# Colour Set-up Version 7.0

| REVISION HISTORY | | | | |
|---|---|---|---|---|
| **Date** | **Rev** | **Description** | **Author** | **Approved** |
| 4/07/14 | F | Iris Colour set-up document | CW / FMC/GN | |
| 17/2/15 | G | Various updates including Win8. | CW/FMC/DMG | |

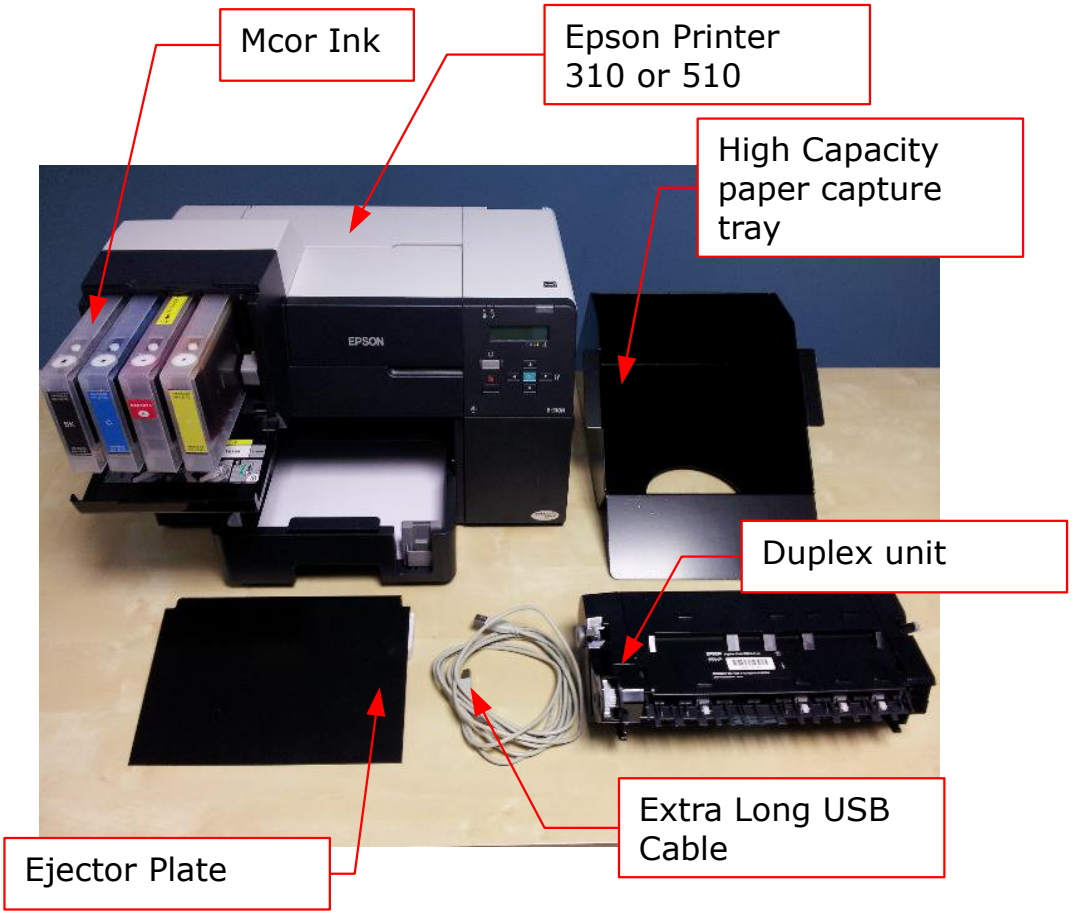
# Table of Contents

# 1 Printer Components

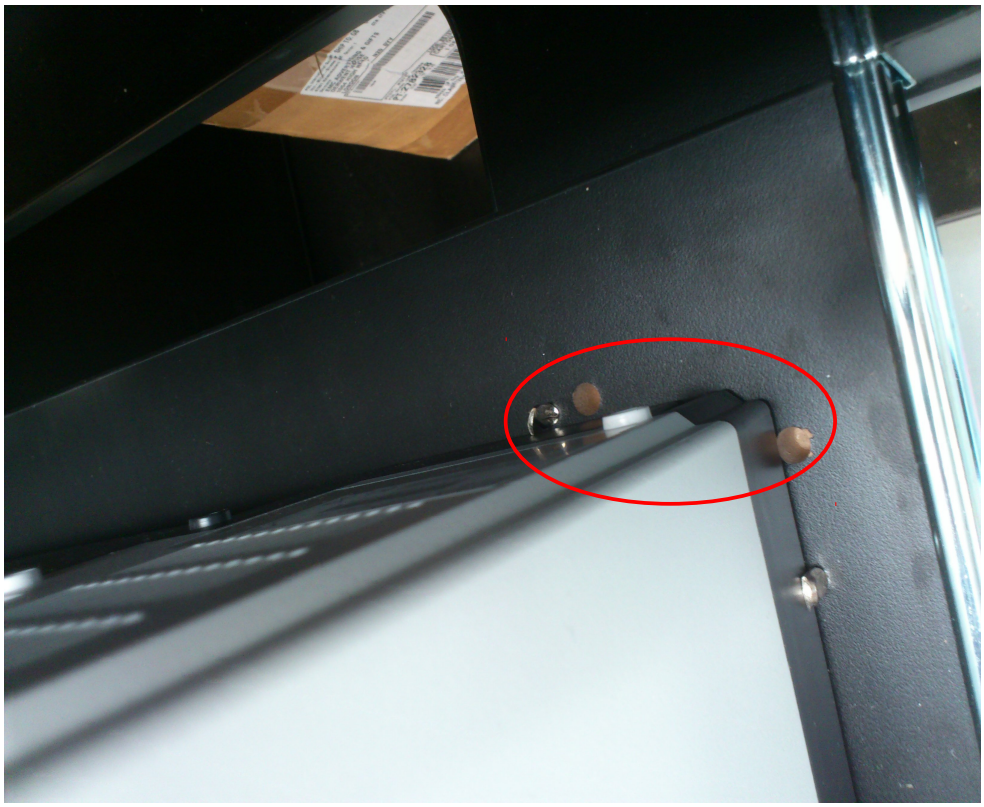
The printer supplied with the colour system is a standard Epson 310N or 510N printer, however a number of modifications have been made to improve its duplex image registration and output tray capacity. (Note that the only difference between the 310 and 510 printers is that the duplex unit comes installed on the 510 printer. Mcor supply the duplex unit for all 310 printers). The components of the system are shown in figure below. Along with these components is the table used to house the unit. The duplex unit comes packaged separately with the 310N.

The printer and the Iris are designed to now function only with Mcor ink.

The Mcor ICC profile is directly tied to Mcor ink. Use of other ink will result in colour penetration problems and possible 2D printer issues which will not be covered by warranty.

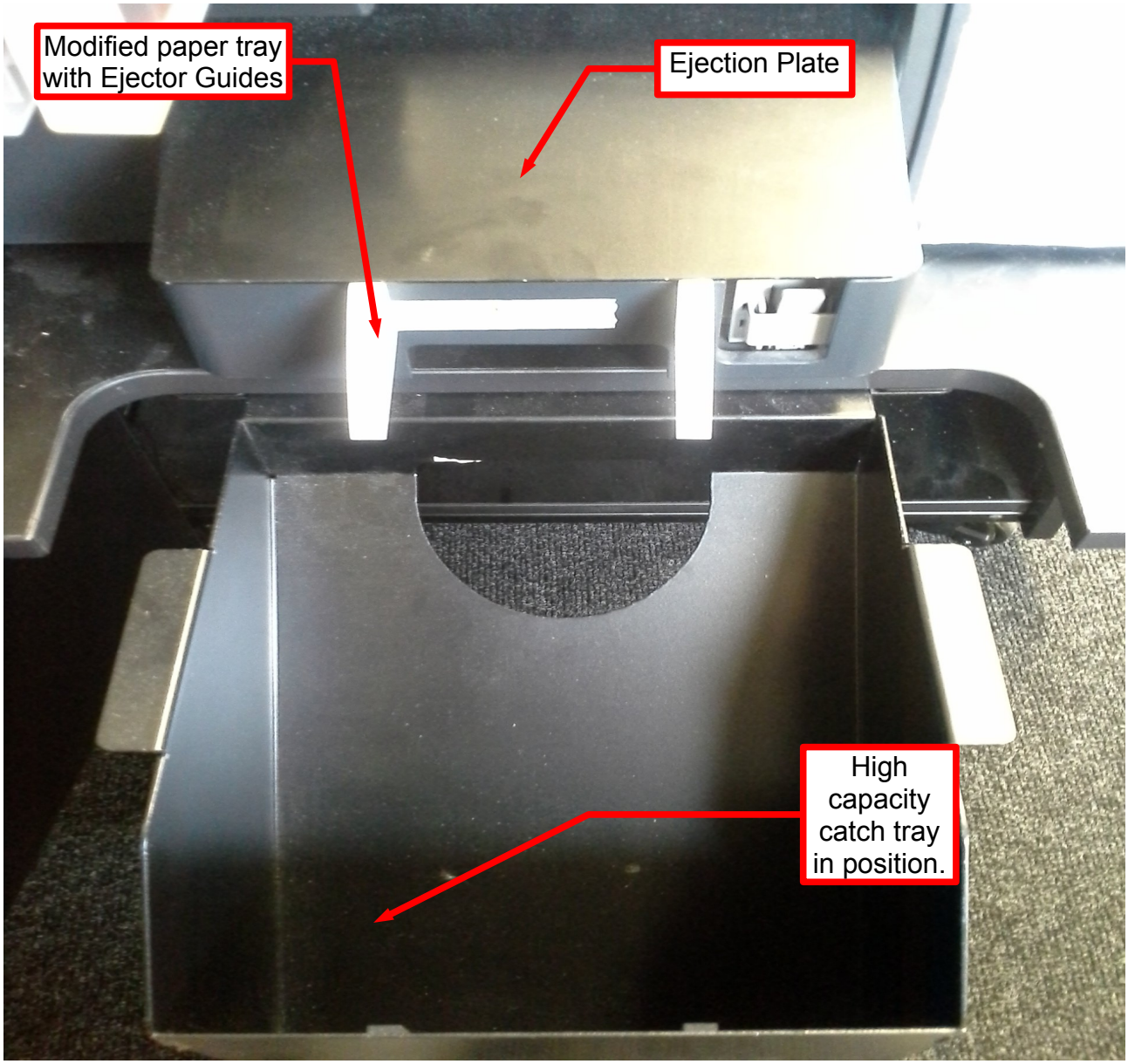


# 2 Installing Printer Components in Cabinet



Locate the 2D printer against the two dowel pins, one at the rear corner and one at the side, as shown above.

If the printer has a separate duplex unit attach it now and run the power and usb cables through the cabinet.




Place the ejection plate into position at the exit of the 2D printer paper feed.

Place the high capacity catch tray in position under the shelf on which the 2D printer sits. This is aligned to receive the pages off of the ejection plate straight in to the tray, as shown above.

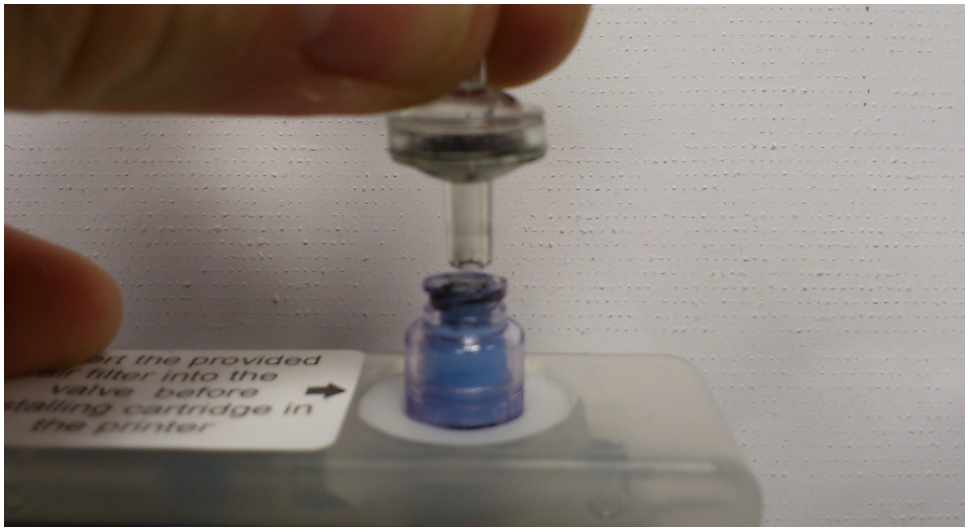
# 3 Installing Ink cartridges

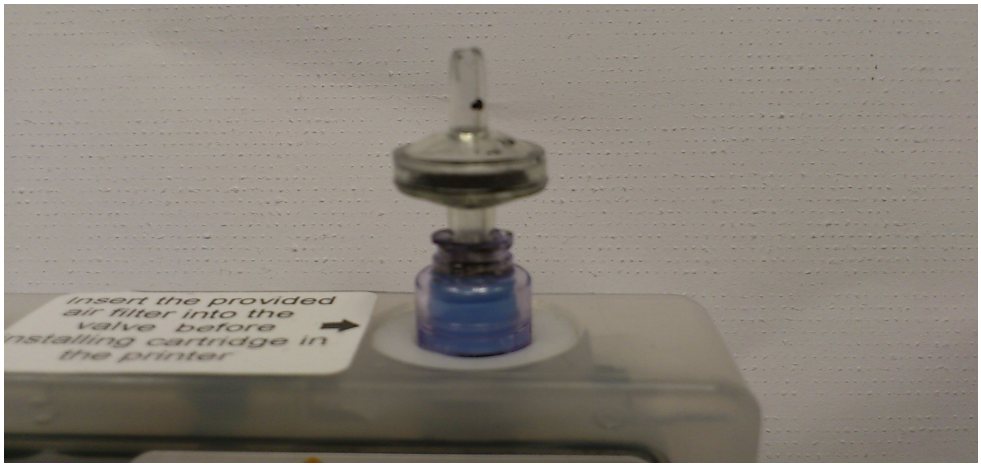
The Mcor ink Cartridges are installed in the following manner.

Note that only Mcor should be used in this printer. Use of other ink including Epson original ink constitutes a breach of contract and voids the warranty.

- Remove the cartridge from its protective package and install the air vent into the air inlet port, with the cartridge upright.
- Push the larger side of the air vent into the inlet port and press down. The internal foam pad should move down breaking the air tight seal. Be cautious as some ink may come out due to pressure in the cartridge.
- All air vents must be in place before installation to the printer. The air vent allows air into the cartridge as the printer draws the ink out.
- Try not to squeeze the sides of the cartridge as this may cause ink to rise up in to the vent. This can later dry and prevent airflow. *If this happens please either replace the vent or pierce the blocked vent with a pin to allow airflow.*
- These cartridges are completely full of ink. There is no need to prime them but should check for an air bubble from transit and ensure that this is away from the lower feed channel.
- Carefully insert the cartridge into the printer taking care not to damage either of the microchips on either side of the cartridge.
- Repeat for the remaining cartridges. Once all of the cartridges are installed, move the select lever on the printer, located to the right of the cartridges, to the locked position.
- Note that when you power up the printer the very first time the ink lines are completely empty. It can take up to 10 minutes to fully charge these lines with ink.(This time should be spent installing all of the software, starting with the Epson software, then SliceIT and ColourIT and finally the webcam software. Note that the 3D printer does not have to be powered up to run the web cameras; they run off of usb power from the computer. See Section 8).
- ***The Ink level detection no longer works on the printer, it is the responsibility of the user to ensure that the cartridges are NEVER allowed to run empty. If this happens ink will dry on the inside of the nozzles causing a permanent blockage. There is no solution for this. When the ink gets to the bottom of the front of the cartridge it must be replaced.***


Insert enclosed air filter into the valve **BEFORE** installing this cartridge into the printer
mcor iris
True Colour
Black


the provided
filter into the
valve before
installing cartridge in
the printer


Insert the provided
air filter into the
valve before
installing cartridge in
the printer

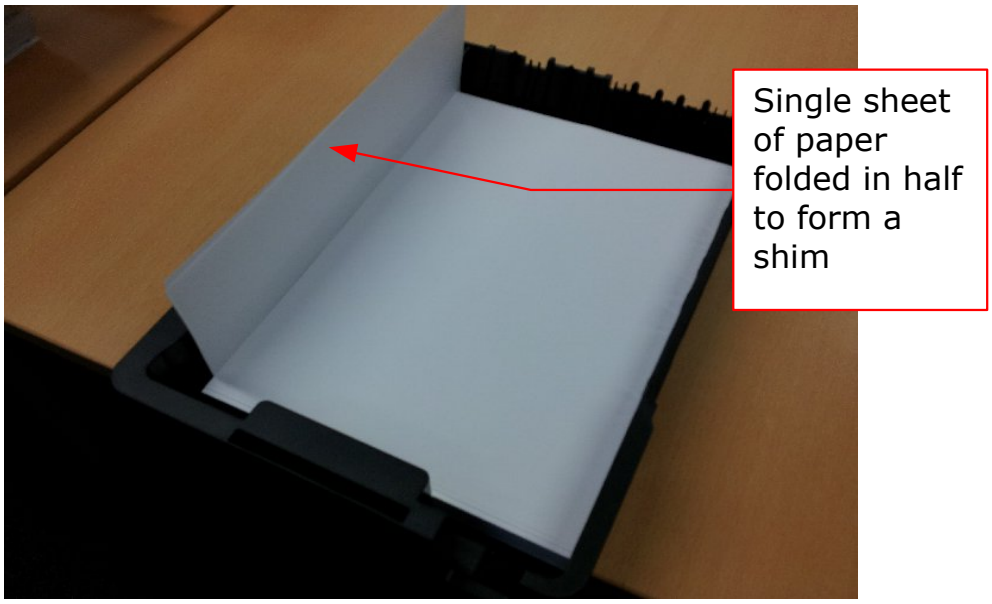

The image above shows the Epson Maintenance tray, located at the bottom right hand side of the 2D printer. This tray is an Epson consumable and periodically needs replacing. Mcor do sell this unit, but it can also be sourced locally from Amazon or e Bay or indeed local office suppliers.

The Epson part number for this is “T6190”.

# 4 Setting up paper tray

The Epson printer comes with a modified paper tray to improve the duplex printing registration. The Mcor modification reduces the possibility of the page being fed at an angle (skew). It allows for far more control of the feeding of the paper into the printer. This is set up in the following way.

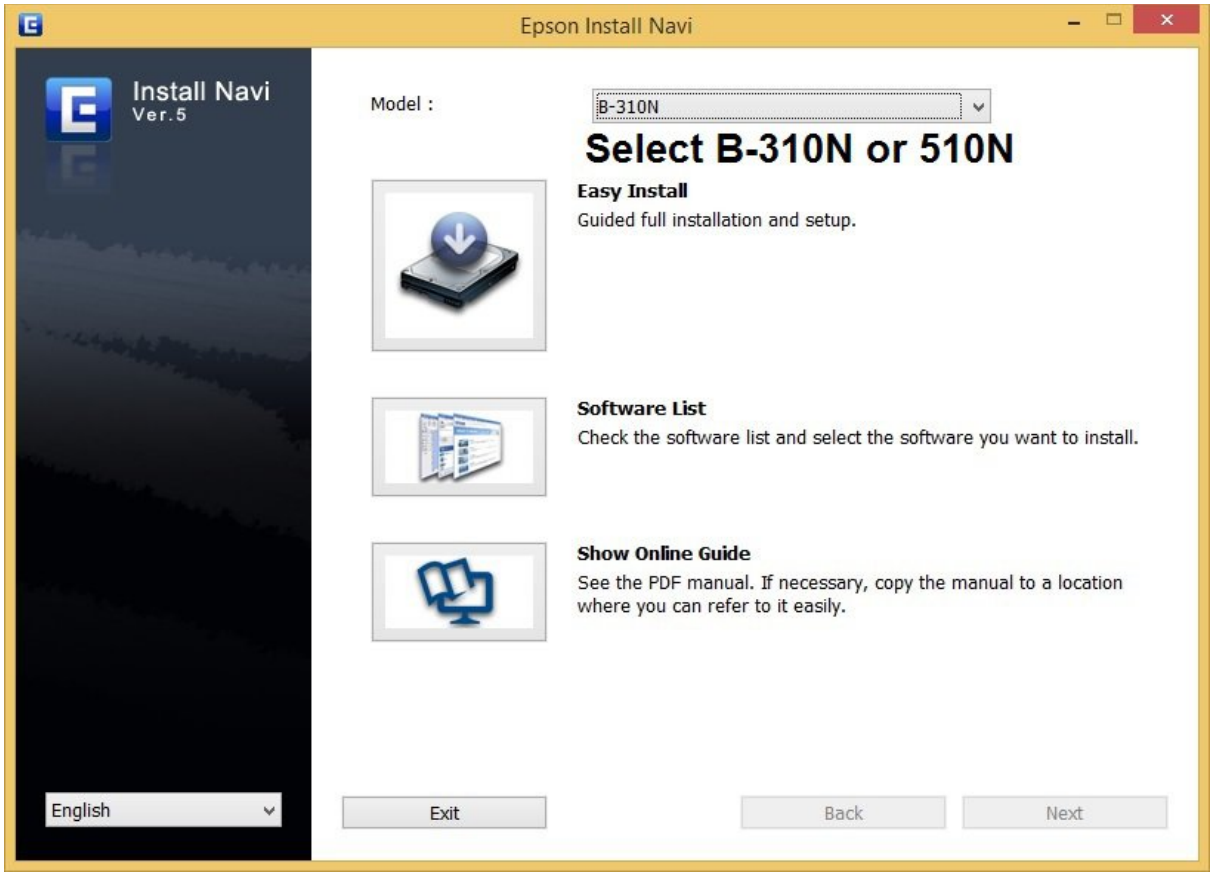
- First loosen the two screws on the bottom of the tray.
- Move the inner paper tray to the left and insert at least 250 but no more that 400 sheets into the paper tray.
- On the left side of the inner paper tray fold a page in two and place it between the side wall of the inner tray and the edge of the pages, see below. (**not between the Epson tray and the stack of paper.**).



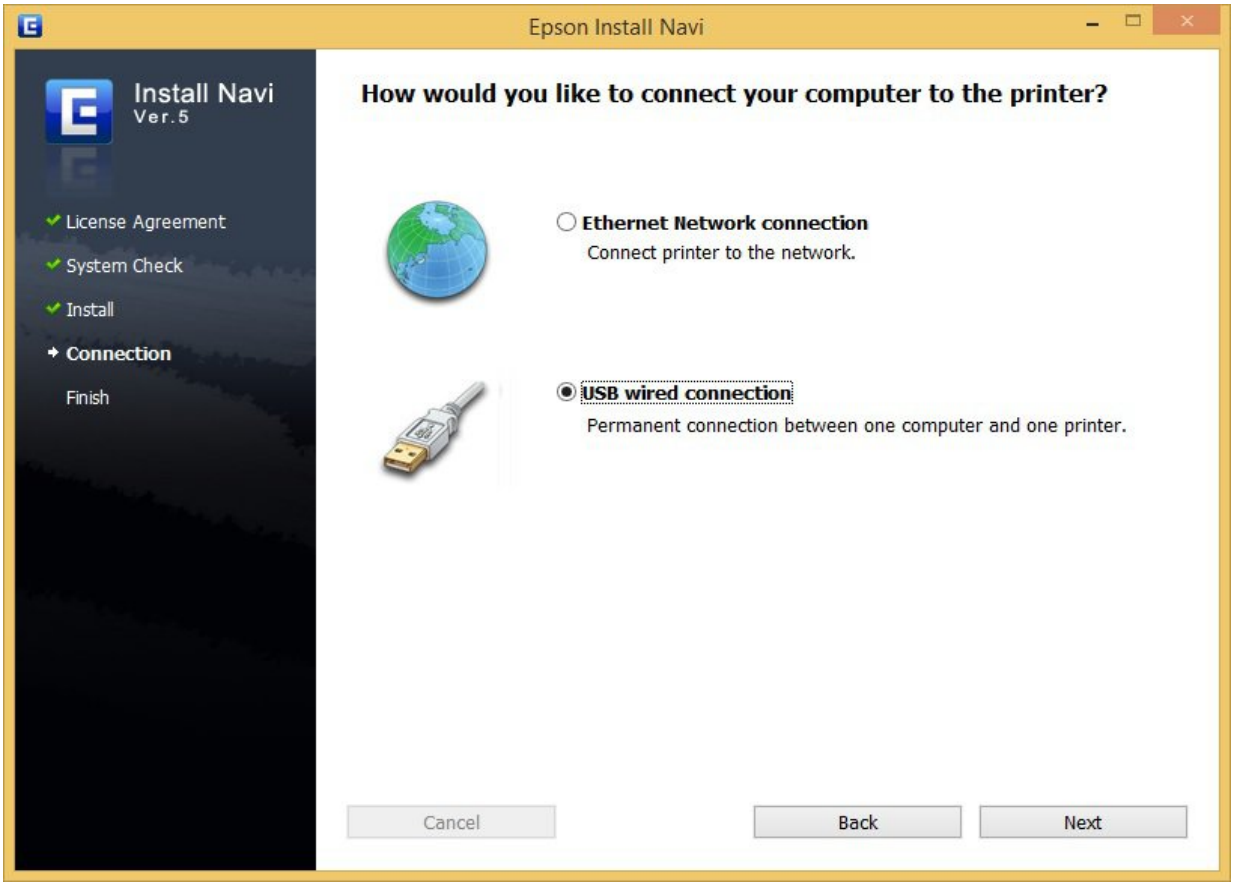

- Next Angle the paper tray and tap on its side so that the inner tray is a tight fit on the pages. (This is creating a 0.2mm gap to allow for tolerances in paper and stacking).
- Once complete tighten the screws on the under side of the tray and remove the folded page. Tighten each screw partially going back and forth until each is secure.
- Remove the folded page slowly. There should be even friction along its complete length, otherwise the tray is skewed.

# 5 Epson Driver Set-up

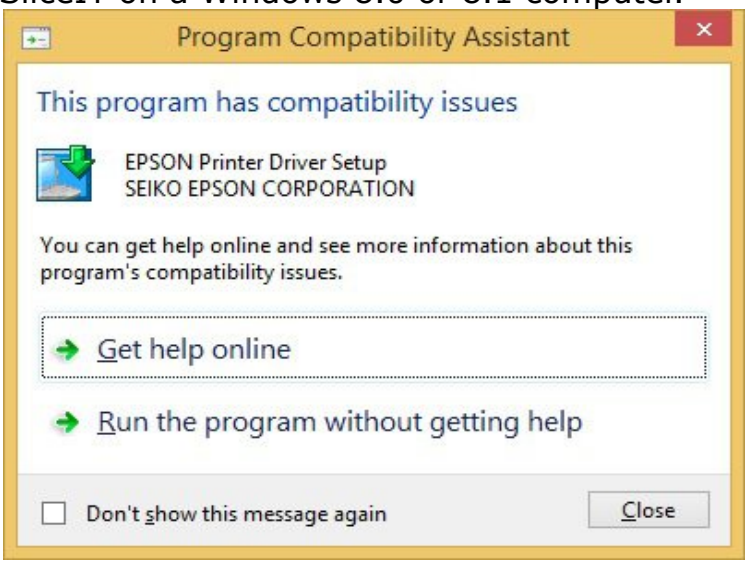
Once the Printer has been set-up, we can install the Epson driver from the enclosed CD. It is important to install the printer as a USB printer. The printer is designed to be used as either a USB or as a network printer, but for our purposes it will only work properly as a USB printer as it gives us complete control of the printing preferences and prevents another document or image from been added to our stack. During the installation process you will be asked to connect the printer, follow the on-screen instructions and use the USB port.




The disc should auto-run to this pop-up window.
Close the browser window that may open once your selection has been made.
The next option is the user agreement followed by the image on the next page which allows you to select the USB connection.
The software can also be downloaded from the Epson website.



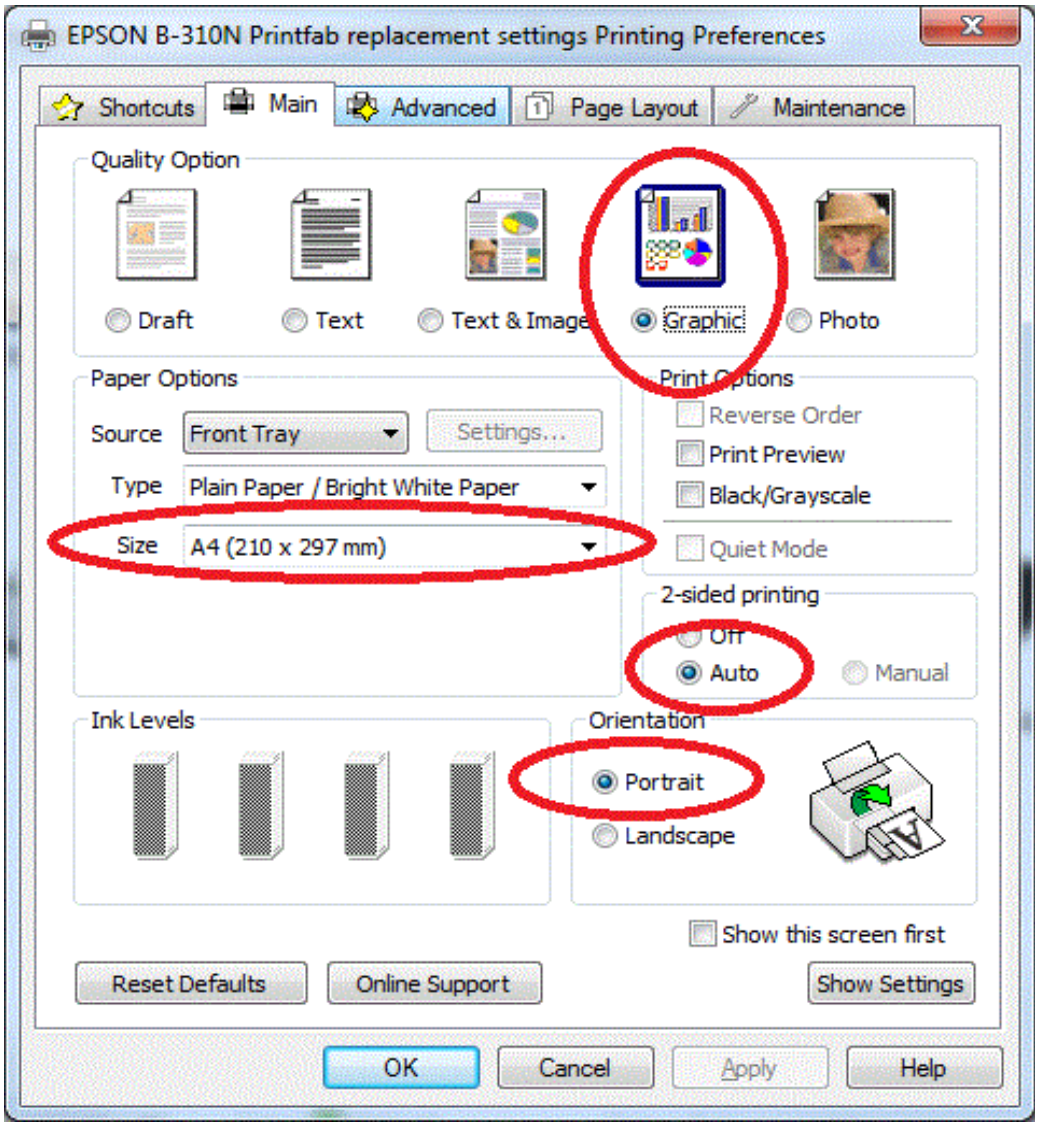

The Epson software is currently only fully compatible with Win 7. If installing the software on a windows 8.0 or 8.1 machine you will receive the following error message, select "Run the program without getting help" as no solution will be available. We are currently unaware of any actual issue when running this printer with SliceIT on a Windows 8.0 or 8.1 computer.



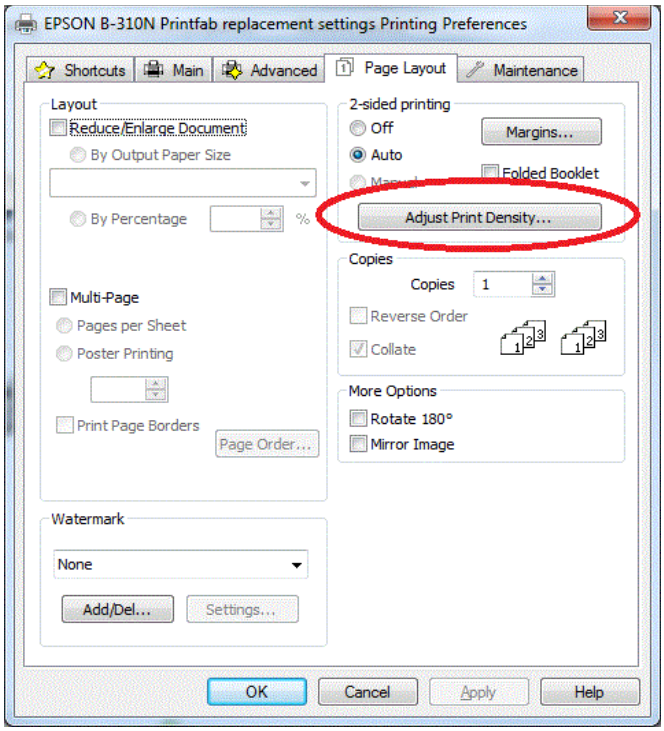
# 6 Epson Printer Preferences

In order for the colour on the Iris to be the best it can be the Epson printer must be configured correctly. Failure to follow these steps will result in issues with the colour on a model.

First of all on the main tab, select your paper size, then select **Graphic** mode, **2-Sided printing to Auto** and leave Orientation as **portrait.**

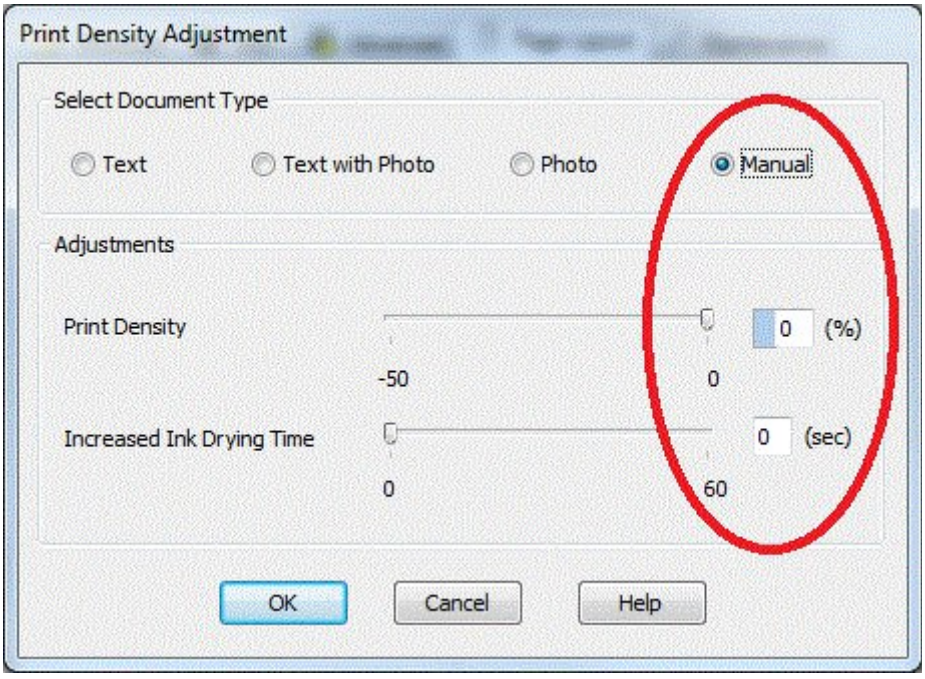


Next go to the page layout tab and click on "Adjust Print Density …"

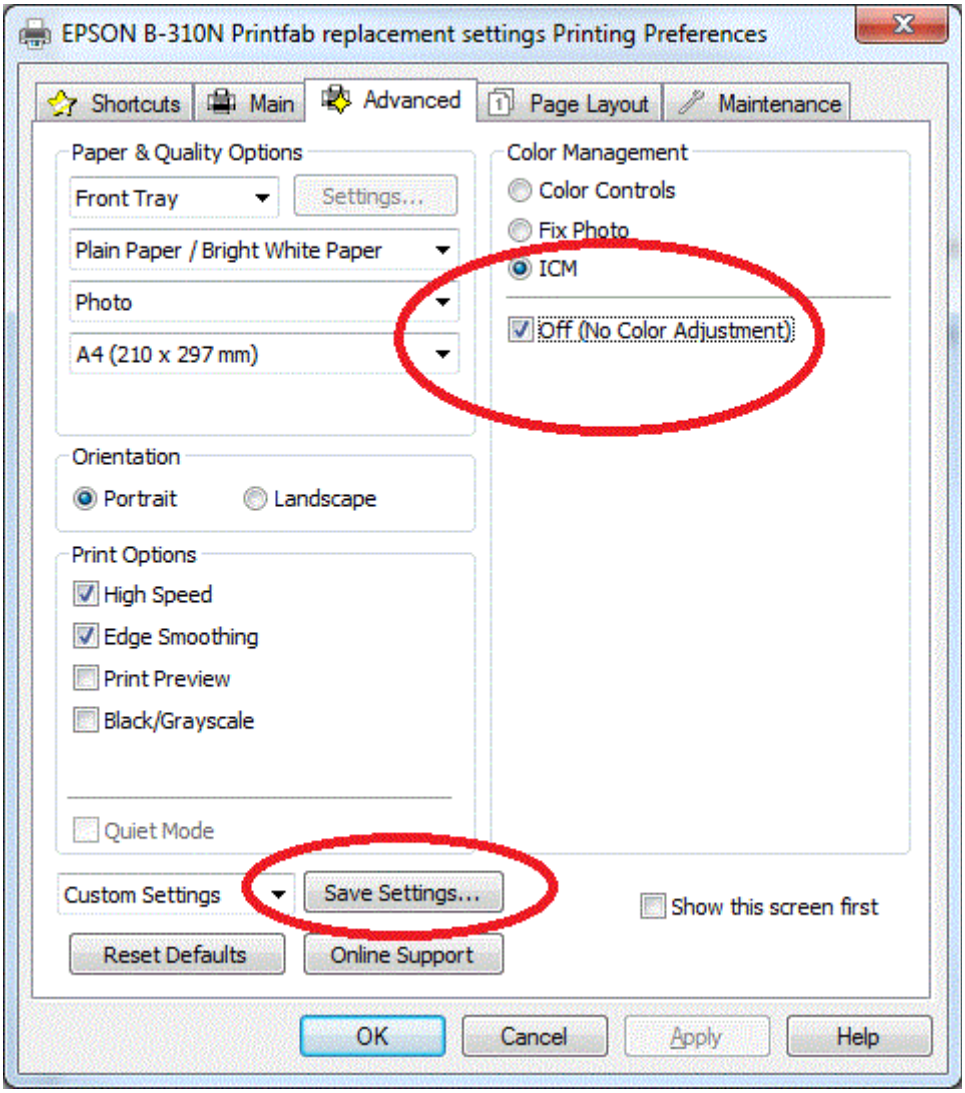



This will open another window, "Print Density Adjustment".

Set the Print density to "**0%**" and the increased drying time to "**0 sec**"



Next move to the "**Advanced**" tab. Under Colour Management, select "**ICM**" and select "**Off (No colour adjustment)**". The colour correction will be made in **SliceIT**.




Then click on the "**Save settings**" button. Set the name of this configuration to "Mcor Default" and save.

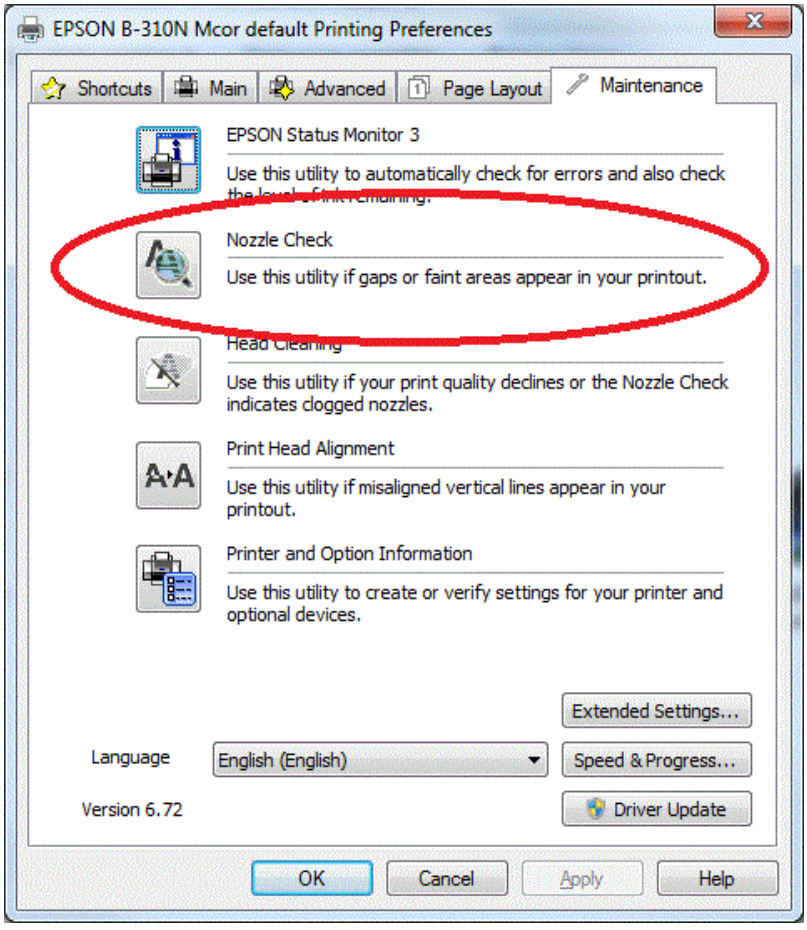
In the "Short cuts" tab select "Mcor Default" and click OK. This will set this configuration as default. In the device manager please also make this Epson printer the default printer for your computer.

At this stage the printer is set-up and the software installed, a test page may have been printed. We now need to carry out a nozzle check to see if the ink has gotten to all nozzles. Before we use the Epson "Nozzle Check" utility it is best to purge some ink through the system using the "Mcor Technologies 4 Colour Test Page". This page has four solid rectangles, one in each colour and allows for a heavy deposition of ink thus priming the ink nozzles. It will also verify that the ink cartridges have been installed in the correct position.

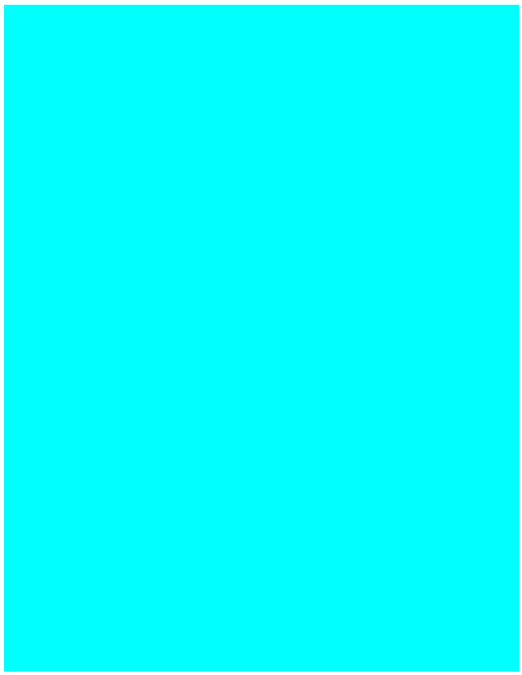
(It is on the next page and also available as a single page PDF. If printing from here ensure that when you print you only print the "**current page**").

The next step is to open the Epson preferences, from devices and printers or Epson print utility from the notification tray. Under maintenance tab you can print out a nozzle check.

You can also print out a nozzle check sheet directly from the printer.



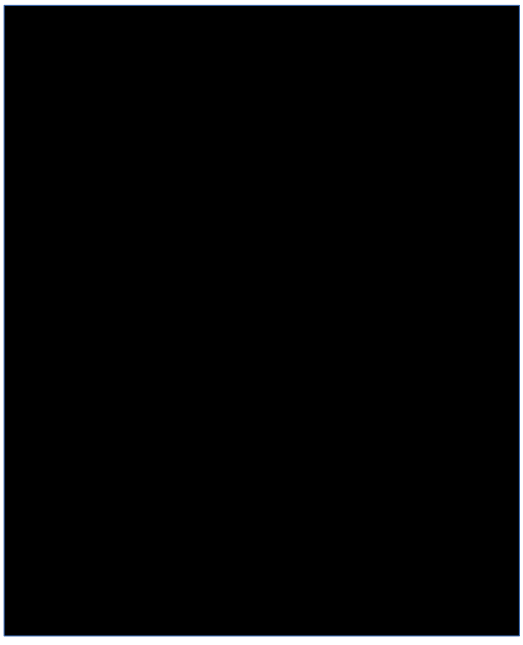
Yellow



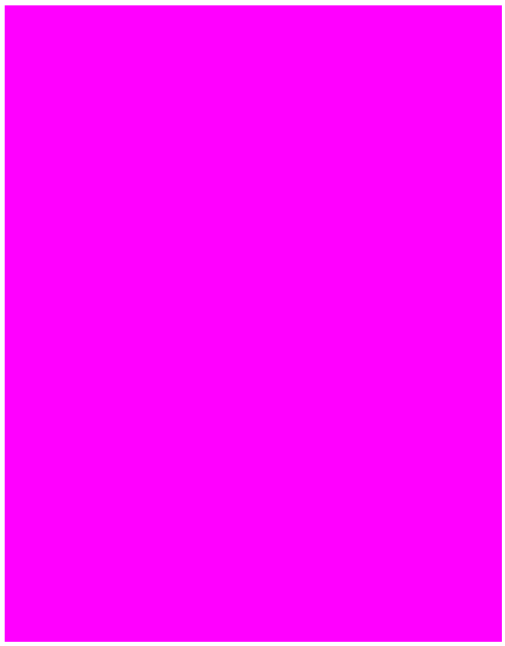
Cyan

**Print using default Mcor Epson settings**

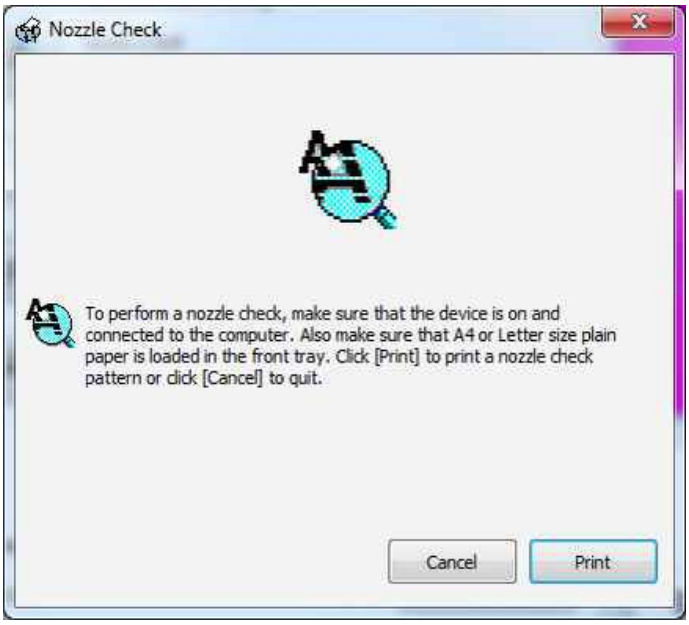
Black



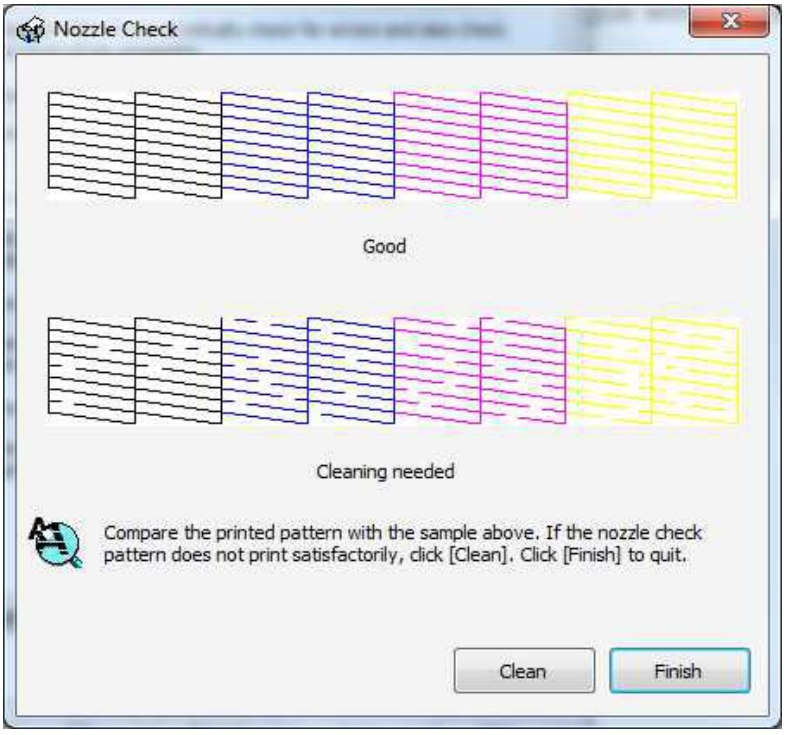
Magenta



Once selected the nozzle check will open a new dialogue window, see below.




Once printed the dialogue will explain what a good nozzle check looks like. Note: If there are issues refer to the Epson user manual for assistance. You may need to carry out a nozzle cleaning procedure.



Check that each line is printed with no or very few missing parts. If large gaps are repeatedly in the same location, cleaning is required.

**Typically small breaks which are individual and isolated will not affect an Mcor 2D print as the Mcor process applies more ink. If they are repeatable then they may cause a problem.**

If there are any breaks in adjacent lines forming a large block of missing ink, and this is repeatable, then you must use the Mcor Technologies nozzle cleaning document to purge the relevant head. (This process involves printing a complete page of unmixed colour. This prevents wasting the other inks and also prevents filling up of the maintenance tray).

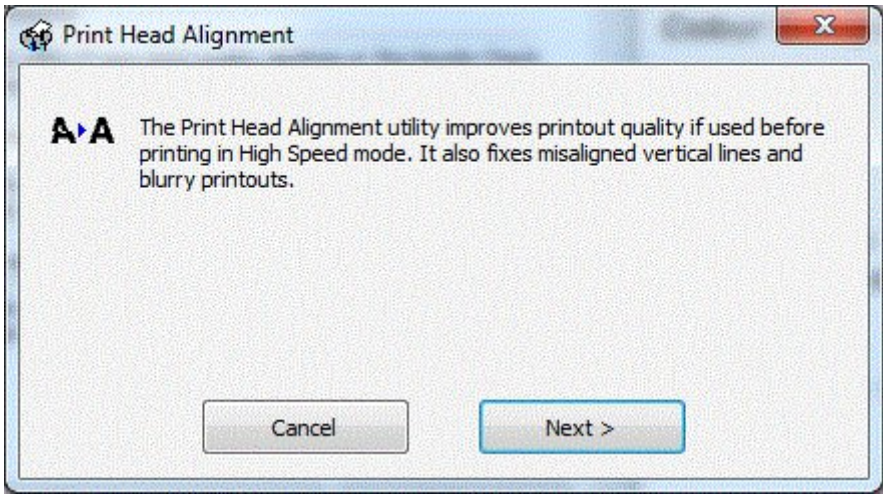
When complete, check the nozzles again and repeat process if necessary. If the problem persists, do this up to 3 times, then as per the manufacturer's recommendations, power down the printer for at least 6 hours or ideally overnight. (This information is on pages 153 + 154 of the Epson manual).

***Note that sometimes gaps in a nozzle check can be as a result of poor head alignment. Thus if difficulty arises it may be best to re-perform the head alignment procedure and begin repeat the nozzle check.***

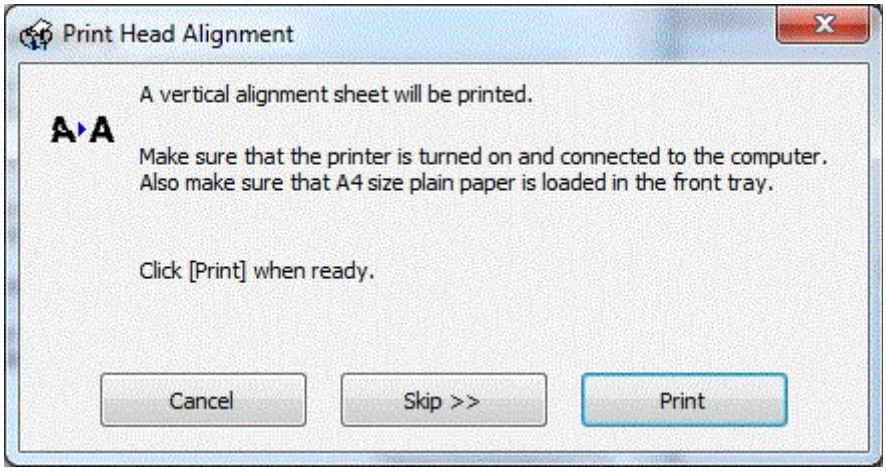
# 7 Print Head Alignment

To align the print heads we use the Align Print Head feature in the Epson Maintenance tab. The following steps detail the alignment process:

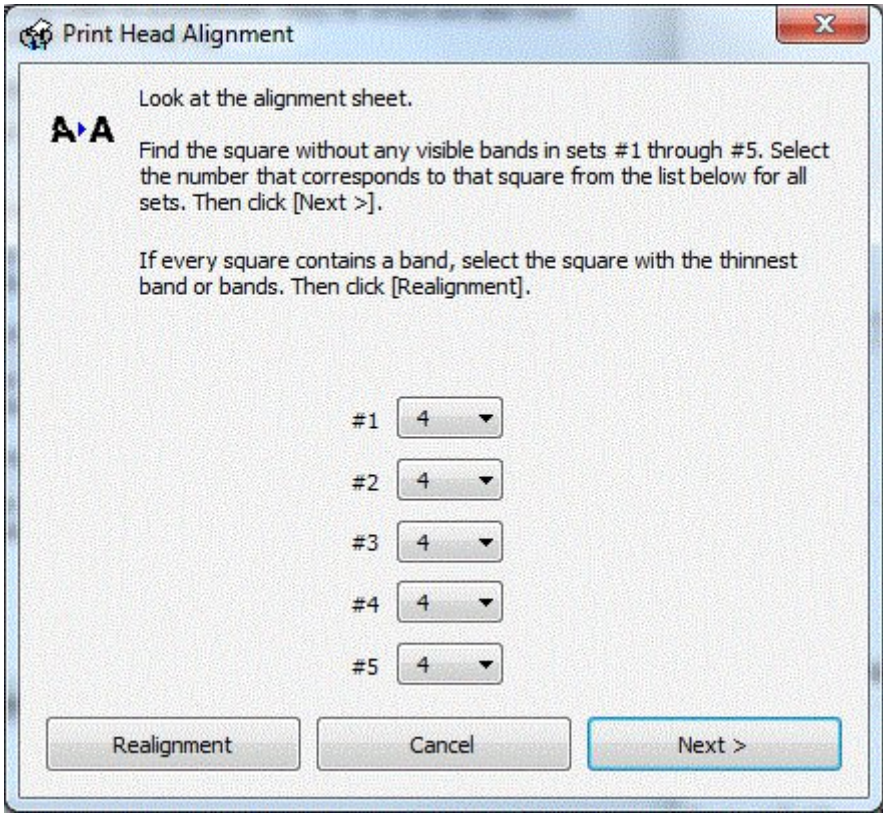
·Choose the Align print head option.




·Make sure that the printer has at least two sheets of paper in the tray and click next.



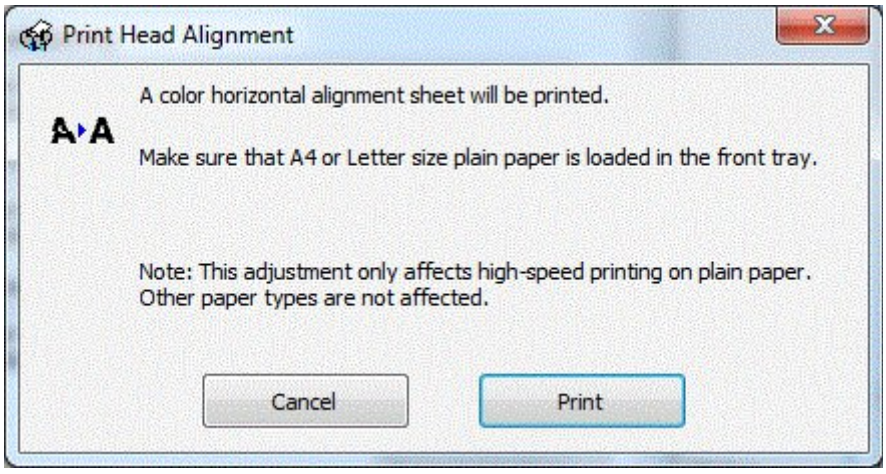

·Wait for the first alignment page to print out. This will be the vertical alignment page.

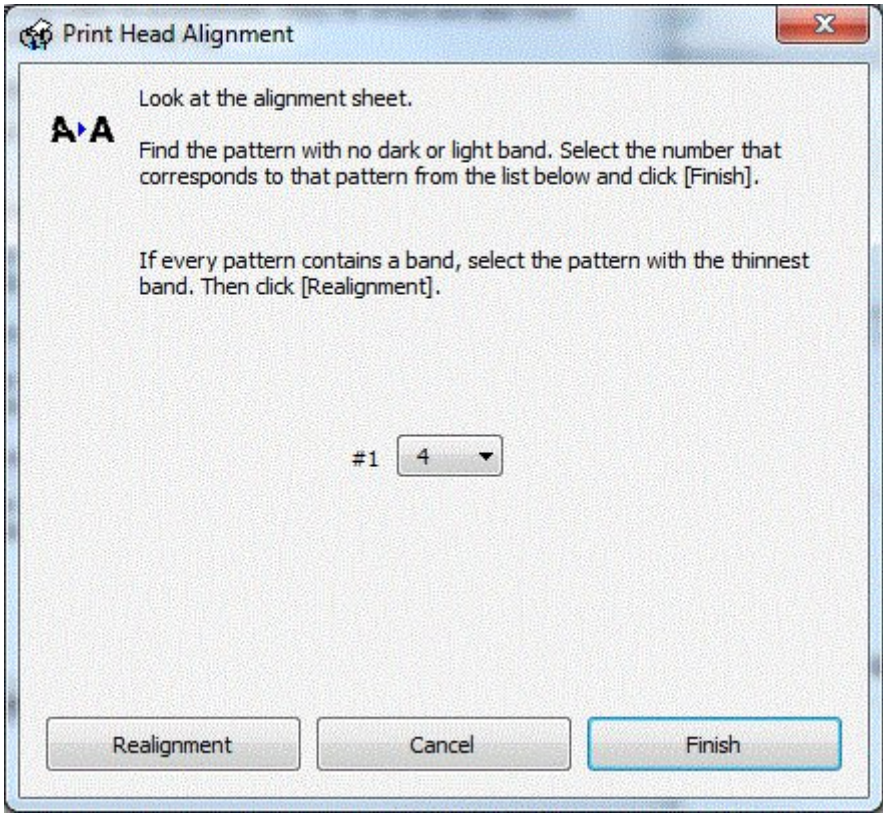



·When the page is printed out enter the number of the best aligned pattern from each row.

·Click continue, you will be asked to insert another sheet of paper. Insert one page if the tray is empty and click continue.

·Wait for the second alignment page to print out.






- Like before, when the page is printed out enter the number of the best aligned pattern.
- Click Finish to finish the alignment.
- This may have to be repeated if either alignment is very bad.

# 8 Installing and using SliceIT and other software

Install SliceIT per 3D printer user / operational manual.

At this stage you can install the Mcor Technologies ICC profile or your own if you wish.

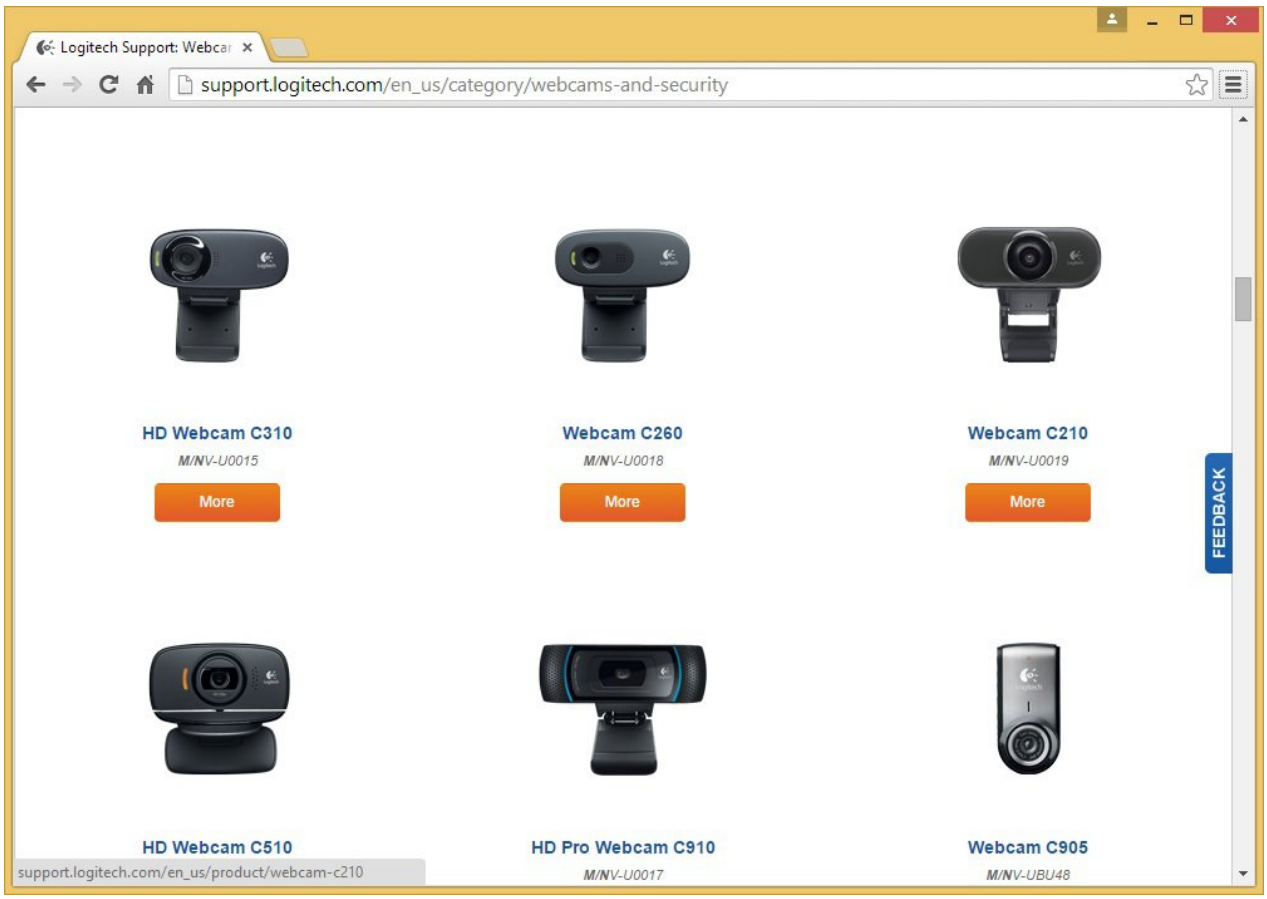
The Mcor ICC profile is available on the USB memory stick that shipped with the Iris.

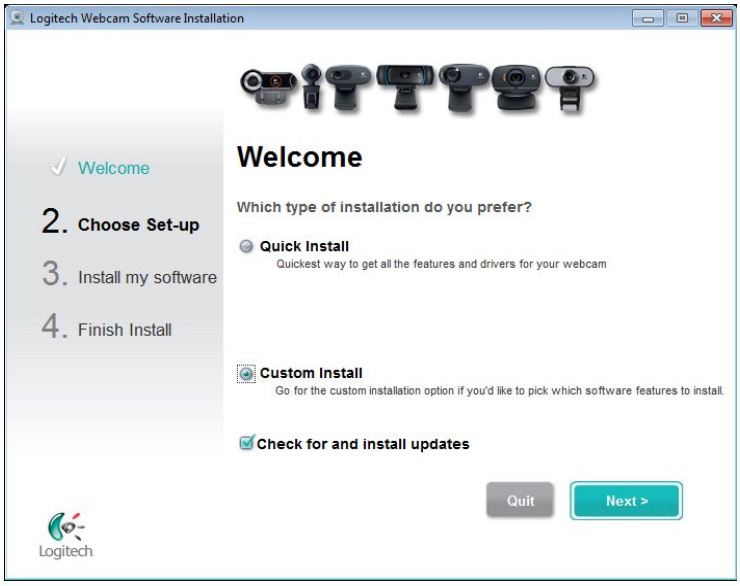
You may wish to also install ColourIt at this point and send the request to Deskartes for a license. Installation instructions are also in the 3D printer operational manual. You can also install the web camera software.

## 8.1 Installing the Logitech software for the web-cams

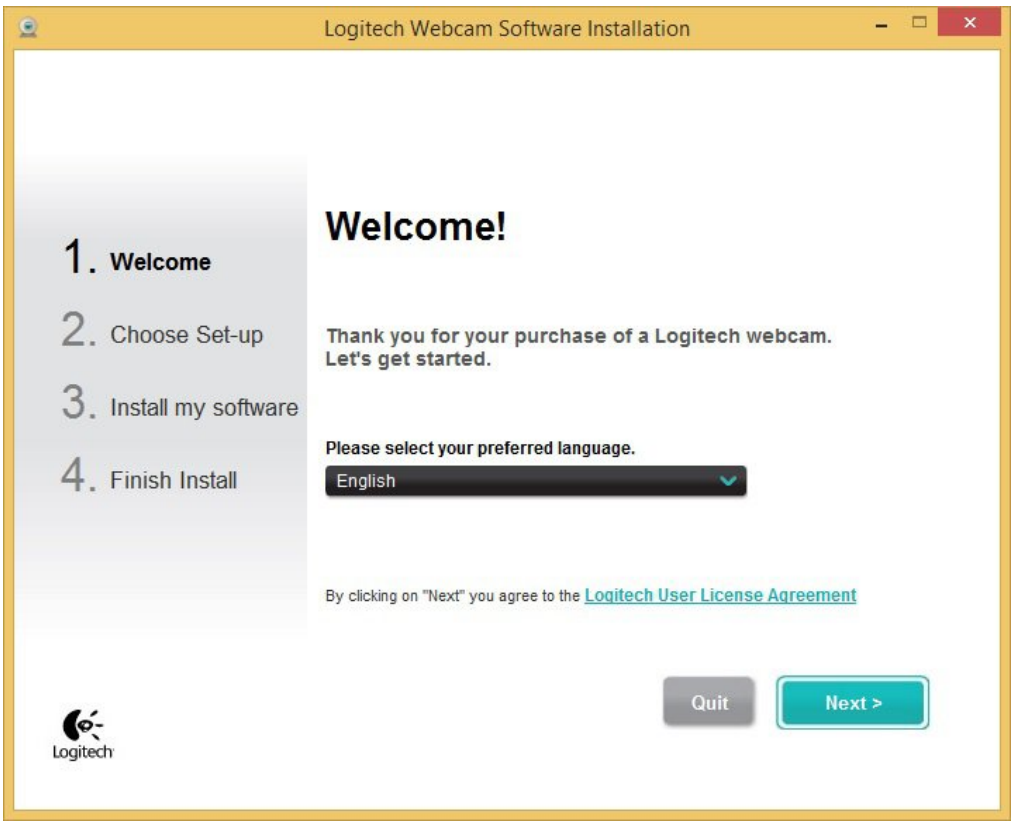
The 3D Printer comes with 2 installed web cams to aid in customer support. The 2 web-cams are connected internally in the machine to a USB hub and then to the output USB connector seen at the rear of the machine. Before these web-cams can be used by SliceIT we first have to install the driver software that comes with the machine.

- Download the software from the Logitech website as per the user manual or from here if no manual is available: "http://support.logitech.com/en_us/category/webcams-and-security"
- Select web-camera, C310 and download the relevant software for your operating system. (Win 7 or Win 8).
- Run the software
- Sometimes the Operating system will try to install software / drivers for the web-camera automatically as it detects them. Try to avoid this.
- When requested, insert USB cable from the rear of the 3D into the PC
- It is permissible (and indeed necessary) to allow the operating system to install drivers and software to run the USB hub. This process must be allowed to finish before continuing the web-camera software installation. A message will be displayed at the bottom right hand side of your screen saying "Your device is ready to use".
- Select the custom installation.
- There are known issues running these cameras off of USB 3.0 ports. The computer may need to be shut down and restarted to enable both cameras. It is easier to run the cameras off of USB 2.0 depending on the operating system and computer architecture.

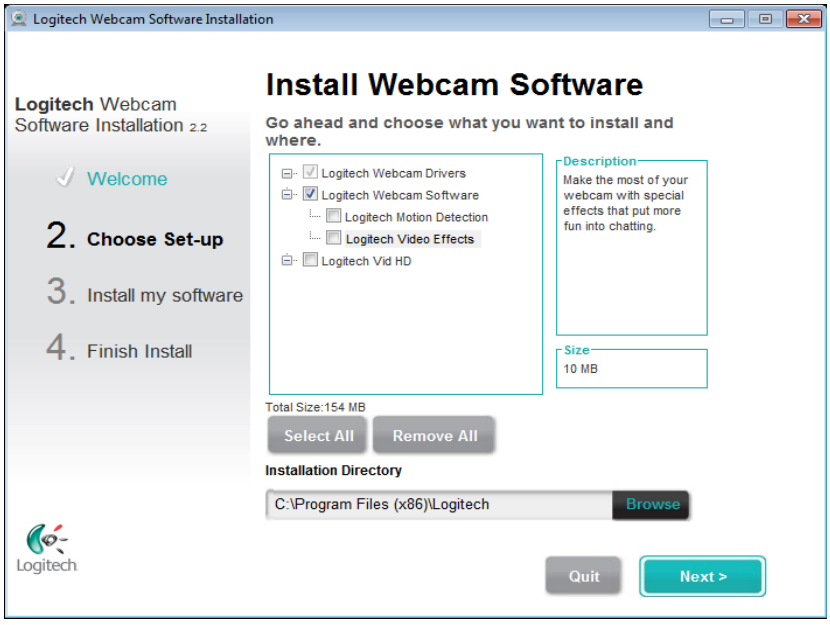


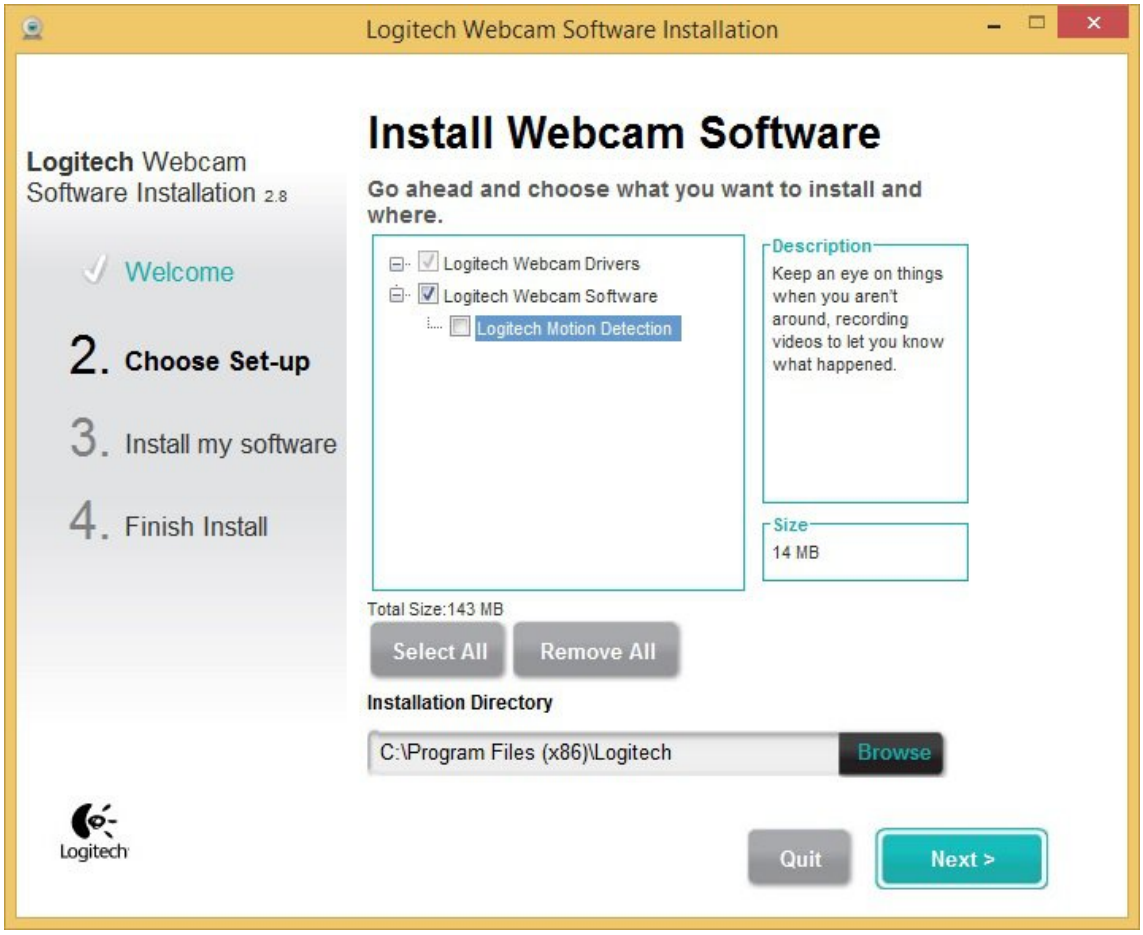

This is the view for Win 7. (see next page for Win 8)



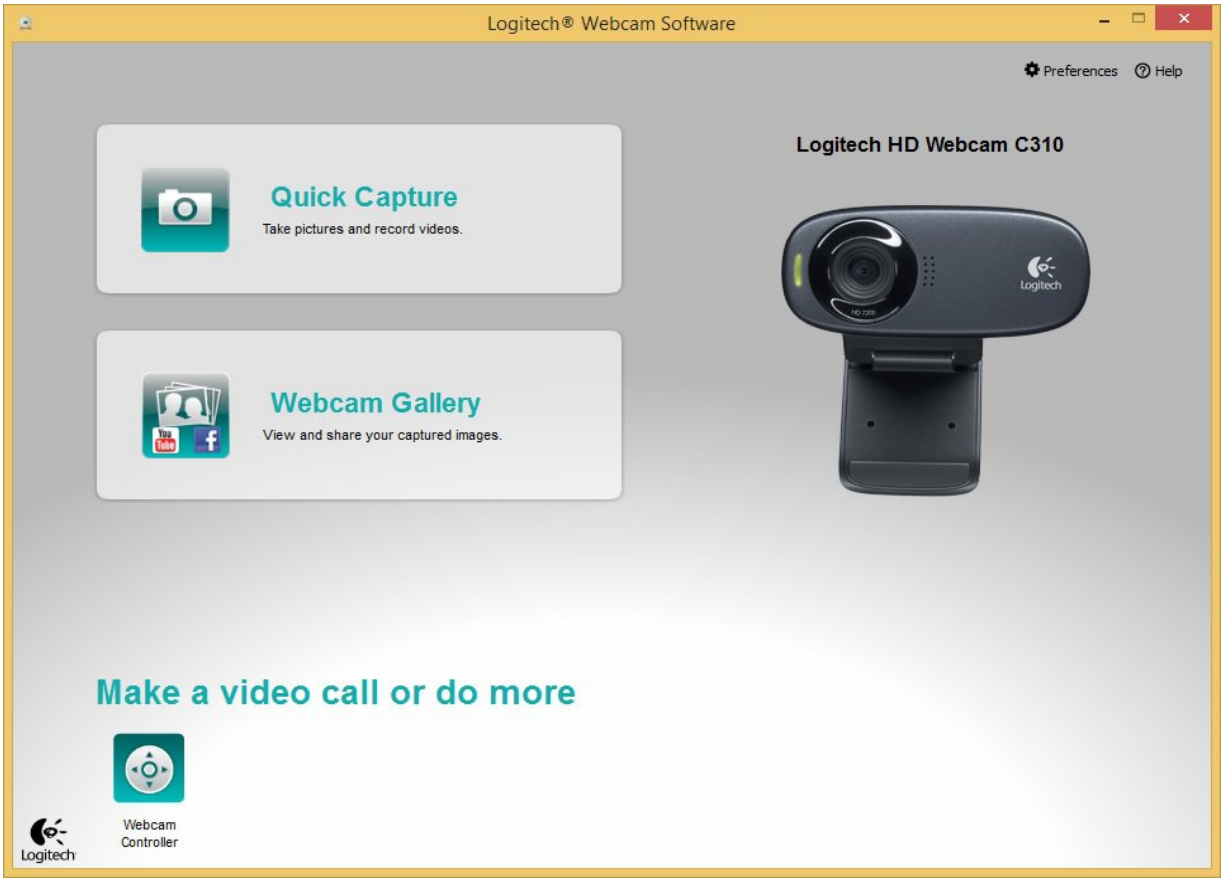

- Then select Logitech Web-cam Drives and Logitech Web-cam software, there is no need for the motion detection or video effects.



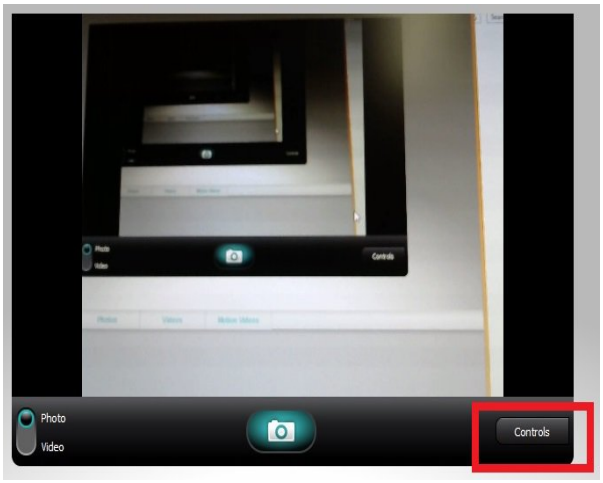

For Win 7 (see next page for Win 8).

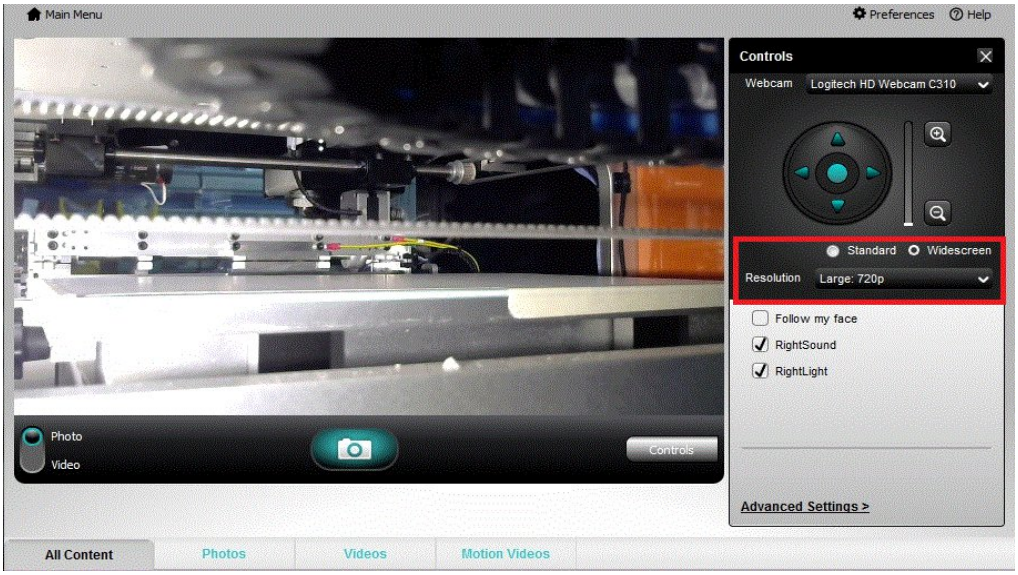



- To view the live feed from the cameras select "Quick Capture"
- Note that the web-cameras are powered from the computer not from the machine. There is no need to have power on the machine to check the cameras. The usb cable powers an internal usb hub and the 2 cameras.

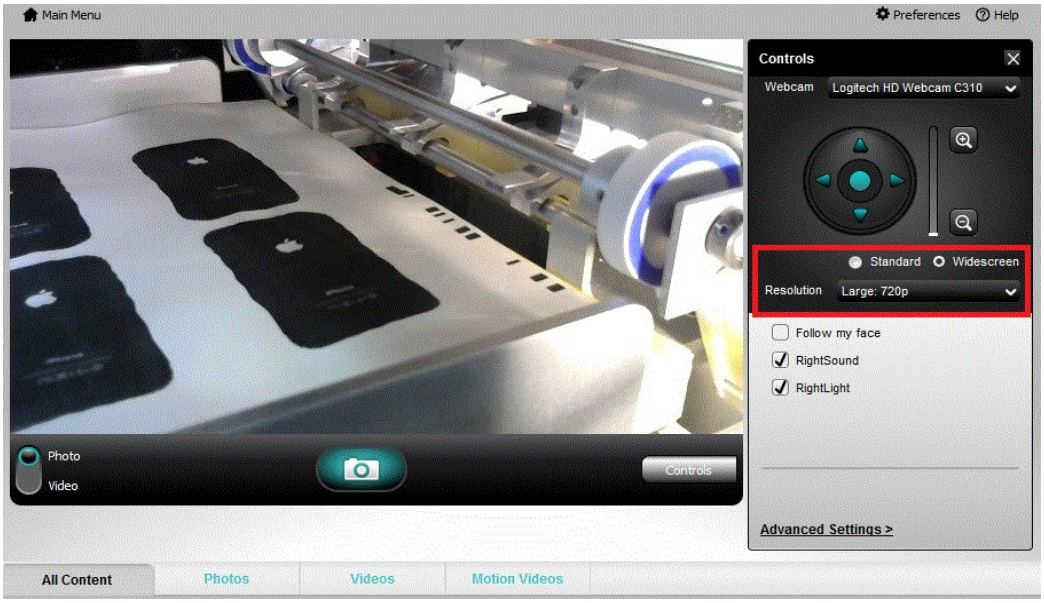



- Once the web-cam software has been installed check that the 2 internal cameras are pointing in the correct location. Switch between views by clicking on the "Logitech HD webcam" highlighted below right.
- Below shows the approximate view from the electrical enclosure and the approximate view from the Paper-feed enclosure.




With the web-cam installed you can then install VLC player (or similar). These players are used to view the videos that are created by the web-cams. VLC is particularly good as it has a slow motion viewing function.




Note that if the web-cams are being viewed through a web-cam viewer, e.g. Logitech software, then SliceIT cannot record at the same time. It is recommended to have the viewer closed in order to record any faults. The alternative is to view live images of the build using the web-cam software.

The record webcam preference can be turned on / off in SliceIT, Help, Preferences.

# 9 Setting 2D Printer Scalers, Duplex and Knife Alignment

When a new Printer is installed, it is required to be set-up on site. The set-ups required are for the XY scalers, duplex page alignment and the image to knife alignment. The procedures for the below tests can be found in SliceIT Help, Colour (Iris only) section.

## 2D Printer XY Scalers

Each 2D printer will have slight variations in its X and Y axis accuracy. In order to produce accurate parts this error has to be corrected in Slice IT. The SliceIT help has a detailed discussion on how to check the XY scalers under

*Slice-IT->Help->Help Contents->Colour(IRIS only)->Colour Settings-> 2D Printer XY Scalers*

## Duplex Page Alignment

Once the 2D Printer X and Y axis scaler have been set-up we then need to set the duplex alignment. Note that in order to allow the ink to penetrate through a page we print out our pages in duplex (both sides), because of this it is very important that the top and bottom images are aligned, this is performed by the duplex alignment test. The SliceIT help has a detailed discussion on how to run this test under

*Slice-IT->Help->Help Contents Colour(IRIS only)->Colour Settings-> How to Calibrate the 2D Printer Duplex Values*

## Image To Knife Alignment

Note that in order to make good quality parts it is important that the knife cuts are aligned to the image on the page. Note that for each machine, this relationship will be different, with this in mind we have to create a 3D printer profile which stores the offset values for the X and Y axis so that the knife will be aligned to the image. SliceIT help has a discussion about the 3D printer profile

*Slice-IT->Help->Help Contents Colour(IRIS only)->Colour Settings-> How to Create a 3D Printer Profile*

To set up the image to knife alignment follow the instruction outlined in the SliceIT help

*Slice-IT->Help->Help Contents Colour(IRIS only)->Colour Settings-> How to Set Image to Knife offsets*

# 10 Printer State

Note that in order to prolong the life of the 2D printer nozzles, it is recommended to leave the 2D printer plugged in at all the time. This will reduce the chances of the nozzles drying out and clogging. In prolonged periods of inactivity the printer may go in to "Power Save" mode and then automatically shut down depending on the model and firmware version.

When shutting down, the printer clears the nozzles thus preventing any blockages. This is similar to powering down a pc as opposed to pulling out the plug and causing an improper shut-down.

In "Power Save" / "Sleep Mode" the machine uses 3.5W.

When shut down and still plugged in it uses 0.2 – 0.4 W depending on supply.

We would also recommend that the auto-clean function is turned off. This can be found in the menu of the 2D printer. From the LCD "Ready" prompt, press the right arrow to get the menu. Then Menu, Maintenance, Auto-cleaning, Off.

# 11 Running a Colour Part

To run a part do the following steps.

- Run the printer nozzle check and make sure all nozzles are clear.
- Open the model to be made in Slice-IT and generate layers.
- Under the "2D Printer Settings" menu make sure that the correct 3D printer profile has been selected, the 2D printer X and Y scalers are correct and Duplex Offsets are correct.
- Load the paper into the paper tray
- Install the capture tray
- Under preferences turn off the duplex check, this will reduce the likelihood of the build stopping. **"Read Duplex" is only used when carrying out a 2D calibration.**
- Start the 2D print job, when the first page has been printed out check the duplex alignment, by making sure the bottom image 3 corner boxes are inside the top image 3 corner boxes. If not then the Duplex alignment set-up may have to be repeated.
- When the 2D print job is complete, we first load a single plain sheet of paper and then load the remaining paper into the paper tray of the 3d printer and start the 3d print job.
- Note if it is required to print out a page during the 3d build then open the same project in another instance of SliceIT and print the desired page.

# 12 Running the 2D printer and 3D printer

Note that due to the time required to print out the pages it is recommend that the 3D and 2D printers are run concurrently. This can be done by opening one instance of SliceIT and pre-printing the 2D pages. After about 50 to 100 pages a second instance of SliceIT can be opened to start the 3D printer working.

As the 2D printer is faster than the 3D printer once the pre-printing is finished for the first build the following build can be printed while the 3D printer is finishing which ensures that the following build is ready to go and there is no delay in operation.

# 13 Colour Builds Faults

There are two unique faults that can occur during colour builds.

1. Pages out of sequence: In this error the pages may and been loaded in the wrong order. Note that the 3D printer reads the page number encoded into the bar code and can detect if the pages are out of sequence. If this occurs the printer will stop and ask the user to check the page sequence.
2. Page Could not be feed: In this error the page could not be feed into the build area. If this occurs then the printer will stop and ask the user to print a new page. If the printer is already running a 2D printer job at this point then the user will have to cancel the print job and print out the required page. Once the requested page has been printed then the user can go back and continue the original print job.

*If a Jam occurs in the Epson printer then the most reliable way to clear the fault is as follows. First from the SliceIT window cancel the 2D printer job. Then open the Operating systems printer dialogue and cancel any print jobs that are not currently been printed, Do not cancel the current print job in the print dialogue. Follow the message on the 2d Printer LCD screen to clear the fault, note this make take a few attempts and cause a few pages to be printed. Once the fault has been cleared and the 2D printer says ready then remove any incorrect printed pages from the capture tray and resume the print job. You may need to stop and restart the print spooler. This can be accessed from windows search for" services" then go to Print spooler, right click on it and stop / restart.*