

Print Head Alignment

This is to describe the proper procedure in aligning the Print heads.

1.1 Test print (Nozzles Test)

Before alignment ensure the nozzle test is perfect!

- Perform Ink Prime by activating the priming button. Do ink bleeding one print head at one time to remove air bubbles trapped inside the print head and the tube.
- Clean the print heads from GUI or wipe print heads with cloth one by one manually.
- Send Test Print head to see if all print heads prints a shown below;

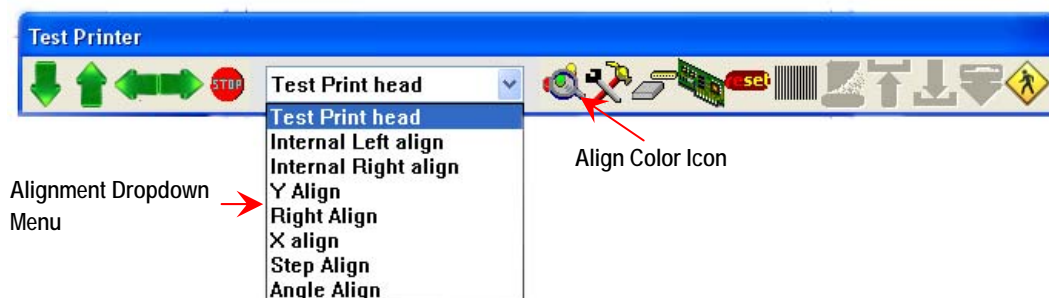


Fig.1.1-1 Test Print Toolbar

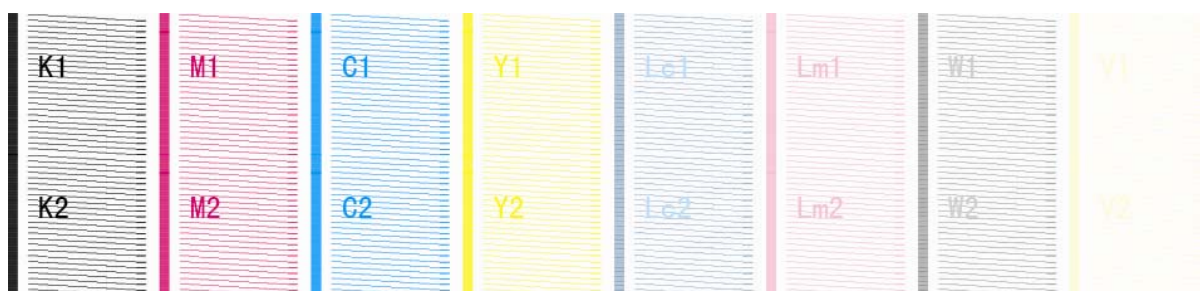


Fig.1.1-2 Test Print Swatch

1.2 Voltage and Temperature Setting

This section will describe the necessity to calibrate the Voltage and Temperature settings for each print head.

For the purpose of getting the best dot print quality, it needs patience. All you can do is play with temperature and voltage settings.

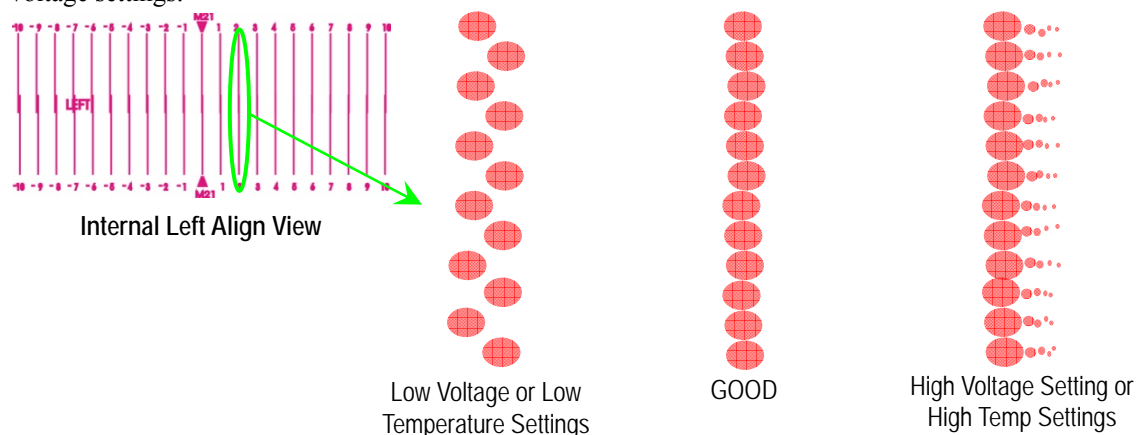


Fig.1.2-1 Dots Illustration

The recommended Voltage setting range is controlled by Flora driver software so there's no chance for you to set the voltage beyond the recommended range.

The recommended voltage is **13V~14V**.

The procedure for setting voltage should be performed as below:

- 1) Set voltage into the text box
 - a) Click **Set Button** after finishing the setting
- 2) Check the actual Voltage by click **Read Button**

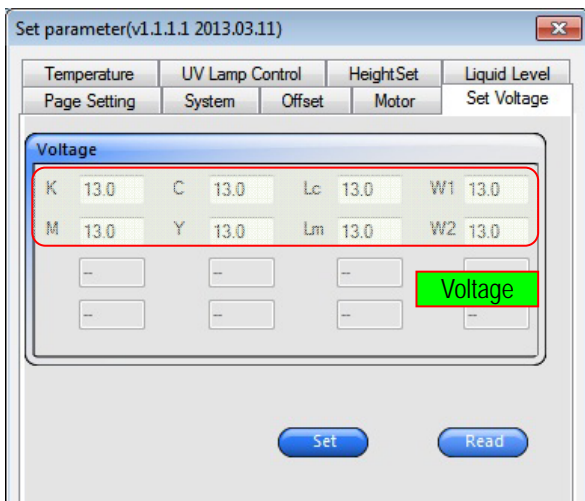


Fig.1.2-2 Voltage Tag

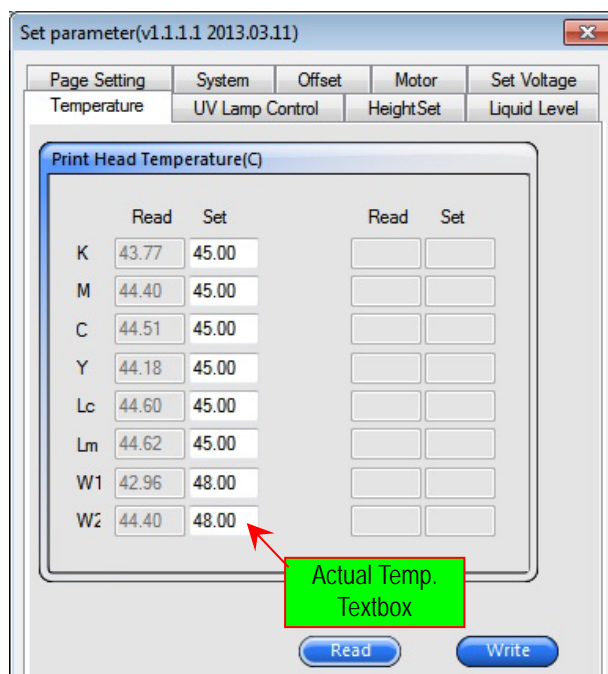


Fig.1.2-3 Temperature Tag

The recommended temperature setting range is controlled by Flora driver software so there's no chance for you to set the voltage beyond the recommended range.

The recommended temperature range is **40C~45C.(White and Varnish should be 45C)**

The procedure for setting temperature should be performed as below:

- 1) Set temperature into the text box
 - a) Click **Writer Button** after finishing the setting
- 2) Check the actual temperature by click **Read Button**, you will get actual temperature

Notice:

Every ink manufacturer has its own recommended temperature and voltage settings. The recommended setting applies to Flora ink only!

If you use your own ink, you need to contact with ink factory or get to test and choose best setting.

Other factors that can influence print quality are:

- ✓ Room Temperature
- ✓ Humidity
- ✓ Ink Viscosity
- ✓ Negative Pressure Settings
- ✓ Carriage Printing Speed

1.3 Print head Y Alignment

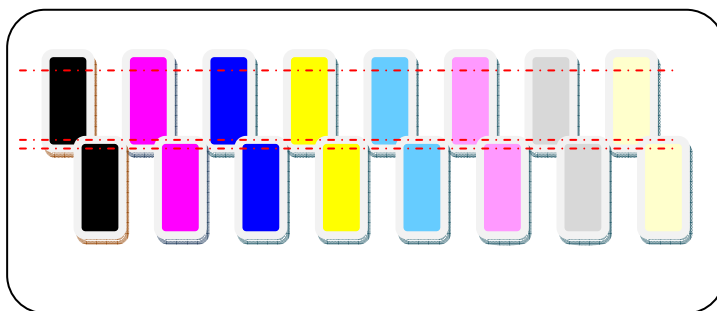
Print head Y Alignment is another mechanical alignment, ensure the print head is perpendicular to Y-axis.

For this machine, there are 8 print heads in total, and divided into 2 two rows. Unaligned print head will affect ink composition a picture. So for every row print heads, the first nozzle of every print head must be on the same

coordinate at Y-axis. The gap between two rows should be same with the gap between two nozzles. Print head installation must ensure the print head is perpendicular to Y-axis, and in parallel with X-axis.



Fig.1.3-1 Carriage with Print Head



- 1) Highlight Y Align from test drop list, and send to print by click send print icon;



Fig.1.3-2 Y Align

- 2) Y Align procedure should be as below:



Fig.1.3-3 8 Heads Y Align Switch

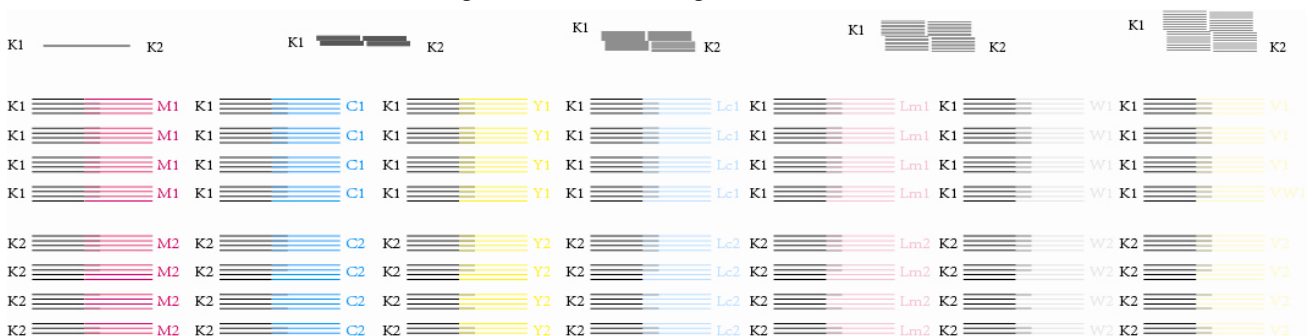
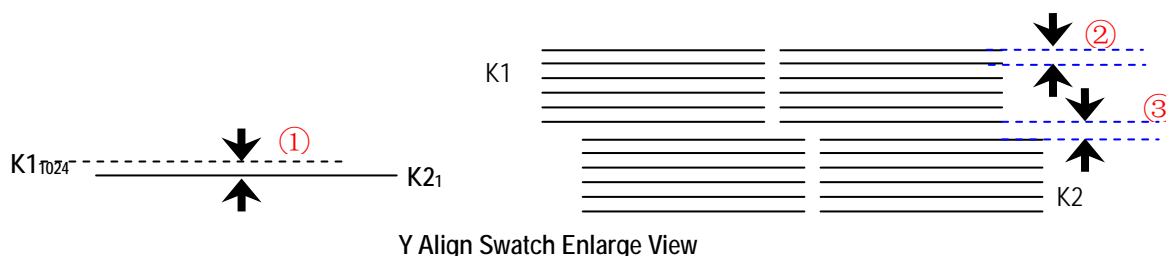


Fig.1.3-4 16 Heads Y Align Switch

For 16 heads alignment, Y alignment is divided into two parts. First K2 should align with K1, then align the other print heads.



- a) Align K2 with K1. The gap between 512th nozzle of K1 and 1st one of K2 ((1) or (3)) must be equal to the gap between two nozzles((2)).
 - ✧ If (3) > (2), push print head K2 go upward.(K1 is basic print head, you mustn't adjust K2)
 - ✧ If (3) < (2),pull print head K2 downward.

Adjust Procedure:

- Loose print head back side fixing screw and bracket fixing screw;
- Rotate the Y-alignment adjust screw to move the print head to correct direction;

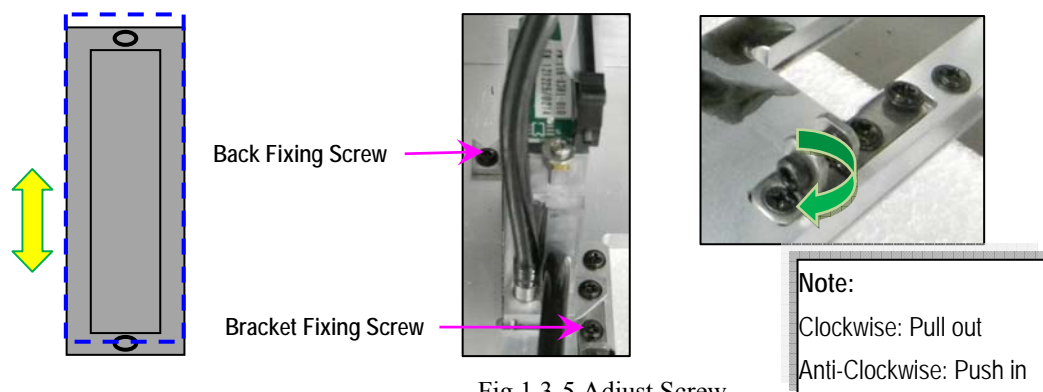


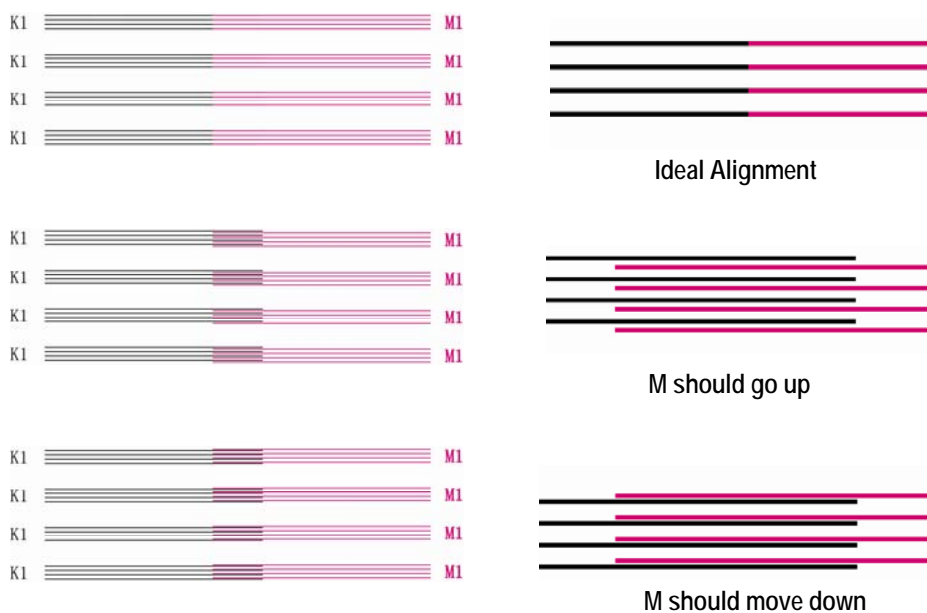
Fig.1.3-5 Adjust Screw

Noicte:

Careful and gradual adjustment should be taken in to consideration when doing Y Align. It will take several prints and adjustments before you are able to get perfect alignments.

- b) Align C, M, Y, Lc, Lm, W and V print head refer to K print head. The lines should be overlap with the K reference lines perfectly.

E.g.: Take M print head as reference



Y Align Enlarge View

Notice:

K is the reference print for print heads.

When perform Y alignment, K print head mustn't be adjusted unless the other heads were in maximum position. If on this occasion, K1 and K2 should be aligned again!!

1.4 Internal Right Align

Internal right align is necessary for Konica heads because the nozzles are made wherein the 512 nozzles are divided into 2 parallel rows of 256 nozzles.

Due to some uncontrollable manufacturing errors (tolerances) perfect alignment is not guaranteed. The internal align is required for both printing directions, especially for monochrome.

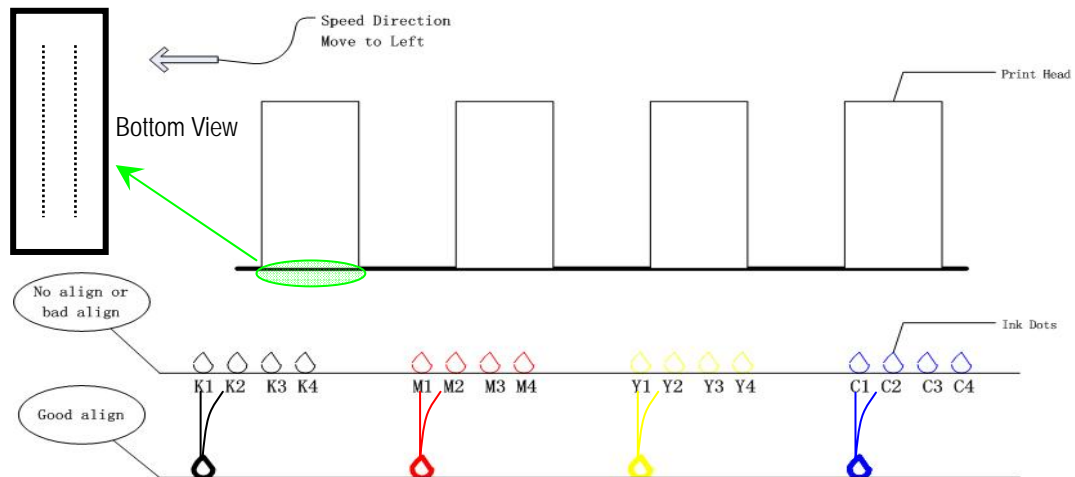


Fig.1.4-1 Internal Right Illustration

- 1) Highlight Internal Right Align from test drop list, and send print by click align color icon;



Fig.1.4-2 Internal Right Align

- 2) You will get prints as below. Every color will have one switch, take K & M for example:

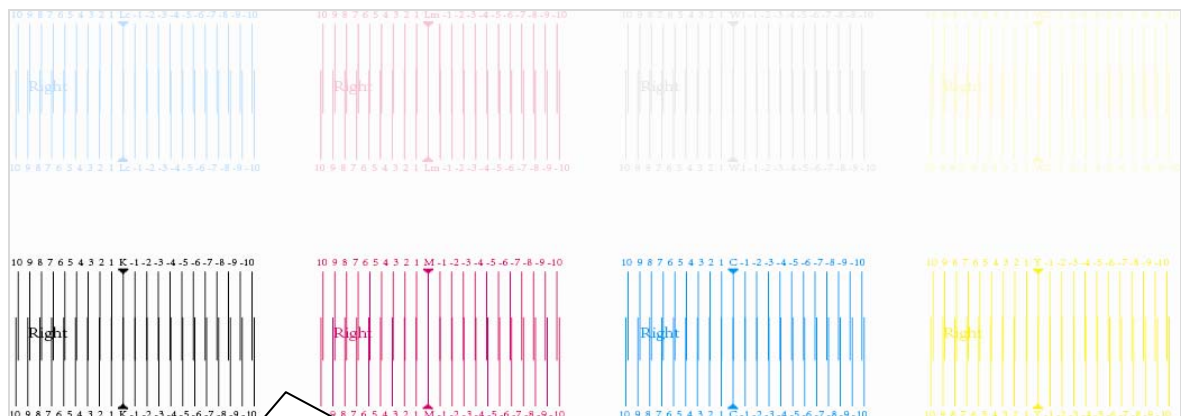
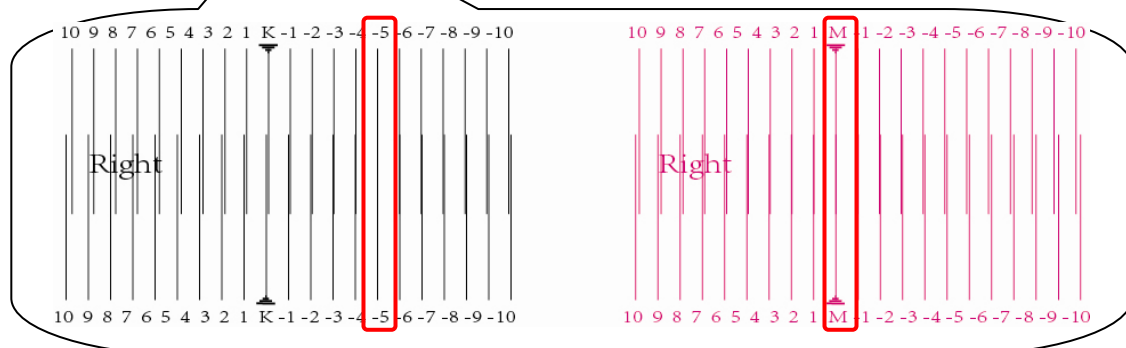


Fig.1.4-3 Internal Right Align Switch



Enlarge View

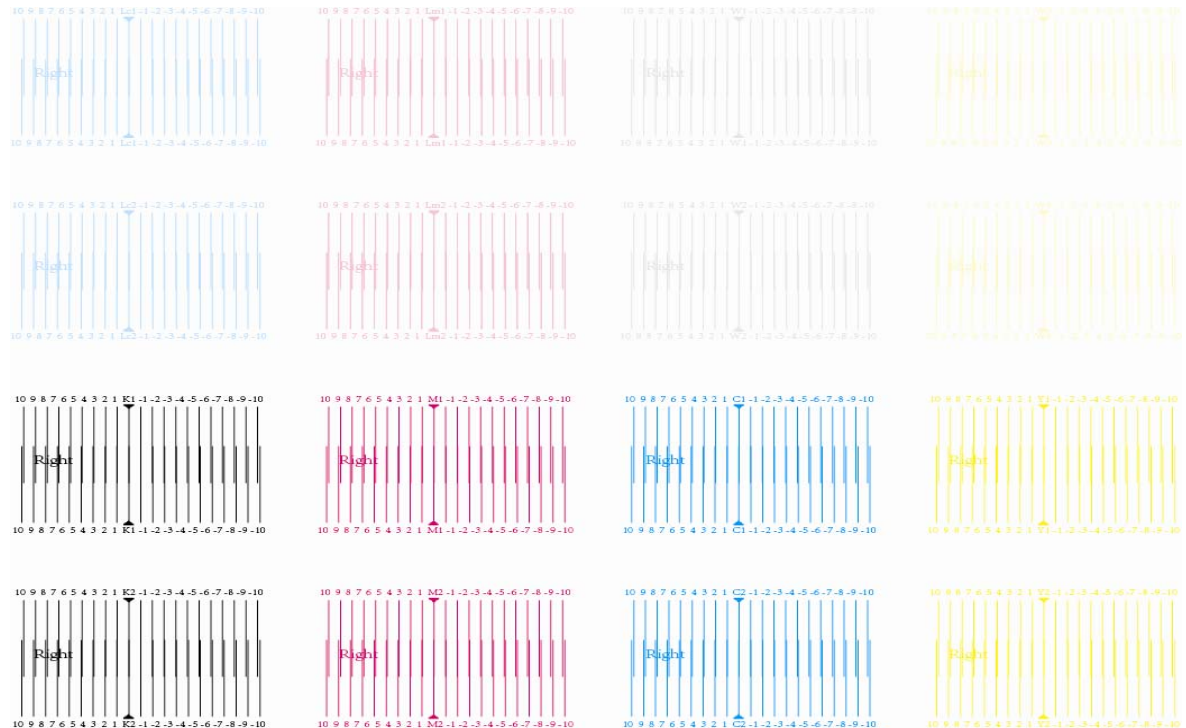


Fig.1.4-4 16 Heads Internal Right Align Swatch

- 3) The “0 position” of the top line must be aligned with “0 position” of down line.
E.g.: In illustration Fig.1.4-3, K meets at “-5 position” (in green circle), and the default value of M is 0. So the K should be $0 + (-5) = -5$.

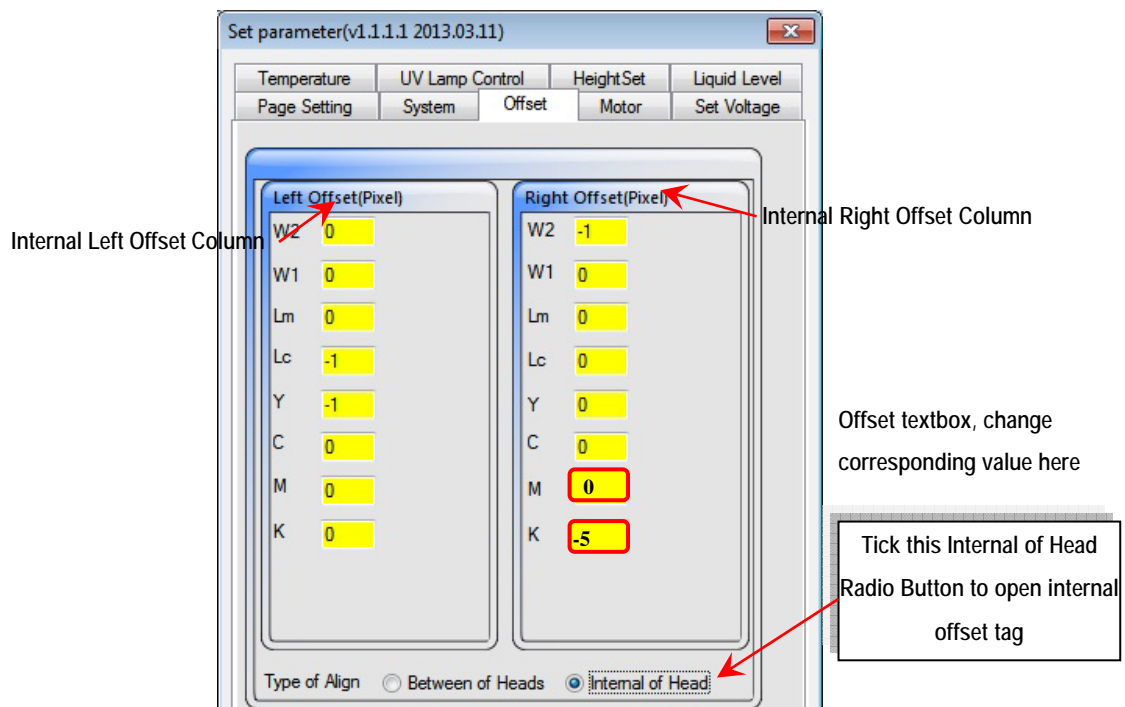


Fig.1.4-5 Internal Offset Tag

- Print Option Tag → Advanced (Test Print Tools Bar → Parameter Setting Icon) → Offset Tab → Internal of Head

1.5 Internal Left Align

Internal Left align is similar with internal right alignment, only the moving direction is different. Because of opposite direction, the inkjet position from bi-direction is different, that is why bi-direction alignment is in need.



Fig.1.5-1 Internal Right Align

- 1) The procedure for Internal Left Align is the same with Internal Right Align, please refer to 1.5

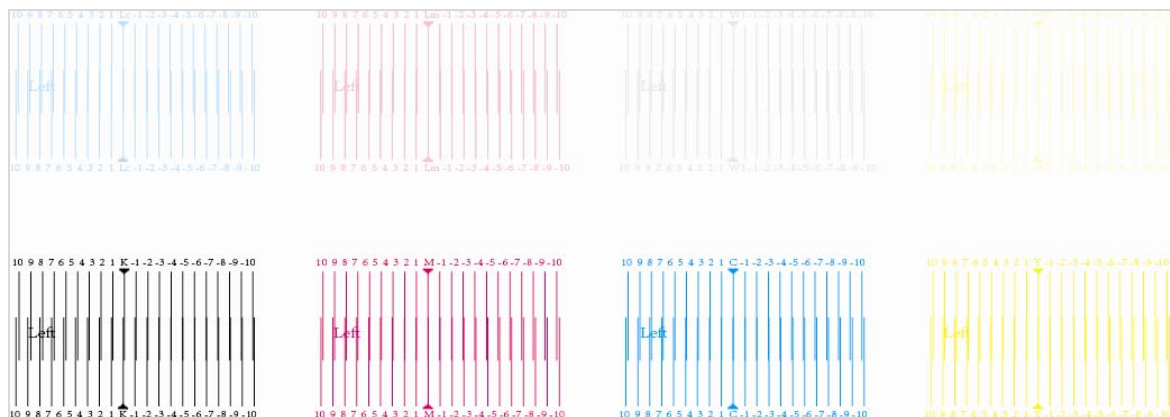


Fig.1.5-2 Internal Left Align Swatch

1.6 Right Align

There are 8 print heads in 4 colors in total. As they are fixed in different physical position, it is necessary to do left alignment for secondary colors, otherwise the secondary color will be fuzzy and the output picture will be rough.

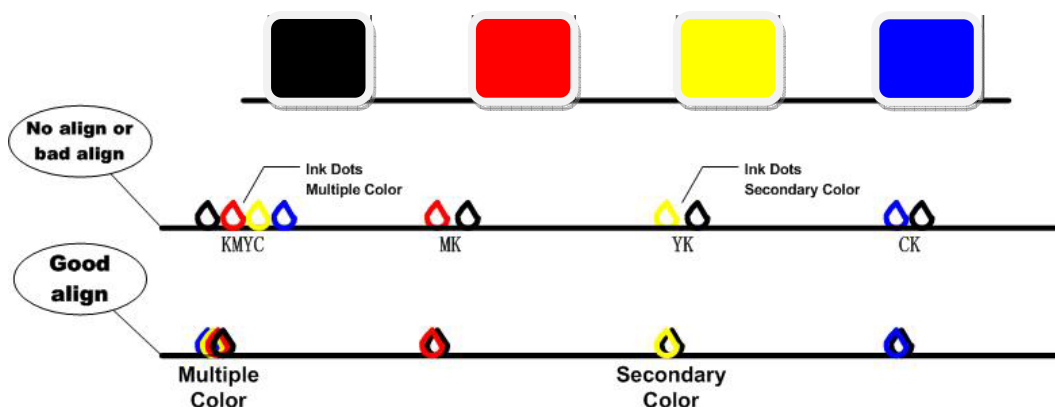


Fig.1.6-1 Right Align Illustration

For Flora machine, we take K1 as the base to align the other print heads.

- 1) Highlight Right Align from test drop down list, and send print by click align color icon. You will get prints as below.



Fig.1.6-2 Right Align

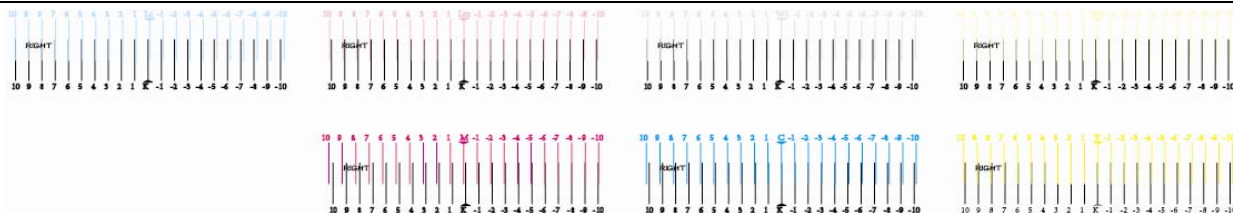


Fig.1.6-3 8 Heads Right Align Swatch

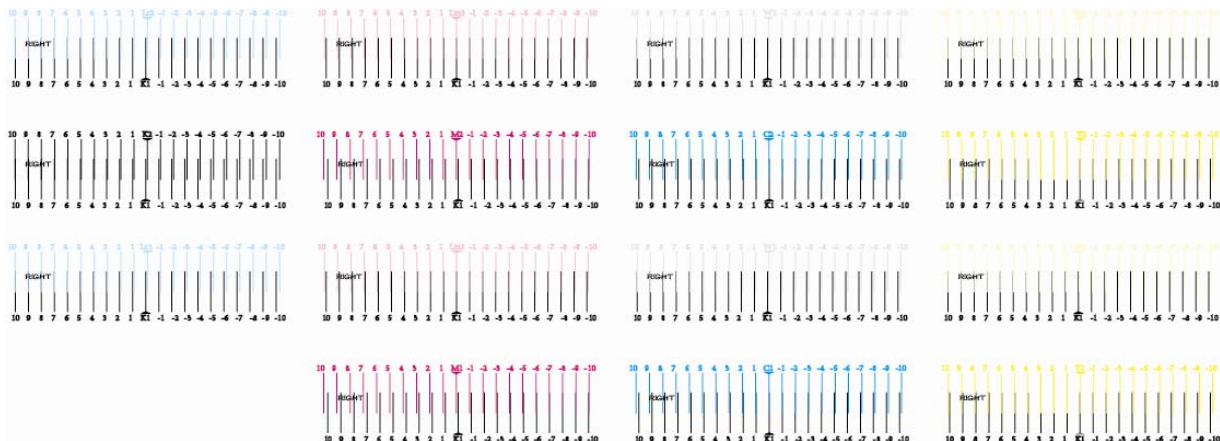
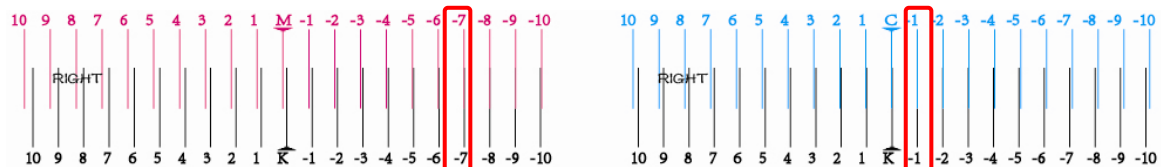


Fig.1.6-4 16 Heads Right Align Swatch

- 2) All the print heads will take K1 as basic. The “0 position” of K1 print heads must be aligned with “0 position” of all the other print heads.

Because of the space problem, I take M & C print head as example. M meets K at “-1 position” (in red circle), C at “-1 position”.



Set parameter(v1.1.1.1 2013.03.11)

Temperature	UV Lamp Control	HeightSet	Liquid Level
Page Setting	System	Offset	Motor
Set Voltage			

X Align Column →

	X Align(pixel)
W2	-6341
W1	-5434
Lm	-4528
Lc	-3620
Y	-2714
C	-1810
M	-902
K	4

Right Offset Column ←

	Right Offset(Pixel)
W2	6343
W1	5437
Lm	4530
Lc	3623
Y	2718
C	1812
M	907
K	0

Change value in this textbox
 $C: 1812 - 7 = 1805$
 $M: 907 - 1 = 906$

Tick this Between of Head Radio Button to open offset tag

Type of Align: ☒ Between of Heads ☐ Internal of Head

Fig.1.7-4 Offset Tag

Print Option Tag → Advanced (Test Print Tools Bar → Parameter Setting Icon) → Offset Tab → Right align Check Box

3) Align the other print heads as the same procedure.

1.7 X Alignment

X alignment is very necessary for Bi-direction print mode. The output image will be rough and fuzzy because of dislocation output coming from double directions.

X alignment is similar with Right alignment. But every print head will take itself as reference print head!

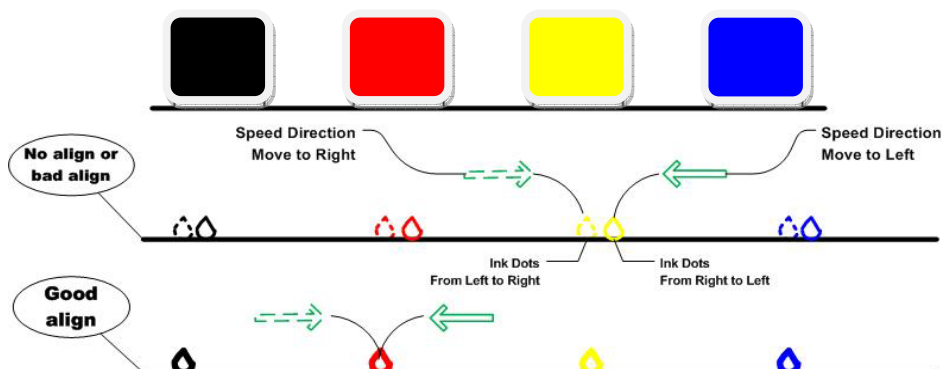


Fig.1.7-1 Illustration for X Align

1) Highlight X Align from test drop down list, and send print by click align color icon;



Fig.1.7-2 X Align

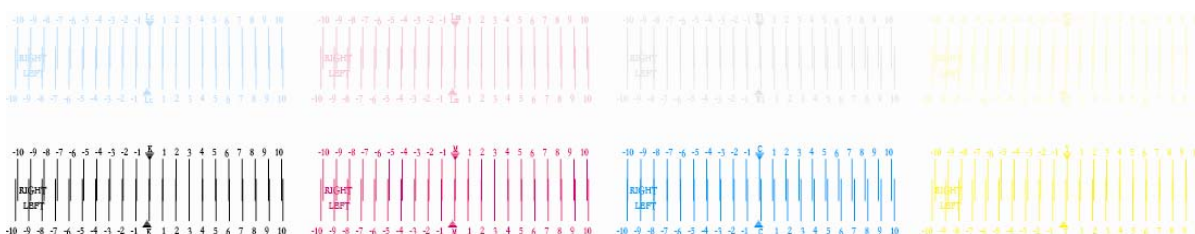


Fig.1.7-3 8 Heads X Align Switch

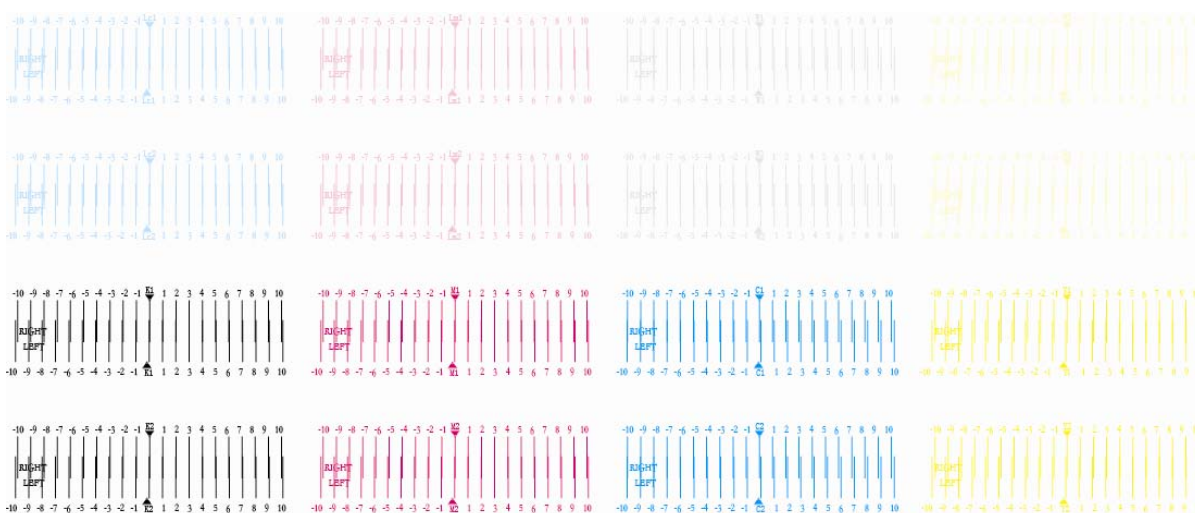
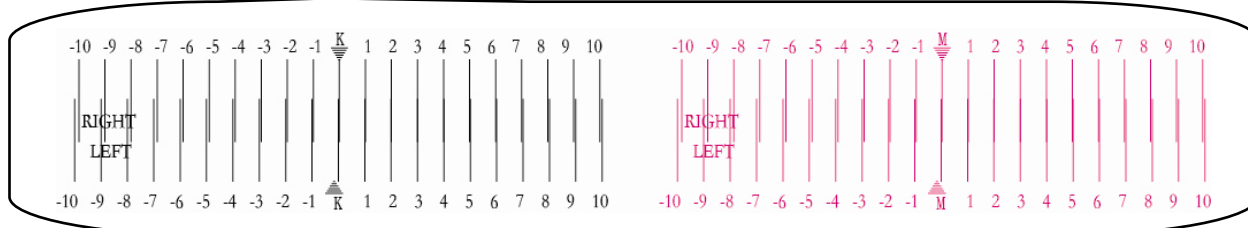


Fig.1.7-4 16 Heads X Align Switch



1.8 Step Alignment

Step alignment is an important alignment for Y-axis.

If the step is too big, the output will have blank line; otherwise, the output will have overlap line.

- 1) Highlight X Align from test drop down list, and send print by click align color icon;



Fig.1.8-1 Step Align

- 2) The first pass will print dotted line, and the printer will feed media forward, after that it will print straight line. Perfect alignment will get two lines overlap completely. You may get three possible cases as below:



Fig. 1 – Insufficient Media Feeding Step

- a) Figure 1 shows the motor step value when the test was sent is higher than exact value so we need to increase, by trial and error method you can get the correct value.



Fig. 2 – Excessive Media Feeding Step

- b) Figure 2 shows the motor step value when the test was sent is lower than exact value so we need to decrease, by trial and error method you can get the correct value.



Fig. 3 – Correct Media Feeding Step

- c) Figure 3 shows the motor step has exact value so no need for any changes.
- 3) Below is the table where you can find the Step Parameter setting.

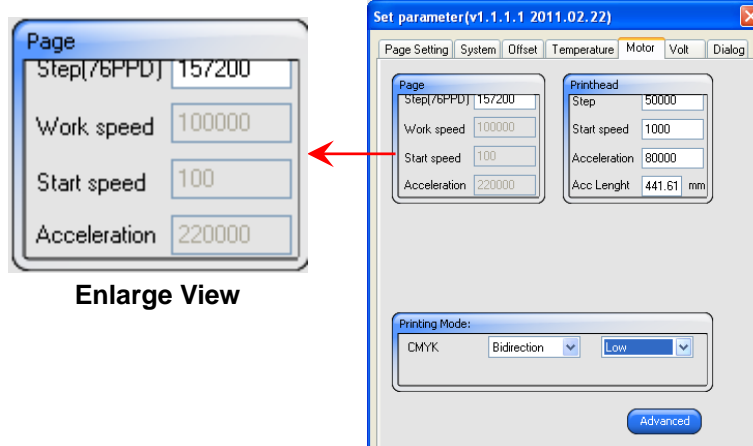


Fig.1.8-2 Motor Tag

Print Option Tag → Advanced (Test Print Tools Bar → Parameter Setting Icon) → Motor Tag → Page

windows

Notice:

If any factor (temperature, voltage and highness of the carriage) which will affect viscosity or firing speed has changed, you must check Internal left & right alignment, right alignment!