Tutorial

Creating a New Derived CPM

Software version: Asanti 6.x
Document version: July 13, 2023

This tutorial is based upon a basic knowledge of CPM's, please consult the online tutorial "Calibrated Printing Modes" available from the Asanti Network!

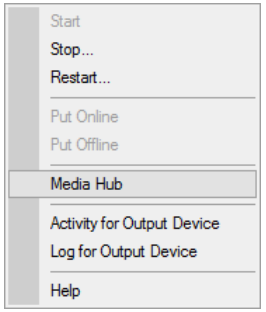
A Calibrated Printing Mode (CPM) is a quality resource that is associated with the 3 major ingredients of a job: the printer that will be used to print it, the media on which it will be printed, and the desired quality of the printed result. Asanti comes with the default installed CPM's for "Generic" media, these are originally made on bright standard media. They have a big color gamut which makes them very suitable as base CPM to derive new CPM's from. New CPM's can be created starting from an existing CPM (=base CPM) using the CPM Wizard. **It's strongly advised to use the Generic CPMs as the base.**

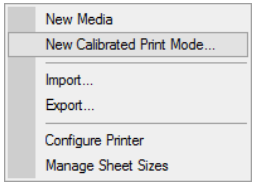
Measurement devices

A measurement device is essential to create a CPM from scratch. Make sure that the right driver is used. See the Annex for detailed info.

1. Creating a derived CPM

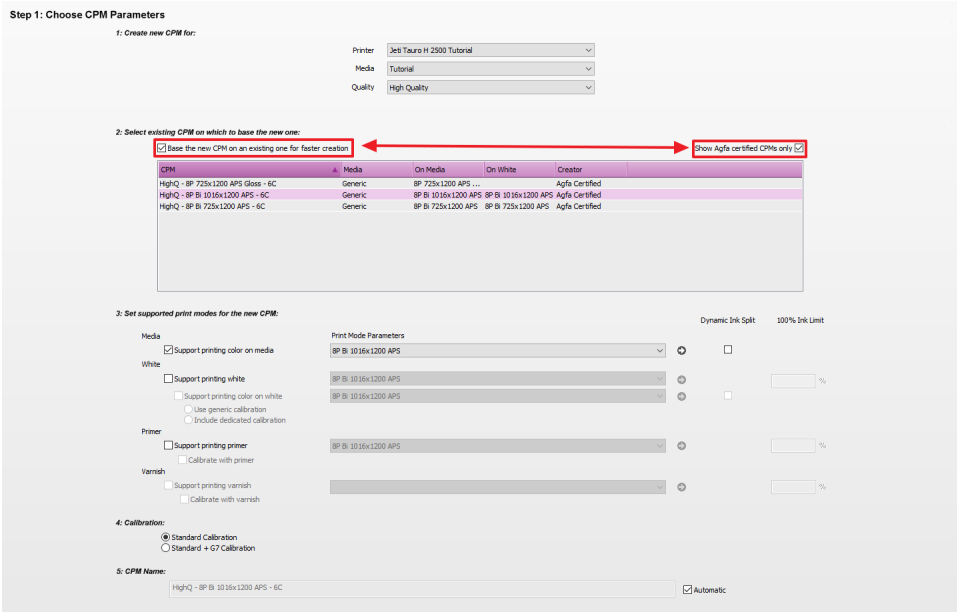
1. In the jobs overview, context-click on the digital press. Open the Media Hub.
2. Select File > New Media, give the new media a recognizable name (e.g. Tutorial)
3. Select File > New Calibrated Print Mode.





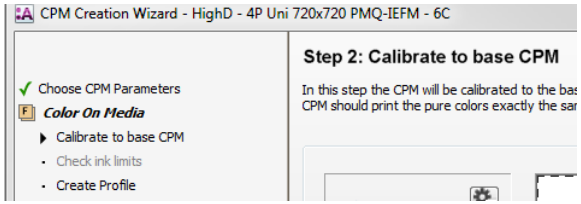
Step 1 - CPM setup and configuration

4. Step 1 – Choose CPM Parameters or Link the Parameters
   - Select your Printer.
   - Select the new media that you created in step 2.
   - Select the Quality e.g., High Quality.
5. By default, only the Agfa-certified CPM's will be displayed (Show Agfa-certified CPMs only).
6. Enable "Base the new CPM on an existing one for faster creation".
7. Select a base CPM (e.g. HighQ – 8P Bi 1016x1200 APS – 6C).
8. Enable "Support printing color on media" to support direct printing of color on the media substrate (without pre-white). Activate (if not) the "Standard Calibration" (no G7). Click "Next" to proceed.



The number of possibilities (media, white, primer, varnish …) depends on the capabilities of the base CPM. It is for example not possible to derive an on-white CPM when there is no white information available in the base CPM.

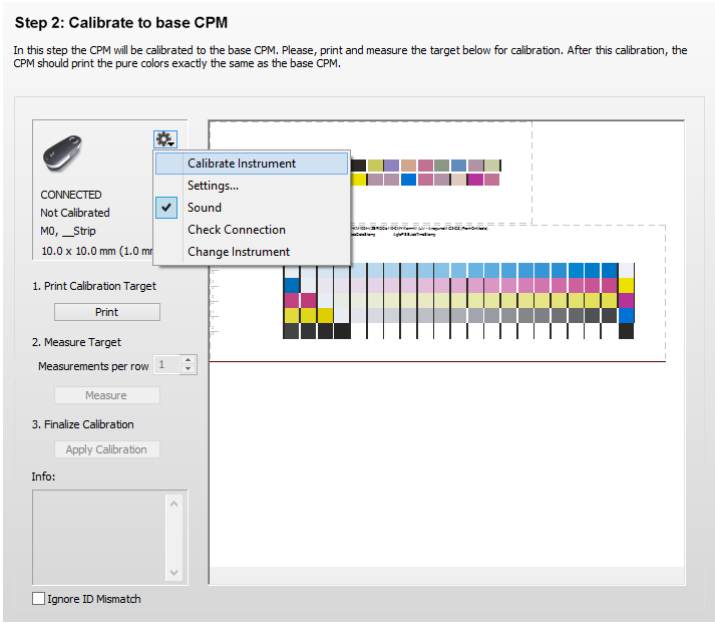
9. On the left pane, an overview is given of the different steps that need to be done to complete the CPM. A green ✓ indicates that the step is finished.



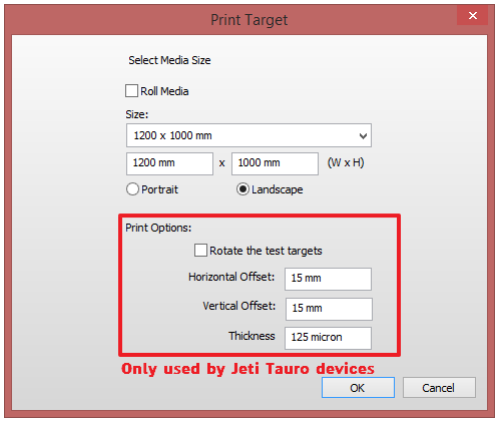
Step 2 – Calibrate to base CPM.

10. Select “Change Instrument” from the cogwheel when “NO INSTRUMENT SELECTED” is shown in the instrument pane. Select your measuring device e.g., i1 Pro 2.

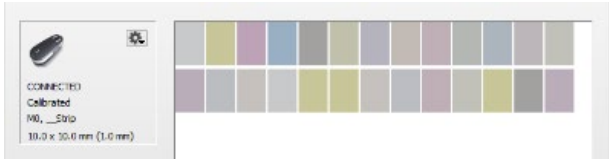
See the measurement device annex for additional info (or when your device is not listed).



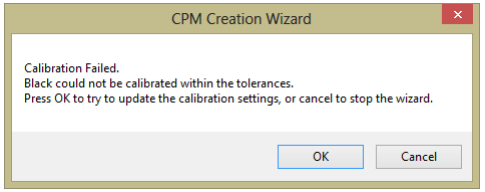
11. Select Calibrate Instrument from the cogwheel (i1).
12. Click “Print”. The print target window will be displayed. The output size can be changed (this will rearrange the targets automatically). The print options with offset and media thickness are only useful for Jeti Tauro devices. The wedge (ID strip and Calibration target) is automatically processed by Asanti and dispatched to the press after clicking “OK”.



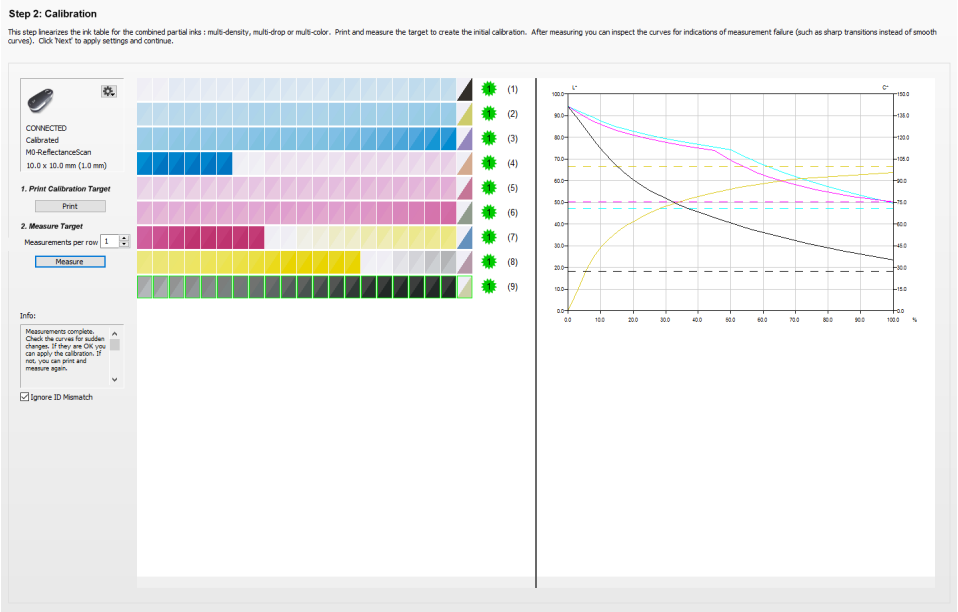
13. Change the number of measurements per row to 1.
14. Click “Measure” and measure the ID strip.
15. Afterward, measure the Calibration target. Each successfully measured row will receive a green state when completed (measure the row again when the red state stays visible) … Measurements can be reset, deleted, or exported by context clicking on the wedges.



It might happen that a warning “Calibration Failed” is posted. This means that the reference values for calibration from the base CPM cannot be reached with the new media type. Click “OK” to replace the reference calibration values with the actual measured values.

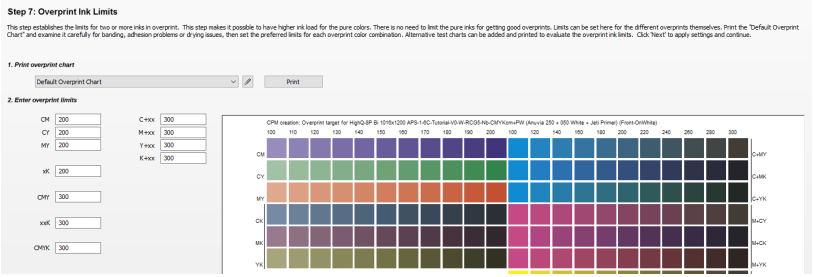


16. Once all measurements are done a graph with the actual tonal behavior is generated (the dashed lines are the reference end values from the base CPM). Click “Next” to accept and proceed to the next step.



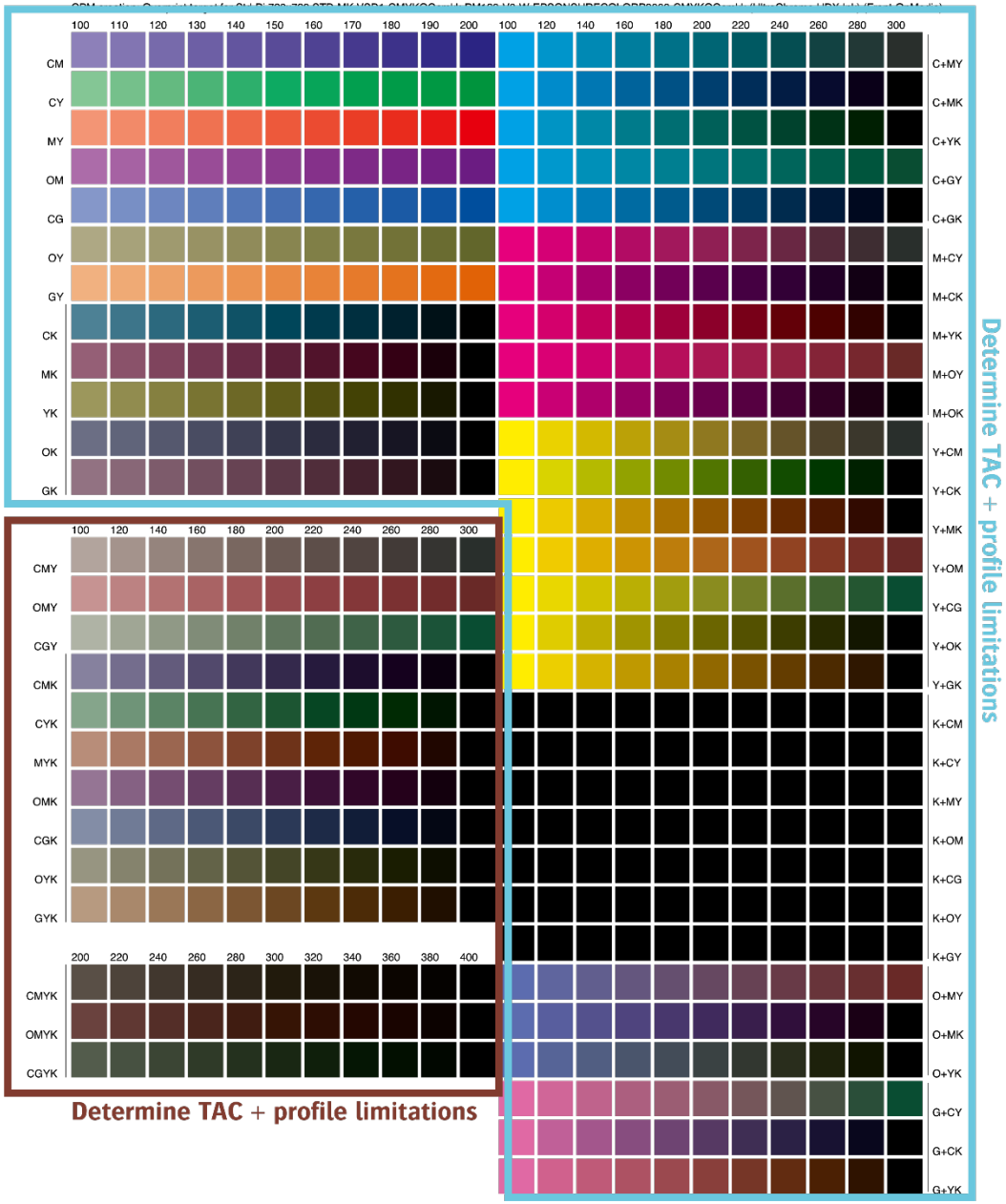
Step 3 – Overprint Ink Limits.

17. From the Print overprint chart drop-down menu, select the Default Overprint Chart and click print. The target is dynamically created based on the used ink set (additional orange, green, blue …).

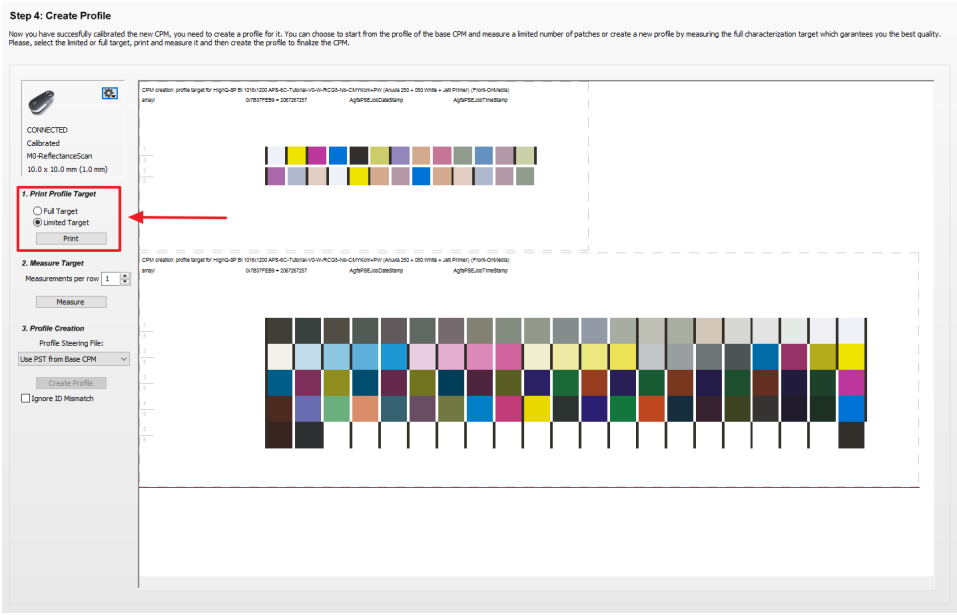


18. Overprint target: the overprint target contains a series of wedges here gradually ink is increased. Judging this printed chart is a matter of finding the right limitation to avoid print problems. Eventually use a sclerometer or something else to test the durability against scratches. Choose for each wedge the best level (higher level = banding, drying issues, scratches …) and update the overprint limits. Click next once finished.

The limitations set on this target are "virtual" which means that they do not have any influence in the previous set limitations on the pure ink. They are taken into account when creating the profile in the next step. A TAC is determined to select a good profiling target.

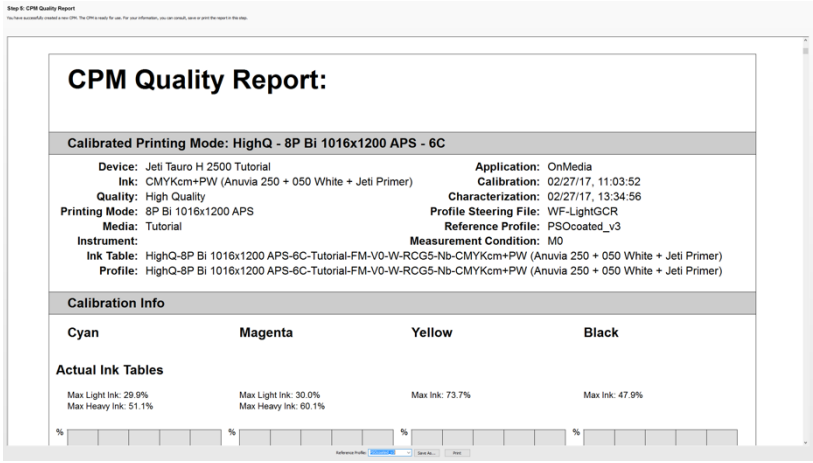


Step 4 – Create Profile

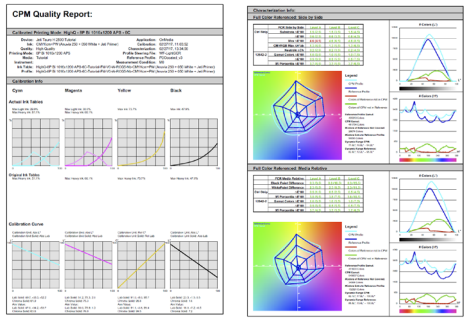


19. A profile can be created based on a full target or a limited target. The full target will create a completely new profile for this CPM.
    A limited target will intelligently combine the measured results of a small target with the profile of the base CPM. The new profile will then be created while combining these measurements with the base CPM profile.
20. Select “Limited Target” and click Print. Do not make any changes in the Print Target dialog and click “OK”.
21. Print the target. Notice that the limited target uses a significant amount of neutral grey patches. The grey balance will be used to match the base profile with the new media.
22. Click “Measure” to start measuring the ID strip and the Profile target.
23. Click “Create Profile” when all rows have been successfully measured.
24. Click “Next” to proceed to the final step.

Step 5 – CPM Quality Report.

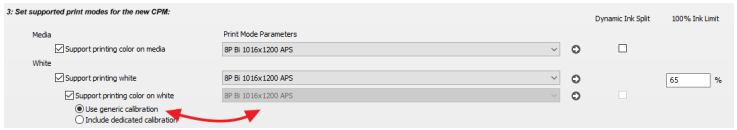


25. The CPM Quality report offers a detailed overview of how the newly made CPM will score. Page 1 is about calibration details such as ink usage while page 2 focuses on how the colors score against a reference profile.



26. Click “Finish” to complete the CPM.

2. Creating a derived CPM with dedicated white calibration



The Media Hub offers the option to add a “print on white” calibration. This can be a shared calibration (the generic calibration) or a dedicated calibration. In the case of a shared calibration, the “on white” from the generic CPM is used. The calibration for “on white” can normally be used for any media, because the white ink layer has the same color on all media, and will normally also result in the same color gamut. Using shared calibrations for on white is simple: just enable “Use generic calibration”. This means that only the Generic on-white calibration set needs to be calibrated/profiled once and be shared with all derived CPMs with this option active.

A dedicated calibration just adds 3 additional steps to the CPM generation wizard:

- Calibration for on white
- Ink limits for white
- Profiling for on white

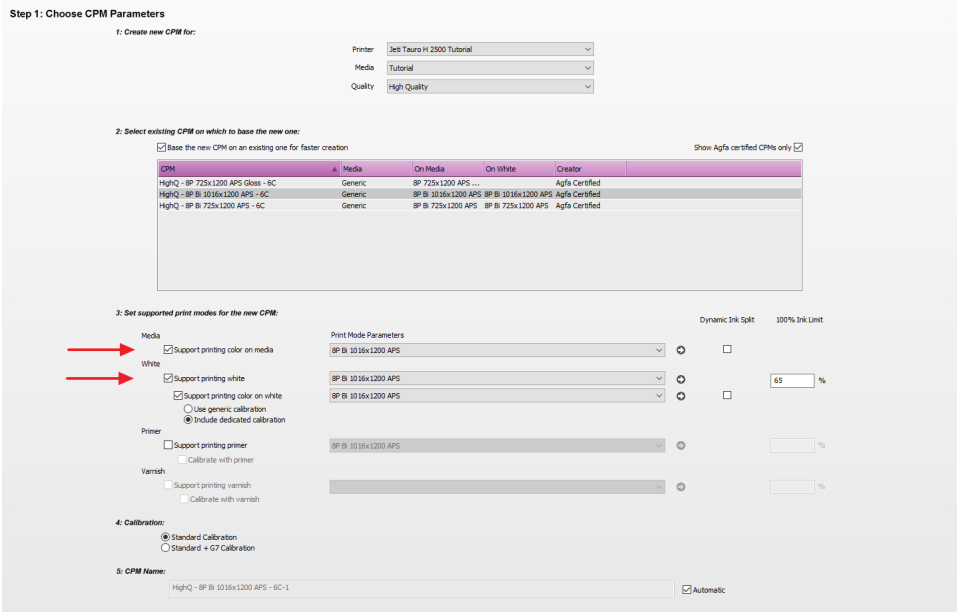
This exercise will learn how to add a dedicated white calibration to a derived CPM. For instructions to generate the “on media” calibration follow the steps described in exercise 1.

Keep in mind that white calibration (shared and dedicated) is only available when the base CPM contains a dedicated on white calibration, and when the ink set of the printer contains white ink.

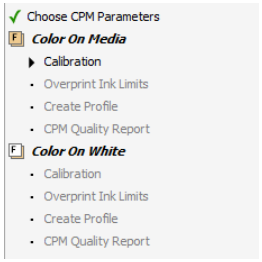
1. In the jobs overview, context-click on the digital press. Open the Media Hub.
2. Select File > New Calibrated Print Mode.

Step 1 – CPM setup and configuration

3. Step 1 – Choose CPM Parameters or Link the Parameters
   - Select your Printer.
   - Select the Media for which you want to make a CPM.
   - Select the Quality E.g. High Quality.
4. By default, only the Agfa-certified CPM's will be displayed.
5. Enable "Support printing color on media" to support direct printing of color on the media substrate. Also, enable "Support printing color on white" and select "Include dedicated calibration". Click "Next" to proceed.

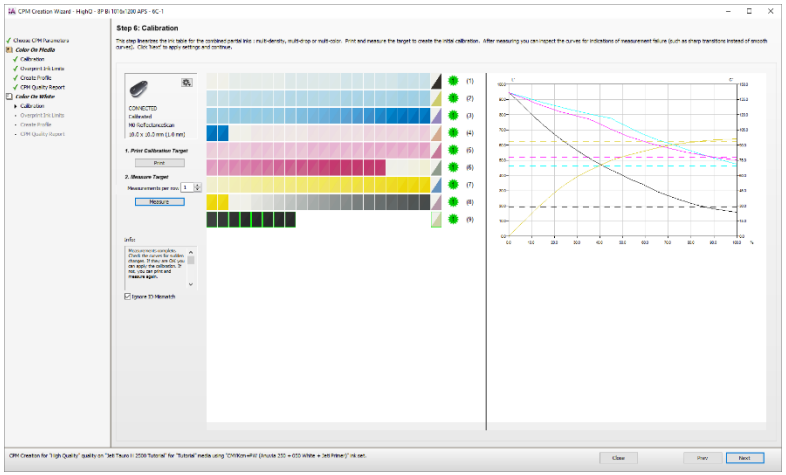


6. Notice the extra steps which are added to the wizard for color on white.
7. Follow Step 3 of the Creating a derived CPM exercise.
8. A second cycle will start when the calibration, ink limitation, and profile are set for the "on media" calibration. The same actions will need to be taken for the dedicated "on white" calibration.



Step 6 – Calibrate to Base CPM

9. The calibration wedge is automatically generated with a white layer.
   The CPM wedges need to be printed pre-white. Not all engines pick this up automatically (Anapurna/Jeti Titan/Jeti Mira). Configure your engine accordingly.
10. Click Print and Click "OK" in the "Print Target" dialog.
    Eventually, change media size and positioning if necessary (see the previous lesson).



Automatically white will be added to all targets (pre-white). The digital press should be configured (if necessary) in such a way that it will print white first followed by color.

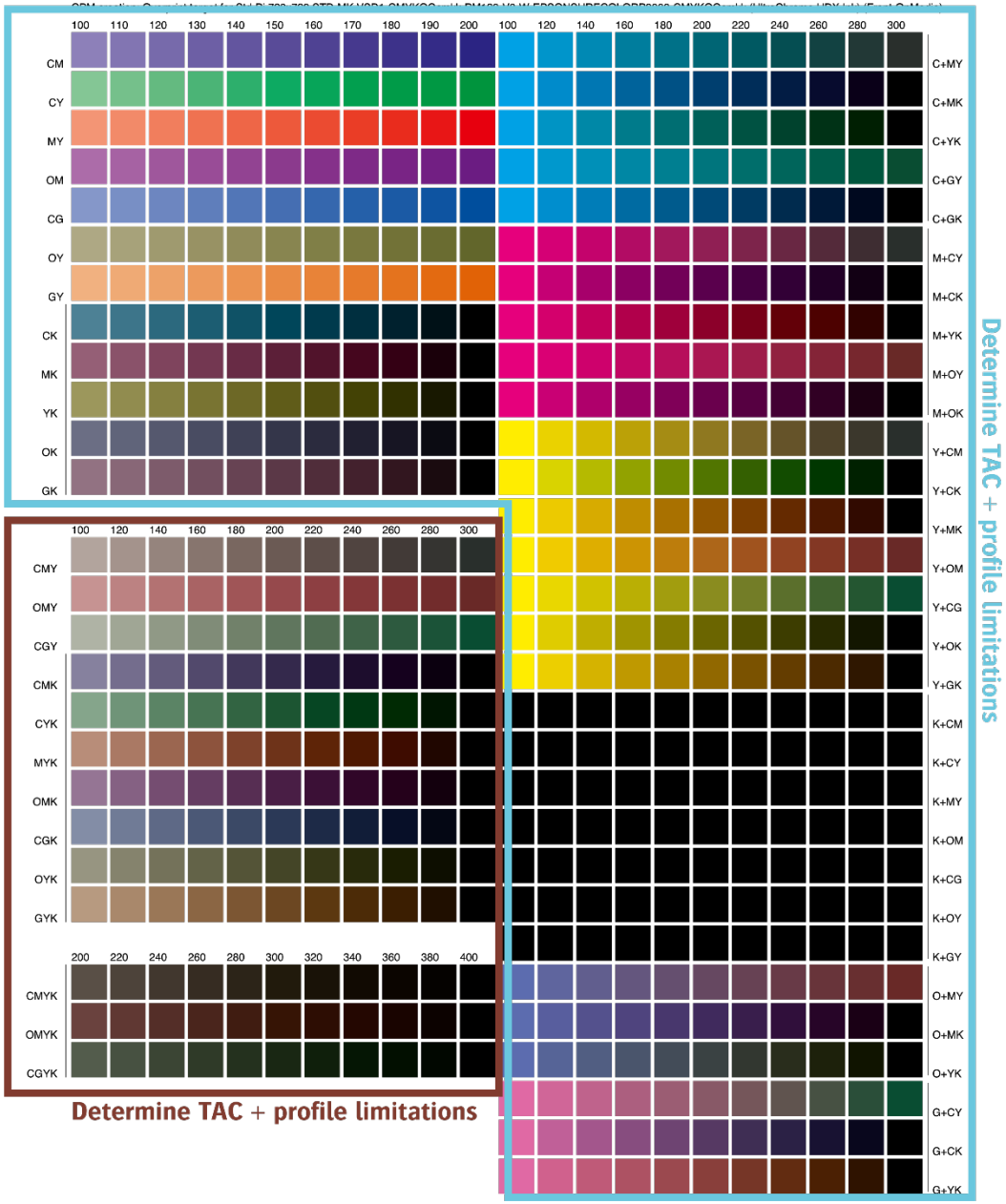
11. Click "Measure" to start measuring the ID strip.
12. Afterward, measure the Calibration target. Each successfully measured row will receive a green state when completed (measure the row again when the red state stays visible) … Measurements can be reset, deleted, or exported by context clicking on the wedges.
13. Click "Apply Calibration" to proceed and click "Next".

Step 7 – Overprint Ink Limits

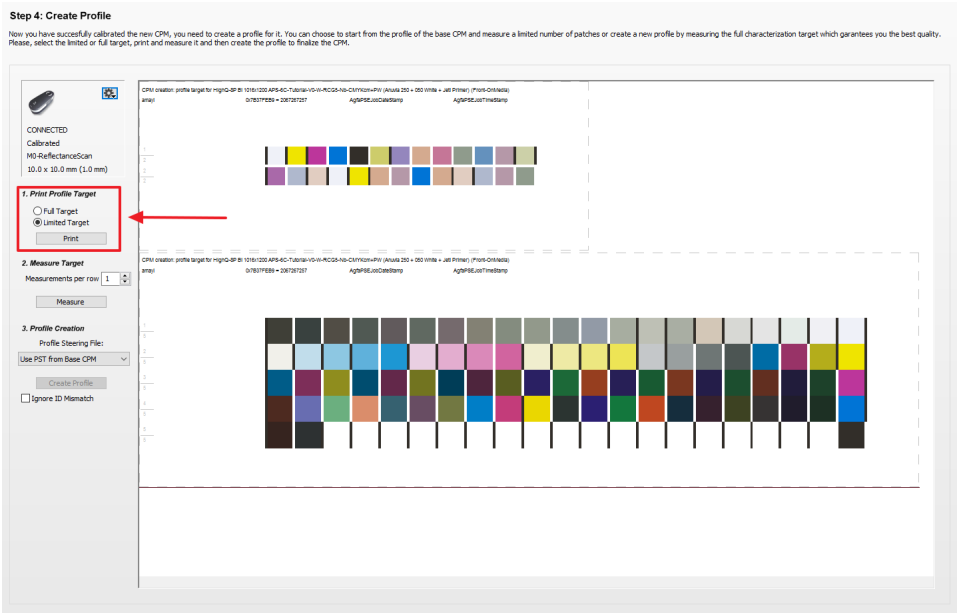
14. From the Print overprint, chart drop-down menu, select the Default Overprint Chart and click print. The target is dynamically created based on the used ink set.

15. Overprint target: the overprint target contains a series of wedges here gradually ink is increased. Judging this printed chart is a matter of finding the right limitation to avoid print problems. Eventually use a sclerometer or something else to test the durability against scratches. Choose for each wedge the best level (higher level = banding, drying issues, scratches …) and update the overprint limits. Click next once finished.

The limitations set on this target are "virtual" which means that they do not have any influence in the previous set limitations on the pure ink. They are considered when creating the profile in the next step. A TAC is determined to select a good profiling target.



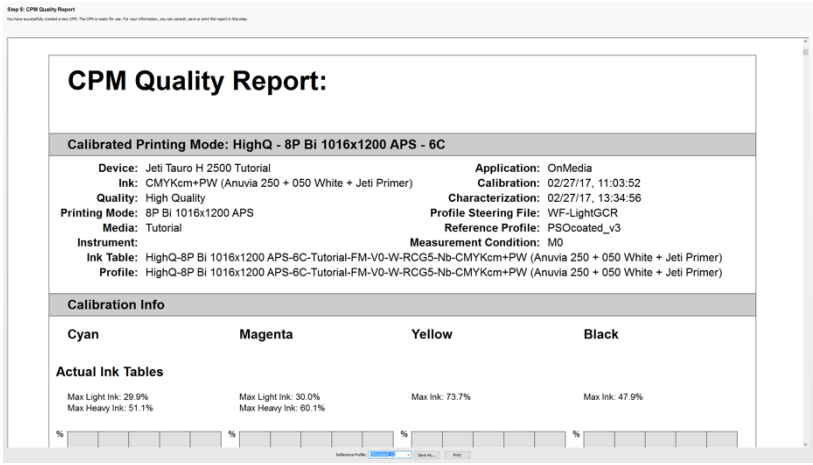
Step 8 – Create Profile.

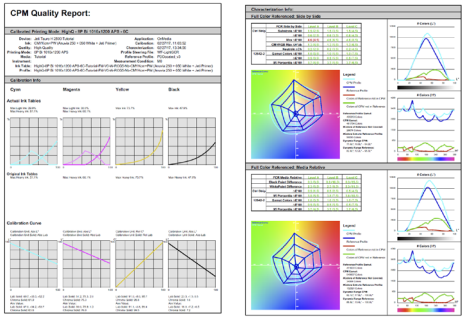


16. A profile can be created based on a full target or a limited target. The full target will create a completely new profile for this CPM. A limited target will intelligently combine the measured results of a small target with the profile of the base CPM. The new profile will then be created while combining these measurements with the base CPM profile.
17. Select “Limited Target” and click Print. Do not make any changes in the Print Target dialog and click “OK”.
18. Print the target. Notice that the limited target uses a significant amount of neutral grey patches. The grey balance will be used to match the base profile with the new media.
19. Click “Measure” to start measuring the ID strip and the Profile target.
20. Click “Create Profile” when all rows have been successfully measured.
21. Click “Next” to proceed to the final step.

Step 9 – CPM Quality Report.

22. The CPM Quality report offers a detailed overview of how the newly made CPM will score. Page 1 is about calibration details such as ink usage while page 2 focuses on how the colors score against a reference profile.





23. Click “Finish” to complete the CPM.

3. CPM with additional varnish

Varnish application allows to “enhance” prints to give the print a more luxurious look. The varnish can cover the complete surface or only a part of the print (spot varnish). Applying a varnish layer will result in a different color behavior.

The selection of CPM needs to be decided per job. Spot varnish will not need a dedicated varnish CPM while completely covered varnish print may need a dedicated varnish CPM.

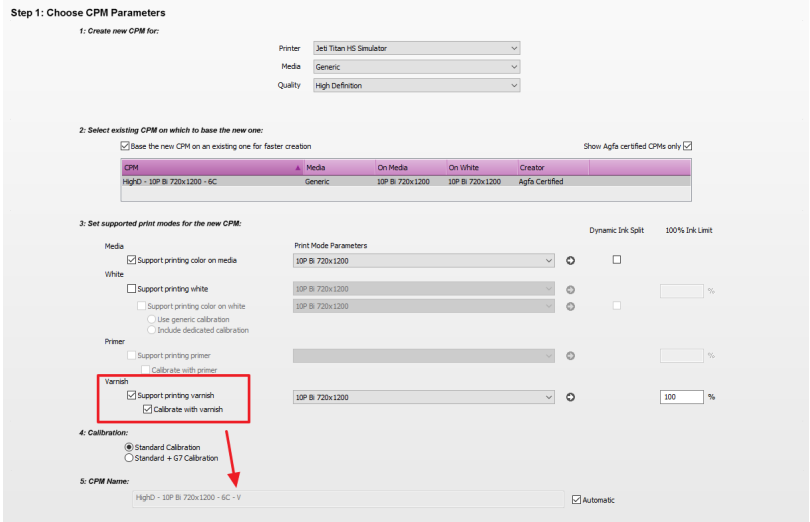
Creating a CPM with varnish capabilities is very like regular CPM creation. The only difference: varnish needs to be enabled and a varnish ink limits target needs to be printed to set the ink limitation. Of course, varnish needs to be present in the active ink set (see configuration wizard from the help menu).

Step 1 – CPM setup and configuration

1. Initiate a new CPM by selecting the following parameters.
   - Select your Printer.
   - Select the Media for which you want to make a CPM.
   - Select the Quality E.g. High Quality.
2. By default, only the Agfa-certified CPM’s will be displayed.
3. Select a suitable base CPM.

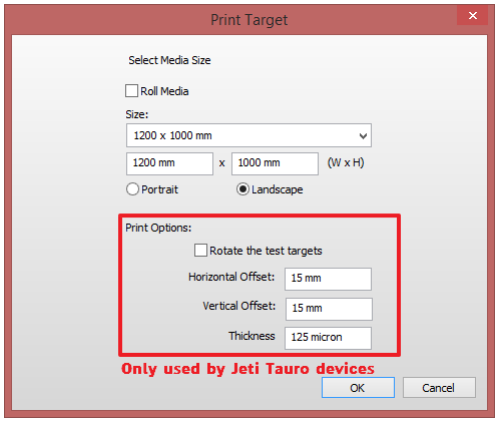
The base CPM does not need to have varnish. The varnish color behavior will be integrated into the derived CPM during calibration and profiling of the new CPM.

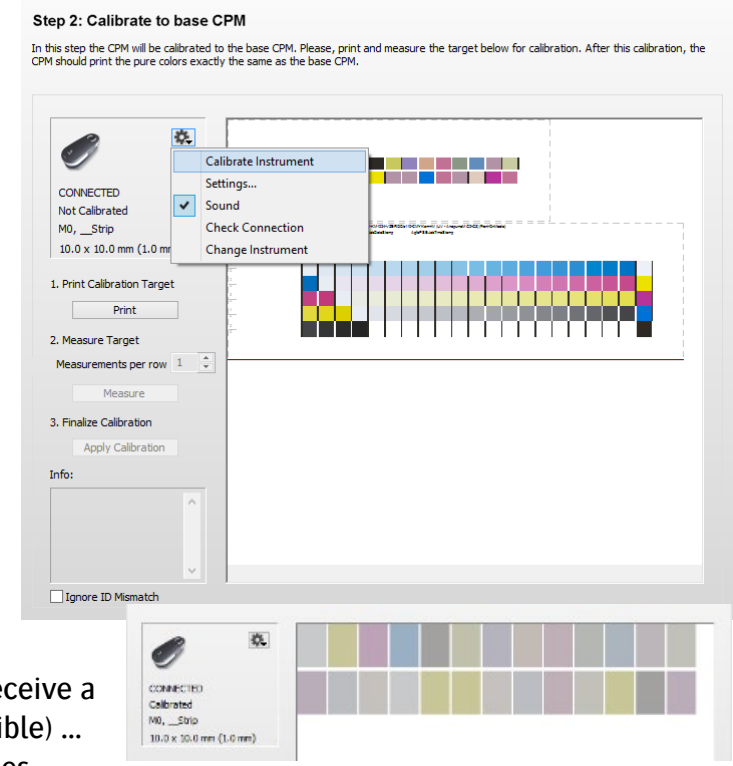
4. Enable ″Support printing color on media″ to support direct printing of color on the media substrate. Also, enable “Support printing varnish” and select “Calibrate with varnish”. The CPM name will receive a “- V” suffix when enabled. The name can still be changed but it is advised to keep the “- V” suffix to distinguish varnish and non-varnish CPM’s during job throughput. Click “Next” to proceed.



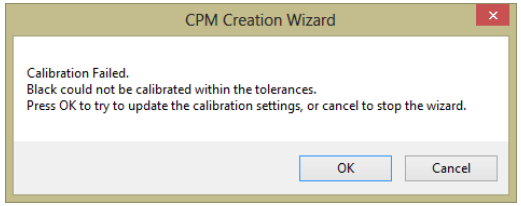
Step 2 – Calibrate to base CPM.

5. Select “Change Instrument” from the cogwheel when “NO INSTRUMENT SELECTED” is shown in the instrument pane. Select your measuring device e.g. I1 Pro 2.
6. Select Calibrate Instrument from the cogwheel (I1).
7. Click “Print”. The print target window will be displayed. The output size can be changed (this will rearrange the targets automatically). The print options with offset and media thickness are only useful for Jeti Titan devices. The wedge (ID strip and Calibration target) is automatically processed by Asanti and dispatched to the press after clicking “OK”.
8. Change the number of measurements per row to 1.
9. Click “Measure” and measure the ID strip.
10. Afterward, measure the Calibration target. Each successfully measured row will receive a green state when completed (measure the row again when the red state stays visible) … Measurements can be reset, deleted, or exported by context clicking on the wedges.

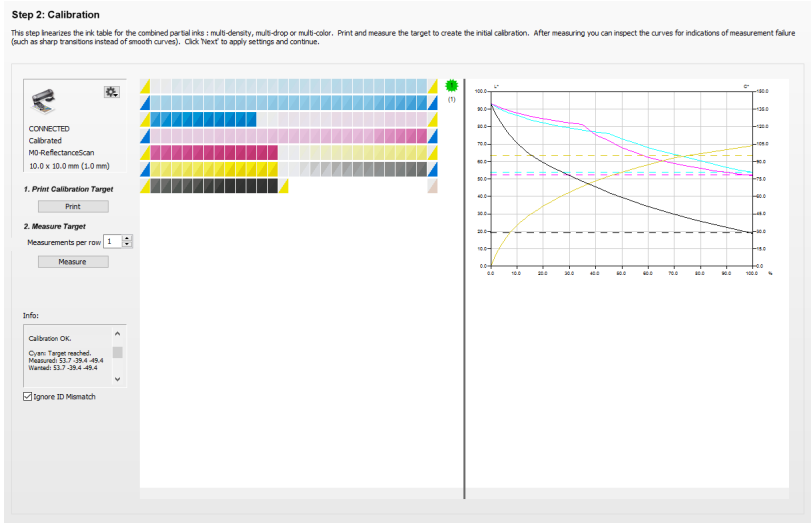




In the case of varnish, there is a big chance a warning “Calibration Failed” is posted. This means that the reference values for calibration from the base CPM cannot be reached with the new media type (and influenced by the varnish layer. Click “OK” to replace the reference calibration values with the actual measured values.

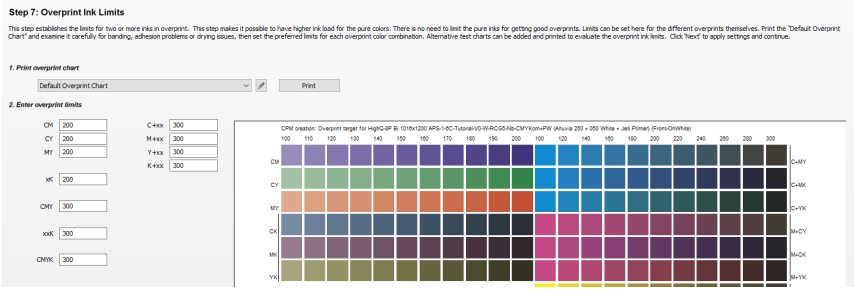


11. Once all measurements are done a graph with the actual tonal behavior is generated (the dashed lines are the reference end values from the base CPM). Click “Next” to accept and proceed to the next step.
12. Print the target, measure the wedge, and apply the calibration. Click “Next” to proceed.



Step 3 – Overprint Ink Limits.

13. From the Print overprint chart drop-down menu, select the Default Overprint Chart and click print. The target is dynamically created based on the used ink set (additional orange, green, blue …).



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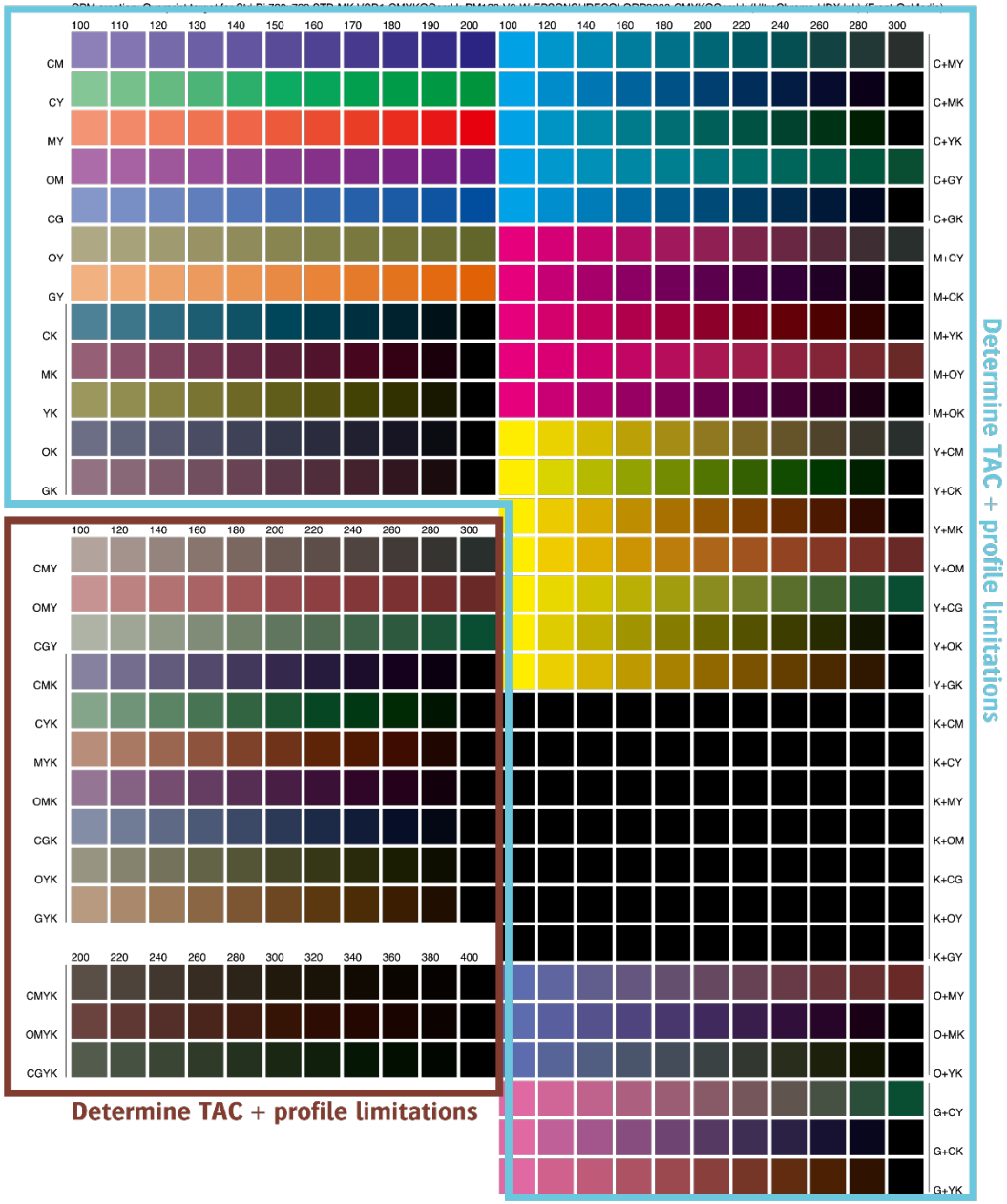
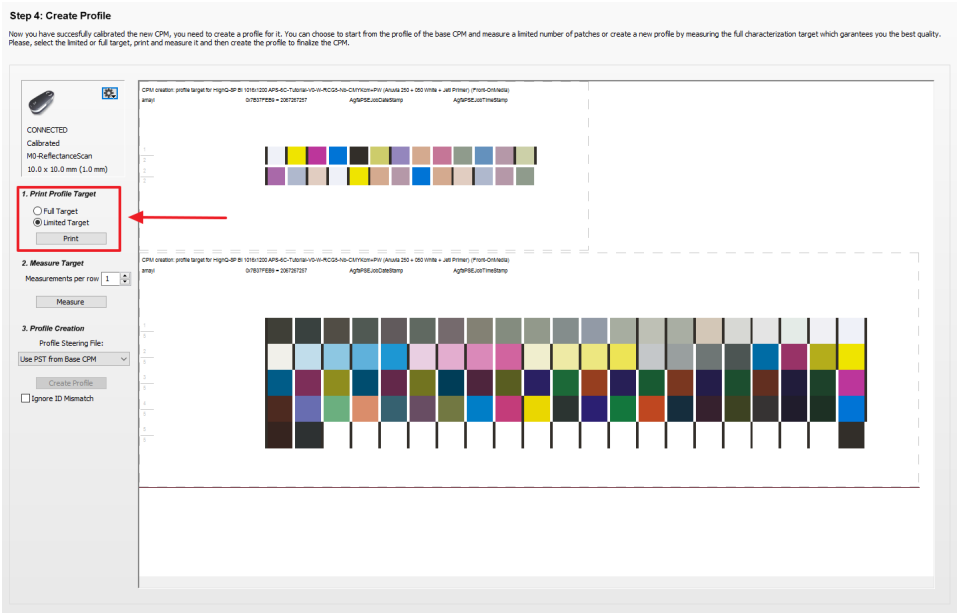


Step 4 – Create Profile



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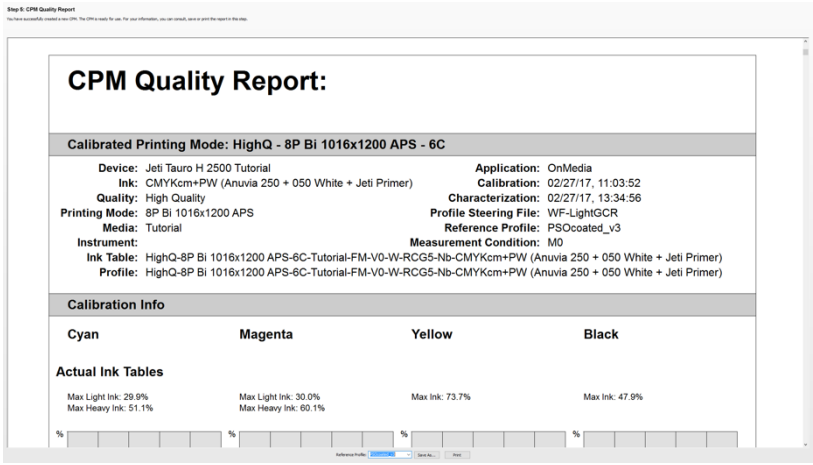
Step 5 – CPM Quality Report.



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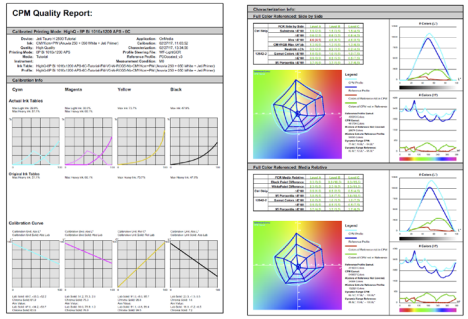


22. Click “Finish” to complete the CPM.

4. Creating a derived CPM with a different measurement condition

To make substrates look “whiter” manufacturers add Optical Brighteners Agents (OBA). These agents reflect portions of the UV range into the visible light (fluorescence effect). This influences the quality of the measurement which may cause unwanted color casts. Using a measurement device with a UV cut filter may fix certain casts but in general, the results aren’t satisfactory. The filters are not standardized and are more a “rough” way to compensate for the unwanted fluorescence effects. To cope with this matter an international agree standard is released: ISO1655.

ISO1655: Spectral measurement and colorimetric computation for graphic arts images

The ISO1655 standard standardizes how color measurements need to be done. To standardize certain combinations (UV or polarization filters) measurement conditions are been introduced. This standardization allows exchanging data from different devices easily. If they use the same measurement condition the results will be the same. This was not the case in the past.

Measurement condition m0: the legacy

The current measurement condition: no adaptation or unknown. The measurement mode doesn’t change anything to the spectral data. The m0 is the most commonly used practice today (all Apogee-supported measurement devices).

Should be used for substrates without any OBA.

Measurement Condition m1: the one fits for all

The m1 measurement condition is defined to reduce differences in measurements between devices as well as to compensate for the fluorescence effects (substrates or even inks). It is the advised way of measuring if possible. Take care, m1 measurements typically require a double measurement! 2 illuminants need to be used; the spectrophotometers which support m1 automatically calculate the correct spectral data from the different measurements.

Measurement Condition m2: UV cut filter

Measurements with the m2 factor simulate measurements with a UV-cut filter. These measurements are different from measurements with a physical filter since they use a standardized theoretical UV filter which influences the complete spectral range.

Measurement Condition m3: polarization filter.

Measurements with the m3 have a physical polarisation filter build in and are used when measuring glossy surfaces to compensate for reflection errors.

Asanti and Calibrated Printing Modes

Measurement conditions do influence color reproduction. The same measurement condition must be used during each step of the CPM creation process.

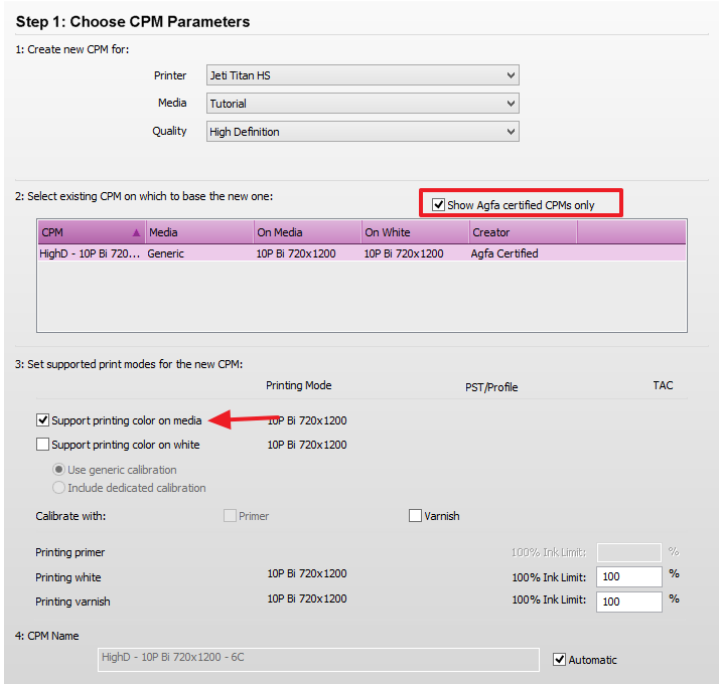
Measurement conditions need to be supported by the measurement device. At this moment only the I1 Pro 2 and the I1 iO 2 are capable to use measurement conditions. Older devices can still be used but only the m0 measurement condition will be used.
The m1 measurement conditions should be if available.

Creating a derived CPM with M1 measurement condition

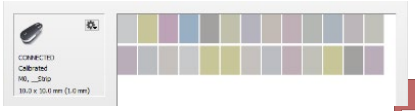
The process of creating a derived CPM is almost identical. The wizard contains the same number of steps but will act slightly differently. Especially when the measurement condition from the base CPM is different from the derived one. This lesson will learn how to change measurement conditions and what to do when there is a mismatch in condition between the base and derived CPM.

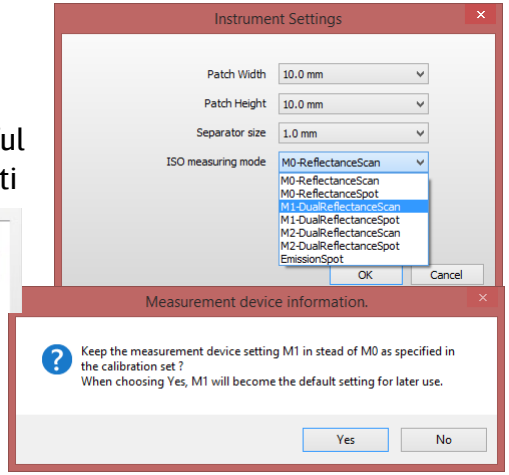
All new Agfa Certified CPMs (Generic) are made with the M1 measurement mode.

1. In the jobs overview, context-click on the digital press. Open the Media Hub.
2. Select File > New Calibrated Print Mode.
3. Step 1 – Choose CPM Parameters or Link the Parameters
   - Select your Printer.
   - Select the Media for which you want to make a CPM.
   - Select the Quality e.g. High Definition.
4. By default, only the Agfa-certified CPM's will be displayed.
5. Enable "Support printing color on media" to support direct printing of color on the media substrate (without pre-white). Click "Next" to proceed.
6. Step 2 – Calibrate to base CPM.
   Select "Change Instrument" from the cogwheel when "NO INSTRUMENT SELECTED" is shown in the instrument pane, Select your measuring device e.g. i1 Pro 2.
7. Select Calibrate Instrument from the cogwheel.



8. In the same cogwheel drop-down list click Settings… In the ISO measuring mode select the M1-DualReflectanceScan mode and click OK to confirm.
9. Now click Print. The print target window will be displayed. The output size can be changed (this will rearrange the targets automatically). The print options with offset and media thickness are only useful for Jeti Titan devices. The wedge (ID strip and Calibration target) is automatically processed by Asanti and dispatched to the press after clicking OK.
10. Click "Measure" to start measuring the ID strip.
11. A warning will be posted when there is a mismatch between the measurement condition of the base CPM and the newly derived CPM.
    Click "Yes" to update the default measurement condition of the new CPM. Afterward, measure the Calibration target. Each successfully measured row will receive a green state when completed (measure the row again when the red state stays visible)…





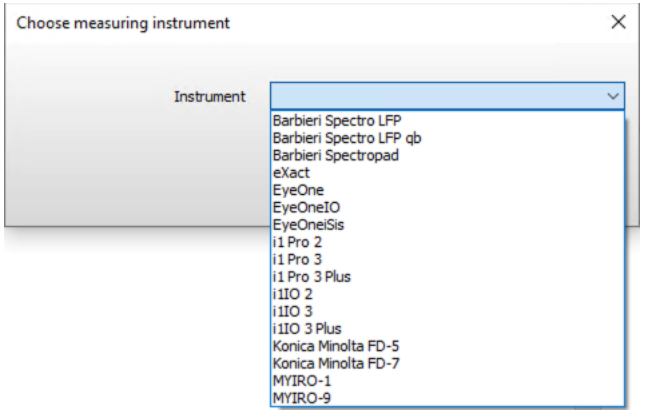
The M1 measurement condition needs 2 measurements per patch/row. Two light sources are used during this cycle: a "conventional" one and one with a significant amount of UV. This allows the calculation of the influence of the OBA.
*The **i1 iO 2/3** measures automatically but proper positioning needs to be cared for. Targets that need to be measured m1 need to be positioned as right as possible against the black line of the IO table (beyond this line no measurements are possible). The positioning itself needs to be properly in the center of the patches. Each row is measured twice but the head will lightly move between 2 measurements.*
*The **i1 Pro 2/3 handheld** needs to be measured from left to right (right indicator will light blue) and a second time from right to left (left indicator will light blue). Only after this 2nd measurement, you may proceed to the next line.*

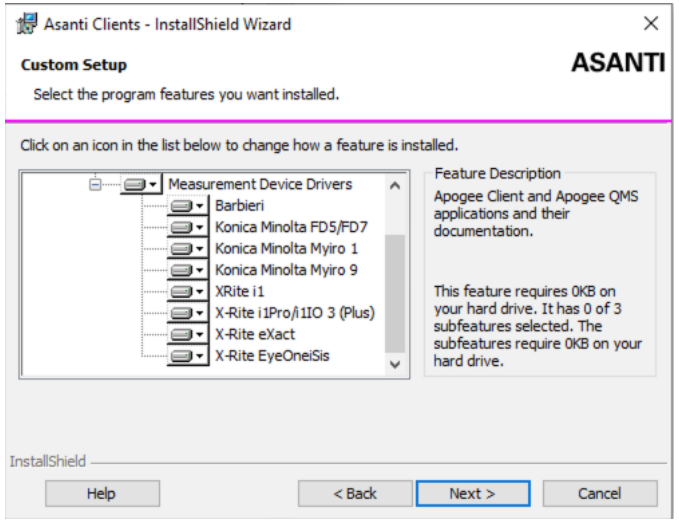
12. Click "Apply Calibration" to proceed and click "Next".
13. Step 3 - setting the ink limits.
    see step 3 of exercise 1
14. Step 4 – Create Profile
    see step-4 of exercise 1 to finalize the CPM.

Pay attention: depending on the preferences of the client (earlier measurements) the measurement condition may be not in sync with the calibration. The client will post a warning to change the condition if this isn't the case.

Annex: Measurement devices

	Measurement conditions
Barbieri Spectro LFP	M0
Barbieri Spectro LFP qb (NEW)	M0, M1, M2, M3
Barbieri SpectroPad	M0, M1, M2
X-Rite i1 (UV cut)	M0 (M2)
X-Rite i1 Pro II	M0, M1, M2
X-Rite i1 IO Pro (UV cut)	M0 (M2)
X-Rite i1 IO Pro II	M0, M1, M2
X-Rite i1 Pro III (NEW)	M0, M1, M2, M3
X-Rite i1 Pro III Plus (NEW)	M0, M1, M2, M3
X-Rite i1 IO Pro III (NEW)	M0, M1, M2, M3
X-Rite i1 IO Pro III Plus (NEW)	M0, M1, M2, M3
X-Rite i1 iSis Pro	M0, M2
X-Rite i1 iSis Pro II	M0, M1, M2
X-Rite eXact scan	M0, M1, M2
Konica Minolta FD-5	M0, M1, M2
Konica Minolta FD-7/FD-5BT*	M0, M1, M2
Konica Minolta FD-9 (old model of Myiro 9)	M0, M1, M2
Konica Minolta Myiro 1 (NEW)	M0, M1, M2
Konica Minolta Myiro 9 (NEW)	M0, M1, M2





Run the client installer (custom setup) again when your measurement device is not available in the list.

I1 Product family

There is a dedicated driver per generation (new since Asanti v5). It is key to match the right driver with your measurement device.

Device	Look	Driver Media Hub
I1 first generation (before 2010)	Grey hard plastic	EyeOne (iO)
I1 Pro II (2010)	Black rubberish plastic	I1 (iO) 2
I1 Pro III (2019 and later)	Black hard plastic	I1 (iO) 3
I1 Pro III Plus (2019 and later)	Black hard plastic with h large aperture	I1 (iO) 3 Plus