

Epson DX5 X 2 Printheads

Calibration and Maintenance



2nd Aug., 2011

Version V2.0

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Chapter 1: Computer Requirement

1) Basic requirement:

- CPU: 2.0 GHz or higher
- Memory: 1 Gb or higher
- Hard disk: 80 Gb (recommend 20Gb free space)
- Mother board: USB connection equipped
- Network card
- Operating system: Microsoft Windows (2000, XP)

2) Recommendatory requirement:

- CPU: 3.0 GHz or higher
- Memory: 2 Gb or higher
- Hard disk: 200 Gb or higher (NTFS format)
- Mother board: USB connection equipped
- Network card
- Operating system: Microsoft Windows (2000, XP)

NOTICE: Suggest user format your hard disk into 2 partitions (NTFS). The first partition is used for installing OS and other software, the second partition is used to save pictures and work files.

Chapter 2: Installation

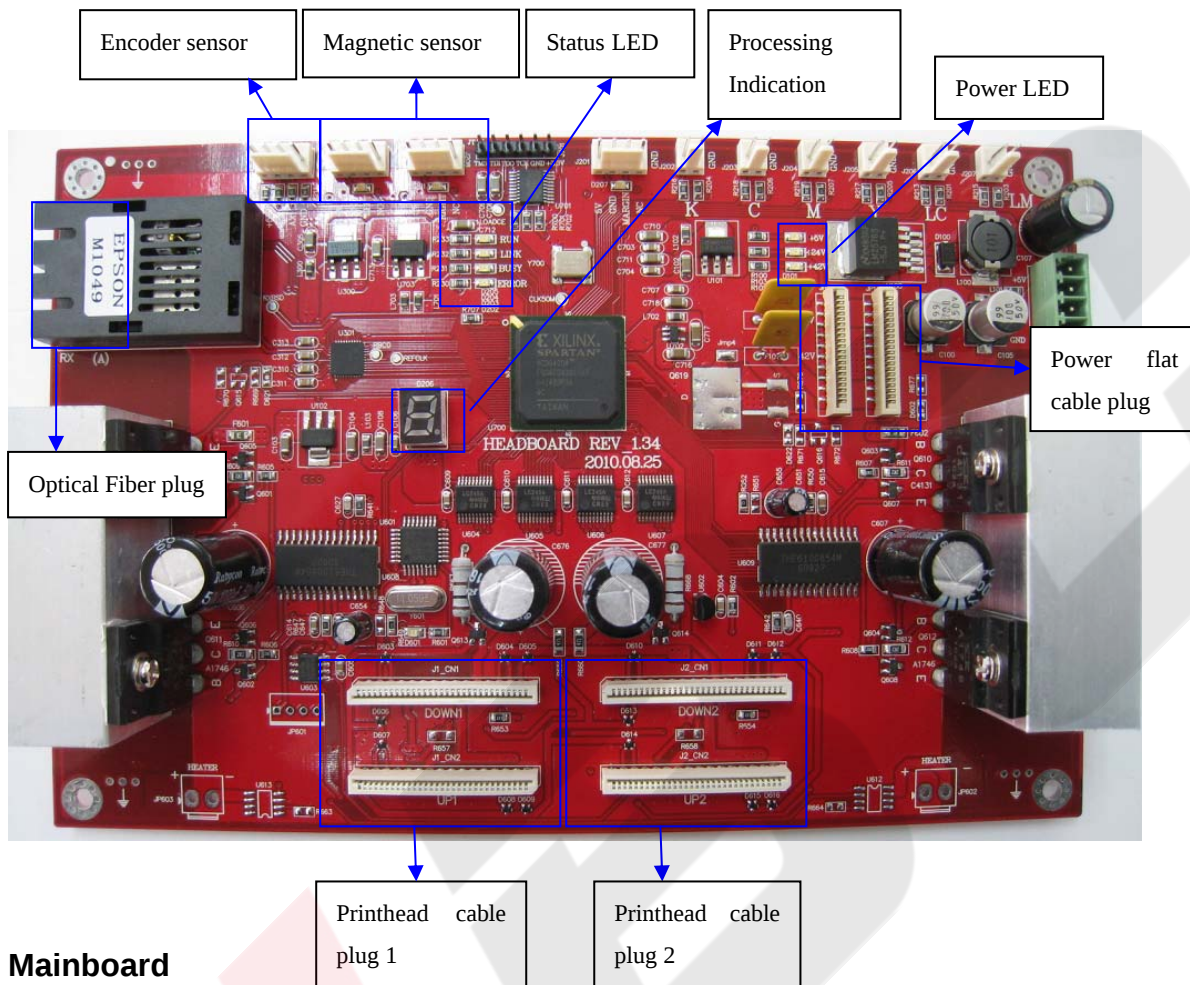
- 1) Move the packing box to the working site and avoid strong shaking.
- 2) Disassemble the wooden packing box from top to bottom. Check whether the parts are complete or not according to the packing list.
- 3) Lift the printer out by a forklift, and move it to the installation site.
- 4) Check if the printer is level.
- 5) Get rid of all the parts that stabilize the carriage holder, and install all the spare parts.
- 6) Move the carriage to the right of printer, then move back to the left manually. During this process, checks if there are abnormal resistance and carefully inspect the belt & the encoder sensor are situated in proper position
- 7) Ground the printer. The grounded voltage shouldn't be more than 0.3V, and the grounded resistance should be less than 3Ω.
- 8) Connect the USB cable between printer and computer. Check if the wires and data cables are plugged in properly.
- 9) Install the output and the rip software.
- 10) Move the carriage to middle of printing platform, turn on the printer, let the carriage move to home position, and keep your hand on the emergency button for turning off the printer if problem happens suddenly.
- 11) Send a file to print to test the condition of the printer.
- 12) Install printhead and dampers, connect the ink tube from damper to special solvent, and use auto clean function to clean the printhead
- 13) Load ink bottle, and use auto clean function to suck the ink from ink bottle to printhead.
- 14) Print nozzle checking and observe the condition of printheads. It is recommended to keep a copy of the test for reference in the future.
- 15) Printhead alignment.
- 16) Start to Print.

Chapter 3: Characteristics

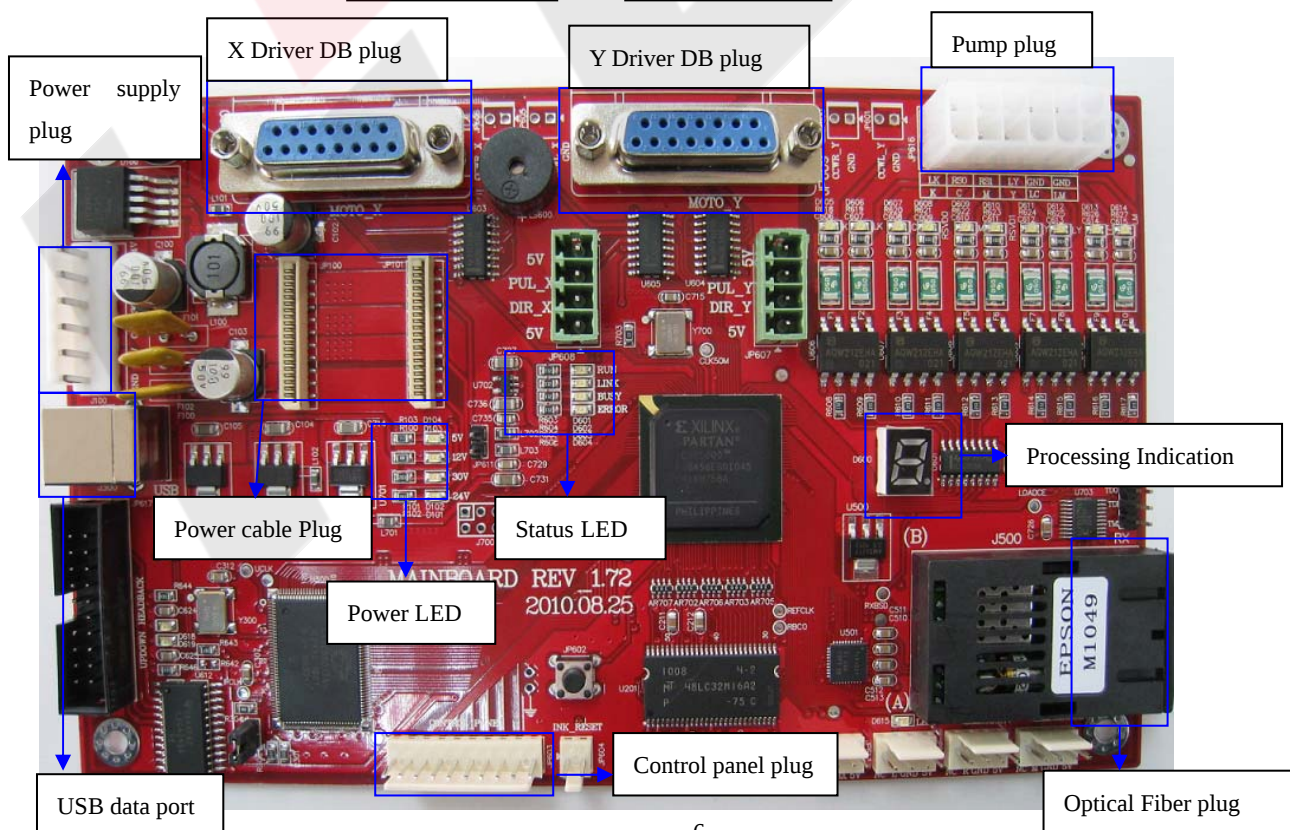
- Printhead: 2pcs (Epson DX5)
- Resolution: 1440\1080\720DPI
- Color: 4 colors
- Print mode: 4,6,8,12 Pass
- Output mode: File or TCP/IP(Rip and Print at the same time)
- Output preview: Convert prn/prt file into a small bmp file for previewing
- Printhead usage: Able to turn on/off each printhead channel
- Print intelligently: Skip white area
- Multi-printing: Able to print single image continuously , or print different image continuously
- Automatically flash jetting: Automatically clean printheads by flash jetting during printing
- Home flash jet: Prevent nozzles of printheads block while not in printing state
- Color bar: Prevent nozzles clogging, and observe nozzles status. Able to set the width of color bar and the instance from image
- Able to align printheads, step difference ,and bi-direction difference during printing
- Printing direction: uni-direction to left, uni-direction to right, bi-direction
- Edge feather: Lighten pass line
- Cleaning System: auto-cleaning, no need to use tools (Syringe) to clean
- Control Panel: use with control panel, it is more convenience

Chapter 4: Board System

Printhead Board



Mainboard



Note: 1. After turning on the machine till the carriage moving back to home position, the processing indication shows as: A. – 1 – 4 – 0.

Main board and Head board show the same indication.

2. The two power cable plug both are 20Pin.

3. In normal state, RUN LED is blinking; LINK LED is on; BUSY LED is on (On Main board, when carriage moves, BUSY LED is on, otherwise it is off) ;ERROR LED is off(only on when there is problem).

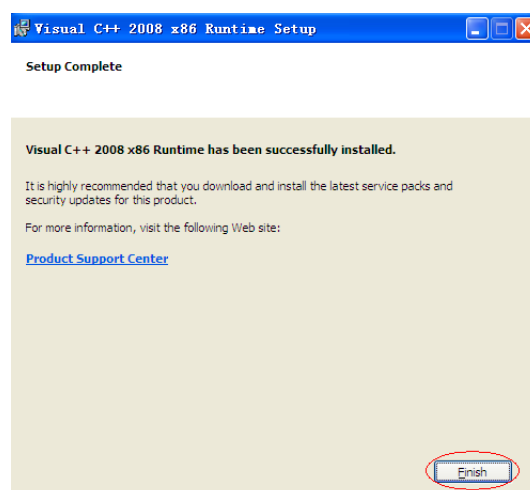
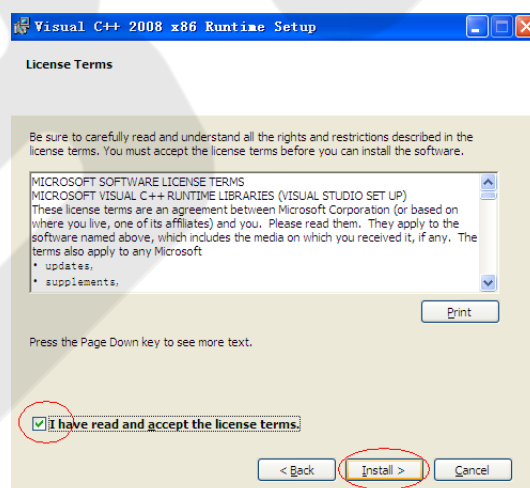
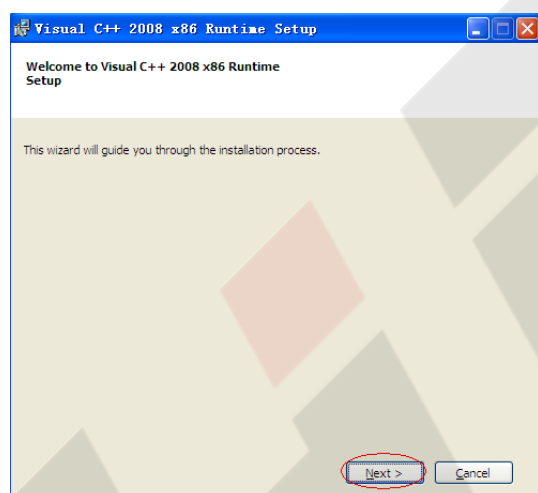
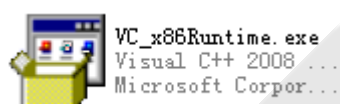
Chapter 5. Software Installation

This software consist of printer driver, printing adjustment and picture printing functions.

Please follow the following steps to install the software:

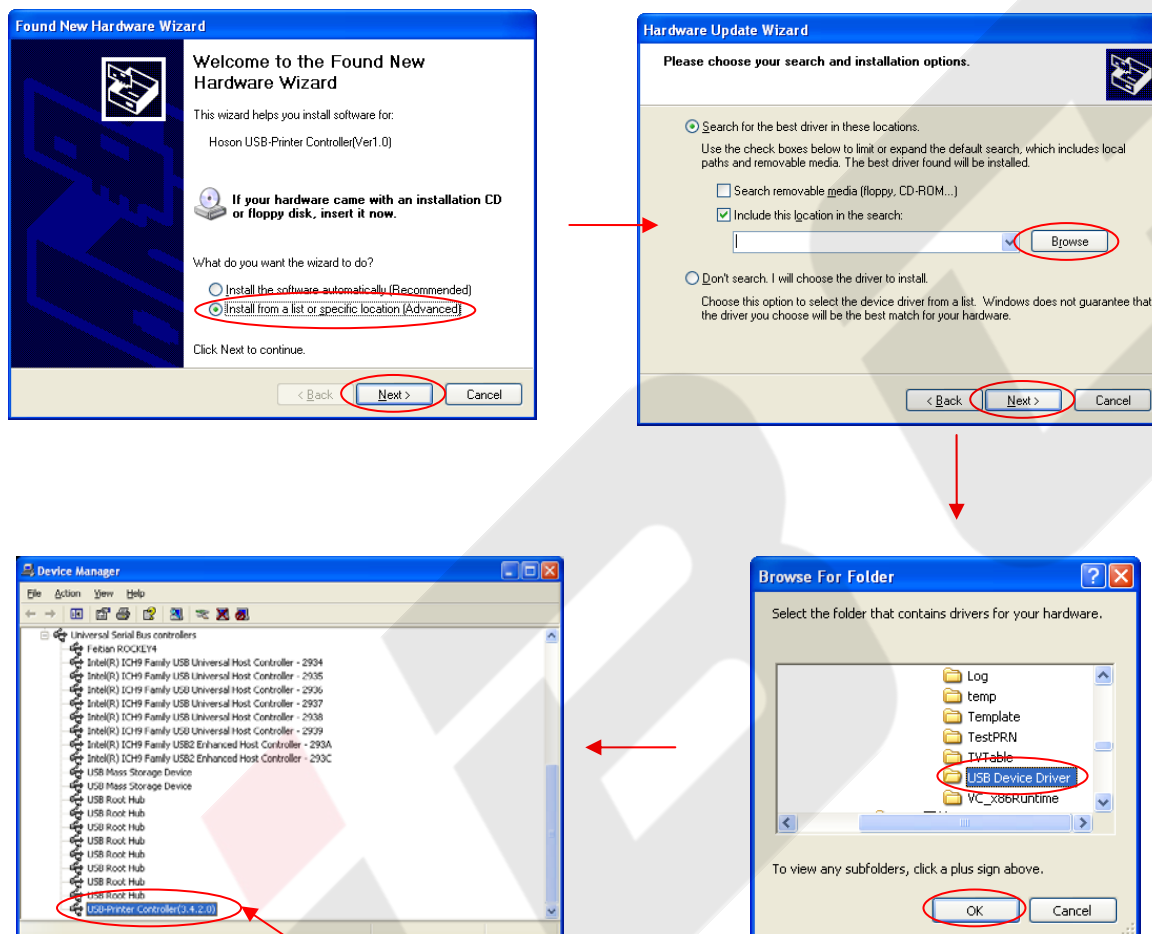
1) Turn on the computer till the system is ready, copy **UDT_PrintExp** to your computer, un-zip to get **UDT_PrintExp** folder. Start to install:

2) Double click to install



3) Connect the USB data cable to the computer, and turn on the machine.

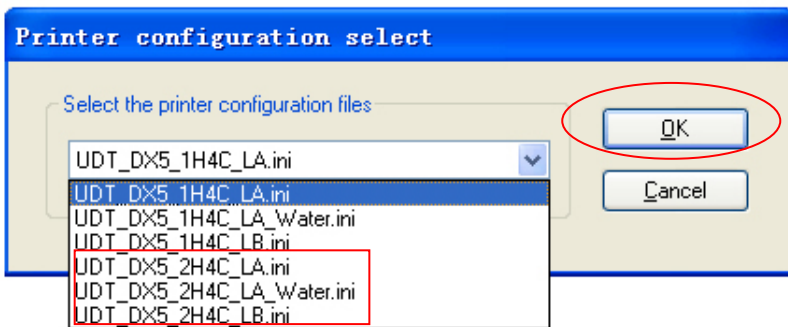
Look for **PrintDrv_new** file in the folder of **UDT_PrintExp**.



It shows as above after finished installing the control software.

Chapter 6. Software Interface

1) Introduction: Double click  to open the software.

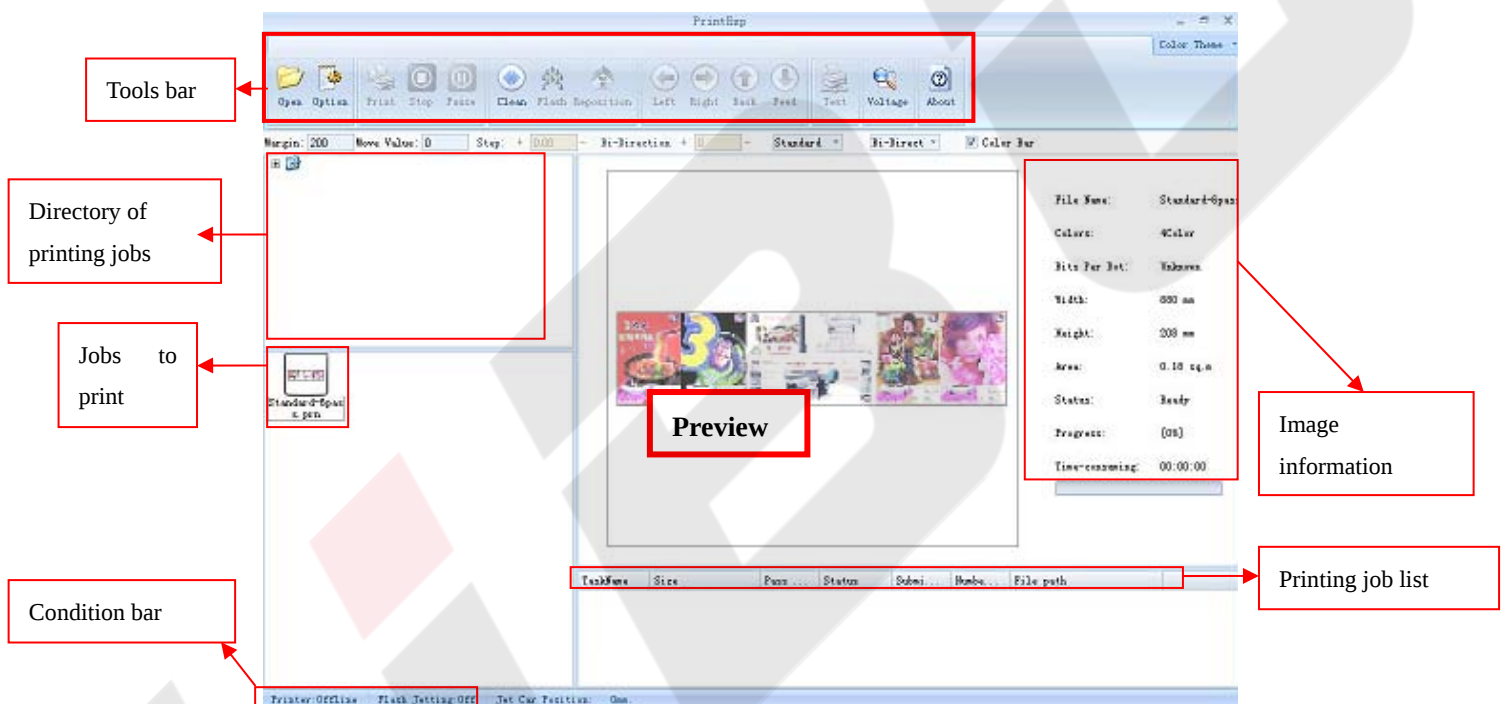


Configuration definition:

UDT_DX5_2H4C_LA: LA model for eco solvent ink with 2 printhead.

UDT_DX5_2H4C_LA_Water: LA model for water based ink with 2 printhead.

UDT_DX5_2H4C_LB: LB machine for disperse dye ink with 2 printhead.

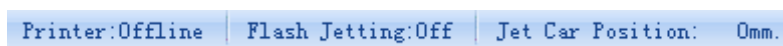


2) Tools bar



We can speed up the implementation of commands by using tools bar which are commonly used function in the software.

3) Status Bar



From the left to the right: **Printer status**, **Flash jetting function status**, **Carriage position**.

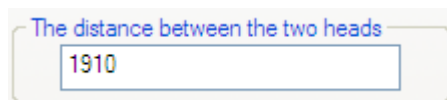
Chapter 7. Software Calibration

1. Nozzle checking: Print the nozzle checking to check the condition of the printhead.

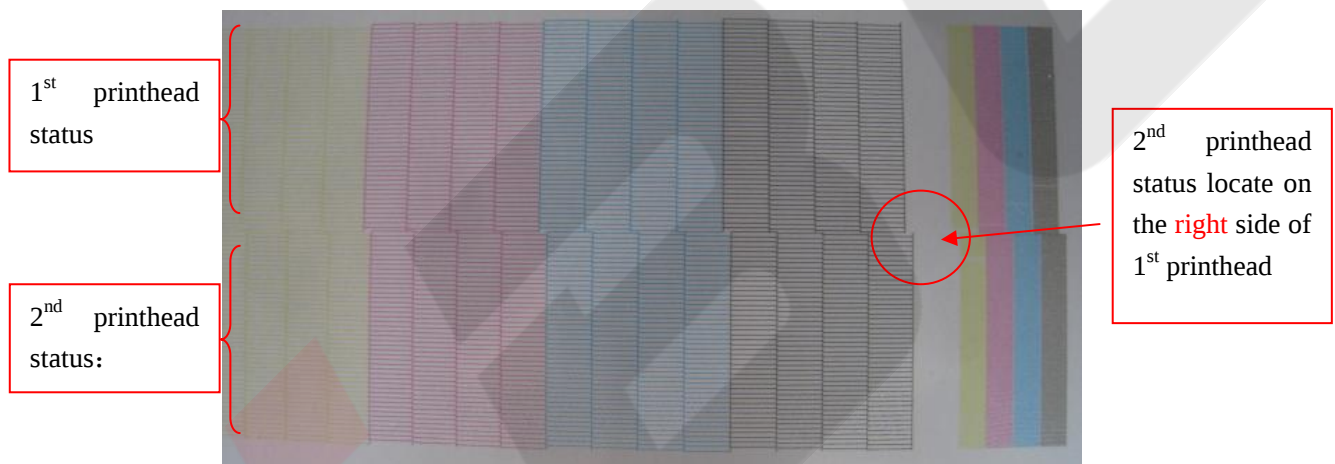


Make sure to turn off the Eclosion (Feather) function before doing the alignment.

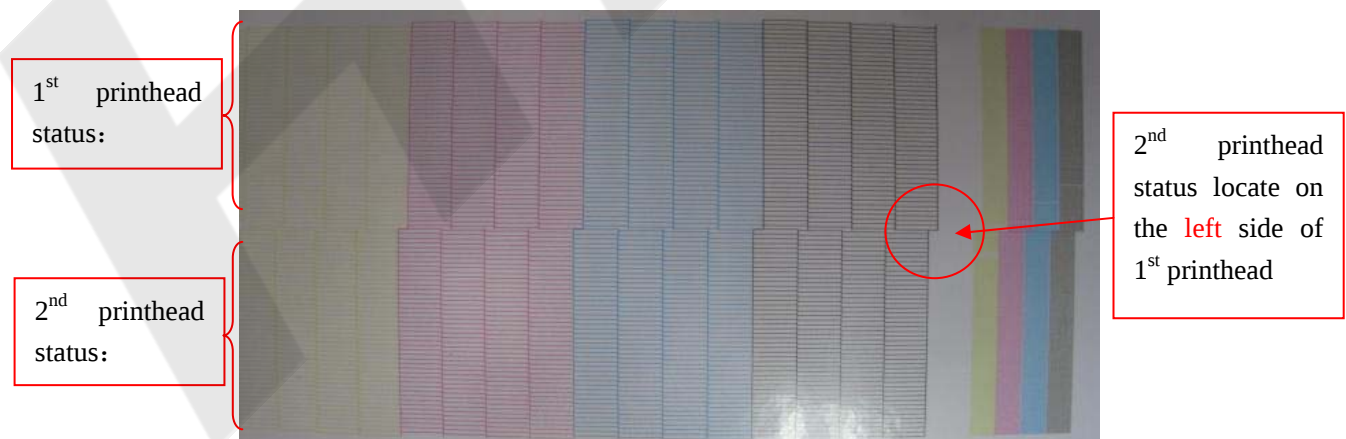
Base on the Head Status diagram to adjust vertical position between two printhead. The setting is at "Option" -> "Calibration" -> "The distance between the two heads"



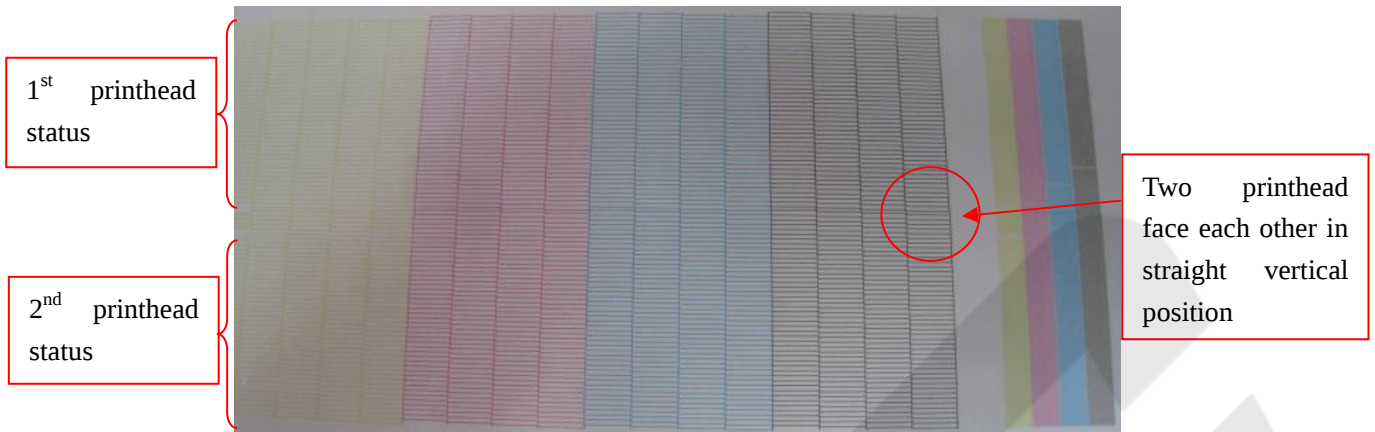
Case 1: Have to **increase** the value between the two heads:



Case 2: Have to **decrease** the value between the two heads:



Case 3: two printhead facing each other perfectly, no need to adjust



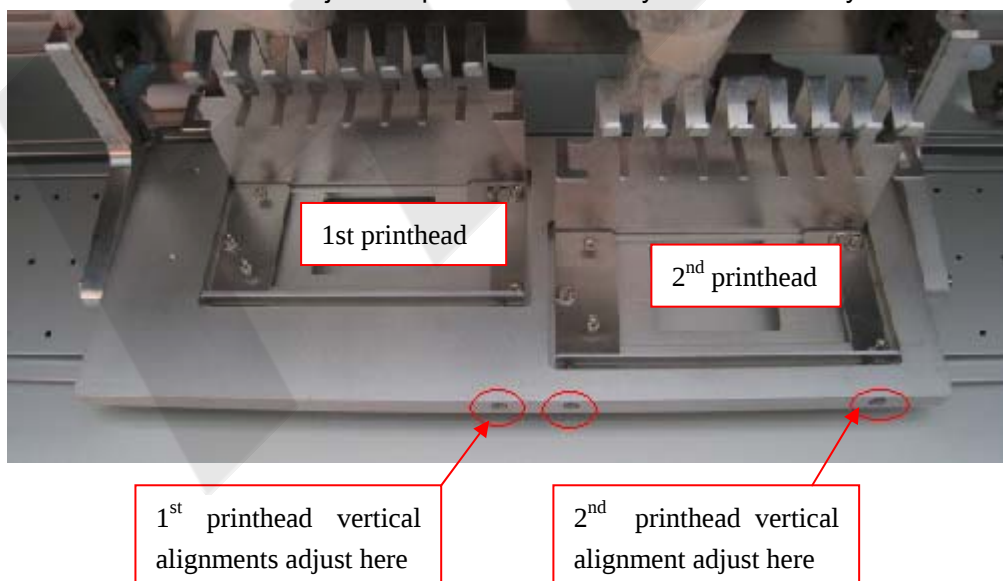
2. Vertical calibration: Observe the physical alignment of printheads
(If this step is not aligned well which will affect the following adjustment)



The procedure to adjust vertical calibration in two printhead:

- 1) Follow the following step to adjust 1st printhead vertical alignment individually (Face carriage, the left one is 1st printhead)
- 2) Then follow the following step to adjust 2nd printhead vertical alignment (Face carriage, the left one is 2st printhead)
- 3) After finish both printhead vertical alignment, adjust 2nd printhead horizontal position to change the space between two printhead. Space between two printhead is 1 nozzle, print the printhead status to confirm.

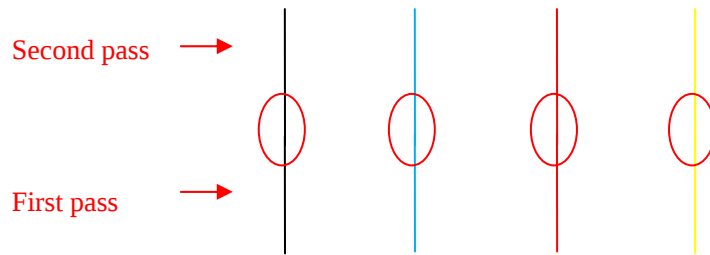
There are 2 screws for adjust 2nd printhead vertically and horizontally:



Align the physical vertical position of printhead.

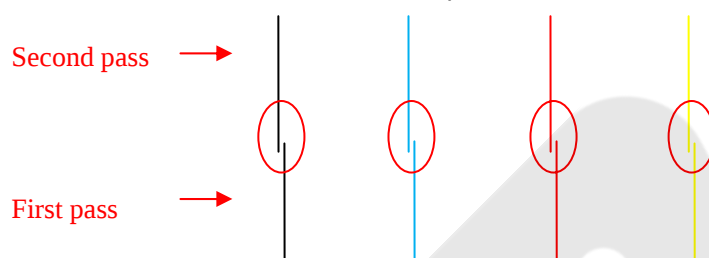
The first pass line is the reference; observe whether the second pass line is perfectly aligned with the first pass line. If not, then we need to adjust the carriage plate. There are 3 situations:

1) The two pass is perfectly aligned, no need to adjust:



No need to adjust

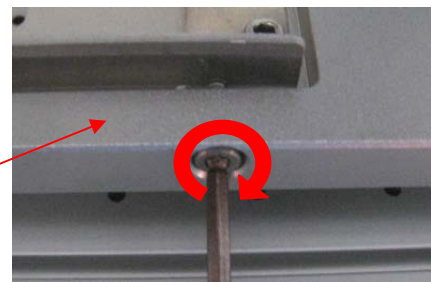
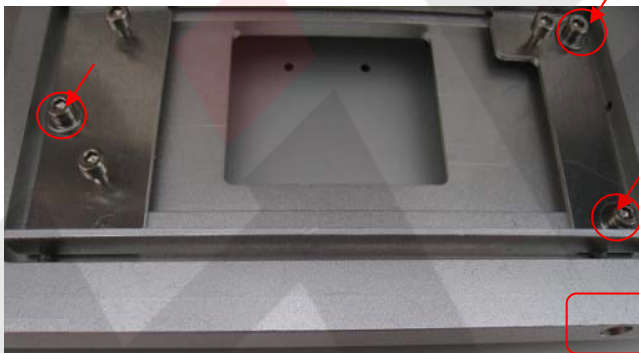
2) The second is on the left side of the first pass:



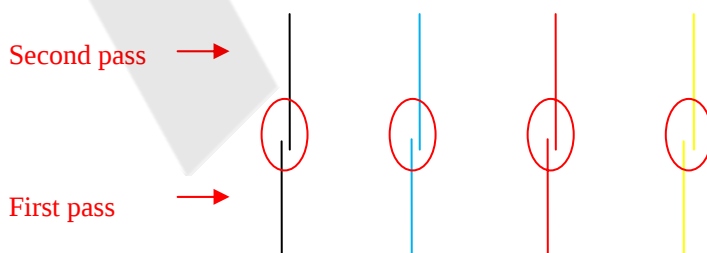
Adjust method:

A. Loosen the 3 screws on the carriage plate

B. Turn the screw clockwise:



3) The second is on the right side of the first pass:

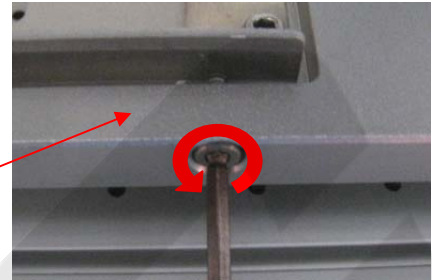


Adjust method:

A. Loosen the 3 screws on the carriage plate:



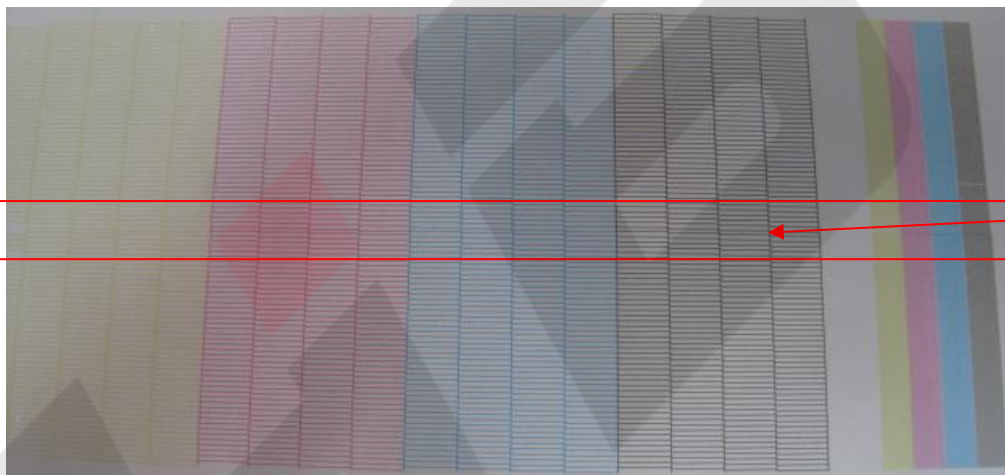
B. Turn the screw anti-clockwise:



Note: Every time after the adjustment, before print another vertical calibration, it is required to fasten the 3 screws on the carriage plate. Keep adjusting until the second pass is perfectly aligned with the first pass.

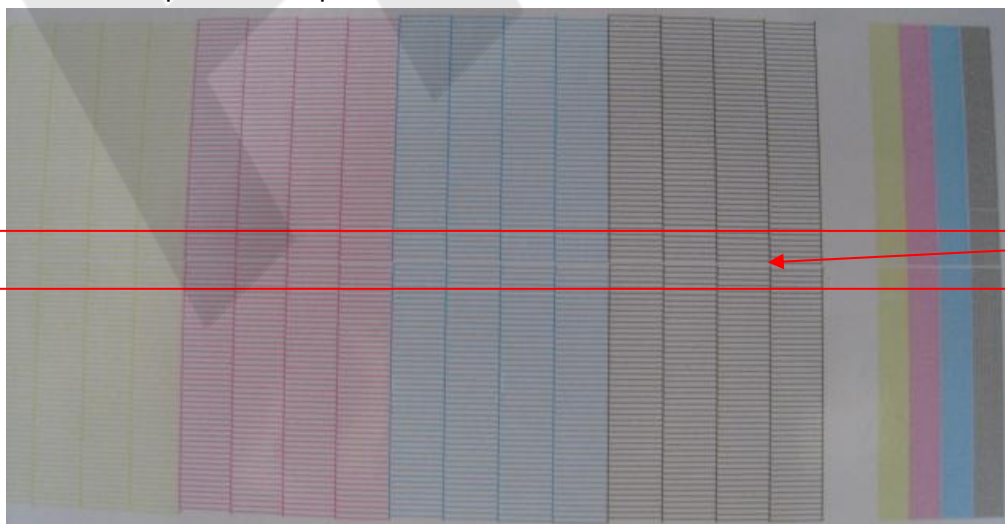
Moreover, after adjust the printhead vertical alignment, check the space between two printhead (note: space between two printhead is 1 nozzle):

Case1: two printhead overlap



Two printhead **overlap**, need to adjust

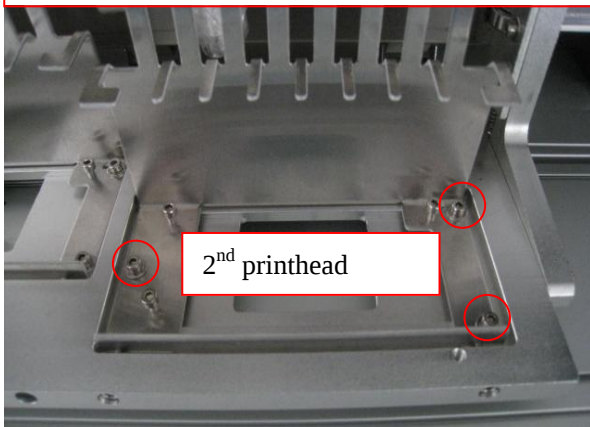
Case2: two printhead separate



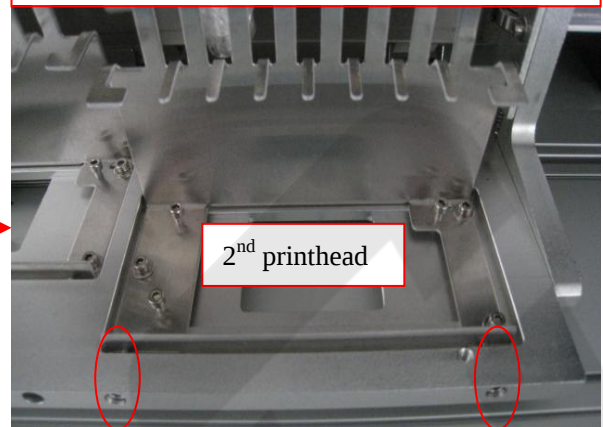
Two printhead **separate**, have to adjust

Adjust method:

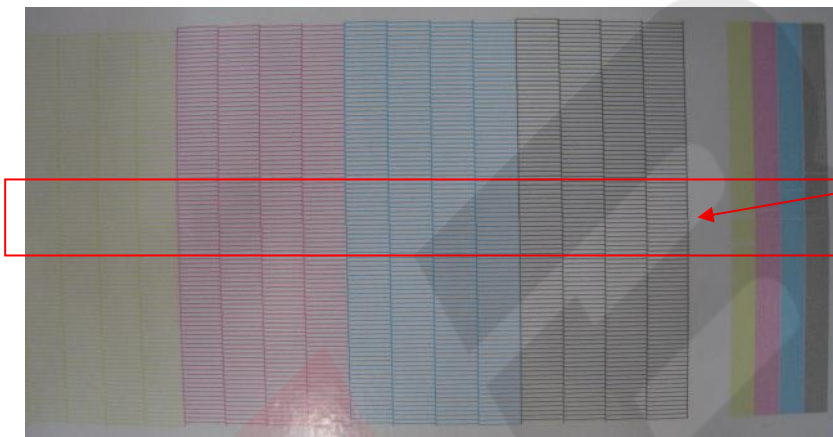
Loosen the 3 screws on the carriage plate:



adjust both screw at same time, to move the 2nd printhead forward and backward



Keep adjusting until the printhead status looks like the following diagram:



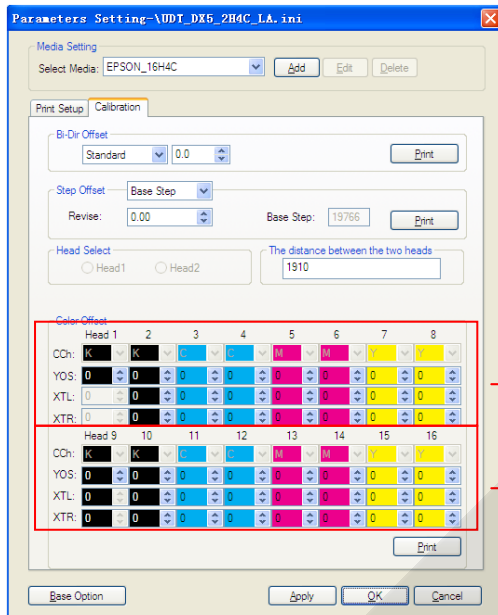
There is no **overlap** or **separate** between two printhead

Note: after finish adjustment, print vertical status to check again and make sure both printheads' vertical are aligned.

3. Color offset: Color offset is to align all color in order to print good quality images.

Tip: Based on the "0" position, the color lines should totally matched with the Black line, if not, find the best one showing on the printed out color offset, then input the corresponding values in the software. Note that values are accumulated.

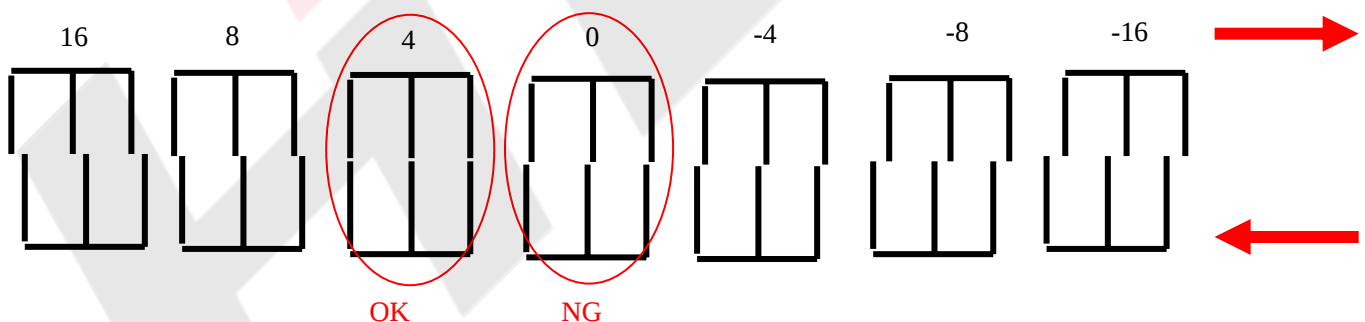
If the "0" position is not the perfect matching one, then we have to adjust the figure on the software. Go to **Option – Calibration – Color Offset**



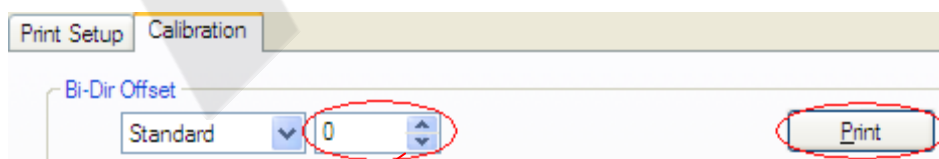
After input the value, print the alignment again. And observe if the "0" position is the best or not. If not, repeat the above procedure until the best result come out.

4. 4. Bi-Dir offset

Bi-Dir offset is to make sure there is no bi-difference while using different speed to print. Bi-Dir offset will be done while the printing speed changed.



If the "0" position is not the perfect matching one, then we have to adjust the figure on the software. Go to **Option – Calibration - Bi-Dir Offset**



Input the value here. This value is accumulated. Press "Print" to print the test pattern.

Repeat the test until the "0" is facing each other perfectly.

5. Step offset

The Step offset locates on **Option – Calibration – Step Offset**

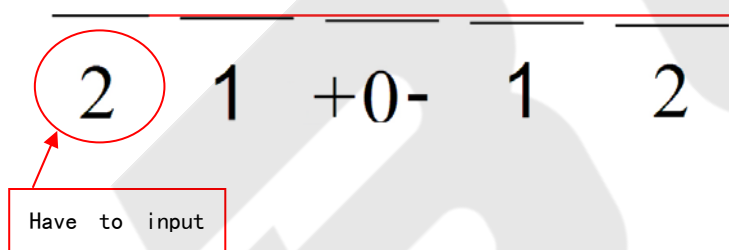
Print Setup Calibration

Bi-Dir Offset
Standard 0 Print

Step Offset
Base Step Revise: 0.00 Base Step: 9883 Print

Input the offset value

To adjust the step offset, firstly adjust the **Base Step**, then the value of other pass will be calculated automatically. And slightly adjustment is needed according to actual printing.



Based on the "0" position, input the value which two line are perfectly overlapped. After input the value, test again to check the result. The step value will be different according to different media.

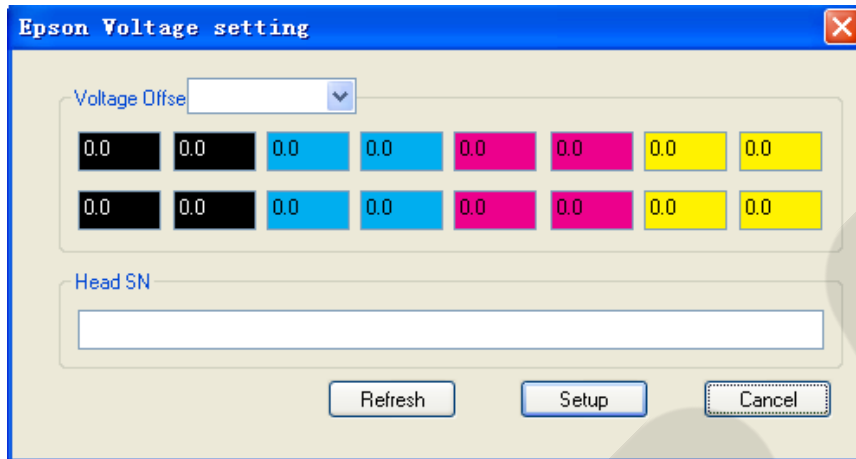
Note: Turn off the Eclosion (Feather) function first while adjusting the step offset. Adjust to get the best step value. Then test print to see whether there is banding on the image. If so, use the Eclosion (Feather) function to reach your best image quality.

The adjustment of software has been completed now

Chapter 8. Other Functions and Parameters

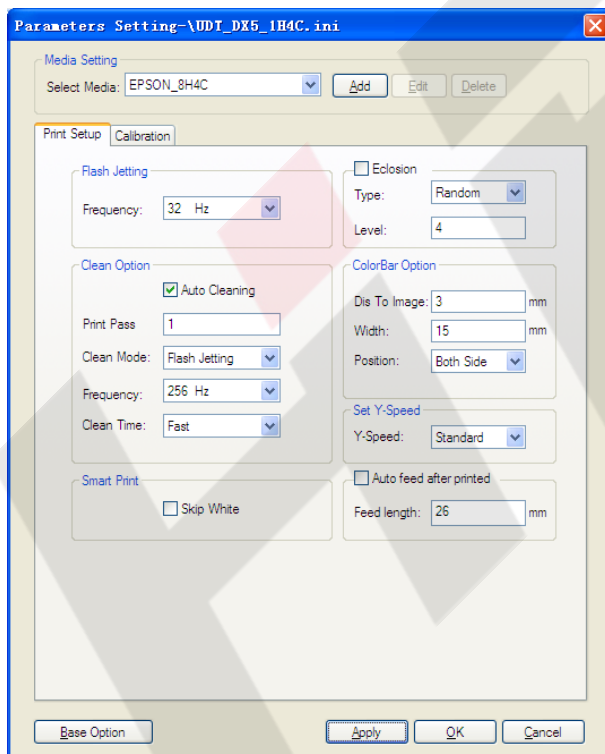
1 Printhead voltage

Normally the voltage function is not being used. The range of adjusting voltage is -42V to +1.3V.



2. Other function

Click Option on the main interface of the software, it shows the following window:



Details of the print option:

1. Flash Jetting frequency:

You could set the flash jetting frequency when the printer is on standby status.

2. Clean Option:

- 1) Click to set the carriage go back to the flash jetting position for jetting during printing;
- 2) Print pass is to set every XX pass, carriage go back to the flash jetting position for jetting;
- 3) Clean Mode is Flash Jetting;
- 4) There are three options in Clean Time, Fast means non-stop jetting, Normal means jetting for 0.5s, Long means jetting for 1s.

3. Eclosion(Feather function):

To blur the pass line, feather pass edge.

- 1) Option: Enable/Disable the feather function; 2) Type of Eclosion; 3) Value of Eclosion.

4. Color Bar:

- 1) Distance (mm): Setup for distance between the color bar and the picture;
- 2) Width (mm): Setup for the width of the whole color bars ;
- 3) Setup for the position of color bar (in the right/left/both side of the image).

5. Smart Print:

Set up for automatically skip white.

6. Auto feed after printed:

Set up for automatically feed media after printing(mm).

Chapter 9. Maintenance

9.1 Normal Cleaning

Click Clean on the main interface of the software. There are two modes of cleaning, **Normal** and **Strong** for different combination.



9.2 Cleaning procedures for nozzle clogging:

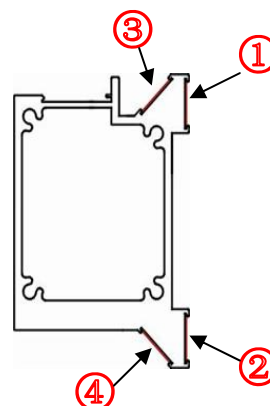
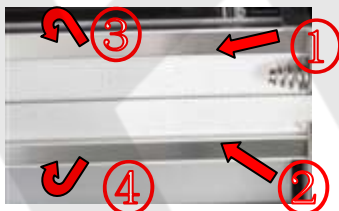
1. Disconnect the tube connector for the tube from cartridge to the damper. Choose Standard clean mode the suck out the ink in the damper. (2 times)
2. Use an extend tube to connect the damper, put the other side of the extend tube into the appointed Flush. Choose Depth clean mode to clean the damper and the printhead at the same time.(3 times)
3. Take out the extend tube from the Flush, and keep it out in the air. Choose Depth clean mode to suck out the Flush inside the damper and the printhead. After that connect the damper to the ink incoming tube and fill ink again.
4. Test print.

9.3 Carriage Bearing and Steel Rail Maintenance

Due to the carriage slides on four steel plates and eight bearing, clean and lubricate four steel plates with grease everyday.

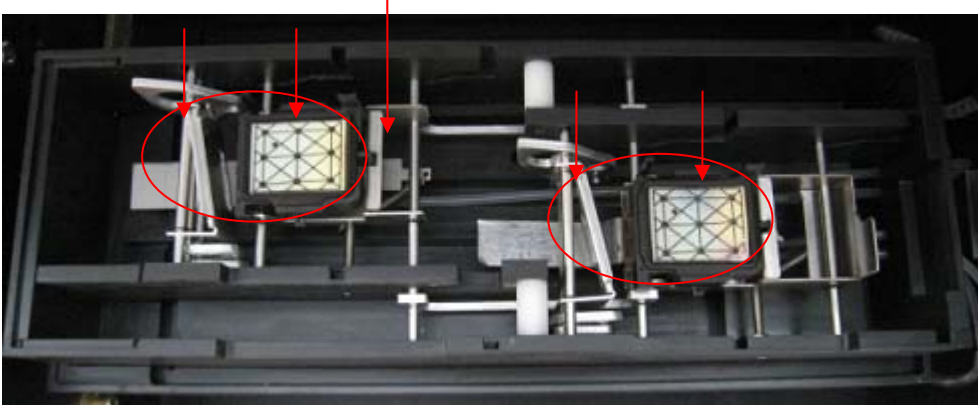
I . Wipe a thin layer of grease on steel plates to maintain cleanliness and grease everyday before and after usage.

II . Be aware of the smoothness of the carriage bearing



9.4 Daily Maintenance

1. Print the nozzle checking before turn off the machine to make sure the printhead is in normal condition
2. Turn off the software, carriage go back to Home position automatically. Turn off the machine, the carriage stay at the Home position.
3. Use sponge stick with appointed Flush to clean the cap and the wiper everyday before turning on the machine.



9.5 Short term shut down (3~7 days)

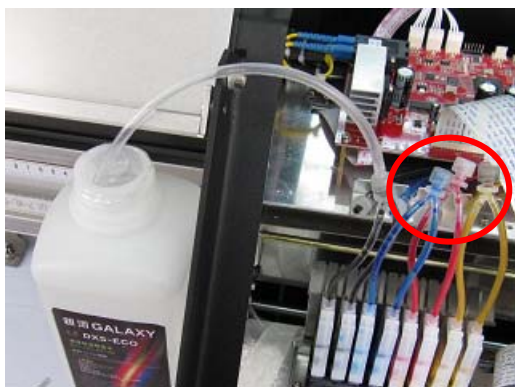
1. Disconnect the tube connector on top of the damper. Use Standard clean mode to empty the ink in the damper. (2 times)
2. Use a extend tube to connect the damper to the appointed Flush.
Choose Depth clean mode to clean the damper and the printhead at the same time.(2 times)
3. Take out the extend tube from the Flush, and keep it out in the air. Choose Depth clean mode to empty the Flush inside the damper and the printhead. Use the tube cover to seal the ink incoming tube, keep the cartridge back to Home position and make sure the capping pad is perfectly capping the printhead.

9.6 Long term shut down (More than a week)

1. Print status before turn off the machine, make sure printhead in good condition..
2. Disconnect the tube connector on top of dampers, let the ink flow back to the cartridge.



3. Use the extend tube to connect them to the appointed Flush. Choose Depth clean mode to clean the damper and the printhead at the same time. Clean one color at a time, use a cap to cover other three color channel.



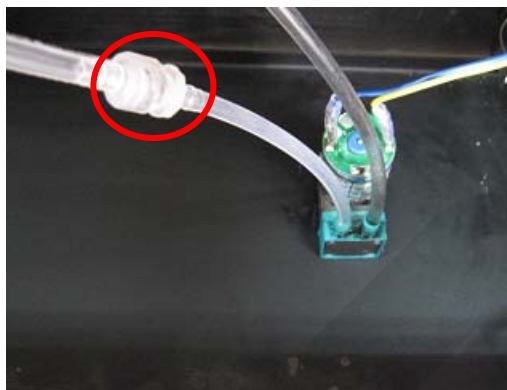
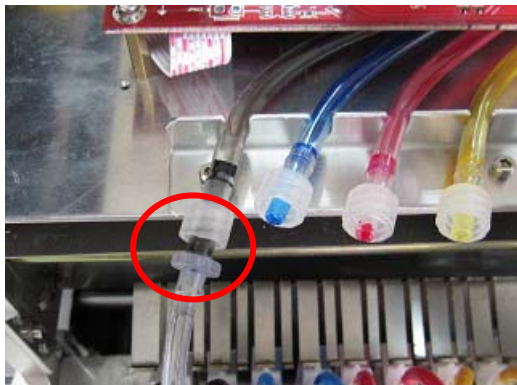
4. Take out the extend tube from the Flush, and keep it out in the air. Choose Depth clean mode to empty the Flush inside the damper and the printhead.



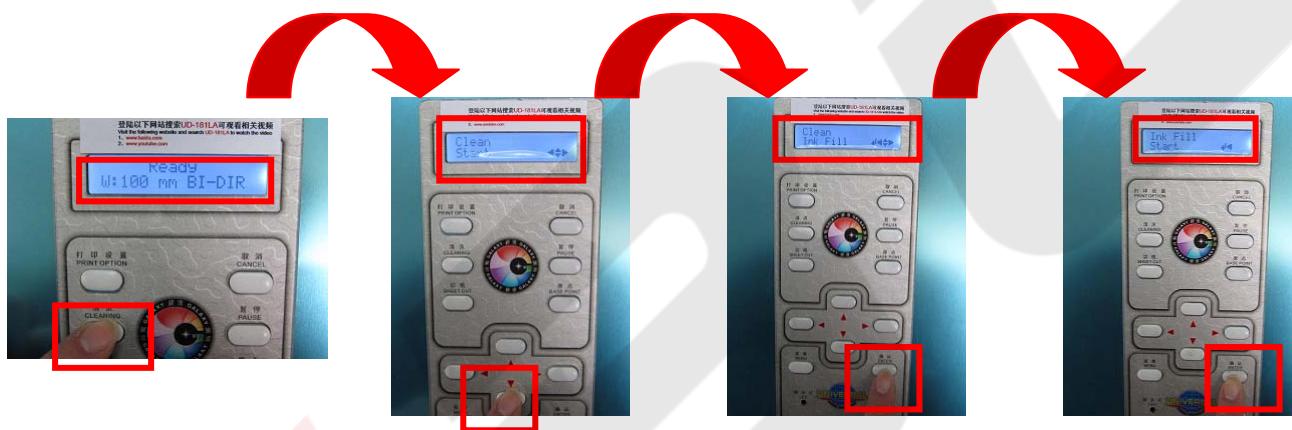
5. Take out the four tubes (K,C,M,Y) from the cartridge. Use the extend tube to connect them to flush.



Use a extend ink tube to connect the ink tube to ink pump



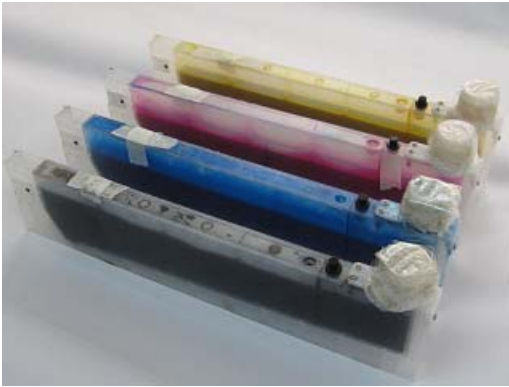
Choose "Ink Fill" mode at control panel, use ink pump to flush ink tube until it is clear. Then take out the tube from the Flush, choose "Ink Fill" mode, empty the Flush inside the ink tube. Clean K,C,M,Y tube one by one



After cleaning, use cap and fresh warp to seal the ink tubes.



6. Take out four cartridges, use fresh wrap to seal the ink supply hole and keep the cartridges in the proper place.



5. Keep the carriage back to Home position and make sure the cap is perfectly sealing the printhead.



Chapter 10. Troubleshoot

10.1 Turn on the machine and carriage reposition normally. Turn on PrintExp and then show a note of Initialize the printer failed or Machine model incorrect :

- 1) Check USB data cable connection, whether damage or not.;
- 2) Check whether the USB driver is installed properly;
- 3) Re-install the PrintExp software.

10.2 Turn on machine, carriage do not reposition

- 1) Check the figure signal and LINK LED on the Hear board and Main board. If the LINK LED is off then check the connection of the optical fiber;
- 2) Check the connection of the X / Y motor driver signal cable.

10.3 Turn on machine, carriage goes to the opposition direction of home

Check the connection of the X / Y motor driver signal cable.

10.4 Position error during printing:

- 1) Check whether the X motor belt and the gear is loosened or damaged ;
- 2) Check the X motor;
- 3) Check whether the encoder is dirty or scratched;
- 4) Check whether the encoder sensor is dirty or defective ;
- 5) Keep a distance from strong magnetic field. Prevent using instable input power. Equip a UPS and stabilizer.

10.5 Error and interruption during printing:

- 1) Check whether optical fiber is connected well;
- 2) Check whether printhead data cable is connected well;
- 3) Check whether the signal cable between mainboard and Servo motor driver is connected well;
- 4) Check whether the USB data cable is normal; Change to another USB data port;
- 5) Check whether the grounding is well.

10.6 Color missing during printing

- 1) Check whether damper is air leaking and causing the ink flown back;
- 2) Check whether there is fiber or some tiny thing stick on the surface of the printhead;
- 3) Check the environment temperature is too high.

10.7 Carriage move normal but not printing:

- 1) Check whether the power supply is normal on the electronic board;
- 2) Check whether the printhead data cable is connected well;
- 3) Check whether there is ink in the damper;
- 4) Check the connection of the optical fiber.

10.8 There is vertical banding during printing

Stop printing and clean the carriage bearing and steel rail. If the problem still exist, please contact the local engineer.

Chapter 11. Output Chart

Output Chart				
Printhead	Epson DX5			
Number of Printhead	2			
Output	Print Mode		Fast mode output(m ² /h)	
			UD-1812LA	UD-2112LA
	Draft	4Pass	31	34
	Standard	6Pass	21	22
	Quality	8Pass	13	17
	High Quality	8Pass	13	17
	Back lit	12Pass	8	10

***The speed data are taken from the printer at the high speed level;
There is tolerance in different computers. ***