DuraCore Operations and Troubleshooting Guide

Rev#: 0.5

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Revision History

Doc. Version	Date	Details	JIRA
0.1	04-Aug-24	Initial Release	DOC-1347
0.2	25-Aug-24	Updated page alignment process; Added info on printed ink use; explained cancel & resume feature; Rearranged several sections; Added more details on use of two-pass duplex; Added XiStep and XiPosition info.	N/A
0.3	7-Oct-24	Removed many references to “DuraCore” to make sharing across other systems easier; S1.1 changed from “bar” to “system”; S2.2 improved wording; S2.3 Updated pix with 4-color DuraCore; S2.4 Explained to check printhead in cap and noted to be sure in cap if powering off (though not recommended); S3.2 Added DMI note for ejectable offset and width and noted RIP needs to be restarted; S3.3 addded note where the Media.lst file is located; S4.2 Added 4-color graphic and noted cancel will be active after printing starts; S5.2 Clarified LEDs on dongle dock; Fixed table 1 printhead “life” instead of “lift”; S5.3.1 updated graphic with 4-color; S5.4 clarified PPS and Improved description for removing printhead and pointed to videos on Memjet website; S5.7.1.1 fixed RGB input profile name; S5.10 Made some minor updates to cover 4-color. Still more to do; S5.10.7 Added capper cleaning; S7.1 Added more operational issues with resolutions; S7.4 New section with some PQ info.	FBT-1267
0.4	26-Nov-24	Add troubleshooting for issue when RIP could not send data to PM-1-2 Add details for setting up spit bars Write up changing declog to first page if using cut sheet Add issue with /etc/resolve.conf and MJ IP addresses Note about yellow not flowing during prime -> valve How to test/check TOF sensor Explain 10G issue if card is not switching to 5G Show error when trying to print duplex w/o collate on If rendering hangs (such as at 50%), explain to reboot RIP Show how to output to ABT to check RIP output Explain how to set speed in R2R system when not using Modbus Explain how it can help to clear job queue via DMI if spooler or render action hangs Add info for cap_vac error due to AES cable short	FBT-1337

0.5	01-May-25	Added example spit bar setup Added details on dry prime troubleshooting Updated dongle dock notes for single PH use Added standard duplex configuration information Moved Color Profile setup to its own section Moved simplex printing to its own section Added official DuraCore logo Fixed up depriming and removing the printhead Added note about TOF adjustment to move spit bars onto media Moved “Setting Print Speed” to the start of the Preparing and Printing Jobs section Added info on fixing print length varying with resolution Added details on managing hydration Added information on turning off KWS between pages Added instructions to print using the DMI Added dehydration to the troubleshooting section Added how to change the wiper Added how to gather logs from the print engine and the Xitron RIP Added info about Xitron RIP unexpectedly pausing and some options for dealing with the slow RIP speed Added more pq artifacts with associated fixes	FBT-1425

Contents

Table of Figures

Tables

1 Introduction

1.1 Aim and Audience

This document covers the basic operations and troubleshooting of common issues related to software, RIP workflow and basic maintenance of the system.

1.2 Prerequisites and Scope

The reader is expected to be familiar with the Xitron RIP and workflow as well as the basic operation and maintenance concepts of the print engine.

1.3 Typographic Conventions

Throughout this document, the following typographic conventions are used:

`Code Character`	`Courier` font is used to identify HTTP GET and POST commands with associated arguments, as well as references to source code, job states, registry settings, directory/file names, XCI commands, and XML settings.
Bold	Text that appears on-screen in the user interface is shown in **bold** font. This includes UI buttons, engine states, warning codes, and fault codes.
Yellow Highlighting	Yellow highlighting indicates sections that are new or updates in this version of the document, compared to the previous version.

1.4 Related Documentation

Other documents, besides this guide, provide further details for specific readers:

- *Software Guides* – For software and firmware engineers who need to understand the software interfaces, commands, scripts, and reference software applications.
- *Installation and Integration Guide* – For OEM engineers who are responsible for initial system integration between Memjet modules and OEM printing system components.
- *Troubleshooting Guide* – For OEM engineers and users to identify symptoms and resolve issues.
- *Release Notes* - For various audiences to detail features, fixes, and specifics related to software and firmware releases.
- *Technical Bulletins* – For various audiences to announce product or process update or to provide specifics on single-subject technical topics.
- *PDFs of CAD and Schematics* – For various audiences to provide detailed dimensions related to specific areas.

1.5 Additional Documentation or Access

For additional product-related technical documents, go to your Memjet Partner Site.

2 Operations

2.1 Overview

To ensure the printing system operates correctly, *Table 1* contains a list of recommendations on how to use the system safely.

Table 1 – System Operation Recommendations

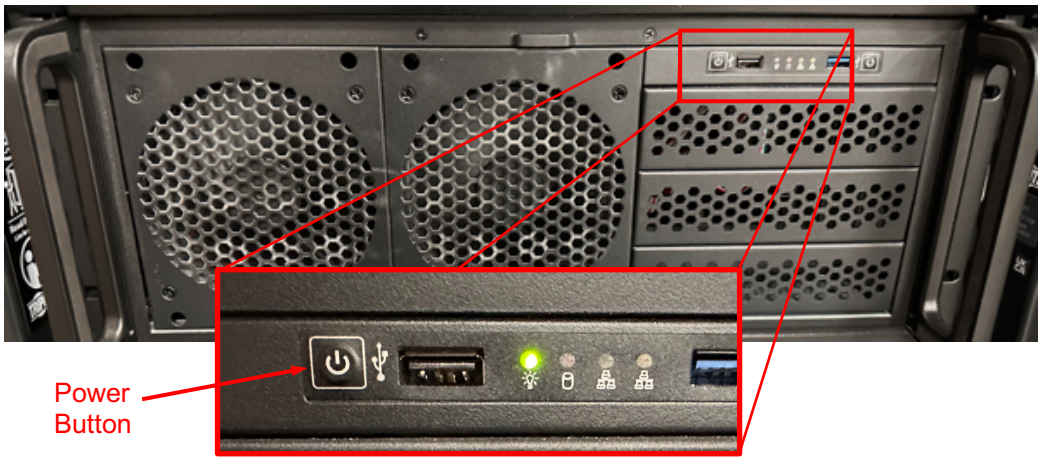
Task	Reason
Follow the recommended KWS settings	Prevents the printhead from being damaged by dehydration and possible dry firing from nozzles.
Power off the system before any electrical connection is performed	Ensures the safety of the operators and protects the electrical components.
Follow all contamination control procedures	Fine microstructures in the printhead can be blocked if external contamination enters the system.
Ensure the aerosol extraction system (AES) has been calibrated. Once calibrated do not adjust the AES fan power setting.	Too much or too little aerosol extraction can affect print quality
Ensure the AES is running before starting a print job.	Running the print engine without aerosol extraction may cause ink residue to build up in critical areas
Ensure that the system has been deprimed before removing the printhead	Prevents ink spills within the print engine.
Printhead should be capped (in the CAP position) when it is not in use, if the printhead has been inked (including deprimed state)	Prevents printhead dehydration and ensures maximum life of the printhead when not in use.
Printheads removed from the print engine must be stored correctly.	Any residual ink in uncapped printheads will dry and may cause blockages within the printhead nozzles.

2.2 Powering on the System

First, power-on the print engine(s). The method will vary depending on the specific implementation and how the power supply is configured. Next, power-on PCs and run the RIP and Printer Controller software. The system uses one PC for each engine stage to RIP print. So, a simplex system would have a single PC, and a duplex system will have two PCs (stage 1 and stage 2). If the PC screen is black even while powered-on, the RIP PCs need to be powered-on.

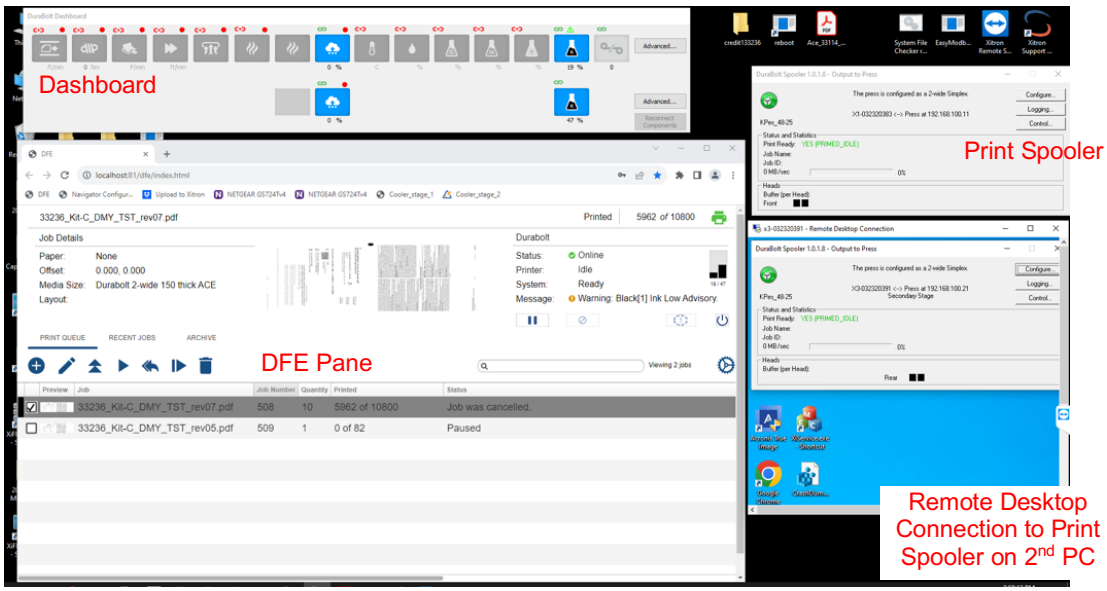
1. Gain access to the PC(s).
2. Press the power button for each.

Figure 1 – Location of PC Power Buttons (one example)



3. When the Windows login screen appears, login with username **xitron**, password **xitron**.
4. For a duplex engine system, open the Remote Desktop app and click Connect to access the second PC.
5. Login to the second PC (using the same username/password as the first). Move the second PC window to the side.
6. Open the Navigator Server using the shortcut in the toolbar ( ) and the DuraCore[1] Dashboard[2] and Spooler windows should appear after a few seconds.
7. Open a web browser and access the web interface at http://localhost:81/DFE/index.html. This will load the Digital Front End (DFE) user interface. The main display should appear as shown in *Figure 2*. This interface is explained in detail.
8. If the Printer is in the OFF state, press the power button on the DFE to turn it on. The Printer status will show initializing then change to PRIMED IDLE if the system has been primed already.

Figure 2 – User Interface



[1] The Dashboard and Spooler Windows may still use the name DuraBolt as much of the software is shared between the two systems
[2] The Dashboard may or may not be available in a particular configuration

2.3 Start of Shift

Perform a light or medium service at the start of the day before starting printing. This ensures optimal print quality.

1. To access the maintenance page, click the gear icon in the DFE (*Figure 3*).
2. If the light service is not sufficient, perform a medium service (*Figure 4*).

Note: As the OEM gains experience with the printer the user will realize which services are required at which time. For example, a medium service may always be required before beginning printing for the day.

Figure 3 – Maintenance Page

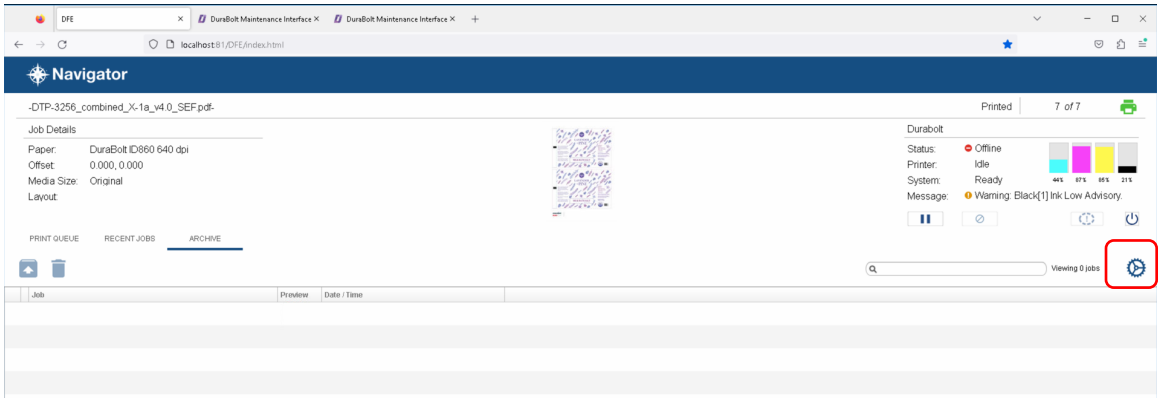
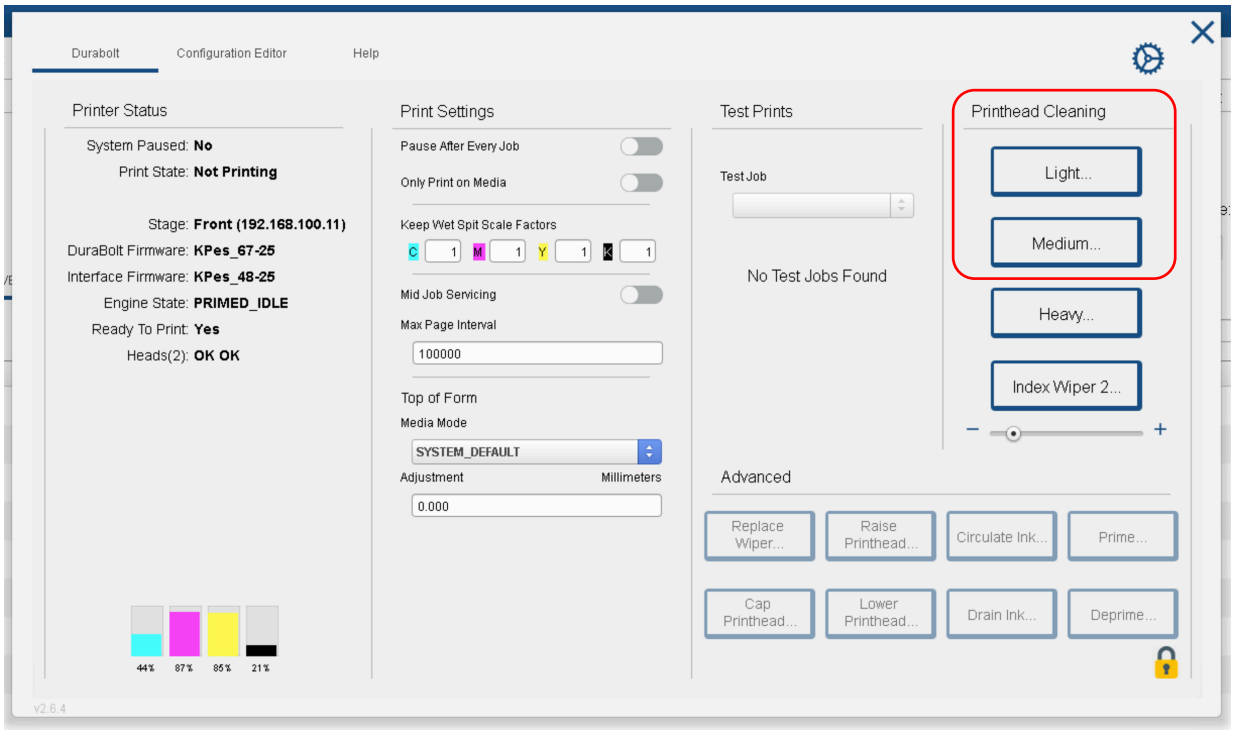


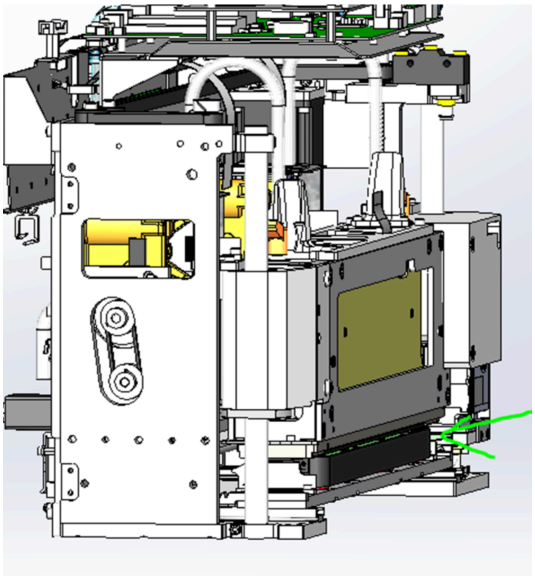
Figure 4 – Maintenance Page



2.4 End of Shift

Memjet recommends the printing system is left powered on when not in use as it has automated routines to keep the printhead healthy. Before stopping work for the night, perform a light service and ensure the printhead is left in a capped position by looking inside the module to check the printhead is in cap. Although not recommended, if the print engine must be powered down at the end of a shift, it is very important to ensure the Printhead is Capped before powering off.

Figure 5 – Printhead in Cap



Note: To avoid dehydration, always keep the printhead capped when not in use.

Note: The system will track printed pages and, at the end of each print job, will check if more than 500 pages have been printed since the last maintenance wipe. If more than 500 pages have printed, the system will run a light maintenance.

3 Configuring Media Alignment and settings for Two-Pass, Cut Sheet Duplex Printing

3.1 Overview

A two-pass, cut sheet duplex system works by printing the front pages on the first side of a piece of media, flipping the media over, then printing the back pages on the second side. Specific implementations will vary in details of how the flipping is accomplished. In any case, the physical and printer media/print paths need to be configured for alignment. This section will explain how to set up the alignment and then set the duplex setting for A3 media.

Note: These steps can be followed for other media sizes, choosing appropriate settings for the chosen media.

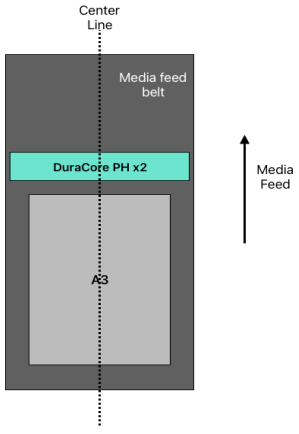
Assumptions:

- The physical media is aligned to roughly the center of the printhead inside the print engine
- The physical media has a specific width. This example uses A3 media feeding short edge first, which is 297mm wide.
- The physical media has a specific length. This example with A3 media has a length of 420mm.
- The print engine will be configured to print to the edge of the media width, which is less than the full width of the printhead (The printhead has a maximum printable width of 322421.25µm).
- Centering of printed images will be done in the RIP, and the RIP will generate a full page-width of data based on the chosen media size

Steps required for configuration:

1. Physically align the A3 media feed system to the center of the printhead (as accurately as possible). This step is assumed to be part of the print engine integration process.
2. Set the printable width and offset of the printhead to match the A3 media position (these are indirectly set using **ejectableOffset** and **ejectableWidth** parameters)
3. Configure the RIP workflow to use the A3 media size
4. Make fine-tuning adjustments to align the TOF and left edge of physical media to the A3 print
5. Configure the Duplex setting and 180-degree page rotation

Figure 6 – Top View of Page Alignment to Printhead



3.2 Setting the Printable Width and Offset

The printable width and printable offset of the printhead are indirectly set using two engine parameters called **ejectableOffset** and **ejectableWidth**. The internal engine software then computes the actual printable offset and printable width.

Note: Starting from Memjet SW release R3.2 and later you can set the **ejectableOffset** and **ejectableWidth** to the "fit-to-printable" setting value in the DMI which will automatically calculate the narrowest ejectable zone for the current configured **printableOffset** and **printableWidth** values.

Here is the calculation to get the **ejectableOffset** and **ejectableWidth**:

Table 2 – Calculating Width and Offset Settings

Media width	MW (in µm)	297000
Desired printable width	PW (in µm)	297000
Computed ejectableWidth	PW + 2*3238.5 (in µm)	297000 + 6477 = 303477µm
Computed ejectableOffset	(MaxWidth – **ejectableWidth**)/2	(322421.25 – 303477)/2 = 9472.125µm

Therefore, for A3 media with the intent to print full width, the settings are:

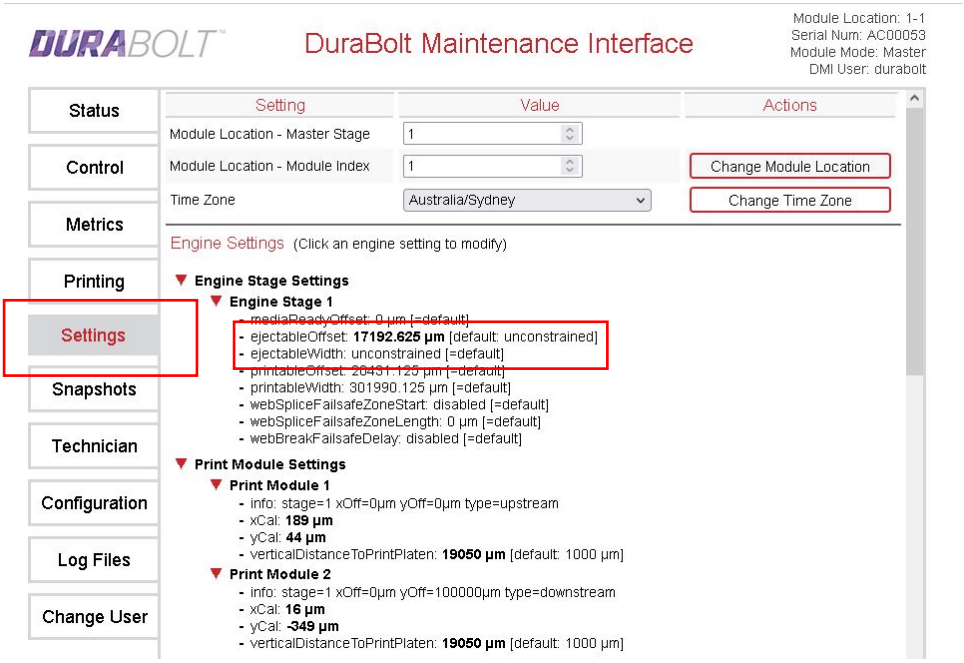
- ejectableOffset = 9472.125µm
- ejectableWidth = 303477µm

Note: Some ink, such as KWS and declog ejections, will eject the whole ejectableWidth of the printhead. And the **ejectableWidth** setting accounts for printhead geometries that, by necessity, require a wider width than the desired **printableWidth** (by 3238.5µm on either side of the **printableWidth** of the printhead. If there is a need to keep ink off the belt, the **printableWidth** must be narrower than the actual media width.

These can be applied through the Maintenance Interface (DMI). The DMI is covered in detail in section *8*. Navigate to the DMI using the IP address (192.168.100.11) or the local ID of the printer, i.e., `durabolt-pm-1-1.local` and with username/password `durabolt.` Then, click on the **settings** button to access the engine settings (*Figure 7*). Click on each of the two items and enter the new numbers.

Note: After these settings are changed, the RIP Navigator Server must be restarted.

Figure 7 – Changing Engine Settings



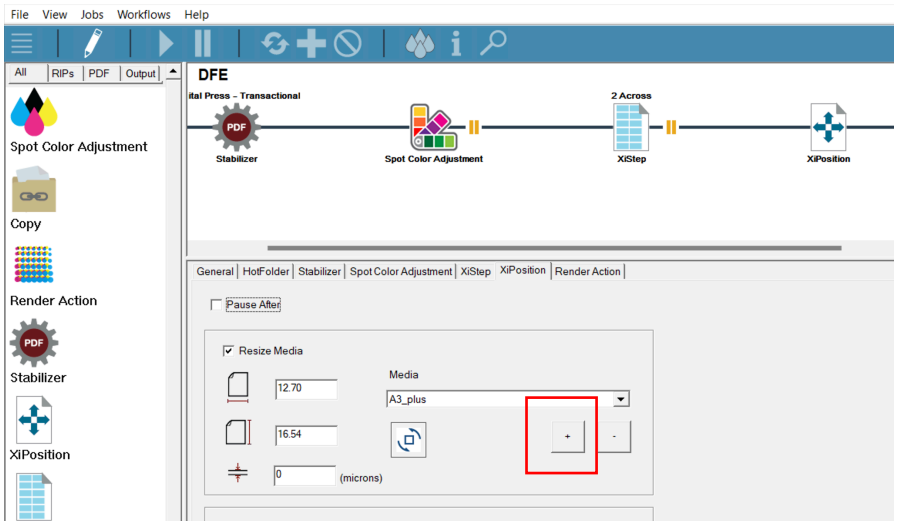
3.3 Configuring the RIP for A3 Media Size

The RIP is pre-configured with an A3 media size. When loading a job, use the **Size** drop-down menu in the **Media** section of the Job Editor (*Figure 23*) and choose A3.

If the full A3 media width is not used, a new size must be created. To add a new media size, open the Navigator Client and edit the workflow. Change to the **XiPosition** tab and click the **+** next to the **Media** box (see *Figure 8*). Name the new size and enter the size width and height.

Note: Media sizes are also defined in C:\Navigator\Navigator\Config\Media Sizes\Media.lst

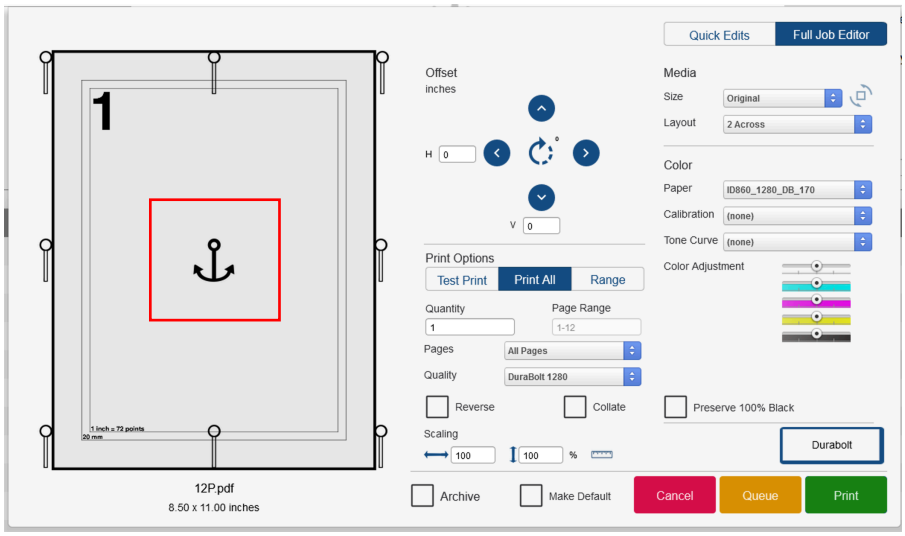
Figure 8 – Add New Media Size



3.4 Fine-Tuning the Print to Media Alignment

Set up a print job that has a full A3 size image (such as a shaded rectangle with black borders). Set the vertical (**V**) and horizontal (**H**) offsets in the Job Editor to 0 for both the **stage 1** and **stage 2** sides (see Section 6.5). Confirm the document anchor point is in the middle of the page (the default setting). To do this, open the Job Editor and click on the document preview. The anchor points will be visible, and the active point looks like an anchor (*Figure 9*). If it is not in the center of the document, click the center point to set the anchor to the center.

Figure 9 – Set the Anchor Point



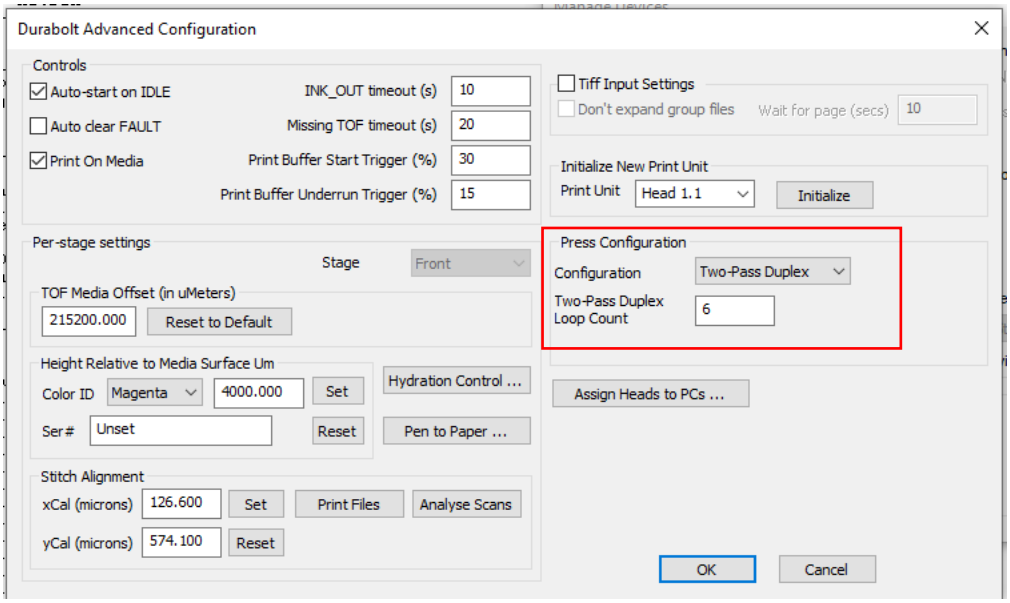
Next, print the full A3 image onto an A3 sheet of media. Examine the leading edge to see if the print starts as expected at the edge. If it starts too soon or too late, adjust the TOF (Section 10.5.1) to move the start of print earlier or later relative to the leading edge of the media.

Then, examine the left edge to see if the print starts as expected and covers the page width. If there is an offset, open the DMI (*Figure 7*) and adjust the **ejectableOffset** to shift the image left or right as needed.

3.5 Set the Two-Pass Duplex Print Configuration

Open the DuraBolt Advanced Configuration settings (see Appendix section 11.1) and set the **Press Configuration** to **Two-Pass Duplex** and set the **Loop Count** to 6 as in *Figure 10*.

Figure 10 – Press Configuration for Two-Pass Duplex



Then, when adding a job, be sure to set the **stage 2** rotation to 180 degrees so the back print image is rotated correctly to the front. This is done in the Job Editor (*Figure 23*).

Note: When this alignment process is complete and assuming the actual media is exactly the size of the desired print (such as A3), then the front and back prints should line up. There could be some misalignment due to paper skew and media size tolerances.

4 Configuring Settings for Standard Two-Engine Duplex Printing

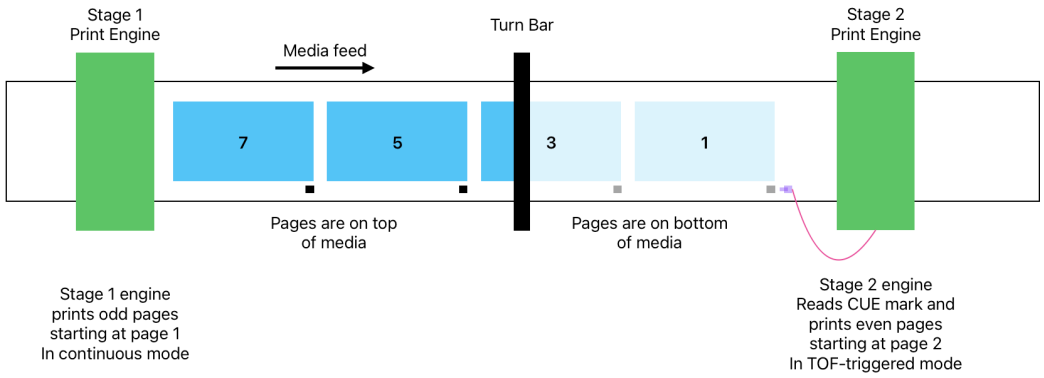
4.1 Overview

Two-Engine Duplex Printing uses one print engine "stage" to print one side of a document and a second print engine "stage" to print the second side of a document. This setup assumes that the print engines have already been configured during installation to support duplex printing and is focused on the page setup and RIP configuration for standard two-engine duplex printing.

Two-engine duplex printing can be used with cut sheet media or with roll-fed media (web). Each case has a different method for synchronizing front and back pages:

- In the **cut sheet case**, the physical edges of each page are used to trigger a TOF sensor at the stage 1 and stage 2 print engines. The assumption is that the print session starts with no pages in the media path, such that the first page that enters the media path will print at stage 1 then continue to stage 2 for printing. This ensures that the front and back pages are correctly ordered.
- In the **roll-fed case**, since media is a web and is situated under both engines at the start of printing, the usual method for synchronizing pages is to use the stage 1 print engine to print a CUE mark at the start of the page at the left or right edge of the media. Then, the stage 2 print engine uses that CUE mark to trigger the TOF sensor. This is shown in *Figure 11*.

Figure 11 – Roll-fed Duplex



Assumptions:

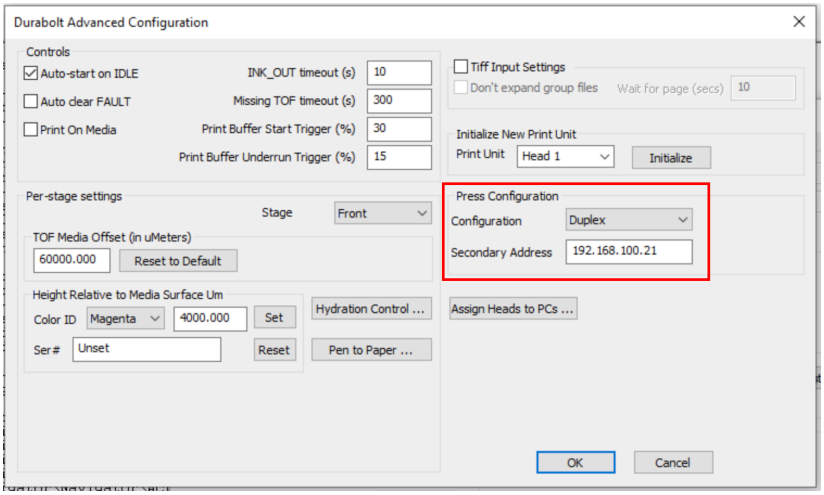
- Media can be aligned as is described in the two-pass duplex case, including any changes to **ejectableOffset** and **ejectableWidth** parameters
- Centering of printed images will be done in the RIP, and the RIP will generate a full page-width of data based on the chosen media size

4.2 Setting the RIP for Standard Two-Engine Duplex Printing

Note: The following assumes the Xitron RIP is used. Note that when the Xitron RIP is used in a two-engine duplex configuration, there is a single Navigator Server instance and single DFE that controls the system. There are two Spooler windows, one for each print stage.

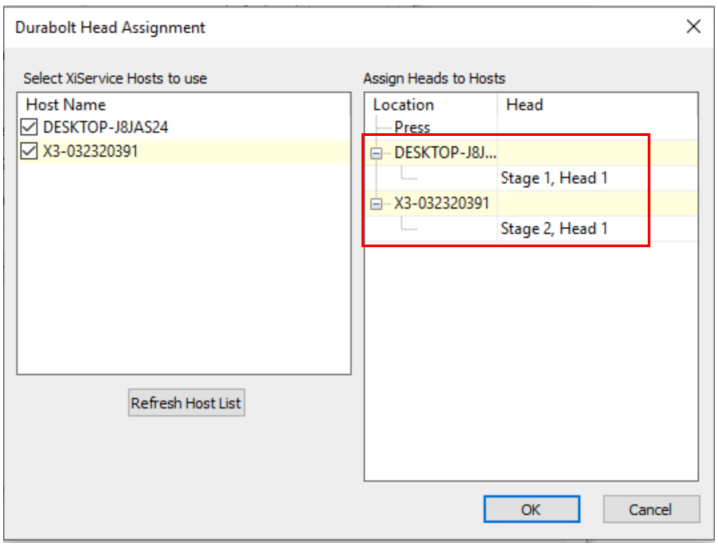
Open the Advanced Configuration settings and set the **Press Configuration** to **Duplex** then set the **Secondary Address** to the **IP address** of the second stage print engine. There will be a pop-up window noting that the system device needs to be restarted after making a Press Configuration change. Click the **Restart Thread** in the Manage Devices screen to restart the system device.

Figure 12 – Press configuration for Duplex



Then, configure the Head Assignment such that the RIP PC for stage 2 is assigned the stage 2 printhead(s):

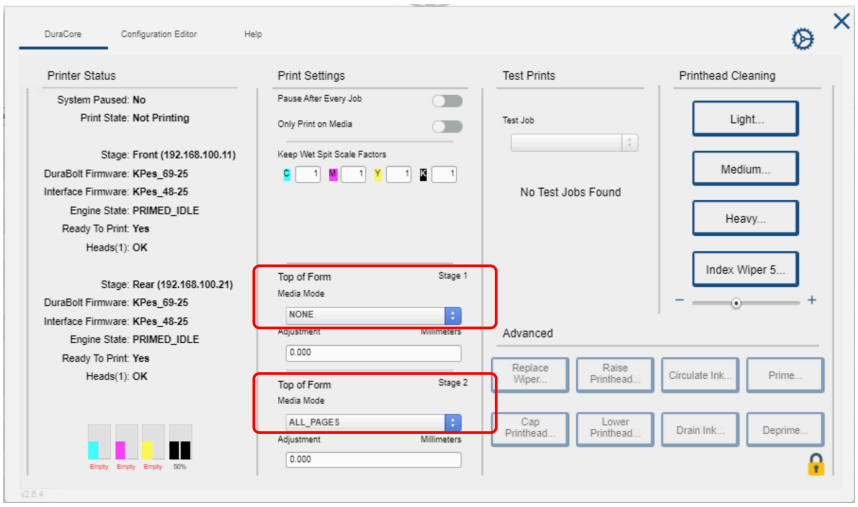
Figure 13 – Duplex Head Assignment



4.3 Setting up the TOF configuration

The TOF configuration is set as follows from the DFE. Set Stage 1 to NONE (which will print pages continuously, without needing a TOF trigger) and set Stage 2 to ALL_PAGES. This step assumes that a TOF sensor has already been configured correctly for Stage 2.

Figure 14 – TOF Configuration for Two-Engine Duplex



4.4 Setting up the CUE Mark Printing

A CUE mark must be printed by the stage 1 print engine. It can be added to the PDF ahead of time for printing. If adding the CUE mark to the PDF is not possible, the Xitron RIP offers an add-on called Preflight that can be used. Preflight is configured during installation with support from either Memjet or Xitron, depending on the support agreement. When configured, the Preflight tool will be set up to print a CUE mark on the odd pages that print from the stage 1 print engine.

If Preflight is used, see section *11.2* for details on how to adjust the size and position of the CUE mark, if needed.

4.5 Configuring Stage 1 for Page Length Allowance

When Stage 1 is configured for a TOF setting of NONE, pages are printed in continuous mode, meaning there is no gap from one page to the next. This will cause skipped pages when printing pages on Stage 2 because there will not be a gap between the end of a page and the CUE mark of the following page. To ensure proper operation, a gap needs to be added between pages. This is accomplished using the **interPageGap** setting in the DMI as shown in *Figure 15*. See Section *9.1.4* for the DMI settings page. When setting the **interPageGap,** the **mediaReadyOffset** must also be increased to a distance that is longer than the **interPageGap**. If set incorrectly, an error will show the minimum distance required. Be sure to apply this setting ONLY to stage 1.

Note: Declog spits and/or spit bars from stage 1 can affect the TOF sensor on stage 2. It is important to use a TOF sensor that can be trained to see only the dark CUE mark and ignore declog spits and spit bars. Spit bar intensity should be much lower than 100% to ensure good performance

Figure 15 – Setting the Inter-Page Gap

4.6 Fine-Tuning the Print to Media Alignment

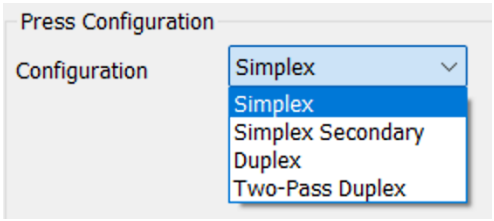
Fine tuning the front and back images for each page can be done the same way as noted in Section *3.4*.

5 Configuring Simplex Printing

5.1 For Two-Pass Duplex Systems

The system that prints duplex with two print engines can perform simplex printing as well as duplex. When set for Simplex mode, the feeder is automatically reconfigured to turn off the page diverter and send pages through in one pass. To set simplex mode, open the Advanced Configuration window (see ***Figure*** 92) then select Simplex from the drop-down Configuration menu (*Figure 16*).

Figure 16 – Simplex Configuration

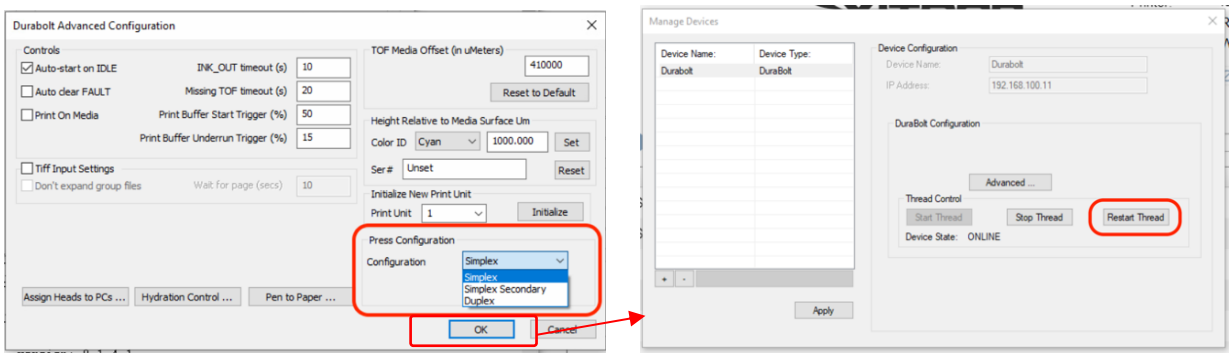


5.2 For Two-Engine Duplex Systems

The system that prints duplex with two print engines can perform simplex printing as well as duplex. In simplex mode, the front (or the back engine) would be used exclusively.

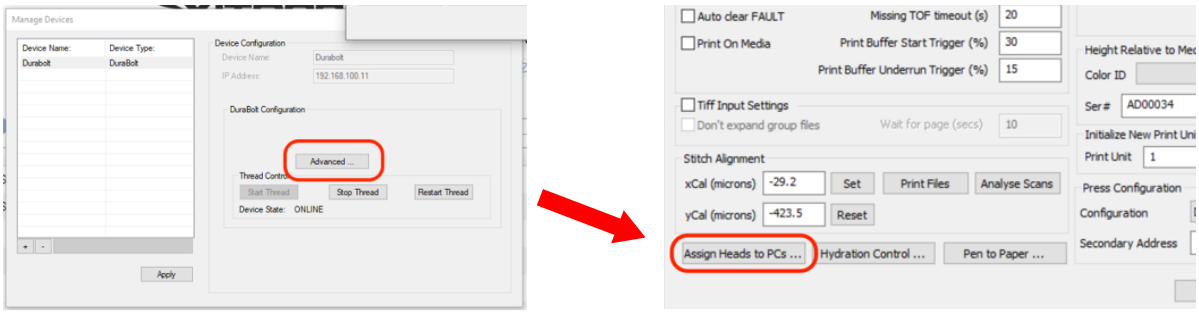
1. To set up simplex printing, open the Navigator Server window (see Appendix section ***11.1***)
2. Choose **Simplex** for printing with **Stage 1** (front) or **Simplex Secondary** for printing with **Stage 2** (back), as shown in (*Figure 17*).
1. After pressing OK, click **Restart Thread** in the Manage Devices screen.

Figure 17 – Advanced Configuration



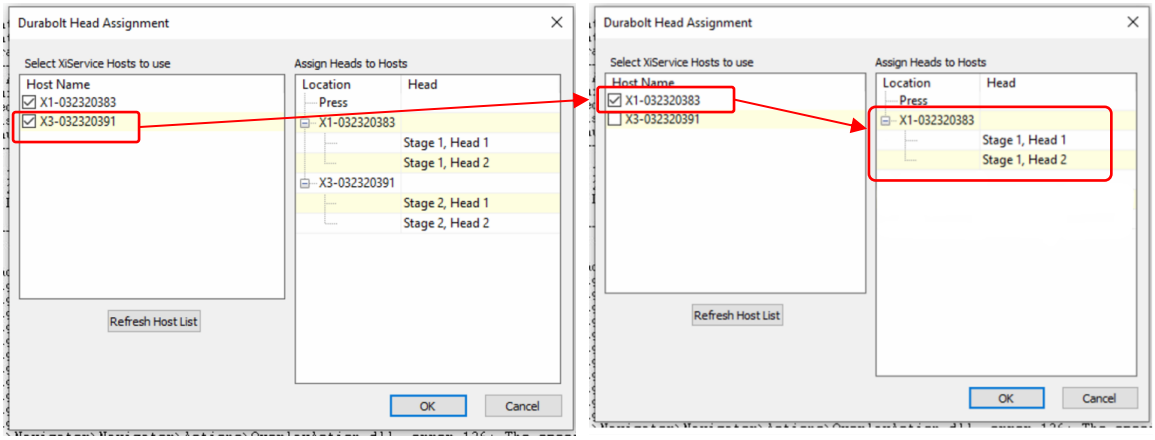
2. Then, click **Advanced** and click **Assign Heads to PCs**.

Figure 18 – Assigning Printheads to PCs



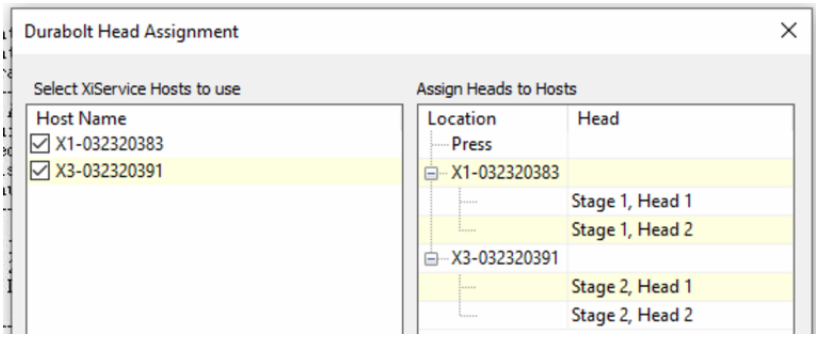
3. Uncheck the box next to the printhead you wish to deselect to show the stage 1 printhead only.

Figure 19 – Selecting Single Printhead



4. Ensure you reset the Configuration back to duplex for double-sided jobs and reset the **Assign Heads to PCs** accordingly. For Duplex see *Figure 20*.

Figure 20 – Selecting Duplex Printhead



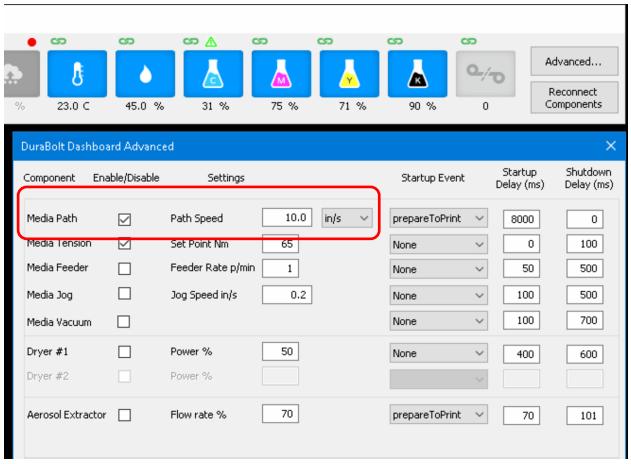
6 Preparing and Printing Jobs

6.1 Setting Print Speed

Setting the print speed is critical to ensure the proper KWS values are used and keep the printhead properly hydrated. The print speed can be set in two different ways, depending on whether or not the system in use has Modbus control of the media path speed. If the speed is set FASTER than the actual speed, KWS will be set too low, and dehydration will likely occur. If the speed is set SLOWER, than the actual speed, there is not an increased risk of dehydration, though there will be excess KWS that may be undesirable.

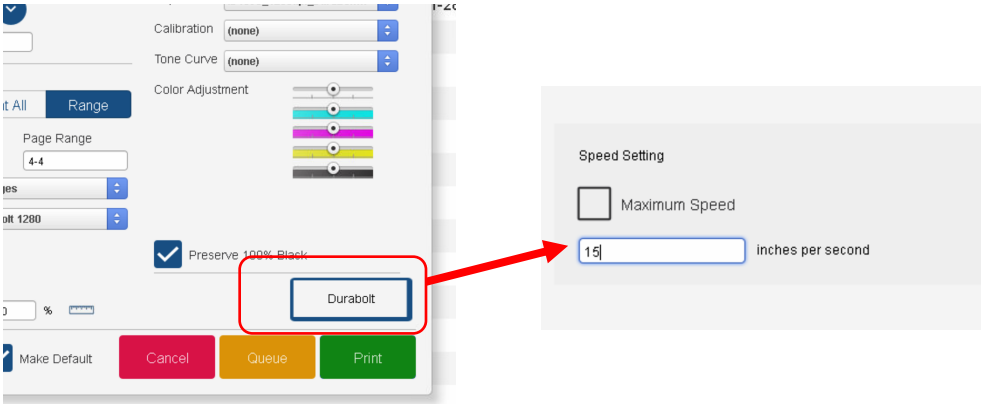
6.1.1 Using System with Modbus Control of Media Path Speed

Open the **Advanced...** DuraBolt Dashboard window and set the speed using the **Path Speed** control:

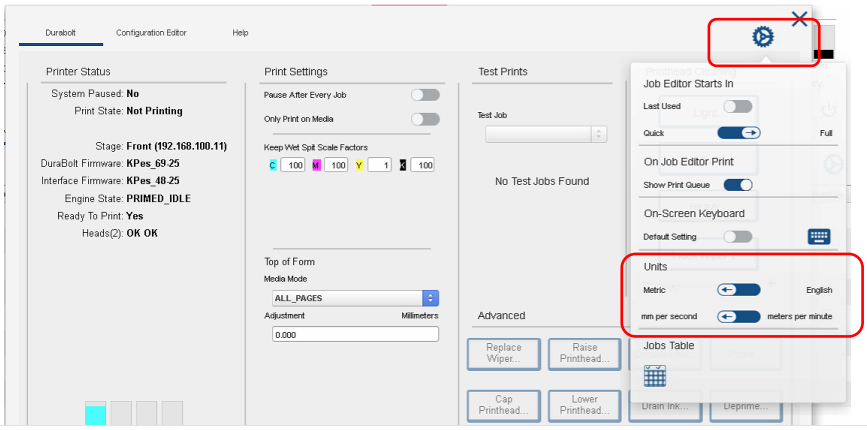


6.1.2 Using System without Modbus Control of Media Path Speed

When preparing a job to print (as shown later), set the speed using the **DuraBolt** button in the **Job Editor**:



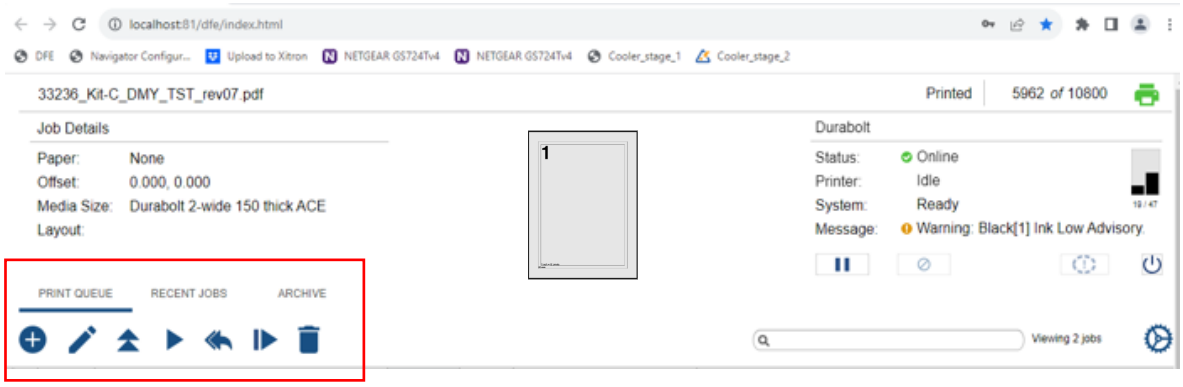
The units can be changed to mm/s in the DFE settings screen below:



6.2 Queuing and Printing Jobs

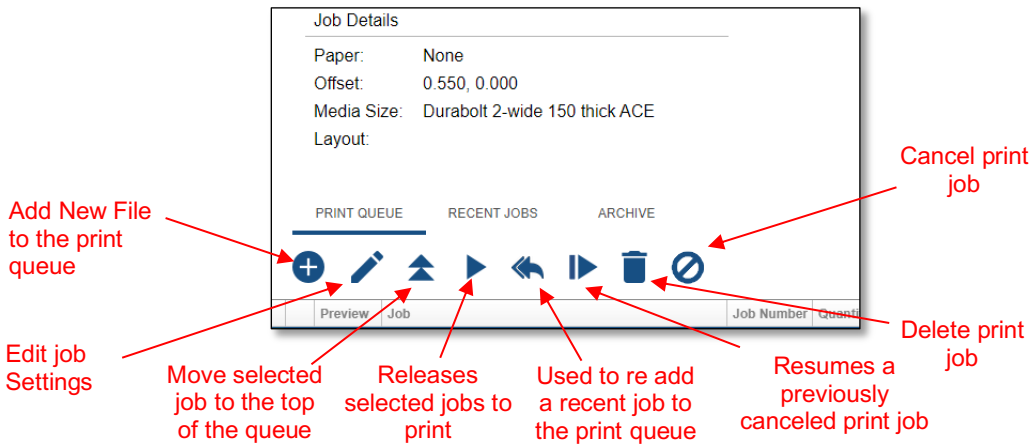
The job controls for the Front End (DFE) are in the main user interface shown in *Figure 21*.

Figure 21 – DFE Print Control Location



The various job control icons and their explanations are shown in *Figure 22*.

Figure 22 – DFE Print Queue Control Details



1. To add a new file to the print queue, click the **Add New File** button.

2. This opens a file dialog box for choosing the file. When the file is opened, it will appear in the job editor window. You can choose to use either the Full Job Editor (*Figure 23*) or the Quick Job Editor (*Figure 24*).

Note: The system is typically setup to display the Full Job Editor by default. To access the quick job editor, click the **Quick Edits** button.

3. If needed, adjust the horizontal and vertical offsets to align the printing to the press (*Figure 23*).
4. If necessary, set the print speed by clicking the **Durabolt** button then entering speed.
5. If planning to use the **cancel and resume functionality**, you must always start a new job with page 1 as the first page. Otherwise, the resume function will not work as expected.

Note: Jobs that are printed in Two-Pass Duplex mode with multiple copies **MUST** have collate enabled (see **Collate** checkbox in *Figure 23*).

Note: Jobs can have their pages reversed for printing (see Reverse checkbox in *Figure 23*). When jobs are printed in reverse, the **stage 1** and **stage 2** settings still apply to the odd (**stage 1**) and even (**stage 2**) pages as they exist in the input PDF. The pages are not reversed until the **Render Action**, which is the last step of the workflow.

Note: PDFs that are submitted for Two-Pass Duplex printing but have an odd number of pages will automatically have an extra blank page added at the end of the document to ensure an even number of pages. The extra page is only added to the whole file. Therefore, if a page range is printed that is an odd number of pages, a blank page will not be added.

6. Click **Print** to add the job to the job queue and start the RIP and printing process.

Figure 23 – Full Job Editor Window (Default)

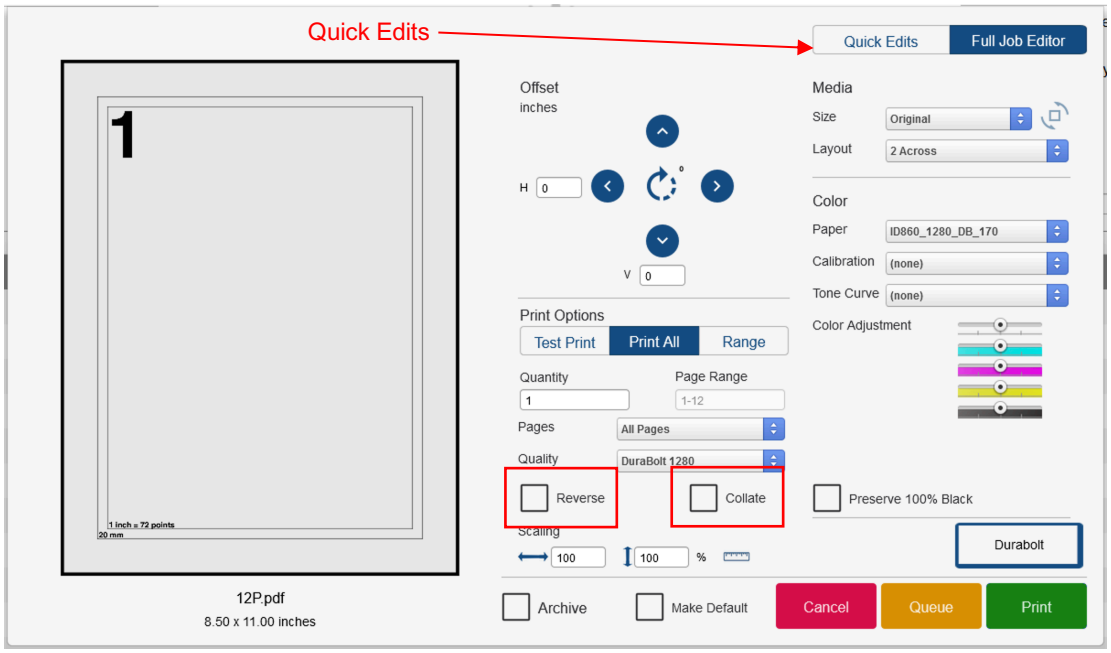
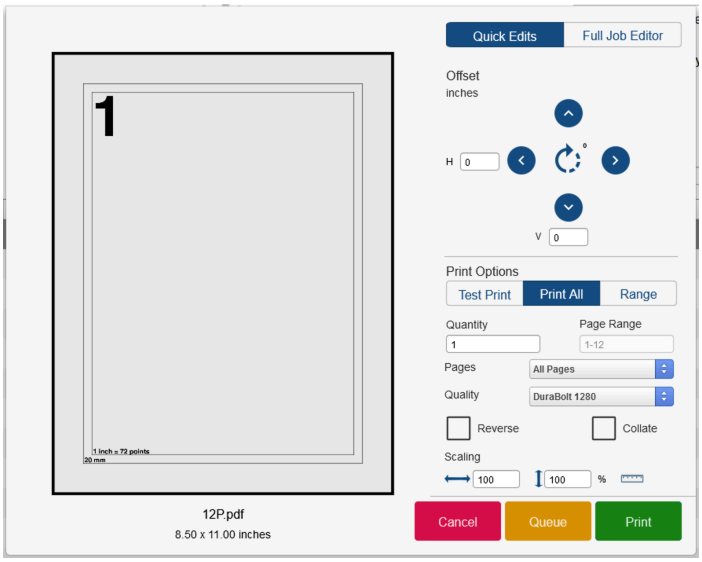


Figure 24 – Quick Job Editor Window



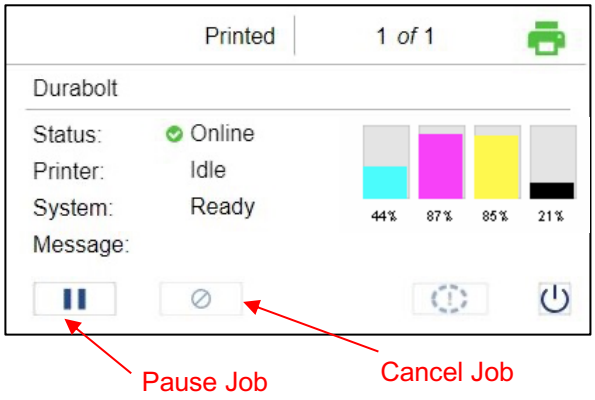
6.3 Canceling a Job that is Printing

When a job is already printing, click the cancel job button (see *Figure 25*). This stops the job and removes it from the print engine. It can be reprinted by editing the job again or can be restarted at a particular page (see Section *6.4*).

Note: The DFE also has a Pause Job button (*Figure 25*). Depending on the particular system configuration, **pausing jobs may not be applicable**, **such as with Two-Pass Duplex printing**. This will be discussed as part of the system integration.

Note: The **Cancel Job** button will not be active until printing has started.

Figure 25 – DFE UI Run/Pause Controls



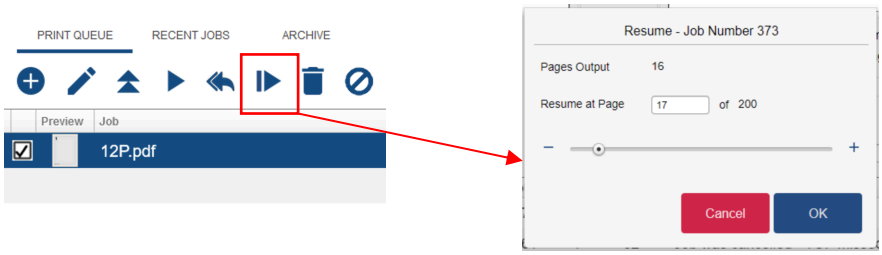
6.4 Restarting a Job after Cancelling

If a print job was **cancelled** prior to completion, it can be re-started at a specified page. Press the Resume Job printing button (*Figure 26*) to bring up the **Restart at Page** dialog box and choose the page from which to restart printing.

Note: Jobs that are printed in Duplex mode **must be resumed at an odd page** or the pages will not be in the expected sequence.

Note: The operator must determine the correct page for resume. The default is set based on the last printed page but may need adjustment depending on why the job was canceled.

Figure 26 – Resume a Canceled Job

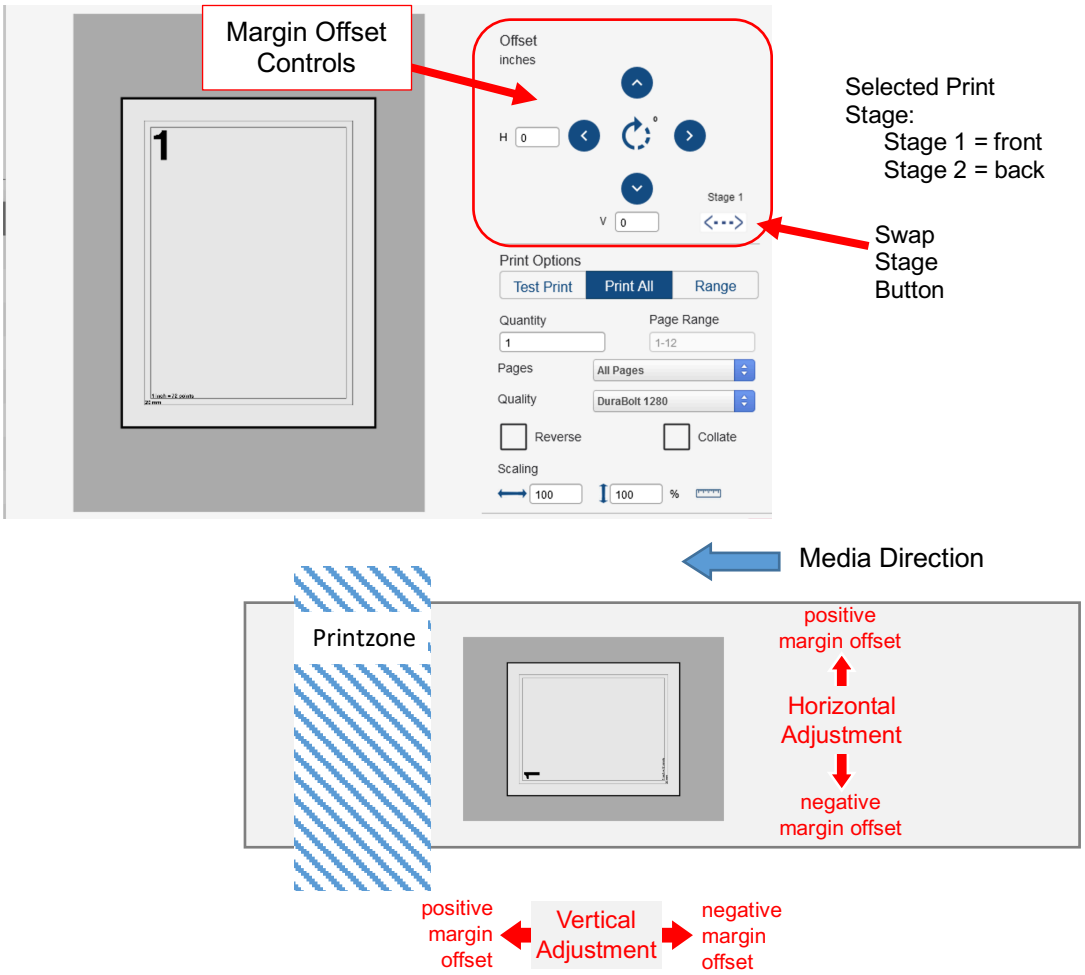


6.5 Setting Margin Adjustments

When using the Digital Front End (DFE) in a duplex print configuration (either with two print engines or with a single engine that runs two-pass duplex), margin and rotation adjustments are applied separately to the front (**Stage 1**) and back (**Stage 2**) pages. Margin adjustments can be made via the Full Job Editor window.

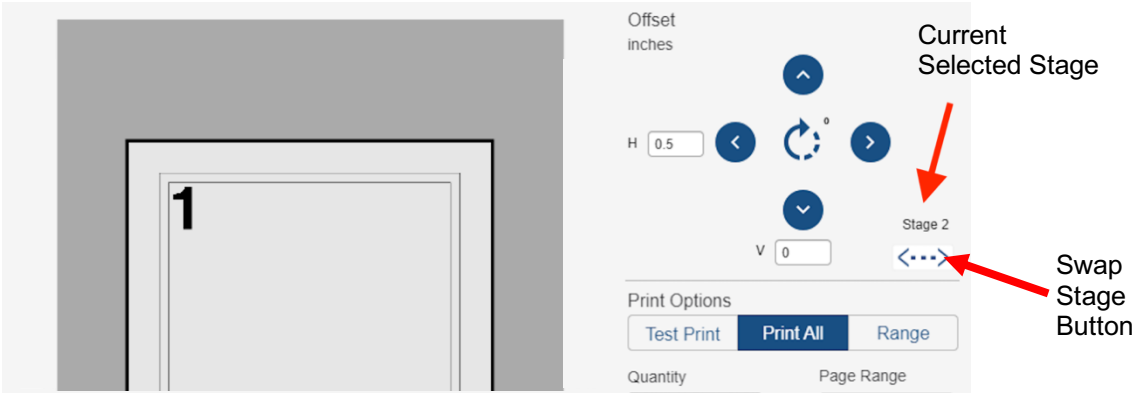
1. Press the **edit job** settings button (*Figure 22*).
2. The selected **Stage 1** is displayed, and any changes made will only affect that stage.
3. Using the horizontal and vertical shift buttons, adjust the values as needed. Adjustment direction is as shown in *Figure 27*.
4. After editing, the job is processed again through all the steps in the workflow.

Figure 27 – Setting Margin Offsets via Quick and Full Job Editor



5. To adjust the other stage, click **Swap Stage** (*Figure 28*). Again, the horizontal and vertical margin offset changes will only be applied to the back pages (Stage 2).

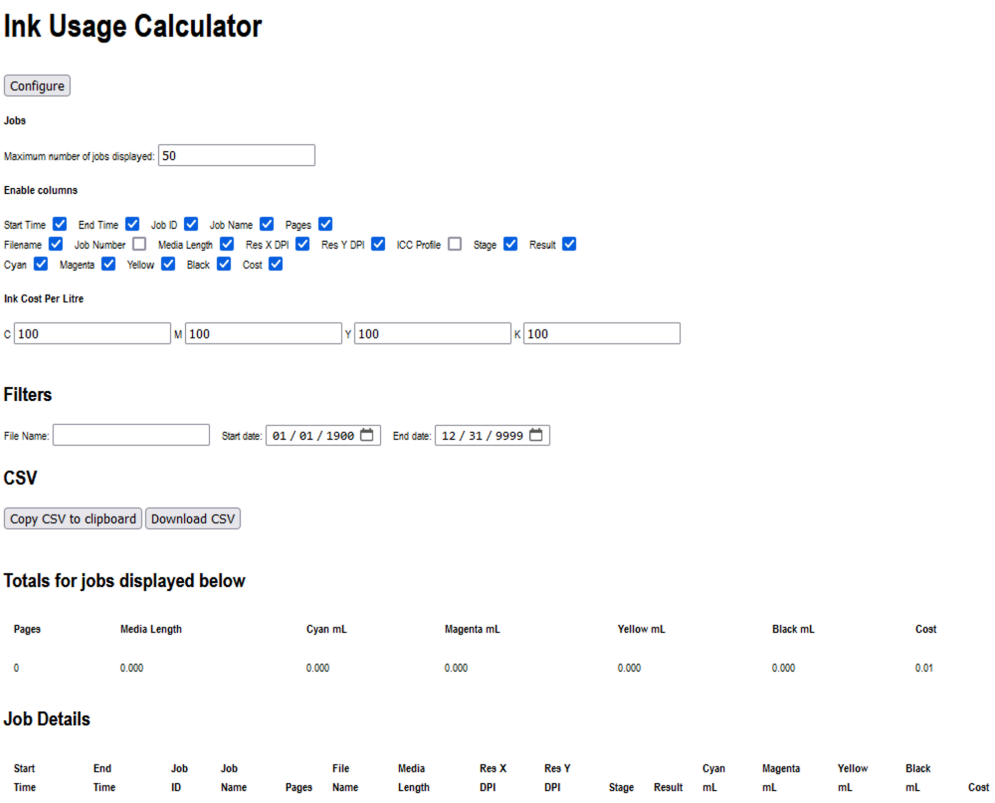
Figure 28 – Stage Selection Window for Stage 2



6.6 Viewing Ink Usage and Job Cost Estimates

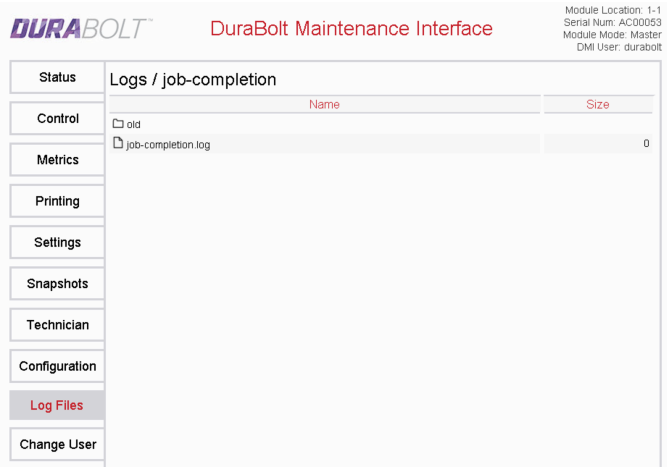
After a job (or jobs) have printed, use the web browser to navigate to http://localhost:81/Ink%20Usage%20Calculator/index.html to view the Ink Usage Calculator. The page has several configuration settings, including cost per L for ink such that each job can show a cost estimate.

Figure 29 – Ink Usage



Job information can also be seen in the job-completion.log from the DMI.

Figure 30 – Job Completion Log



7 General Use and Preventative Maintenance

The print engine requires regular maintenance both during production runs and during down-time to ensure smooth running and minimal downtime.

7.1 Preventative Maintenance Schedule

A general timetable of preventative maintenance is shown in *Table 3.*

Table 3 – Recommended Preventative Maintenance Schedule

Item	Recommend Interval
Light service	At start of day
Medium service	At start of day if light service is not adequate
Wiper index	The wiper will index one time every five wipes automatically
Wiper Cartridge check and replace if required	Once per day, start of first shift (ensure wiper can still advance with lever)
Printhead edges and nest clean	Only if visibly dirty
AES nozzle wash	TBD based on use cases

Note: If you have an issue where the RIP is not running as expected, restart the Navigator Server instead of the PC (see section *10.2.1*). This will minimize the risk of files disappearing from the RIP queue.

If you required additional information, please contact Memjet support.

7.2 Changing the Bulk Ink Supply

The bulk ink supply can be changed at any time, even during printing. Residual ink in the container can be poured into the new tank when there is room.

1. Memjet recommends that the ink dongle be changed at the same time as the bulk ink supply. This can be done by replacing whichever dongle is showing **two (2)** green LEDs. Alternatively, you can wait until the LED on the DDM (Dongle Dock Module) displays a red LED indicating it is empty. If there is only one non-empty dongle, then the LED will turn orange when nearly empty.
2. Once the dongle has been replaced, the LED should display green. Discard the used dongle according to local regulations once it has turned red.

Note: In print engines with a single printhead and print module, there is only one bank of dongles that are used. Therefore, changing a dongle DURING printing could result in the job automatically canceling. (this is fixed in R3.2 and later Software)

Note: Bank 1 and Bank 2 do not map to Stage 1 and Stage 2. They can be thought of as "in use" and "reserve", and they will swap. The two (2) green LEDs shows that the dongle has less ink in it than the one with one (1) LED. Red indicates the dongle must be changed.

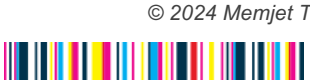


Figure 31 – Empty Ink Dongle LEDs

Figure 32 – Replaced Ink Dongle LEDs and Swap Over

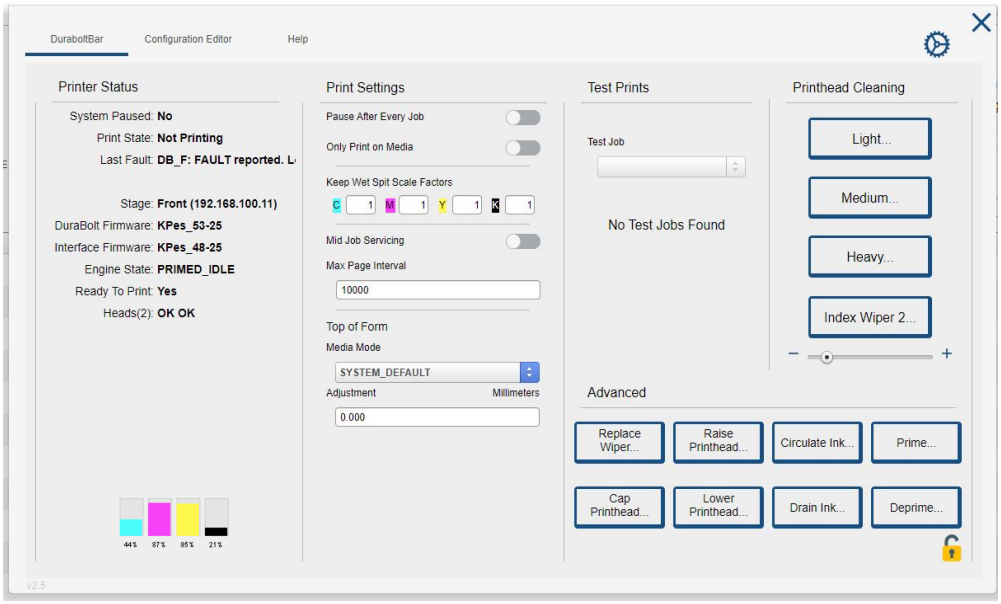
7.3 Changing a Printhead

Note: Printheads must be changed one at a time. You must remove only one printhead and completely insert the new printhead, before removing the second printhead. Do not remove both printheads and then replace both printheads.

7.3.1 Depriming the Printhead

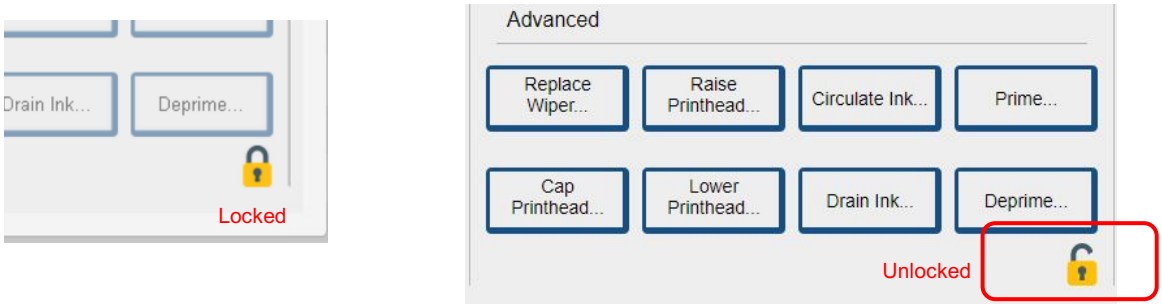
To deprime the printhead, open the DFE Maintenance Page as shown in *Figure 33*.

Figure 33 – Maintenance Page



1. Click the unlock icon in the Advanced section (*Figure 34*) and enter the password **xitron** to access the advanced controls.

Figure 34 – Unlocking the Advanced Controls



2. Deprime the printhead. Click the Deprime… button and choose the printhead to deprime.

Figure 35 – Deprime the Printhead

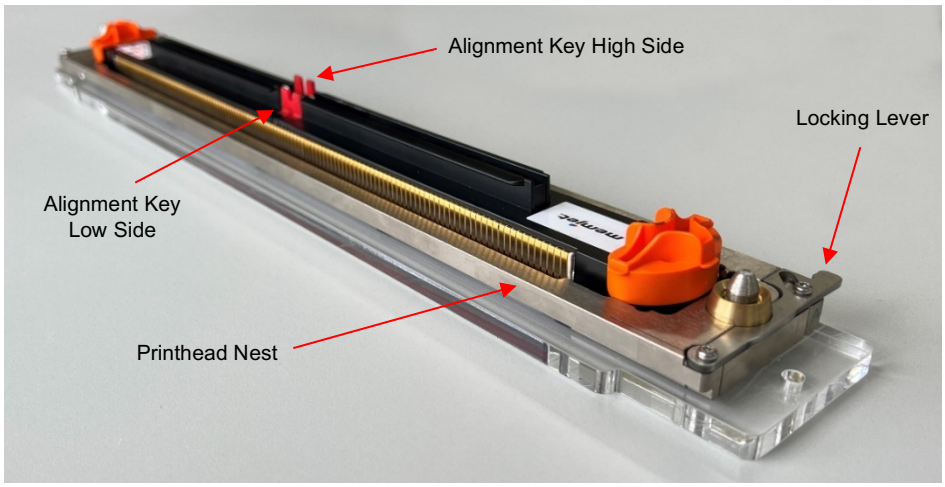
7.3.2 Replacing the Printhead

1. Lift the printhead away from the cap by clicking **Raise Printhead** in the Advanced Section of the DFE. Select the deprimed printhead you wish to raise by clicking the toggle switches in the dialog box, then click **Raise Printhead** (*Figure 36*).

Figure 36 – Raise the Deprimed Printhead

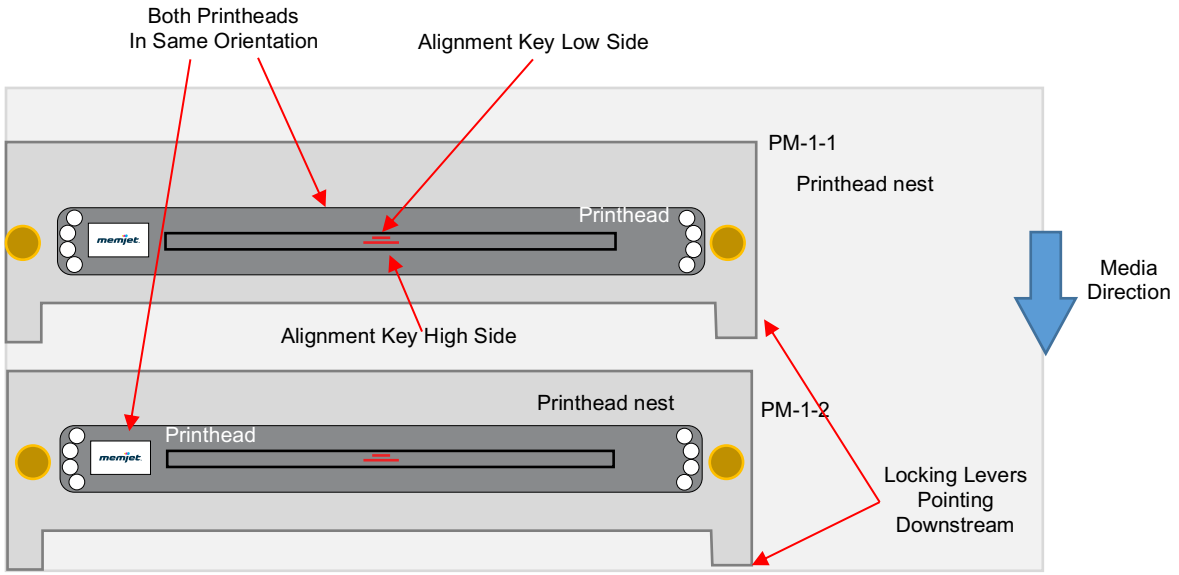
2. With the printhead raised, manually lower the printhead and printhead nest as one piece by twisting the orange handles anti-clockwise to unscrew. Loosen each orange handle by turning a half-turn each, then alternate turning each to lower the nest evenly. Use a gloved hand and hold the edges of the nest as it lowers to catch it as it releases fully from the screws. Refer to the video on the Memjet website for a demonstration. You MUST put the printhead on the printhead stand to avoid damaging the nozzles. The key points of the printhead are shown below.

Figure 37 – Printhead Installed in a Nest on the Printhead Stand



3. Unpack the new printhead, remove the orange inlet covers, and install it into the nest and insert it into the unit, paying attention to the lever orientation (*Figure 38*).

Figure 38 – Correct Orientation of Printhead Nests in the Tandem Configuration



7.3.3 Priming the Printhead

Once the new printhead has been installed, prime it using the **Prime** button in the DFE. A second window will pop up to choose which printhead to prime (*Figure 39*).

Figure 39 – Priming the Printhead

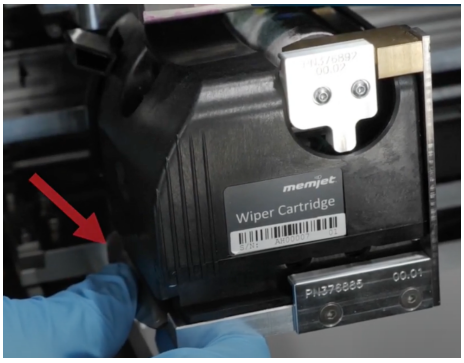
7.4 Changing a Wiper

Using a clean wiper is essential to keeping the printhead healthy. When a wiper has used up all the microfiber, it must be changed and a new wiper installed. For convenience, the wiper can be moved to a "replace wiper" position that allows for replacement. The move to this position also resets the wiper count that can be seen in the DMI. To move the wiper to the "replace wiper" position, open the maintenance page as shown in *Figure 33*. Then, unlock the Advanced controls as shown in *Figure 34*. Then, click the **Replace Wiper…** button as shown in *Figure 40*. Choose the wiper to replace and click the **Replace Wiper…** button in the pop-up window.

Figure 40 – Replace Wiper

The printhead will move up and the wiper will move out. Click the tab as shown below to release the wiper, then insert the new wiper. Use the **Cap Printhead…** button to move the wiper back home and complete the process.

Figure 41 – Release the Wiper



7.5 Adjusting Printhead to Paper Spacing (PPS)

The distance between the printing nozzles and the media surface is critical and is known as the printhead to paper spacing (PPS). This is also referred to as pen to paper spacing. Adjusting the PPS is performed via the Navigator Server Advanced Dialog (see Appendix section *11.1*). Once open, click on **Pen to Paper** (*Figure 43*) to open the settings.

The initial configuration has already been completed during integration. See the installation guide printhead height calibration section for more details. To change for different media or to adjust print quality, the following is adjustable:

- the media thickness (µm) typically this is 100µm for 80gsm paper
- the PPS (µm) which is ideally set for 700µm for the best print quality.

Note: The nozzles are not the lowest print of the printhead. The gap between the lowest point on the printhead and the media is approximately 0.3mm less than the PPS. However, the recommended measurement point used in the print height calibration process IS aligned with the nozzle height and so no additional compensation is needed.

Figure 42 – PPS View

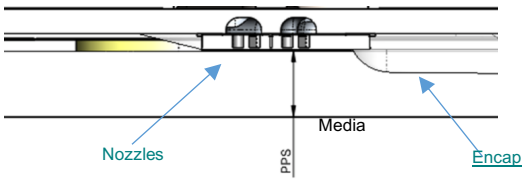
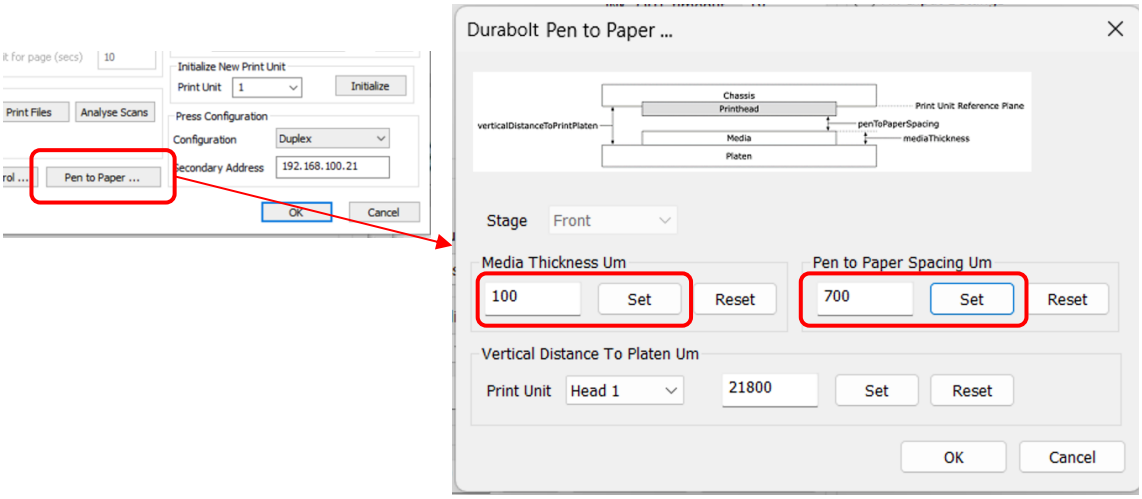


Figure 43 – Pen to Paper Settings (also called Printhead to Paper Settings)



7.6 Hydration Management to prevent Dehydration

Managing hydration to prevent dehydration is a key aspect of the print system. The printhead must be kept properly hydrated and healthy to achieve the best print quality. See *Figure 44* for an example of print artifacts from dehydration. Dehydrated ink becomes more viscous, in some cases blocking nozzles during ejection. Dehydration is greatly affected by temperature and humidity and can require mitigation by the end user or a technician to achieve good print quality.

Figure 44 – Dehydration Example

Memjet systems have multiple options for managing hydration:

- **KWS (Keep Wet Spit)**
  - Fires all nozzles at an adjustable frequency
  - Can be turned off between pages in a cut sheet system (though will be less effective)
  - Essential, though can be reduced if print quality is an issue and sufficient pre-page spit bars and/or inter-page spit bars can be used
- **Declog spit prior to job start**
  - Fires a high energy declog pattern
  - Can be triggered at a variety of times before and during printing
  - Essential for initial hydration management at job start
- **Pre-page spit bar**

  - Prints a bar of settable intensity and height prior to the first page of a job or each page of a job
- **Inter-page spit bars**
  - Prints a repeating pattern of bars in-between pages
  - Excellent for keeping printhead hydrated when gaps between pages are large
  - This is usually used in cut sheet systems that have a spittoon to capture the ejected ink
- **Temperature Regulation**
  - There are four settings of adjustments to reduce the regulation temperature target and improve hydration with some sacrifice of print quality.

Note: Changing Temperature Regulation from the default setting will degrade ejection uniformity since the printing ICs will not be a uniform temperature.

Additionally, managing relative humidity in the print zone will reduce dehydration risks.

The general approach to setting up all these settings is as follows:

- Set up declog spit to **PRE_JOB** for roll-to-roll or **FIRST_PAGE** for cut sheet
- Set KWS to 1.5 for roll-to-roll or 3.0 for cut sheet
- For roll-to-roll, set **allowInterPageEjections** to **on** (described later) and **printOnMedia** to **false**.
  - Cut sheet systems usually should set **allowInterPageEjections** to **off** and and **printOnMedia** to **true** to avoid spitting ink onto a belt or drum. However, if a spittoon is available or, if the belt or drum will be cleaned periodically, it should be set to on.
- Set **Temperature Regulation** to **normal**
- Run test prints
- Make adjustments until hydration is sufficient: Increase KWS, add pre-page spit bars, add inter-page spit bars, change temperature regulation
- Make tradeoffs: Can consider adding pre-page spit bars and/or inter-page spit bars to improve hydration or to reduce KWS intensity.

7.6.1 Adjusting Keep Wet Spit (KWS)

The default KWS configuration should be suitable for most applications but may need adjustment for some situations such as:

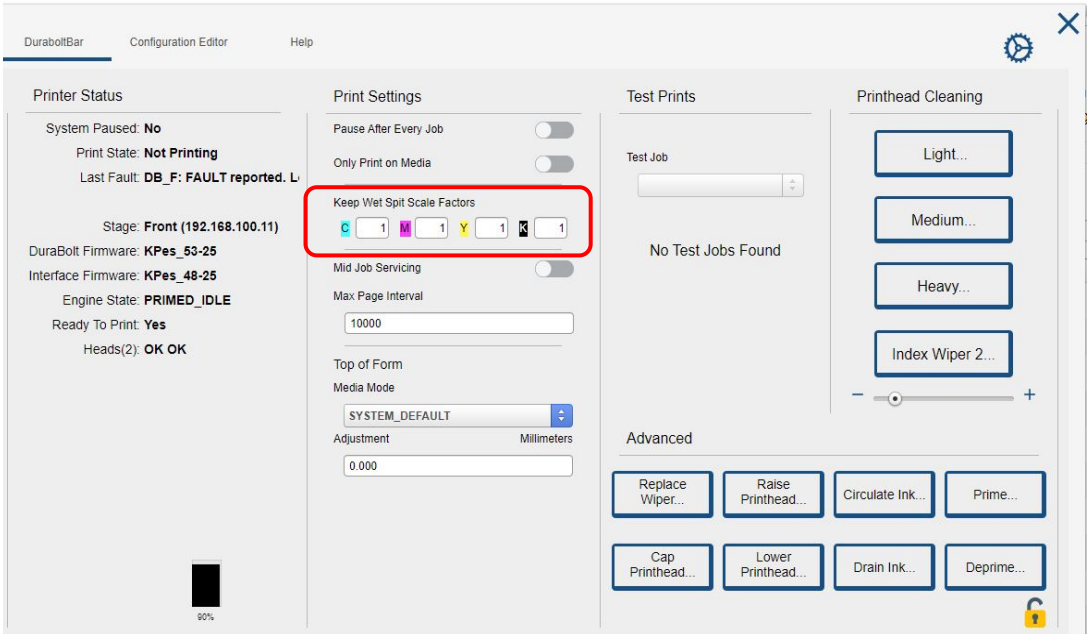
- Cut sheet printers that use vacuum belts or vacuum spittoons
- Hotter or drier printer environments
- Long print runs.

1. To adjust the KWS, open the DFE Device Configuration Window (*Figure 45*).
2. Locate the KWS multiplier settings (*Figure 45*).
3. Set **allowInterPageEjections** to **on** or **off**, for either roll-to-roll or cut sheet systems, respectively. This can be done via the DMI (see section *9.1.4*) or via the **Enable Inter-Page Spit Bars** checkbox in *Figure 49*.

Note: For systems that do not use the Xitron RIP, these settings can also be adjusted using the DMI. See section *9.1.4* for the settings page of the DMI.

Lower KWS numbers reduce the KWS frequency and higher numbers increase it. The lower the humidity (drier environments) the higher the KWS should be set to avoid nozzle dehydration. KWS multiplier values can be set between 0 and 9.99. A value of 0 will disable the KWS for that color (a value of 0 should never be used in normal operation without some other type of hydration, such as spit bars).

Figure 45 – Device Configuration – Pen to Paper Settings

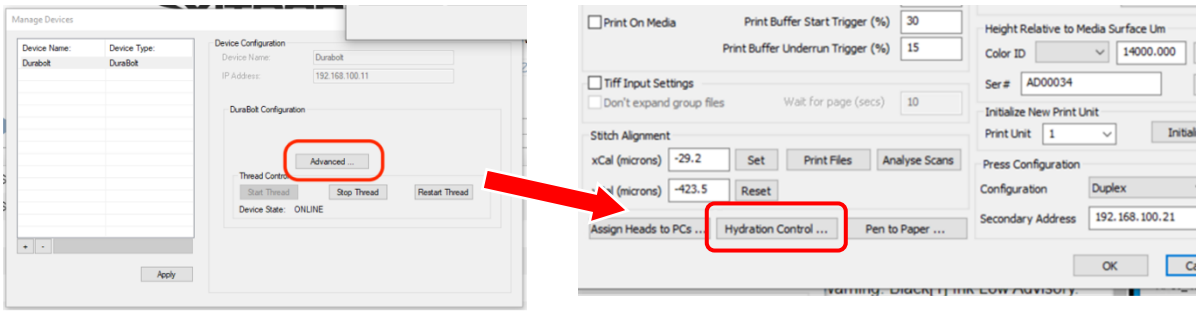


7.6.2 Hydration Control Advanced Settings (other than KWS)

Specific hydration control settings can be set via the **Hydration Control** in the Advanced Configuration screen which is accessed via the Manage Devices page (See Appendix section *11.1*).

Note: For systems that do not use the Xitron RIP, these settings can also be adjusted using the DMI. See section *9.1.4* for the settings page of the DMI.

Figure 46 – Accessing Hydration Control Modes



7.6.2.1 Declog Mode

Choose the desired declog mode from the dropdown menu shown in *Figure 48*. See Appendix Section *11.5.2* for a detailed explanation on declog modes and other printhead hydration settings.

It is helpful in a cut sheet system to set the declog mode to FIRST_PAGE. This enables the declog spits to happen just before the first page of the job, which is beneficial when the media feeder takes some number of seconds to start feeding media after the job is started. If setting declog to FIRST_PAGE, the **First Page Spit Length** must be set to 150mm or more to accommodate the full length of the declog spit.

7.6.2.2 Printhead Temperature Regulation Mode

The printhead temperature regulation mode can select between the options shown in *Figure 48*. The **Normal** temperature regulation mode will produce the best print quality. If printhead dehydration is an issue, then **Best** can be selected.

Note: Changing Temperature Regulation from the default setting will degrade ejection uniformity since the printing ICs will not be a uniform temperature.

7.6.2.3 Pre-Page Spit Bars

Spit bars can be printed before each page and are selected as shown in *Figure 49*. The intensity (amount of ink) ejected in the spit bars can also be adjusted from 0-100% via the drop-down box. See Appendix Section *11.5.2* for a detailed explanation on spit bars and other printhead hydration settings.

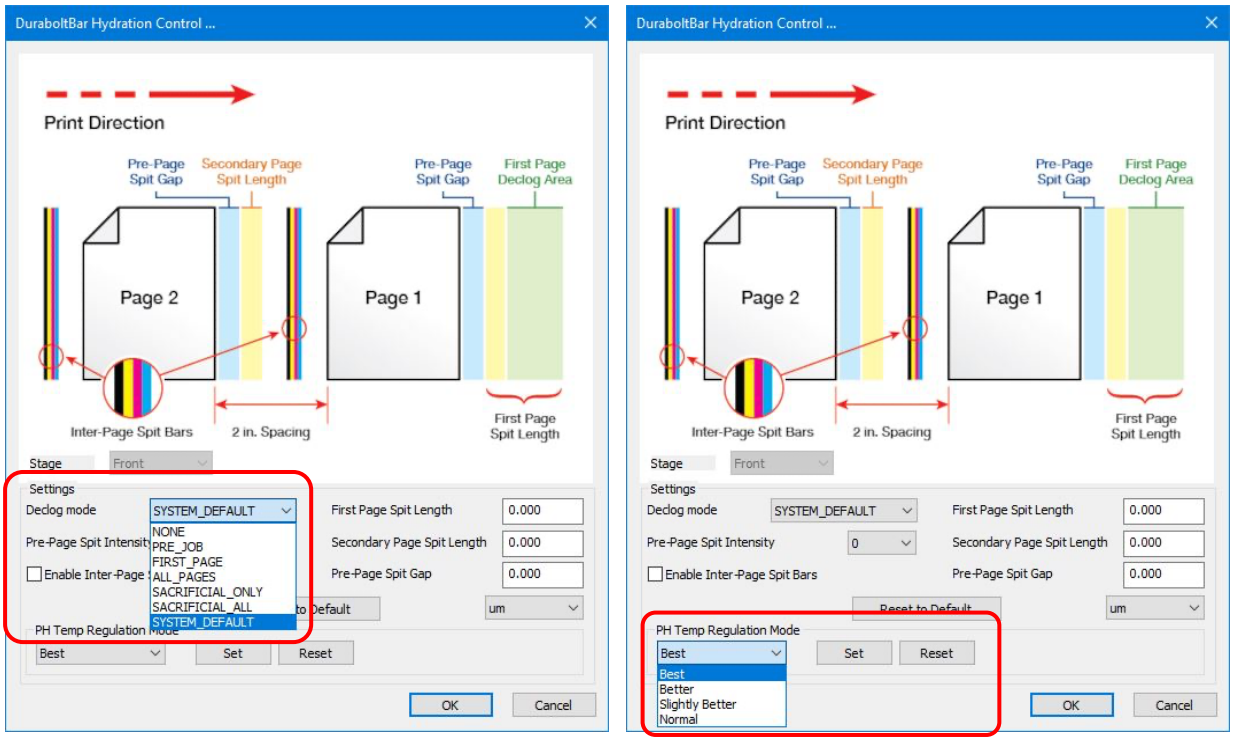
As an example in a cut sheet case, setting the **First Page Spit Length** and **Secondary Page Spit Length** to 2mm, **Pre-Page Spit Gap** to 1mm and Pre-Page Spit Intensity to 100 will spit a 2-mm long, page-wide spit bar 1mm before the start of the page data for each page. If the **TOF Media Offset** is also shifted several mm, the spit bar can land at the top of the cut sheet page.

7.6.2.4 Inter-Page Spit Bars

See section *11.5.3* for setting up inter-page spit bars. When these are configured, the output between pages is a repeating spit bar that may look like the following:

Figure 47 – Inter-Page Spit Bar Example

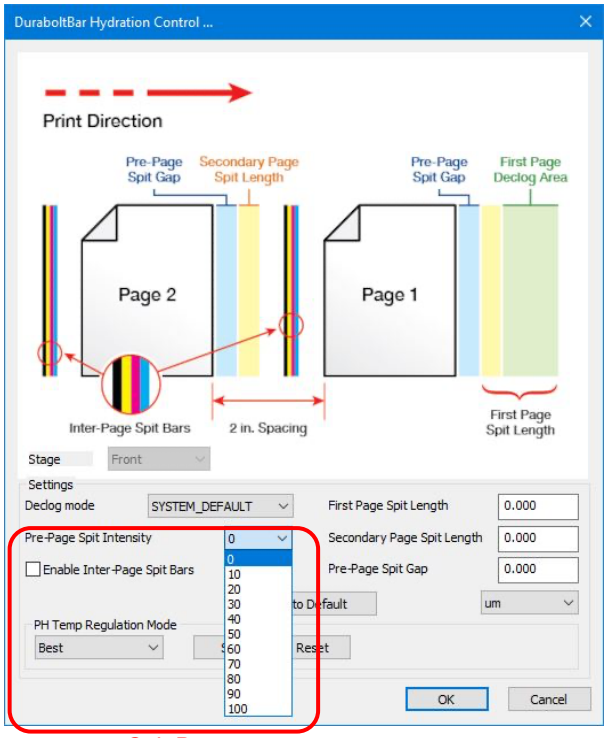
Figure 48 – Hydration Control Modes Declog and PH Temperature Regulation



Declog Mode Settings

Printhead Temperature Regulation Mode Settings

Figure 49 – Hydration Control – Spit Bars



Spit Bars

7.7 Optimal Printhead Usage

The guidelines shown below in *Table 4* are for optimal printhead usage during production and non-production intervals. Contact Memjet support for further assistance or support if required.

Table 4 – Storage Conditions for Non-Production Periods

Scenario	Days Without Use	Optional States
Overnight (12 hours)	<1 day	Capped in a `Primed_IDLE` state
Over regular weekend (2 days)	2 days	Capped in a `Primed_IDLE` state
Over extended weekend (3-4 days)	> 3 days	Capped in a `Primed_IDLE` state
Over a week	> 7 days	Capped in a `Primed_IDLE` state, **Or** De-primed and Capped state, Powered ON
Over longer holiday periods	7+ days	De-primed and Capped state, Powered ON, **Or** De-prime and remove printhead
14 days or more	14+ days	De-prime and remove printhead (following both storage and contamination recommendations as per documentation and recap ink couplings. It is highly recommended to re-prime the printhead after it has been removed from the printer and stored for 30 days, in order to keep the printhead nozzles in good condition. If the printhead will be still not in use for > 14 days after re-priming, de-prime and store it again according to the storage documentation.

7.8 Pre-production Maintenance

This should be performed before the start of a production run and during downtime (ideally once per day during production runs.

7.8.1 Printhead Dehydration

If the print output contains sections of unusually light printing and/or streaks, then the printheads may have dehydrated.

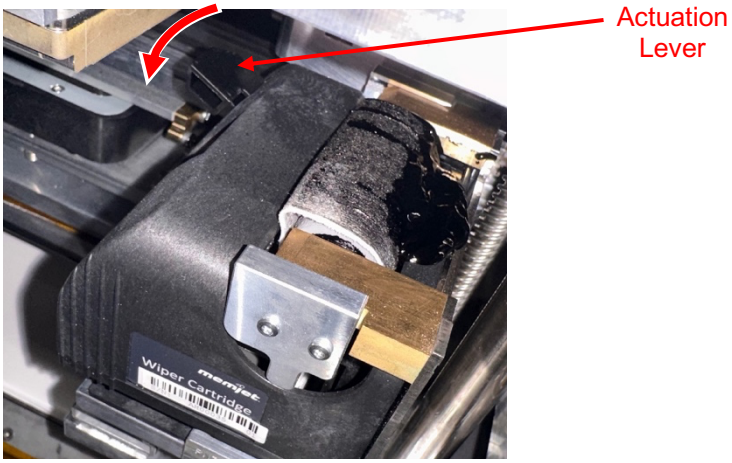
1. Run a light service first.
2. If this does not fix the issue, perform a medium service. Severe dehydration may require multiple (up to 3) medium services.
3. If this still does not fix the issue, see Section *7.8.2*.

7.8.2 Wiper Function

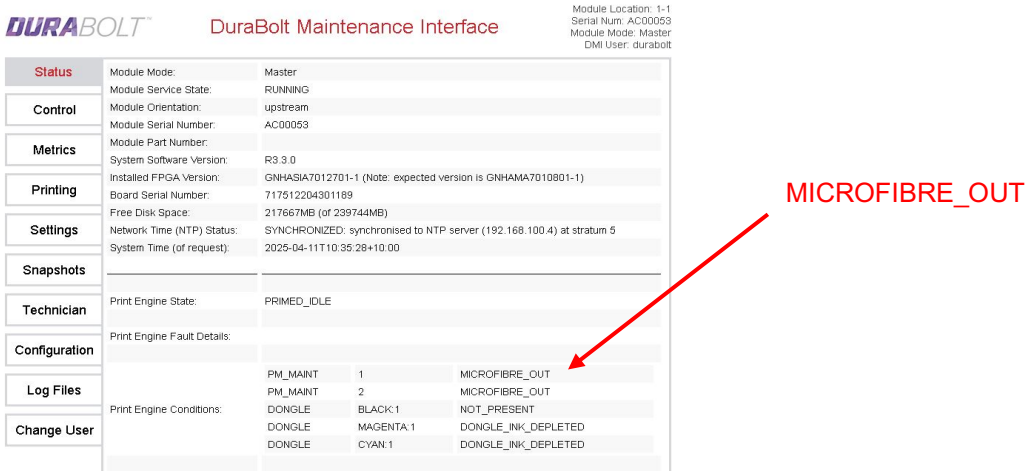
If you find that a medium service is required frequently, inspect the wipers on the module that needs continuous servicing.

1. Use the **Raise Printhead** command to expose the wiper. Confirm that the microfiber material still advances by clicking the wiper lever down manually a few times and look for cleaner material to come up toward the top of the wiper (*Figure* 50).

Figure 50 – Wiper Functionality Check



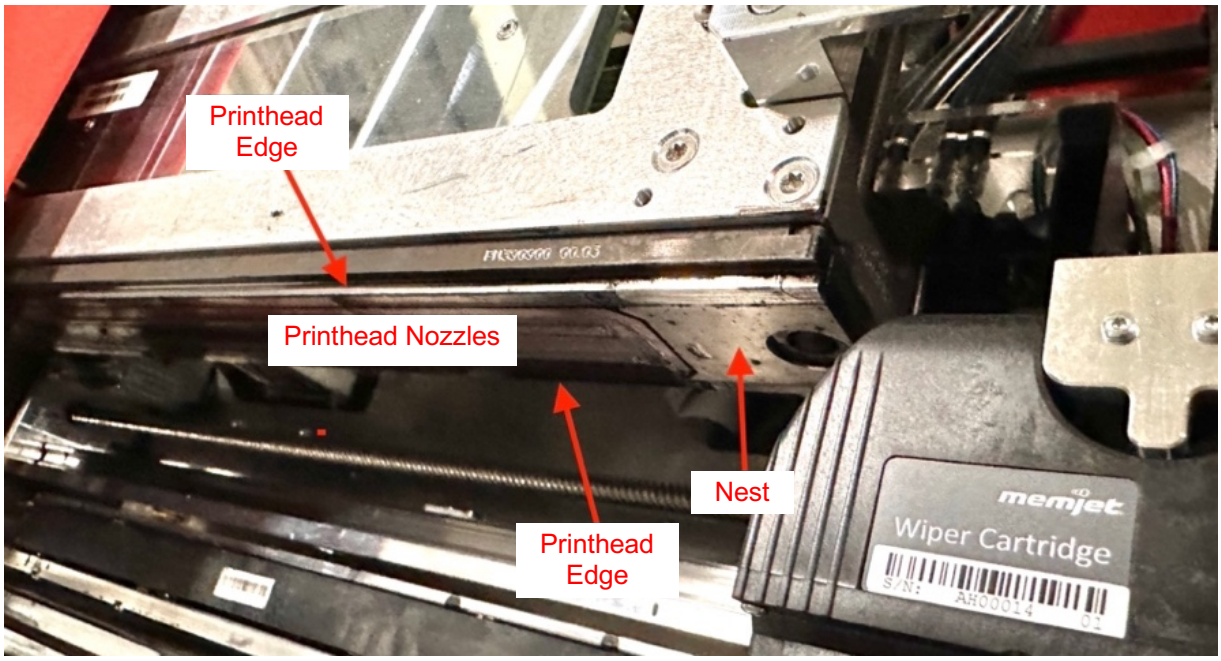
2. Confirm that an excessive amount of ink has not built up on the wiper preventing the microfiber material from advancing. If the wiper material will not advance, use the **Replace Wiper** command to expose the wiper for replacement and replace the wiper cartridge. If the wiper material advances, use the **Cap Printhead** command to cap the printhead.
3. Confirm that the system does NOT have an active MICROFIBRE_OUT error condition using the DMI after replacing the wiper. This is ONLY cleared when the **Replace Wiper** command is used to expose the wiper for replacement. If this is not cleared, the wiper will not index.



7.8.3 Printhead Cleaning

Ink can build up on the edges of the printhead, particularly on the downstream side. Ink can also buildup on either side of the printhead and on the underside of the printhead nests (*Figure* 51).

Figure 51 – Removing Excessive Ink



4. To remove excess ink, use a clean microfiber cloth that has been dampened with deionized (DI) water.
5. Carefully wipe the edges of each printhead until clean, **do not** wipe the printhead nozzles in the middle of the printhead. The downstream edges of the printhead are readily visible on print modules 1-2 and 2-2. The downstream edges are toward the back of print modules 1-1 and 2-1.

Note: Ink that builds up on the underside of the printhead nest can transfer onto media near the start of print jobs.

7.8.4 Aerosol Nozzles

The aerosol nozzles collect ink aerosol to prevent it from transferring to the media.

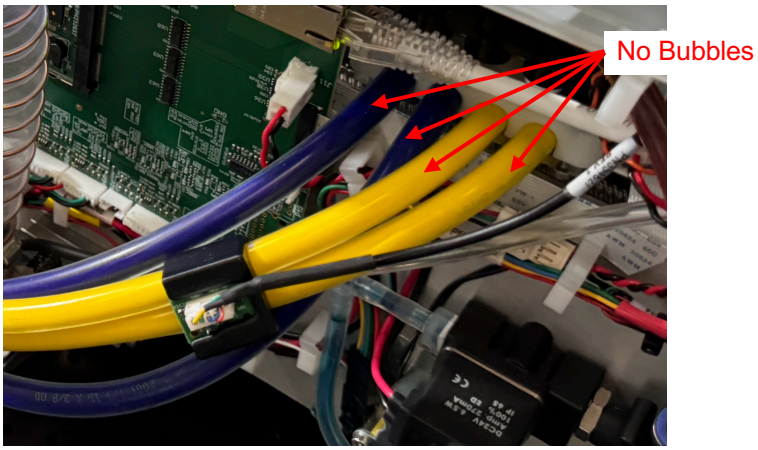
1. Remove each of the four aerosol nozzles and rinse out with water until water runs clean.
2. Dry the nozzle off and reinstall it under the print modules.

7.8.5 Ensure Ink Inlet Tubes to Each Print Module Are Full of Ink

Inspect each set of ink inlet tubes at the top of the print engine and check for any air pockets in the ink as shown. (*Figure* 52). Be sure to check all four colors.

If the inlet tubes are not full of ink or have air pockets in them, perform a Medium Service. The software will run the pumps for sets of tubes in parallel and should fill up the tubes. Contact Memjet Support if there are any issues.

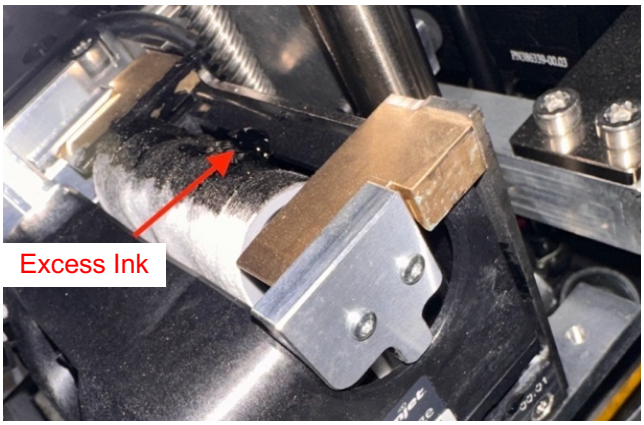
Figure 52 – Ink Inlet Tubing Full of Ink



7.8.6 Wiper Cleaning and Visual Inspection

Inspect wipers for excess ink build up and gently wipe off any if visible. Also ensure the wiper material advances when the lever is depressed (see Section 7.8.2).

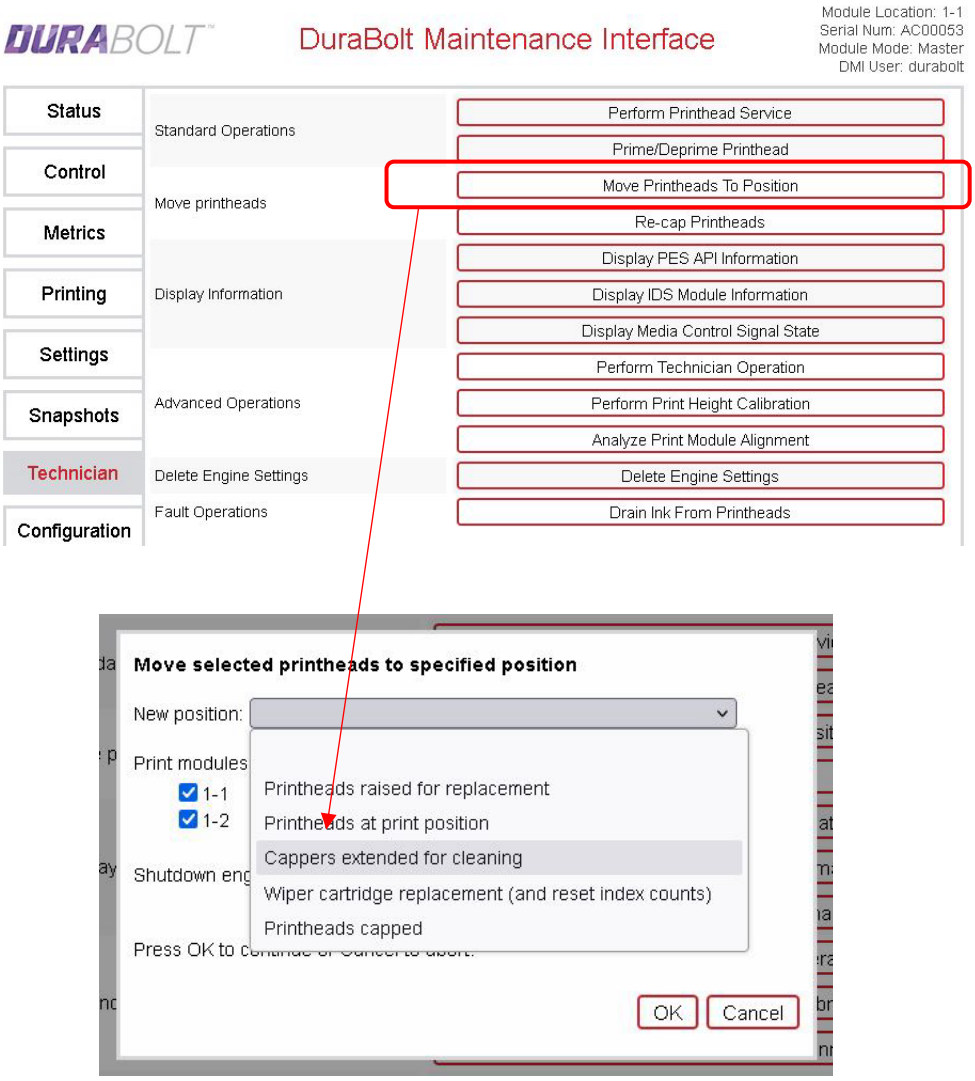
Figure 53 – Excessive Ink on Wiper Roller



7.8.7 Caper Cleaning and Visual Inspection

Using the DMI Technician tab, click **Extend Capper for Cleaning**. This exposes the cap for inspection. Check for excess ink build up and gently wipe off any if visible. It is important to do this efficiently to avoid leaving the printhead exposed to air for too long. Click **Re-cap Printheads** when finished.

Figure 54 – DMI Technician Tab for Extending Capper



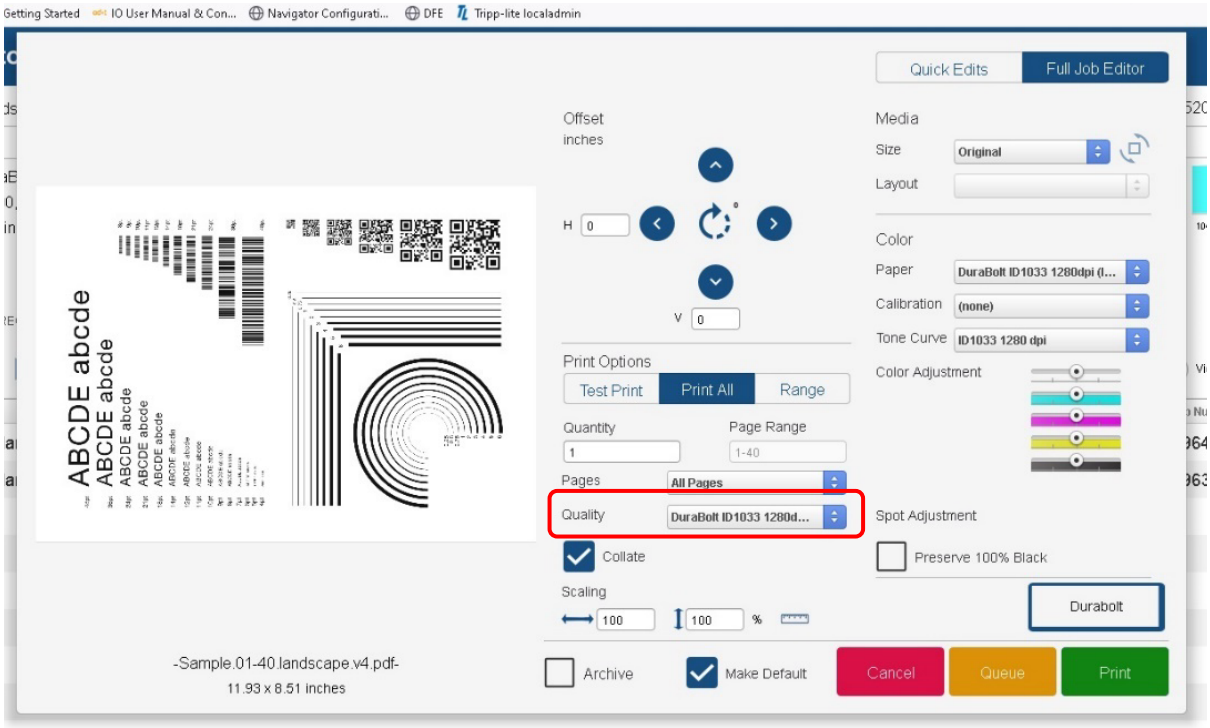
8 Adding Color Profiles

8.1 Adding New ICC Profiles and Render Configurations

This section explains how additional color profiles and rendering settings can be added to the RIP, assuming an ICC color profile has already been generated. Color profiles are used by making them available to the RIP software, pairing them with an input profile and other settings, and linking them to a print resolution and halftone screen. These files and settings are then combined into a Render Configuration which can be used and reused for different jobs.

When setting up a print job, a Render Configuration is chosen from the **Quality** drop-down menu in the Job Entry screen (*Figure* 55). The Quality setting sets up a variety of settings, including paper type, based on the Render Configuration.

Figure 55 – Job Entry Screen



8.1.1 Creating a Render Configuration

The Navigator Configuration Editor page (*Figure* 56) has tabs for setting print resolution setting, the color profile setting (paper) with optional tone curves and calibration. These items are then populated on the Job Editor screen as follows:

- Items in the Render Configs tab populate the Quality list in the job editor
- The Tone Curves list populates the Tone Curve list in the job editor
- The Color Profiles list populates the paper list in the job editor

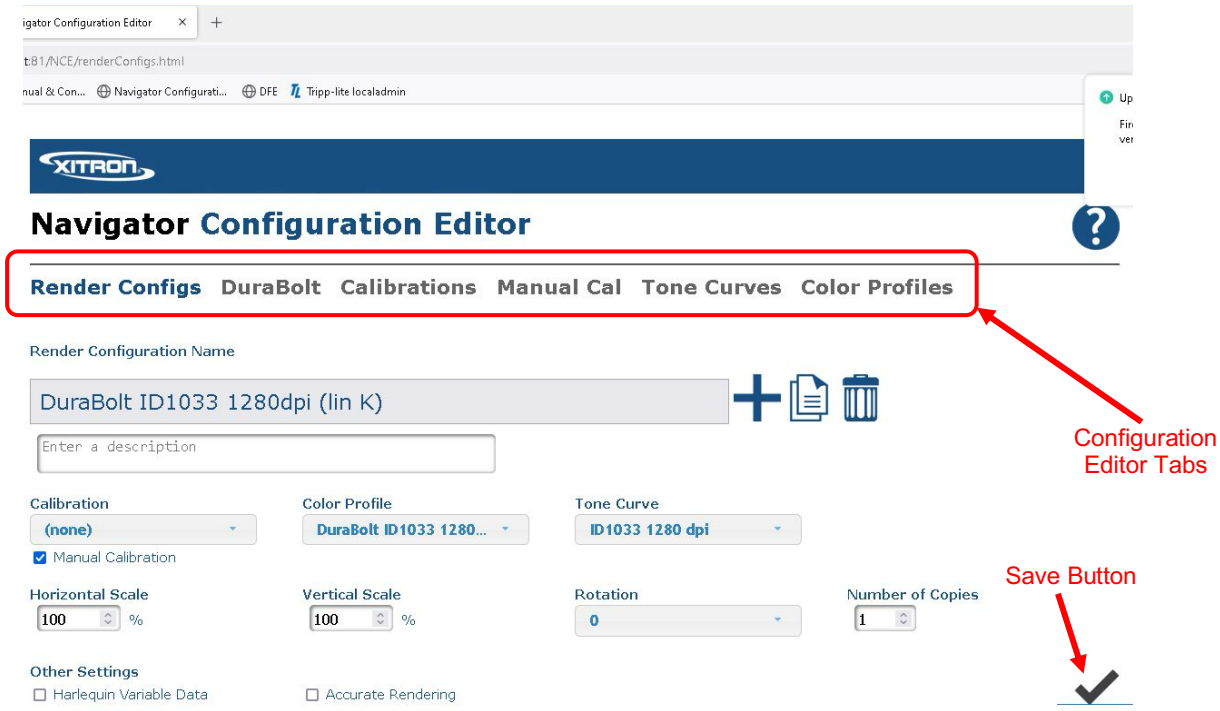
Configuration files are stored in the folder: `C:\Navigator\Navigator\Config\RenderConfig\`

Setting up a Render Configuration (or "Render Config") requires the following steps:

1. Create a Color Profile Configuration
2. Create a Render Configuration
3. Connect the Render Configuration to a Print Resolution.

These configurations are set via the Navigator Configuration Editor (NCE). The NCE is accessed via opening a new tab in the DFE web browser with the following URL:
`Localhost:81/NCE/index.html`

Figure 56 – Navigator Configuration Editor (NCE) Screen



8.1.1.1 Creating a Color Profile Configuration

Store your ICC profile file in `C:\Navigator\Navigator\Config\RenderConfig\ICC Profiles`

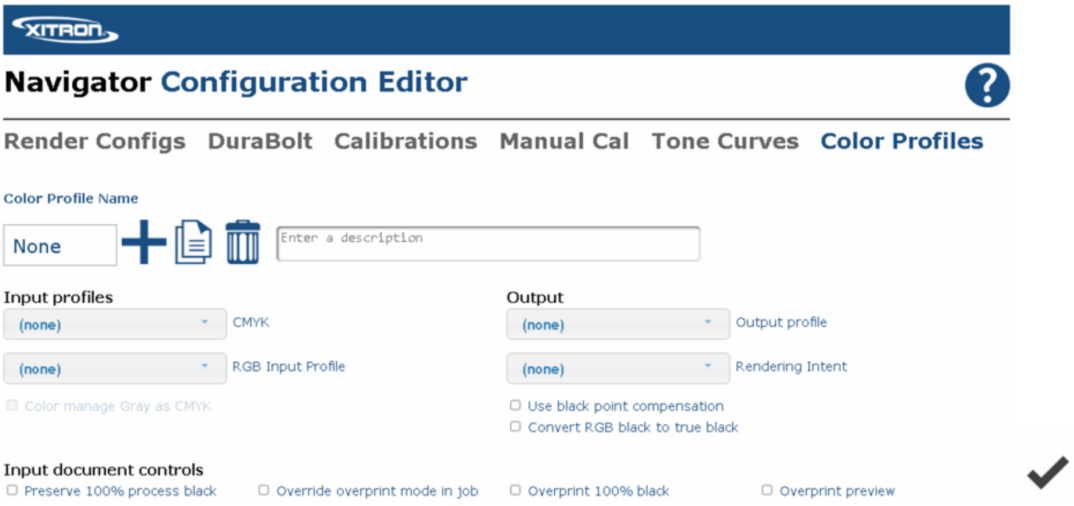
Then create a color profile configuration in the **Navigator Configuration Editor** Color Profiles screen: http://localhost:81/NCE/color.html

1. Press the **+** button then you can name a new profile
2. Select the profile you added to the directory as the **output** profile
3. Select a **rendering intent**
4. Select Input profiles, usually as follows:

   The CMYK Input Profile is set to: `GRACol2013_CRPC6.icc`
   The RGB Input Profile is set to: `sRGB_IEC 61966-2-1_withBPC.icc`

5. Click the **Save** checkmark button to save the configuration

Figure 57 – NCE Color Profiles



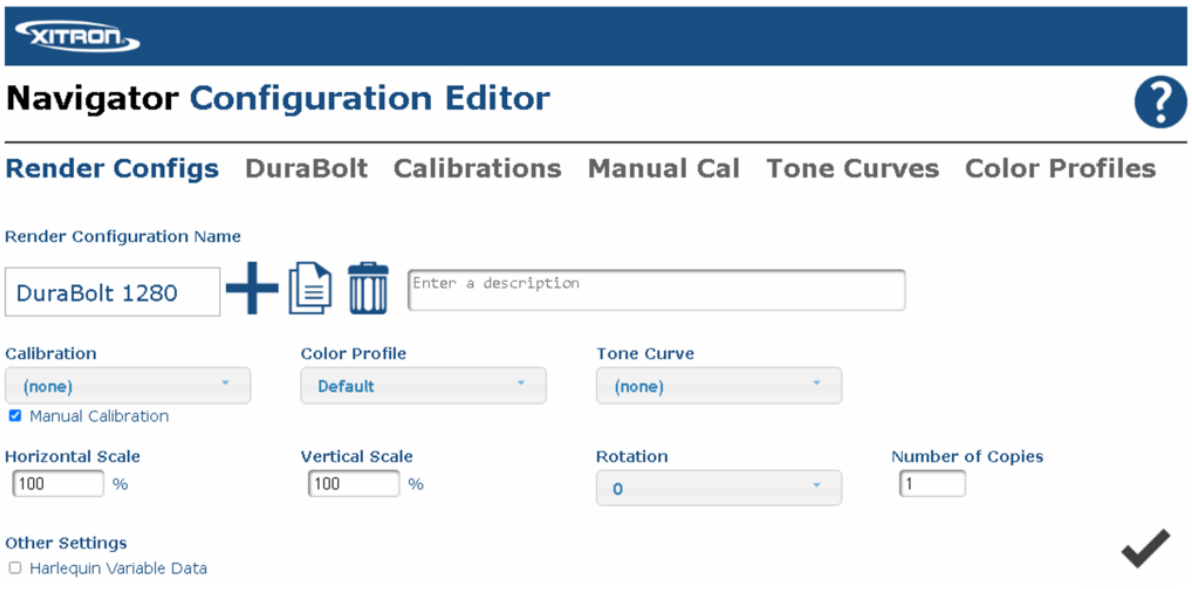
8.1.1.2 Creating a Render Configuration

Then create a render configuration (render config) using the new color profile name in the Navigator Configuration Editor under **Render Configs** screen:

http://localhost:81/NCE/renderConfigs.html

1. Press the **+** button and enter a name for the new render configuration.
2. Select the color profile name you created above
3. Click the **Save** checkmark button to save the configuration

Figure 58 – NCE Render Configs



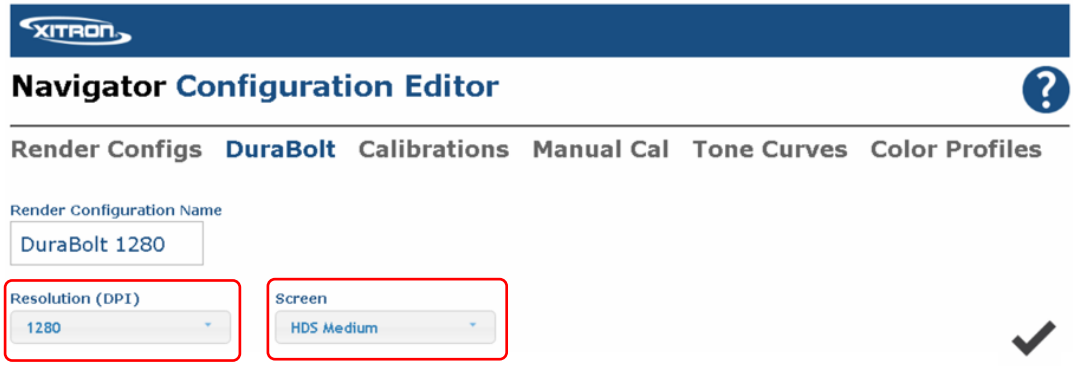
8.1.1.3 Creating a Resolution Configuration

Then connect the render config to a print resolution in the Navigator Configuration Editor **DuraBolt (named DuraBolt but applies to DuraCore)** screen: http://localhost:81/NCE/DuraBolt.html

1. Choose the Render Configuration Name you created.

2. Select the resolution from the **Resolution** dropdown box and under the **Screen** dropdown select **HDS Fine**.
3. Click the Save button to save the configuration. This configuration can then be selected from the job editor screen in the **Quality** drop-down menu.

Figure 59 – NCE Resolution and Screen Setting



9 The DuraBolt/DuraCore Maintenance Interface (DMI)

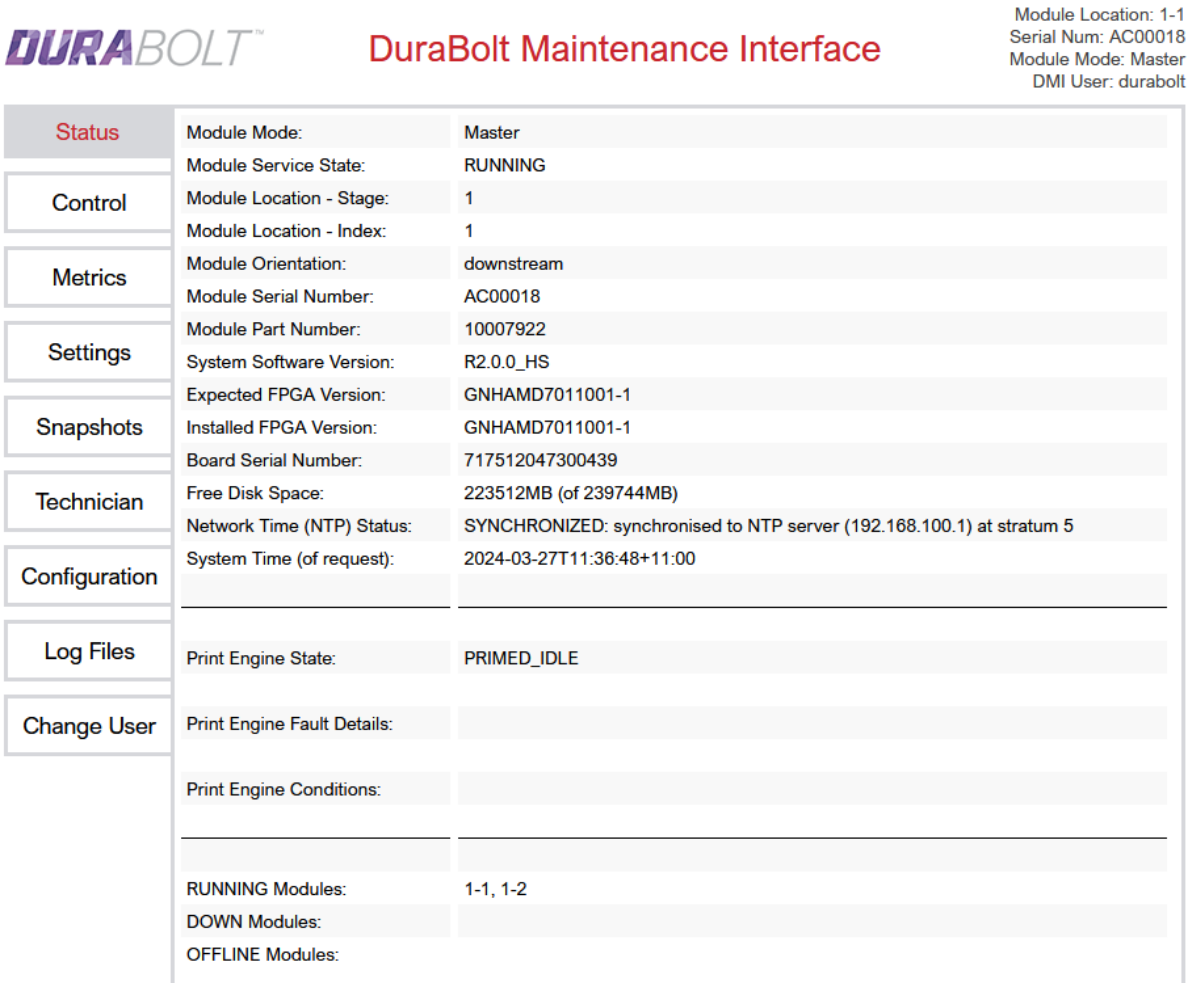
9.1 Connecting to the DMI

The DMI is used to maintain the software of the printer. It can be accessed from any PC on the same local area network via web browser. Use the IP address or the local ID of the printer, i.e., `durabolt-pm-1-1.local` and with username/password `durabolt` . This will open the DMI status page.

9.1.1 Status Page

The Status screen displays all the critical information for the printer.

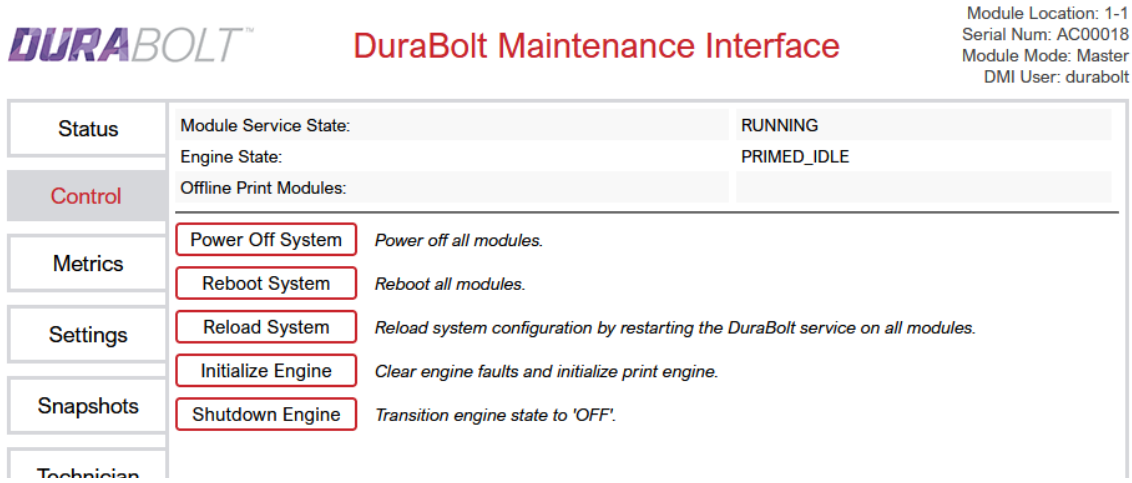
Figure 60 – DMI Status Page



The other DMI screens are shown below.

9.1.2 Control Screen

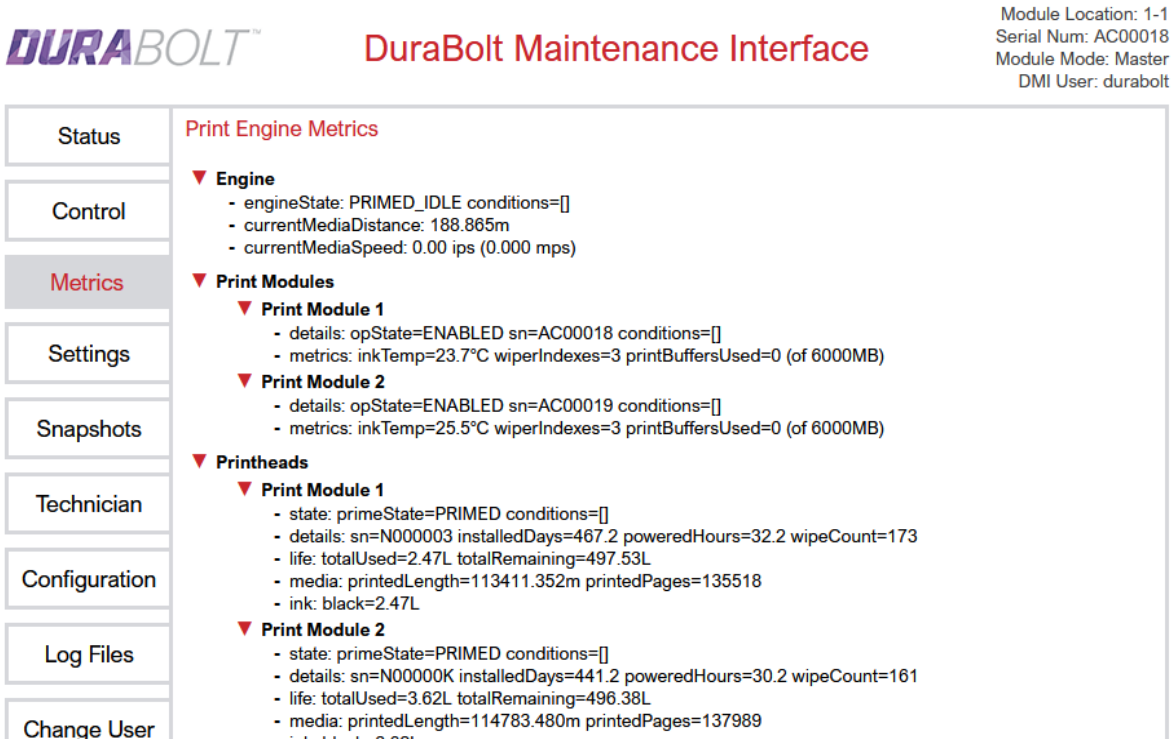
Figure 61 – DMI Control screen



9.1.3 Metrics

The Metrics page displays the numerous values use by the software that can either be set/adjusted or measured.

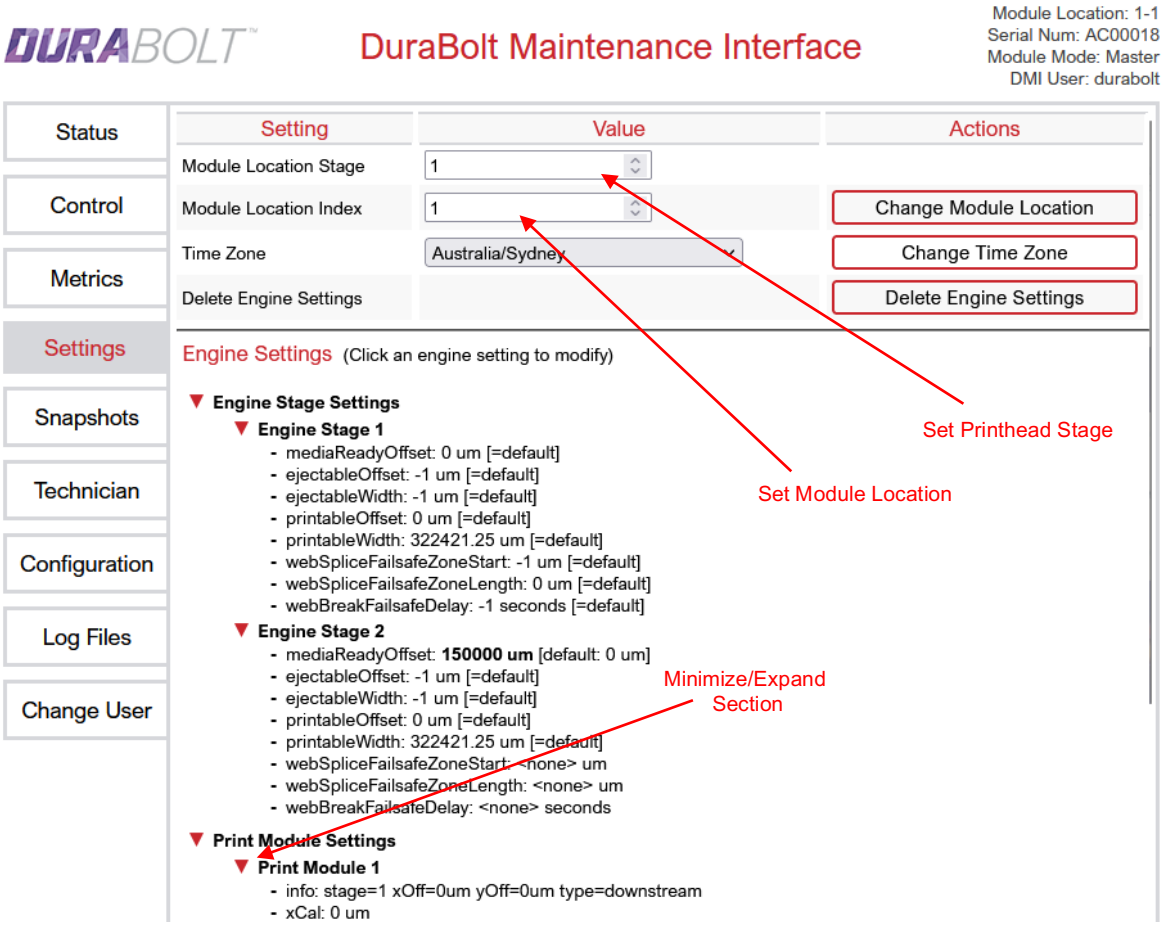
Figure 62 – DMI Control screen



9.1.4 Settings Page

The Settings page displays all the current values for the numerous printing/software settings for each of the printhead modules. Choose which printhead stage, and which module to view, then click on the red triangles to expand/minimize parameters.

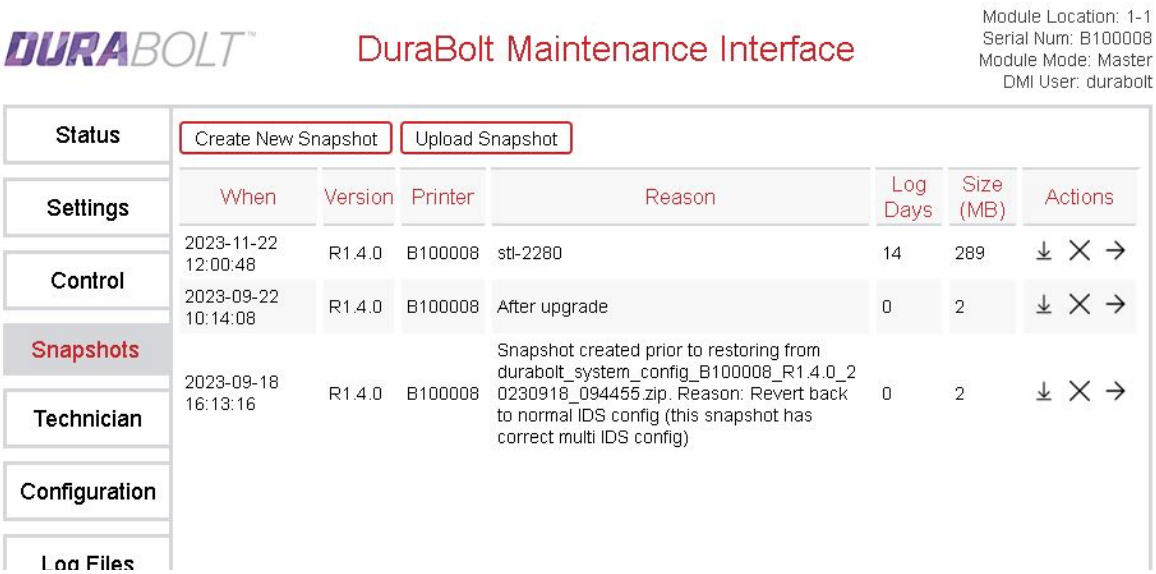
Figure 63 – DMI Settings Page



9.1.5 Snapshots Page

The Snapshots page (*Figure* 64) displays the current list of saved and/or uploaded snapshots for the system and contain all the logs and settings useful for debugging and SW updates.

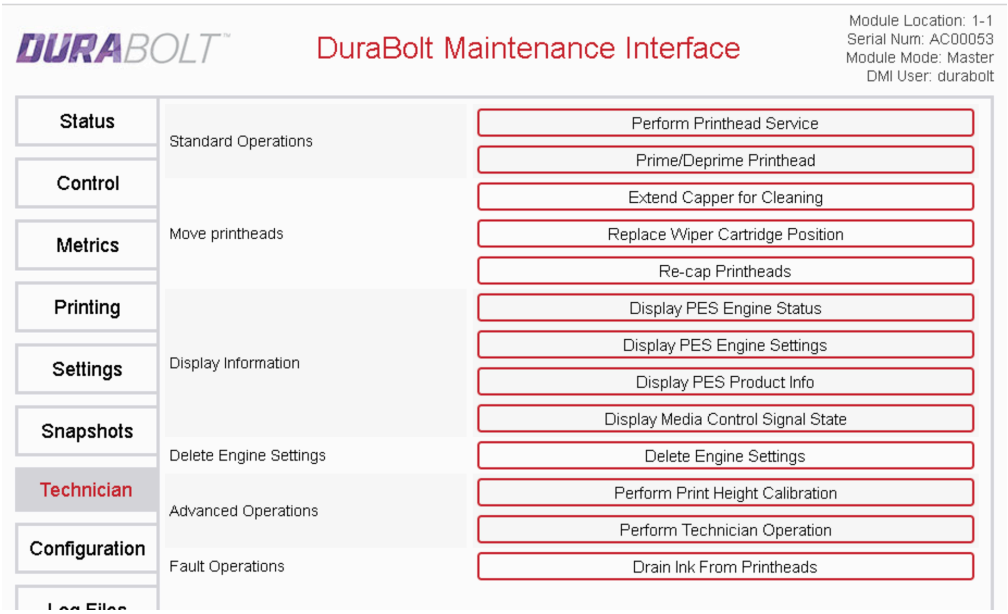
Figure 64 – DMI Snapshots page



9.1.6 Technician Page

The Technician Page (*Figure* 65) allows an operator to perform common maintenance tasks on the system, without needing to use the command line to enter commands. These settings should not be used without training or guidance from Memjet.

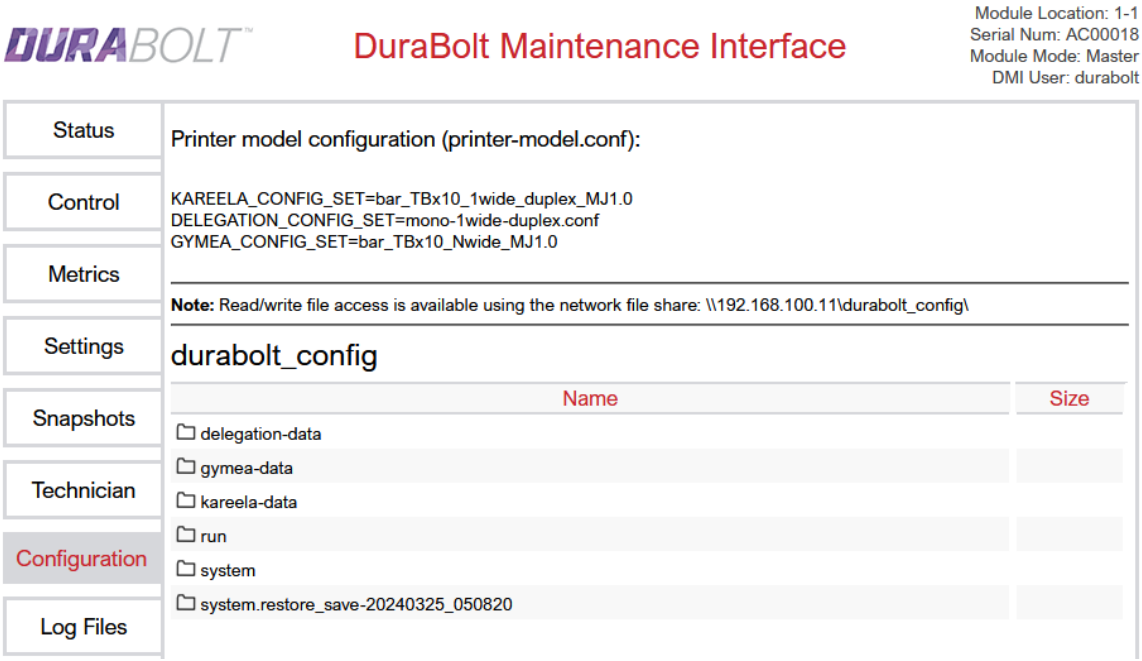
Figure 65 – DMI Technician Page



9.1.7 Configuration Page

The Configuration page (*Figure* 66) should only be used under the direction of Memjet or a Memjet technician.

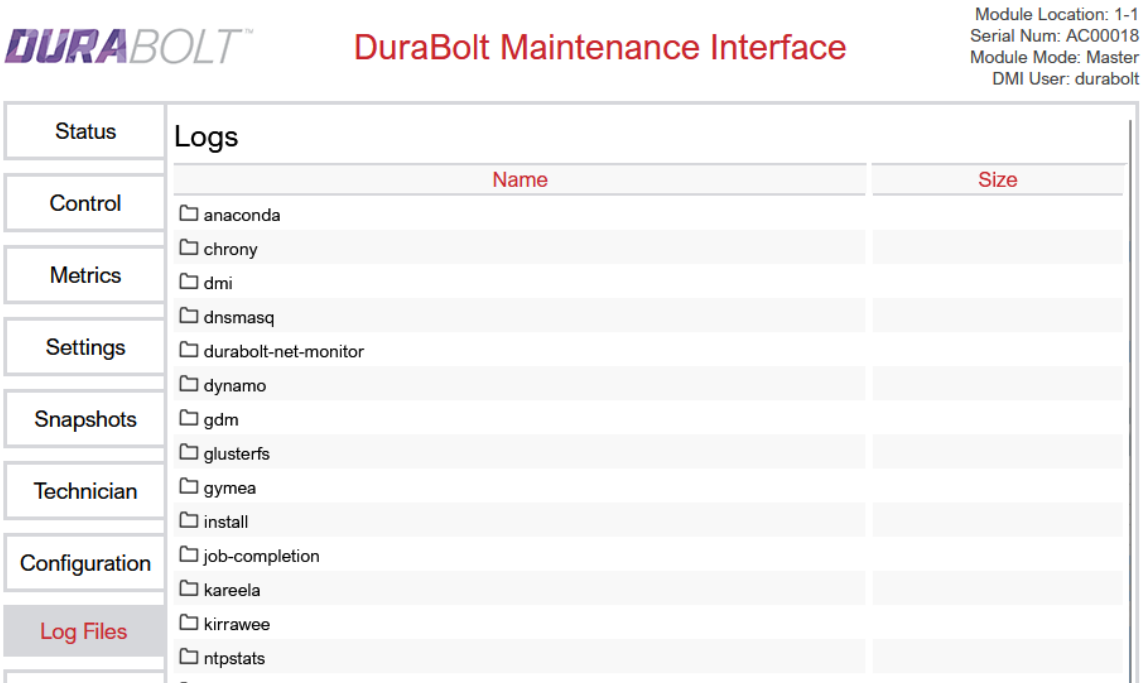
Figure 66 – DMI Configuration screen



9.1.8 Logs Page

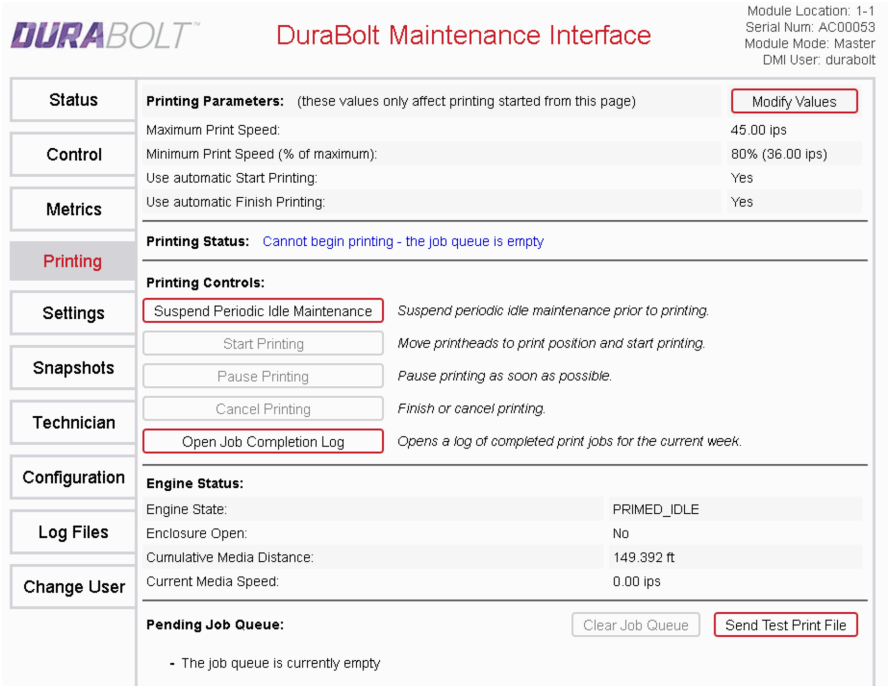
The Logs screen (*Figure* 67) allows access to all the log files for the various components in the system. This page also allows you to access individual logs as required, however for troubleshooting purposes operators should use the Snapshot function to collate all the logs for sending to Memjet for remote assistance.

Figure 67 – DMI Log Files screen



9.1.9 Printing Page

The Printing page allows for printing pre-rendered files and for clearing the job queue. Printing from this page does NOT use the Modbus to control the media path so that must be done manually.



10 Troubleshooting

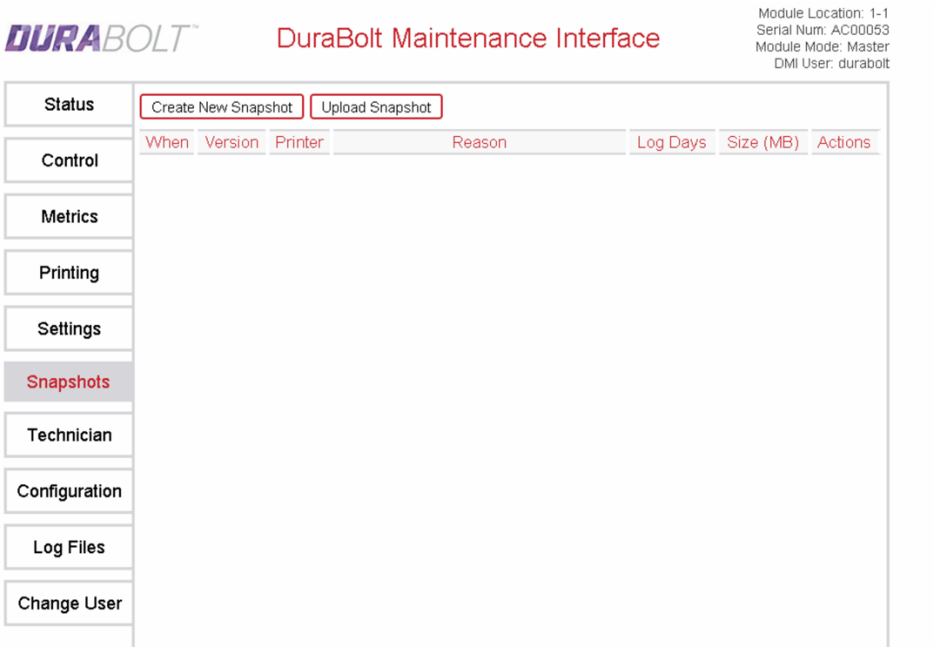
10.1 Gathering logs for analysis

For cases where further detailed analysis is required by Memjet, gathering logs is a key step. There are print engine logs and, for systems that use the Xitron RIP, there are RIP logs.

10.1.1 Gathering Print Engine Logs

For the print engine logs, there is a feature in the DMI that will create a snapshot that has logs from a specified number of days. Open the DMI (see section 9) and click the **Snapshots** button in the left navigation section.

Figure 68 – Snapshot Screen



Then, click the **Create New Snapshot** button and use the drop-down menu to choose the number of days of logs to include in the snapshot. Be sure to include the days that any issues were seen. Then give the snapshot a name, ideally alluding to the issue that was seen. Click **OK** then wait for the snapshot to be created. When complete (as seen in *Figure 69*), click the Snapshots button in the left navigation section to reload the snapshot list (shown in *Figure 70*). Then, click the download icon ( ) next to the new snapshot to download the file to the PC to send to Memjet.

Figure 69 – Snapshot Created

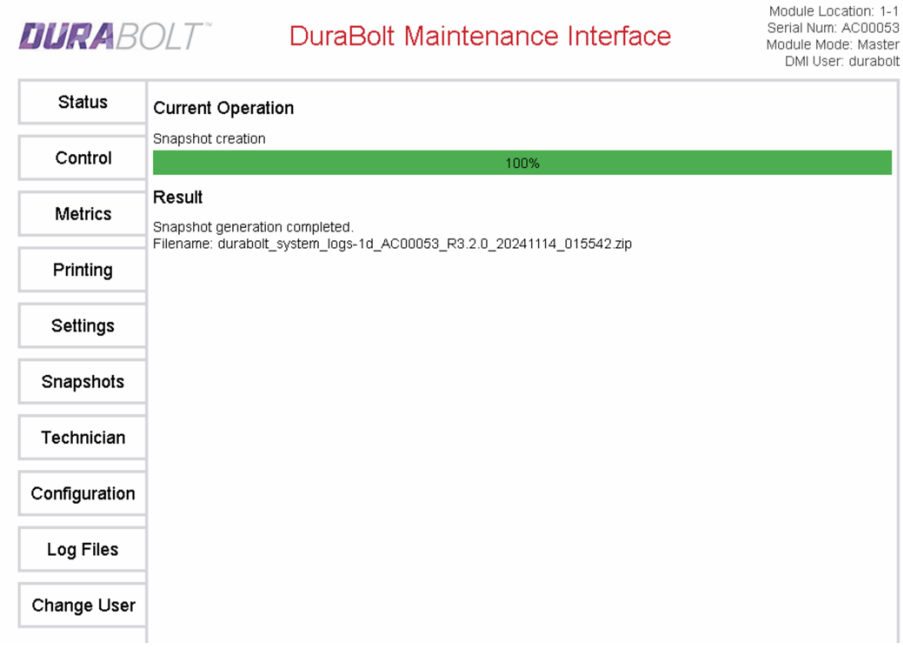
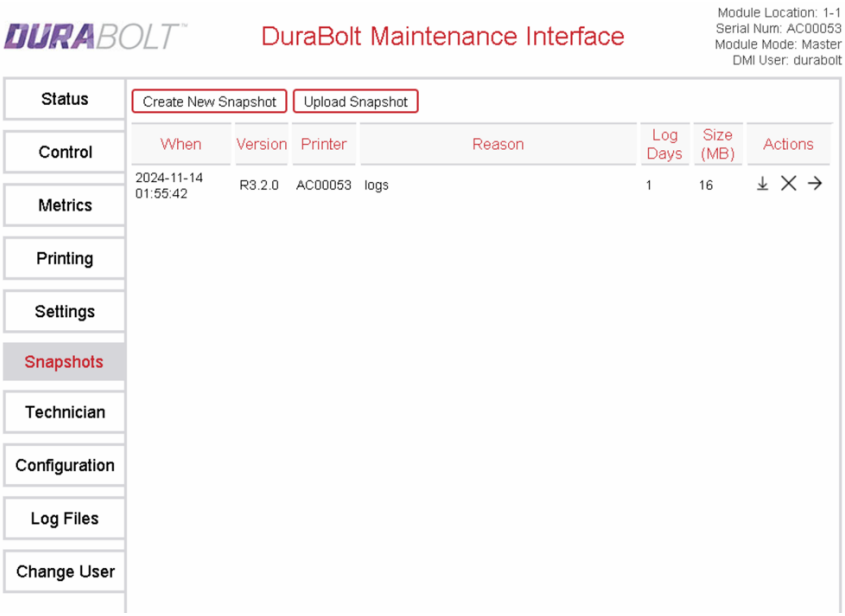


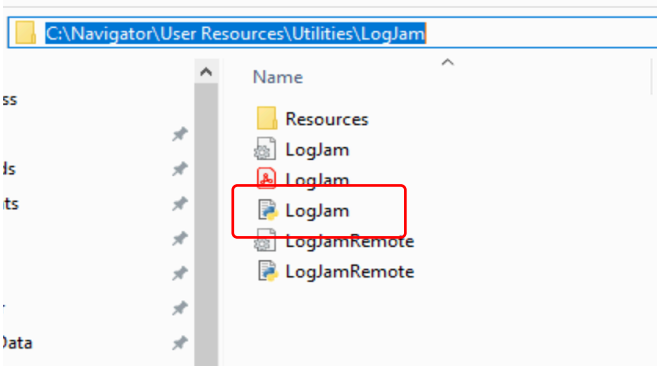
Figure 70 – Snapshot List



10.1.2 Gathering Xitron RIP Logs

For the RIP logs, navigate to C:\Navigator\User Resources\Utilities\LogJam\ and then double-click on logjam.py to run the script to gather logs. It will prompt for a location for the logs and create a zip file.

Figure 71 – Logjam Script



10.2 Operational Errors

10.2.1 RIP Offline or Jobs Hang Instead of Printing

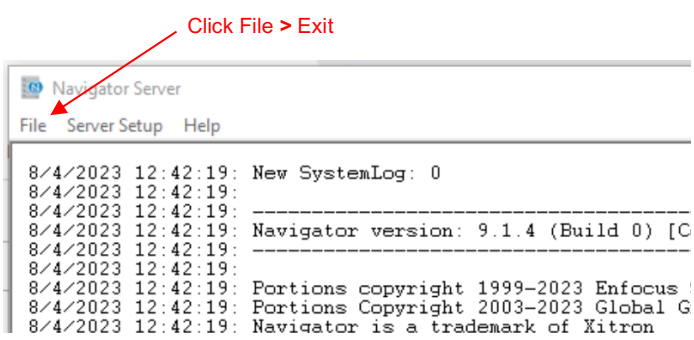
Note: **Do not** reboot the RIP PCs unless these steps do not solve the problem. Rebooting the RIP PCs can cause files to be removed from the print queue.

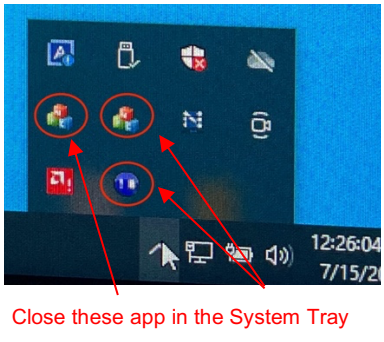
You may need to restart the Navigator Server, such as in the following cases:

- When the "Spoolers" show "PRIMED_IDLE" but the DFE shows "Offline"
- When the printed pages are mismatched with the front data *printed on the back page*
- When the RIP renderer workflow action hangs and the print engine does not start the PRE_JOB sequence

4. To shutdown click **File** > **Exit** in the Navigator Server window (*Figure* 72):
5. If you get a window that "The program is not responding" click Close.
6. After several seconds, this should close the Dashboard and spoolers.
7. If the Spooler windows do not close, click **X** on each of the two spooler windows to close them.
8. Click the **^** arrow on the System Tray to open it (*Figure* 72).
9. You may need to right-click and close the indicated icons if they are still visible.
10. Double click the Navigator server icon on the task bar and restart as normal.

Figure 72 – Restarting Navigator Server





10.2.1.1 Clear the Print Engine Job Queue

Sometimes the reason for a job to hang instead of printing is because a previous job cancel leaves a job in the print engine job queue. See section 9.1.9 for the DMI Printing Page. The

bottom of the page shows the Job Queue. If it is not shown as empty, use the Clear Job Queue button to clear it. If the print engine has more than one printhead, this must be done for each printhead, logging into each DMI separately.

10.2.2 Printhead Moves to Print Position but does not Start Printing. No Error.

At the start of print job, the printhead moves to the print position but nothing prints and printhead stays in the print position. After several minutes there is no fault registered and operator needs to cancel job to continue.

10.2.2.1 Possible Cause(s)

Media encoder or TOF sensor issue

10.2.2.2 Resolution

1. Check that the media encoder/TOF sensor is connected
2. Check that the media encoder/TOF sensor is functioning and is communicating with the print engine. Use the DMI Technician “Display Media Control Signal State” to check the functioning (see section *9.1.6*).
3. Restart the RIP
4. Restart the Print engine
5. If the problem persists, replace the media encoder/TOF sensor

10.2.3 Printing is Garbled/Stretched Unexpectedly

Printing occurs but the output looks stretched or garbled.

10.2.3.1 Possible Cause(s)

Media encoder may be faulty or have a bad connection

10.2.3.2 Resolution

1. Confirm the Media Encoder wiring is sound
2. Check that the media encoder is functioning and is communicating with the print engine. Use the DMI Technician “Display Media Control Signal State” to check the functioning (see section *9.1.6*).

10.2.4 Incomplete Printing Results in Unresponsive State

If a job does not complete due to a media jam, media misfeed, or other reasons, the printhead will remain at the PRINT position and the printer may remain unresponsive.

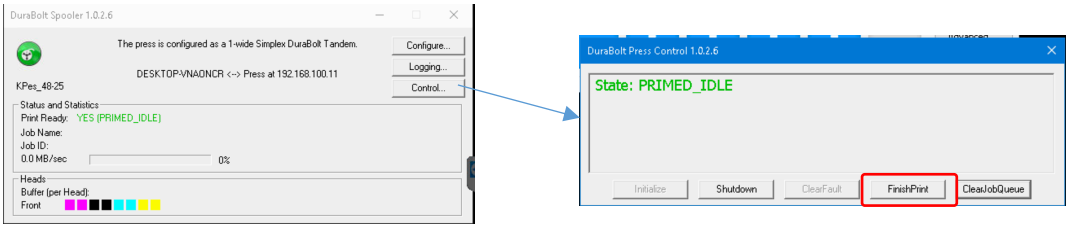
10.2.4.1 Possible Cause(s)

Printer Controller out of sync with Print Engine.

10.2.4.2 Resolution

1. Cancel the job from the DFE (see section *6.3*).
2. If Cancel does not work from the DFE, click the **Control…** button in the **DuraBolt Spooler** window then click **FinishPrint.**

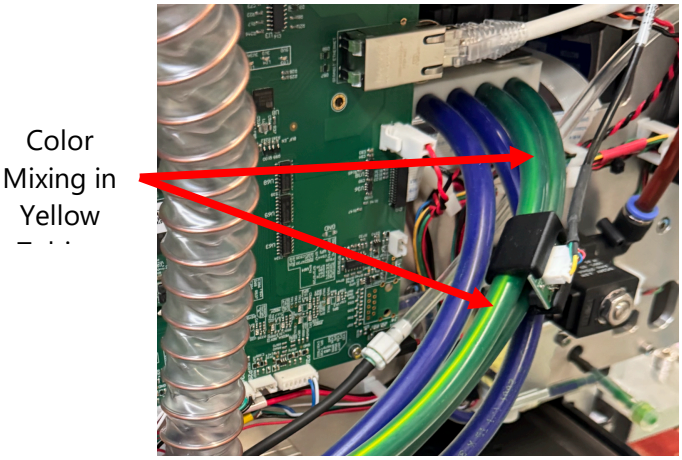
Figure 73 – Spooler Print Engine Control



10.2.5 Major Color Mixing

Color mixing is a serious problem and requires immediate attention to prevent ink contamination throughout the printer. Major color mixing is defined as any uncontrolled ink mixing inside the printer or ink tubing. If any color mixing has occurred, the OEM must drain the contaminated ink from the system and replace it with new ink using the instructions provided below.

Figure 74 – Major Color Mixing



10.2.5.1 Possible Cause(s)

There are several possible causes of major color mixing, which include one or more of the following:

- Fibers or external debris bridging across color channels
- Wiper not indexing, and flooded with ink
- Printhead nozzle plate is touching the wick in the cap, which causes cross ink flow
- Pinched or twisted ink tubing in the system
- Damaged or incorrectly seated o-ring coupling seals on the printhead
- Incorrectly connected or routed ink tubing
- The height of IR tank is incorrect, which leads to flooding across all colors.
- The height of the IR tank for cyan is higher than the IR tank for yellow.
- Ink foaming creates a meniscus in vent tubing or vent tank filter blockage, which builds up pressure.
- Wiper vacuum tubing is pinched.
- Cap is not draining properly.
- Internal printhead failure

10.2.5.2 Resolution

Work through the possible causes and identify the likely cause and rectify it. Once rectified, the contaminated ink tubing must be drained and replaced with new ink. This is usually an issue with

Yellow as it is the lightest color so the Yellow ink return has a valve to use for draining (see *Figure* 75)

Note: This procedure may consume a significant amount of ink.

Figure 75 – Draining Yellow Ink

Once the tubing is set up for draining, use the **Circulate Ink** button to circulate fresh ink into the IR tank and flush the mixed ink into the waste container. This may require repeated **Circulate Ink** operations.

Figure 76 – Circulate Ink

10.2.6 Printhead Moves to Print Position but Does Not Print. No Error

Print engine cover sensor switches may not be engaged. Check all covers and make sure covers are closed tight and sensor switches activated.

10.2.7 Print Signal Error

If this error occurs, it is likely that the printhead needs to be deprimed, removed, and the connectors wiped with slightly moist microfiber cloth and DI water:

HANDLING_FAULT reported. Location: JOB_QUEUE. Job 00000000000000000000000076231 failed (PRINT_SIGNAL_ERROR)

Check the spooler windows to see which of the two stages had the fault (one will show “NO (FAULT)” or similar).

10.2.8 FAULT: No Virtual Ink Available

If the following error occurs, check the ink dongles to see if there is a red LED on. If so, the dongle next to the red LED needs to be replaced.

ERROR: FAULT reported. Location: ENGINE. IDS for black: no virtual ink available

10.2.9 RIP_DISCONNECT Error.

Look in the Navigator Server window. If the log shows “Error during GetPageSet – Failed to open JSL channel,” it could mean that the network connection to the printengine may have an issue. Cycle power on the printengine and try printing again.

10.2.10 Print Engine Network Configuration Error.

Incorrect entries in the /etc/resolve.conf can prevent the print engine from initializing. Errors in the kareela.log file may look as follows:

```
AC00083 [durabolt@durabolt-pm-1-1 ~]$ tail -f /var/log/kareela/kareela.log
2024-10-18T12:54:24.805776+11:00 durabolt-pm-1-1 Kareela0: <I> [] CommandHandler: KPesApi::abortEventSession() <Host: ::ffff:192.168.100.11 Port: 52488>
2024-10-18T12:54:24.806218+11:00 durabolt-pm-1-1 Kareela0: <I> [] CommandHandler: KPesApi::abortEventSession() <Host: ::ffff:192.168.100.11 Port: 52488>
2024-10-18T12:54:24.813474+11:00 durabolt-pm-1-1 Kareela0: <I> [] Thrift: TConnectedClient socket closed: No more data to read.
2024-10-18T12:54:24.814008+11:00 durabolt-pm-1-1 Kareela0: <I> [] CommandHandler: KPesApi command client <Host: ::ffff:192.168.100.11 Port: 52488> disconnected
2024-10-18T12:54:24.814501+11:00 durabolt-pm-1-1 Kareela0: <I> [] Thrift: TConnectedClient socket closed: No more data to read.
2024-10-18T12:54:24.815005+11:00 durabolt-pm-1-1 Kareela0: <I> [] EventHandler: KPesApi event client <Host: ::ffff:192.168.100.11 Port: 56620> disconnected
2024-10-18T12:54:24.815478+11:00 durabolt-pm-1-1 Kareela0: <I> [] Thrift: TConnectedClient socket closed: No more data to read.
2024-10-18T12:54:24.815942+11:00 durabolt-pm-1-1 Kareela0: <I> [] EventHandler: KPesApi event client <Host: ::ffff:192.168.100.11 Port: 56622> disconnected
2024-10-18T12:54:26.846015+11:00 durabolt-pm-1-1 Kareela0: <I> [#6] InitialiseEngine: Found 'pmmc-AC00083.local' dynamo board: moduleType=29, moduleSn=AC00083, moduleRev=3, moduleVariant=0,
boardType=64, boardRev=2, boardSn=B101046, fwVersion=MJ5.0.3, swCompat=4
2024-10-18T12:54:26.847128+11:00 durabolt-pm-1-1 Kareela0: <I> [#6] InitialiseEngine: Found 'pmmc-AC00084.local' dynamo board: moduleType=29, moduleSn=AC00084, moduleRev=3, moduleVariant=0,
boardType=64, boardRev=2, boardSn=B101048, fwVersion=MJ5.0.2, swCompat=4
2024-10-18T12:55:15.055682+11:00 durabolt-pm-1-1 Kareela0: <E> [#6] GymeaMux: Failed to open comms to Gymea durabolt-pm-1-1.local:9020: Thrift exception: THRIFT_EAGAIN (timed out)
2024-10-18T12:55:22.924766+11:00 durabolt-pm-1-1 Kareela0: <I> [] Thrift: TConnectedClient socket closed: No more data to read.
```

If this happens, edit the /etc/resolve.conf and delete any entries other than the first entry that says “search memjet.local local.”

10.2.11 Testing the TOF Sensor Input

The TOF sensor input can be checked using the DMI. Using the web browser, navigate to the DMI Technician page (See Section 9.1.6) then click the button **Display Media Control Signal State**. This will list a number of details about the media control signals. The line that shows **media_present_sensor_assertion_count** should incrementally increase as media is used to trigger the TOF sensor. If it does not change, check the TOF sensor wiring.

10.2.12 Ethernet 10G Network Connection Fails

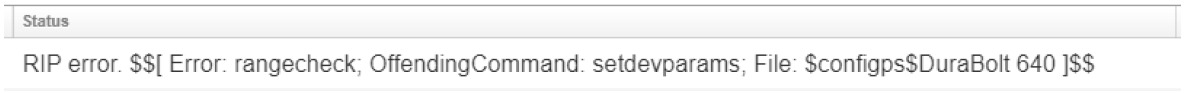
If the 10G Ethernet network lights turn off after the print engine boots up, it is likely due to the Ethernet card in the RIP PC not being compatible with 5G speeds. For example, the Intel X710-T4 does not support 5G speeds but the Intel X710-T4L does. The print engine network settings are configured to run at 5G for better stability. If the RIP PC 10G Ethernet card cannot support 5G, the print engine can be configured to run at 10G. To configure 10G, add a file named network.conf to the print engine directory /mnt/durabolt_config/system/. This directory can be accessed from the RIP PC using File Explorer share access to \\192.168.100.11\durabolt_config\system. The file should have one line in it with the following:

FORCE_10G_RIP_DATA_SPEED=1

Then reboot the print engine.

10.2.13 RIP rangecheck Error

When printing in two-pass duplex mode, Collate must be set. If Collate is not set, the RIP will show an error as noted:



10.2.14 Cap_Vac Error

If a “cap_vac” error is detected, similar to this:

```
MaintDelegate: Operation Prime failed: RESULT_ERROR: PHM_1: RESULT_ERROR, Prime failed during
printhead filling / wiping: cap_vac: The hardware has detected a fault
```

The fault is likely to be due to the AES control cable that connects from the print engine to the power panel. The cable may be shorting where the black and yellow cables exit the gray cable. Inspect and fix as needed.

10.3 Priming Issues

10.3.1 IDS Dry Prime Fails

In some cases, the circulation pumps may not correctly prime the IDS from dry. This issue resolves

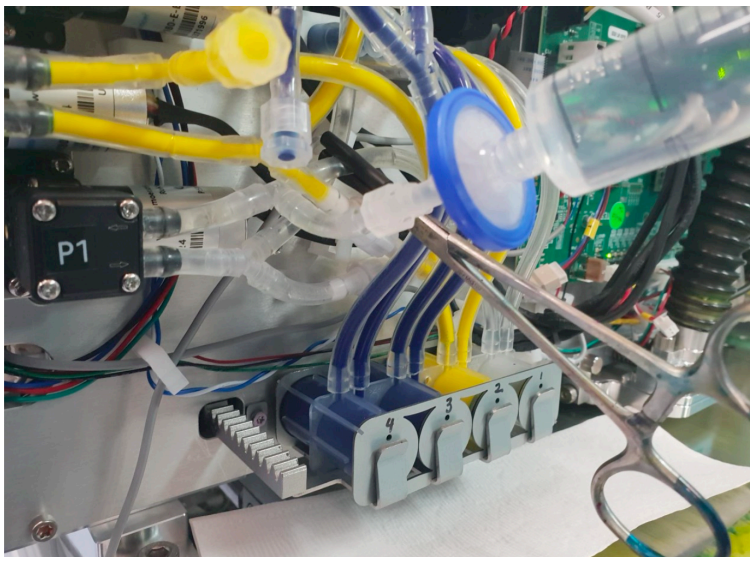
after the first prime but has been observed with new systems.

Check if ink has filled the complete IDS tubing for the print module that was primed.

If ink is present in the LC-IDS ink filters but has not progressed to the circulation pump(s), the following process may be performed:

1. Identify the channel that has failed to prime and its corresponding circulation pump. If it is the yellow channel, confirm that the “Y Drain Valve” is in the position shown in *Figure* 79.
2. Use a hemostat to clamp the tube between the circulation pump inlet test port and the compliance bellows as shown in *Figure* 77.
3. Unscrew the cap from the test port and attach the Memjet supplied priming-aid syringe assembly as shown in *Figure* 77.
4. Inject about 5mL of the contained fluid into the tubing.
5. Unscrew the priming-aid syringe assembly from the test port and re-attach the cap to the test port firmly
6. Re-attach the cap to the priming-aid syringe assembly.
7. Remove the hemostat clamp

Figure 77 – Syringe and Hemostat Connections



10.3.2 Print Engine Fails to Prime or Build Suction Fault

Note: If you have an issue with an engine failing to prime, contact support for further assistance. Perform the Inspection steps and provide this information to support.

Notes about the priming sequence and buildup of suction:

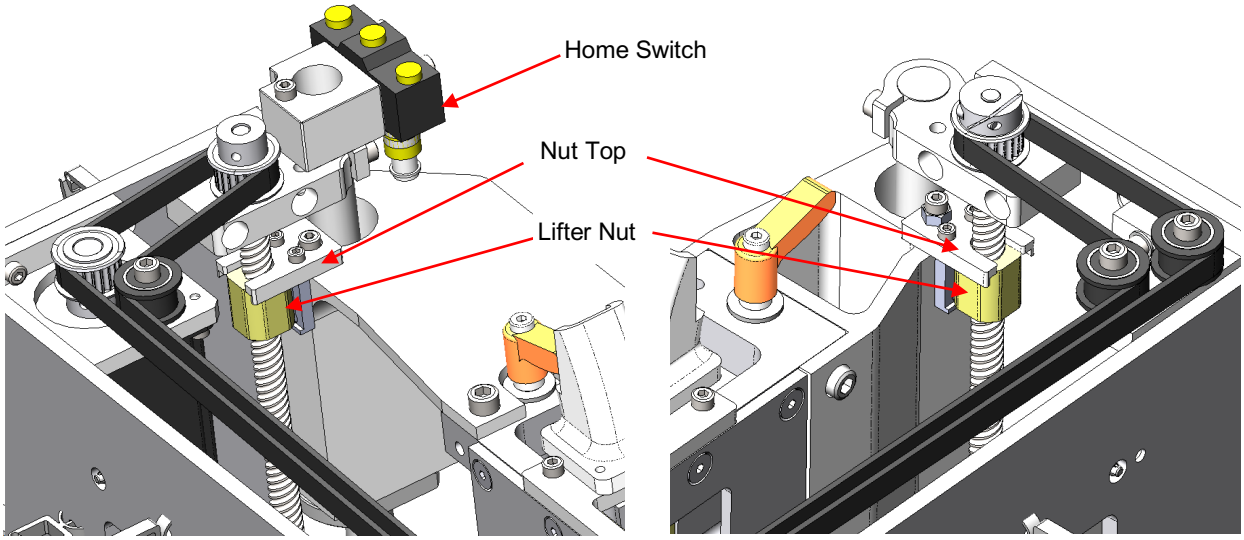
1. After the first light wipe in the priming sequence, the printhead will be capped, which uses the cap seal to pull ink into the printhead to fill the inlet lines and the printhead.
2. If the cap seal is not strong, one or more ink tubes may appear to have air bubbles or look empty of ink.

3. Then, with no ink in the printhead, the first wipe with heavy suction (which is the third wipe during prime sequence), does not build the suction needed and the action fails.

10.3.2.1 Possible Cause if all Colors Fail to Prime in a Printhead

- Printhead may not be seating fully on cap due to loose lifter nuts (*Figure* 78). This can happen after a lifter jam, and the lifter nuts must be rotated back into place.
- Ensure that both sides (particularly the home switch side) are tight against the Nut Top. You may need to tighten the nut another ¼ or ½ turn to make it snug. This will ensure that when the lifter is pressed the home switch it is in the correct position.

Figure 78 – Location of Lifter Nuts and Home Switch in Print Module



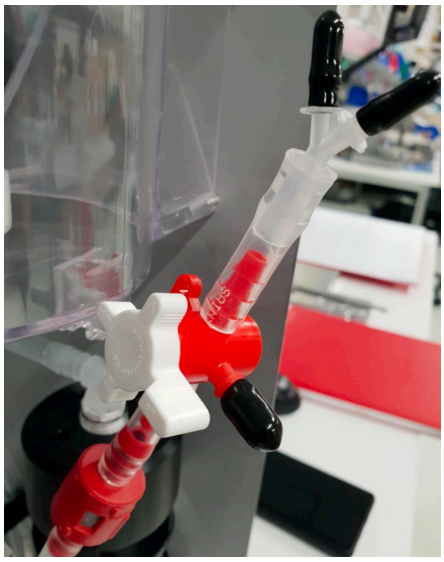
Perform the Following Inspections before contacting Memjet support:

- Take note of which print engine is affected.
- Inspect all of the ink inlet and outlet tubing for bubbles or empty tubes.
- Inspect for kinked tubing that may be preventing ink flow or wiper suction.

10.3.2.2 Possible Cause if Yellow Failing to Prime

If Yellow is not priming, it may be due to the ink flush valve position. Inspect the Yellow LC-IDS module and ensure the valve is positioned as follows:

Figure 79 – Yellow Ink Flush Valve



10.4 TOF Mis-Triggering on Stage 2 of Two-Engine Duplex System

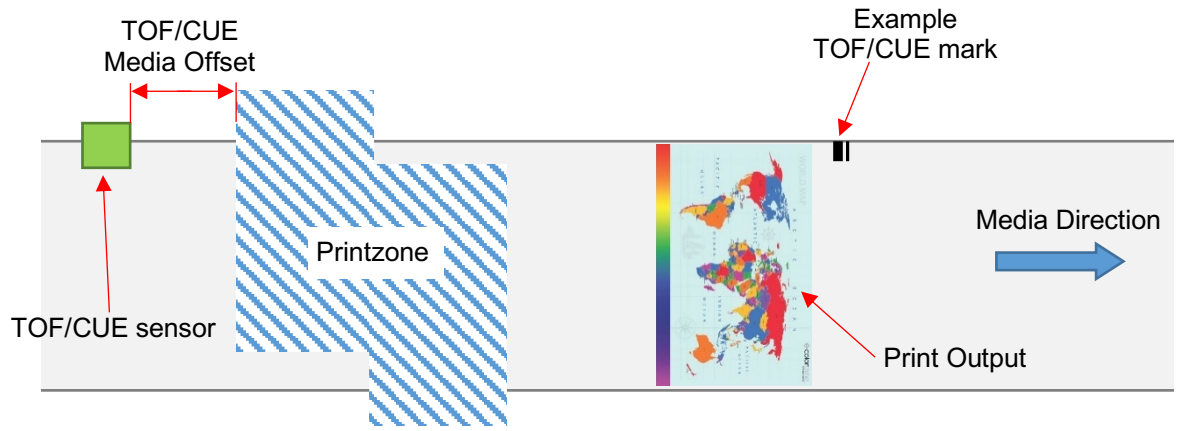
If it appears that stage 2 printing is starting prematurely ahead of the first page from stage 1,it could be triggering on the declog spit, particularly when the print speed is slow. When the print speed is slow, the declog spit will be compressed, making a darker line which may trigger the TOF sensor. To resolve this, one option is to figure out a minimum starting speed that produces a declog that is clearly lighter than the TOF marks printed by stage1 (perhaps 50% of max speed), Then, train the TOF sensor using the resulting declog as the background color. This will set a threshold darker than the declog to sense the TOF mark from stage 1.

10.5 TOF/CUE Misalignment

If the prints are out of alignment at the top edge in the direction of printing (i.e., with respect to the TOF/CUE mark) they can be adjusted using “TOF Media Offset (in micrometers µm)”. Ensure the following:

1. The offset value should be equal to the distance between the TOF/CUE sensor and the print zone in terms of media path length.
2. Making the TOF Media Offset smaller will shift the start of printing closer to the top of the page, relative to the TOF/CUE mark.
3. Making the TOF Media Offset larger will shift the print further away from the top of the page, relative to the TOF/CUE mark.

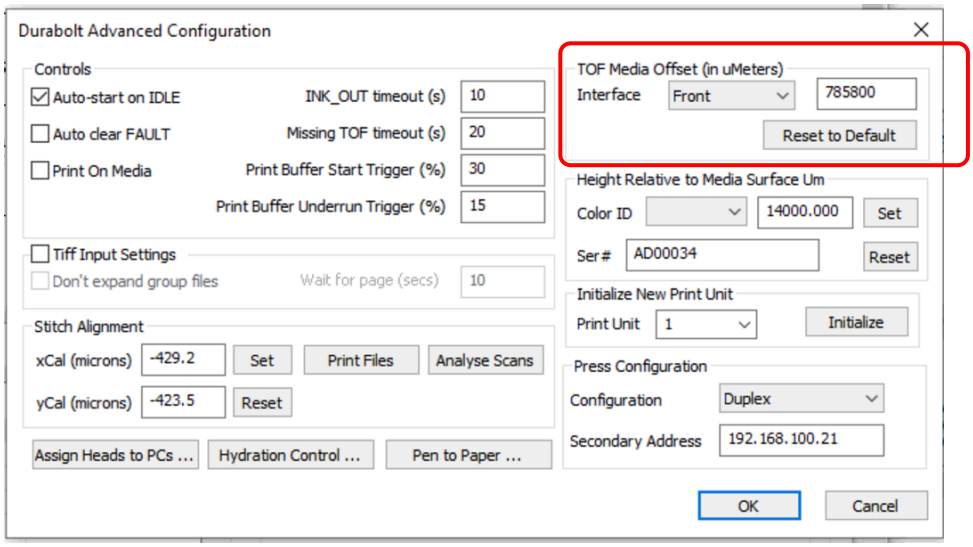
Figure 80 – Example Print Stage Showing TOF Media Offset



10.5.1 Adjusting the TOF Media Offset

1. Open the DuraBolt Advanced Configuration window (see *Figure* 81).
2. There are separate settings for the Stage 1 (front) and Stage 2 (back) PCs.
3. Note the current setting for the offset you wish to adjust, then enter an updated value.
4. Press OK to save it.

Figure 81 – Stage Selection Window for Stage 2



10.6 Print Quality

Print quality (PQ) can be affected by many circumstances related to the printing system and environmental factors.

If PQ issues are present, Memjet may be able to assist by providing a detailed analysis of the prints. If PQ issues occur and diagnostics are required, follow these steps:

1. First, open a case in Zendesk, your Memjet TAM may also be able to provide additional assistance.
2. Before removing the printhead for analysis, print a PQ chart using the suspected printhead.
3. Provide the following information regarding the test print and the printing environment:
   - Media type

- Printing speed
- KWS level
- Details of any induced airflow that may be present around the printhead, i.e. platen vacuum, etc.

4. Provide a clean media sample without ink on it.
5. Send the above to Memjet as per your TAM's instructions.

Note: In some cases, your TAM may advise returning a printhead for analysis. If directed to do so, deprime and remove the printhead and prepare and package it for shipping as per the *DuraFlex Printhead Storage and Shipping Guide* and your TAM's instructions.

10.6.1 Dehydration

Dehydration shows up as streaks in printed images. One example is as shown in *Figure 82*. If this occurs, please review the settings in section *7.6* related to managing hydration properly. Here are some items to look for:

- Double-check KWS settings to make sure they were not inadvertently changed
- Ensure the print speed is being set to ensure proper KWS adjustment for speed
- Consider changing the Temperature Regulation setting if it has not been adjusted

Figure 82 – Dehydration Example

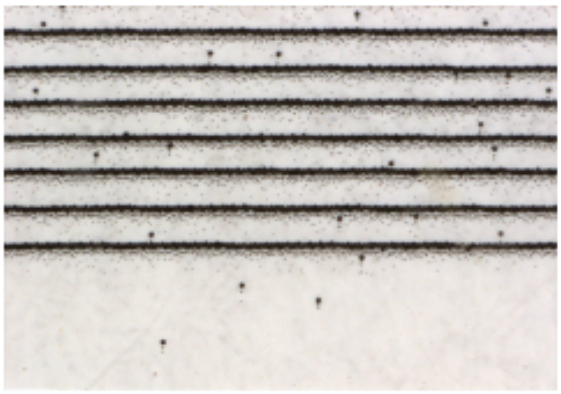
10.6.2 Fuzzy or Non-Uniform Print

Fuzzy or non-uniform print can be from many causes. Some specific cases and remidies are explained here.

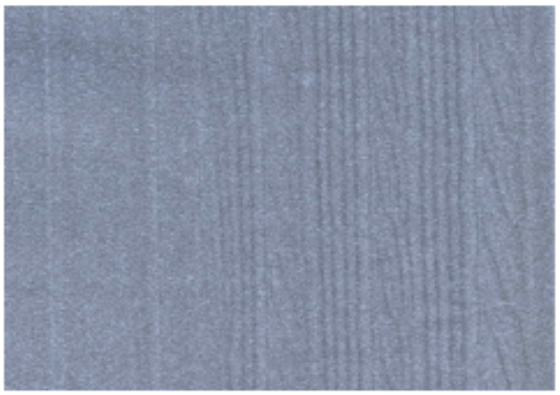
10.6.2.1 Fuzzy Print, Tiger Striping / Wood Grain / Sand Dunes

One of the more common print quality issues is fuzzy print or tiger striping (also known as wood grain or sand dunes). See *Figure 83* for examples. These are typically caused by PPS that is too high.

Figure 83 – Print Artifacts Due to Incorrect PPS Setting



Satellites and Ink Mist



Tiger Stripes and Sand Dunes

Print quality is sensitive to changes in PPS, the distance between the printhead nozzles and the media surface. As the PPS increases, print quality generally decreases. To ensure optimum print quality, Memjet recommends a PPS setting of:

- **0.7 mm (+0.0 mm, -0.2 mm)**

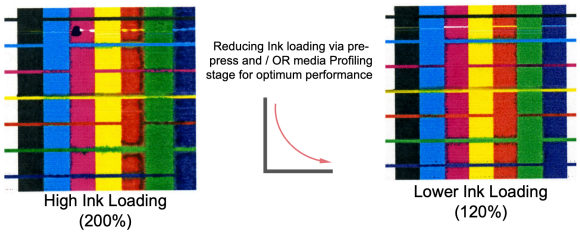
This PPS setting minimizes the detrimental (and unquantified) effects caused by factors such as nozzle directionality, deceleration of ink droplets after ejection, satellite ink droplets, ink mist media velocity, and air currents.

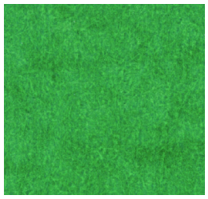
10.6.2.2 Mottle and Graininess

Mottle and graininess are caused by unwanted ink migration after the ink is deposited on the media. Some examples are shown below. To counteract these, there are several options to consider, the first of which is the most common:

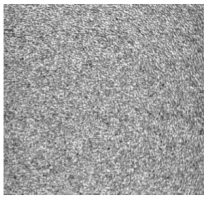
- Reduce ink loading. This is by far the most common reason for mottle as medias have limits as to the amount of ink they can absorb.
- Review ink / media interactions to ensure media is suited for inkjet use
- Improve drying conditions. Speeding up drying can prevent ink from migrating after lay-down.

Figure 84 – Mottle and Graininess Examples





Mottle



Graininess

10.6.2.3 Casts

Casts (or noise) in prints are usually from KWS. If the KWS settings are high enough, it could become objectionable in some cases. KWS that is set too high can be reduced and KWS that cannot be reduced can be offset by changing other hydration settings as noted in section 7.6. One way to reduce the required KWS is to print faster, up to the maximum print speed.

Figure 85 – Cast Example

10.6.3 Image Length Varies with Print Resolution

A printed image output is a different printed length than expected when changing resolutions.

10.6.3.1 Possible Cause(s)

- Encoder scaling settings not optimized, causing excessive frequency jitter. This can happen when encoders are running at interpolated frequencies away from their native frequency.

10.6.3.2 Resolution

- If using one of these two encoders, the **encoderScale** can be set per this table. If using a different encoder, consult your Memjet technical contact.

Figure 86 – Encoder Scaling Settings

Encoder	Configured ticks per rev (TPR)	encoderScale
SICK DFS60B 10000 tick programmable	Programmed to 8192	8
Encoder Products TR1 10000 TPR	Fixed 10k	4

- Setting the **encoderScale** is accomplished as follows (starting with software release R3.3.0):
  - Map the configuration network drive as noted in the DMI Configuration page
  - Copy the appropriate file (scaling 8 or 4):

82-change_mtg1_encoder_prescale_to_4.json

82-change_mtg1_encoder_prescale_to_8.json

  - From: \\192.168.100.11\durabolt_config\kareela-data\release-customizations\
  - to: \\192.168.100.11\durabolt_config\kareela-data\customization\
- Check the printed length is correct using the following steps
  1. Print a ruler chart (see install guide for details)
  2. Measure the length of the printed plot.
  3. If the hard copy print output is longer or shorter than expected, consult your Memjet technical contact.

10.6.4 Image Length Varies with Print Speed

A printed image output is shorter at lower speeds.

10.6.4.1 Possible Cause(s)

- Encoder is slipping

10.6.4.2 Resolution

- Ensure the encoder is functioning properly and within specification
- If using a shaft encoder, ensure that the media is sufficiently wrapped around the shaft. This is a particular risk with stiff media substrates. A rolling encoder may be more suitable if a sufficient wrap angle cannot be achieved.
- Check the printed length is correct using the following steps
  1. Print a ruler chart (see install guide for details)
  2. Measure the length of the printed plot.
  3. If the hard copy print output is longer or shorter than expected, change the `encoderTicksPerInch` setting in DMI as needed.

10.6.5 Image Length Varies with Media Thickness

A printed image output has visible color-to-color misalignment. This is mostly visible on a Tandem system.

10.6.5.1 Possible Cause(s)

- This is generally an issue when a shaft encoder is used and the encoder TPI setting is not adjusted for the media thickness that adds to the shaft diameter.

10.6.5.2 Resolution

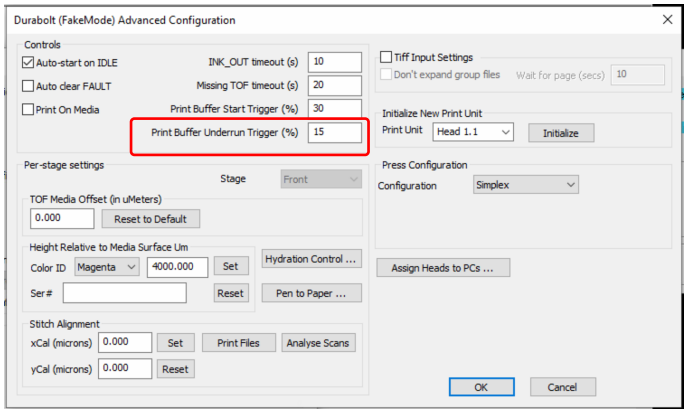
- Use the “encoderCalFactor” to make a temporary adjustment to the encoder TPI. The installation guide has more information the expected error that can be caused by this issue.

10.7 Xitron RIP Speed Issues

10.7.1 Xitron RIP Pauses Unexpectedly During a Print Job

If the Xitron RIP detects buffers running out, it will attempt to pause the print job. This is usually due to trying to print a complex document that is processed slower than usual by the RIP. If this occurs, one option is to open the Xitron RIP **Advanced…** window (see section *11.1*) and lower the Print Buffer Underrun Trigger percentage (see *Figure 87*).

Figure 87 – Print Buffer Underrun Trigger



Sometimes the reason for the slow RIP processing is due to very high image resolutions of pictures embedded in the PDF. In these cases, one option is to process the PDF through a program such as ghostscript. Here is an example that will change every embedded image into a 300dpi image (there should be no line breaks when running the command):

```
gs -dNOPAUSE -dBATCH -sDEVICE=pdfwrite -dCompatibilityLevel=1.4 -
dDownsampleColorImages=true -dColorImageResolution=300 -sOutputFile=output-
300dpi.pdf input.pdf
```

Adobe Acrobat Professional also has similar features that can be used instead of ghostscript.

10.7.2 Xitron Speed Test

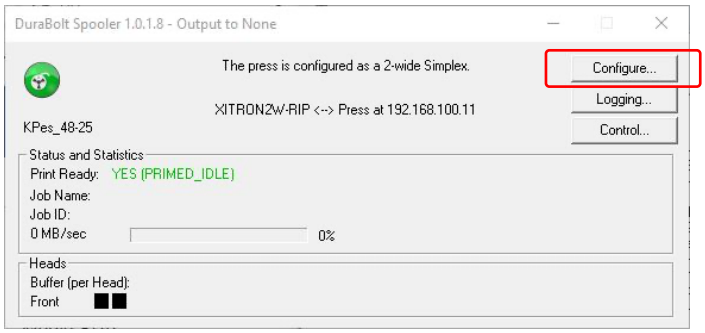
This process configures the RIP to process a job through all the workflow steps as quickly as possible but discards all data from the spooler that would otherwise be sent to the press. This allows a job to be benchmarked to ensure it can be processed fast enough to keep the press supplied with data when running.

1. Change the spooler to output to **None**.
2. Run a job normally.
3. When output begins through the spooler confirm that the data rate is greater than 550 Mbytes/sec. This should be sufficient for printing speeds up to 700 feet/min.
4. Cancel the job after 10,000 pages or so or allow it to complete.
5. Change the spooler output back to **Press**.

10.7.2.1 Detailed Instructions

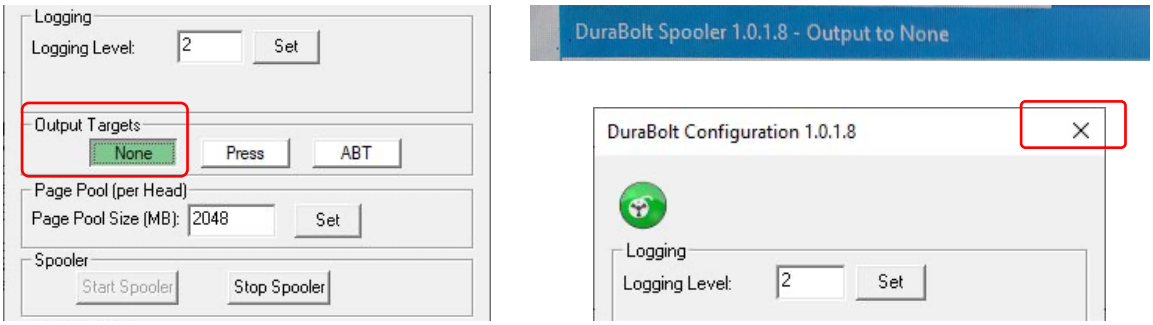
1. Change the spooler to output to **None**.
2. There is a spooler running on the main PC (X1) and on the PC for the second stage of the press (X3). You only need to make changes to one of the spoolers and that change will propagate to the other, however Memjet recommends you visually confirm the changes have been applied to both spoolers.
3. Press **Configure** on one of the spoolers (*Figure* 88).

Figure 88 – Configuring A Spooler



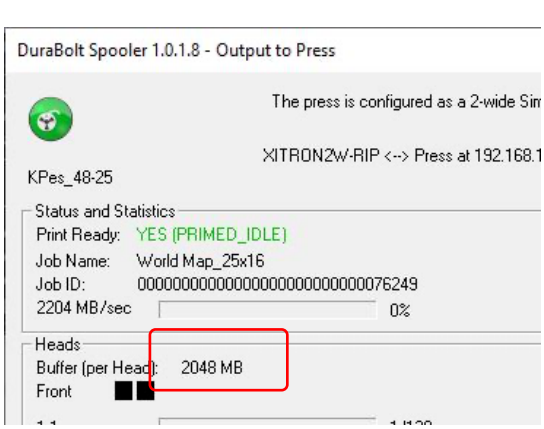
4. Change the output target to **None** then check the other spooler has automatically been set to **None**. (*Figure* 89). Click **X** in the upper right corner to close this dialog.
5. The title bar of the dialog will change to show the Output is nothing (*Figure* 89).

Figure 89 – Changing Output Targets

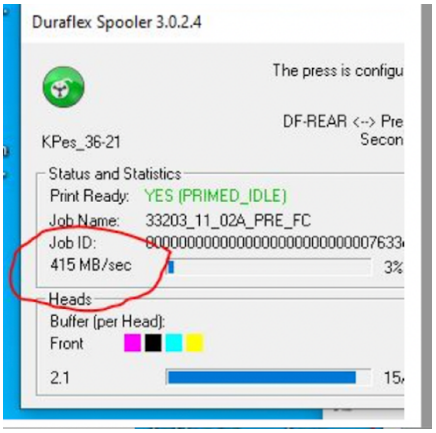


6. Run a print job normally.
7. When output begins through the spooler, check the data rate shown on the spooler window. Confirm the speed for both spoolers via both spooler windows.
8. Typically, data rates of greater than 600MBytes per second will be sufficient for printing. *Figure* 90 shows both sufficient and insufficient data rates for sustained printing.

Figure 90 – Spooler Data Rates for Sustained Printing



Sufficient Data Rate for Printing



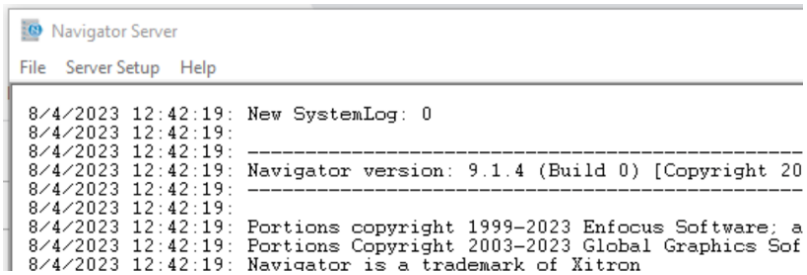
Insufficient Data Rate for Printing

11 Appendix

11.1 Accessing the Navigator Server Advanced Window

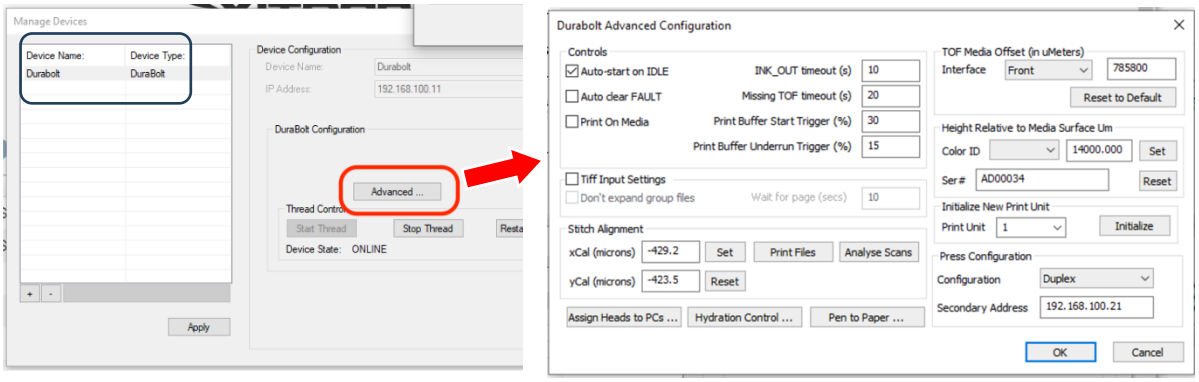
There are a number of configuration settings in the RIP and Printer Controller in different locations. One location is in the Advanced Configuration window. That is accessed through the Navigator Server as follows

Figure 91 – Navigator Server Window



1. Open the Navigator Server window
2. Select **Server Setup** > **Administrator Login** (unless this was already done)
3. This will pop open a window for a password, leave it blank and click OK.
4. Select **Server Setup** > **Manage Devices, from the list click on** then click **Advanced** (*Figure* 92). This will open the advanced configuration page.

Figure 92 – Location of The Advanced Configuration Page

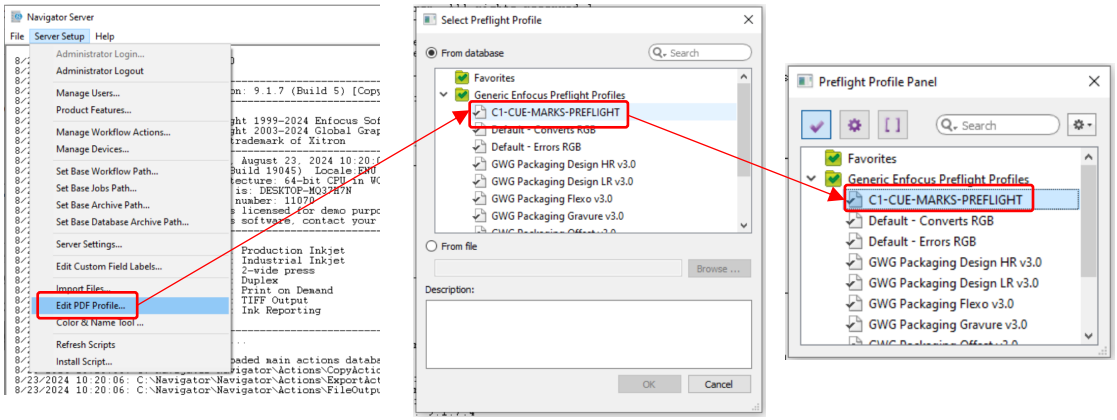


11.2 Adjusting Printed Cue Mark Size and Location

For some systems, a cue mark has been configured to print on the last page of each copy of a print job (such as for two-pass duplex printing). This section describes how to change the size and location of the cue mark.

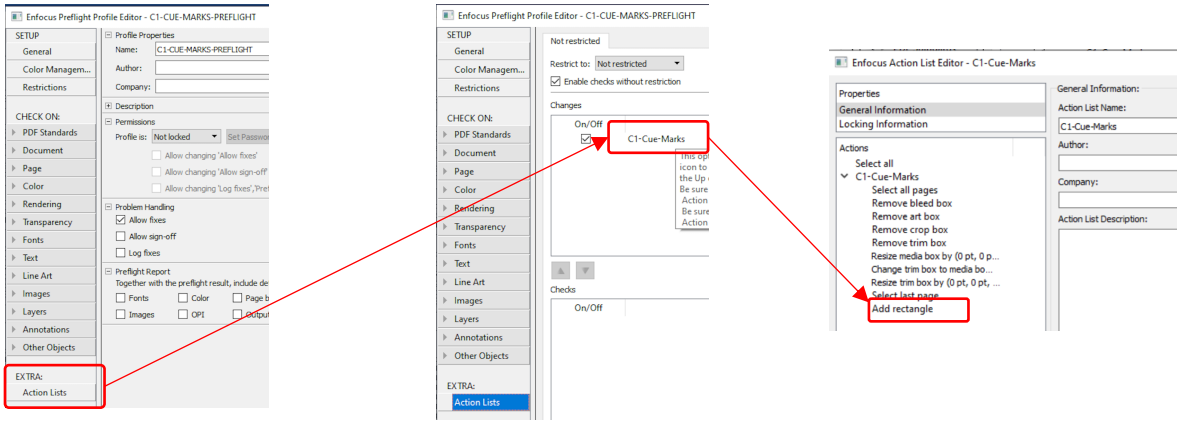
First, open the Navigator Server and click on **Server Setup -> Edit PDF Profile...** and then double-click on the following items in each of the successive screens:

Figure 93 – Edit PDF Profile



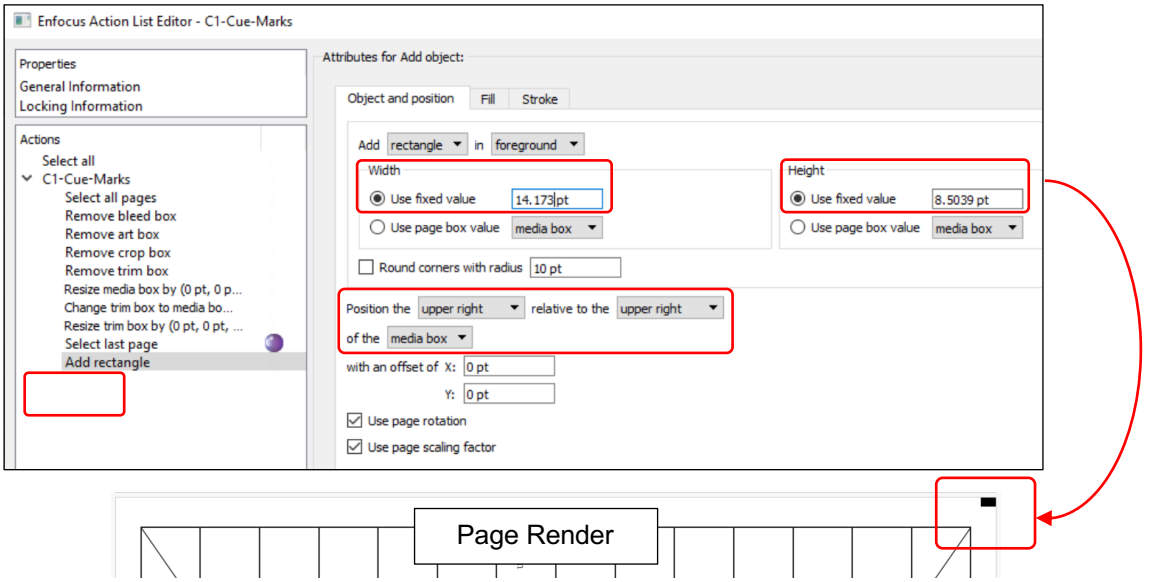
That will bring you to this screen, where you click on **Action Lists**, then double-click **C1-Cue-Marks**, then click **Add rectangle** at the bottom of the **Actions** list in the last window that pops up.

Figure 94 – Edit Action



Then, the **Width** and **Height** settings can be adjusted as needed, along with the **Position**. Settings are in points (pt) where **2.8346pt = 1mm**. The settings shown create a Cue mark 5mm wide and 3mm in height as shown in the example page render.

Figure 95 – Adjust Size and Position



11.3 XiStep Workflow Action

This action will repeat incoming pages of a document in a specified arrangement. It was created for use with labels so the controls use that term, but it operates on pages that are input from the PDF. Templates are available for quick settings and more templates can be created.

To get a better understanding of this Action, enable Pause After and then look at the resulting PDF output from XiStep, available in the Navigator Client:

Figure 96 – XiStep Output

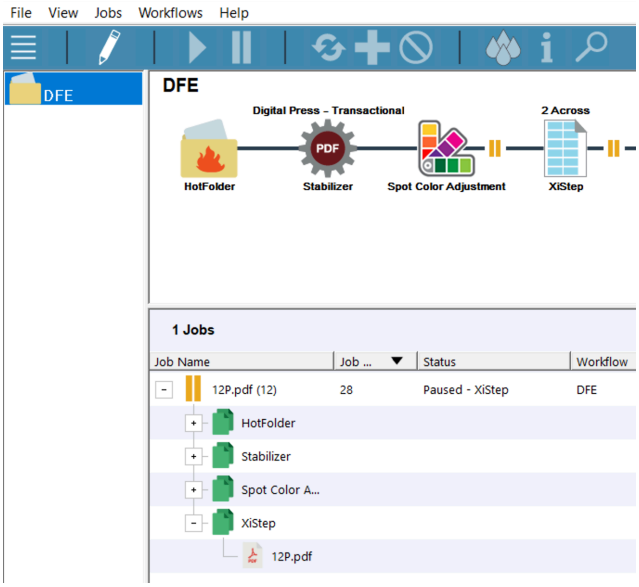
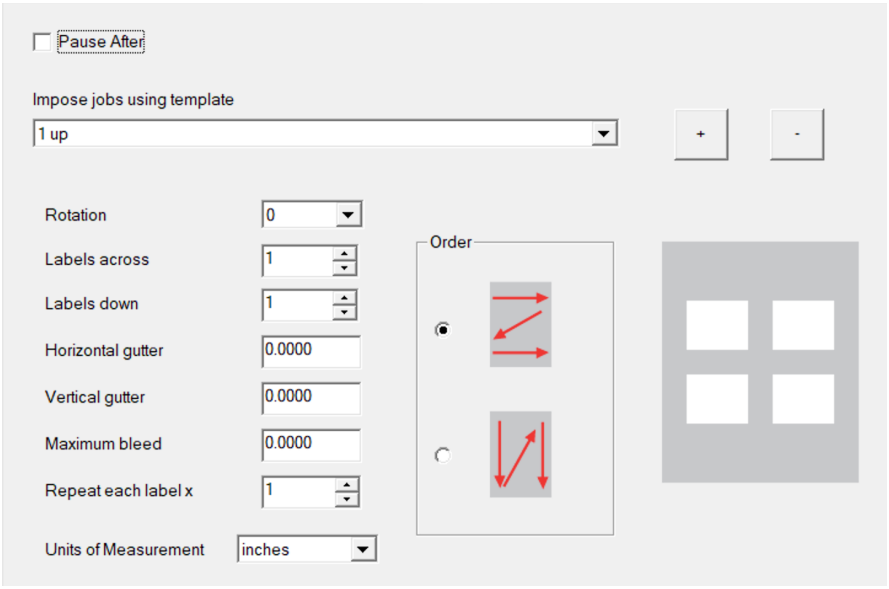


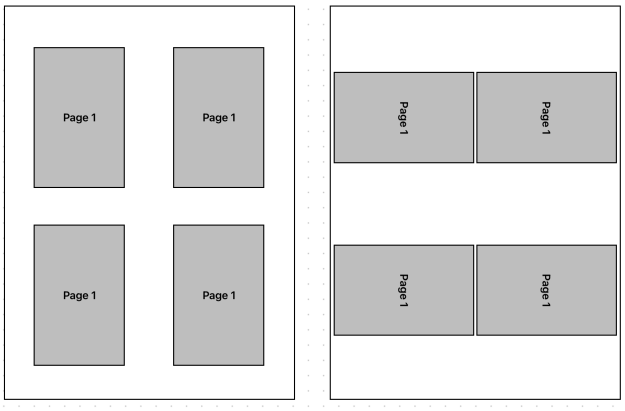
Figure 97 – XiStep Action Settings



The relevant settings work as follows:

- **Rotation**: Rotates the INCOMING pages before applying other settings. Here's a 90-degree rotation with a repeated page:

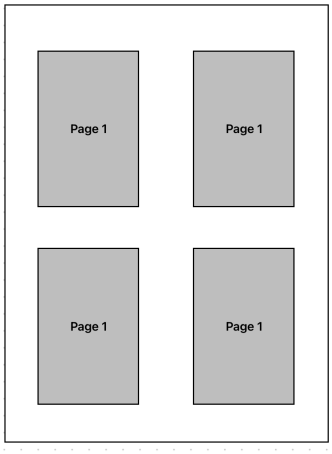
Figure 98 – Example Rotation



- **Labels across:** Controls the number of pages that are stepped across the media (X axis)
- **Labels down**: Controls the number of pages that are stepped down the media (Y axis)
- **Order**: Controls the flow of pages across and down: Either left to right, top to bottom OR top to bottom, left to right.
- **Horizontal Gutter**: Controls the horizontal gutter – the vertical gap between pages
- **Vertical Gutter**: Controls the vertical gutter – the horizontal gap between pages
- **Maximum bleed**: If there is a bleed box specified in the input PDF, this controls the maximum amount of bleed that will be allowed outside the trim box.
- **Repeat each label X**: This repeats incoming pages a set number of times.

Here is a two-across, two-down example with horizontal and vertical gutters and repeat each page 4 times:

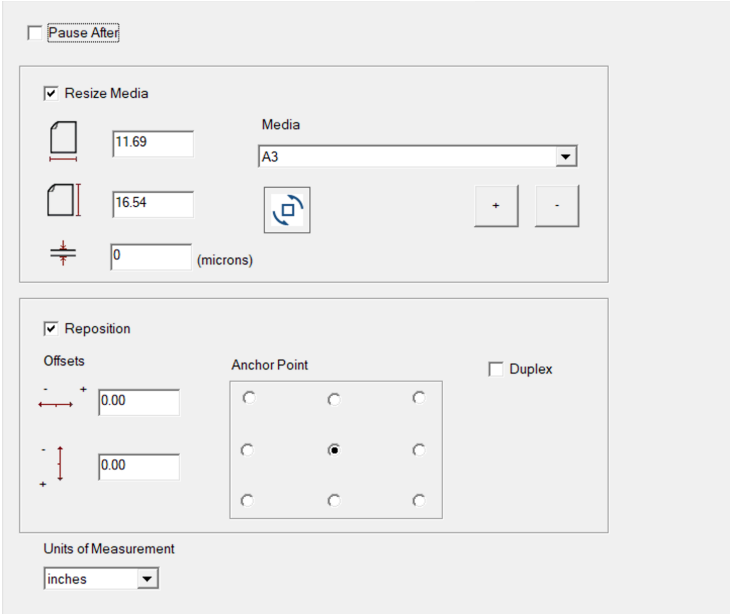
Figure 99 – Example Layout



11.4 XiPosition Workflow Action

This action takes each incoming page and adjusts the position relative to the chosen output media size. Note that this Action does NOT change the size of the incoming pages. It only changes the size of the raster output to match the chosen media size. For example, if an A3 page is the input page size and A4 is chosen as the media, the output will be a raster the size of A4 media, and it will only render a portion of the A3 page. The part of the page it renders will be based on the chosen settings. As with XiStep, setting this to Pause After and then looking at the output PDF will provide a view of what the settings affected in terms of the input vs output. The Resize Media and Reposition check boxes enable or disable the controls in each of those boxes.

Figure 100 – XiPosition Action Settings



The relevant settings are as follows:

- **Media**: Chooses the media size for the default and for adjusting the size
- **Plus/Minus controls**: Add or remove a media size
- **Rotate control**: Chooses between portrait and landscape
- **Media Width**: Sets the width of the media
- **Media Height**: Sets the height of the media
- **Offsets**: Adjusts the horizontal and vertical offsets of a page relative to the output page. This is particularly useful with Duplex printing to align the front and back pages.
- **Anchor Point**: Sets the starting point of an input page relative to the output page. For example, a center anchor point will align the center of the input page to the center of the output page. As a second example, using the top left anchor point will align the top left corner of the input page to the top left corner of the output page.
- **Duplex**: When this is checked, it enables a stage 1 and stage 2 option for position where the stage 1 settings apply to odd input pages and stage 2 settings apply to even input pages. This is used for duplex print alignment between the front and back pages.

11.5 Declog Spit and Pre-Page Spit Bars

A declog spit procedure can be associated with any print job. A declog spit is an energetic ejection of ink onto media which is specifically aimed at clearing nozzles which may have partially dehydrated due to environmental exposure in the time between last printhead wipe and first printing related ejections or during long interpage gaps or during long interpage gaps.

There are numerous modes of declog spit that can be configured by the user. The various modes are described below, however only one mode can be selected at a time. The permissible combinations with the TOF Sync Modes are detailed in *Table 5* below.

The pre-page spit bar is used to maintain printhead nozzle hydration during a printing run. It allows operators to choose exactly when in the print job the hydration maintenance occurs. The pre-page spit bar consists of a dense, short burst of ink that is ejected onto the pre-page spit target area. This method of keeping nozzles hydrated is most effective for shorter page lengths, where the time between spit bars, and therefore the risk of dehydration, is minimized.

Note: If you choose the system default declog option the printer will use the `PRE_JOB` declog mode.

Table 5 – Permitted Printhead Declog Modes and TOF Sync Modes

	TOF Sync Modes	
Declog Modes	`NONE` and `FIRST_PAGE`	`ALL_PAGES` and `TRANSACTIONAL`
`NONE`	**YES**	**YES**
`PRE_JOB` (System default)	**YES**	**YES**
`FIRST_PAGE`	NO	**YES**
`ALL_PAGES`	NO	**YES**
`SACRIFICIAL_ONLY`	**YES**	**YES**
`SACRIFICIAL_ALL`	NO	**YES**

The intensity of the spit bars is user adjustable from 0 – 100% (see Section *11.5.4*). Memjet recommends that only the minimal spit bar intensity be used where possible as this will reduce

ink usage. The minimal spit bar settings will need to be determined by the OEM as it will depend on the ink saturation/absorption properties of the various media to be used.

11.5.1 Declog Modes Not Requiring TOF Signal for Every Page

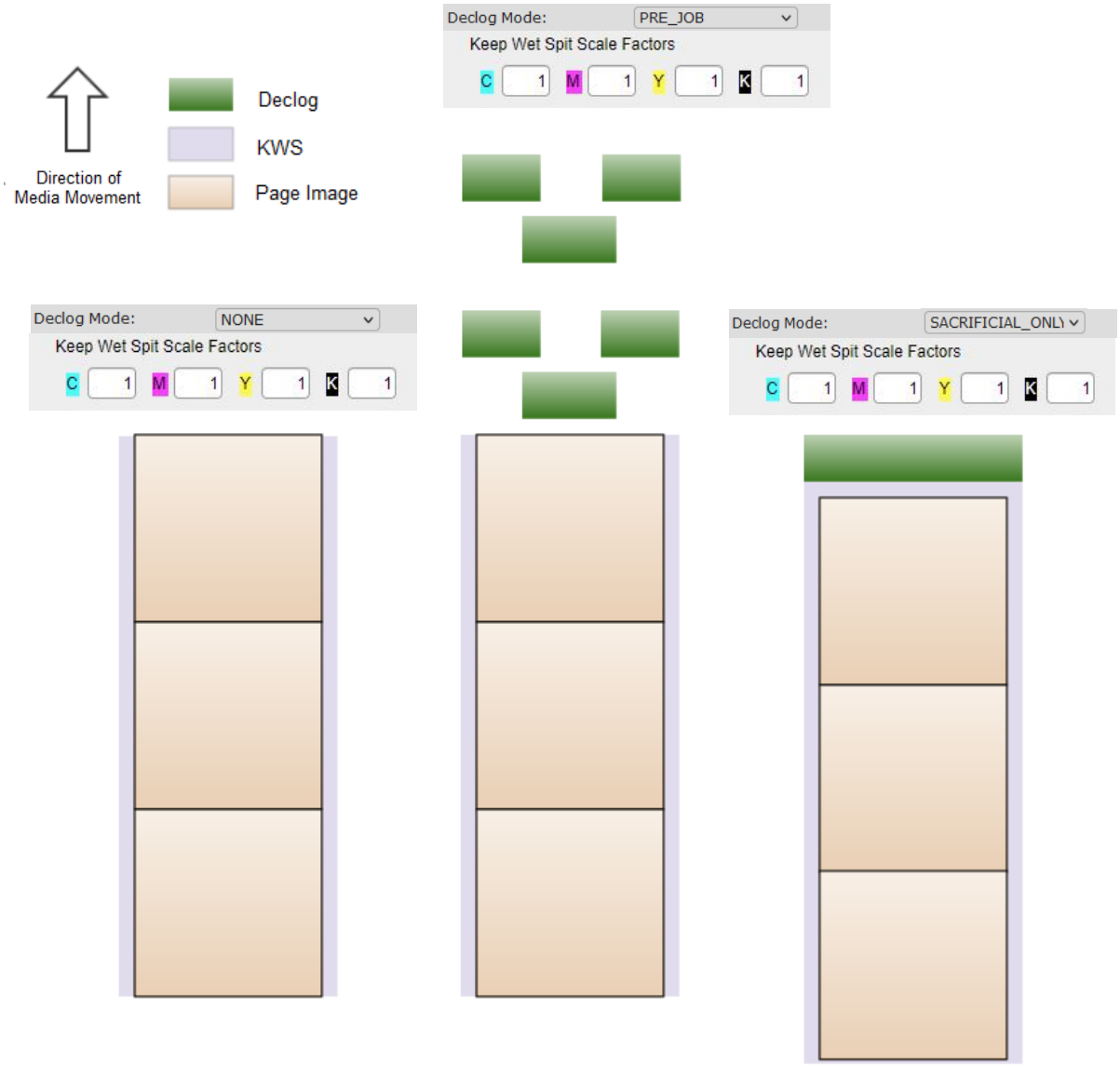
The declog modes shown in *Figure* 101 and *Figure* 102 can be used on continuous media which does not use a TOF sensor input signal to synchronize every page i.e., when using `TofSyncMode::NONE` or `TofSyncMode::FIRST_PAGE`. The resulting ejections during these modes, while pre-page spit-bars are disabled and inter-page ejections are disabled, are shown below.

The key difference between the `PRE_JOB` and `SACRIFICIAL_ONLY` modes is that `PRE_JOB` is performed on all printheads simultaneously, so it is spread over a greater distance and for printheads with large Y-offsets, there is a significant gap between the end of declog and top of the first page.

For `SACRIFICIAL_ONLY` the declog is synchronized so that each printhead completes declog close to the top of the first page. If pre-page spit-bars are enabled then they are inserted before each page, with pre-page gaps before and after the pre-page spit-bar as shown in *Figure* 102 below.

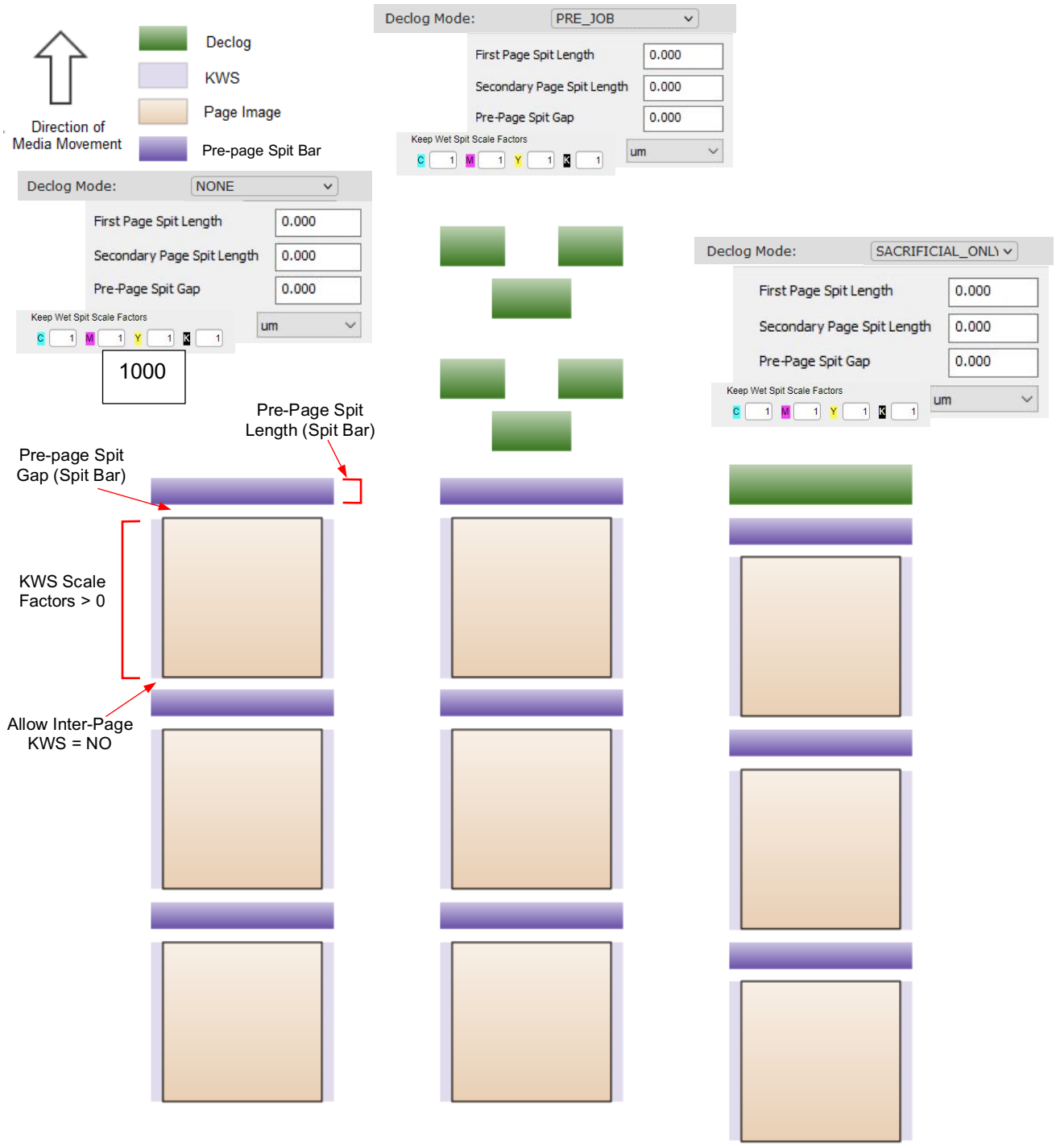
Note: Declog mode `NONE` is not recommended as it is likely to lead to decap (dehydration) issues at the start of the job.

Figure 101 – Declog Modes Without TOF or Pre-Page Spit Bars



If pre-page spit-bars are enabled then they are inserted before each page, with a minimum inter-page gap before, and a pre-page gap after the spit-bar as shown in *Figure* 102.

Figure 102 – No TOF Declog Modes with Pre-Page Spit Bars



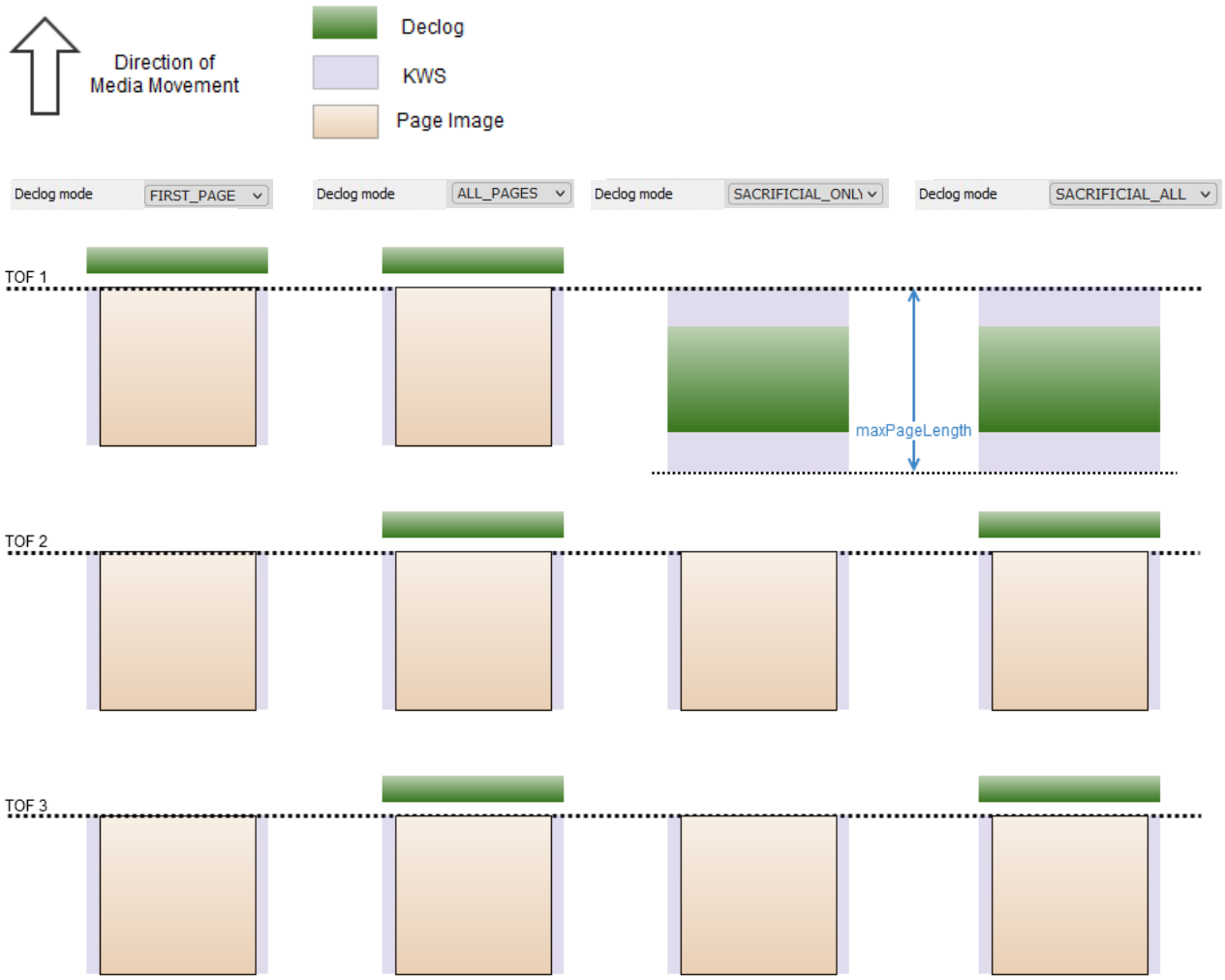
11.5.2 Declog Modes with TOFs for Every Page

All declog modes can be used while a TOF signal is being used to synchronize every page i.e., when using `TofSyncMode::ALL_PAGES` or `TofSyncMode::TRANSACTIONAL`. Declog modes that require a TOF signal, namely `DeclogMode::FIRST_PAGE, ALL_PAGES` and `SACRIFICIAL_ALL` (see also *Table 5*) can only be used that way.

The resulting ejections while using those modes, with pre-page spit-bars and inter-page ejections disabled, are shown in *Figure* 103. The `SACRIFICIAL_ONLY` mode is also shown because, although it can be used without a TOF signal, its primary intention is to use it with a TOF signal.

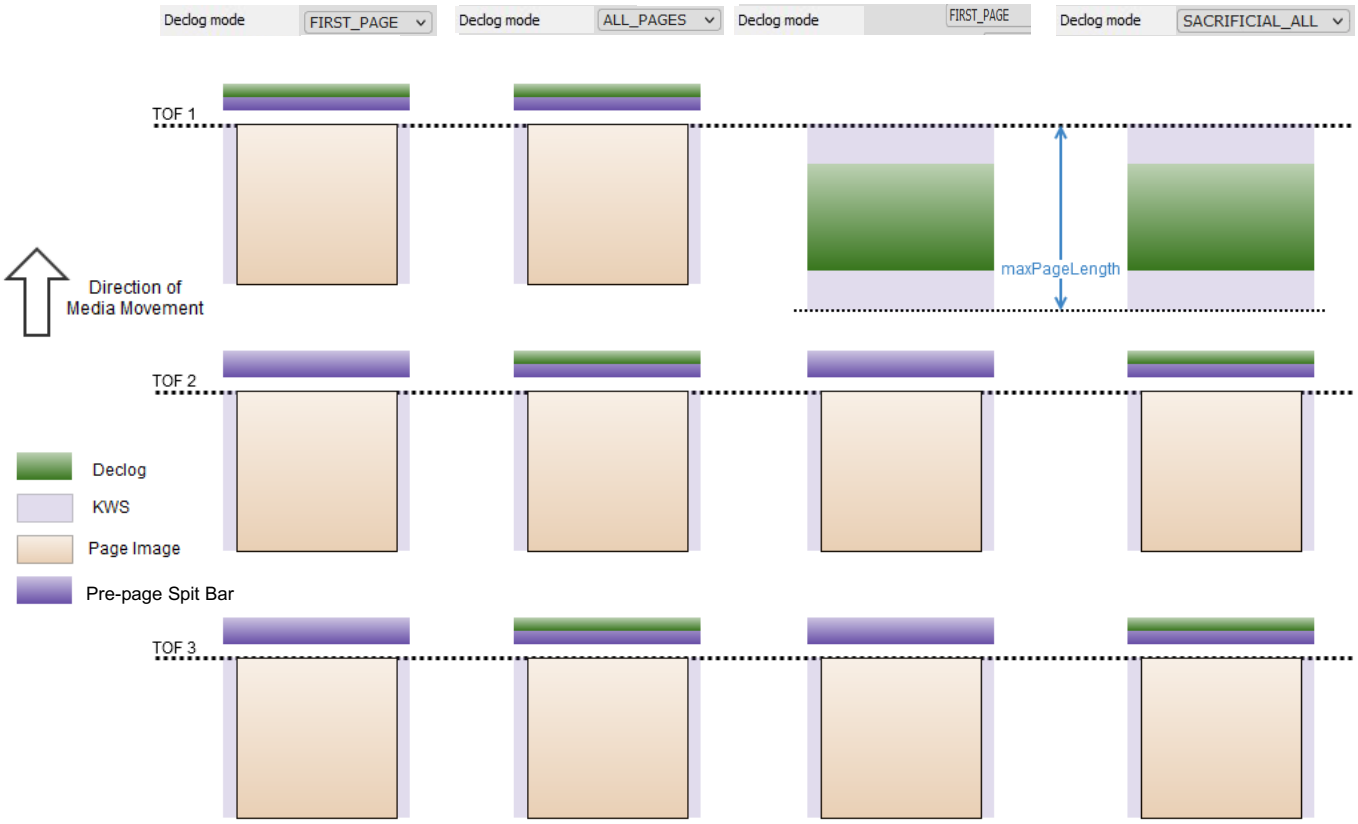
In *Figure* 103, the `FIRST_PAGE` and `ALL_PAGES` modes perform declog into the pre-page spit target area. Because declog takes a fixed amount of time to complete, for higher media speeds declog requires a greater length of media. Hence to make declog fit in the pre-page target area either a longer target area is required, or the declog duration must be shortened. If both of those options are undesirable, then one of the sacrificial declog modes can be used. Those modes allow declog to occupy up to the configured maximum page length after the first TOF i.e., the first sheet in a sheet-fed engine is sacrificed for declog and the first page image is instead printed after the second TOF.

Figure 103 – Declog Modes Using TOF for Every Page; Pre-page Spit Bars and Inter-Page Ejections Disabled



When spit-bars are enabled (*Figure* 104), they are inserted before each page in the pre-page spit target area. In some declog modes that means declog and spit-bars must share that area so truncation of the declog and the spit-bar become likely, and it may be necessary to use a sacrificial mode or `PRE_JOB` mode.

Figure 104 – Declog Modes; TOF for Every Page; Pre-page Spit Bars Enabled, Inter-Page Ejections Disabled

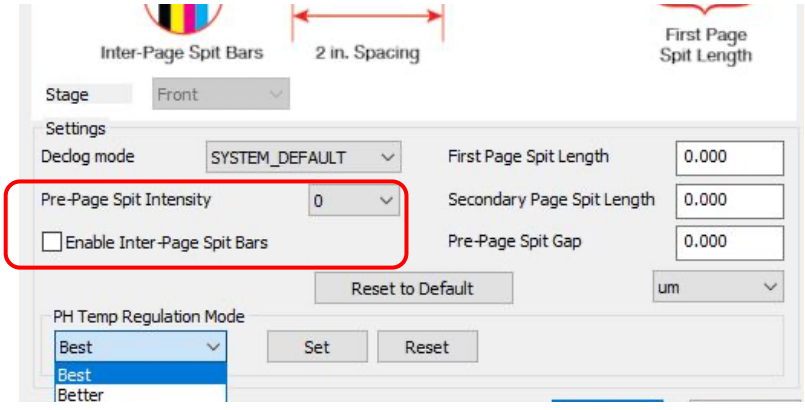


11.5.3 Inter-page Ejections

Inter-page ejections are controlled via two separate settings.

1. The **Enable Interpage Spit Bars** checkbox in the Hydration settings (*Figure* 105).

Figure 105 – Interpage Ejections Settings



2. A customization file needs to be added. In R3.1.0 and later, the file is located at `/mnt/durabolt_config/kareela-data/release-customizations/82-enable_interPageSpitbars_CMYK.json`. In older versions, the customization file is located at `/opt/memjet/kareela/configurations/src/21-interPageSpitbars_CMYK.json`.

   To edit the file, it must be copied to `/mnt/durabolt_config/kareela-data/customization/`. If it is the file from older software versions, rename it to `90-interPageSpitbar-custom-`

settings.json. The delay (from end of last page), period, and height can then be adjusted for each color. The defaults are:

```
"delayUm": 30000,
"periodUm": 3000,
"heightUm": 300,
"mask": 255
```

Setting the period to 20000 would be a reasonable starting point.

The **Enable Interpage Spit Bars** setting specifies whether the engine is allowed to eject KWS and the interPageSpitbars (as defined in the custom .json file noted above) ink onto any unused vertical space before the first page or in the inter-page gaps between secondary pages.

Note: On roll-fed printers, users may choose to allow inter-page KWS because that ink would land safely on waste media. For cut-sheet printers, ejecting ink without media under the printhead may be unacceptable and users may choose to disallow it.

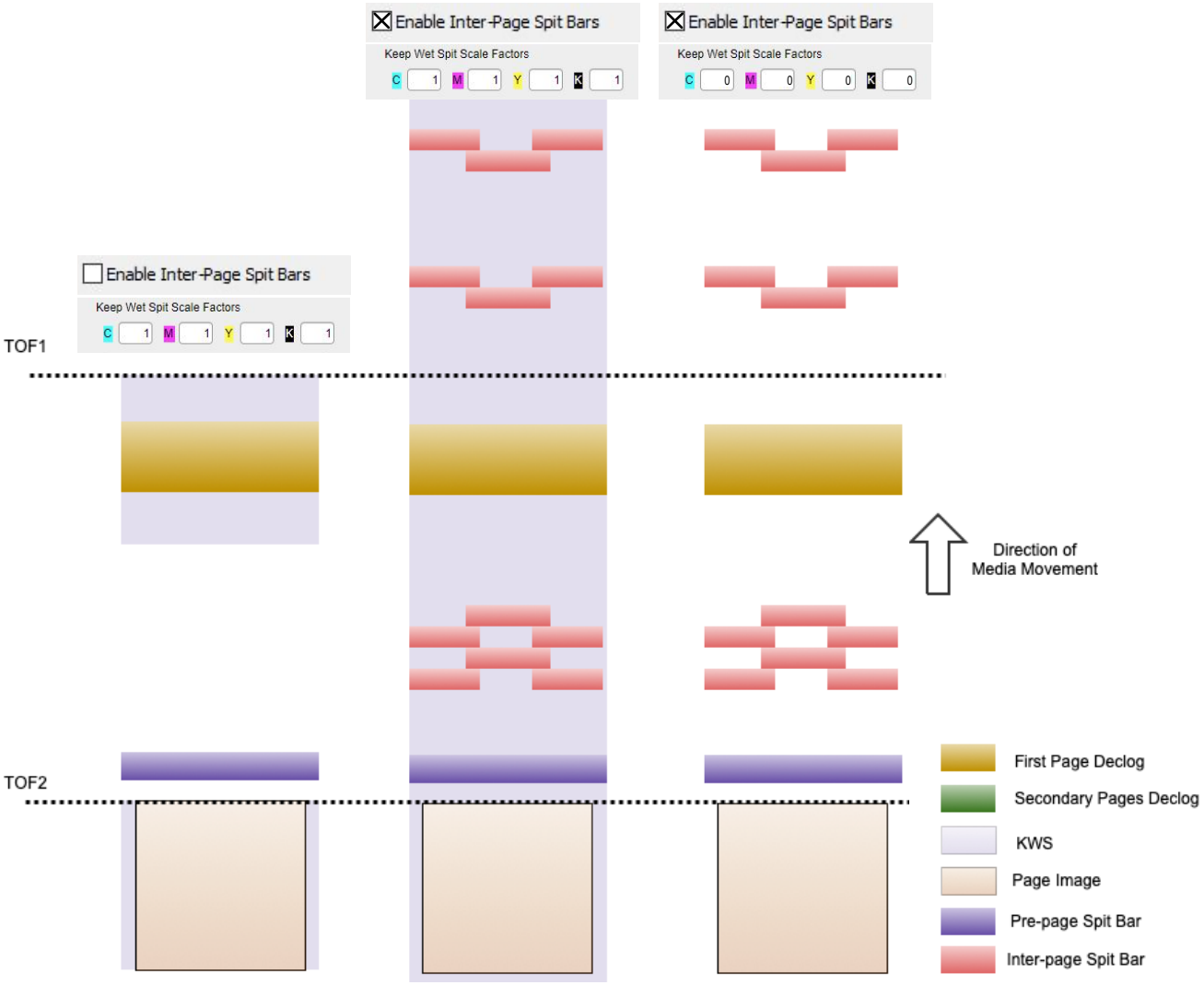
When inter-page KWS is allowed a declog will be performed in the pre-job area in addition to any other configured declog mode (except NONE).

If the configuration in 90-interPageSpitbar-custom-settings.json is set up to eject spit bars, the following will occur:

- A declog in the pre-job area will be performed in addition to any other configured declog mode (except NONE).
- Inter-page spit-bars will be ejected periodically before the first page and in inter-page gaps if those gaps are large enough.

Figure 106 shows the results of inter-page ejections, combined with the effect of the KWS and interPageSpitbar settings. Pre-page spit bars and the sacrificial page are also shown.

Figure 106 – Inter-page Ejections and KWS

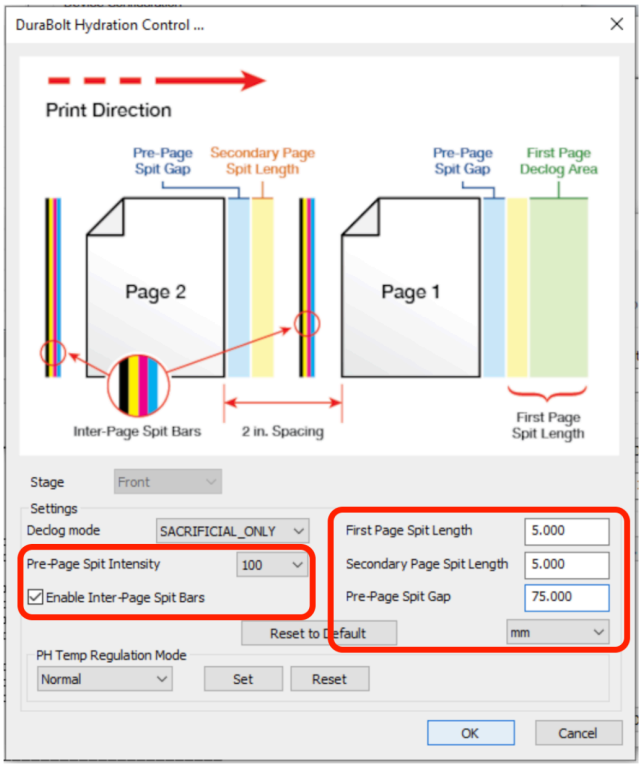


11.5.4 Example Inter-Page Spit Bar Configuration

Here is an example configuration that configures a 100% CMYK spit bar 5mm thick (in the print direction) that starts printing 75mm before the edge of the actual page. Note that in a duplex system, there is a setting for the front or back stage. That choice is made on the **Advanced Configuration** window prior to opening the **Hydration Control** window.

For cut sheet printing, if spit bars are *desired to be on each page instead of between pages*, the TOF Media Offset can be adjusted to "move" the spit bars onto the media. This will only work if the printed image is shorter than the physical media page. Otherwise, the printed image will move down off the bottom of the page. See *Figure* 81 for the TOF Media Offset adjustment.

Figure 107 – Example Spit Bar Configuration



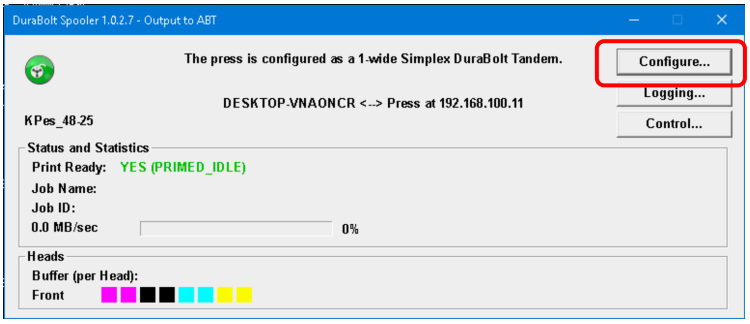
11.6 Output RIP to File

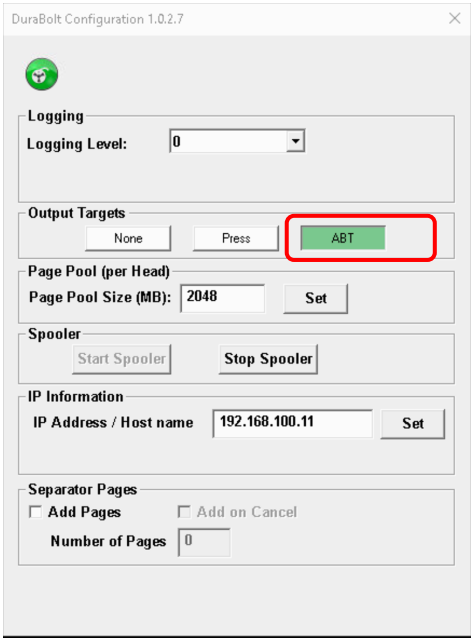
Sometimes it is helpful to output the RIP data to a file for viewing. To do this, view the DuraBolt Spooler window and click the Configure… button. This will open the Durabolt Configuration window. Click ABT in that window as shown below. This will send the output file(s) to the directory:

C:\ProgramData\Xitron\XiShare\DuraBoltOutput\

The files can be opened with the PrintView.exe app.

Note: Be sure to set back to **Press** to print again to the print engine.





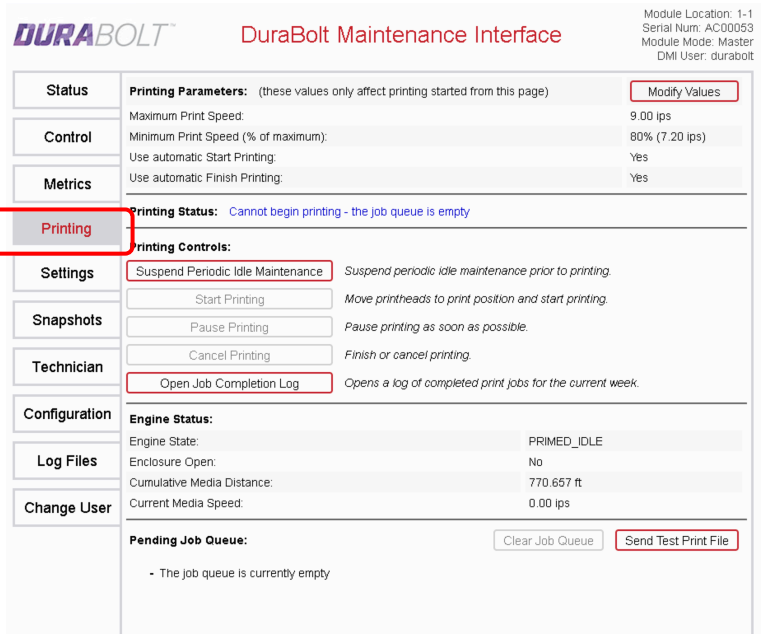
11.7 Printing via the DMI

The DMI can be used to send pre-rendered print jobs to the print engine and then run a basic print sequence.

11.7.1 Simplex Print

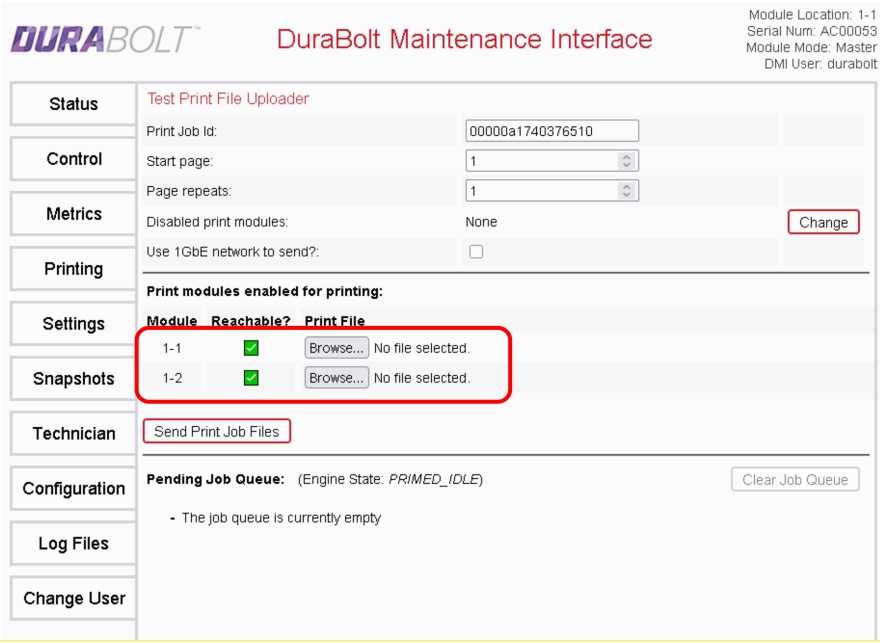
For a simplex print, open the DMI to the Printing page as shown in *Figure 108*. Click on the **Suspend Periodic Idle Maintenance** button to ensure automated maintenance will not start while setting up the print. Set any other settings, such as the **Printing Parameters**, then click the **Send Test Print File** button.

Figure 108 – DMI Printing Page



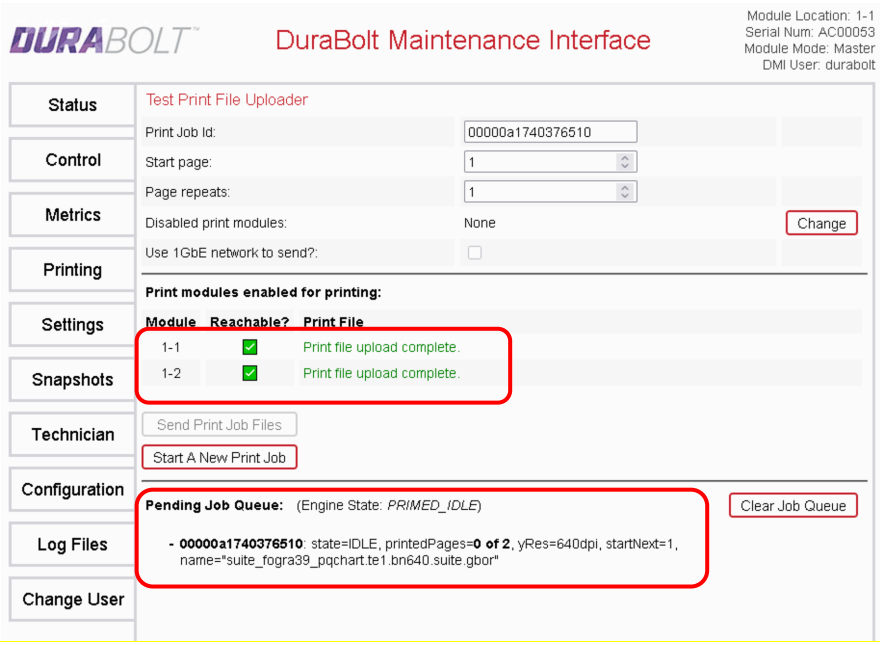
The screen will change and show button(s) for submitting a pre-rendered print file. For a Tandem system, two files are needed for a single print. For a 1x1 system, one file is needed. This example shows two buttons in a Tandem configuration. Click on each **Browse…** button and choose the file to print.

Figure 109 – Send Test Print File



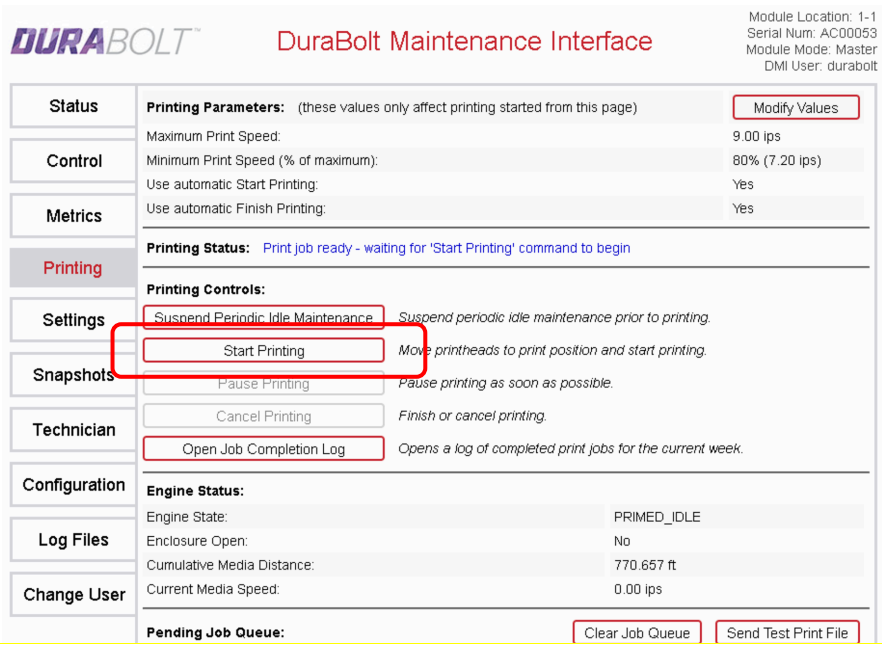
Once the files are chosen, click the Send Print Job Files button and wait for the files to be sent to the print engine. The screen will then show the files are uploaded and the Job Queue has a job ready as in *Figure 110*.

Figure 110 – Job Ready to Print



Then, click on the **Printing** button (or close this browser tab) to go back to the **Printing** screen (*Figure 111*). Once there, start the media path running to feed pages or start the roll-to-roll media, then click **Start Printing** to start the print job. It will start and finish automatically. Stop the media path when printing completes.

Figure 111 – Start Printing from DMI



11.7.2 Duplex Print

To run a duplex print with the DMI, the above steps can be completed on both stage 1 and stage 2 of the duplex system. The timing between starting each stage will need to be controlled manually by deciding when to start the second stage print.