

SCANMASTER Plus

3D SCANNER

Take your 3D scanning to the next level!

Setup Guide

*"There is no other 3D Scanner that is so easy to use
as the new ScanMaster Plus"*

System Requirements

Windows 7,8.1 or 10 64bit
2 x available USB ports
1 x available HDMI or VGA port on the same graphics card
3D Graphics card - recommended Nvidia GTX 650M or higher
Recommended dual core processor or higher

STEP 1 - Check you have received everything



1. Scanner Head
2. Stand assembly
3. VGA cable
4. VGA to HDMI adaptor
5. USB cable (Scanner Head)
6. Power supply (Scanner Head)
7. Quick Start Guide
8. Calibration board assembly
9. USB to Micro USB cable f
- HDMI adapter*
10. Scanning Alignment Mat
11. USB Turntable
12. USB cable (Turntable)
13. Power supply (Turntable)
14. USB key with software a
- Allen key


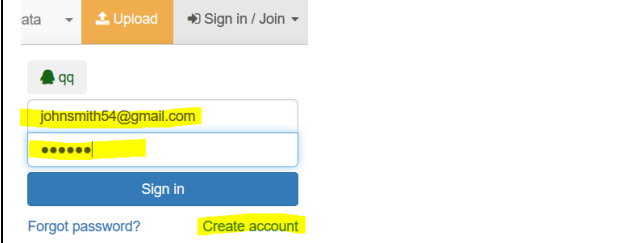
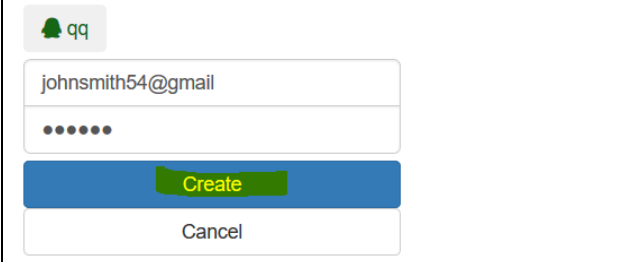
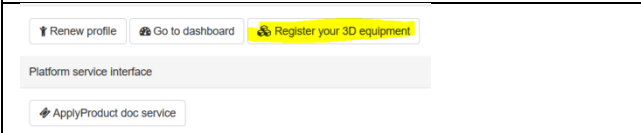
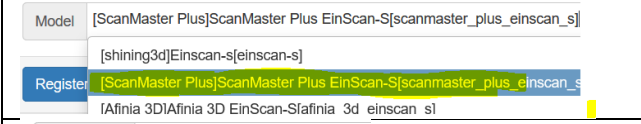
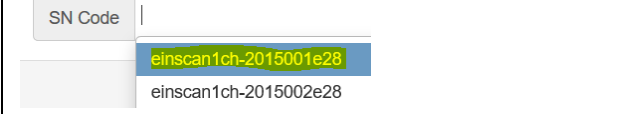

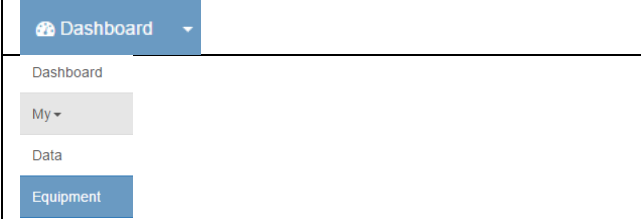
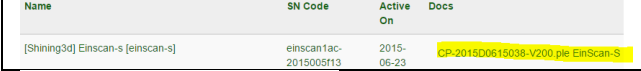
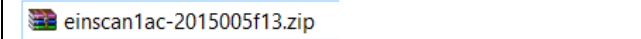
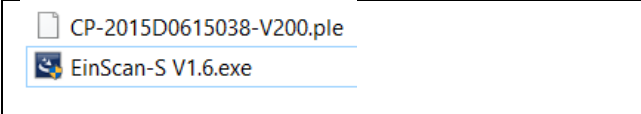
*9. USB to Micro USB cable is provide extra power to the 4. V to HDMI adapter if required. most cases this is not required.

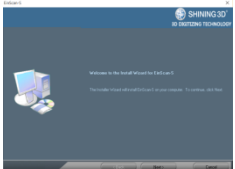
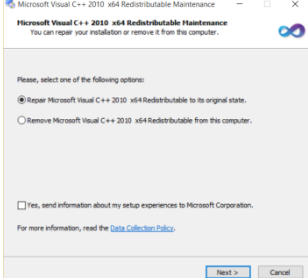
STEP 2 - Software setup

It is recommended to download the latest version of the ScanMaster Plus software as software residing on the included USB Key can become dated. The software only works on 64 bit versions of Windows 7,8 or 10.

Appologies in advance of the crytic method of regsitering your device and getting the latest software, we are working with our manufacturer to improve this method. Please follow the below step by step guide.

<div>名称</div> <div>Q 搜索</div> <div>English</div> <div>数据</div> <div>上传</div> <div>登入 / 注册</div>	<ul style="list-style-type: none">Visit http://www.3DKER.comClick "English"
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	<ul style="list-style-type: none"> Click "Sign in / Join"
	<p>Enter your email Enter a new password Click "Create account"</p>
	<p>Click "Create" button</p>
	<p>Click "Register" your 3D equipment"</p>
	<p>Select from "Model" "ScanMaster Plus"</p>
	<p>Enter the serial number located on the back of the scanner head. Don't enter the last two digits of the serial number, instead select the correct one from the dropdown list. Note: Double check that your license matches your hardware otherwise the scanner will not work! Click "Register"</p>
	<p>Click "Dashboard"</p>
	<p>Click "My" and then click "Equipment"</p>
	<p>Click on the CP-.... link to download the ZIP of the software.</p>
	<p>Extract the contents of the ZIP to a folder.</p>
	<p>The ".ple" file is the license that matches your hardware. This .ple file <u>must</u> be in the installation folder during setup. Click "EinScan-S V.....exe" to start the installation</p>

	<p>Follow the on screen prompts. Install in the default folder C:\EinScan-S</p>
	<p>If you get a prompt for Visual C++2010, either click install or repair.</p>
	<p>Click Finish</p>

STEP 3 - What each compont includes

Scanner Head Front View



- A. Two web cameras
- B. Built in computer projector

Scanner Head Back View



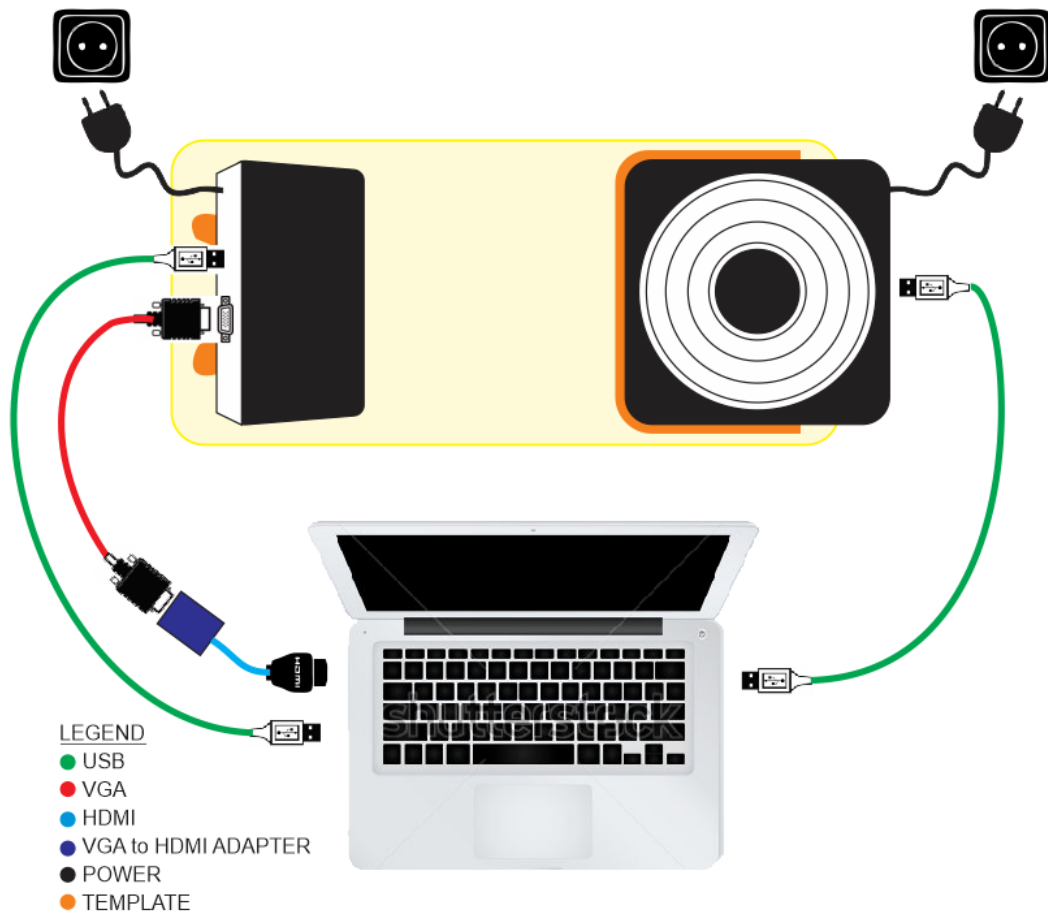
1. Serial number, used to register on www.3DKER.com website
2. Power button (note this always glows blue when the unit is powered) Switch on to get the projector light shining.
3. USB to go between computer and scanner head
4. VGA connector to go to PC or Laptop as an extended monitor
5. Power supply

Turntable side view



- A. Power
- B. USB Cable

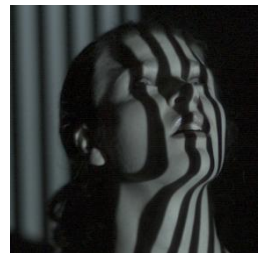
STEP 4 - Example setup



STEP 5 - Introduction

There are several different technologies used to 3D scan objects. The ScanMaster Plus uses structured white light, that uses a projector, similar to a projector you would use for a presentation. The built in projector, projects a series of vertical stripe patterns over the object. The two cameras built into the scanner head capture the deformation of the stripe patterns and software then calculates the 3d model from this information.

The turntable turns the object and the cameras capture a section of the object at a time. The software slightly overlaps each section, then stitches and aligns each section together to build up a 3d model.



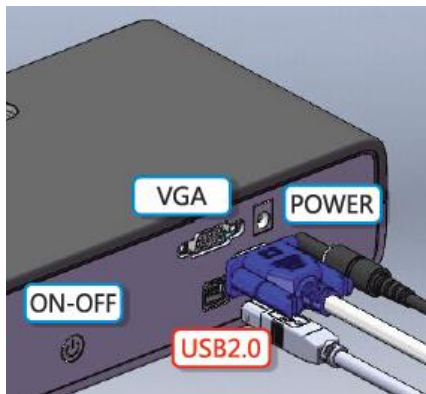
STEP 6 - Assemble scanner head stand



You need:
Scanner Head
Stand assembly
Allen key
2 x Alan screws

Using the Allen key and 2 x screws supplied, fit the camera mount to the bottom of the camera.

STEP 7 - Connect Scanner Head



Connect power supply to power outlet and connect power to Scanner head.
Connect the USB cable between scanner head and your computer.
Connect the VGA cable to the computer VGA port, if your computer doesn't have a VGA port then use the VGA to HDMI.

For PC users with no spare HDMI port, refer to "Connecting scanner head to Desktop PC"

STEP 8 - Connect Turntable



Connect the power to the turntable
Connect the USB between the turntable and your computer

STEP 9 - Layout scanner head and turntable on the mat




Layout scanner head and turntable on the template mat.

STEP 10 - Assemble calibration device



Assemble the calibration device
Place on the centre of the turntable

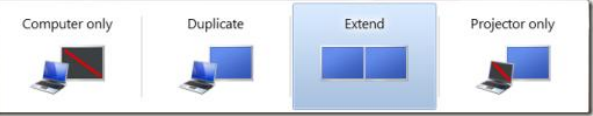
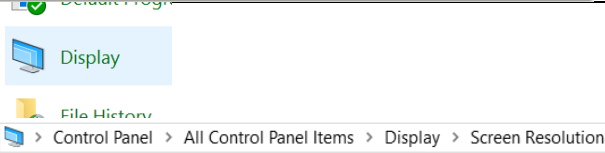
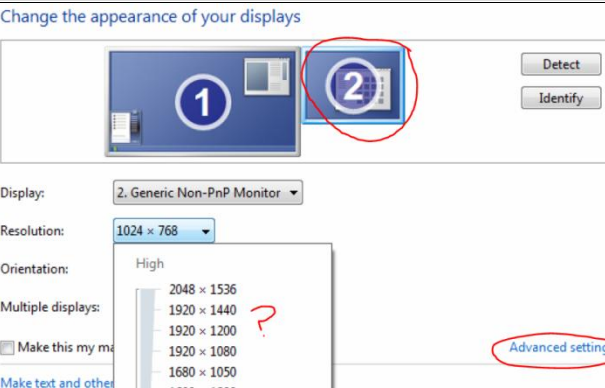
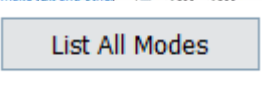
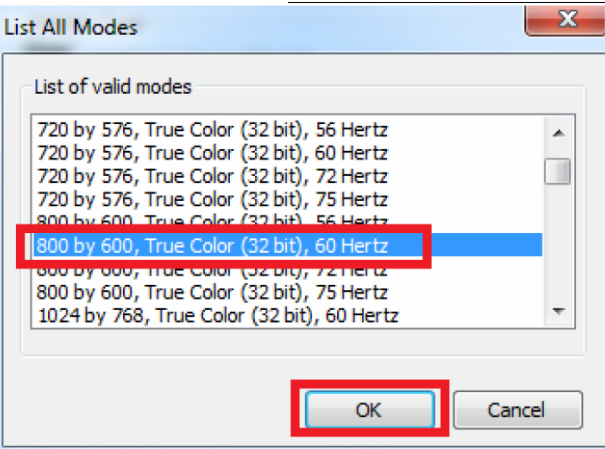
STEP 11 - Setup extended display (for Scanner Head Projector)

Note: Because the ScanMaster head contains a built in projector, this needs to be setup as an **extended monitor**  +P as the built in projector will project a pattern over your object and then the two stereo cameras record what they see to calculate the 3d geometry - clever stuff really!


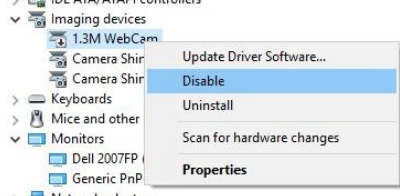
With the scanner head connected to the power, switched on and connected to your PC/Laptop with the USB and VGA/HDMI cable. Press the power button on the back of the scanner head. Wait a few seconds and you should see light coming from the internal projector light in the centre of the scanner head.

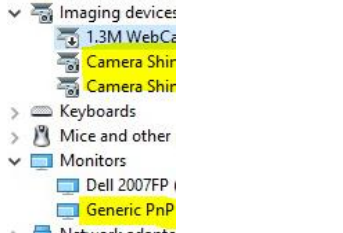

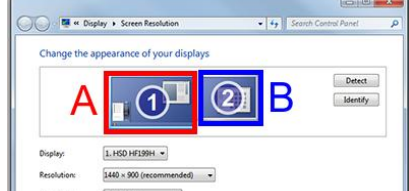
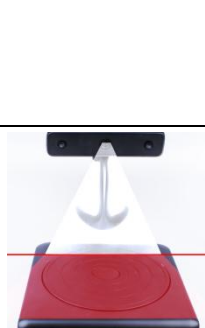
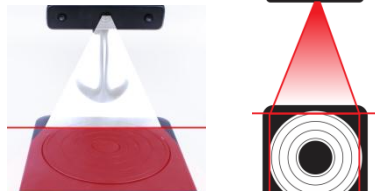




	On your computer press
	Windows key + P

	Click "Extend" to have the scanner head projector setup as an external display.
	Navigate to Control Panel, and select screen resolution setup. DISPLAY / ADJUST RESOLUTION
	<p>The Scanner head projector must be on the right hand side of your main monitor, as per the example on the left.</p> <p>The scanner head projector can only work at 800 x 600 at 60 Hertz</p> <ul style="list-style-type: none"> Click on the Scanner Head display to select it Click "Advanced Settings"
	Click "List All Modes"
	<p>Select 800 x 600 at 60 Hertz.</p> <p>The scanner can only work at these settings. If this is not available check our trouble shooting guide.</p>

STEP 12 - Check list, before you start scanning

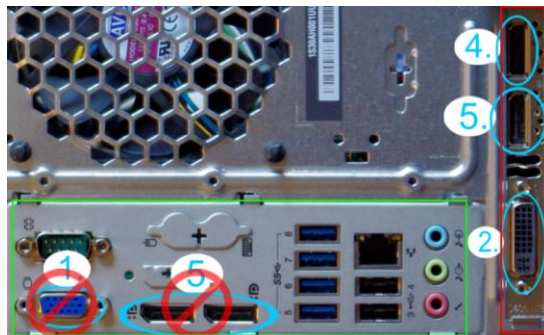
	<p>Latest software installed?</p> <p>Check that there is light coming from the projector. If there is no light, press the power button (2) and wait a few seconds for light to come on.</p>
	<p>In Windows device manager, disable any webcams that you might have, except the two Shining Cameras. This can conflict with the scanner.</p>

	<p>In Windows device manager, check that you have 2 x Camera Shinning under imaging devices. Check you have a "Generic PNP" under monitors as this is likely the projector. Different versions of Windows can call devices differently.</p>
	<p>If there are any red warnings, check your connections and device manager. Refer to trouble shooting.</p>
	<p>Ensure the Scanner projector (B) is on the right hand side as per picture and screen resolution for the projector set to 800x600 at 60 Hertz</p>
	<p>Is the Projector displaying your desktop background when you don't have the software running. When you start the software the projector should project a white light.</p>
	<p>Align the scanner head and the turntable, onto the alignment mat. Adjust the scanner head mount, so that the projector starts shining the light on the first ring of the turntable.</p>
	<p>Fluorescent lighting can affect your scan quality, so it is recommended to turn off these during scanning.</p>
	<p>For best scans, scan in a low light environment with a black background. This will reduce any noise being picked up by the scanner.</p>

Connecting the Scanner Head (Projector) to a Desktop PC

If you are having trouble getting the extended display to work with your scanner head projector, please follow this guide. PC users are more prone to having this kind of trouble as modern PCs have a motherboard with integrated graphics and a separate graphics card.

On most PCs they have a built in graphics card onto the mother board indicated in the picture as a (green box). However in order to run the ScanMaster Projector you need to have a two head / extended monitor display setup. This means, that you computer must support running an extended desktop with two display ports, one for your monitor and one for the projector. As each PC configuration is different it is difficult to guide you on what to expect. However generally you can't connect your main monitor to the motherboard display port (green box) while connecting the scanner to the graphics card (red box) of the main monitor or vice-versa. To work correctly, they both need to be setup on the same graphics card. e.g. Both on the separate graphics card (red) or both on the motherboard (green) of your PC.



We recommend connecting your main monitor to your graphics card and also the Scanner Head VGA/HDMI to the same graphics card (*figure 1*) on your PC. Most modern graphics cards will have 1xDisplay Port, 1xHDMI port and 1xDVI port or 1xVGA port. If your main monitor is using the HDMI port and you don't have a free HDMI or VGA port, then you will need to purchase a VGA to DVI adapter (*figure 2*).

In a nutshell you require one port to go to your Main display and one port to go to the scanner projector from the same graphics card.



Figure 1.a



Figure 1.b



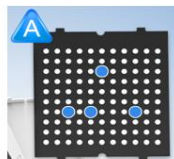
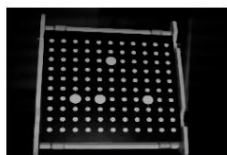
Figure 2

Calibrating the Scanner



Calibration Scan 3DKER Help About

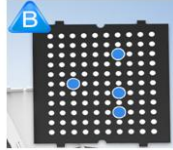
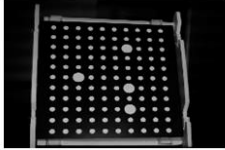
Before you can calibrate you must check that the projector is projecting a white light (hold a piece of paper in front of it to check) If you do not have a white projection image go back and check your setup. Click "Calibration"



Place the calibration board in the center of the turntable, as shown in Fig.A.

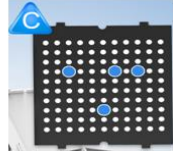
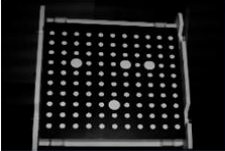
Ensure the calibration pattern is facing the scanner, and then click NEXT. After the first capture is complete, the turntable will stop and the software will show what is in Fig.B.

NOTE: You must not move the calibration holder during scanning. If you do move the holder, then close the software and start again.



Take out the calibration board from the holder, rotate the calibration board 90 degrees counterclockwise and place the board back into the holder and click next.

NOTE: You must not move the calibration holder during scanning. If you do move the holder, then close the software and start again.



Take out the calibration board from the holder, rotate the calibration board 90 degrees counterclockwise and place the board back into the holder.

NOTE: You must not move the calibration holder during scanning. If you do move the holder, then close the software and start again.

Once complete the software will calculate the calibration values. If the calibration fails, then you will need to start it again. Capturing super fine detail, requires the scanner to be setup really well.

Turntable Scanning Mode



Select the shade that most closely matches your object



Bright:

Choose for light color objects



Medium:

Choose for objects neither bright or dark



Dark/difficult to scan:

Choose for objects difficult to scan, such as dark, gloomy, shiny or fuzzy



BrightDark:

Choose for objects bright and dark

Select detail of scanning



Choose high detail



Choose middle detail



Choose low detail

Cancel

Apply

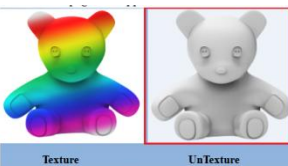
Place the object in the center of the turntable and click "Describe Your Object". Check the luminance (brightness) from the preview window in the lower left hand corner of the software. Choose a suitable luminance (brightness) and level of detail and then click APPLY.

It is important to choose the correct medium brightness to describe your object. If it is too bright, then the scanner will not get any detail. Too dark and again it won't capture good detail.

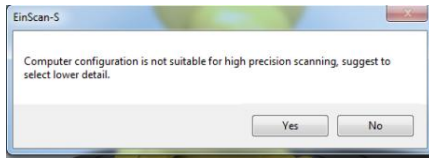
NOTE: You cannot scan black, transparent, mirrors or other highly reflective surfaces. For best scanning ensure the object is matte and has no to little black.

Ideally it is best to have a dark background behind the turntable.

EXPERT TIP: It is always best to test your object using a "Low detail" setting before doing a high detail scan, as a high detail can take a long time to process.



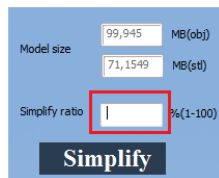
The next screen will give you the option to capture the full colour texture. If this is your first scan then please choose "UnTexture". Once you click "UnTexture" the scan will start and the turntable will rotate. Refer to "Texture" section in the manual. Do not adjust lighting, move the model, scanner head or turntable during scanning!



If you select 'high detail scan', you might receive a warning that you don't have sufficient resources for high resolution scanning, however you can choose to ignore the warning and continue scanning.



If your computer starts running low on resources you will be prompted with a dialogue telling you to stop scanning. Then you can Pause or Stop scanning.



After the scan has completed, you can reduce the file size by decimating (reducing the scan detail) of the model.

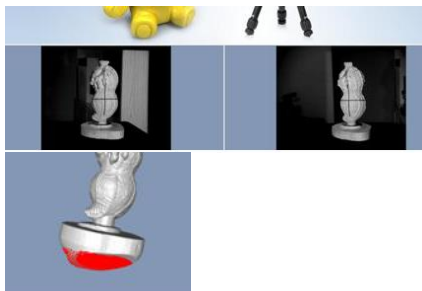


Once the scan has finished, you can rotate the model on the turntable and scan the underside and top of the object. To do this, rotate the object on the turntable and click "Continue" otherwise just click "Complete"

Free Scan Mode

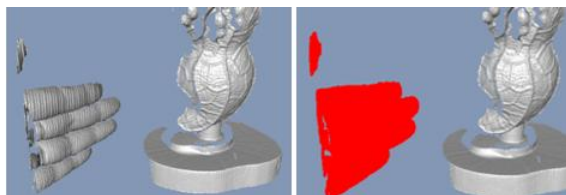


In this mode you can scan larger objects, or objects that are harder to capture details in holes etc. The scanning is done section at a time and each time you overlap part of the previous scan by about 10-30%. This allows the stitching software to combine



In this mode the projector, projects a cross over the object. Place the cross in the centre of the object.

NOTE: Refer to the brightness setup in the turntable mode. If the object is over exposed then it will show up as red.



After each section of a scan has been done, you can clean and remove noise from the scan. Use SHIFT + LEFT mouse button to crop sections out (as per image in red) Then press DELETE and it will remove the highlighted section.

Once you have completed editing that section, then move the part along and leave about 30% overlap. This is so the software can stitch with the previous section. Click NEXT. If the object had enough texture to automatically stitch, then the software will attempt to stitch each section together. If the automatic stitching failed, click MANUAL ALIGN



In Manual Align mode, you need to select points on the two scans that match. If you don't provide enough overlay on your scans it can be difficult to align.

Texture Mode - scanning in colour

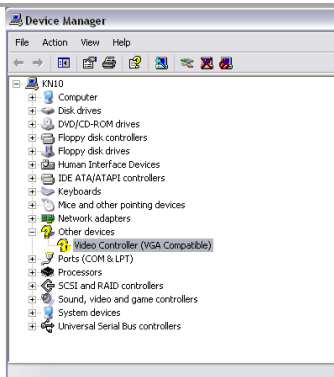


Texture scan is only available in low and medium detail modes. Choose 'Texture scan'



When scanning a colour object, a white balance test is required to achieve better colour reproduction. Put a piece of white paper in the position of the calibration plate and click 'white balance test'. Once the white balance test has been complete, the scan will continue.

Trouble Shooting



If the Software is crashing do the following:

1. Restart the computer
2. Check that the drivers for the scanner have installed correctly and there Yellow question marks in device manager.
3. Run through the checklist before scanning.
4. Turn off driver signature enforcement in Windows and then uninstall and reinstall the software.

How to Disable Driver Signature Verification on 64-Bit Windows 8.1 or 10

To disable driver signature verification, we're going to need to get into the Troubleshooting options from the boot manager. The easiest way to bring this screen up is using a secret trick.

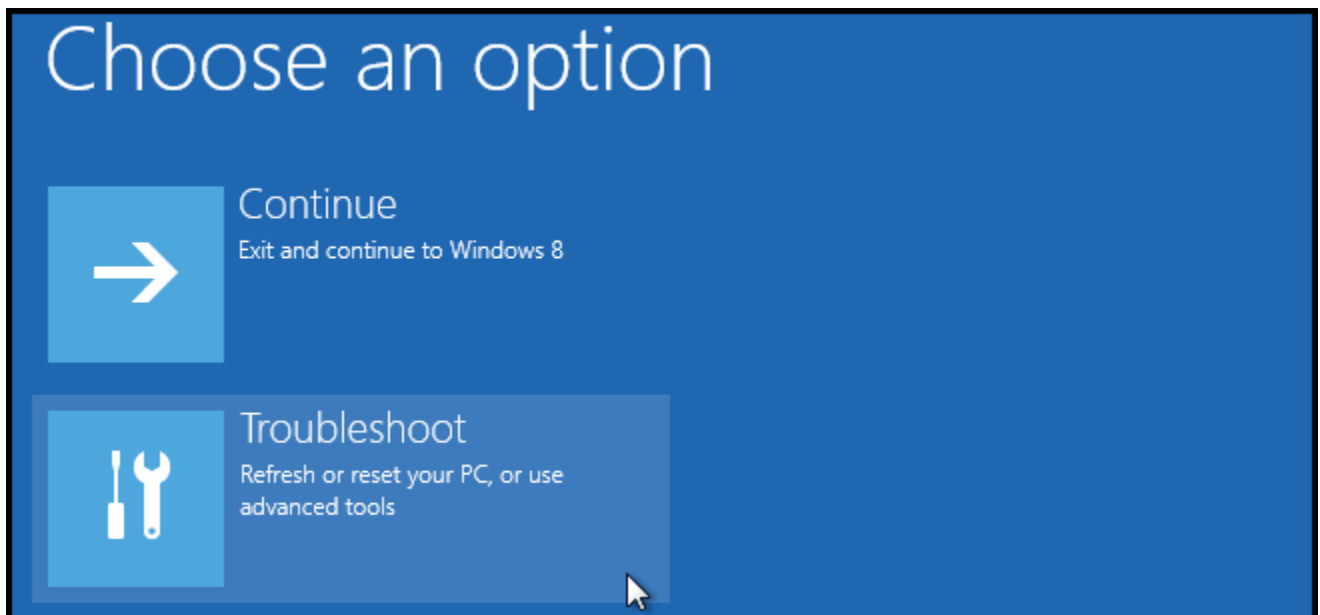
Simply select Restart from the power options menu (on Windows 8 that's under Charms or on the login screen, and in Windows 10 it's on the Start Menu).

Hold down the **SHIFT** key while you click Restart.

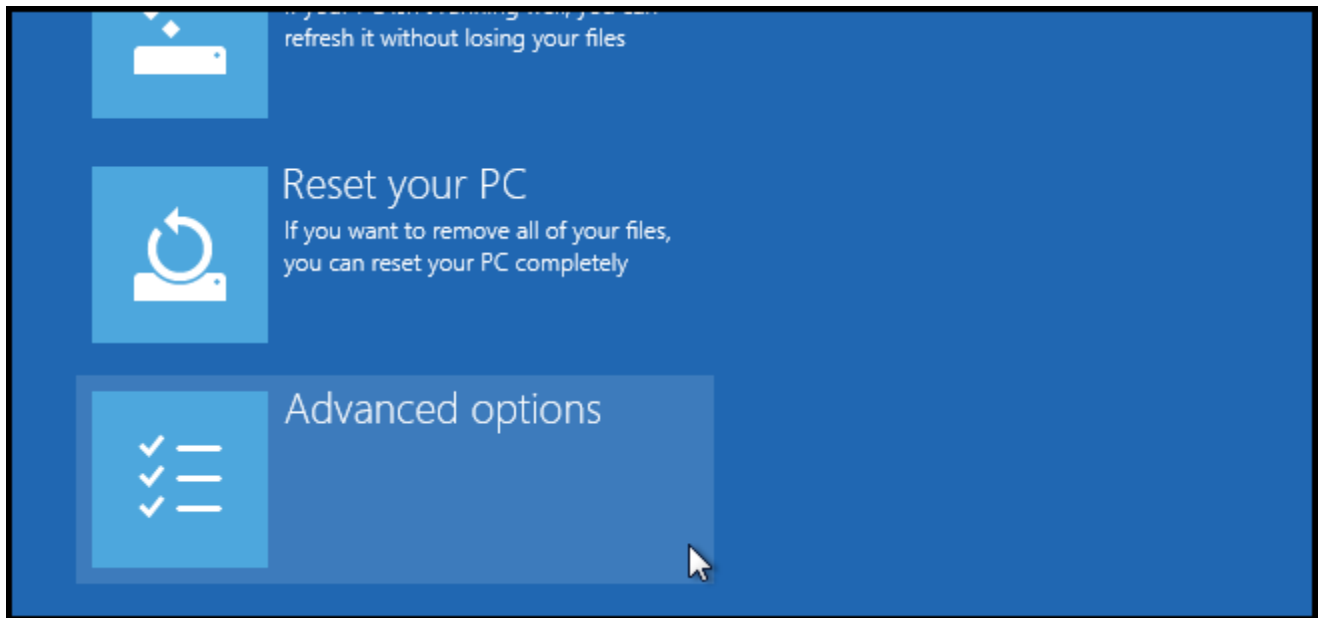


(Again, you can use this trick on any of the power menus in Windows 8 or 10, whether on the login screen, Charms bar, Start Menu, or Start Screen)

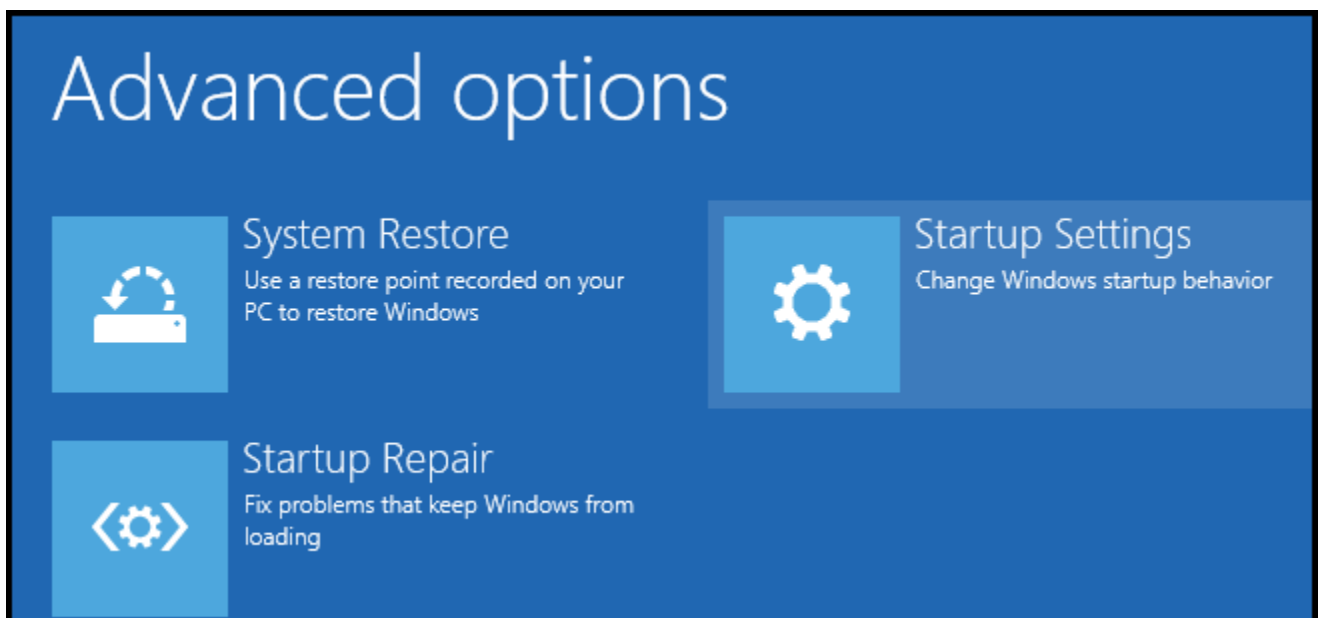
Once your computer has rebooted you will be able to choose the Troubleshoot option.



Then head into Advanced options.



Then Startup Settings.



Since we are modifying boot time configuration settings, you will need to restart your Computer one last time.

Restart to change Windows options such as:

- Enable low-resolution video mode
- Enable debugging mode
- Enable boot logging
- Enable Safe Mode
- Disable driver signature enforcement
- Disable early-launch anti-malware protection
- Disable automatic restart on system failure

Restart

Finally, you will be given a list of startup settings that you can change. The one we are looking for is "Disable driver signature enforcement". To choose the setting, you will need to press the F7 key.

Startup Settings

Press a number to choose from the options below:

Use number keys or functions keys F1-F9.

- 1) Enable debugging
- 2) Enable boot logging
- 3) Enable low-resolution video
- 4) Enable Safe Mode
- 5) Enable Safe Mode with Networking
- 6) Enable Safe Mode with Command Prompt
- 7) Disable driver signature enforcement
- 8) Disable early launch anti-malware protection
- 9) Disable automatic restart after failure

3D Scanning Tips

- Paint your objects in a matte white paint to get excellent results
- Cover your object in baby/talcum powder to get good results.
- Turn off any fluorescent lights during scanning
- A room with a small amount of natural light is best.
- Don't trip on the cables as this will move the setup and require calibration again
- Don't move anything during scanning.
- Check that you select the correct brightness of the object.
- The scanner cannot capture black, so for example it doesn't capture the turntable!

Appendix a - support

Please take the time to join the community forum where users hangout.

forum.3dprintingsystems.com

To get support for your product please contact 3D Printing Systems

Australia

Phone: +61 (0)3 9099 0225

support@3DPrintingSystems.com

New Zealand

Phone: +64 (0)9 281 4206

support@3DPrintingSystems.com

Appendix b – 3d related scanning software

There are many great free or low cost 3D CAD programs that can be used for design, scanning and cleaning up files to 3D print.

We highly recommend using [MeshMixer](#) with your scanned data to clean, smooth and repair!

For an every growing range of excellent software apps, check this list out:

<http://3dprintingsystems.com/education-stem-apps/>

TO share your 3D Scans, signup for a free account with [Sketchfab](#)

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Revision Sheet

Release No.	Date	Revision Description
Rev. 0	10/4/15	User's Manual Created as draft
Rev. 1	1/10/15	General updates