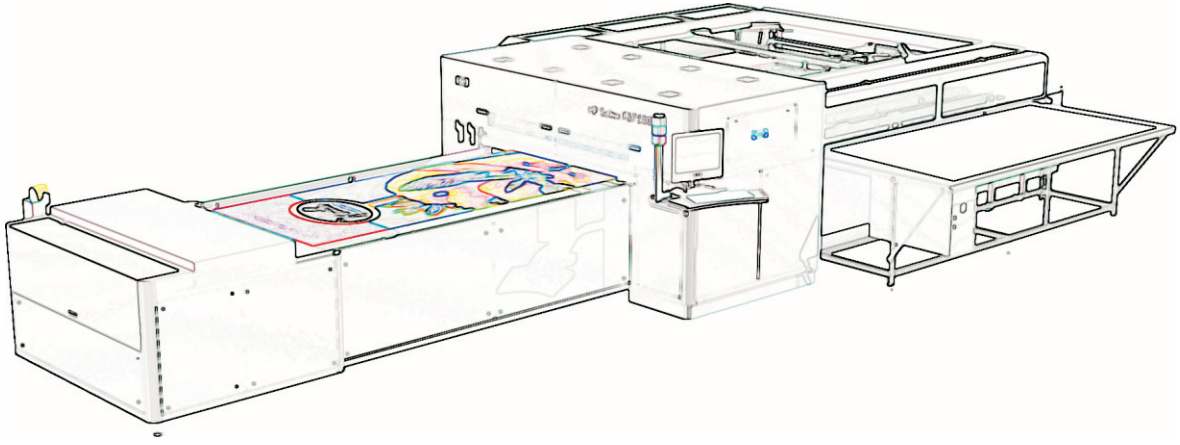
HP Scitex FB7500

Advanced Printer Guide



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Revision B

July 2010

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Safety Hazard Warning Conventions

The safety hazard warning conventions used in this guide (and supplementary HP Scitex FB7500 documentation) are provided for the identification of safety hazards. They are used to identify conditions or actions for which a specific hazard is known to exist, and that may, cause personal injury and/or equipment malfunction.

The conventions are classified into the following categories: **Danger**, **Warning**, and **Caution**. Examples are shown below:

Danger

Danger is used to identify conditions or actions for which a specific hazard is known to exist, and which will cause severe personal – or even fatal – injury, or substantial equipment damage.

Warning

Warning is used to identify conditions or actions for which there is a known risk, which may cause serious – or even fatal – injury.

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Caution is used to identify conditions or actions for which a potential hazard may exist, which will or can cause minor personal injury or equipment damage.

Other Conventions

The following conventions are used to draw your attention to important points which are beyond or in addition to the regular information in this book:

Note

Notes are used to identify an explanation, or provide additional information for purposes of clarification.

Tip

Tips provide useful shortcuts or recommendations.

Reference

References are provided to refer you to further information in this document or another guide.

Acronyms

The following table displays frequently used acronyms:

Acronym	Definition
CMYK	Cyan, Magenta, Yellow, Black
LC, LM, LY, LK	Light Cyan, Light Magenta, Light Yellow, Light Black
RGB	Red, Green, Blue
DPI	Dots per Inch
PS	Postscript
EPS	Encapsulated Postscript
ICC	International Color Consortium
FSE	Company Field Service Engineer
PDU	Power Distribution Unit
UPS	Uninterrupted Power Supply
UV	Ultra Violet
RIP	Raster Image Processing
TIFF	Tagged Image File Format
TIFF-BMP	Tagged Image File Format - Bitmap

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CHAPTER

1

Introduction

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Safety Instructions

Reference

For the HP Scitex FB7500 safety instructions refer to HP Scitex FB7500 Operator Manual.

About HP Scitex FB7500 Printer

The HP Scitex FB7500 is a digital wide-format flatbed printer. It allows remarkably high quality printing on both rigid and flexible substrates up to 25mm thick in semi-automatic loading.

The HP Scitex FB7500 utilizes drop-on-demand piezoelectric technology using ultraviolet (UV) curable ink. A family of UV FB221 curable inks prints on a wide variety of media, producing superior results even on difficult substrates.

Figure 1-1 HP Scitex FB7500 Printer

High print speeds make the HP Scitex FB7500 printer ideal for printing medium and long runs of POP/POS applications within tight schedules, in fast-paced, demanding environments. Just what you need to increase your business agility and enhance your ability to take advantage of growth opportunities.

Features and Benefits

- The most cost-effective solution for POP jobs up to 250 copies
- Intuitive workflow and short learning curve for screen printer operators
- Very high versatility in formats and media types - from paper sheets to thick (25 mm/1") boards
- Maximum printing speed of up to 500 m^2/hr (5,380 ft^2/hr)
- HP Scitex X2 print heads: the next generation print head for high-end printing systems
- High print quality for close-view POP applications, 6 colors with optional upgrades for 7th and 8th color
- 3/4 automatic loading mechanism
- Highly accurate registration for double-sided and backlit applications

Applications

The range of applications you can print on the FB7500 printer is virtually unlimited. You can use it for:

- POP/ POS displays
- Indoor and outdoor signage
- Transit signage
- Interior design, furniture and architecture
- In-store advertising
- Rigid building coverings
- Museums, visitor centers, exhibitions
- Theatre graphics
- Construction and real estate signage

Figure 1-2 FB7500 Applications

Substrates

Suitable substrates include:

Rigid substrates - PVC, polycarbonates, corrugated cardboards, foam board, aluminum, styrene, acrylic, polyester, wood, ceramics, marble, and more

Flexible substrates - banner, self-adhesive vinyl, paper, and more

Print Modes

The FB7500 printer offers a choice of different print modes to meet an enormous variety of general and special printing requirements. The FB7500 print modes are listed in Table 1-1.

Selection of the most suitable print mode depends on various factors, such as the specific print job application, the required viewing distance, and the media type.

Table 1-1 FB7500 Print Modes

Print Mode	Resolution (DPI)		Throughput		Full-Size Sheets/hr	Application
	X Print	Y Cross Print	m^2/hr	ft^2/hr		
POP 17	508	500	90	969	17	Near offset-quality posters
POP 34	508	500	180	1,937	34	High definition POP
POP 34 Text	600	400	180	1,937	34	High definition POP jobs with file details
POP 42	400	400	220	2,367	42	Mainstream POP
Production 63	400	400	330	3,551	63	2m view distance
Production 95	400	300	500	5,380	95	5m+ view distance

HP Scitex FB7500 Workflow

RIP Software

The RIP software is a part of the FB7500 workflow (see Figure 1-3) and plays an important role in color management, density adjustments, and the use of ICC profiles.

The FB7500 printer is supplied **without** the RIP hardware, and it is the customer's responsibility to purchase the computer hardware required for the RIP software according to HP Scitex specifications provided in the HP Scitex FB7500 Site Preparation Guide.

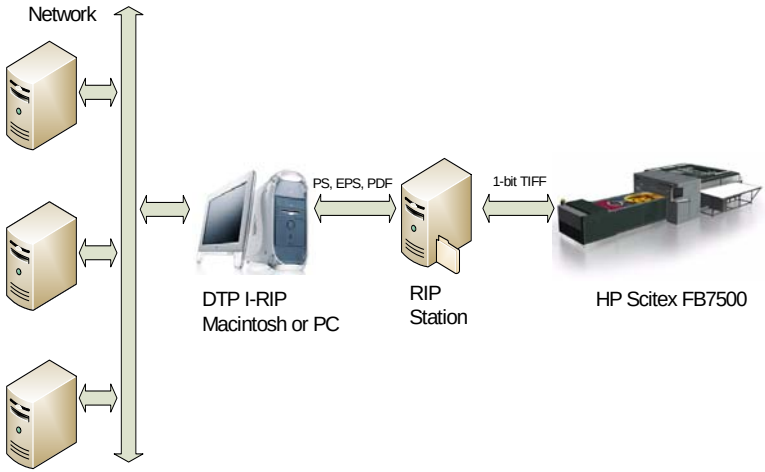

Figure 1-3 HP Scitex FB7500 Workflow

CHAPTER

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General

The HP Scitex FB7500 system main components are:

- Printer (see Figure 2-1)
- Vacuum pump in the silence cabinet
- Electrical cabinet
- UV system (UV electrical cabinet, UV cooler, UV blower)
- Dedicated RIP software

The FB7500 printer components are shown in the picture below.

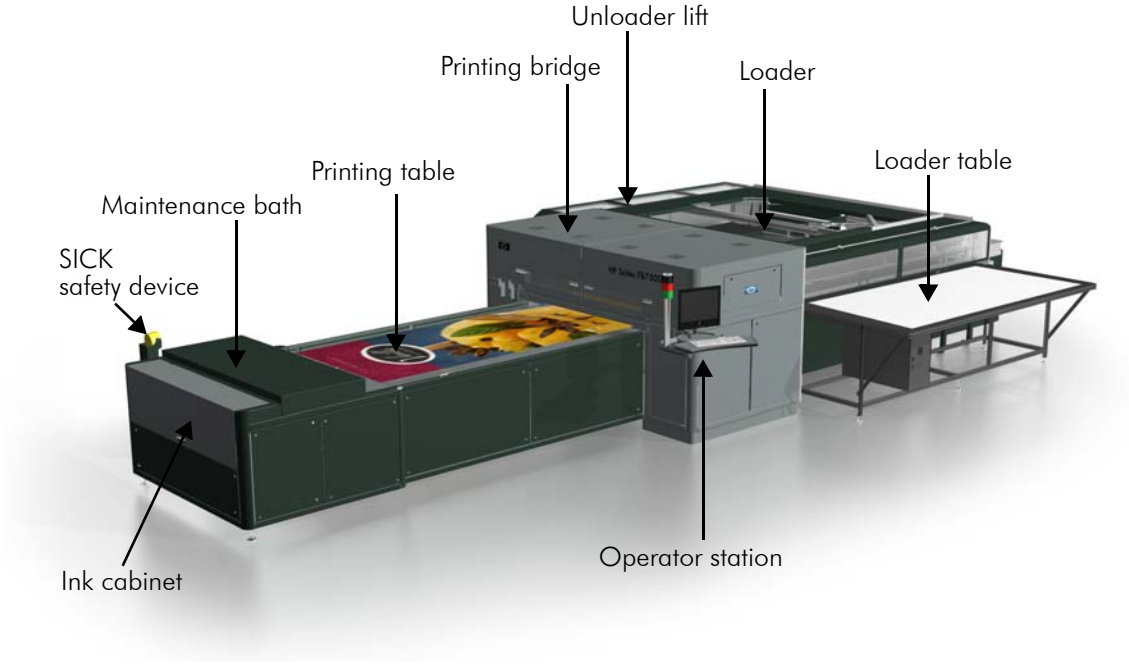


Figure 2-1 HP Scitex FB7500 Printer Components

FB7500 Printer Directions and Axes

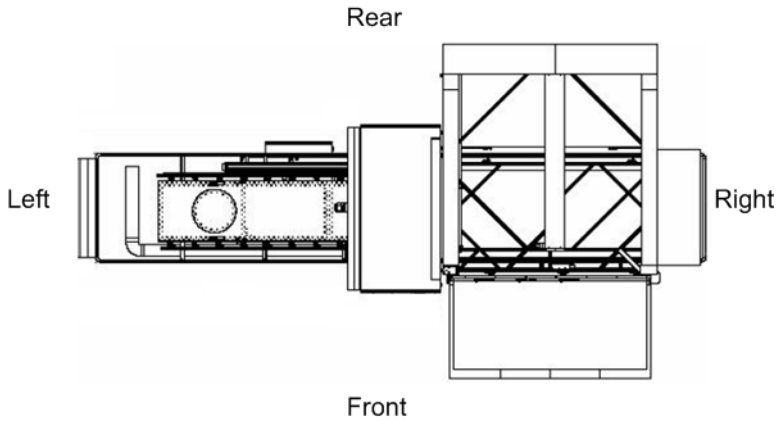


Figure 2-2 FB7500 Directions

The FB7500 printer has 7 motor-driven axes. The function of each axis is described in Table 2-1 on page 10.

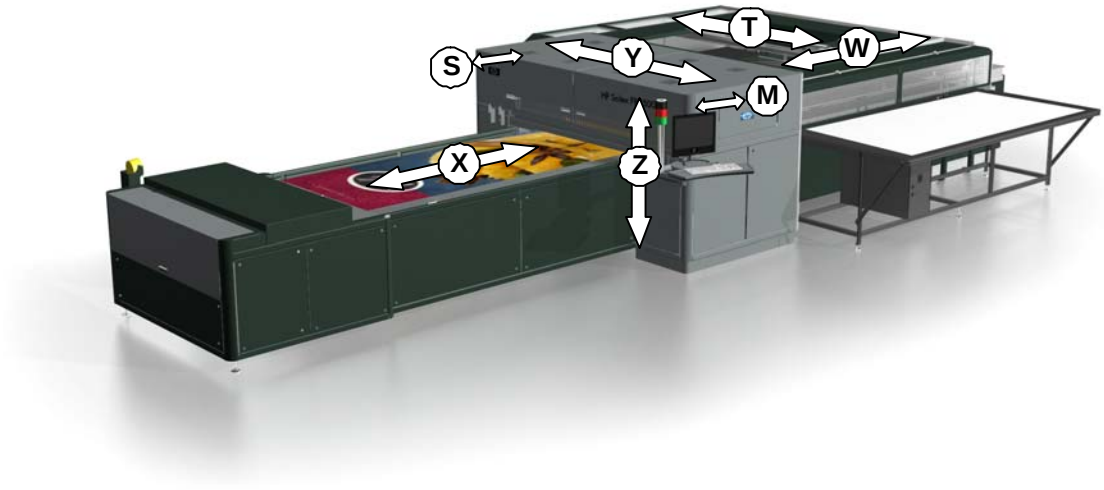


Figure 2-3 FB7500 Axes

Table 2-1 FB7500 Axes Functions

Axis	Function
X-axis	Printing table movement.
Y-axis	Bridge cross-print movement that determines the cross-print resolution.
Z-axis	Bridge up and down movement. Up/down movement along the Z-axis is required to adjust the distance between the substrate and the print heads for different substrate thicknesses.
T-axis	Loading substrate onto the printing table.
W-axis	Substrate alignment when loading it onto the printing table.
M-axis	Opening/closing the UV lamp external shutters on the front side.
S-axis	Opening/closing the UV lamp external shutters on the rear side.

Printing Bridge

The FB7500 printing bridge contains the print heads and all of the peripheral systems supporting them, such as secondary ink tanks with taps, vacuum knife, water reservoir, two overflow boards, switch ink valves, UV lamp housing, UV lamp external shutter, UV fumes extraction duct, power distribution boards, PIC and ORCA electronic boards, purge manifold, water manifold, ink and water tubing, electrical cables, bridge lifting pistons, Y-axis, Z-axis, M-axis, and S-axis motion systems.

The bridge is covered with the upper and lower hoods. The printing bridge components and their location are shown in Figure 2-4 to Figure 2-7.

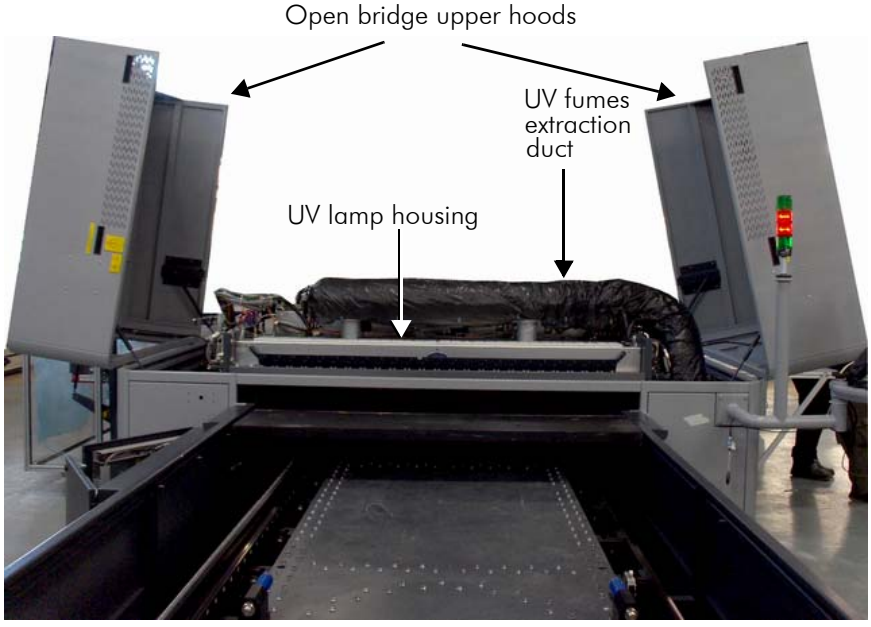


Figure 2-4 Printing Bridge with Closed/Open Upper Hoods

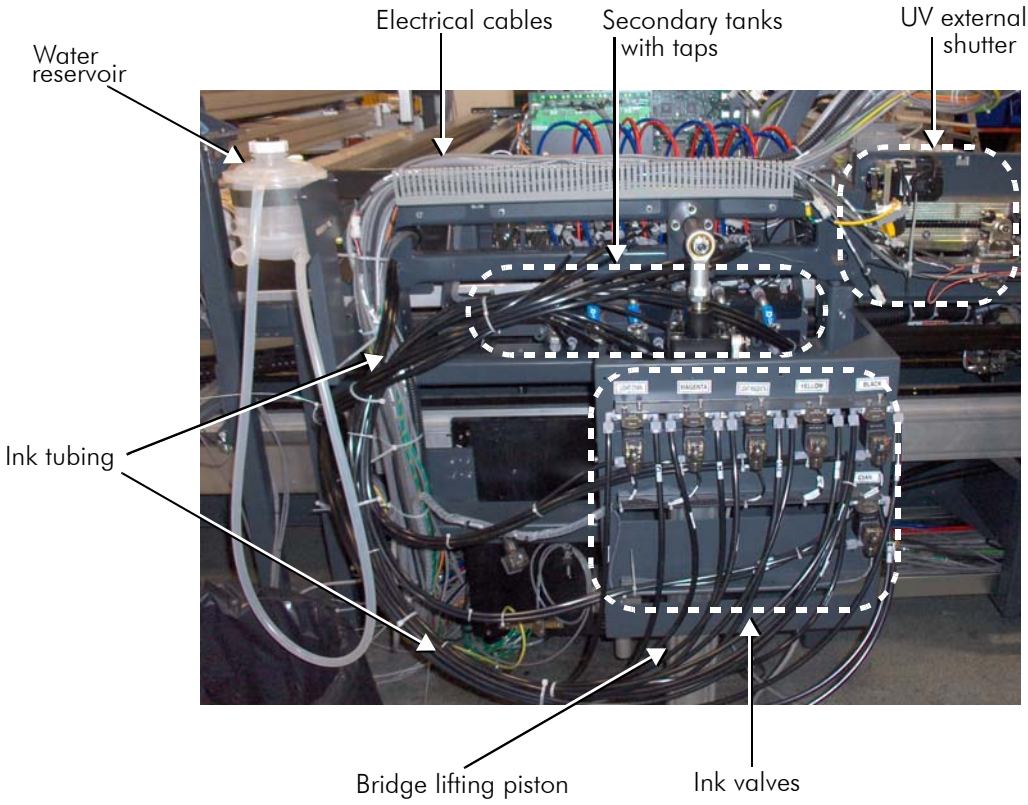


Figure 2-5 Bridge Rear Side without the Lower Hood

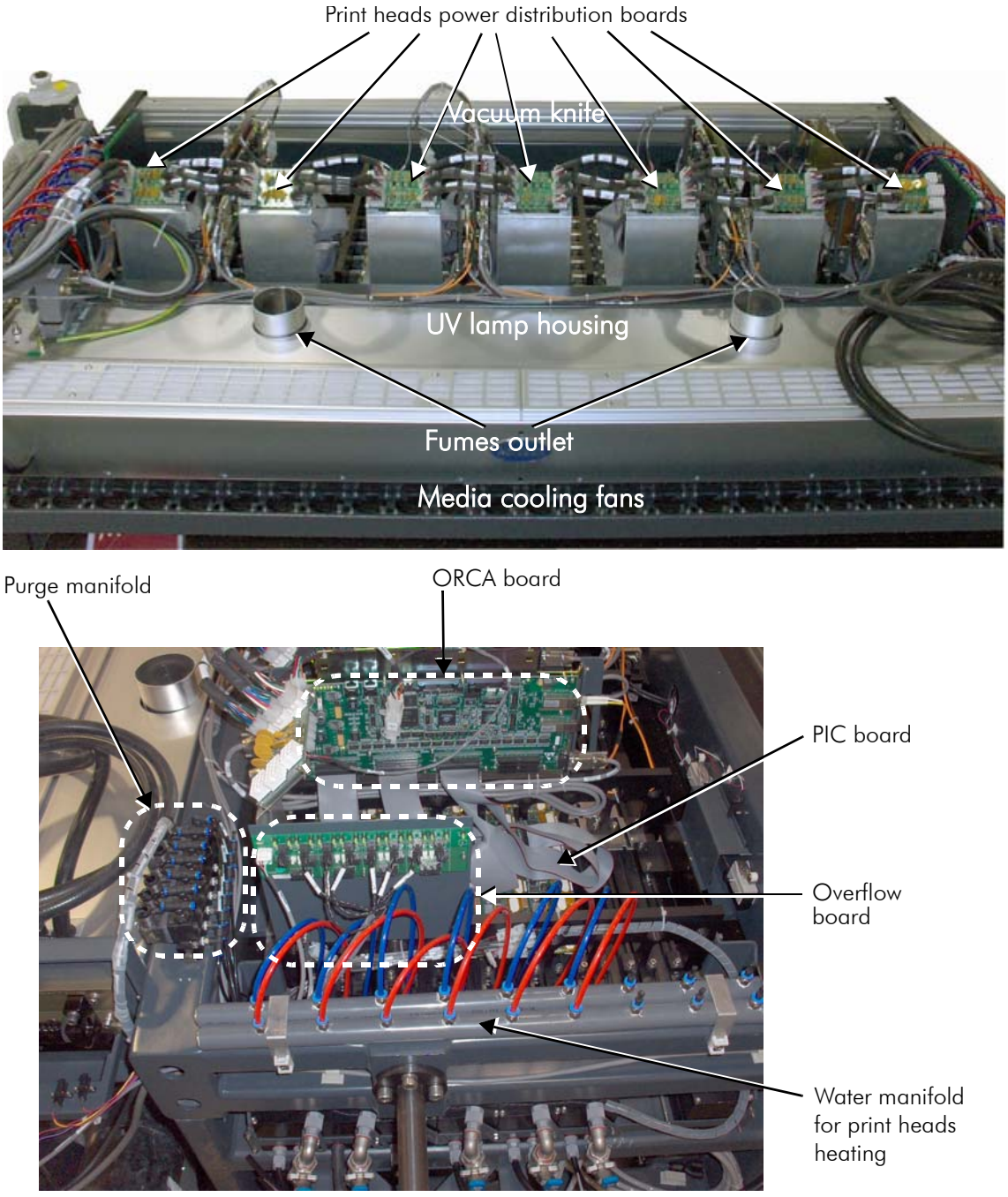


Figure 2-6 Bridge Top and Front Side Views

The bridge contains the 312 print heads, 52 per color. All print heads are mounted on the ink bar and arranged in arrays. Each array contains 8 print heads which are connected to their PIC board. Each print head (in addition to the ink supply) includes an electronic package and a 26-pin male connector, as shown on Figure 2-16 on page 22. A set of registration pins ensures accurate positioning of print head modules with respect to each other and to the plate on which they are mounted.

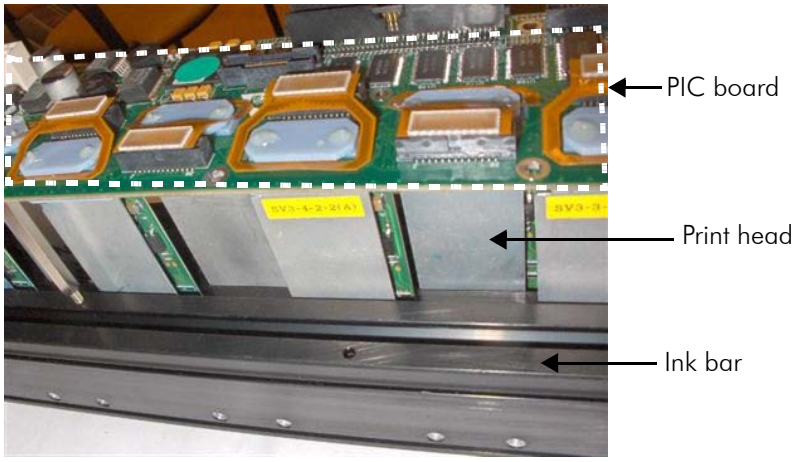


Figure 2-7 Eight Print Heads Connected to the PIC Board

For the maintenance procedures, the printing bridge should be lifted using the two lifting pistons.

Caution

To avoid curing of the ink while the bridge is in vertical position (during maintenance), the following guidelines are recommended:

- **Do not position a light source directly above the printing bridge. If there is one directly above the printer, it should be turned off while the bridge is in vertical position for more than a few seconds.**
- **The power density of a light source above the bridge should not exceed 3mW/cm^2.**
- **Sunlight is a real risk in case there is an open window that allows direct sunlight into the room and towards the exposed bridge. Make sure that such windows are shut.**

In general, if the bridge is left in vertical position for more than a few moments - it should be covered.

Printing Table

The vacuum printing table major functions are:

- Advancing the substrate through the machine along the X-axis.
- Holding the substrate in place during printing.

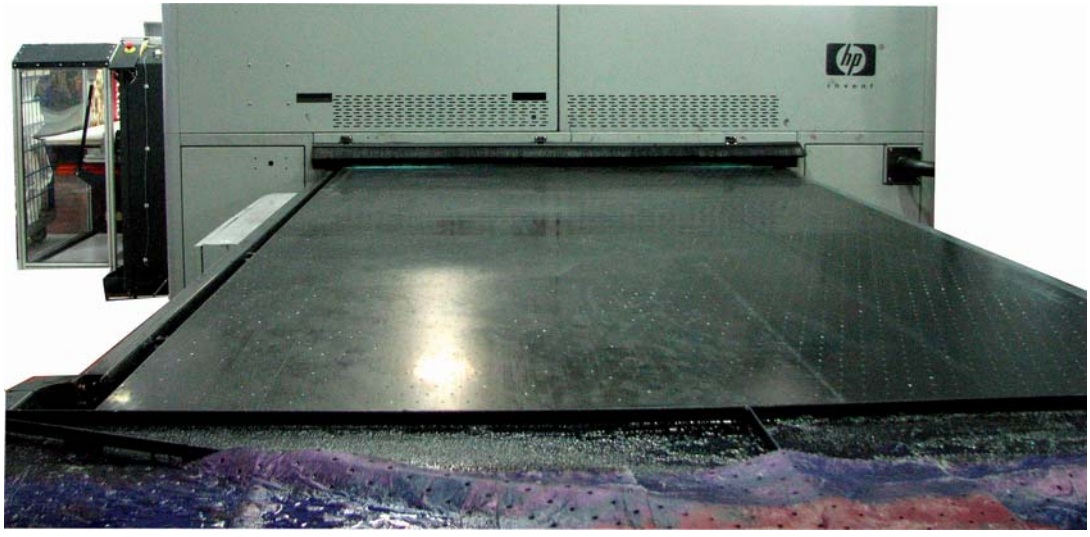


Figure 2-8 Vacuum Printing Table

There are 4 registration pins on the printing table, which are used for manual loading of the substrate (see Manual Substrate Loading on page 91). In this process, you press a pedal, which deactivates the vacuum to the printing table and raises the registration pins (see Figure 2-9 on page 16). Then, you place the substrate on the printing table and attach it to the registration pins.

The printing table is divided into the six sections. A vacuum manifold is located under the six sections. Switching between the Normal and Vacuum modes is done pneumatically.

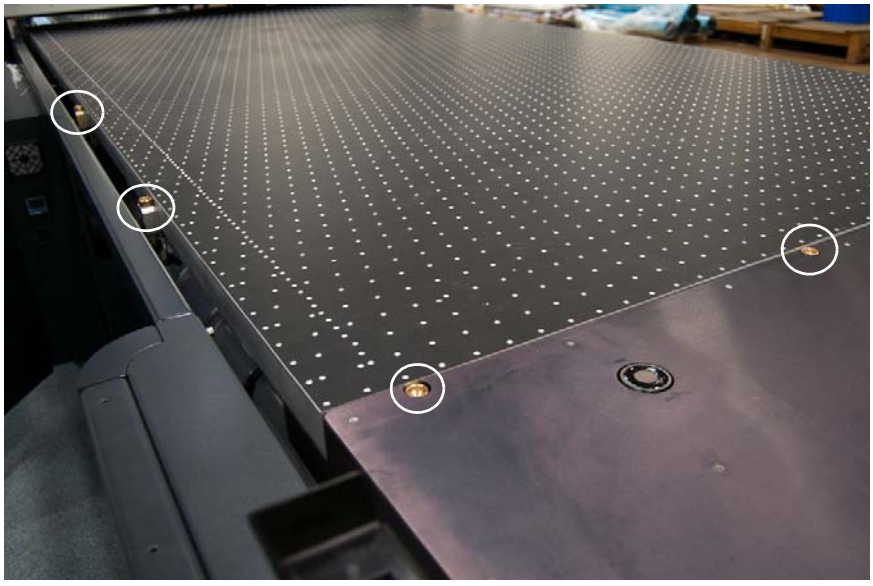


Figure 2-9 Alignment Pins on the Printing Table

Ink System

The ink system controls the ink flow, and supplies ink to the print heads. The ink is supplied in disposable 5 liter plastic containers.

Note **The ink containers can be replaced during the print run.**

The FB7500 ink system contains the following components:

- Ink containers
- Ink caps
- Load cells
- Ink filters (5µ and 1µ)
- Ink pumps
- Print heads heating water system
- Circulation and Switch valves
- Secondary ink tanks with their taps
- 2 overflow boards
- Ink bars
- 312 print heads

For better understanding of the ink system operation refer to "Ink System Functional Diagram" shown in Figure 2-10.

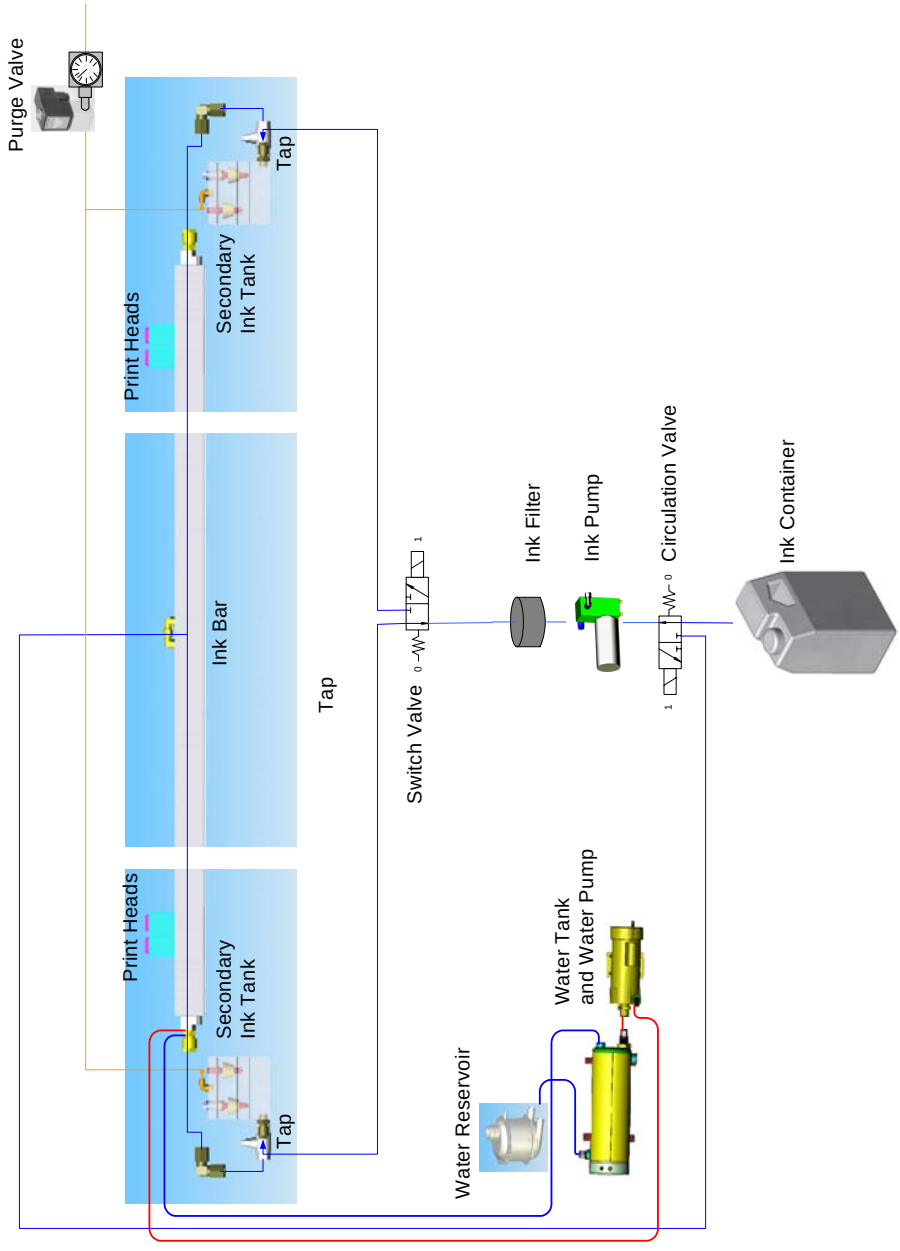


Figure 2-10 FB7500 Ink System Functional Diagram

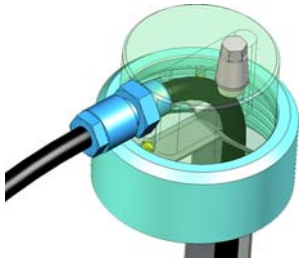
Reference **For the ink system maintenance procedures refer to HP Scitex FB7500 User Safety and Maintenance Guide.**

Ink Cabinet

The ink cabinet is located on the left side of the FB7500 printer (see Figure 2-1 on page 8). It contains 6 sockets for SMYK, LM and MC colors and 2 spare sockets.

Figure 2-11 Ink Cabinet with Ink Containers

The load cells are located under the sockets (total of 8) and used for measuring the ink containers weight. This value is then converted into the voltage, sent to the machine computer and displayed in the FB7500 main window indicating the ink level (see System Status Section on page 82).



The ink container is closed with a special cap, which prevents air from entering into the ink system.

For instructions on how to replace the ink containers, refer to Replacing Ink Container on page 97.

Secondary Ink Tanks

Figure 2-12 Secondary Ink Tanks with Taps

The 12 secondary ink tanks (two per color) are mounted on the front and rear sides of the printing bridge. These tanks are filled from the ink containers with the help of the individual ink pumps and supply ink to the print heads through the ink bars.

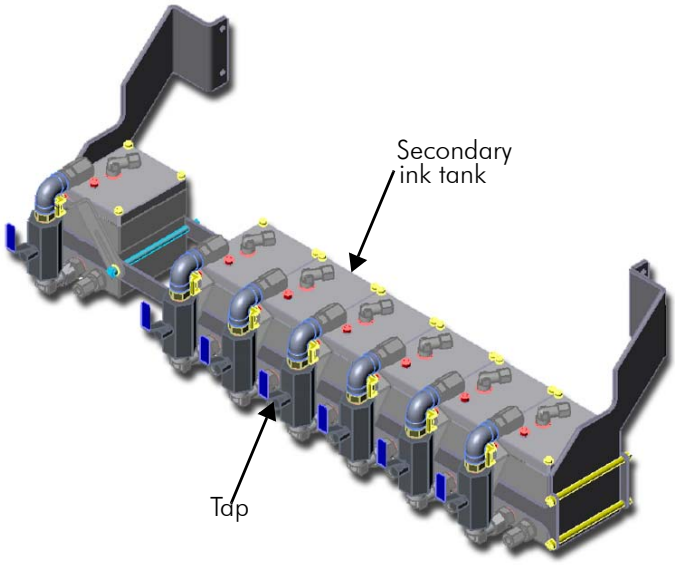


Figure 2-13 Secondary Tanks Assembly

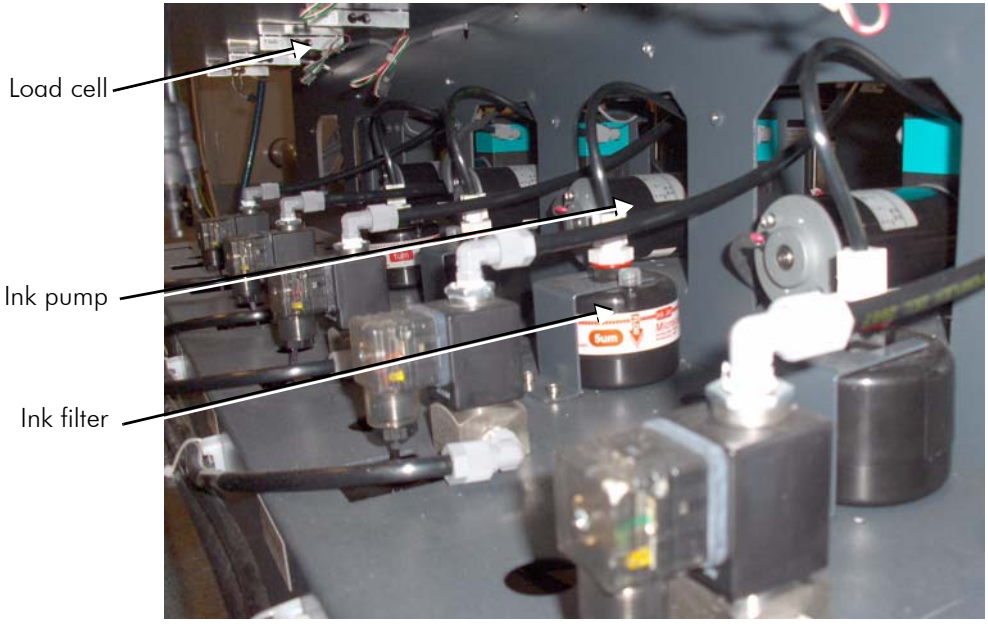


Figure 2-14 Ink System Components

Ink Bars

The ink bars (one per color) are located on the printing bridge. Each ink bar carries 52 print heads, which are arranged in arrays. Each array contains 8 print heads, which are connected to their PIC board.

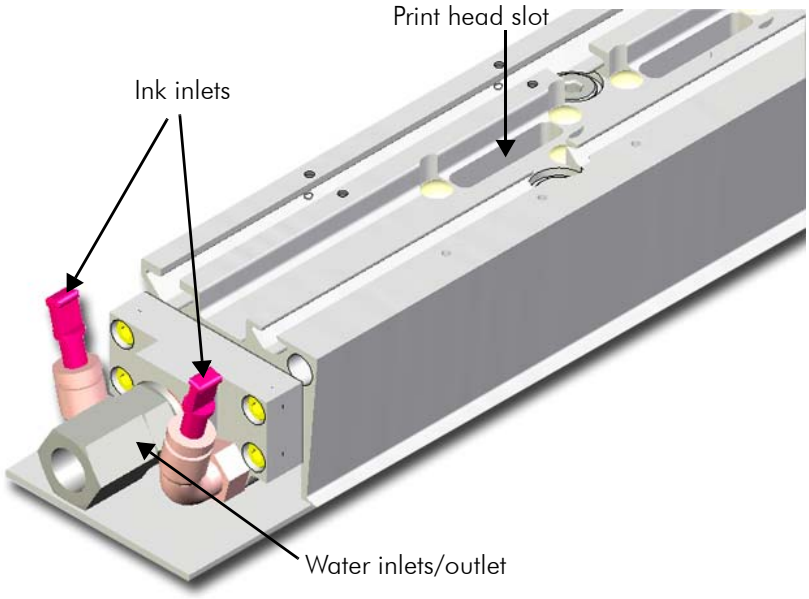


Figure 2-15 Ink Bar - Top View

HP Scitex X2 Print Head

The X2 print head specifications are:

- 128 nozzles per print head, 64 nozzles on each side
- Native resolution: 100 dpi
- Drop rate: up to 30 kHz
- Drop volume: up to 50pl
- Ink flux: more than 10ml/min
- Print speeds: up to 2 m/sec

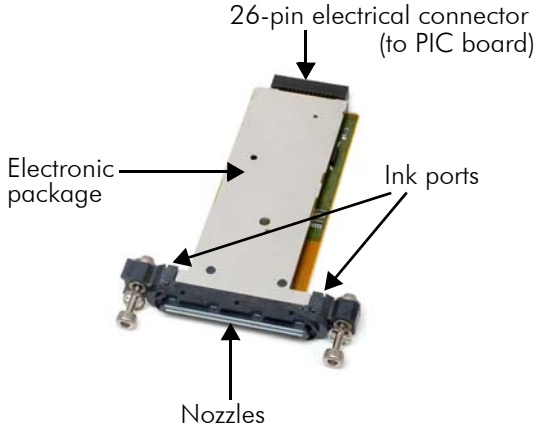


Figure 2-16 HP Scitex X2 Print Head

Reference **For instructions on how to replace the print head, refer to HP Scitex FB7500 User Safety and Maintenance Guide.**

Print Heads Heating Water System

The water system supplies hot water for heating the print heads. It contains the water reservoir, water pump, water manifold and water tank (see Figure 2-17, Figure 2-18, and Figure 2-19 accordingly).

Figure 2-17 Water Reservoir

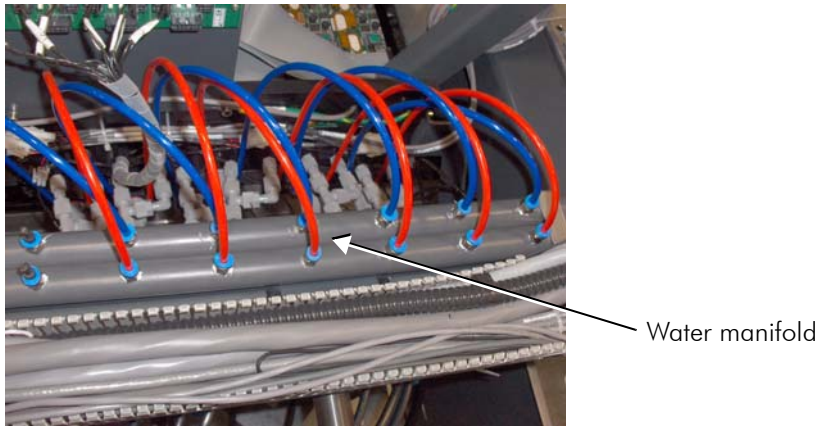


Figure 2-18 Water Manifold

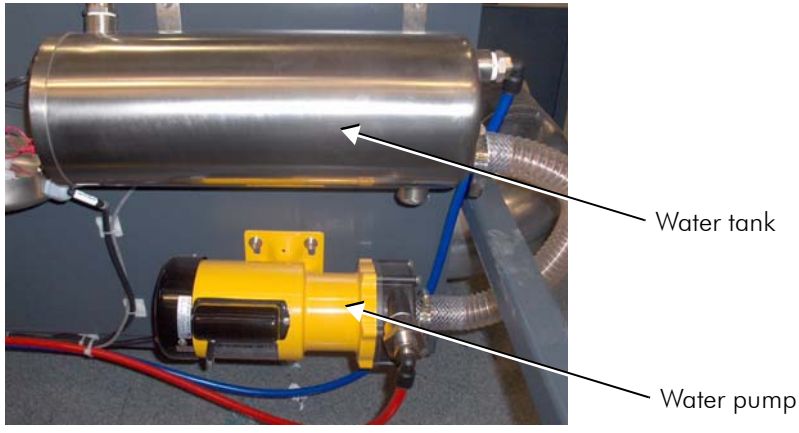


Figure 2-19 Water Tank and Water Pump

Loading/Unloading System

The FB7500 loading/unloading system is a 3/4 automatic system, which controls loading and unloading of the substrate sheets. The system includes the loader, loader table, loader cabinet, and unloader lift.

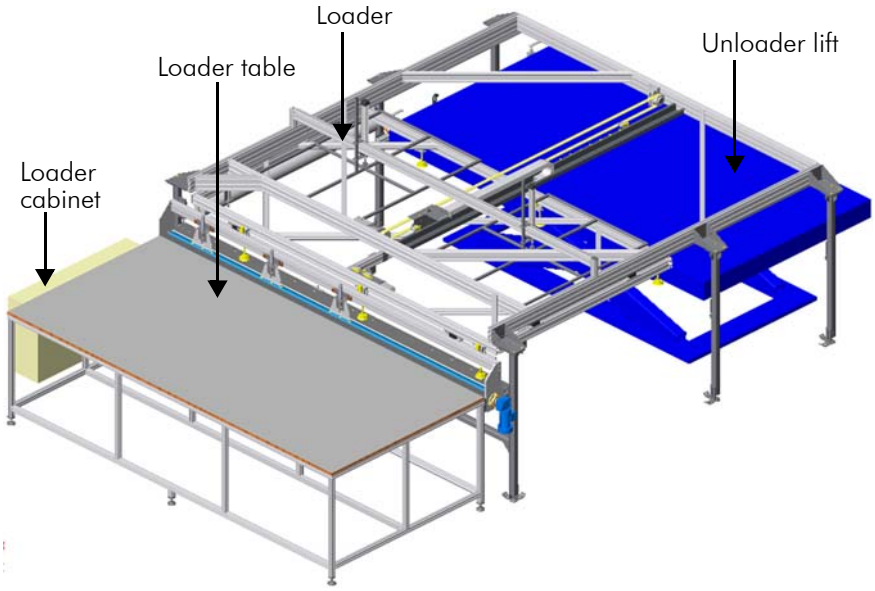


Figure 2-20 Loading/Unloading System

Loader Table

The loader table is a part of the loader. It is used for placing the substrate prior to automatic loading.

Note **The substrates should be placed one at a time.**

Loader

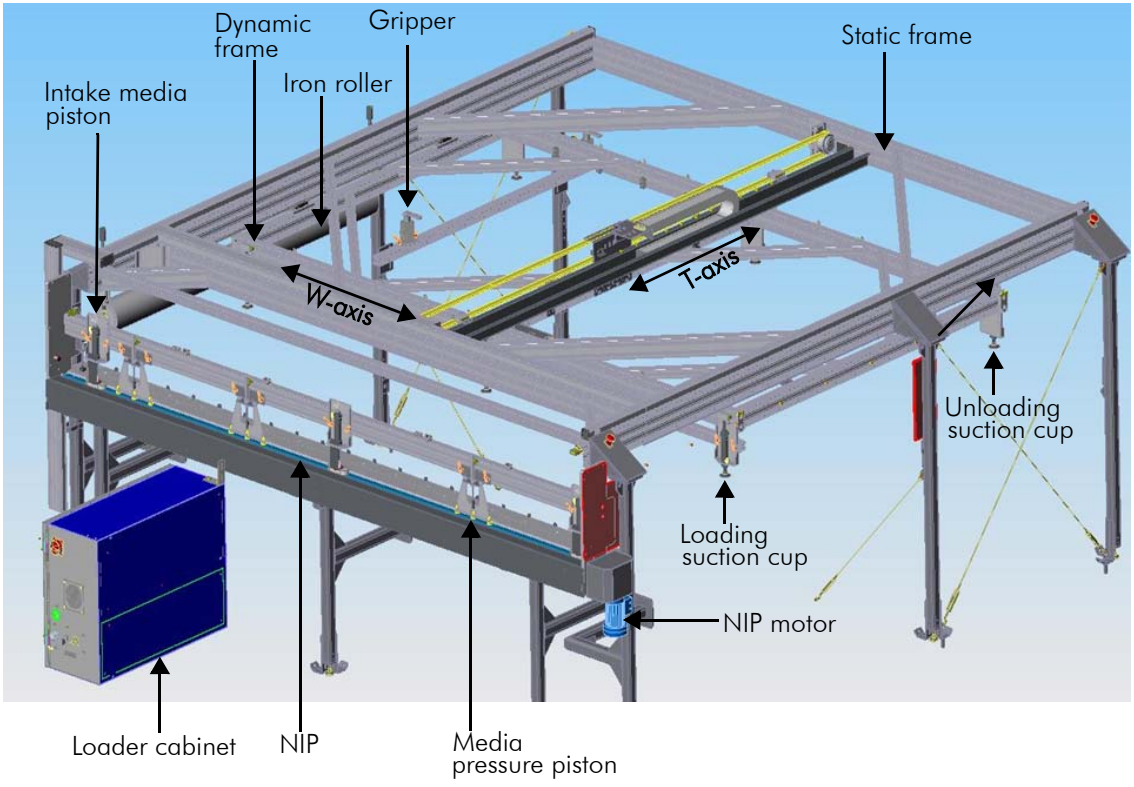


Figure 2-21 Loader Structure

The loader mechanism is comprised of the following components:

- Dynamic frame
- Static frame
- NIP assembly
- 3 intake media pistons for rigid substrates
- 3 media pressure pistons for flexible substrates
- 3 loading suction cups
- 3 unloading suction cups
- T motor-driven axis
- W motor-driven axis
- 2 grippers

The dynamic frame grabs the substrate from the loader table, places it onto the printing table, and unloads it after the printing is complete.

NIP

The NIP is a part of the loading system and carries the functionality of aligning the substrate along the Y-axis before loading it onto the printing table.

The NIP mechanism contains the following components:

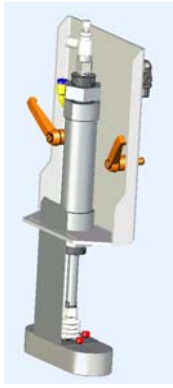
- **NIP roller** - The NIP roller is activated when the substrate reaches the NIP's two inlet sensors. The NIP roller advances the substrate towards the alignment fence. This is done by the intake media pistons (for rigid substrates) or media pressure pistons (for flexible substrates), which press the substrate against the NIP.
- **NIP inlet sensors (2 front sensors) -** These sensors activate the NIP roller and the intake media pistons/media pressure pistons as explained above.
- **Alignment sensors (2 rear sensors)-** These sensors are located closer to the alignment fence and used for alignment relative to the Y-axis.

Media Thickness Detector

The media thickness detector is a safety device located on the left side of the NIP. This detector compares the actual substrate thickness to the value entered in the Substrate Editor window (see Substrate Editor on page 59) and causes one of the following:

- If value measured by the detector is equal (with tolerance of up to + 0.8 mm) to the predefined value, loading continues and a message appears on the operator console.
- If the value measured is higher or lower than the predefined value, printing is aborted.

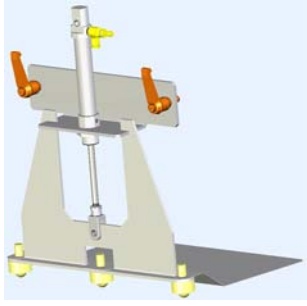
Intake Media Pistons for Rigid Substrates



These pistons blow air on the substrate board against the NIP roller while the media advances from the loading table over the NIP roller. The pistons working pressure is 6 bars.

Figure 2-22 Intake Media Piston

Media Pressure Pistons for Flexible Substrates



These pistons press on the substrate board against the NIP roller while the media advances from the loading table over the NIP roller. The pistons working pressure is 6 bars.

Figure 2-23 Media Pressure Piston

Loading/Unloading Suction Cups

The loading and unloading suction cups are mounted on the dynamic frame of the loader. The loading suction caps grab the substrate from the NIP and place it onto the printing table. Then the unloading suction cups remove the substrate from the table and place it onto the unloader lift.

The loading suction cups move the substrate to left, along the W-axis. This alignment finally positions the substrate at 0,0 point on the X-axis, i.e. at the print start position.

Figure 2-24 Loading/Unloading Suction Cup

Loader Cabinet

The loading system is set and controlled from the dedicated loader cabinet (see Figure 2-26 on page 29). The loader cabinet is located under the loader table.

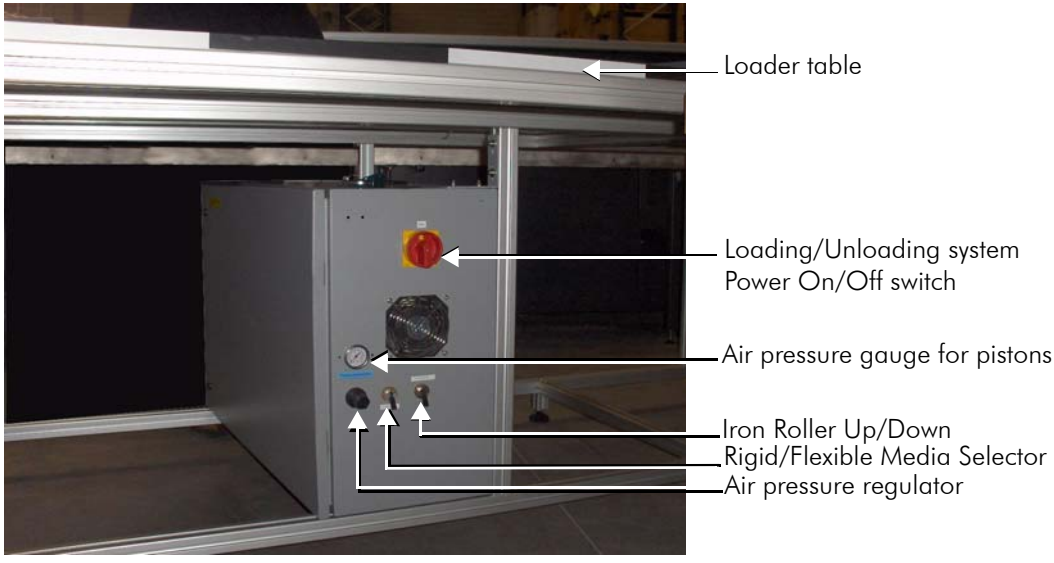


Figure 2-25 Loader Cabinet Front View

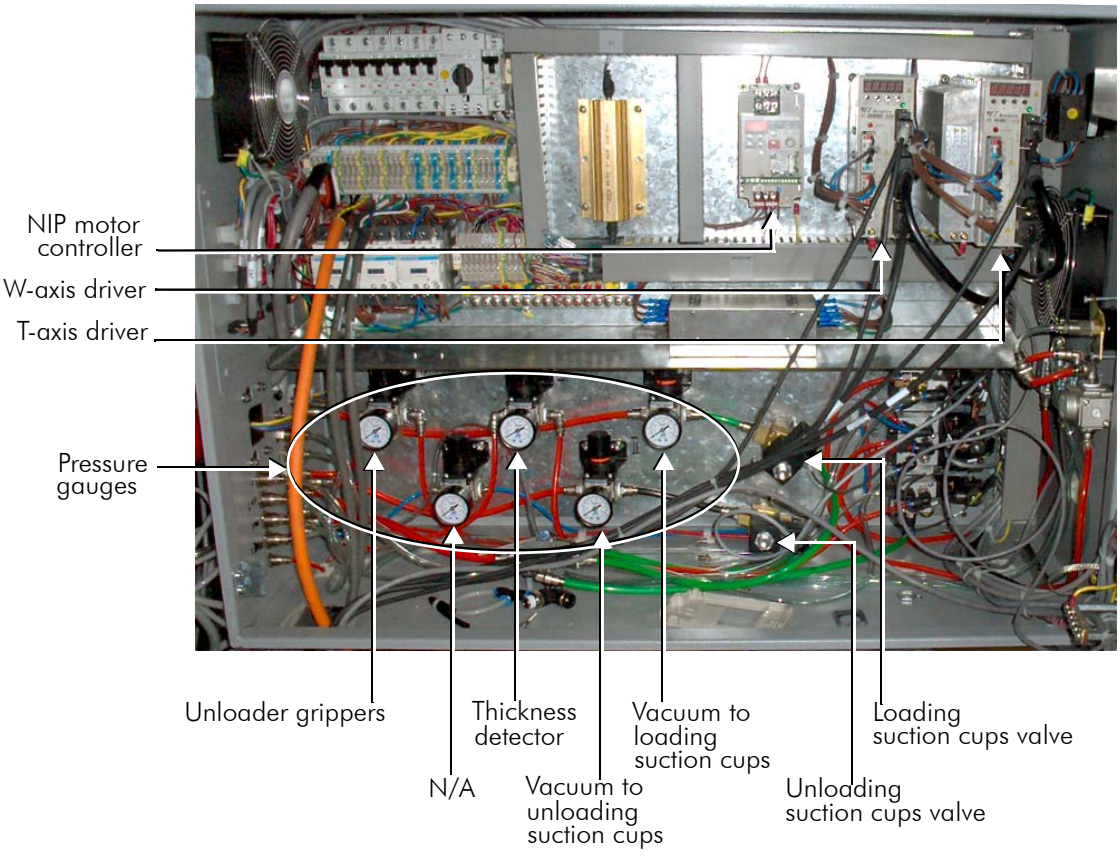


Figure 2-26 Inside of the Loader Cabinet

Loading/Unloading Sequence

1. The machine operators place the substrate onto the loader table.
2. The NIP inlet sensors (2 front sensors) detect the substrate.
3. The system activates the selected set of pistons according to the Rigid/Flexible selector position.
4. The NIP roller advances the substrate.
5. The alignment fence moves up.
6. The alignment sensors (2 rear sensors) detect the substrate.
7. Substrate advance stops and the pistons, alignment fence and the NIP roller are deactivated.
8. The loading suction cups, located on the dynamic frame, move down and grab the substrate.
9. The loading suction cups move the substrate to left, along the W-axis to 0,0 point (print start point on the X-axis).
10. The loading suction cups move up.
11. The dynamic frame moves above the printing table.
12. The system activates the vacuum to the printing table (rigid substrates) or the 1st section of the table (flexible substrates).
13. Loading suction cups go up.
14. The system prints the image.
15. Unloading suction cups move down to the printed media.
16. The system deactivates the vacuum to the printing table.
17. Unloading suction cups grabs the substrate.
18. The dynamic frame moves above the unloader lift.
19. Unloading suction cups move down and place the printed substrate onto the unloader lift.
20. Unloading pistons go up.

Unloader Lift

The unloader lift is a surface where printed substrates are stacked on. At the end of every print run, after the substrate boards are stacked, the lift automatically moves down so as to be at an appropriate height for unloading the next board.

Figure 2-27 Unloader Lift with Open/Closed Cover

Electrical Cabinet

The FB7500 electrical cabinet is positioned near the printer and contains the following components (see Figure 2-28):

- Machine computer
- Etherway boards
- Power supplies
- Safety controller
- Drivers
- Connectors' panel

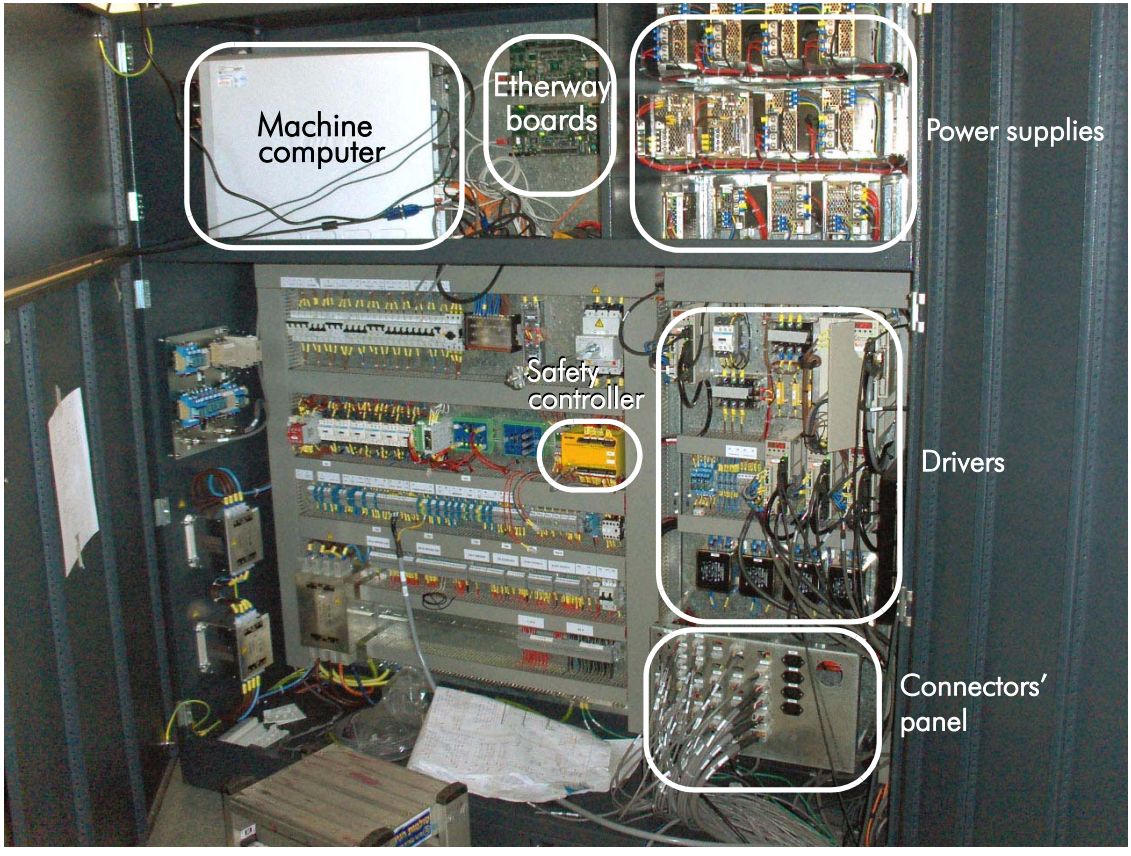


Figure 2-28 Electrical Cabinet

BLSC Cabinet

THe BLSC cabinet located on the rear side of the machine chassis. This cabinet contains I/O electronic boards (BLSC boards), Pumps board, purge air pressure regulator, and air pressure inlet valve (see Figure 2-29).

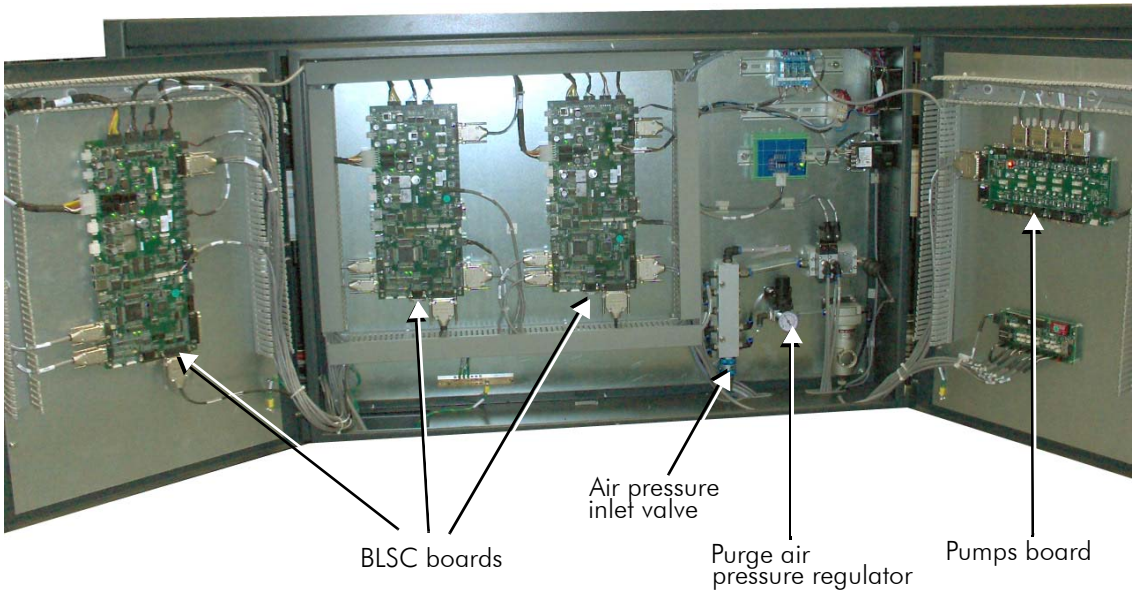


Figure 2-29 BLSC Cabinet

Pneumatic System

The FB7500 pneumatic system supplies compressed dry air to the following subsystems:

- **Printing bridge** - bridge lifting pistons
- **Printing table** - pancake pistons and registration pins for the manual loading
- **Loader/Unloader system** - media pressure pistons, intake media pistons, media thickness indicator, iron roller, alignment fence, loading suction cups, unloading suction cups, and unloader grippers

- **Maintenance system** - purging manifold, vacuum knife pistons, and maintenance bath lifting pistons

The required pressure for the compressed air is **6 bars** with a minimum flow rate of 120 liters/min (4.3 cfm). The compressed air inlet is located inside the machine in the rear left corner.

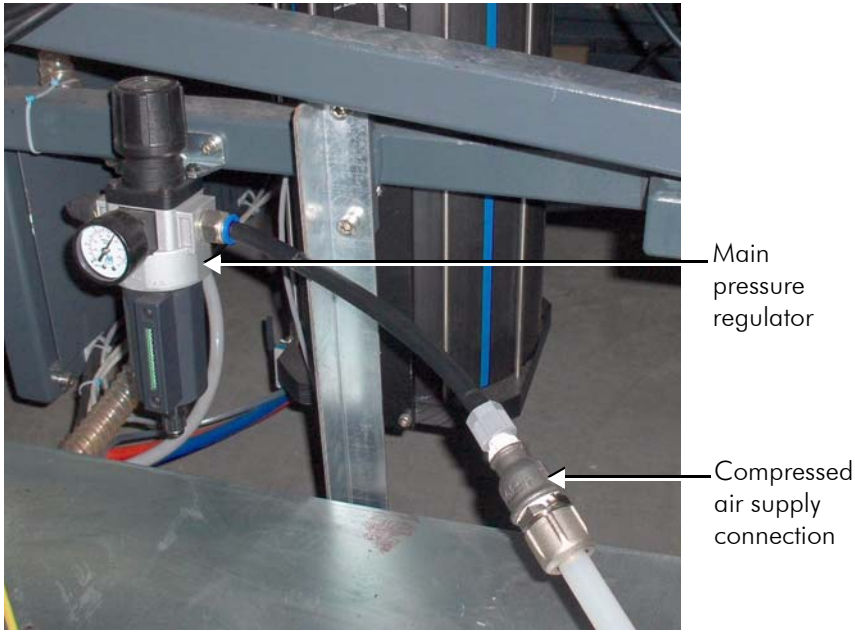


Figure 2-30 Compressed Air Main Pressure Regulator

Vacuum System

The main functions of the vacuum system are:

- **Holding the substrate on the printing table** - a unique vacuum system, especially designed to apply vacuum to the vacuum printing table along the X-axis (see Printing Table on page 15).
- **Cleaning the print heads -** as part of the maintenance system, a vacuum knife is used to clean the print heads (see Vacuum Knife on page 37).

The vacuum is generated by the vacuum pump (see Figure 2-31), which is enclosed within the silence cabinet and can be positioned outside the print production area.

Figure 2-31 Vacuum Pump in the Silence Cabinet

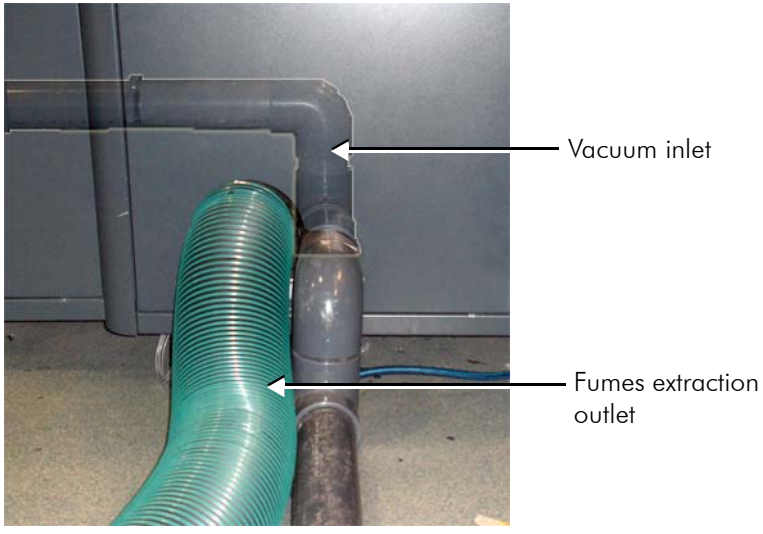


Figure 2-32 Vacuum Inlet on the Printer's Read Side

Maintenance System

The FB7500 maintenance system includes the maintenance bath, vacuum knife, and vacuum separator.

Maintenance bath

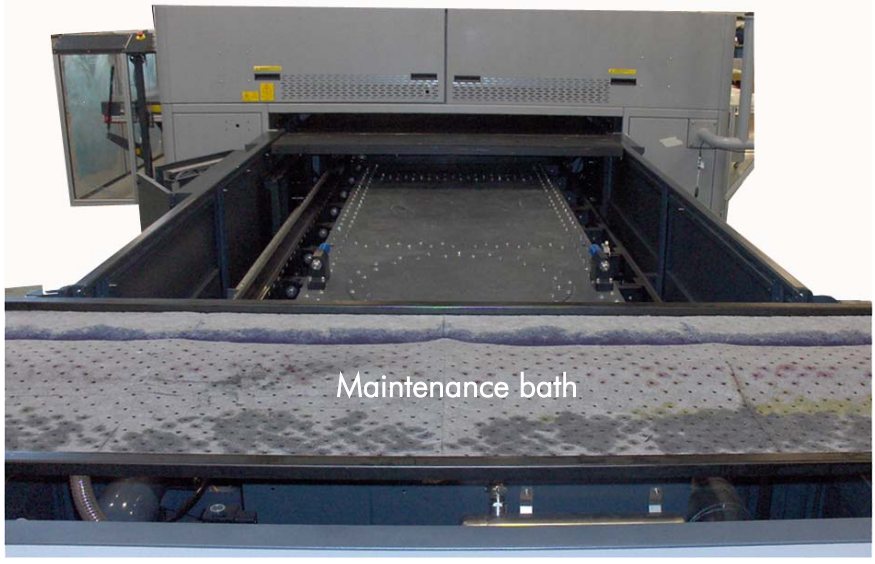
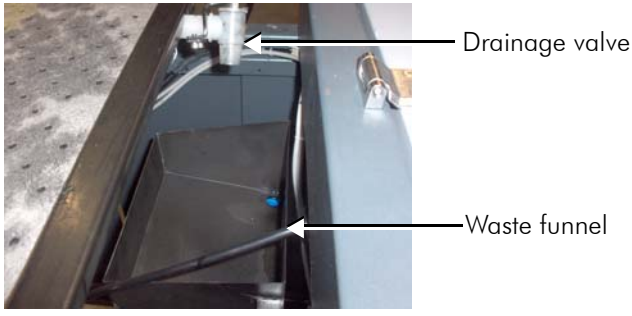


Figure 2-33 Maintenance Bath

During the print heads maintenance, the ink (spills and particles) and dirt are collected in the maintenance bath. From there, they drain into the waste funnel, located inside the machine, on its left side.



Vacuum Knife

The vacuum knife piston moves the vacuum knife along the Y-axis. The vacuum knife sucks dirt and ink dripping from the print heads (all six colors simultaneously).

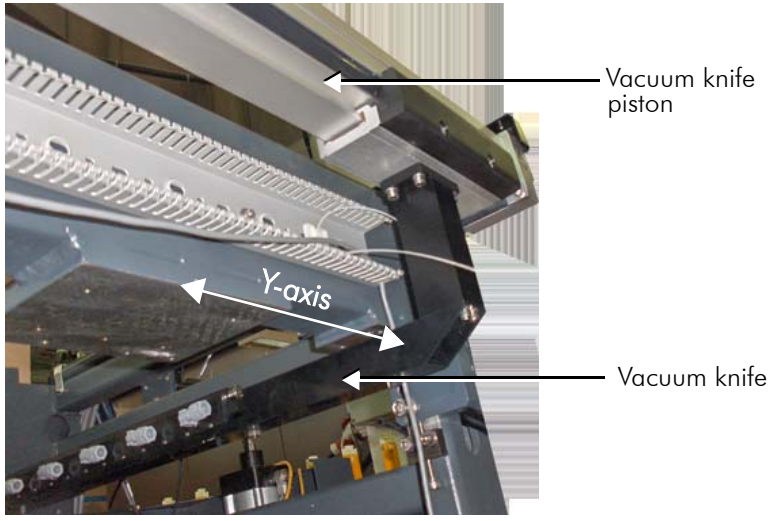


Figure 2-34 Vacuum Knife

Vacuum Separator

The vacuum separator is user for separating air and dirt coming from the vacuum knife. Air is sucked into the vacuum pump and dirt is accumulated at the bottom of the separator.

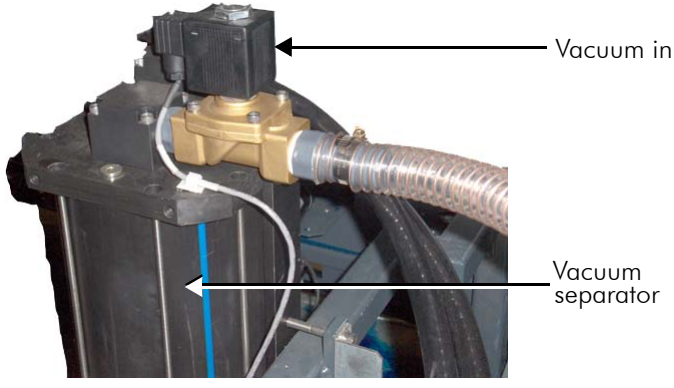


Figure 2-35 Vacuum Separator

Operator Console

The FB7500 printer's operator console is mounted on the operator arm together with Safety lights, Service key and Emergency Stop button.

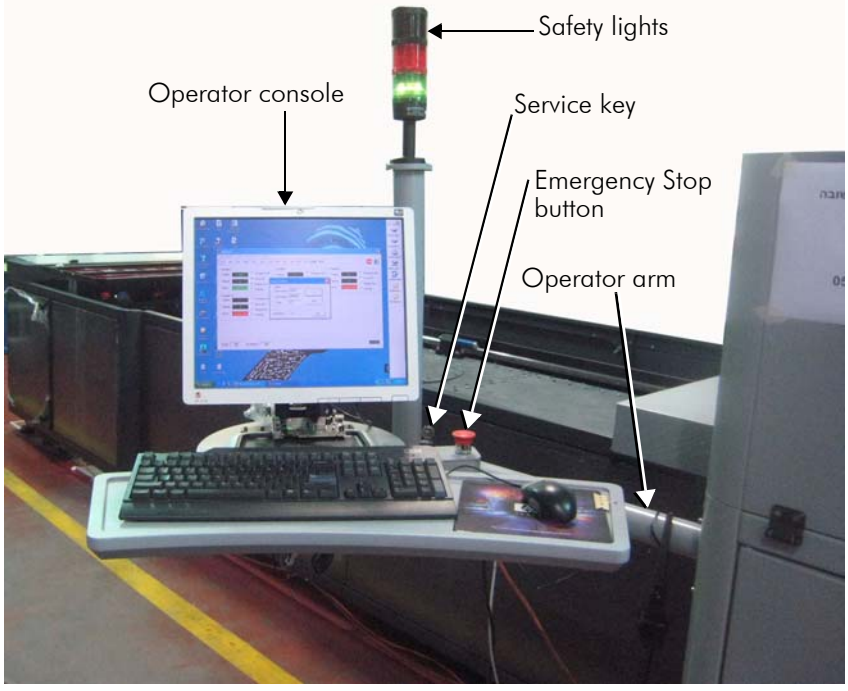


Figure 2-36 Operator Console

The Service key on the operator console is an Emergency Stop button with an additional feature. When the key is removed, the emergency mode cannot be canceled accidentally until the key is returned.

The Safety lights are used for indication of the machine status, as follows:

Red light is On - machine initialization process or safety event.

Green light is On - machine is ready to print or printing.

Printer's Computer

The printer's computer is located within the electrical cabinet (see Figure 2-28) and its configuration is based on the HP 8200xw workstation.

Note

Make sure that all cables are connected as shown in Figure 2-28. The wrong USB connection may cause failure of communication with the Weight and PILZ controller.

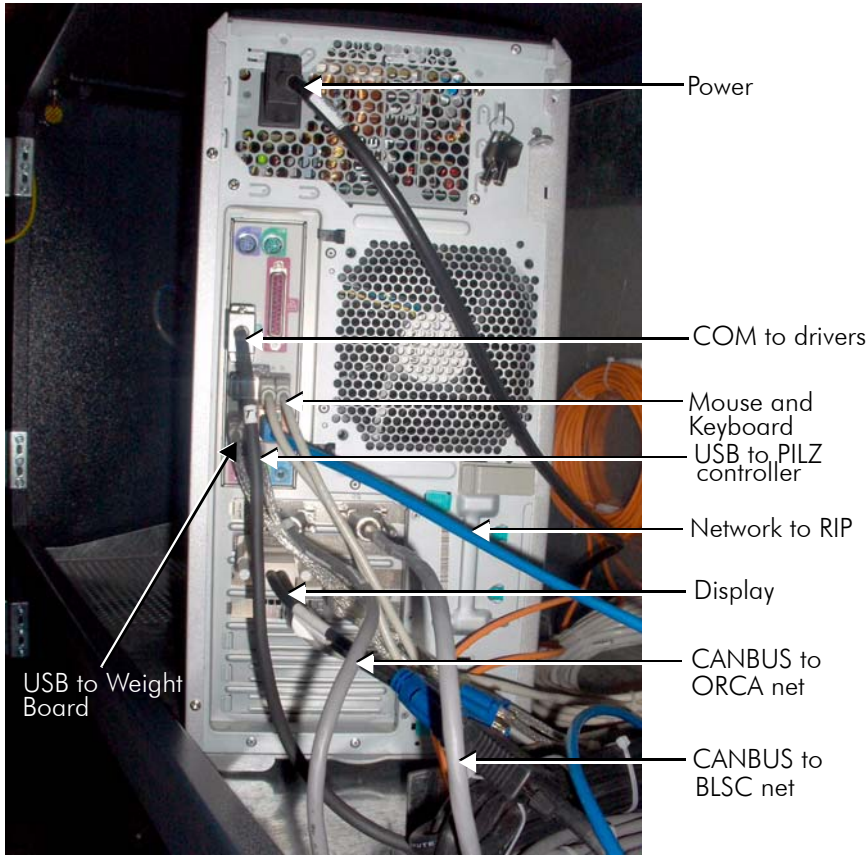


Figure 2-37 Printer's Computer Connections

Data Path

The data path components are:

- RIP station
- Machine computer
- Two Etherway boards
- 7 ORCA boards
- 42 PIC boards (7 PIC boards per color)
- 312 Print heads (52 print heads per color)

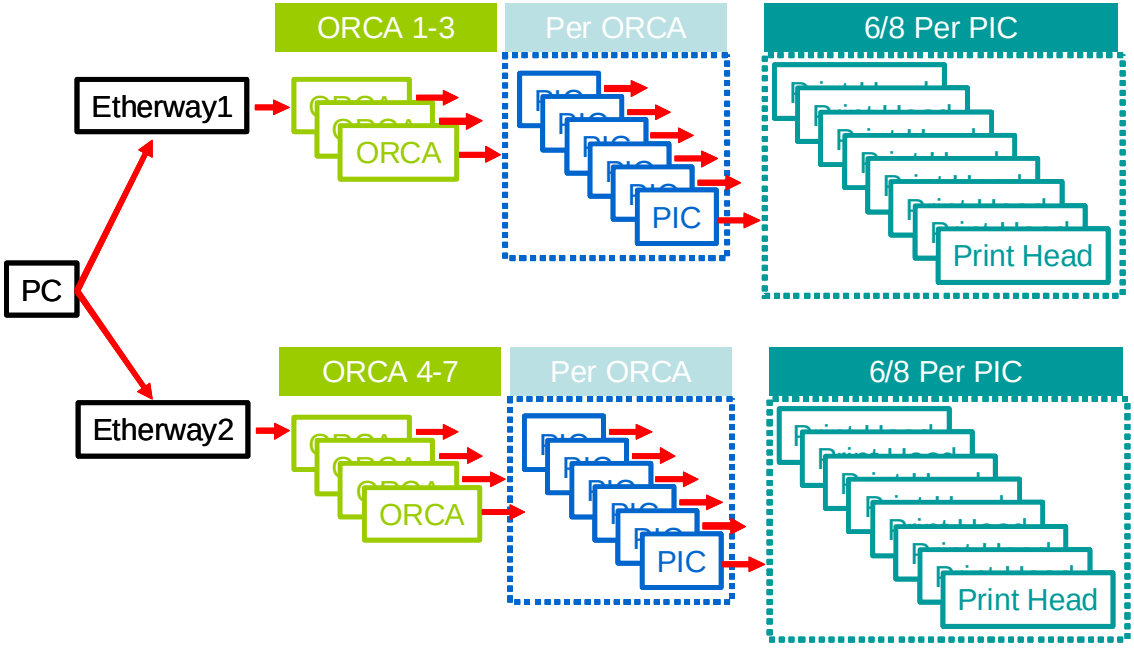


Figure 2-38 FB7500 Data Path

UV System

The UV system includes the following components:

- UV lamp housing
- UV electrical cabinet
- Extraction fan
- UV cooler
- UV bulb
- UV Shutters

UV Lamp Housing

The UV lamp housing (see Figure 2-39) is located above the printing table.

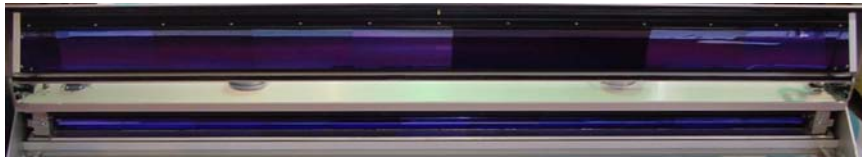


Figure 2-39 UV Lamp Housing

The UV lamp housing includes the following components:

- UV bulb
- Shutters
- Reflectors
- Quartz plate filter
- Air extraction windows
- Water tubes and ducts

The function of the UV lamp is to cure the UV ink on the printed substrate. During printing, the shutters are automatically opened, exposing the media to UV radiation, which cures the printed ink. At the end of the printing, the shutters are automatically closed.

UV Electrical Cabinet

Figure 2-40 UV Electrical Cabinet

The function of the UV electrical cabinet is to:

- Supply the required voltages to the UV system.
- Supply the required voltages to the UV cooler.
- Supply the required voltages to the UV extractor fan.
- Control the UV lamp housing.
- Control the UV cooler.
- Control the UV extraction fan.

Extraction Fan

The function of the extraction fan (see Figure 2-41) is to:

- Remove heat from the UV lamp housing.
- Remove the generated ozone particles from the vicinity of the UV lamp housing.

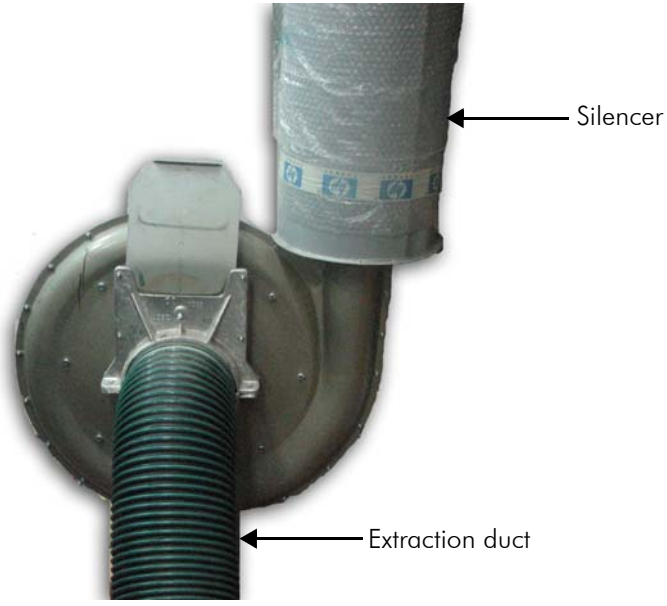


Figure 2-41 UV Extraction Fan

The extraction fan is controlled by the UV electrical cabinet and its flow rate is determined according to the UV lamp power.

UV Cooler

The UV cooler is located near the machine. The function of the cooler is to cool down the UV lamp housing by circulating distilled water through the system.

Figure 2-42 UV Cooler (Front and Side View)

CHAPTER

3

FB7500 Software

FB7500 Main Window 46
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Preview and File Information Section 79
Maintenance and Motion Section 80
Machine Operations Section 81
System Status Section 82

FB7500 Main Window

The HP Scitex FB7500 user interface enables you to select files to be printed, set the printing parameters, perform a print run and maintenance cycle. During any stage of the printing process, you can view dynamically-updated print information at a glance.

To start the FB7500 application, click the **FB7500** icon on your Desktop; the FB7500 main window appears.

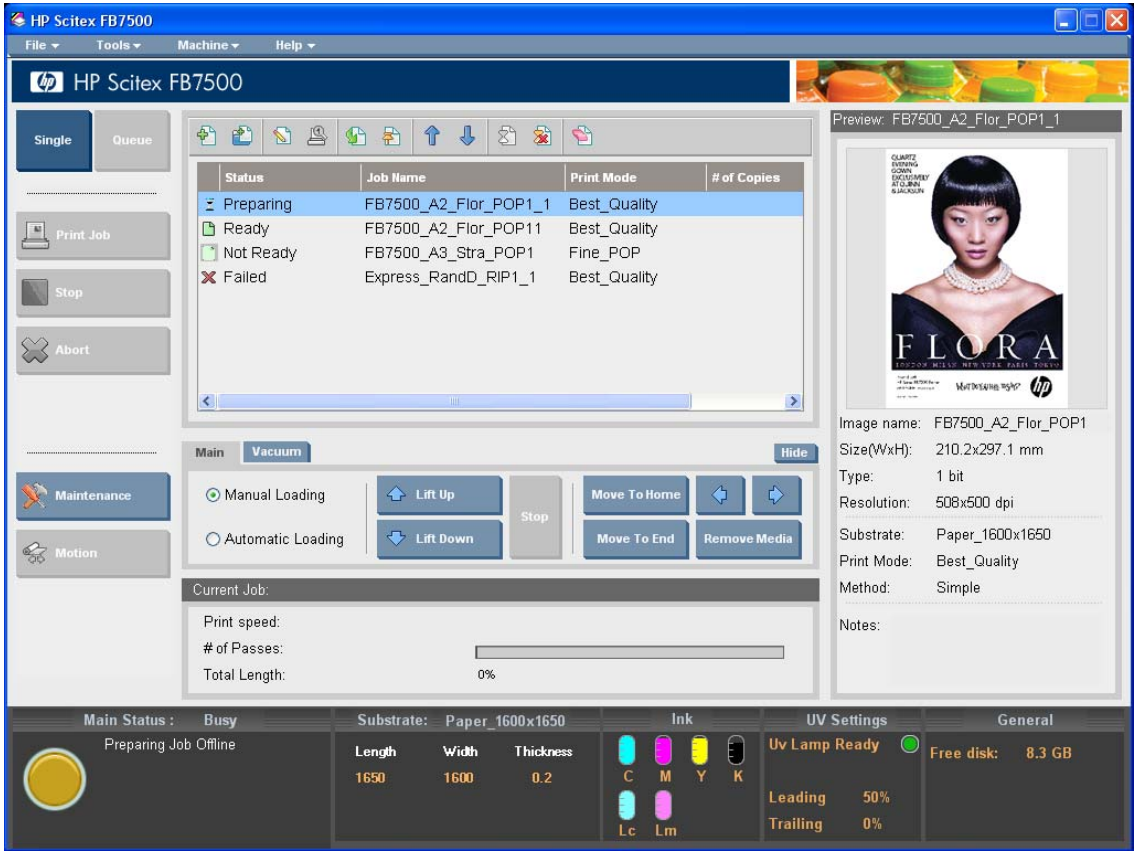


Figure 3-1 FB7500 Main Window

The FB7500 main window is divided into the following sections, as shown in Figure 3-1:

1 - Main menu

2 - Print controls

3 - Jobs list

4 - Preview and file information

5 - Maintenance and motion

6 - Machine operations

7 - Current Job

8 - System status

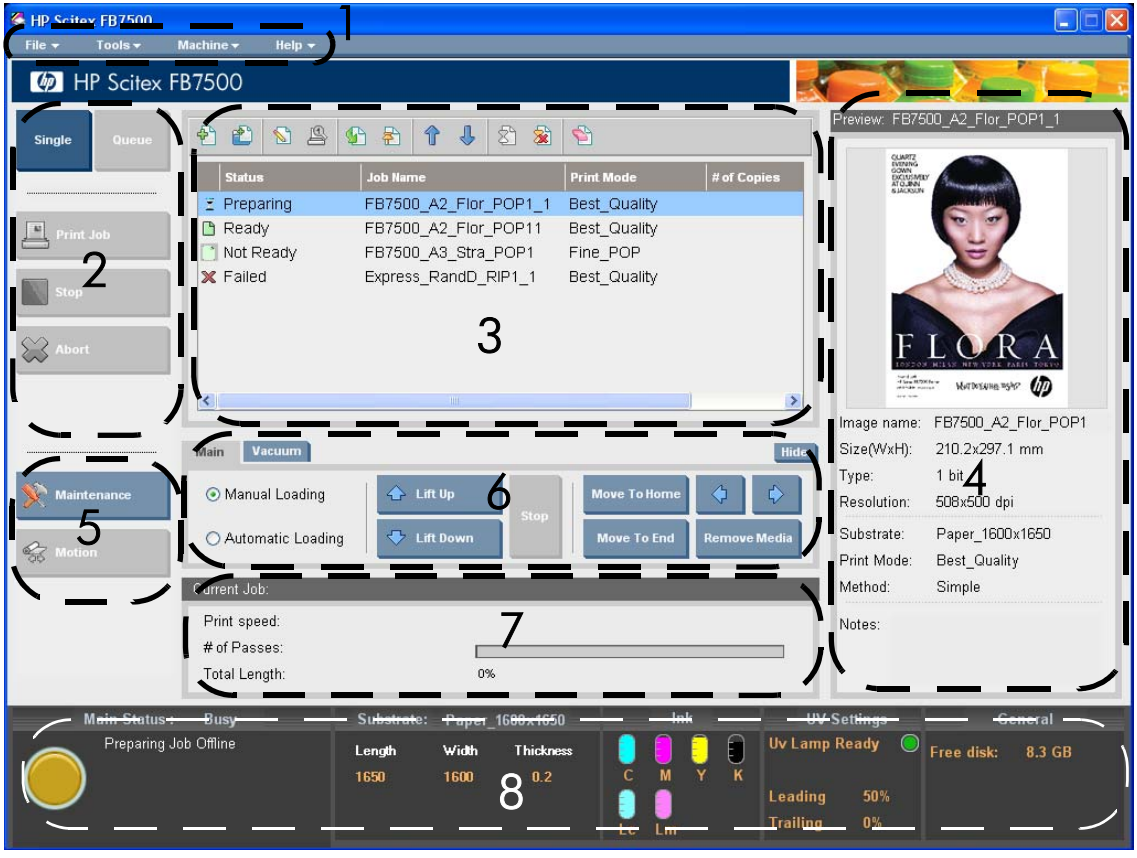


Figure 3-2 FB7500 Main Menu Sections

Main Menu

The FB7500 main menu options and features are described in the following sections.

File Menu

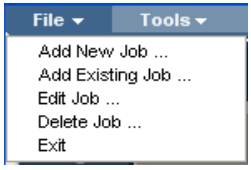
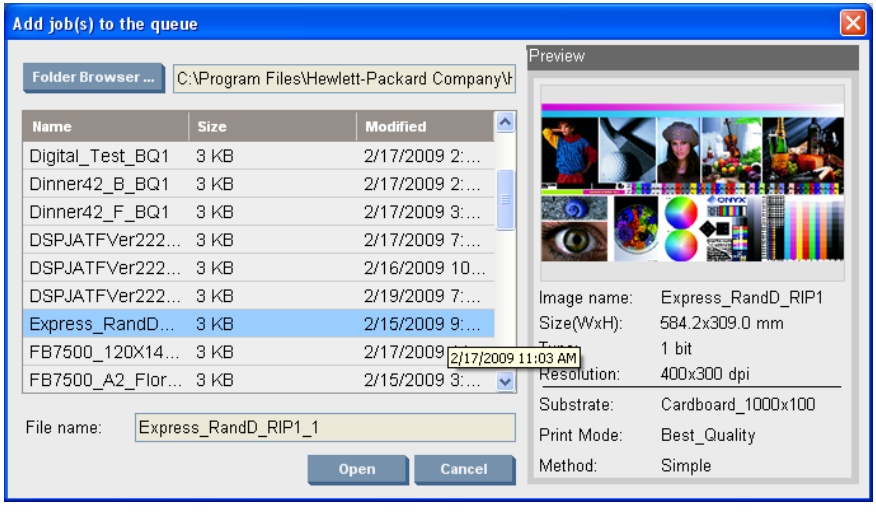
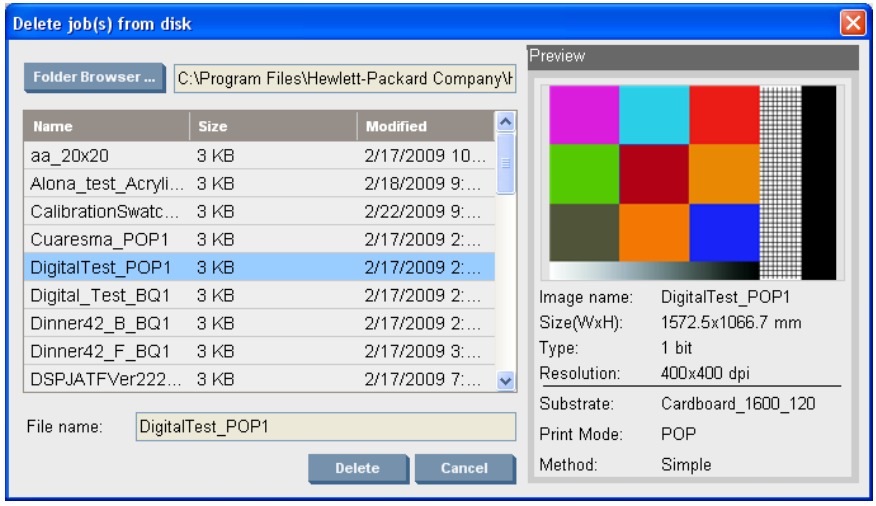


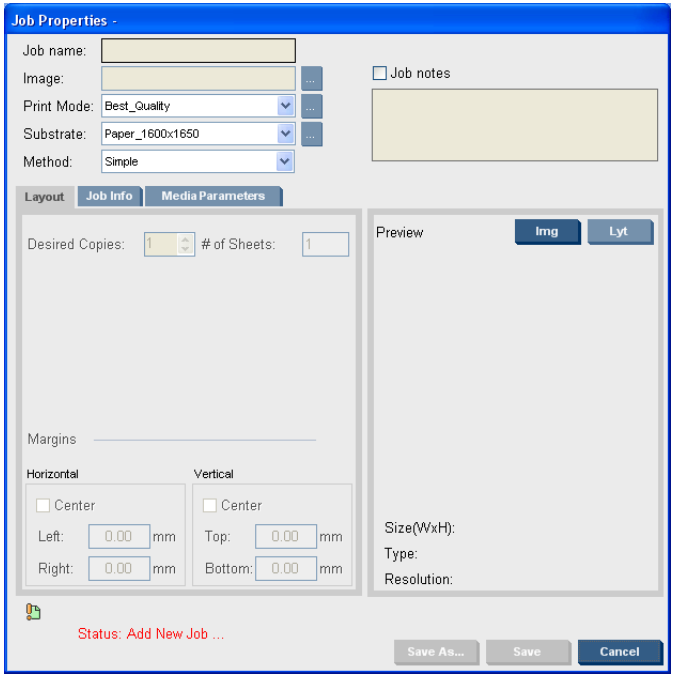
Figure 3-3 File Menu

Option	Used to...
Add New Job	Add a new job to the Jobs List. For instructions refer to Adding a New Job on page 49.
Add Existing Job	Add a new job to the Jobs List. 

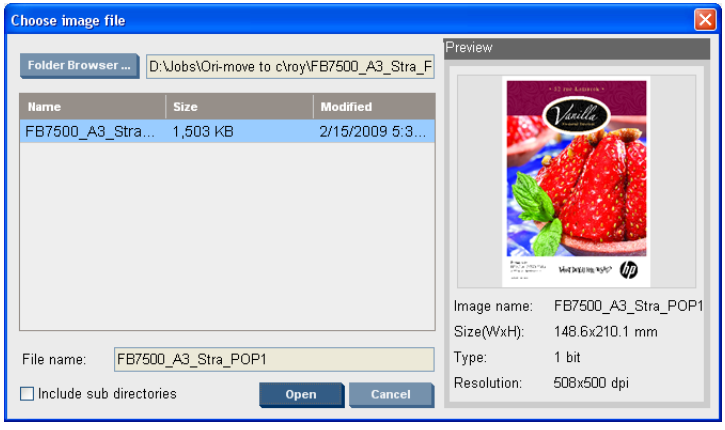
Option	Used to...
Edit Job	Edit a job from the Job Properties window as described in Adding a New Job on page 49.
Delete Job	Delete a job from the Jobs List. 
Exit	Exit the FB7500 application.

Adding a New Job

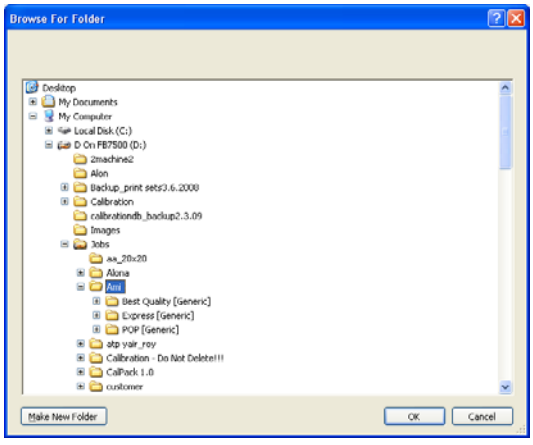
1 In the File menu, select **Add New Job**; the Job Properties window appears. Within this window, there are three tabs: **Layout**, **Job Info** and **Media Parameters**. The **Layout** tab is displayed by default.



2 Click the button, next to the **Image** box; the Choose Image File window appears.



3 Click **Folder Browser**; the Browse window appears.



4 Select the folder that contains the file separations and click **OK**; the Job Properties window appears again displaying the file's preview and information, as shown in Figure 3-4.

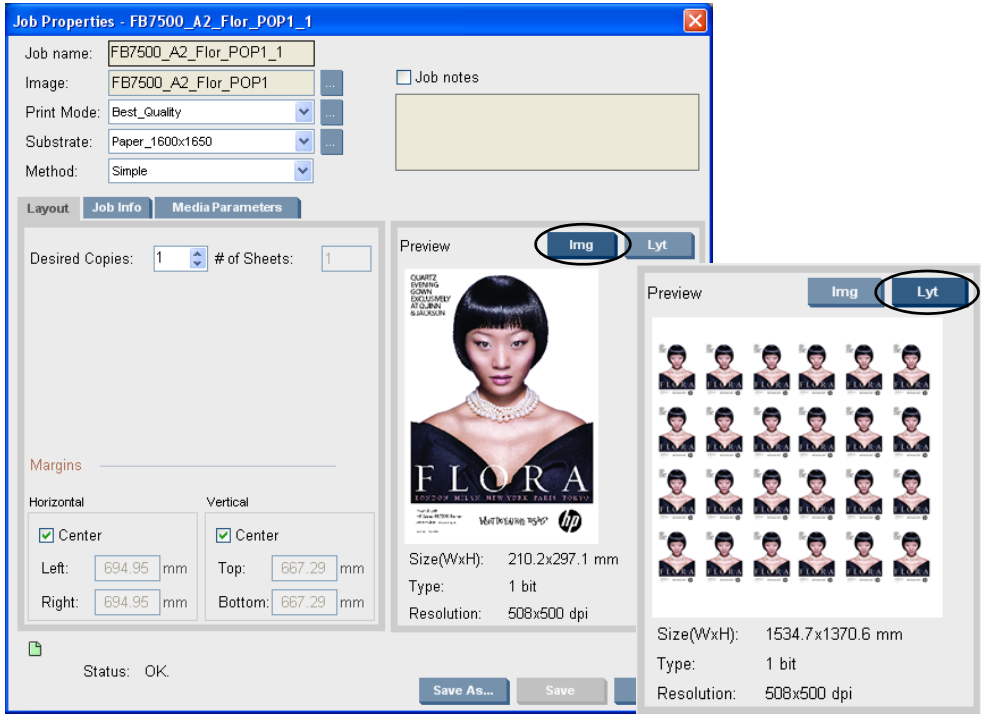


Figure 3-4 Job Properties - Layout Tab

5 Select the way of displaying the file preview (see Figure 3-4 on page 51):

Option	Description
Img	Shows the single file, enlarged to maximum size.
Lyt	Shows the job dimensions relatively to the substrate dimensions.

6 The Job name is named the same as the image by default, but you may change it to a different name at this stage.

7 From the **Print Mode** list box, select the desired print mode. The FB7500 print modes are listed in Table 1-1 on page 5.

The print mode determines the printing quality. It includes the printing table speed, resolution, print directions, number of passes, screen file, mask file, UV factor, and other parameters.

8 From the **Substrate** list box, select the substrate on which you want to print your file.

Upon selecting a specific substrate, the relevant information about it appears on the right side of the window: length, width, thickness, print heads height, and UV power.

Note

All substrates are saved in a dedicated folder, which is an integral part of the FB7500 software. You may add new substrates from the Substrate Editor window (see Substrate Editor on page 59).

9 From the **Method** list box, select the printing method: **Simple** or **Step&Repeat**.

Method	Description
Simple	Each job is printed on one substrate sheet. Under the **Layout** tab, enter the number of copies and the margins' values.

Method	Description
Step&Repeat	This is used when the printed job is smaller than the substrate sheet. In this method you may define the horizontal and vertical copies (on the single sheet and the number of sheets to print) and the gaps between them (see Figure 3-5).

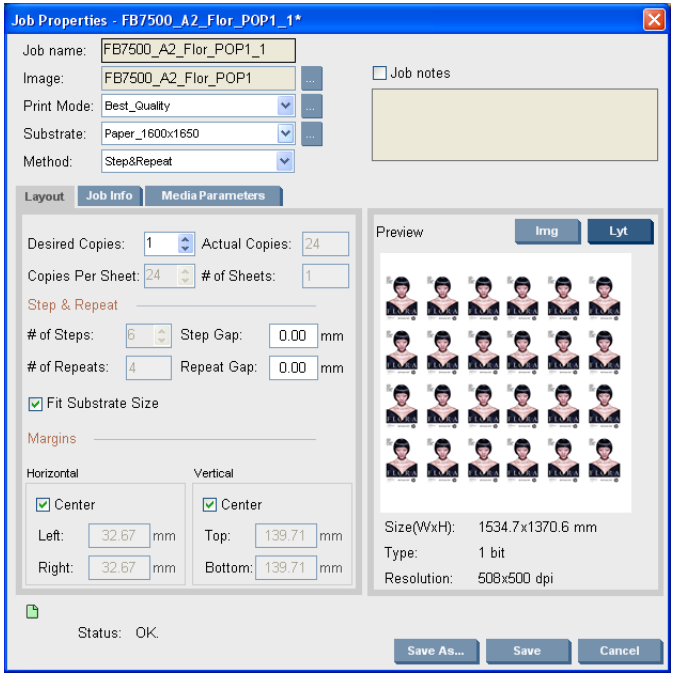


Figure 3-5 Job Properties - Step&Repeat

Option	Description
Copies per Sheet, # of Sheets	Indicates the required number of copies. In **Simple** mode, the **Copies per Sheet** is equal to the **# of Sheets**. In the **Step&Repeat** mode, the **# of Sheets** is calculated automatically by the application, making sure that the number of sheets will be enough to print the required copies. For example: if **Copies per Sheet** is 100 and 6 jobs can be printed on a single, the **# of Sheets** will be 17, and actual number of copies will be 102 (17x6=102).
Margins	A margin is the distance between the job edge and substrate edge. Margins may be added from all 4 sides: left, right, top and bottom. Select the **Center** option (**Horizontal** and/or **Vertical**) to center the job on the media. In this case, margins will be automatically calculated.
Status	Appears at the bottom of window, indicating if the Step&Repeat job fits the selected substrate.

10 If needed, select the **Job Notes** box and enter the notes. These notes will be printed aside the printed image.

11 Click the **Job Info** tab (see Figure 3-6).

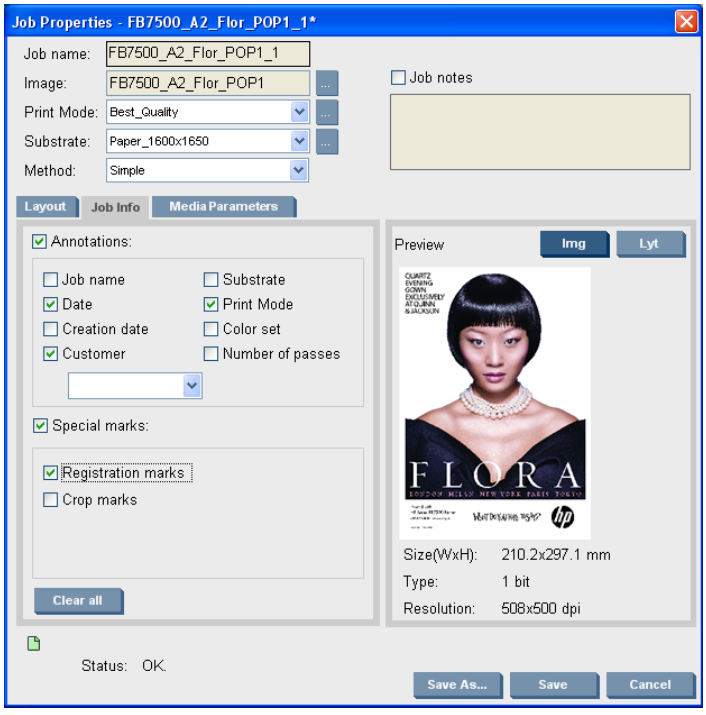


Figure 3-6 Job Properties - Job Info Tab

Option	Description
Annotations	Enables printing of the selected annotations options aside the printed image.
Special marks	Enables printing of the registration marks and crop marks.
Registration marks	Prints registration marks that can be used for double-side or backlit printing.
Crop marks	Prints crop marks on the margins of the current job.

12 Click the **Media Parameters** tab (see Figure 3-7); the parameters of the selected substrate are displayed.

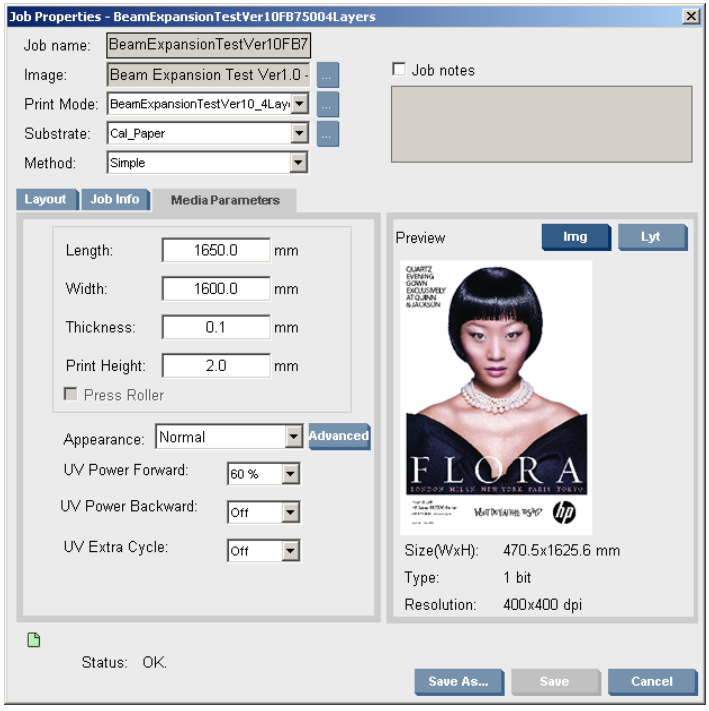


Figure 3-7 Job Properties - Media Parameters Tab (Normal)

13 Select/deselect the **Press Roller** option to enable/disable the press roller, which was predefined in the Substrate Editor on page 59.

14 In the **Appearance** box, select the desired printed image appearance: **Normal** (see Figure 3-7), **Semi Gloss**, or **Gloss** (see Figure 3-8 on page 57).

Note

Cycle is a single move of the printing table under the printing bridge.

Option	Description
Advanced	Opens the Appearance Editor window. Refer to Appearance Editor on page 61.

Option	Description
UV Power Forward	Defines UV intensity (**40%-100%** or **Off**) when the printing table moves forward (from right to left).
UV Power Backward	Defines UV intensity (**40%-100%** or **Off**) when the printing table moves backward (from left to right).
UV Extra Cycle	Enables/disables curing (**40%-100%** or **Off**) after printing is complete. This option is used when the ink is not cured enough and additional curing (forward and/or backward cycle) is required.

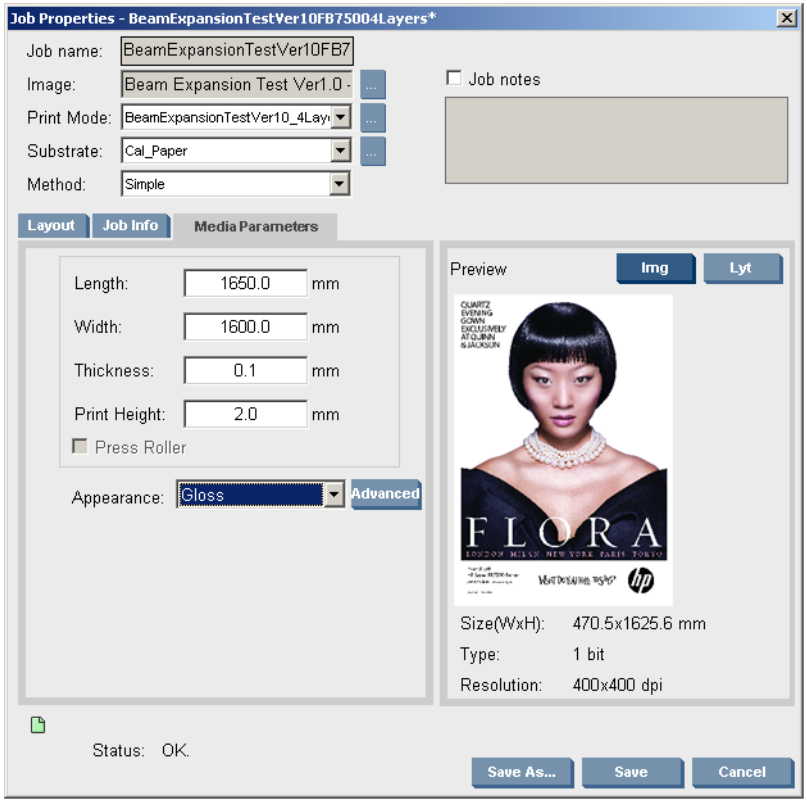
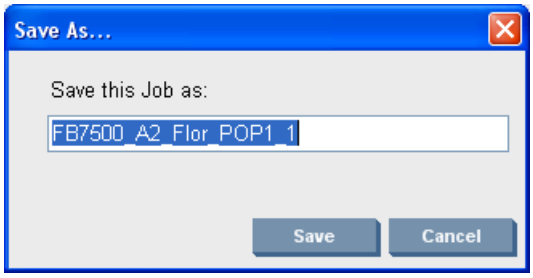
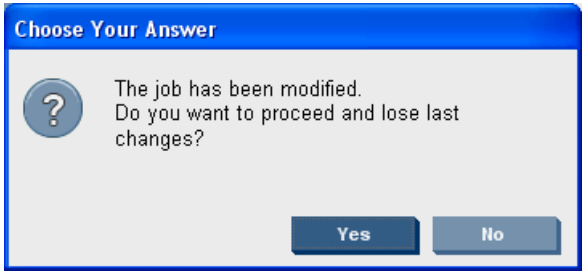


Figure 3-8 Job Properties - Media Parameters Tab (Gloss)

15 Click **Save As** and enter the job name.



16 Click **Save** and then **Yes** to save the job.



The job is displayed in the Jobs List with the **Not Ready** status.

Tools Menu

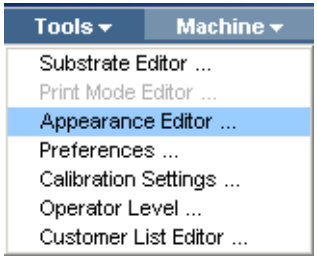
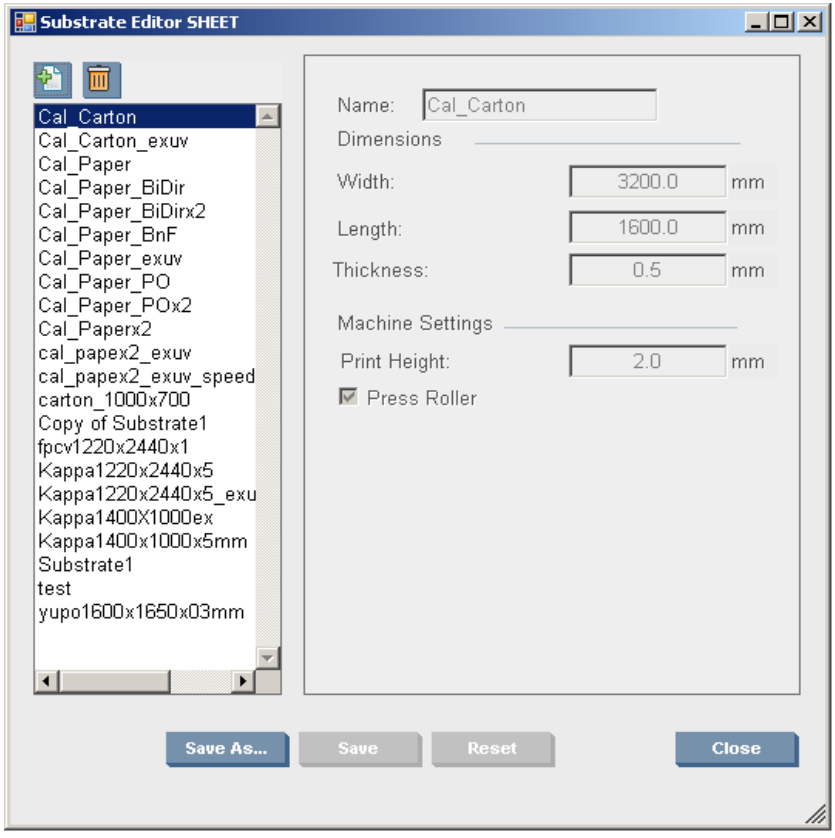
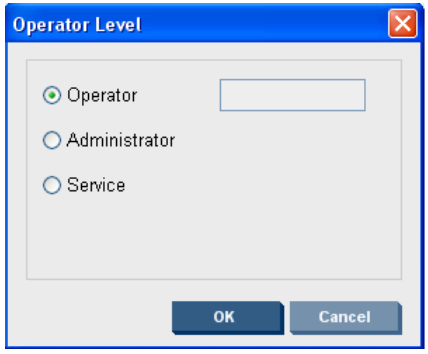
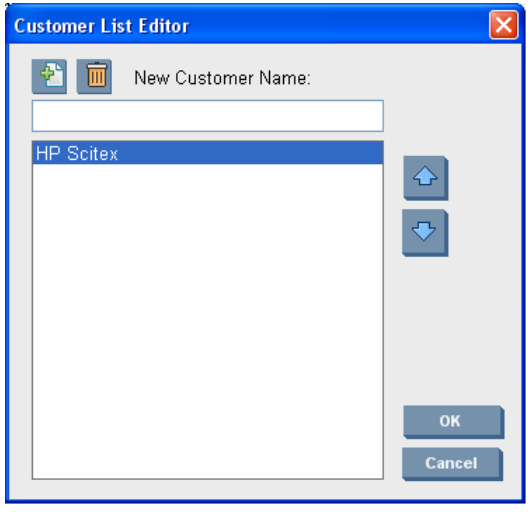


Figure 3-9 Tools Menu

Option	Used to...
Substrate Editor	Add a new substrate or edit parameters/remove an existing substrate. To enable this feature, open the Operator Level window and log on as Administrator. 
Print Mode Editor	For R&D purposes only.
Preferences	Set the preferences. For instructions, refer to Preferences on page 64.
Appearance Editor	Define appearance of a printed image (Normal, Semi-Gloss, or Gloss). Refer to Appearance Editor on page 61.
Calibration Settings	Calibrate the FB7500 printer. For instructions refer to Calibration Settings - Heads V-Trimming Tab on page 66.

Option	Used to...
Operator Level	 Define the level of accessibility for different users. Operator and Administrator are the user's levels.
Customer List Editor	 Create and manage a list of customers. This list is accessible in the Job Properties window, under the **Job Info** tab (see Figure 3-6 on page 55).

Appearance Editor

You can access the Appearance Editor from the Job Properties window (see Figure 3-7 on page 56) by clicking the **Advanced** button.

The Appearance Editor enables you to adjust the appearance of a printed image. There are three possible appearance types: **Normal**, **Gloss**, and **Semi Gloss**. You may change settings of the appearance for the specific print mode or specific substrate, name it, and save for future use. You may rely on your own judgment when changing settings in the Appearance Editor to achieve the desired appearance.

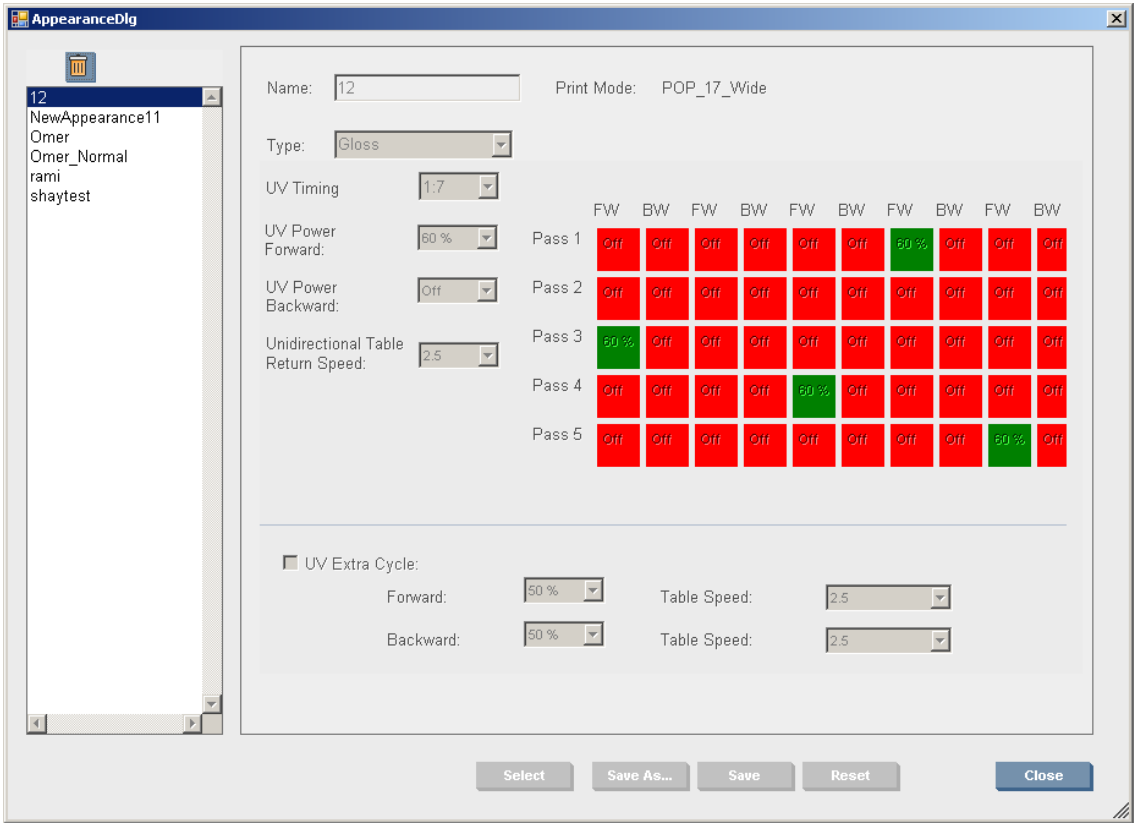


Figure 3-10 Appearance Editor - Gloss

Note **If you select Appearance Editor from the Tools menu, the Appearance Editor window opens for viewing only.**

Note **Cycle is a single move of the printing table under the printing bridge.**

Option	Used to...
Name	Save the appearance settings under a specific name.
Type	Select one of the appearance types: Normal, Gloss, or Semi-Gloss.
UV Timing	Define at which cycle the UV lamp is On. For example, 1:7 determines that each seven cycles the UV lamp will be turned on.
UV Power Forward	Define the UV intensity (**40%-100%** or **Off**) for the printing table forward movement (from right to left).
UV Power Forward	Define the UV intensity (**40%-100%** or **Off**) for the printing table backward movement (from left to right).
Unidirectional Table Return Speed	Define the speed of the backward printing table movement in m/sec (for unidirectional print modes only).
UV Extra Cycle	Enables/disables curing (**40%-100%** or **Off**) after printing is complete. This option is used when the ink is not cured enough and additional curing (forward and/or backward cycle) is required. **Forward** - Defines UV intensity (40%-100% or Off) during the forward movement. **Backward -** Defines UV intensity (**40%-100%** or **Off**) during the backward movement. **Table Speed -** Defines the speed of the printing table.
Select	Select one of the appearances listed on the left side of the window.
Save As	Save the new appearance settings under a new name.
Save	Save changes for the existing appearance.

Option	Used to...
Reset	Reset all settings to defaults, i.e. to change back to their original settings.

The Appearance Editor window for the **Normal** type is shown in Figure 3-11.

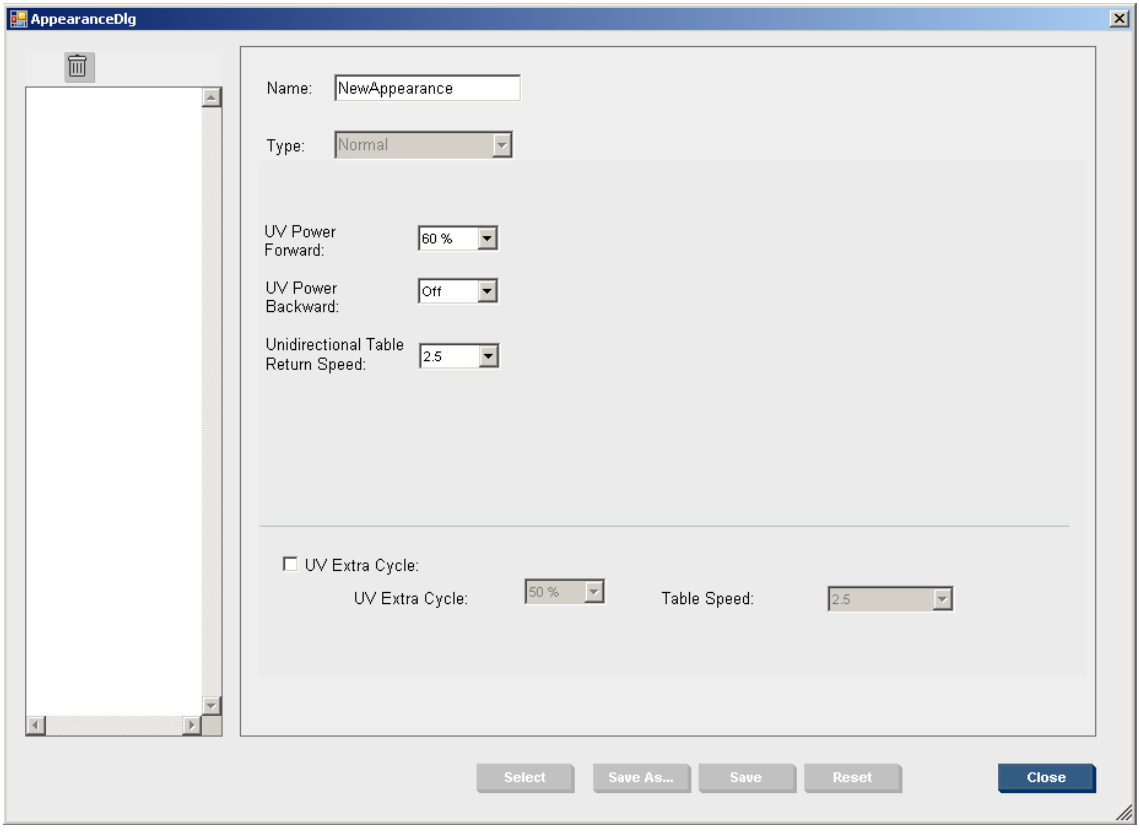


Figure 3-11 Appearance Editor - Normal

Preferences

The Preferences window contains the three tabs: **General**, **Quality** and **Additional Settings** (see Figure 3-12).

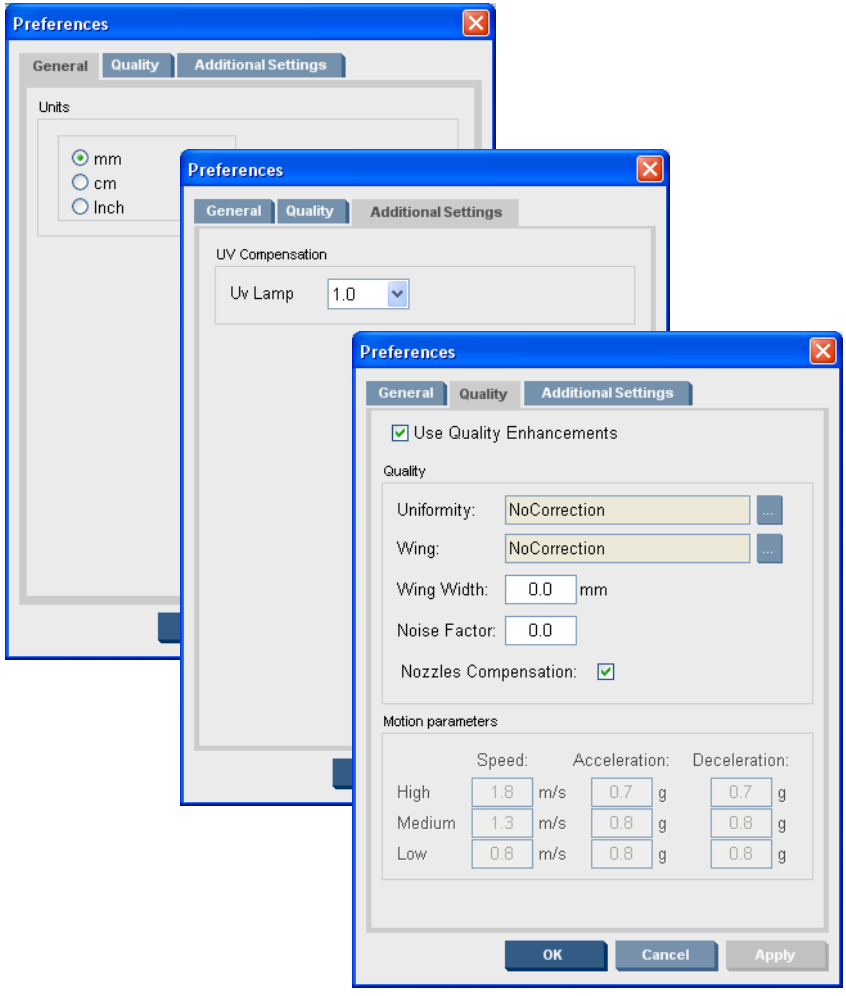


Figure 3-12 Preferences Window Tabs

Option	Description	
Units	Defines the measurement units (**mm**, **cm** or **inch**)	
UV Compensation	In time the UV bulb radiation fades out, which can be indicated by insufficient ink curing. This option enables you to compensate the fade-out via the machine software.	
Use Quality Enhancement	Select this option to enable the quality enhancement tools	
Quality	**Uniformity**	Select a Uniformity Profile to enhance the appearance of unified areas.
	Wing	Future option
	Wing Width	Future option
	Noise Factor	The algorithm that improves the image smoothness. However, if the applied value is more than 10%, it may increase the image graininess.
	Nozzles Compensation	When selected, it enables compensation of the missing nozzles, also called MNC procedure, via the Calibration Settings window shown in Figure 3-15 on page 69. For instructions refer to Missing Nozzles Compensation (MNC) Procedure on page 98.
Motion Parameters	For service purposes only.	

Calibration Settings - Heads V-Trimming Tab

The **Heads V-Trimming** tab shows the print heads' numbers and voltages applied to the specific print head of the specific color (see Figure 3-13).

Reference

For detailed instructions on how to perform the Trimming procedure, refer to ACT-Trimming User Guide on the ACT DVD supplied in the FB7500 User Documentation Pack.

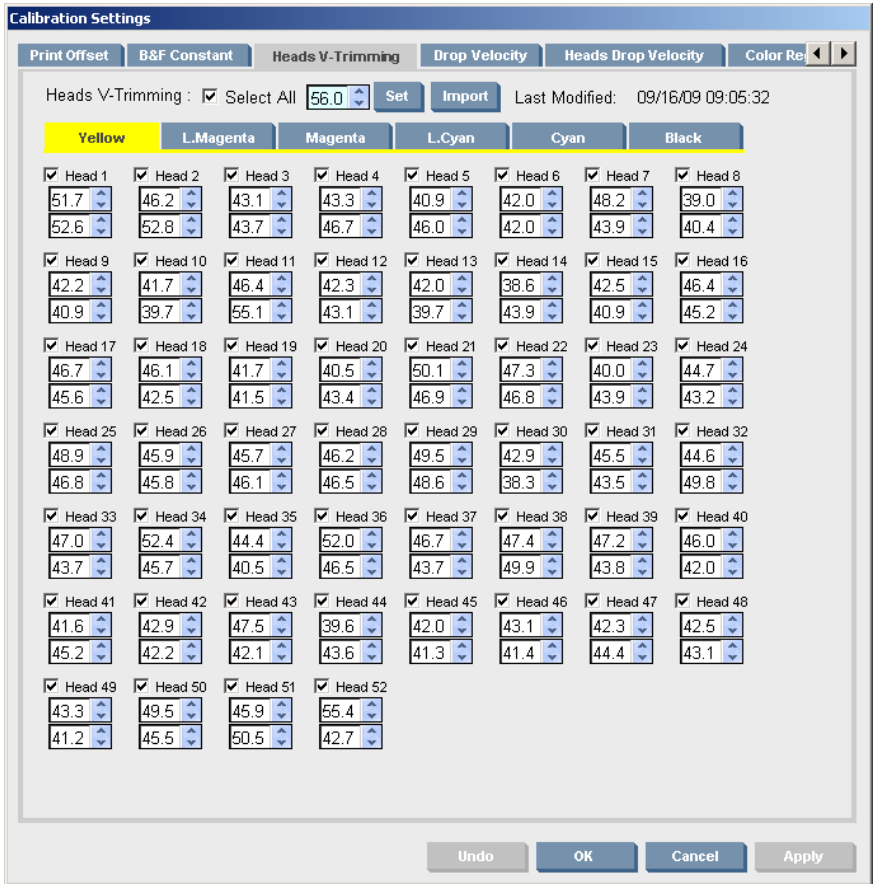


Figure 3-13 Calibration Settings - Heads V-Trimming Tab

Calibration Settings - Import & Export Tab

This tab is used for importing the **.meir** file at the end the Trimming procedure and exporting/importing of the **CalibrationDB.ini** file.

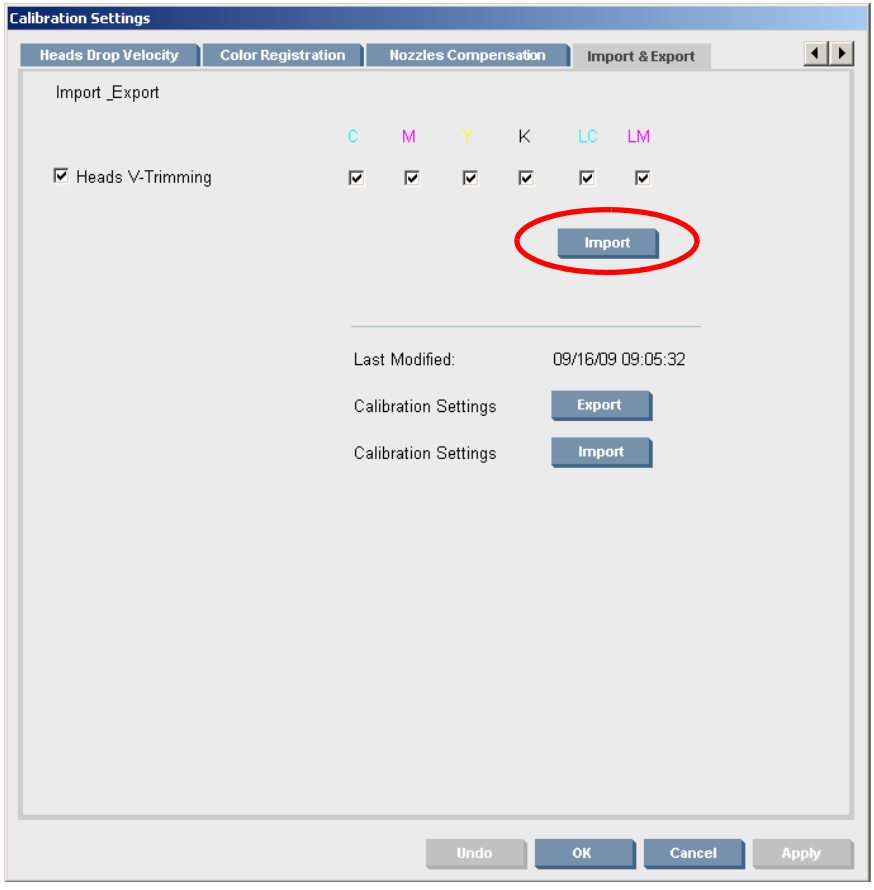


Figure 3-14 Calibration Settings - Import & Export Tab

Reference

For detailed instructions on how to import the .meir file, refer to ACT-Trimming User Guide on the ACT DVD supplied in the FB7500 User Documentation Pack.

Option	Description
Heads V-Trimming	This option should be selected while importing the **.meir** file.
Import	Imports the **.meir** file for the selected colors. The **.meir** file contains voltage correction values that will be applied to the print heads to achieve uniformity between them and inside each print head.
Calibration Setting Export	Saves the **CalibrationDB.ini** file in the desired folder. You may save the file under a different name. The **CalibrationDB.ini** file contains all machine settings created during the FB7500 Calibration Procedure.
Calibration Settings Import	Imports the **CalibrationDB.ini** file to restore the machine settings previously saved.

Calibration Settings - Nozzle Compensation Tab

This option should be activated from the **Preferences** => **Quality** tab (see Missing Nozzles Compensation (MNC) Procedure on page 98).

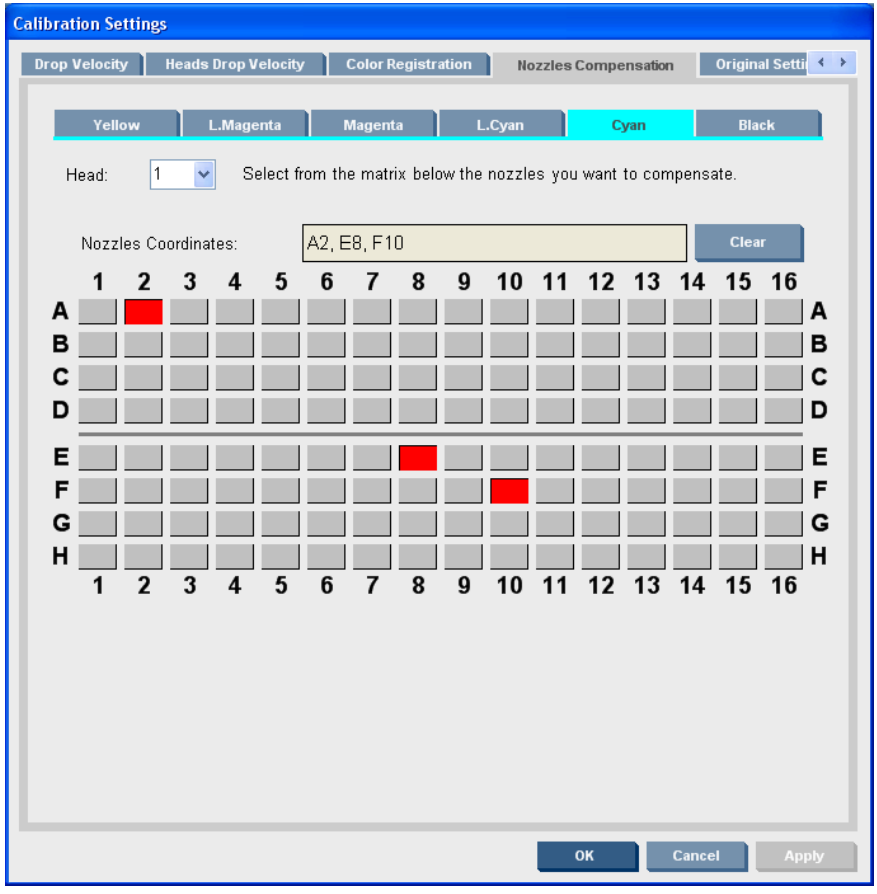
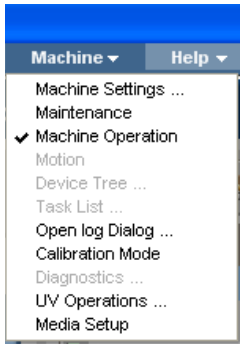
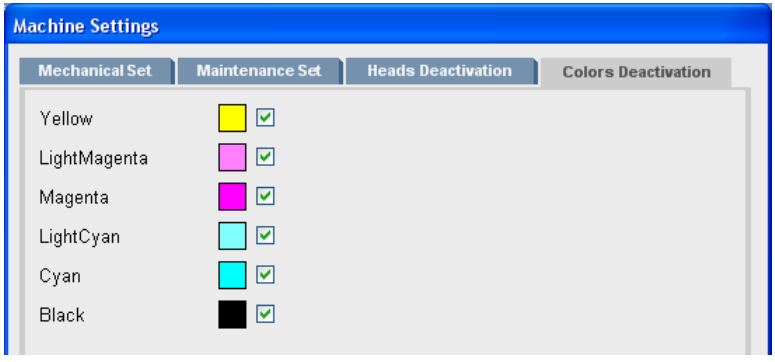


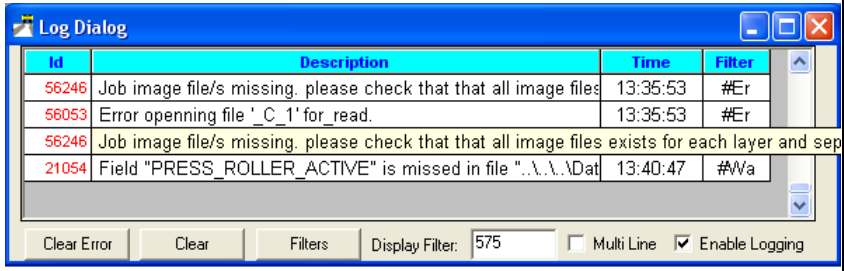
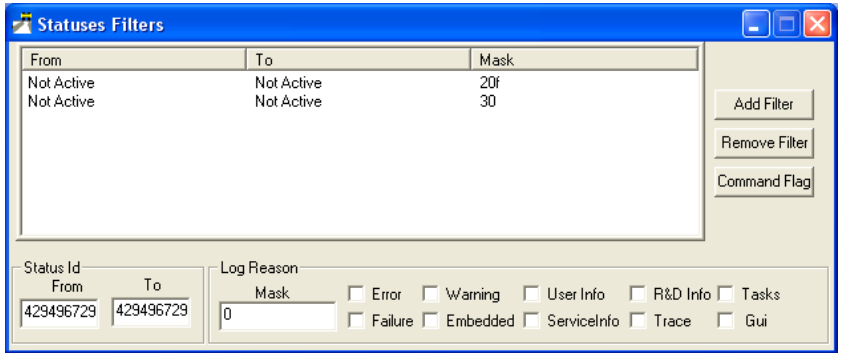
Figure 3-15 MNC Window

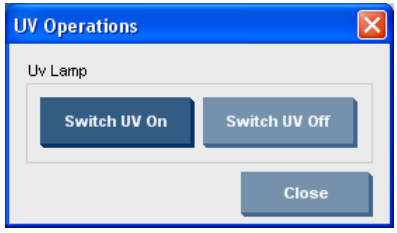
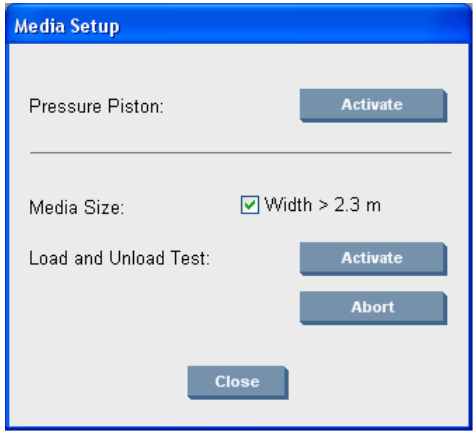
For instructions on the MNC procedure, refer to Missing Nozzles Compensation (MNC) Procedure on page 98.

Machine Menu

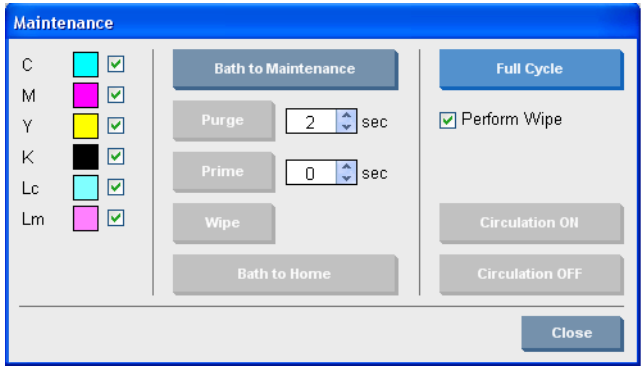


Option	Description
Machine Settings - Colors Deactivation Tab	Enables you to deactivate specific colors. Once deactivated, the image will be printed out without that color.  Other tabs are for the service purposes only.
Maintenance	Performs a print heads maintenance (see Maintenance Window on page 73).
Machine Operation	Opens/Hides the **Machine Operations** section on the FB7500 main window (see Machine Operations Section on page 81).
Motion	For service purposes only.
Device Tree	For service purposes only.
Task List	For service purposes only.

Option	Description
Open Log Dialog	 The Log Dialog contains information regarding the failed jobs: error ID, cause of a failure, time it happened, and filter. Open this window to if you suspect a problem with the printer. Buttons: **Clear Error** - clears the error messages **Clear** - clears all messages **Filters** - opens the Statuses Filter window  **Display Filter** - future option **Multi Line** - future option **Enable Logging** - enables to view the Log Dialog window
Calibration Mode	In the Calibration mode, clicking **Open Existing Job** shows the Calibration jobs only.
Diagnostics	For service purposes only.

Option	Description
UV Operations	 Switches on/off the UV system. The UV lamp, by nature, cannot be switched on or off instantly. It should be switched on at startup and switched off at the end of the work day. When the machine is in the Stand By mode, the UV lamp switches to the reduced power level of 30% and its shutters are closed.
Media Setup	 **Pressure Piston** - used for the rigid substrates. 2 (or 3) pistons press the substrate against the NIP. **Media Size** - select this option to activate 3 pistons for the substrate sheets wider than 2.3 m **Load and Unload Test** - used for checking if the loading/unloading system functions properly (see Loading/Unloading Sequence on page 30).

Maintenance Window



Option	Description
Full Cycle	Automatically performs a full print heads maintenance cycle. It is recommended to perform it with **2 sec.** purge and **Perform Wipe** selected.
Purge	Performs purge for the specified duration.
Prime	N/A
Bath to Home	Wipes the print heads with the vacuum knife after the purge.
Circulation Off/On	Removes air bubbles from the ink system.
Bath to Maintenance	Moves the printing table to the left; then the printing table takes the maintenance bath to the position under the print heads.

Help Menu

Displays current FB7500 software version and Copyright.

Print Controls Section

Option	Description
Single	This allows you to add several jobs to the list and set their printing parameters. The jobs will be printed one by one (one copy or more).
Queue	Future option

Option	Description
Print Job	The printing process is described in Printing a Job on page 92.
Stop	Stops the current job after completing the current copy.
Abort	Stops the print process immediately.

Jobs List Section

The Jobs List section displays all the image files waiting to be printed with their status, print mode, and the number of copies.

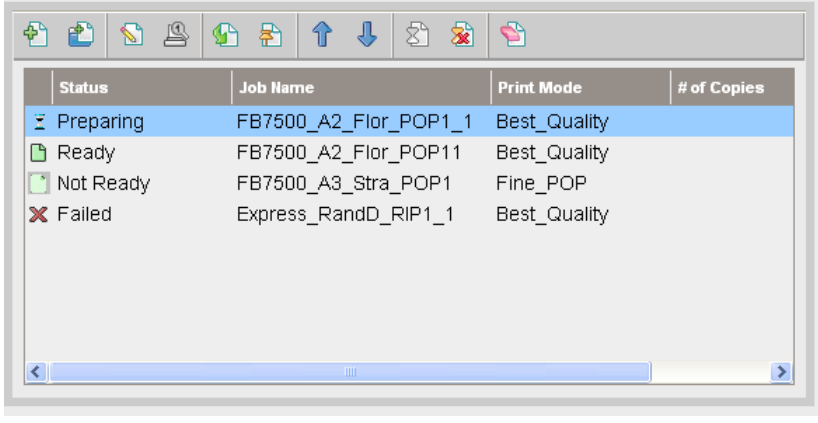


Figure 3-16 Job List Section

Toolbar

Use the toolbar for managing the Jobs List.

Icon	Function	Use this icon to...
	Add New Job	Add a RIPed job to the list (same as **Add New Job** in the **File** menu). After selecting the job and saving it, the job is automatically archived in a dedicated folder within the FB7500 application folder.
	Add Existing Job	Add a job which was previously added to the list (same as **Add Existing Job** in the **File** menu).
	Edit Job	Review/change the properties of a job in the list (same as **Edit Job** in the **File** menu).
	Proof	Print one copy of the job, or a cropped portion of it for checking.
	Activate	Release a job from one of the following statuses: Hold, Pause, Stop or Abort.
	Hold	Disable the print of a job on the list. To release the job from Hold status, right click the stopped job and select **Activate**.
	Up/Down	Move a job on the list upward so as to print it earlier Move a job on the list downward so as to print it later.
	Remove	Remove a job from the list.

Icon	Function	Use this icon to...
	Prepare Job Offline	Prepare a RIPed job to print. In this "Offline Prepare" stage the bitmap separation's data of the job is nozzle-mapped, using a Mask file. In other words, the job's data is distributed among the print heads and the different passes/cycles. "Prepare Job Offline" should be activated manually by the user. Jobs that are prepared successfully switch to the "Ready" status.
	Abort Prepare Job Offline	Abort a Prepare Job Offline process.

Job Statuses

Every job on the Jobs List appears with its status, as follows:

Icon	Status	Description
	Ready	The job is ready to print, i.e. the job has passed the Prepare stage successfully.
	Not Ready	This is the status of a new job. The job has to pass the Prepare process, and only then it will be ready to print.
	Preparing	The job is in the "Prepare" process.
TBD	**Completed**	The job was successfully printed.
TBD	**Hold**	The job will not be printed (even though it was prepared successfully) until the user releases it from this status. To release the job from **Hold** status, right click the job and select **Activate**.
	Failed	The job failed to pass the Prepare process, or was aborted (by the user) in the middle of the Prepare process.

Job Options Drop-Down Menu

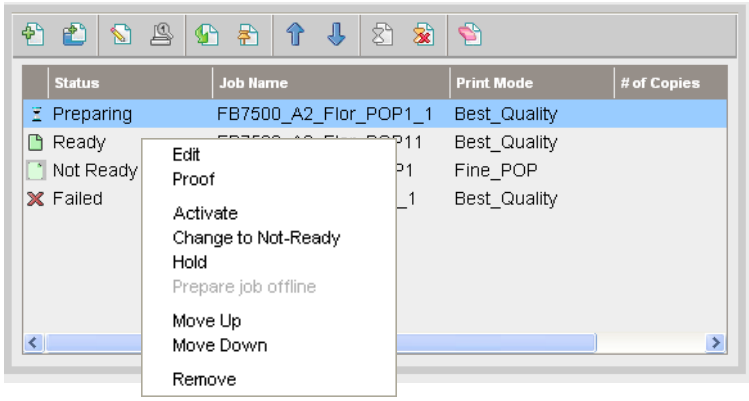


Figure 3-17 Job Options Drop-Down Menu

Option	Used to...
Edit	Open the Job Properties widow for changes (same as **Edit Job** in the **File** menu).
Proof	Print one copy of a job, or a cropped portion of it for checking.
Activate	Release a job from one of the following statuses: Hold, Pause, Stop or Abort.
Change to Not-Ready	Future option
Hold	Disable the print of a job on the list. To release a job from Hold status, right click the stopped job and select **Activate**.
Prepare Job Offline	See Prepare Job Offline on page 77.
Up / Down	Move a job on the list upward so as to print it earlier Move a job on the list downward so as to print it later.
Remove	Remove a job from the list.

Preview and File Information Section

The Preview window, located on the right side of the FB7500 main window, displays the selected image, together with general file information as seen in Figure 3-18.

The file information shown in this section is defined from the Job Properties window (see Adding a New Job on page 49).

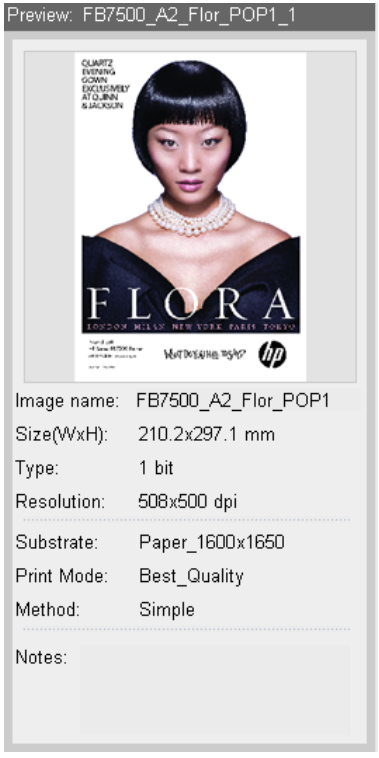


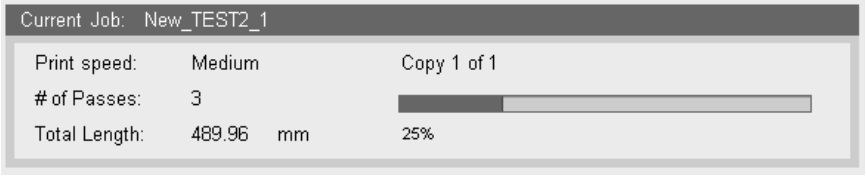
Figure 3-18 Preview and File Information Section

Maintenance and Motion Section

Option	Description
Maintenance	Opens the Maintenance window, see Maintenance Window on page 73.
Motion	For service and R&D purposes only.

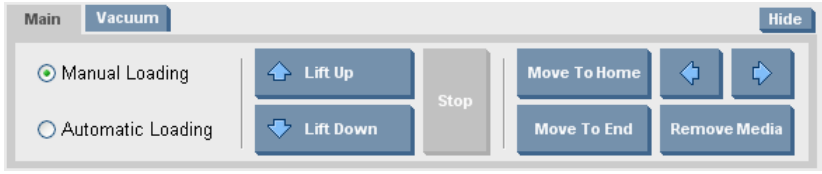
Current Job Section

This section allows visual indication of the job printing progress.



Option	Description
Print Speed	Printing speed level.
# of Passes	Number of passes.
Total Length	Total image length that has been printed.

Machine Operations Section



Tab	Option	Description
Main tab	**Manual Loading**	Refer to Manual Substrate Loading on page 91.
	Automatic Loading	Refer to Substrate Loading on page 91.
	Lift Up	Used to move up the unloader lift.
	Lift Down	Used to move down the unloader lift.
	Stop	Stops printing upon completion of the current copy.
	Move to Home	Moves the printing table to its home position (to the right) for the automatic loading.
	Move to End	Moves the printing table to the left for the manual loading.
	Arrows	Continuously moves the printing table to the right/left.
	Remove Media	Automatically unloads the substrate sheet.

Tab	Option	Description
Vacuum tab	**Auto Vacuum**	The printing table areas are automatically activated according to the substrate size.
	Area 1...6/All Areas	Activates the selected areas.
	Vacuum On/Off	Activates/deactivates vacuum to the printing table.

System Status Section

Option	Description
Main Status	The machine current status
Substrate	Substrate parameters
Ink	Indication of the ink level in the ink containers
UV Settings	Current UV system settings
General	Free disk space

CHAPTER

4

Printing with FB7500

System Startup 84
Loading/Unloading System Setup 86
Substrate Loading 91
Manual Substrate Loading 91
Printing a Job 92
System Shutdown 93
Replacing Ink Container 97
Missing Nozzles Compensation (MNC) Procedure 98
Trimming Procedure 101

System Startup

The HP Scitex FB7500 system startup procedure involves the following steps:

1 Visually check for:
- Ink leakage
- Loose connections
- Overheating components
- Obstacles on the printing table

2 Perform general cleaning, as follows:
- Clean the printer and the production area.
- Remove obstacles or foreign objects placed close to the printer.
- Check that the maintenance waste bath is clean.
- Clean the quartz filters in the UV lamp housing.
- Clean the printing table.

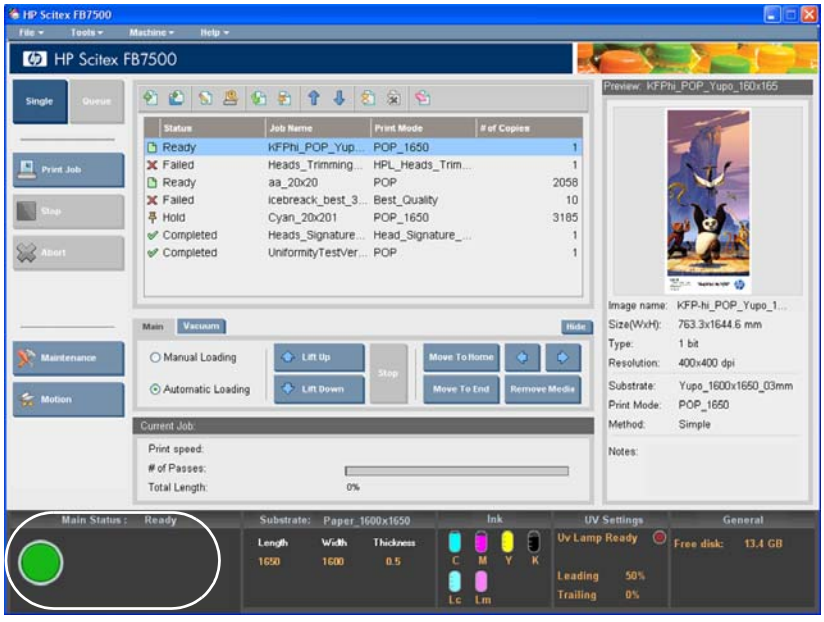
3 Prior to the system startup, check the following:
- Check the ink level in the main ink tanks.
- Make sure the air pressure in the main air pressure regulator is **6 bars.**

4 On the electrical cabinet, turn on the main power switch.

5 On the UV electrical cabinet, turn on the UV main power switch.

6 Launch the HP Scitex FB7500 application; the UV system turns on automatically.

7 Wait until the **Main Status** is **Ready** and the button is green:



8 Perform a full print heads maintenance cycle: **Maintenance -> Full Maintenance** (see Maintenance Window on page 73).

9 Print the Head Signature to evaluate status of the nozzles. Follow the instructions in Missing Nozzles Compensation (MNC) Procedure on page 98).

Loading/Unloading System Setup

You should set up the loading/unloading system parameters each time you change the substrate. The preparation and setup procedure is described in the following sections. For better understanding of the unloading/loading system components, refer to Loading/Unloading System on page 24.

Constant Parameters for All Types of Media

Location of left loading suction cup: edge of profile

NIP speed: Max speed

Air pressure for media thickness detector: 1.5-2 Bars

Air pressure for unloader grippers: 3-5 Bars

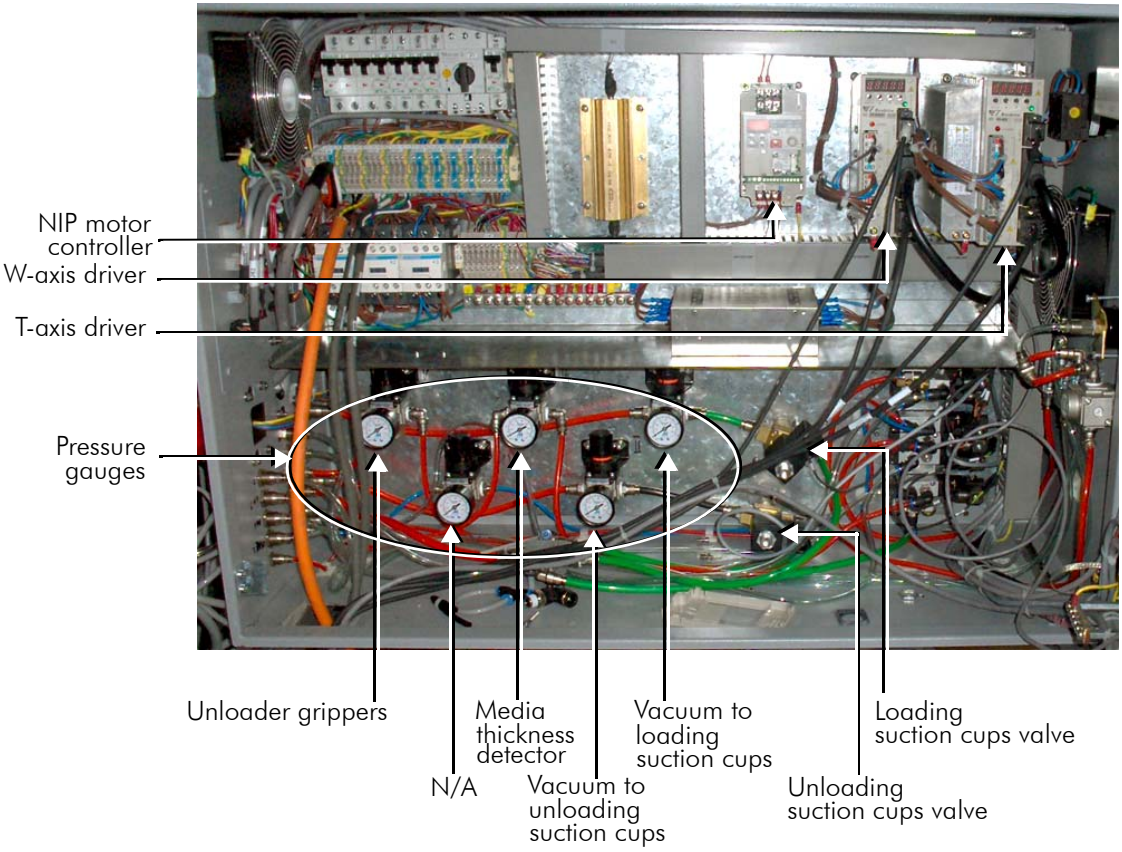


Figure 4-1 Inside of the Loader Cabinet

Preparing the Loading/Unloading System for the Flexible Media

1 On the loader cabinet front panel set the selector valve to **Flexible**.

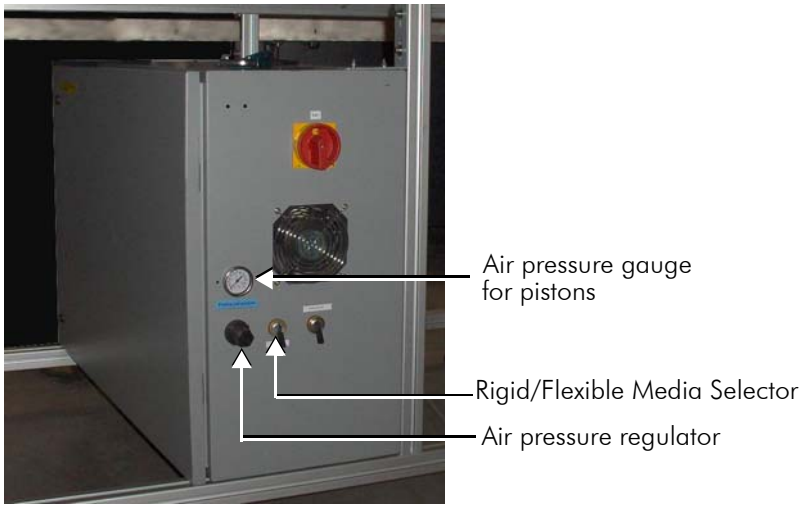


Figure 4-2 Loader Cabinet Front View

2 Use the white suction cups supplied in the Accessories Kit.

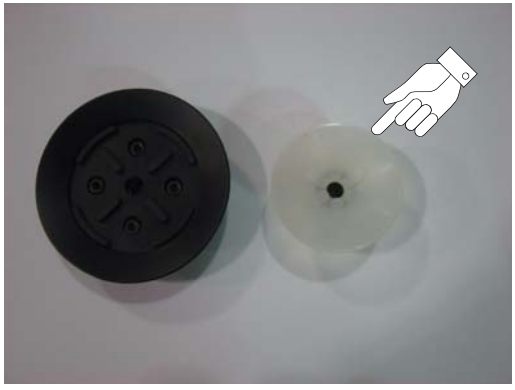


Figure 4-3 Black and White Suction Cups

Note **Unlike all flexible media types, Yopu requires the black suction cups.**

3 Position the two loading and two unloading suction cups at the edge of the substrate and one in the middle of it.

4 Using the pressure regulators inside the loader cabinet, adjust the air pressure (for creating vacuum) for the loading and unloading suction cups to **2-3 bars.**

5 Adjust the air pressure for the media pressure pistons in accordance with Table 4-1.

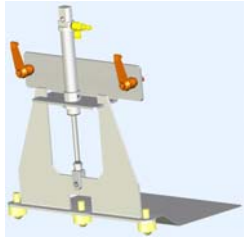


Table 4-1 Air Pressure Values for Flexible Media

Media	Air Pressure
You 3.2 x 1.6	2.4 bars
You 1.6 x 1.65	2.2 bars
SAV 1 x 1.4	2.1 bars
Paper 150gr 1.6 x 1.65	2.2 bars

Preparing the Loading/Unloading System for the Rigid Media

1 On the loader cabinet front panel set the selector valve to **Rigid.** See Loader Cabinet Front View on page 88.

2 Use the black suction cups supplied in the Accessories Kit.

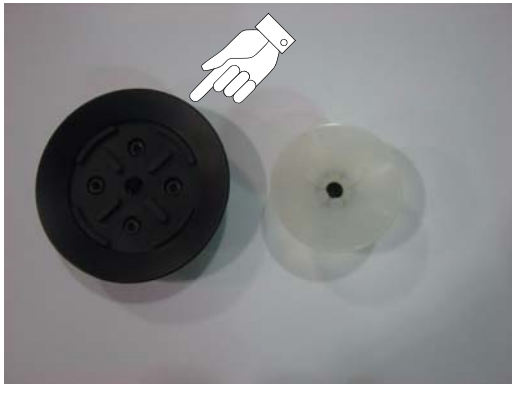


Figure 4-4 Black and White Suction Cups

3 **For the substrate width up to 1.4 meter:** position the two loading and two unloading suction cups, each at the edge of the substrate.

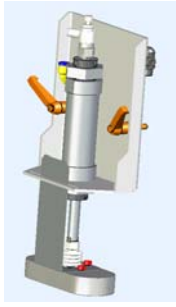
For the substrate width above 1.4 meter: position the two loading and two unloading suction cups at the edge of the substrate, and one in the middle of it.

4 Using the pressure regulators inside the loader cabinet, adjust the air pressure (for creating vacuum) for the loading and unloading suction cups to **4-5 bars.**

5 Adjust the air pressure for the intake media pistons in accordance with Table 4-2:

Table 4-2 Air Pressure Values for Rigid Media

Media	Air Pressure
Fluted 3.2 x 1.6	5 bars
Cardboard 3.2 x 1.6	5 bars
Foam PVC 2.4 x 1.2	5 bars
Cardboard 1.6 x 2.6 e/f	5 bars
Kappa (thk 5mm) 2.4 x 1.2	5 bars
PVC (thk 5mm) 2.4 x 1.2	5 bars
Polystyrene (thk 5mm) 1.6 x 1.6	5 bars
Compressed Cardboard (thk 2mm) 1.6 x 1.2	5 bars
Acrylic/Polycarbonate 1.6 x 1 (thk 3mm)	5 bars
Cardboard 1.2 x 0.8	5 bars



Substrate Loading

In the 3/4 automatic loading, you should place the substrates on the loader table one by one and push them towards the loader entrance. The loader aligns and feeds them onto the printing table.

If there is more than one copy, you may place the second substrate immediately after the loader has returned to its home position, even if the first substrate is still being printed (see Loading/ Unloading Sequence on page 30).

When the printing cycle is complete, the system automatically unloads the first substrate and stacks it on the unloader lift. Simultaneously, it feeds the second substrate onto the printing table.

Manual Substrate Loading

In this method, the substrate is placed on the printing table manually, by the machine operator.

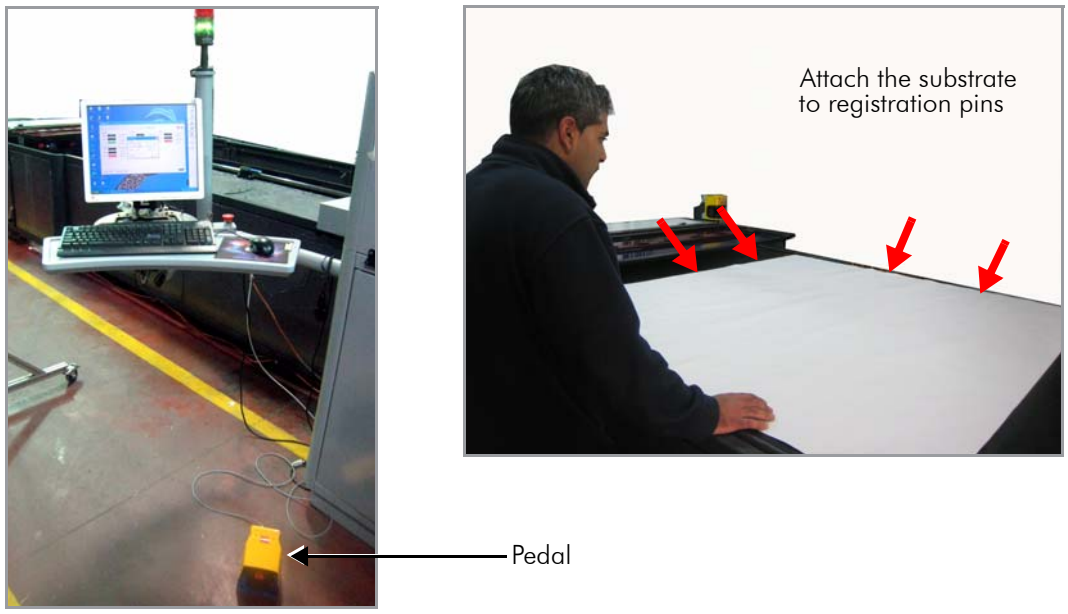


Figure 4-5 Manual Substrate Loading

To load the substrate manually:

1 In the FB7500 main window, click **Print Job**; the printing table moves to the left.

2 Press the pedal; the system deactivates the vacuum to the printing table and raises the registration pins.

3 Place the substrate on the printing table and attach it to the registration pins (see Figure 4-5 on page 91).

4 Release the pedal; the system activates the vacuum to the printing table and lowers the registration pins. A message appears, asking you to confirm that the substrate is loaded properly.

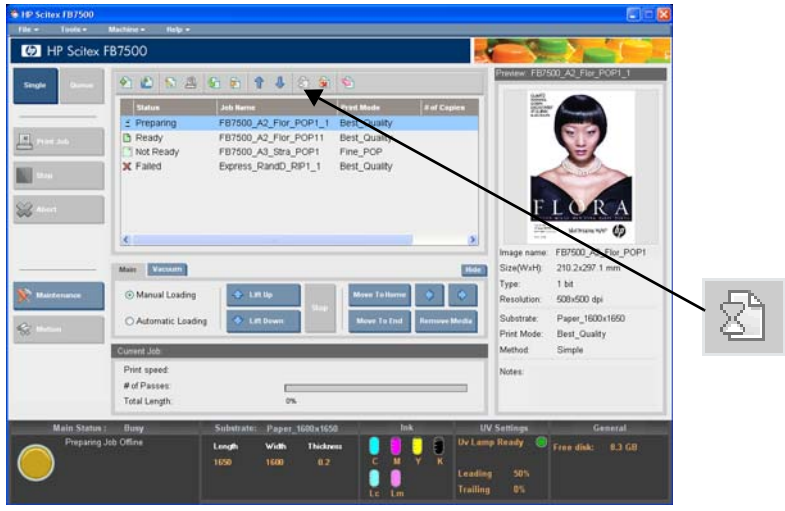
Click **Yes** to start the printing process.

Printing a Job

1 Set the loading/unloading system parameters for the selected substrate as described in Loading/Unloading System Setup on page 86.

2 Add a new job as described in Adding a New Job on page 49; the job appears in the Jobs List with the **Not Ready** status.

3 Select the job and click the **Prepare Job Offline** icon on the toolbar; the job status changes to **Ready**.



4 Load the substrate sheet.

5 Click the **Print Job** button to start printing.

System Shutdown

1 Exit the FB7500 application;

- The UV system shuts down automatically.
- All axes automatically move to their home position.

2 Turn off the UV main switch on the UV electrical cabinet.

3 Turn off the Main Power switch on the electrical cabinet.

4 Drain the maintenance waste bath.

Morning Head Signature and Print Heads Maintenance

The Head Signature file is specially designed to check the print head nozzles for spraying uniformly and that none are clogged with the cured ink.

A test pattern enables you to easily determine the functioning of each of the print heads, and the condition of the nozzles in each print head.

Print the Head Signature every morning before printing, or whenever you suspect that there is a problem with any of the print heads.

To print the Head Signature file:

1 Turn on the machine.

2 Perform a full maintenance cycle from the Maintenance window.

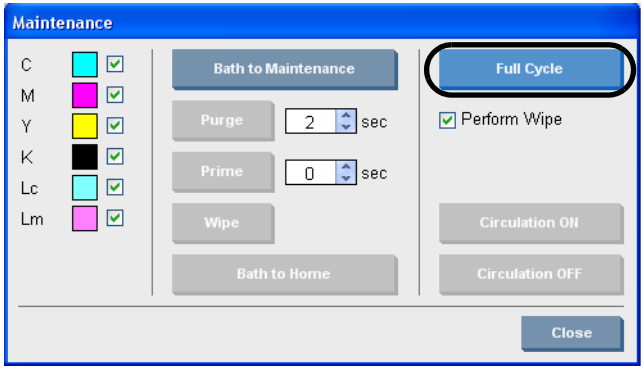


Figure 4-6 Maintenance Window

3 Make sure you have the latest **CalPack 1.x** files on **D:\Jobs**.

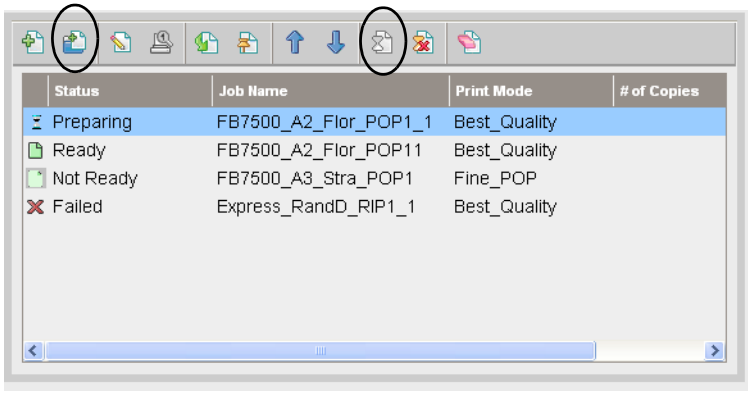
If not, load the files from the latest CalPack included in the FB7500 Software DVD.

Note

Do not change parameters of any of the Calibration jobs!

4 From the machine application, select **Machine =>Calibration Mode.**

5 On the toolbar, click the icon and select the **Head Signature** file.



6 Click the icon to prepare the file and then **Print Job**.

Figure 4-7 Head Signature Print Result

Note

Do not forget to cancel the Calibration Mode before printing regular files.

The print result contains the short line segments which are printed by each nozzle. A missing segment indicates a missing nozzle. As each nozzle prints, it is possible to trace misfiring nozzles since their corresponding line segments are missing (see Figure 4-8 on page 96).

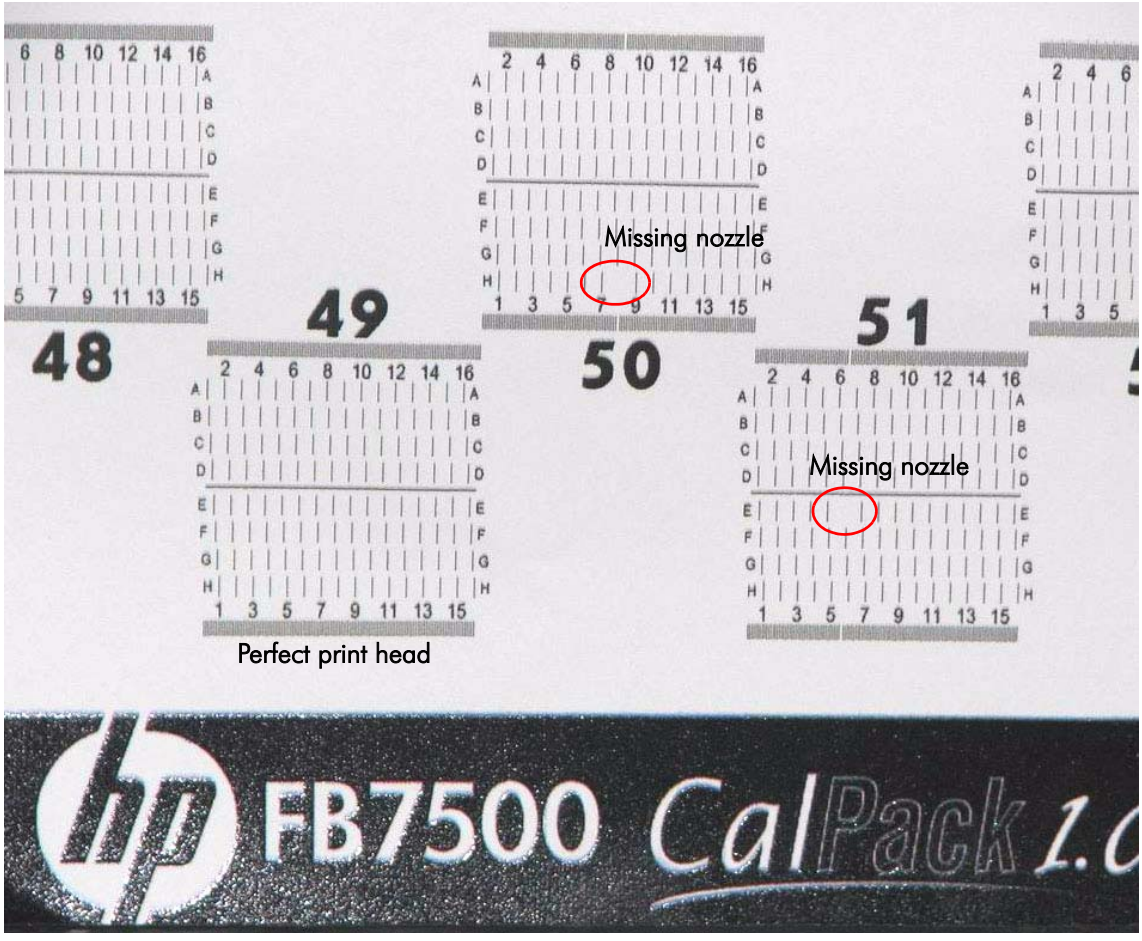


Figure 4-8 Missing Nozzles

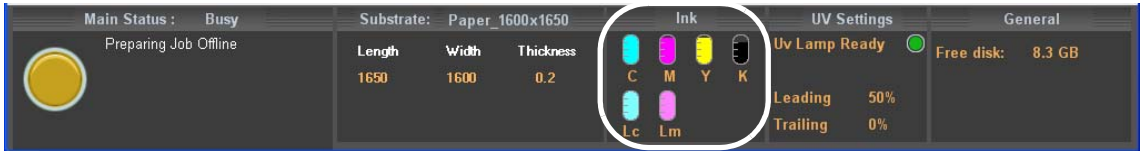
7 If necessary, perform a full maintenance cycle from the Maintenance window.

Replacing Ink Container

Replacement of the six 5-liter ink containers is performed as-needed and can be done without interrupting printer operation.

Figure 4-9 Ink Containers' Sockets and Ink Container

The ink level in the ink tanks is indicated in the FB7500 main window:



However, it is recommended to manually check the ink containers every 8 hours.

Missing Nozzles Compensation (MNC) Procedure

This Missing Nozzles Compensation procedure (MNC) should be performed in case of a bad printing quality or after replacing the print heads.

The reason for a bad quality could be clogged nozzles, nozzles firing aside (shifting), or not stable nozzles. These problems create quality problems such as micro banding. The MNC allows to eliminate these nozzles and compensate with others while printing.

Limitation of this method is that **not more than 5 nozzles** per print head may be compensated. For example, the print head shown in Figure 4-10 has 7 missing nozzles.

If you choose to replace such print head, refer to the Print Head Failure Approval Process in your Warranty Policy.

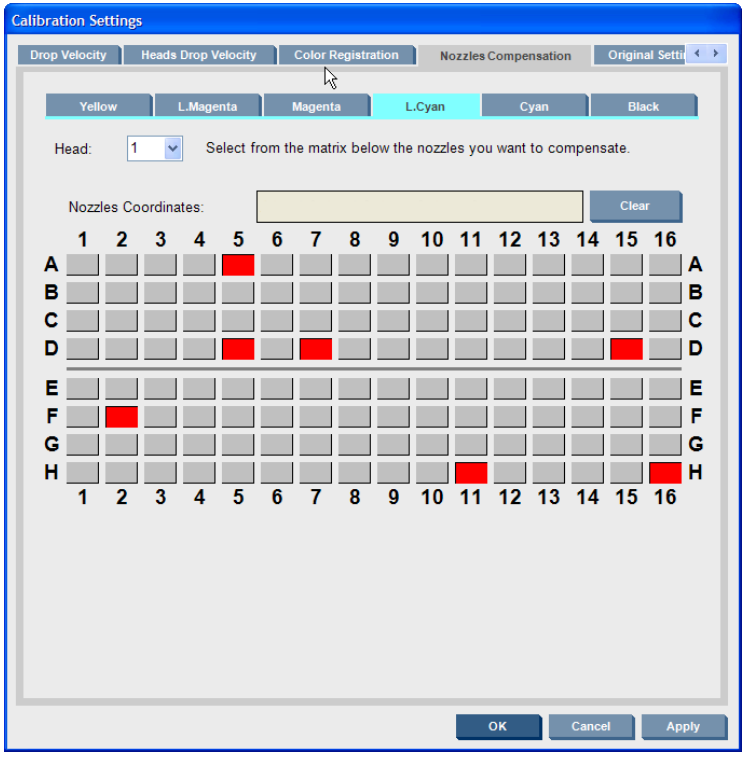


Figure 4-10 Problematic Print Head

To compensate the missing nozzles:

1 In the FB7500 main menu, select **Tools** => **Preferences** => **Quality tab.**

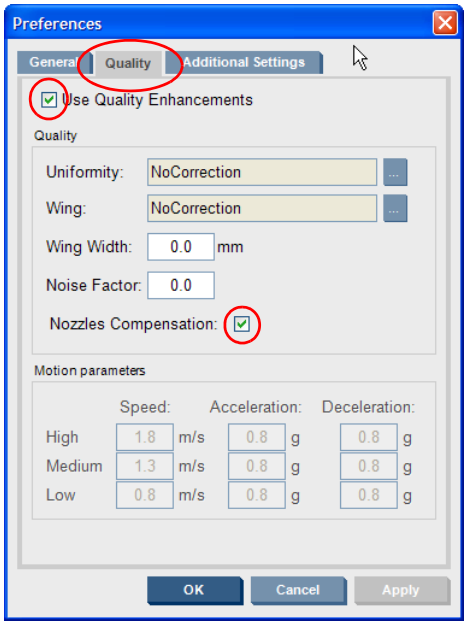


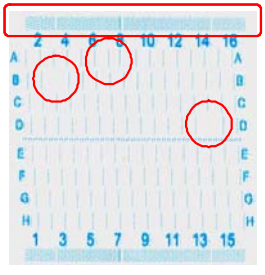
Figure 4-11 Quality Tab

2 Select the **Use Quality Enhancements** option.

3 Select the **Nozzle Compensation** option and click **OK**.

4 Print the Head Signature file (see Morning Head Signature and Print Heads Maintenance on page 93).

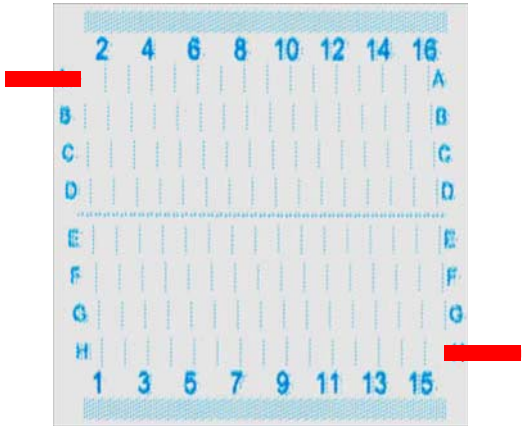
Perfect print head



Missing and shifting nozzles

Figure 4-12 Signature of the Specific Print Head

Note **Nozzles 1A and 16H might be missing but this is hard to detect.**



5 Select **Tools** => **Calibration Setting** => **Nozzles Compensation.**

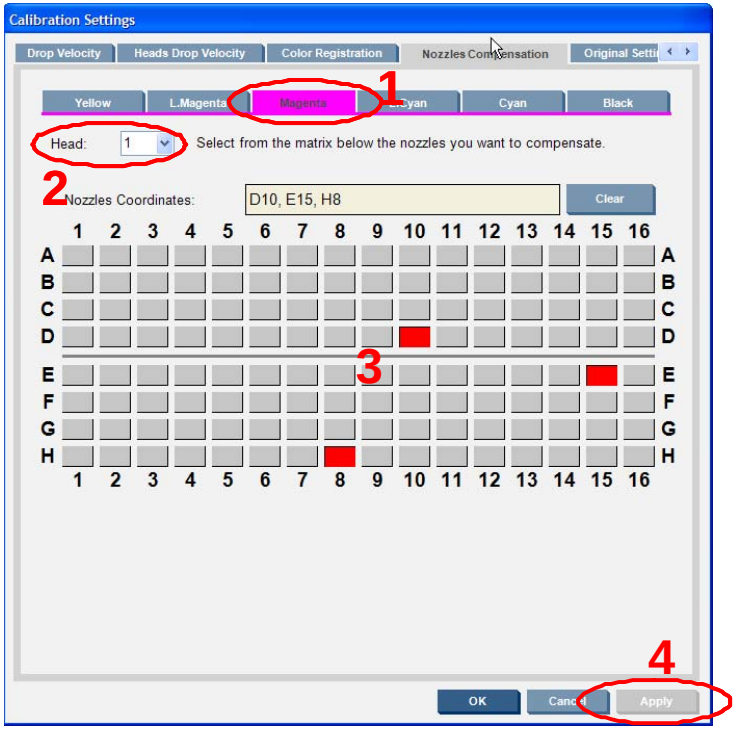


Figure 4-13 Nozzle Compensation Tab

6 Mark all missing/problematic nozzles and click **Apply**.

7 Perform the MNC for all problematic print heads.

For those print heads, which have more than 5 missing nozzles, refer to the Print Head Failure Approval Process in your Warranty Policy.

8 To evaluate the effectiveness of the whole MNC procedure, from the CalPack select the file that represents the print mode most commonly used at your site. The file name should be:

MNC_Detector_<print mode> _One_Color (or **All_Colors**)

9 Print the file.

Note

Set the margins to 0 on both axes (horizontal and vertical).

10 Perform steps **1** - **7** for all print heads.

11 Update the **Nozzles Compensation** tab accordingly.

Note

After updating the Nozzles Compensation tab, your current jobs should be prepared again (via the Prepare Job Offline).

Trimming Procedure

Reference

For detailed instructions on how to perform the Trimming procedure, refer to ACT User Guide on the ACT DVD supplied in the FB7500 User Documentation Pack.

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