G7 System Certification Application Data Sheet

PRISMAsync Color Print Server for
Canon imagePRESS digital color presses

The Idealliance Print Properties Working Group has established a certification process for G7 Systems. In accordance with this process The G7 System Certification Program is designed to evaluate the ability of a candidate system to calibrate a printing device to meet the G7 greyscale definition using four 1-D Curves within the tolerances outlined in this document. All evaluations are based on the parameters of the G7 Specification (draft 2008). The following information is intended to assist producers and consumers in the use of the vendor system as specified for creating the four 1-D Curves.

Manufacturer

Océ-Technologies B.V.,
a Canon Company

Product

PRISMAsync Color Print Server for Canon imagePRESS digital color presses

Due to the system's closed structure, G7 System certification was obtained by a method that cannot be reproduced directly by users, but similar results should be obtained through the use of the G7 Media Family Calibration from the Local User Interface (LUI) on the PRISMAsync Color Print Server for Canon imagePRESS digital color presses.

Calibration Procedures:

Printing the Test Target(s)

Prior to printing media family calibration targets, the operator should perform Autogradation and Shading Corrections. The Autogradation routine is initiated at the LUI. Each family of imagePRESS digital color presses has a calibration wizard with the proper routine established. Consult the LUI and user manual for the specific imagePRESS device for details. Upon completion of Autogradation and Shading Correction, a G7 media family calibration should be undertaken.

Initiation of media family calibration is at the LUI by the operator. Twelve (12) pages are printed. The first four (4) sheets consist of solid block halftone objects in CMYK. These should be visually inspected for print artifact or defect. Any defect should be addressed prior to attempting calibration.

Measuring the Target(s)

Using an i1 V2 hand held spectrophotometer (supplied with the Color Print Server) measurement of each of the eight (8) target pages should be completed. Visual feedback is given via the LED on the i1 V2 (green indicates a complete measurement, red indicates an incomplete measurement). If the operator believes a row was miss-read, it can be re-measured, in sequence, without re-starting the calibration procedure. Care should be taken to ensure that 5-10 sheets of white paper are placed between the target sheets and any surface to ensure proper measurement data is gathered.

Loading Measurement Files into PRISMAsync

At the completion of the measurement process, the operator touches the *"Next"* button on the LUI. The Color Print Server performs all calculations and installs the calibration curve directly into the proper location. An ICC profile for the media family is created and assigned at the same time. If desired, the operator can use either this profile or elect another through the use of the *Settings Editor Session > Media Families Menu > "Media Family Name" > Edit function.*

Adjusting Parameters

There are no parameters for the operator to adjust in the calibration routine. It is highly recommended that the operator ensure optimal imaging of the calibration media through the use of the media optimization tools. Media optimization is accessible either from the LUI or remotely through a settings editor session. Further details on media optimization are available in the user manual.

Applying Parameters to the Printing System

All parameters are applied to the printing system through the optimization of a media.

Verification by Physical Print Testing:

Printing a "Verification" Target

Verification of conformance for Greyscale tolerance requires the use of 3rd party software. Target printing where calibration is active and color management is inactive is accomplished through the use of an automated workflow. Creating an automated workflow is accomplished via the HTML based web user interface "*Settings Editor"*. The automated workflow set up is located in the *Settings Editor > Workflow tab > Automated Workflows menu*. Workflows can be named as desired by the operator for clarity. An automated workflow which has elected the use of "external profiling" in the color target printing area disables color management and leaves both calibration curves and editorial curves active. The operator should then expose the target that conforms with their 3rd party software through this established workflow either via PRISMAsync Remote Manager, through affiliation with a hot folder or through printing to the associated queue. Care should be taken that this workflow is not used for the production of daily work as undesirable results may occur. For more information regarding settings editor and automated workflow, please refer to the user manual.

Measuring the Verification Target

Measurement and verification should follow either the ADS or the respective manufacturer's operation guide for the 3rd party software elected.

Analyzing Results:

PRISMAsync Tolerances

Using the 2010 G7 System Certification sample test files and the Analysis Instructions (see above) or the Idealliance Validation Process (see below), PRISMAsync Color Print Server for Canon imagePRESS digital color presses will achieve tolerances equal to or lower than the following.

Metric	Average	Maximum
ΔCh (CMY only)	≤0.6	≤1.5
ΔL* (CMY only)	≤0.25	≤0.75
ΔL* (K only)	≤0.5	≤1.5

Table 1: PRISMAsync tolerances for 2010 sample test files

Note: Because the current G7 System Certification method uses a simulation process that eliminates print-to-print variation, and because the sample data provided by Idealliance for G7 System Certification is highly uniform, PRISMAsync can produce extremely low delta errors with those specific data files. Higher errors should be expected when calibrating live printing devices, depending on the characteristics and variability of each printing system.

Idealliance Validation Process:

To validate that the G7 calibration process has been successful, a target consisting of two gray scales having the CMYK patch values listed in Appendix A: shall be printed through the calculated correction curves using the same print settings in use when the calibration was calculated.

Validating NPDC (CMY and K scales)

To validate NPDC correction, both the K-only scale and the CMY-only scale shall be measured with a densitometer or spectrophotometer and the relative neutral density (ND) values (measured in the "K" or "Visual" channel) shall be recorded for each patch. To obtain relative ND values, either the measuring device shall be zeroed on the substrate, or the white patch neutral density value shall be subtracted from itself and all other patches. The (relative) ND values shall be converted to (relative) L* by the standard CIE formula in Appendix B:
The Delta L* (ΔL*) error shall be computed for each patch compared to target values on file with Idealliance by the formula in Appendix B:
The average and maximum ΔL* must not exceed the Idealliance Tolerance values in Table 2, below.

Validating Gray Balance (CMY scale only)

To validate gray balance correction, the CMY-only scale shall be measured with a spectrophotometer and the a* and b* values recorded for each patch.
The Delta Ch (ΔCh*) error shall be computed for each patch compared to target values on file with Idealliance by the formula in Appendix B:
The average and maximum ΔCh* must not exceed the Idealliance Tolerance values in Table 2, below.

Idealliance Tolerances:

Metric	Average	Maximum
ΔCh (CMY only)	≤1.5	≤3
ΔL* (CMY & K)	≤1.5	≤3

Table 2: Idealliance required tolerances

P2P patch values

Column 4 (K only)

C%	M%	Y%	K%
0	0	0	0
0	0	0	1.96
0	0	0	3.92
0	0	0	5.88
0	0	0	7.84
0	0	0	10.2
0	0	0	14.9
0	0	0	20
0	0	0	25.1
0	0	0	30.2
0	0	0	34.9
0	0	0	40
0	0	0	45.1
0	0	0	49.8
0	0	0	54.9
0	0	0	60
0	0	0	65.1
0	0	0	69.8
0	0	0	74.9
0	0	0	80
0	0	0	85.1
0	0	0	89.8
0	0	0	94.9
0	0	0	98.04
0	0	0	100

Table 3: CMYK percentage values in column 4 of the P2P target

P2P patch values

Column 5 (CMY only)

C%	M%	Y%	K%
0	0	0	0
1.96	1.18	1.18	0
3.92	2.77	2.77	0
5.88	4.15	4.15	0
7.84	5.61	5.61	0
10.2	7.41	7.41	0
14.9	11	11	0
20	14.9	14.9	0
25.1	18.8	18.8	0
30.2	22.91	22.91	0
34.9	26.78	26.78	0
40	30.98	30.98	0
45.1	35.48	35.48	0
49.8	39.82	39.89	0
54.9	44.71	44.71	0
60	49.8	49.8	0
65.1	54.9	54.9	0
69.8	60.16	60.16	0
74.9	66.07	66.07	0
80	71.77	71.77	0
85.1	78.06	78.06	0
89.8	84.61	84.61	0
94.9	92.2	92.2	0
98.04	96.86	96.86	0
100	100	100	0

Table 4: CMYK percentage values in column 5 of the P2P target

Appendix B:

Formulae

Converting ND to L*

$Y = 1/10^{ND}$

If: $Y > (6/29)3$

$L* = 116 \times Y^{1/3} - 16$

Else:

$L* = 116 \times (841/108 \times Y + 4/29) - 16$

Calculating Delta L* (ΔL*)

$\Delta L* = (L*_{sample} - L*_{target})$

Calculating Delta Ch* (ΔCh*) – also known as Delta-ab

$\Delta Ch* = ((a*_{sample} - a*_{target})^2 + (b*_{sample} - b*_{target})^2)^{1/}$