



Idealliance[®]

G7 System Certification Application Data Sheet

ORIS Lynx, COLORLynx Standard & COLORLynx Profiler

ORIS



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

ORIS Lynx, COLORLynx Standard & COLORLynx Profiler are a production of;

**CGS Publishing Technologies
International, LLC**

100 N. 6th Street
Suite 308B
Minneapolis, MN 55403



Product

ORIS LYNX

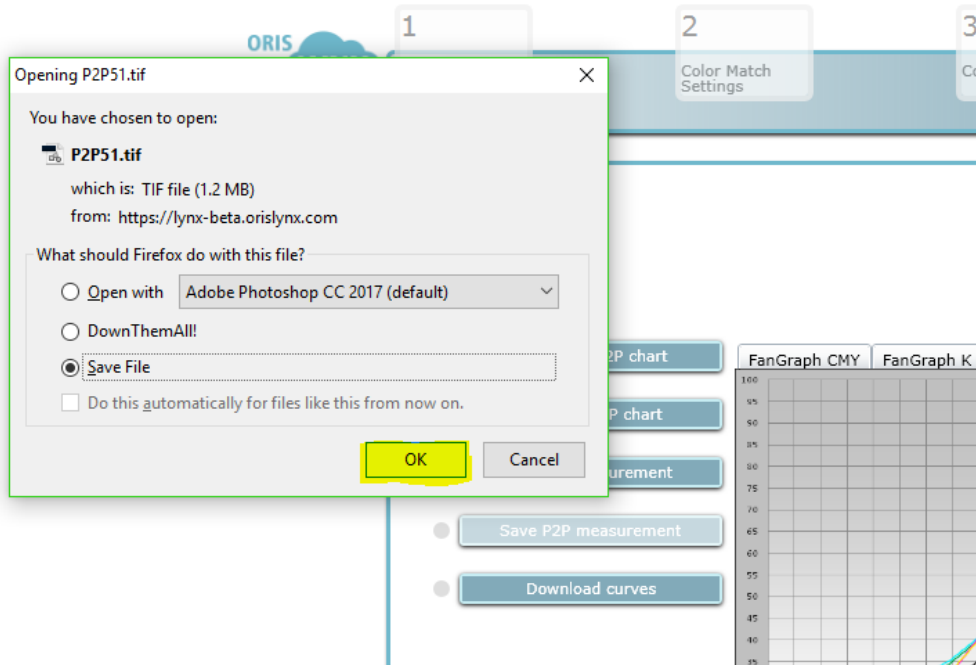
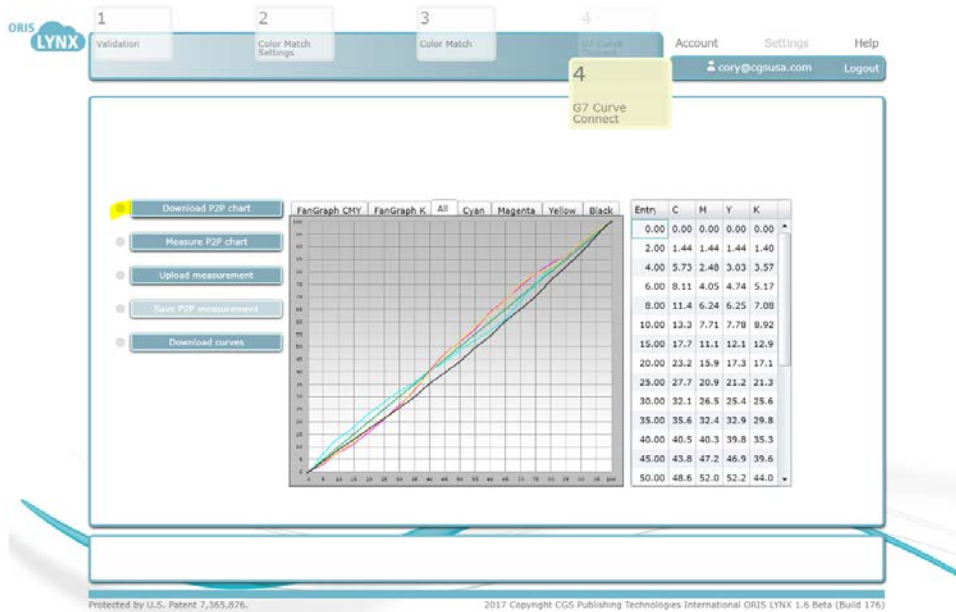
COLORLynx Standard

COLORLynx Profiler

Instructions (procedures)

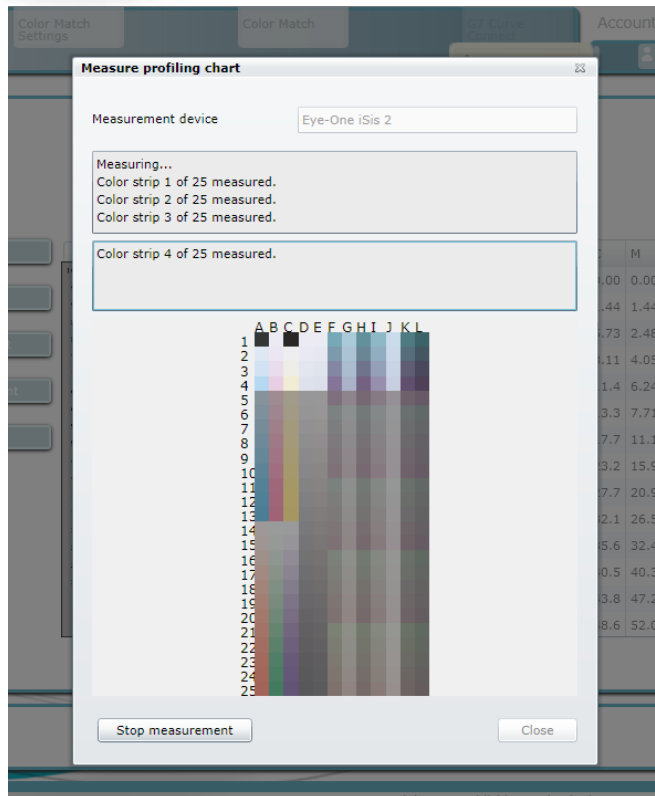
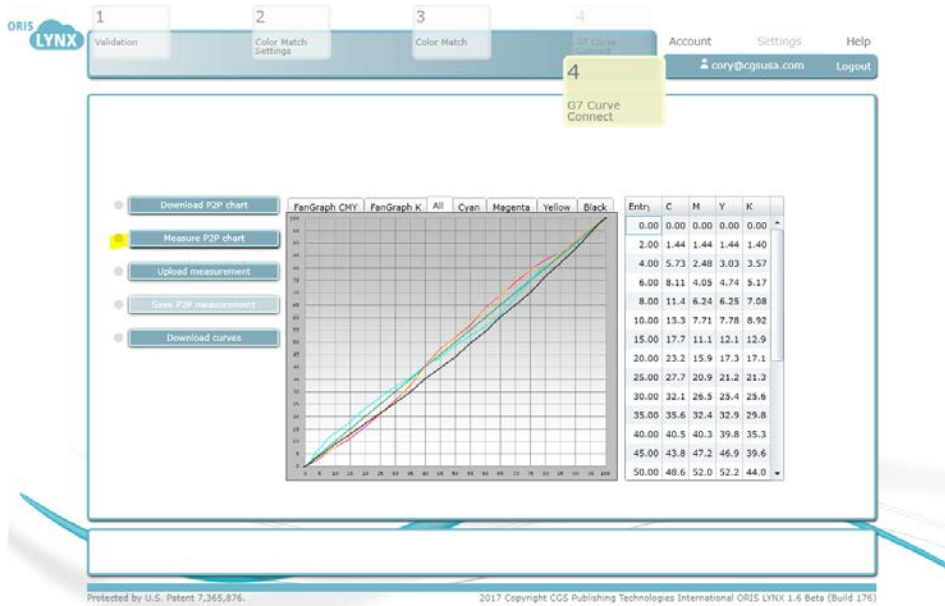
Printing the test target(s)

From within the G7 Curve Connect tool, click on the Download P2P chart button. This will prompt you to save the file wherever you choose. Take this chart and print it on the device you would like to create curves for.



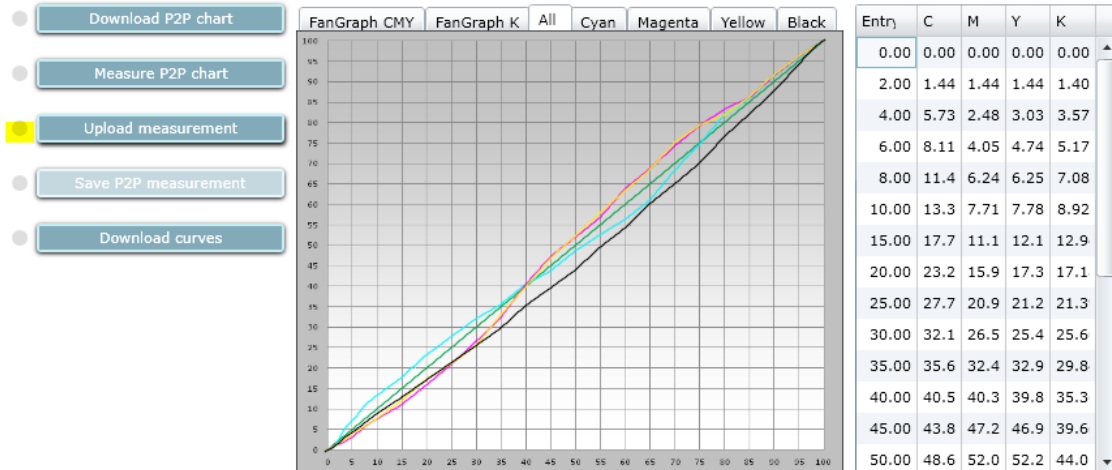
Measuring the target(s)

Once you have printed your P2P, you simply click on the Measure P2P button and it will start the measurement plugin. Follow the steps on the screen to finish this measurement.



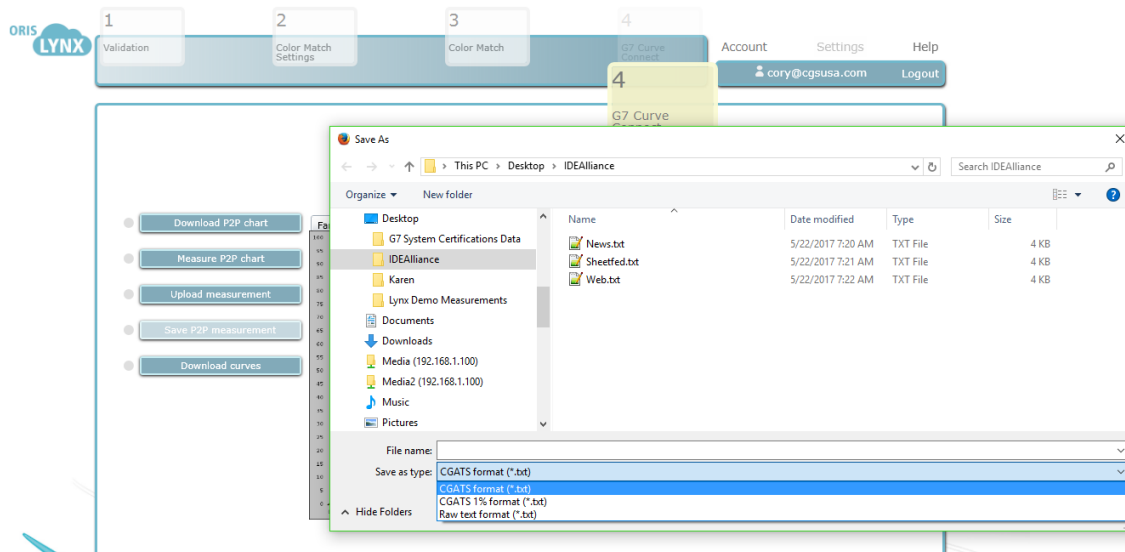
Loading measurement files into ORIS Lynx, COLORLynx Standard & COLORLynx Profiler

If you have used a 3rd party application to measure in your P2P chart, you are welcome to simply upload it here by clicking the “Upload measurement” button, and selecting your chart.



Adjusting parameters

At this point there is no more adjustment necessary. You are ready to simply download the curves for application into any standard system.



Applying parameters the printing system

Once you have downloaded the 4 1-D curves, you may use them as you please. Most applications give you the ability to import a standard CGATS formatted data set. We allow for download of Highlight and Shadow Weighted (P2P), 1% steps, or raw text.

ORIS Lynx, COLORLynx Standard & COLORLynx Profiler Tolerances

Using the 2010 G7 System Certification sample test files and the Analysis Instructions (see above) or the Idealliance Validation Process (see below), ORIS Lynx, COLORLynx Standard & COLORLynx Profiler will achieve tolerances equal to or lower than the following.

Metric	Average	Maximum
ΔF^* (CMY only)	≤ 1.0	≤ 2
ΔL^* (CMY & K)	≤ 1.0	≤ 2

Table 1: ORIS Lynx, COLORLynx Standard & COLORLynx Profiler 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, ORIS Lynx, COLORLynx Standard & COLORLynx Profiler 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 F* (ΔF^*) 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 ΔF^* must not exceed the Idealliance Tolerance values in **Table 2**, below.

Idealliance Tolerances

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

Table 2: Idealliance required tolerances

Appendix A:

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*

$$Y = 1/10^{ND}$$

$$\text{If: } Y > (6/29)^3$$

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

Else:

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

Calculating Delta L* (ΔL^*)

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

Calculating Delta F* (ΔF^*) – also known as Delta-ab

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

Appendix C:

Verification Instructions (using VPR module)

The optional VPR module allows adjustments calculated by ORIS Lynx, COLORLynx Standard & COLORLynx Profiler to be tested without making a second physical print. For this a characterization target (e.g. IT8.7/4) must have been printed and measured at the same time as the P2P, ideally on the same sheet of material.

NOTE: Results determined by the VPR process may differ slightly from results obtained by physical print testing, due to printing and measuring variations between the first and second prints, or variations between the characterization target and the P2P target.

1. In the same ORIS Lynx, COLORLynx Standard & COLORLynx Profiler session used to create the curves being verified, click **Virtual Print Run** to launch the VPR module.
2. In the **Run (curves to be applied)** tab select the calibration run used to create the calibration curves. (Note that all variables in the **Create Curves** window - such as number of control points, **Gray Balance Options**, etc., must not have changed.)
3. In the **Target data to be curved:** list, select the same P2P target data file used to create the curves.
4. In the **Training Target (Optional):** list, select the measurement file from the characterization target (e.g. IT8.7/4) printed at the same time as the P2P target. (*When applying VPR to a P2P target, the training target is NOT OPTIONAL*).
5. In the **Curving Method** area, select **Curve Lab values (retains CMYK values and target type)**.
6. Set the **Precise / Smooth** slider to **Precise**.
7. Click **Curve & Export...** and save the VPR-adjusted P2P data.
8. Click the + (Plus symbol) at the bottom of the **Calibration Runs** list to create a new run (called by default **Run 2 – Verification**).
9. Either drag the VPR-adjusted P2P data into the **Measurements** list, or click on the + (Plus symbol) below the list and browse for the file.
10. Select the **Analyze** tab and then select the **G7** sub-tab.
11. In the **Analyze – G7** window the **Results** table shows the average and maximum Delta L* (ΔL^*) values for the K-only and CMY gray scales (P2P columns 4 and 5). Also shown are the Delta F* (ΔF^*) (also known as Delta-ab (Δab)) for the CMY gray scale (P2P column 5). These values can be compared to the ΔL^* and ΔF^* tolerances shown in the chart in **Analyzing Results**.