

Dimatix Printer Quick Guide

Before Printing

1. Degas/filter the ink and load a cartridge.
2. Create a pattern file (L-edit, bitmap source or Dimatix pattern editor).

At the Printer

3. Log onto CORAL. Turn on the printer. Remove anything that has been left on the platen.
4. Open the Dimatix Drop Manager (DDM) control panel. Follow any instructions on the screen.
5. Select the "Replace Cartridge" tab & install the cartridge.
6. Replace cleaning pad: Open "Tools: Replace Cleaning Pad."
7. Convert the pattern file to a .PTF or .PTN and set the drop spacing.
 - If the file is a .TDB, open it in L-edit. Use File:Export Mask Data [Gerber] and save as a .GBR.
 - If the file is a .GBR or a .BMP, open it using DDM control panel: Tools: Pattern editor (bitmap images). Save it as a .PTF.
8. Set the drop spacing using the pattern editor. Save and load the file, and change the head angle, if prompted.
9. Select the "Load/Unload Substrate" tab and enter the substrate thickness. Load the substrate & turn on the vacuum.
11. Select the "Print Set-up" tab, and load cartridge settings (.JST) with an embedded waveform file (.CSV).
12. Use the "Run Cleaning Cycle Now" button to prime (purge 2 seconds) and clean (spit-purge-blot) the cartridge.
13. Open the Drop Watcher window. Focus & "calibrate the nozzle view" (Tools). Select & tune the jetting nozzles.
 - Jetting nozzles must be adjacent.
 - Tune individual firing voltages to achieve an identical speed between 600 – 1100 um/100 μ s.
 - Specify the firing nozzles, cartridge print height, and other settings. Save the changed settings file (.JST).
 - Reload the changed settings file (.JST). in the "Print Set-Up" tab window.
14. Close the Drop Watcher.
15. Open the fiducial camera window. Use the following tool features, as needed.
16. Measure head angle (Tools: Measure head angle). *Adjust the head angle if it is off to ensure vertical accuracy.*
17. Calibrate theta (Tools: Calibrate Theta). *Should be done every time a new substrate is loaded.*
18. Set the drop offset (Tools: Set Drop offset). *Should be done every time the head angle is changed for accurate pattern placement.*
19. Set a printing origin (Select Printing Origin).
20. Print by clicking the green "Print" button in the "Print Set-Up" tab. Verify the # of jets and layers; click OK.
21. Check print quality using the fiducial camera.

After Printing

22. Unload substrate (in the "Load/unload substrate" tab window).
23. Unload cartridge (in the "Replace Cartridge" tab window).
24. Close the DDM control panel.
25. Turn the printer off.

Procedures for new inks and substrates

1) Build a settings file that reproducibly jets the ink.

- Start with a pre-existing waveform (.CSV) that is closest to the ink, or build one from scratch (see next section).
- Start with firing voltages at 16 mV and room temperature cartridge temperature.
- Purge and clean the cartridge a couple of times.
- Open the Drop Watcher window, calibrate and focus the nozzle view. The nozzles should be pulsing when they are not firing.
- Turn on all nozzles and choose a set that look the most promising:
 - if they are firing, tune the drops to single drops that cross the same point between 600 – 1000 μm at 100 μs .
(Decreased voltages will bring fractured drops together and slow the drop velocity.)
 - if they are not firing, try increasing the firing voltages. Also try increasing the cartridge temperature.
(Typical values are 16 – 24 mV and up to 32 °C for most aqueous inks.)
- periodically clean the cartridge head to renew any nozzles or to check on the reproducibility of drops.

To build a waveform from scratch:

Open a settings file and Edit the waveform file.

Build a New Waveform with 5 identical segments.

Align the nozzles at the 0 μm line. Turn on all of the nozzles, and increase the voltage until drops fire.

Change to strobe delay with the drops visible and focused around 300 μm .

Change the duration of the 3rd segment to get maximal velocity (distance). Change all segments to the same duration.

2) Determine the drop spacing for the coverage that you wish.

-Determine drop size on your final substrate.

Print single drops (set drop spacing to 100 μm in a 1 cm-square array .PTN file provided by Dimatix).

Measure the drop diameters on the BX-51 microscope.

-Change the Drop Spacing using the pattern editor, and save the file (.PTF or .PTN).

As a guideline, a drop spacing that is half the diameter of the drop gives full coverage.

More coverage can also be achieved by printing several layers. This is set in the Pattern Editor window.

-Reload the file in the DDM control panel.

Recommendations for each printing job.

Run the “Check Cartridge Angle” and “Set Drop Offset” functions in the Fiducial camera Tools menu anytime the head angle is changed.

Before Printing

Load cartridge 1-24 hours prior to printing. (No particulates >0.2 um. De-gas aqueous inks.)

Create a pattern file (L-edit, bitmap or Dimatix pattern editor).

At the Printer

Log onto CORAL. Turn on the printer. Open the Dimatix Drop Manager (DDM) control panel.

Select the "Replace Cartridge" tab and install the cartridge.

Open "Tools: Replace Cleaning Pad" and install a new cleaning pad.

Select the "Select Pattern" tab and load a pattern file (.PTF or .PTN) and edit the drop spacing or other parameters.

If the file is a .TDB, open it in L-edit. Use File:Export Mask Data[Gerber] to save as a .GBR.

If the file is a .GBR or a .BMP, open it using the DDM control panel (Tools: Pattern editor (bitmap images)). Set the initial drop spacing and other specifications and save it as a .PTF.

If the file is a .PTF, open it using Tools:Pattern Editor (bitmap images),and save it as a .PTF.

If the file is a .PTN, open it using Tools:Pattern Editor, and save it as a .PTN.

Change head angle, if prompted.

Select the "Load/Unload Substrate" and input substrate thickness.

Load substrate and turn on vacuum

Select the "Print Set-up" tab, and load cartridge settings.

Use the "Run Cleaning Cycle Now" button to prime (purge cycles) and clean (spit,purge, blot cycles) the cartridge.

Use the Drop Watcher to select and tune nozzles

Nozzles must be adjacent to each other.

Tune individual firing voltages to achieve identical speeds (600 – 1100 um in 100 microseconds).

Specify the firing nozzles, the cartridge print height, and any other settings and save the cartridge settings.

Reload the changed cartridge settings in the Print set-up tab.

Close the Drop Watcher window.

Use the fudicial camera window to calibrate theta, set the drop offset, and set a printing origin (in that order).

Print pattern by pressing the green "Print" button in the Print Set-Up tab.

Check print quality using the fudicial camera.

When finished

Unload substrate (with "Load/unload substrate" tab)

Unload cartridge (with "Replace Cartridge" tab)

Close the DDM control panel.

Turn off the printer.