How to use the HP Latex 300 printer series as a color emulation for the HP Latex 3000 using CALDERA GrandRIP+ v10

This document is complementary to the "Color Matching Guide on the HP Latex 360" document. It briefly describes the basic steps on how to configure CALDERA GrandRIP+ to properly use a **single** HP Latex 300 printer series as a color emulation[1] for a **single** HP Latex 3000 press (individual profiles advised if proofing multiple printers as one profile for various machines would be inconsistent).

Contents

[1] Bear in mind that the final color consistency among the printers will depend greatly on the variability of the measuring instrument used and the variability of the printers.

Summary

Proofing is the process of simulating the printing behavior of one printer, the target printer, on another printer, the proofer printer. To get good results in the proofing experience, there are four basic concepts to take into account:

- A good **ICC profile** should be created for each printer using the **same physical device** (spectrophotometer)
- The printers should be **calibrated/linearized periodically** or whenever any significant deviation in color reproduction is observed, and, of course, before any ICC profile is created
- The **proofer gamut** (the color space of the proofer printer) should **fully encompass the target gamut**. This can be observed comparing both ICC profiles with an ICC profile viewer
- For each different media AND print mode (number of passes and ink saturation) combination the same process should be followed.

This document describes the steps to follow to use a Latex 300 series as a color emulation for a Latex 3000 series (target) for a specific media and print mode combination on the target side.

Basically it consists of 4 steps; the first 3 are just one-time set-up steps and the 4th is the usual operator usage.

Step-by-step instructions

The following describes the steps for the emulation of the HP Latex 3000 series using an HP Latex 300 series printer.

Equipment and material requirements

- Substrate: 1 roll of the same media per printer or 1 roll used for both printers
- HP Latex 3000 series (target printer) / HP Latex 300 series (proofer printer)
- Spectrophotometer. The same physical spectrophotometer should be used for both printers.
- Working knowledge of CALDERA GrandRIP+ v10 or newer, installed on a proper workstation.

Please take a look at the *RIP version and printer model compatibility* matrix

Caldera RIP	Printers supported	
GrandRIP+ 10 GrandRIP+ 11	Target printer	HP Latex 310, 330, 360 and 370
	Proofer printer	HP Latex 3000, 3100 and 3500
GrandRIP+ 11	Target printer	HP Latex 310, 315, 330, 335, 360, 365, 370 and 375
	Proofer printer	HP Latex 3000, 3100 and 3500

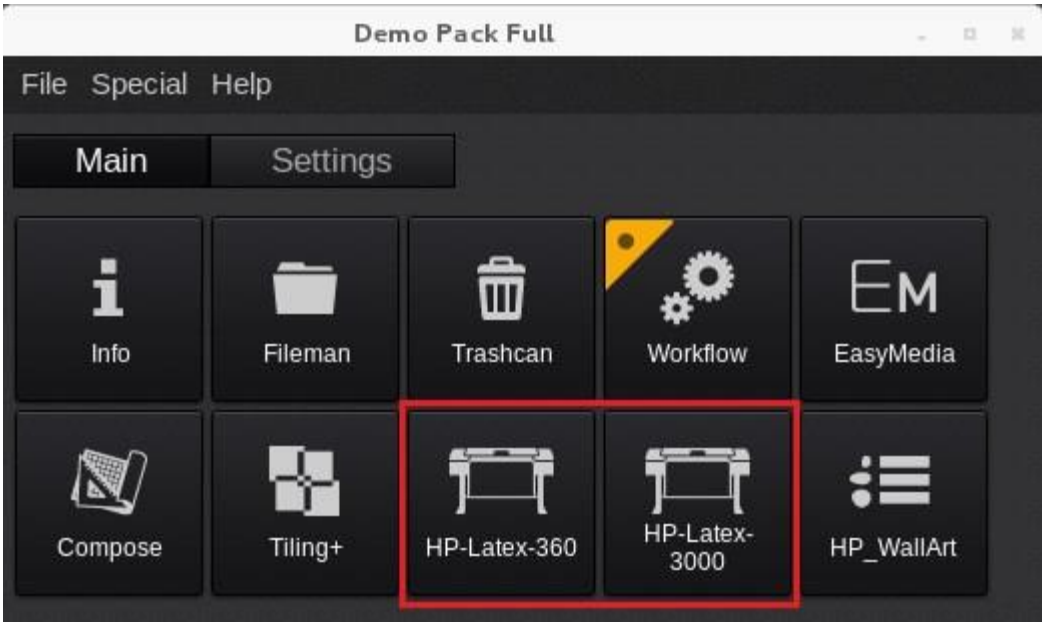
General system recommendations

For good color matching between proof and print, the following recommendations should be followed:

- Use the **same brand and type of substrate** in both the target printer and the proofer:
  - Avery 3001
- For a given substrate, use the **maximum ink density available for the proofer** baseline, to emulate any equal or lower ink density on the same substrate by the target printer:
  - 100%
- Use **print modes with comparable print quality** (not necessarily the same number of print passes) on both printing systems. This might be quite time consuming until a corresponding print mode for the proofer is found to match a specific ink-density/print mode for the target.
  - 3500 6p 6c 100%
  - 300 12p 100%

Step 1: Install both printers in CALDERA RIP

CALDERA RIP requires a minimum of two active printers for proofing: one for the final output (the HP Latex 3000 in this case) and one for the previous proofing (the HP Latex 300 in this case). It is assumed that the reader has sufficient knowledge of how to create the printer queues in the RIP.



Step 2: HP Latex 3000 setup

1. Set up the **HP Latex 3000 target baseline**, using your substrate. This includes:
   a. Creating a new media preset on the printer's Internal Print Server (the Front panel). This can be achieved either by:
      1. Selecting a base generic media preset that already exists in the IPS that better defines the type of media you are using and clone it. The cloned preset is editable and will be our target to emulate. Rename it to a meaningful name, or
      2. By downloading, from the IPS, the media preset for the media from the Web. This is the way we have done the tests.
   b. Make sure printheads are aligned. If not, launch the Printhead alignment routine.
   c. Adjust, if needed, all substrate settings (advance, temperature, vacuum, inter-pass delay…) to the desired values (in our tests we left them all at their default values).
   d. Select the ink density to emulate. In our case we selected **100% ink density, 6-pass print mode, 6-ink configuration**.

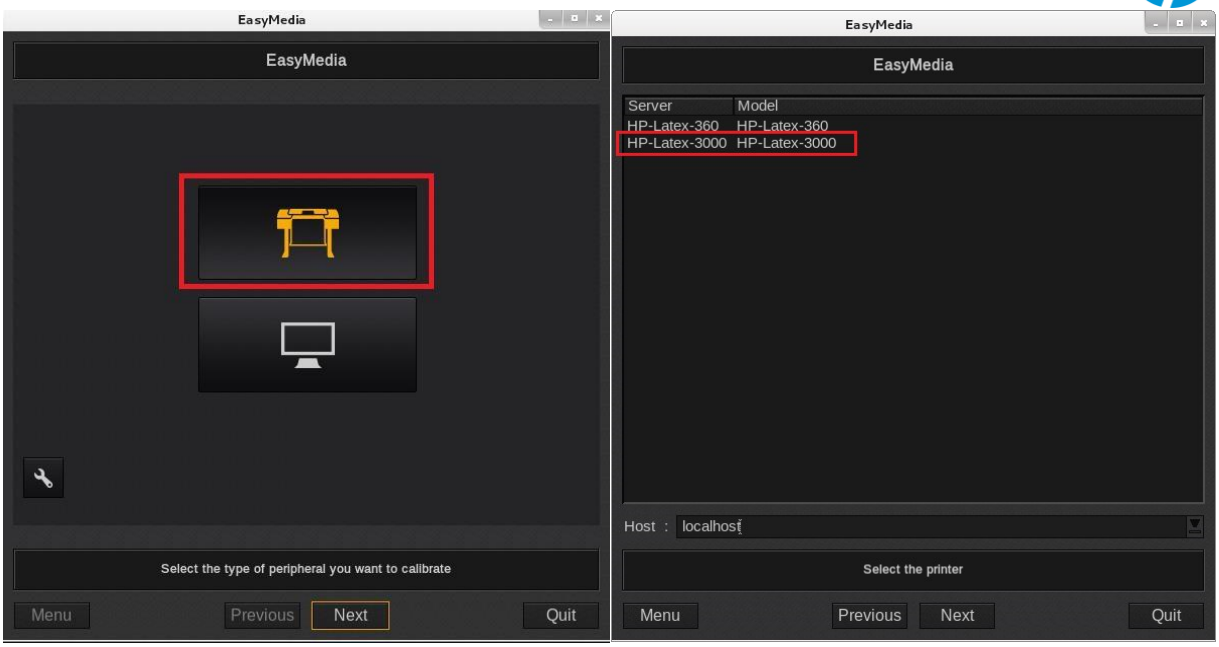
2. **Color calibration** of the target printer baseline.

   To start Color calibration from the Internal Print Server (IPS), select **Substrate** > **Color calibration**, and then click the **Calibrate** button.

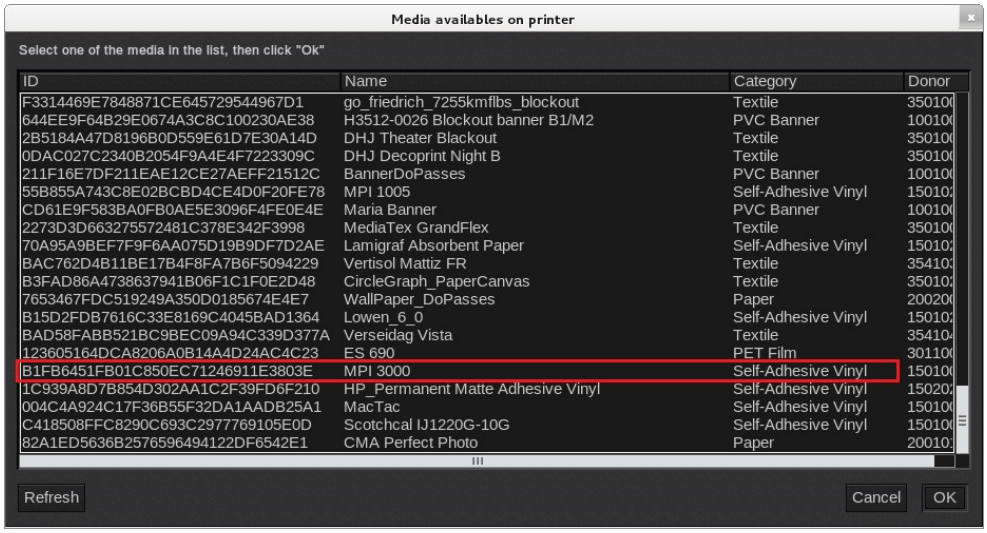
   If a media cannot be calibrated by the printer (e.g. backlit media) then the calibration/linearization should be performed using the EasyMedia module within the CALDERA RIP (see Step2.3.d). In such case, please go through the Linearization and Ink Limit tabs to define the individual ink limits, create the linearization curves and define the global ink limit. Also remember that whenever later in the document a printer calibration is asked for, an internal RIP calibration/linearization is to be made (the relinearize option in the Linearization tab of the EasyMedia module), instead of printer calibration for such media.

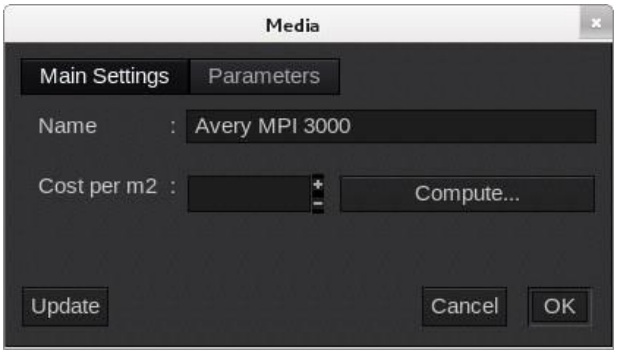
3. **Color characterization** of the printer baseline. That is, creation of the RIP media profile, including an ICC profile, of the target printer baseline.

   a. Start CALDERA EasyMedia to create the media preset for the recently cloned/installed media for the printer. Select the HP Latex 3000 to start the creation of the media and click the New button to display the new media types for the printer.

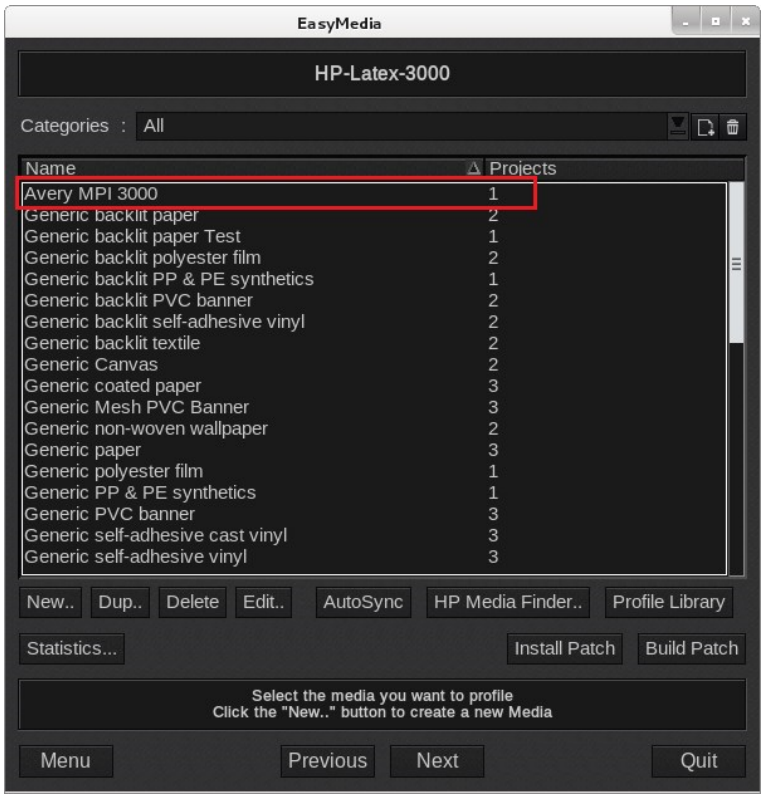


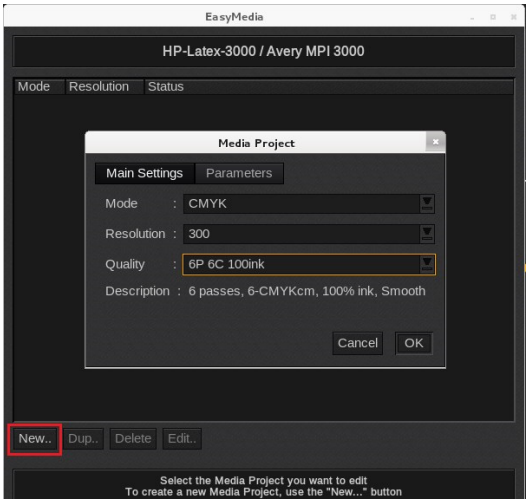
b. Make sure you select the recently cloned media on the drop-down menu to link the CALDERA media preset to the media preset defined for the printer. In our example, the printer media preset is MPI 3000 and the name in the RIP is Avery MPI 3000.



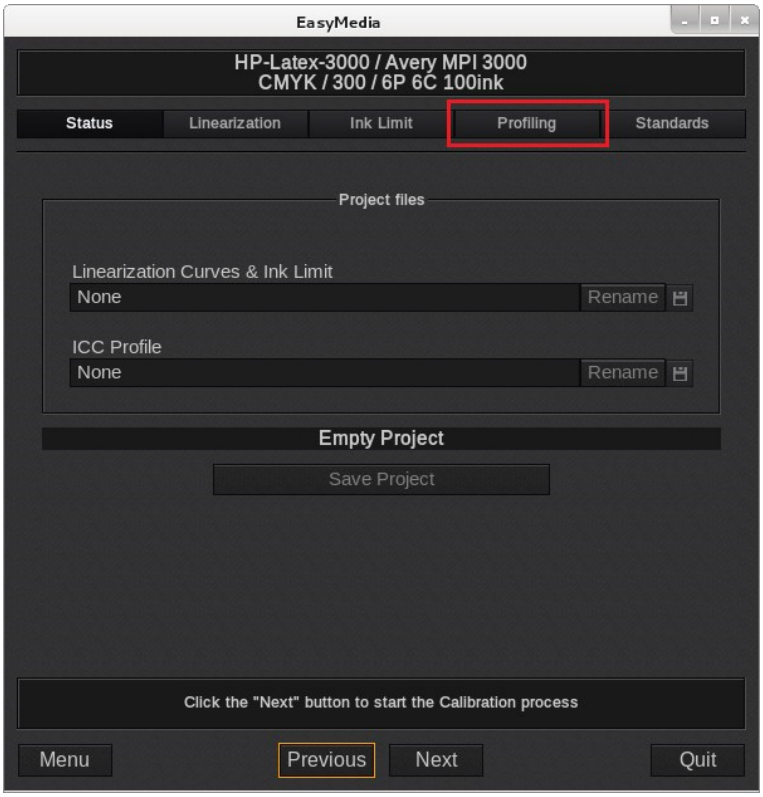


c. Click the New button in order to add/select the print mode to emulate. In our example: 6p 6c 100%.



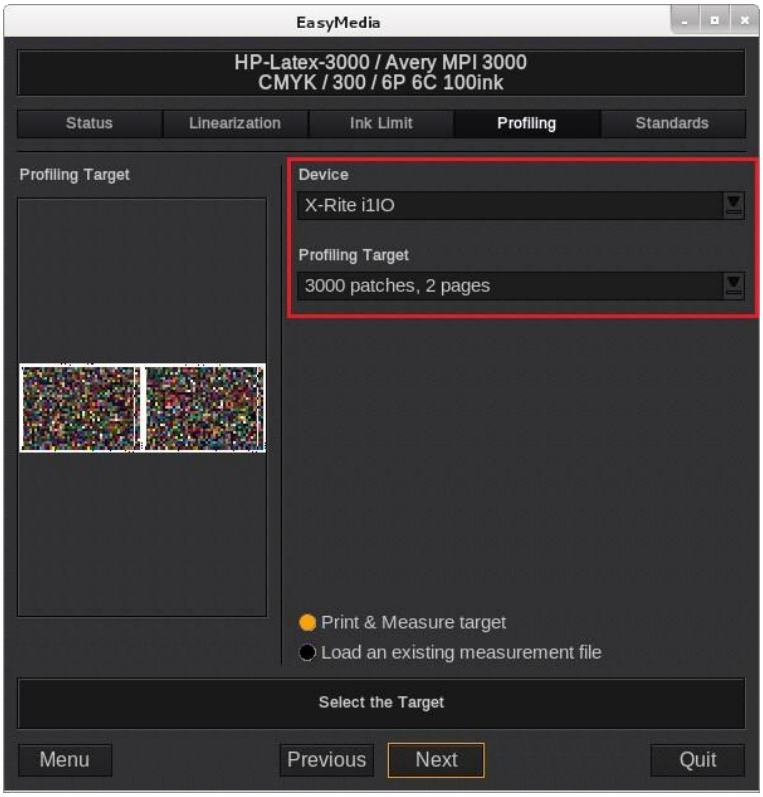


d. Click the Next button to create the ICC profile. Skip Linearization and Ink Limit processes and select the Profiling tab. But please note: as specified in Step2.2, if the printer cannot calibrate a media, you should go through the Linearization and Ink Limit steps at this point before creating the ICC profile.

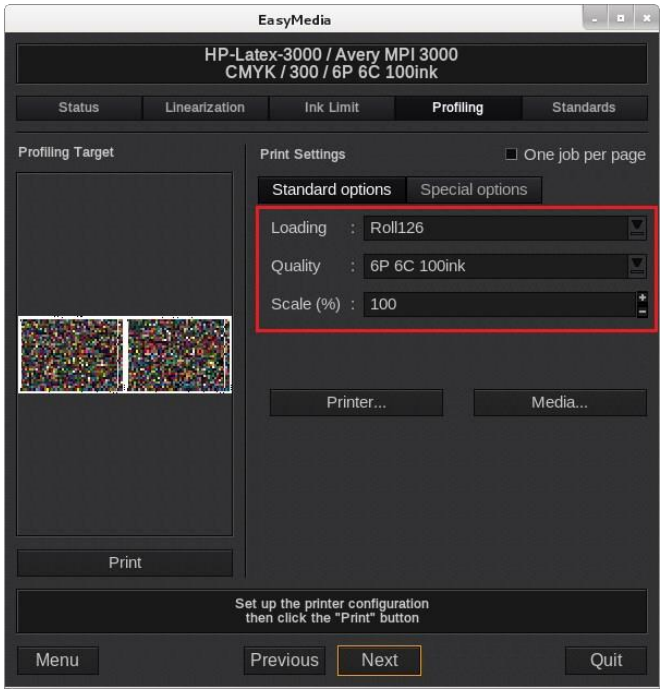

EasyMedia
HP-Latex-3000 / Avery MPI 3000
CMYK / 300 / 6P 6C 100ink
Status
Linearization
Ink Limit
Profiling
Standards
Project files
Linearization Curves & Ink Limit
None
Rename
ICC Profile
None
Rename
Empty Project
Save Project
Click the "Next" button to start the Calibration process
Menu
Previous
Next
Quit


EasyMedia
HP-Latex-3000 / Avery MPI 3000
CMYK / 300 / 6P 6C 100ink
Status
Linearization
Ink Limit
Profiling
Standards
Select the main operation to perform
Create a new ICC profile with i1Prism V2
Create a new ICC profile with OBC
Edit / Check current profile
Select the procedure to use
Run Wizard (Print/Measure/Build)
Load/Import an existing file
Create from scratch
Click the "Next" button to start the profiling process
Menu
Previous
Next
Quit

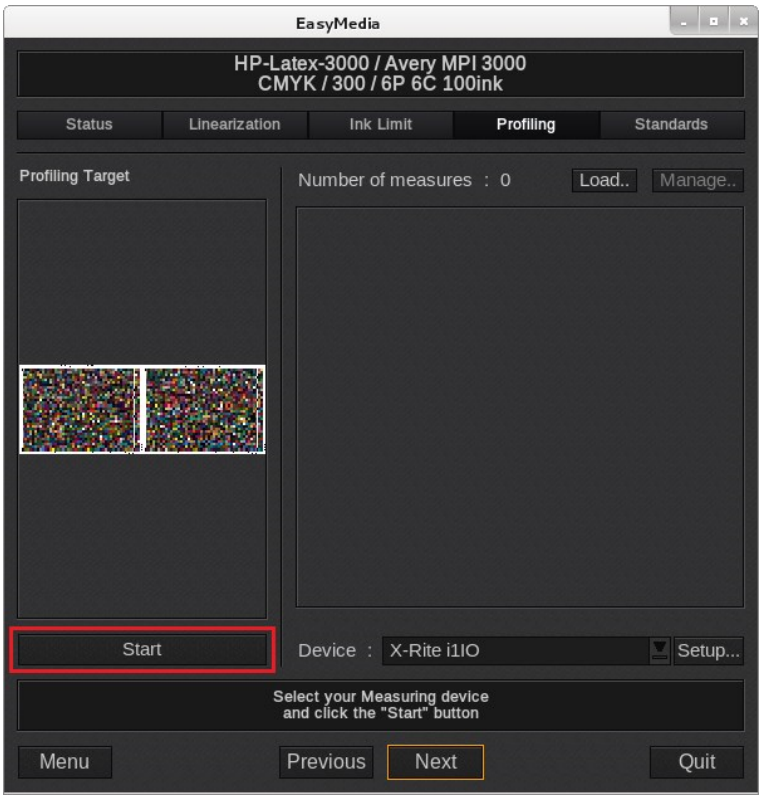
Select the spectrophotometer device to read the patches and the Profiling Target to use. Then click Next.



Make sure the Loading, Quality and Scale settings are correct. Then press the Print button to print the Profiling Target.

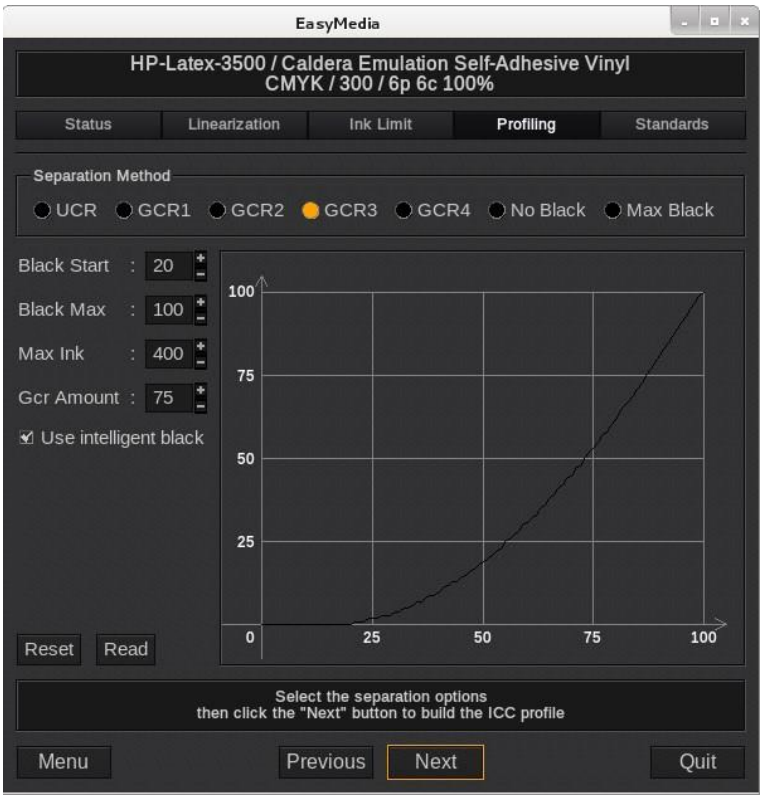


e. After the swath has dried, click Start and follow the instructions displayed above the Next button.



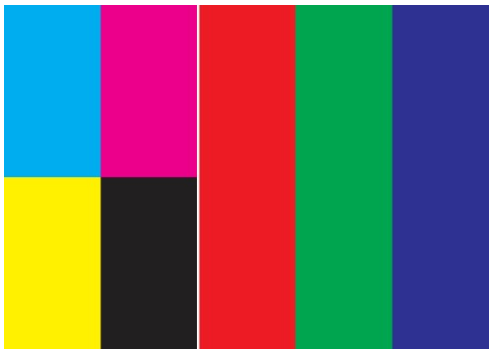
f. Click the Next button to access Build Options. In our case, we keep the default settings.

g. Once the ICC build settings have been modified, click Next to complete the profiling process.



h. The new media preset will be available in the HP Latex 3000 RIP and will be shown as "Completed."

4. Measure the values for maximum primary and secondary color saturation:
    a. Once the calibration is performed, please print the attached plot (CMYKCheckPlot.tif) without any color management (in Native mode), and measure, with the spectrophotometer, the maximum densities[2] for each patch. Write them down as they will be used in step 3.



For more accurate results, you could print several copies of the image along the width of the printer and later average the values obtained for each patch.

Once the target baseline is set, remember to print using this media profile and print mode whenever a print conforming to the proof will be needed.

Step 3: HP Latex 300 setup

The best color matching accuracy can only be obtained when the **color gamut of the proofer baseline** completely includes that of the **target printer baseline**, in other words, when the color gamut of the proofer encompasses (is a superset of) the color gamut of the target printer for the same media. Also, please make sure you use the **same physical spectrophotometer device** to create the ICC profile on both printers.

The first basic step is to set up the widest gamut baseline in the proofer for the selected substrate. This can be accomplished by selecting the highest possible ink density on that substrate. For **reflective media**, including PVC Banner, Self-adhesive Vinyl, Paper, PP & PE Synthetics, and Polyester Film or Canvas, the maximum possible ink density is **120%**. For **backlit media and textiles**, the maximum possible ink density is **260%**. However, if it is necessary to use more than 120% for a nontranslucent media, load the media as backlit.

1. Set up the **HP Latex 300 proofer baseline**, loading the same substrate as in Step 1 (the same media make and type, not necessarily the same physical media roll). This includes:

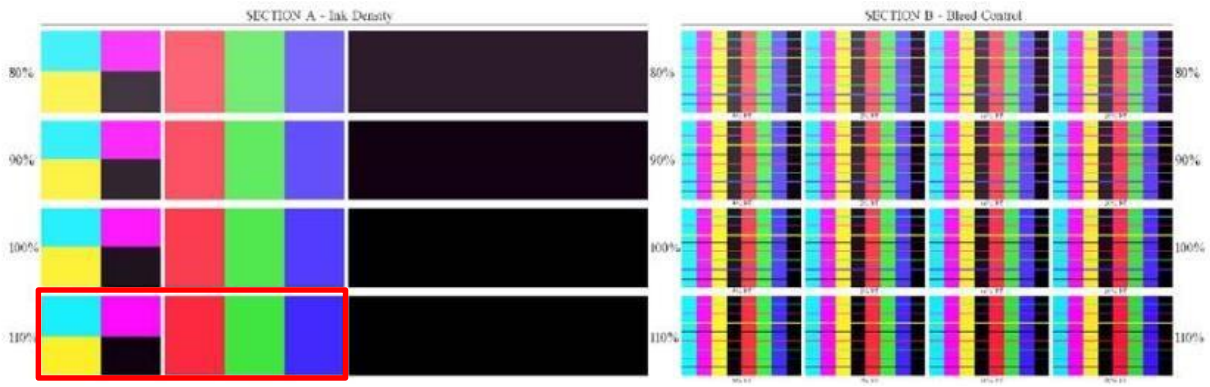
    a. Making sure the printheads are aligned. If not, launch the Printhead alignment routine.

    b. Creating a media preset (the **proofer baseline**) from the printer's Front panel. As in Step 1, it can be done in two ways:

[2] Alternatively you could measure the CIELab values.

1. By cloning a media that is already defined in the Front panel that better defines the type of media you are using, naming it with a meaningful name (in our case: Proofing – Self-adhesive vinyl), or
2. By searching for and downloading a media preset that is specific for the media you actually have.

c. Select Modify > Add New Print mode on the Front panel.
   1. Select a number of passes greater than the print mode selected at the target printer (the HP Latex 3000 printer). In our case we choose 12 passes.
   2. Print the diagnostic plot (Print test) and check that:
      a. The IQ is similar to the one achieved by the target printer (considering bleeding, coalescence, banding, ink drying, ...)
      If needed adjust the substrate settings (advance, temperature, vacuum, inter-pass delay...) so there are no IQ issues (in our tests we left them all at their default values).
      b. The densities of the primary colors are greater than the ones measured in step 2.4.a[3].



If there are no ink saturation levels that produce the previous conditions, then go back to step 3.1.c.1 and select a higher number of passes.

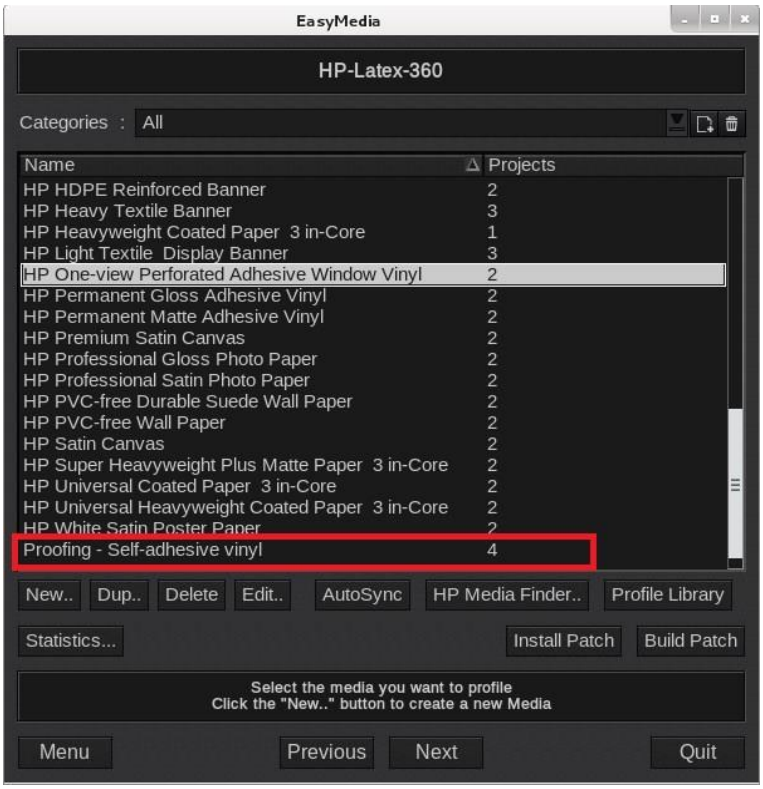
If increasing the number of passes does not help either, then the proofer (HP Latex 300 printer) will not be a good proofer, but, by following the rest of the process, we will still be able to get the best color matching possible.

3. Select the Ink Saturation you just defined and Save the print mode.
   Bear in mind that this stage might be quite time consuming until a proper print mode and ink saturation level is found.

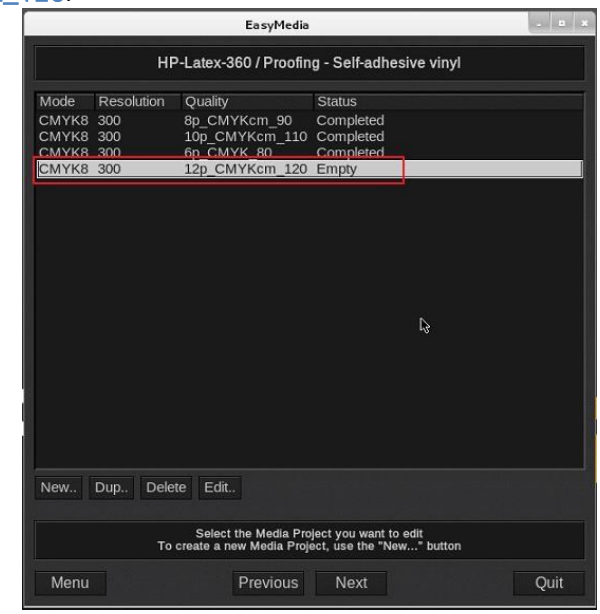
2. Color calibration of the proofer baseline.
   a. To start Color calibration from the Front panel, select Substrate > Color calibration, and then click the Calibrate button.
   As commented in Step 2, if the media is not able to be calibrated by the printer, the calibration should be done by the RIP (see Step3.3.c). [3]

[3] If you have values in CIELab instead of densities, please bear in mind the following to compare the colors:
- For all colors except for Yellow, use the **L** (lightness) value and for Yellow use the **b** value.
- The **L** value for the HP Latex 300 printer should be lower than the **L** value for the HP Latex 3000 printer.
- The **b** value for the HP Latex 300 printer should be higher than the **b** value for the HP Latex 3000 printer.

3. Color characterization of the printer baseline, that is, creation of the RIP media preset and an ICC profile for the target printer baseline.
   a. Start CALDERA EasyMedia to create the media preset for the recently cloned media in the printer. Select the HP Latex 300 to start the creation of the media.

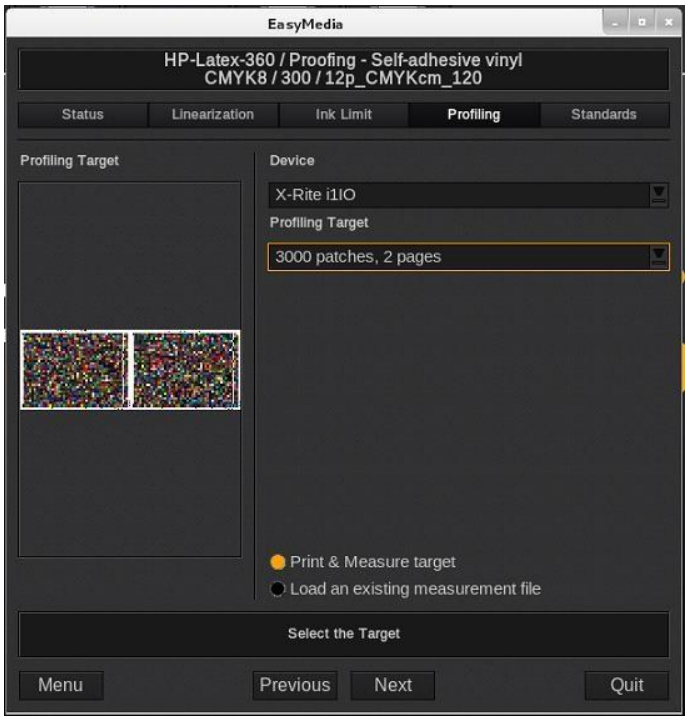


   b. In the Media Project dialog, select the created print mode. In our example, 12p_CMYKcm_120.



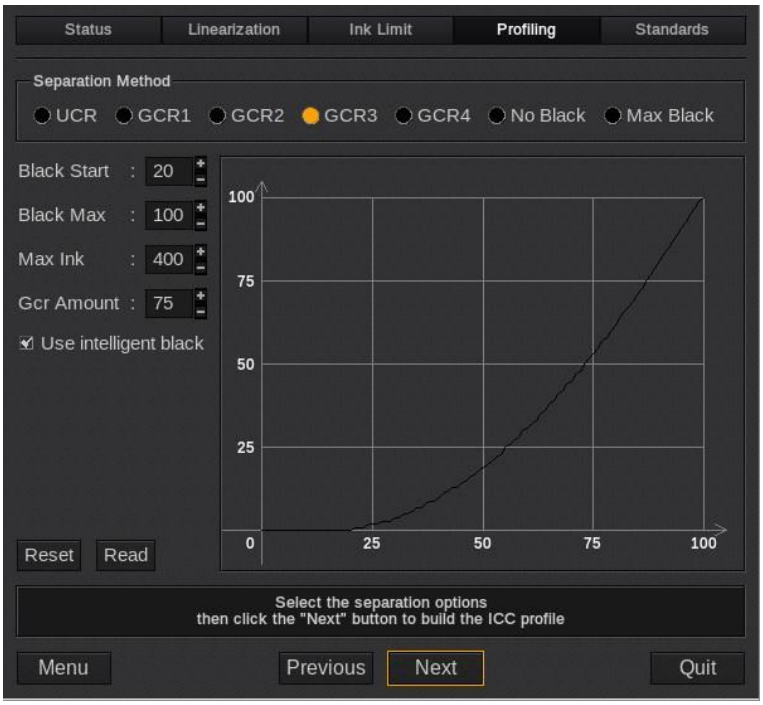
c. Click the Next button to create the ICC profile. Skip the Linearization and Ink Limit processes and select the Profiling tab. But please note: as specified in Step3.2, if the printer cannot calibrate a media, you should go through the Linearization and Ink Limit steps at this point before creating the ICC profile.

In the Profiling tab, click Create new ICC profile with i1Prism V2. Select and setup your spectrophotometer device (in our case the X-Rite i1iO). It is recommended to use the 3000 patches profiling target.



d. After the chart has dried, click Start to measure it.

e. Click the Next button to access Build Options. In our case, we keep the default settings.

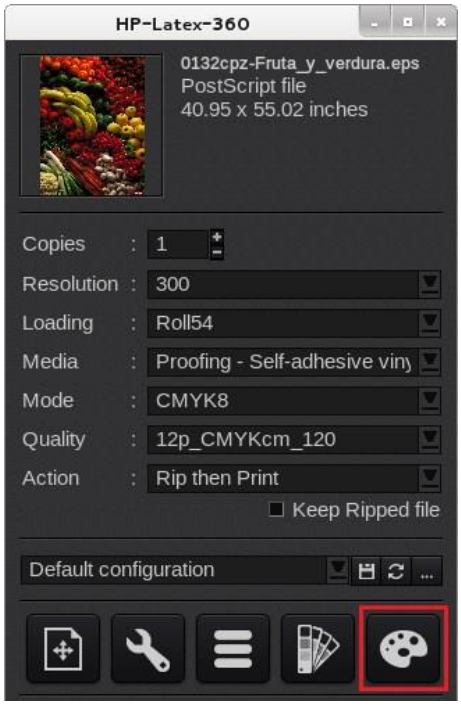


f. Once the ICC build settings have been modified, click Next to complete the profiling process.

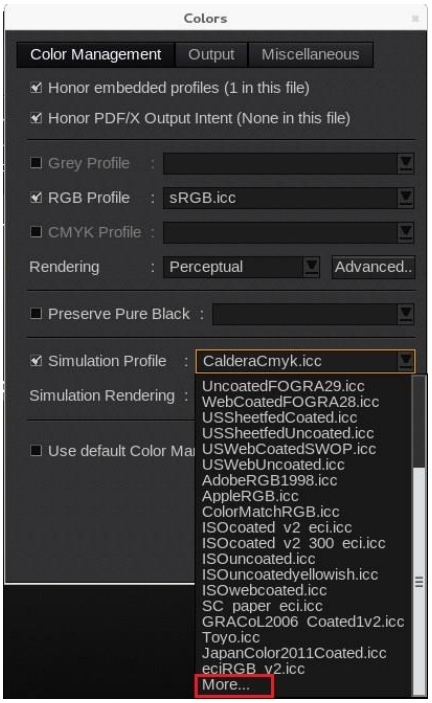
Step 4: Printing the proof

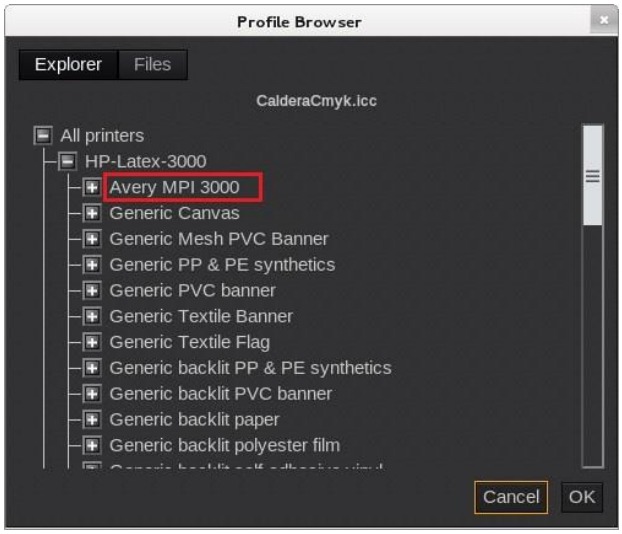
In order to automate the process we will distinguish between the first time we proof (where we will define some presets) and the rest of the proofs:

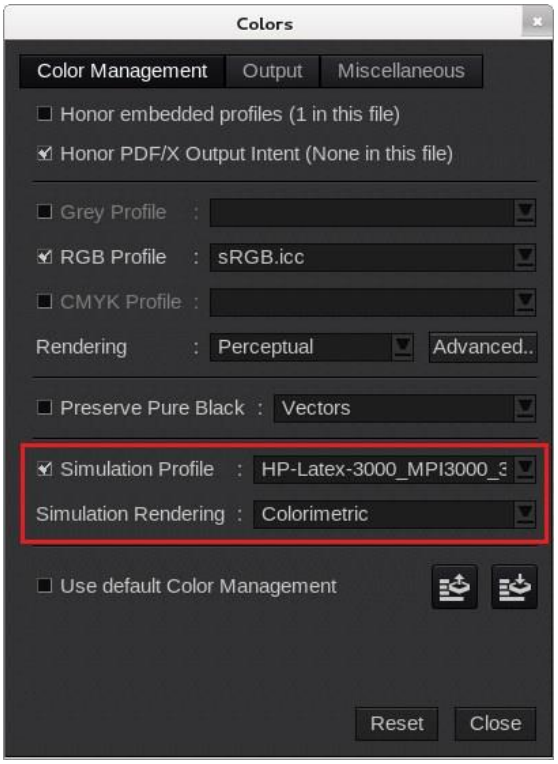
1. First time proofing:
   a. Open the job in the HP Latex 300 queue.
   b. Go to the Color Tab:



c. Define the Simulation Profile and Simulation Rendering Intent. The Simulation Profile should be the Latex 3000 ICC profile created in step 2.3.h. To find it, select More... in the list and navigate through the Profile Browser:

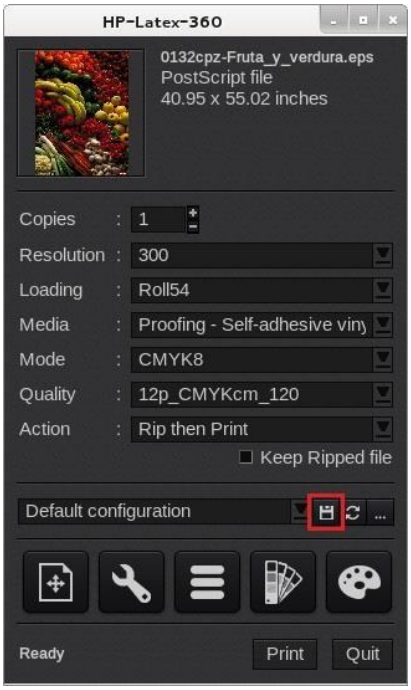






Specify the Simulation Rendering as Colorimetric. If you change any of the other ICC profiles or any of the other Rendering Intents, please make sure to specify the same settings when printing later on against the HP Latex 3000.

d. In the main window, click the Save button:



e. Set a meaningful name and click OK:

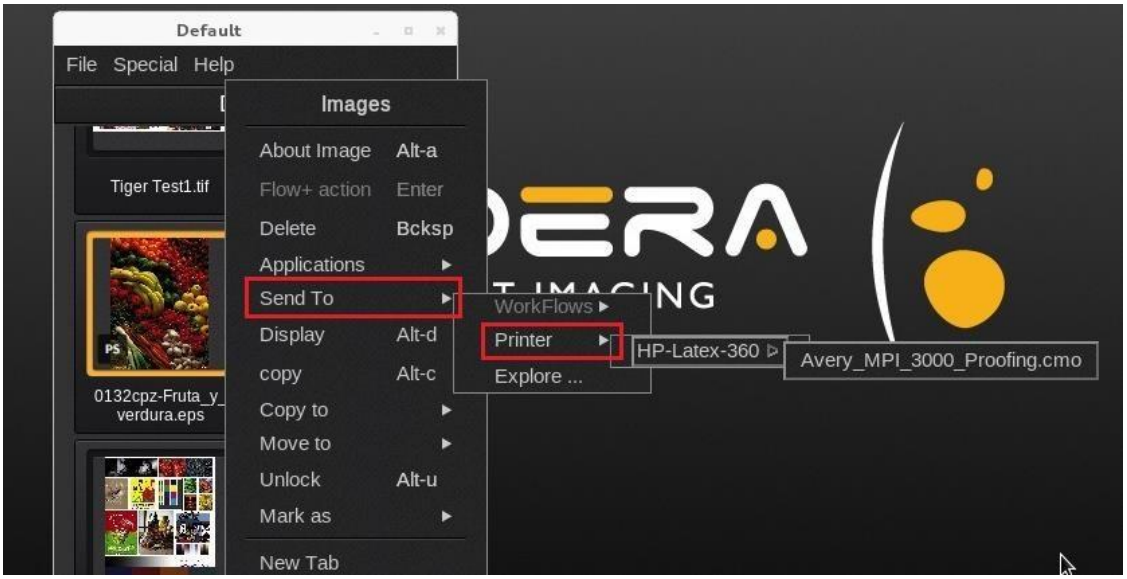
f. Print using the corresponding settings on the proofer. **Remember to use the same settings** (except for the Simulation Profile that should be blank) **on the target printer.**

2. Printing the rest of the proofs:

a. Select the print configuration created (that loads all the printer parameters specified previously). It can be done in two ways:

From the main window:

Or from the Image Bar:



3. Periodic printer calibration

    a. Please remember that periodically and whenever a color deviation is observed, the printer should be calibrated/linearized.
    b. If a calibration does not bring the printer back to its original conditions, then please consider re-creating its ICC profile for the media and print mode. In the case that the target printer ICC has been re-created, please save it in the Color Management settings for the proofer printer again (Step4.1.c).

Resources

Additional help and or technical support can be found on the CALDERA website: www.caldera.com .

Disclaimer

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