



Off-Press Proof Application Data Sheet

Remote Director and NEC LCD3090WQXi on GRACoL Coated #1

The IDEAlliance Print Properties Working Group has established a certification process for off-press proofs as input material to publications. In accordance with this process: “The appearance of a hard copy or monitor proof used in this application must have the ability to closely match specific CGATS or other documented characterization data sets within outlined tolerances.” See further explanations and recommendations outlined on www.swop.org or www.gracol.org.

NOTE: It is important for the industry to understand that performing certification on any one display with any one monitor proofing system does not necessarily guarantee the same result on a different display of the same model of monitor. IDEAlliance notes that each monitor of a particular brand and model is unique. That is, for any given brand of monitor, while our experience in certification shows that while most displays pass the ISO criteria, an individual monitor may fail the ISO criteria due to manufacturing issues or may fail at some point in the future as a result of use. IDEAlliance therefore recommends that in addition to calibrating each monitor routinely, users should also verify the uniformity of the display over time as well. The monitor proofing systems vendors have agreed to provide a monitor uniformity test with their system and over the next 12 months will implement software to automate that process for users.

The following information is intended to assist producers and consumers in the use of vendor specified proofing materials in an off-press proof application:

I. Manufacturer

Integrated Color Solutions (ICS)
60 Madison Avenue, Suite 1105
New York, NY 10010
Phone: (212) 683-0585
Fax: (212) 683-0578



Certified 10/22/08

II. Product

Remote Director/NEC LCD3090WQXi Display/GRACoL Coated #1

III. Introduction

Color proofing is the safeguard that syncs together the goals and vision of the client, designer, agency and printer, assuring each party is visually on the same page. ICS's Remote Director™ is the first SWOP® Certified monitor-based contract proofing system that applies advanced color management to verify the accuracy of every monitor and every proof. Running on commercially available hardware, Remote Director software allows multiple reviewers in dispersed locations to view, collaborate and comment on color as well as content and build a digital record of the proofing process from start to finish, including legal sign-off. Reviewers can collaborate in real-time or work at their own convenience, allowing photographers, agencies, clients, prepress shops and printers to communicate more effectively while accomplishing in hours what used to take days. The GRACoL/SWOP Certification guarantees that Remote Director proofs match the Certified Press Proofs used in Publication production. It's the next step in the design-to-print evolution.

IV. Control Guide

IDEAlliance specifies a control guide such as an ISO 12647-7 Digital Control Strip 2007 be supplied on every off-press proof. As a minimum, the guide used for proofing applications should contain solids for the primary process colors (YMCK), two-color overprints (RGB) and a three-color overprint (YMC), as well as 25%, 50%, and 75% tints in stated line screen resolution of each of the primary process colors and 3-color gray patches. All control guides should be checked for accuracy of the original values. Use and interpretation of a control guide is the responsibility of the creator.



Remote Director is set up to automatically display the patches of the IDEAlliance Control Strip and measure the same. This is done through the Color Management pull-down menu, under Monitor, Validate, GRACoL-2006 Coated #1, and Quick Verification. The automated program will calculate and display color differences and errors in compliance with the IDEAlliance specifications based on ΔE_{2000} color difference calculations. Make sure that proof parameters are defined to be an illuminant of D50 and target luminance of 160 cd/m² for the display.

V. System Components

MINIMUM SYSTEM REQUIREMENTS

Macintosh Specifications

- PowerMac G4 with OS 10.4 (Tiger) or greater
- Quartz Extreme capable
- 1GB RAM
- 2GB available hard-disk space

Windows Specifications

- Intel® Pentium® III processor or greater
- Microsoft® Windows® 2000 Server, Windows 2003 Server, or Windows XP Pro with Service Pack 2
- 1GB RAM
- 2GB available hard-disk space

Display Specifications

- 24-bit color video card
- Minimum display resolution (2560 x 1600 pixels)

Instrument Specifications

- GretagMacbeth® "EyeOne Monitor", "EyeOne Pro" Spectrophotometer, or X-Rite® "DTP94" Colorimeter

Network Specifications

- 512 Kbps DSL/Cable connection (minimum)
- 1 Mbps Cable (recommended)
- Internet access to the Remote Director application machine

VI. Finishing Procedures

Launch the Remote Director application and open the application Preferences. Click on the Display tab and make sure that the Monitor Driver selection is set to "DDC Capable LCD Monitor" and that the Utilize Digital Controls checkbox is checked. It is also from within this dialog that the measurement sensor to be used is defined.

Open an existing proof, or create a new proof. Add at least one CMYK image or PDF.

The Proof Parameters should be set to illuminant D50 and a display target luminance of 160 cd/m² should be selected.

The source profile should be set to GRACoL2006_Coated1v2.icc (from the Tools palette, Color tab, Source Profile field).

The display must have been properly warmed up, at least 45 minutes, preferably one hour prior to calibration and measurements. The instrument must also be warmed up in contact with the display for at least 45 minutes, see the RD Users Guide for options on measurements. The certification process is done with the instrument in physical contact with the display. It is also important that the USB connection to the display is connected to the computer.

Note: If the EyeOne Pro spectrophotometer is being used to calibrate and/or create a uniformity correction map, it is important that the orientation of the instrument remain vertical, either head-up or head-down. Measurements taken with the instrument held at an angle will not be accurate.

Remote Director must have virtual 10-bit color enabled as well as have a uniformity correction map for the monitor in order for the display to meet the screen evenness requirement for certification. While the certification proof is open, within the General section of the Remote Director Preferences enable Virtual 10-bit color. Within the Display section, create the uniformity correction map with Remote Director by going to the Uniformity Corrections tab. Click Create New Correction Map...for the D50 selection and follow the instructions to generate an 81-patch correction map. Once created, make sure that the D50 selection is active. (See Appendix 2)

If a correction map is used, the display must be calibrated with the map active, and validations should reflect a good calibration; average error should be less than 0.5, peak error should be less than 0.75, and the white point error should be less than 0.5.

VII. Finished Proof Characteristics

A proof with the color characteristics referenced in Appendix 1 is to be expected when measured from the IDEAlliance ISO 12647-7 Digital Control Strip 2007 having been properly made to all the listed system components and procedures.

Note: Three-color grays are comprised of Cyan, Magenta, Yellow: 75, 66, 66; 50, 40, 40; and 25, 19, 19 values.

An EyeOne Pro spectrophotometer was used to perform the measurements.

The user may at this time perform a Quick Verification (Color Management:Monitor:Validate:GRACoL:GRACoL-2006 Coated #1:Quick Verification). This is an automated process and will present the IDEAlliance Control Strip CMYK values for measurements and evaluation to data in Appendix 1. Note that the measured values may differ from the values in Appendix 1 due to systematic differences in measurement devices and/or display. However, it is expected that the verification will display a full "Pass" on all counts, as shown below. The same resulting window will also be displayed after a Complete Certification run on all the patches in the IT8.7/4 target (Color Management:Monitor:Validate:GRACoL:GRACoL-2006 Coated #1:Complete Certification). Resulting errors are shown with reference to the specification values shown in Appendix 1 as an example; values may differ from display to display.



VIII. Sample Proofs

ICS has made this Application Data Sheet and the corresponding monitor proofing system available to the IDEAlliance certifying contractor to perform independent, corroborating measurements in the course of certification.

IX. Additional Proof Data

An image file of the IDEAlliance Control Strip CMYK can be downloaded from the www.gracol.org website, numerical data is included in Remote Director.

Appendix 1
Characterization Data CIELab Values

IDEAlliance ISO 12647-7 Digital Control Strip 2007 for GRACoL 2006 Coated #1

Patch ID	CIELab Data			Maximum
	L*	a*	b*	ΔE_{2000}
A1	30.05	-22.65	-28.82	-
A2	54.96	-37.12	-50.00	7
A3	66.60	-25.13	-37.01	-
A4	82.64	-9.99	-17.85	-
A5	26.45	41.59	-1.73	-
A6	47.93	74.11	-3.01	7
A7	60.35	51.93	-5.67	-
A8	80.03	20.38	-5.35	-
A9	48.53	-5.30	49.19	-
A10	88.94	-5.02	93.17	7
A11	90.56	-4.57	63.58	-
A12	92.84	-2.51	24.77	-
A13	52.53	-53.19	-19.34	-
A14	37.89	52.56	-22.07	-
A15	70.88	22.91	72.40	-
A16	50.86	15.13	33.06	-
A17	42.17	33.42	13.25	-
A18	34.60	23.09	-17.15	-
A19	52.45	-18.04	26.12	-
A20	36.56	-1.43	-26.62	-
A21	92.88	-0.08	-1.96	-
A22	87.93	-0.20	-1.98	-
A23	77.43	-0.40	-1.93	-
A24	59.77	-0.53	-1.61	-
A25	39.75	-0.57	-1.02	-
A26	25.57	-0.21	-0.53	-
A27	14.95	0.19	-0.14	7

Patch ID	CIELab Data			Maximum
	L*	a*	b*	ΔE_{2000}
B1	15.18	8.84	-24.61	-
B2	24.13	17.20	-46.14	7
B3	40.84	17.09	-35.77	-
B4	69.57	8.37	-19.26	-
B5	26.22	35.38	24.54	-
B6	47.37	68.25	48.79	7
B7	59.09	47.55	39.25	-
B8	78.62	17.92	18.20	-
B9	28.47	-39.38	12.04	-
B10	50.12	-68.43	25.00	7
B11	62.69	-41.44	20.96	-
B12	80.64	-14.75	8.25	-
B13	42.57	-16.27	-48.19	-
B14	48.28	70.95	17.76	-
B15	72.70	-25.21	65.09	-
B16	70.23	19.71	18.63	-
B17	53.40	36.61	28.63	-
B18	41.61	32.01	26.83	-
B19	45.40	-26.20	-3.82	-
B20	95.00	-0.02	-1.96	3
B21	92.43	0.19	-2.06	-
B22	86.74	0.31	-2.04	-
B23	75.52	0.07	-1.50	-
B24	57.54	-0.12	-1.44	3
B25	39.39	-0.30	-0.55	-
B26	23.00	0.17	-0.25	-
B27	8.46	0.34	0.44	-

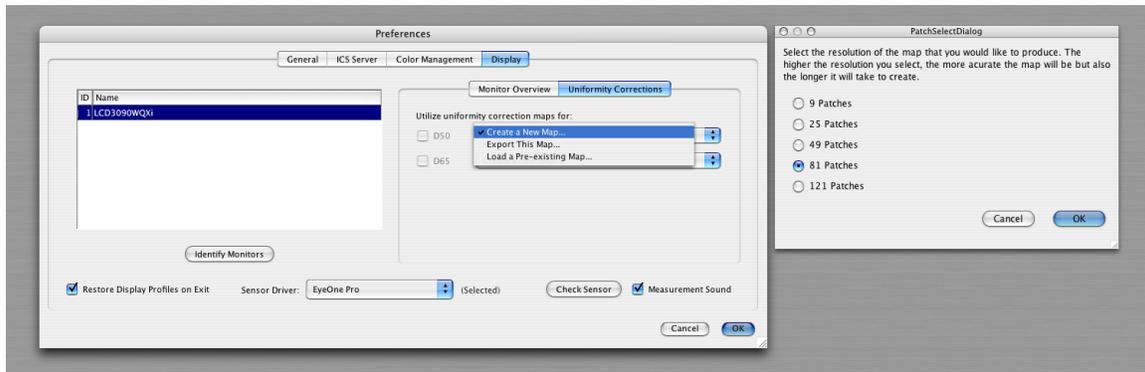
Note: Color is measured with a calibrated EyeOne Pro spectrophotometer.

Appendix 2

Monitor Uniformity Correction Procedures

The Remote Director Uniformity Correction Map technology can often be used to overcome color and luminance shifts in the display. If you are uncertain of the uniformity quality of your display you may use the ICS Spot application, available from ICS, to check.

To build a Correction Map, launch Remote Director, open a proof, and set Color Management:Change Proof Parameters, to D50, and Other: 160. These are the same target parameters as will be used in the certification process.



Then, open the Remote Director Preferences. Choose the Display tab and then choose the monitor for which you wish to create a Correction Map. Select the “Uniformity Corrections” tab, and select the instrument, which you will use for the process (we are going to assume it will be an Eye-One Pro.)

Next to the “Utilize uniformity corrections maps for:” area, select D50, and from that tab choose “Create a New Map...”

Choose the 81-step option. (We have found that Correction Maps with fewer than 81 steps may not create a map with sufficient resolution to enable a non-uniform monitor to pass the certification requirements.)

WARNING: The Eye-One Pro sensor uses polarization techniques to separate individual spectral bandwidths. Because LCD monitors also have a polarization effect, it is extremely important that all measurements be taken with the Eye-One placed vertically on the monitor. If measurements are taken with the Eye-One Pro held at any angle other than 0 or 180 degrees (head up or head down) the measurements will not be accurate. So if, for example, you turn your Eye-One 45 degrees to keep it from bumping into the bezel of an NEC LCD3090WQXi, the measurements will not be taken accurately and so a false correction will be applied in the Correction Map causing the uniformity process to fail.

Place your monitor flat on its back, supported by small boxes or a stack of books so that the monitor lays flat. The example here uses boxes of paper.



Plug in your Eye-One via USB to your system to “power it up,” and then place it on the surface of the monitor. Allow them both to warm up for 45 minutes

You may now measure.

Measure the first 7 rows of patches normally using the LCD foot supplied by X-Rite.



For the 8th row, turn the Eye-One 180 degrees so that the top of the instrument is now facing the bottom of the display - and measure normally.



And for the 9th and last row, remove the LCD foot, keeping the Eye-One rotated 180 degrees, and measure.

