lighting interference in your scans

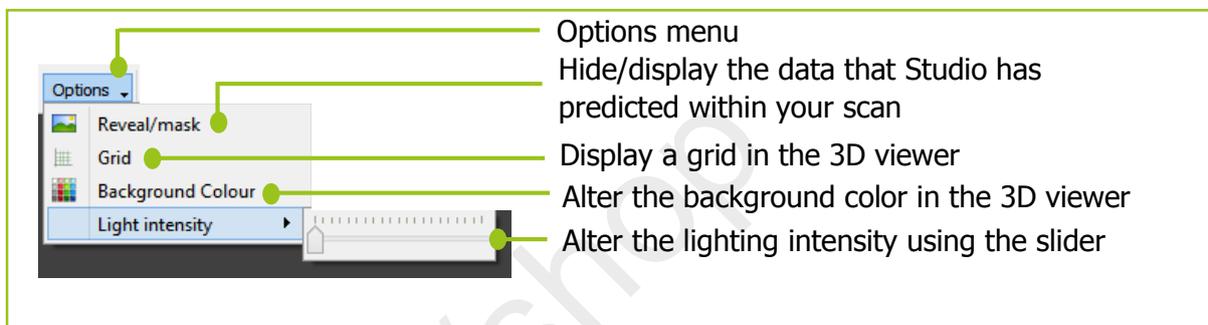
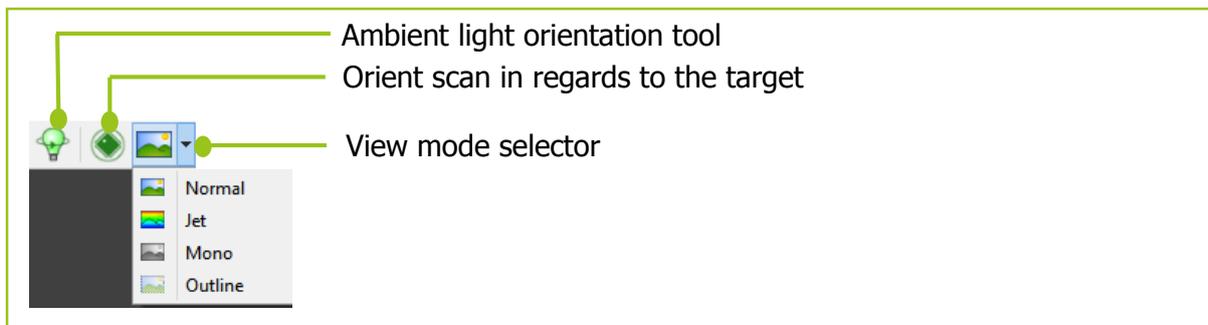
Movement within scans can generate bad data. For example, you may see a noisy scan occasionally (surface of scan will appear rough when it should be smooth) this can be attributed to movement either on the part of the operator of the scanner or the subject being scanned.

This can be solved by ensuring your subject and the operator remain still and may require retaking the scan.

Lighting interference can cause large spikes in the 3D model, or cuts through the data. This can be caused by background lighting, shiny or reflective objects that may be present in the scan area.

Further controls

There are further controls that can help you inspect your scan.



Notes:

- Changing the view mode does not alter the output data.

Cropping a scan



Select the cropping button to open the crop interface

Cropping allows you to place points on your scan to select the area you wish to keep.

You can place a point by clicking a position on your scan. This creates a node. At least three nodes are required to create an area that can then be accepted as a crop but it is recommended to select more depending on what you are cropping.

The more node points you have the less sharp the edges of the scan will appear; this is helpful when cropping something round, such as a face, as this helps to keep the shape of the face.



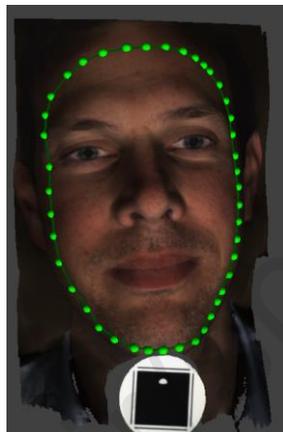
Confirm the crop you have selected

Undo or redo your previous node selection

Select to erase nodes you have placed

Add a negative crop inside a current crop area

Add an additional crop outside of the current crop area



Cropping a scan

You may also use keyboard controls to control the cropped scan within the 3D viewer.

Shift + ↑	: Zoom-in
Shift + ↓	: Zoom-out
Ctrl + ↓, ↑, ←, →	: Pan/rotate
Ctrl + Z	: Undo crop node placement
Ctrl + Y	: Redo crop node placement



Note:

- Don't worry, your original scan data is saved and a crop can always be undone, even after the software is closed.

Exporting your scan

Your scan can be exported in three different file-types:

- STL: this will export your model without any color data. This can be useful if you're sending your model to a non-color 3D printer or for use in other 3D modelling software applications, such as Solidworks.
- PLY: this will export your model with color if you select the 'color' option and exports it as one file. The color information is stored per-vertex, therefore, if you lower the polygon count of the model the color texture resolution will also be lowered.
- OBJ: this will export your model with color as with PLY, however, it will export 3 files: the object, material and bitmap files. The bitmap is then overlaid on top of the model and so lowering the polygon count will not deteriorate the resolution of the color texture.

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Troubleshooting

Target troubleshooting

It is important to look-after your targets. They should be stored safely when not in use so that they do not get bent or damaged.

Bending the targets will cause processing to fail and the view finder will be unable to track the target correctly.

Do not replicate the targets as this can cause issues with processing and may result in an inaccurately scaled model. You can order new targets from the Fuel3D website.



Note:

- If you are having problems with your target then please contact support at: fuel3d.zendesk.com.

Cuts in your scans

Cuts in your scans can be caused by a number of reasons:

- If there is a shiny or reflective object in the scan, such as jewellery.
- If there is bright lighting in the background, such as a light or bright window.
- If the subject is moving quickly whilst the scan is being taken.
- Very dark objects which the scanner struggles to illuminate.
- Bright objects which may reflect too much light.

If you continue to have problems capturing a scan you can use the 'Share with Fuel3D' button to upload your scan to use for evaluation and guidance.



Inaccurate geometry

Inaccurate geometry is most likely the result of selecting an inappropriate subject. Please see the subject selection section to help guide you with selecting a suitable subject.

Workarounds

Workarounds may help scan subjects which may otherwise not scan correctly.

You may embed your subject in kinetic sand to leave an imprint. This imprint can then be scanned and cropped to produce a replica of the subject, much like making a cast.



You may also use non-permanent texture spray to coat your object with and then complete your scan. This spray will help to cover reflective surfaces which will improve the scan outputs.

? Note:

- For a full list of workarounds, instructions and issue troubleshooting please visit our FAQ at: fuel3d.zendesk.com.

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