

Measure.

Optimize.



ColorAnt
Quick Start Guide **5**

COLOR
Logic

Quick Start Guide for ColorAnt 5

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Foreword

Thank you for choosing ColorLogic's ColorAnt. Reaching higher quality in production environments has never been easier.

ColorAnt is the ultimate color management tool to manipulate, analyze and optimize measurement data including RGB, CMYK and Multicolor.

Use ColorAnt to create special measurement charts, measure color patches, and to check measurement data prior to profiling to avoid issues such as mis-measurements or inhomogeneous data. ColorAnt can be used to average several measurements together when required prior to profile creation. The quality of ICC profiles depends strongly on the quality of the measurement data used to create them. By adding analysis and optimization of measurement data, profile quality will improve which also leads to a higher production safety.

Enjoy analyzing and optimizing your measurement data!

Your ColorLogic Team

INSTALLING COLORANT



Getting Started with Colorant

Installation, requesting demo licenses,
loading licenses



Installing ColorAnt System requirements

macOS

10.7.5 or later - (Intel only)

Windows

Windows XP, Vista, Windows 7, Windows 8, Windows 10

Installers for the respective platform installs the program by default in either the

Applications

folder (Macintosh) or the **Programs** folder (Windows).

Begin installation by double-clicking on the ColorAnt installation package.

After accepting the Software License Agreement, select the destination volume and click **Install**.

Computer vs USB dongle license

Computer based ColorAnt licenses refers to a specific computer on

which ColorAnt was installed and can be requested for temporary test purposes. Computer licenses are also advantageous if the computer has no USB ports or no space for a USB dongle, i.e. a rack server.

USB dongle licenses are serialized to a USB dongle. The USB dongle is shipped with a permanent license and permits use of ColorAnt on different

The screenshot shows the 'Registration' window for ColorAnt. It has two tabs: 'License details' and 'Demo license request'. The 'Demo license request' tab is active. The form contains the following fields and information:

- First name:** Colorlogic
- Serial:** 1676760710-5
- Last name:** User (with a green checkmark)
- Phone:** (empty field)
- Company:** ColorLogic (with a green checkmark)
- Country:** United States (with a green checkmark)
- Email:** user@colorlogic.de (with a green checkmark)
- Dealer:** CrossXColor Inc. (with a green checkmark)

Below the form, there are links for 'Terms of Service' and 'Privacy Policy'. Two checkboxes are checked:

- I agree that a sales partner of ColorLogic GmbH may contact me either by phone or in writing. Data transfer is limited to the sales partners of ColorLogic GmbH and is not used for other promotional purposes. I may revoke this consent at anytime. *
- I have read the Privacy Policy and I agree to the Terms of Service. (with a green checkmark)

A note at the bottom states: '* In the event of a disagreement, you may request an evaluation license directly from us during our normal business hours by sending an email with your request and contact details to demo@colorlogic.de.' A 'Send direct request' button is located at the bottom right. The window title is 'Registration' and the caption below is 'Registration Window FIG 1.1'.

computers. To assign the license to the USB dongle, the dongle must be connected before starting ColorAnt.

Demo license request

ColorAnt allows users to automatically request a 14 day demo license to evaluate ColorAnt.

To request a demo license follow the steps below:

1. Click the registration button located on the lower left-hand corner of the Main Navigation Panel.
2. Click on the **Demo license request** tab.
3. Enter all required information.
4. When your location is chosen, ColorAnt will show the available dealers for your region. Select a dealer and click **Send direct request**. A demo license will be automatically sent to the email address supplied in the contact form.

5. Save the license file contained in the email (indicated by the ending *.lic) to your system.

6. Under **License details** in the **Registration** window and select the .lic file.

After installing the demo license file, the expiration date of the demo license is shown below the **License details** (Fig 1.2).

Restrictions with Demo licenses and ColorAnt

ColorAnt demo license gives users a 14 day evaluation period to try all the functions of ColorAnt within

the application. The demo license permits saving and exporting of data.

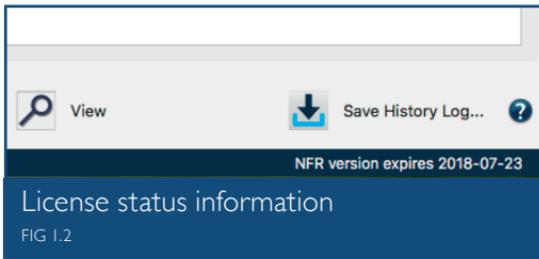
Purchasing ColorAnt

ColorAnt is available in 2 packages, **M** or **L**. Click on **Buy ColorLogic products** under **License details** or **Demo license request** in the **Registration** window.

A list of ColorLogic resellers will open in your browser, then locate the appropriate dealer for your country or region.

Installing a permanent license

A permanent license provided by the individual dealer will be supplied after



purchasing ColorAnt. The permanent license is available in the form of a computer-based license or a

dongle license (see previous section).

After purchasing the software, a **permanent license file** (.lic) will be sent via email license. Load the license file under **License details** in the **Registration** window.

After installing the permanent license file, the licensed modules are displayed under the **License details**.

ColorAnt's Packages

ColorAnt's packages standard features that address every aspect of measurement data correction.

ColorAnt PACKAGES	
COLORANT M	COLORANT L
STANDARD FEATURES	All Features of ColorAnt M
Viewing, Comparing, Reporting	Multicolor Custom Chart Generation Includes Multicolor chart generation
Correction, Smoothing, Averaging, White and Black Correction, Brightener, Rescale, Tone Value, Link	Edit Primaries Multicolor Support Edit Primaries for CMYK and Multicolor
Measure Tool Measure all charts and color spaces	Merge Multicolor Charts Combine charts by channel names
Edit Primaries Edit Primaries for CMYK	Color Editor Edit Color for CMYK and Multicolor
Custom Chart Generation Color spaces supported: Gray, RGB, CMYK	Embed CxF/X-4 Embeds spectral spot colors in PDF files
Color Editor Edit Colors for CMYK only	
CIE Conversion Edit illumination and Standard Observer	

ColorAnt Documentation

ColorLogic's ColorAnt offers some of the most powerful and advanced measurement data tools in the industry today. Integrated within ColorAnt are help buttons represented with the **?** icon, with detailed and current information.

Automatic Updates

ColorAnt includes an automatic update function that can be enabled or disabled by going to **Help>Check for Update**.

USING THE SIDE BAR



ColorAnt's Side Bar

Access all of ColorAnt functions
from one central location.



Automatic Correction

 Auto

Data Import/Export

 Custom Chart

 Export Chart

 Measure

 Report

 Embed CxF/X-4

Editing

 Redundancies

 Correction

 Smoothing

 White/Black Correction

 Brightener

 Tone Value

 Rescale

 Edit Primaries

 Color Editor

Merging and Conversion

 Averaging

 Link

 ICC Transformation

 CIE Conversion

Registration Preferences

ColorAnt's Side Bar

ColorAnt's **Side Bar** allows quick access to all tools from a central, easy-to-use location.



Auto

Correct measurement data automatically



Custom Chart

Create custom charts for measurement



Export Chart

Export custom chart for printing and measuring



Measure

Measure printed charts or ambient light



Report

Generate detailed reports on measurement data



Embed CxF/X-4

Embed CxF/X-4 spectral data in pdf files



Redundancies

Correct redundant patches by averaging data



Correction

Correct and detects faulty measurements and inconsistent data



Smoothing

Smooth and correct uneven curves



White/Black Correction

Apply manual correction to white and black areas



Brightener

Remove optical brightener from measurement data



Tone Value

Correct measurements as if printed to a specific reference



Rescale

Recalculate data to a different color chart



Edit Primaries

Add, remove, and exchange primaries or substrate in an existing measured test chart



Color Editor

Edit colors to match a reference file



Average

Average several data sets into one data set



Link

Combine multiple charts into one measurement file



ICC Transformation

Use ICC device and DeviceLink profiles to test impact on data



CIE Conversion

Change the standard observer illumination from standard D50



Online Help

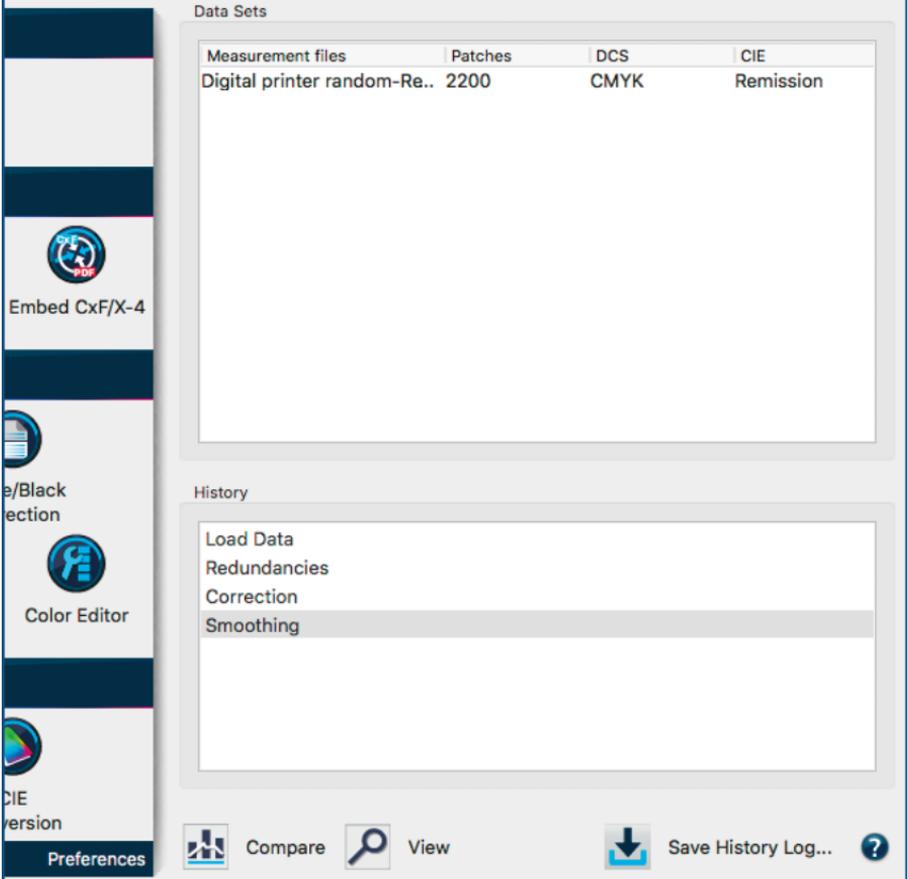
Get detailed help by clicking the ?

Registration

Access the Registration and license dialog

Preferences

Preferences - Customize various ColorAnt settings



Data Sets, History and Saving History

FIG 2.1

Data Sets

Select the data set (or sets) to process. The **Data Sets** section of the main window (Fig 2.1) displays pertinent information about the measurement data including: number of color patches, color model (Lab, CMYK, RGB, Multicolor), measurement value type (colorimetric = Lab - spectral = Remission).

History

The tools applied to the measurement data are shown in the lower right side **History** window. Clicking on an action item in the **History** window (either above or below the current state) gives the user control over individual corrective tasks.

Save History Log and Averaging Report

Save History Log

is available at the bottom right (Fig 2.3) of the main dialog.

This saves all modifications applied to all files in a detailed PDF document. When double-clicking an single entry in the **History** section, a dialog pops up showing the settings applied to the data at a specific step. The single step can be saved with **Save Log**.

Averaging Features

The averaging log contains (Fig 2.2) detailed reporting with sample colors (similar to the **Report** feature) comparing the averaged data and providing process control statistics. Standard deviations (**sigma**) for **Density**, **dE** and **dH/dL**. This allows users to easily see colors with large deviations which would not be obvious by visually verifying values.

Statistics:

CMYK	PatchID	L	a	b	Density (±Sigma) (±2Sigma) (±3Sigma)	dE (±Sigma) (±2Sigma) (±3Sigma)	dH/dL (±Sigma) (±2Sigma) (±3Sigma)
Substrate/Paper white							
0 / 0 / 0 / 0	69	95.33	0.08	-2.07	0.00 (±0.00) (±0.00)	0.36 (±0.06) (±0.11) (±0.17)	0.29 dH (±0.18) (±0.36) (±0.55)
Maximum							
100 / 0 / 0 / 0	1	56.47	-38.72	-48.77	1.00 (±0.00) (±0.00)	37.48 (±15.76) (±31.53) (±47.29)	36.90 dH (±16.24) (±32.47) (±48.71)
Full Primary							
100 / 0 / 0 / 0	1	56.47	-38.72	-48.77	1.36 (±0.08) (±0.16) (±0.24)	37.48 (±15.76) (±31.53) (±47.29)	36.90 dH (±16.24) (±32.47) (±48.71)
0 / 100 / 0 / 0	6	48.82	75.19	-3.58	1.62 (±0.02) (±0.04) (±0.06)	0.56 (±0.16) (±0.32) (±0.48)	0.19 dH (±0.14) (±0.29) (±0.43)
0 / 0 / 100 / 0	11	89.30	-5.42	92.54	0.96 (±0.02) (±0.04) (±0.06)	0.58 (±0.11) (±0.22) (±0.32)	0.03 dH (±0.04) (±0.07) (±0.11)
0 / 0 / 0 / 100	21	17.31	0.19	-0.03	1.57 (±0.02) (±0.04) (±0.06)	1.33 (±0.46) (±0.92) (±1.38)	-0.16 dL (±0.46) (±0.92) (±1.38)
Full (CMY) Secondaries							
100 / 100 / 0 / 0	25	26.01	21.60	-46.93	0.99 (±0.00) (±0.01) (±0.01)	1.64 (±0.45) (±0.90) (±1.35)	0.38 dH (±0.27) (±0.55) (±0.82)
100 / 0 / 100 / 0	35	50.80	-66.89	27.14	0.99 (±0.01) (±0.01) (±0.02)	1.09 (±0.40) (±0.80) (±1.20)	0.12 dH (±0.48) (±0.97) (±1.45)
0 / 100 / 100 / 0	30	47.03	68.78	49.94	1.00 (±0.00) (±0.00) (±0.00)	2.31 (±0.80) (±1.60) (±2.41)	0.08 dH (±0.70) (±1.40) (±2.10)
Maximum Primaries							
100 / 0 / 0 / 0	1	56.47	-38.72	-48.77	1.36 (±0.08) (±0.16) (±0.24)	37.48 (±15.76) (±31.53) (±47.29)	36.90 dH (±16.24) (±32.47) (±48.71)
Maximum (CMY) Secondaries							
70 / 0 / 70 / 0	36	63.74	-39.86	22.03	0.83 (±0.01) (±0.01) (±0.02)	2.02 (±0.50) (±1.00) (±1.51)	0.89 dH (±0.72) (±1.44) (±2.16)

Save History Log with Averaging Report

FIG 2.2

View and Compare Data

When viewing measurement data, the **View** Options in the **2D** and tabs have been updated with additional color channel check boxes for the primary colors available in the loaded data set. The color channel check boxes can be combined with the above color filters so that only the Multicolor Primaries or Secondaries can be shown. This greatly facilitates finding and viewing patches. The removed viewing options, Duplex and Triplex known from previous versions of ColorAnt, can be compensated by selecting appropriate color channels individually (e.g. Cyan + Black shows duplex combinations and Cyan + Magenta + Black shows triplex combinations). Both options were removed to gain space in the user interface. In addition, the filters work in combination with the color channels. If, for example, the check box **Secondaries** is enabled, the check boxes **Primaries** and **White** are automatically enabled. They can be disabled if only two color combinations (Secondaries) are to be highlighted. The **TVI** tab allows users to switch between the typical density based dot gain curves according to **Murray Davies** or the modern colorimetric dot gain curves

according to **ISO 20654 (SCTV)**. Linear dot gain curves according to ISO 20654 would show a straight horizontal line.



The screenshot displays the 'ColorAnt History Log' window. At the top left is the ColorAnt logo, and at the top right is the date '2018-07-23'. The main content is organized into sections: 'Load Data', 'ChartInfo', 'Redundancies', and 'Correction'. Each section provides file paths and specific settings or statistics.

ColorAnt History Log 2018-07-23

Load Data
Loaded file:
/Users/jamesgeorge_1/Google Drive/ColorLogic/Testing/ColorAnt_Tests/00_Files/Digital printer random.txt

ChartInfo
REFERENCE_PROFILE Demo-Digital printer random_OriginalTAC250.icc
CREATED 2013-08-08T10:53:27
ORIGINATOR CoPrA
FILE_DESCRIPTOR Unknown

Redundancies
Processed file:
/Users/jamesgeorge_1/Google Drive/ColorLogic/Testing/ColorAnt_Tests/00_Files/Digital printer random.txt

Resulting file:
Digital printer random-RemovedRedundancies.txt

Settings:
Mode: 0
Mode description: Auto (depends on the number of redundant patches)
Remove duplicates: No
Delta: Method: Delta-Auto

Statistics:
Quality: < 0.01
Count: 404.00
Group count: 91.00
Average delta: 0.18
Maximum delta: 7.03

Correction
Processed file:
Digital printer random-RemovedRedundancies.txt

Resulting file:
Digital printer random-RemovedRedundancies-Corrected.txt

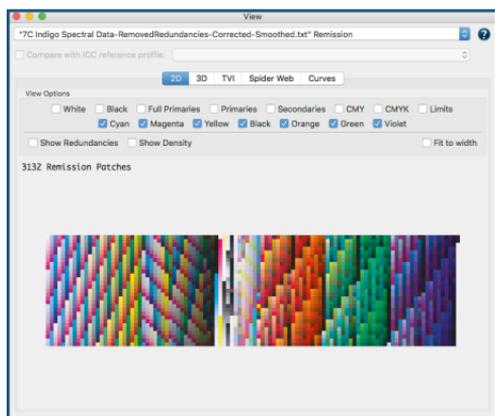
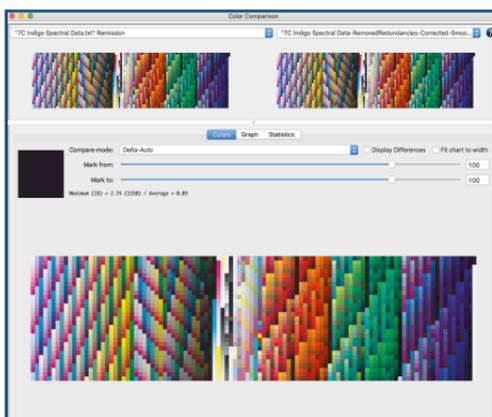
Settings:
Mode: 1
Mode description: Correct bad measurements
Delta: method: Delta-Auto
Protect lights (%): 0

Data Sets, History and Saving History
FIG 2.3

View and Compare Tools

Advanced viewing options for ColorAnt's tools located at the bottom of the main window that can be enabled for both viewing measurement data (**View**) and comparing pre and post comparison of measurement data (**Compare**). Absolute or Relative Density can be set in ColorAnt's

Preferences

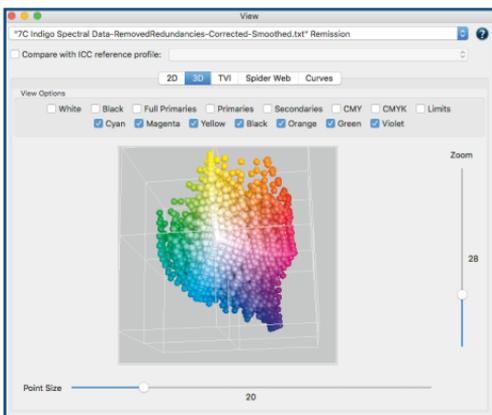


2D highlight with Color Filter

The Color Filter highlights selected colors in **2D** and **3D** views. View by full primaries, limits, selected channels, primaries, secondaries, paper white or black. Other custom settings are also available.

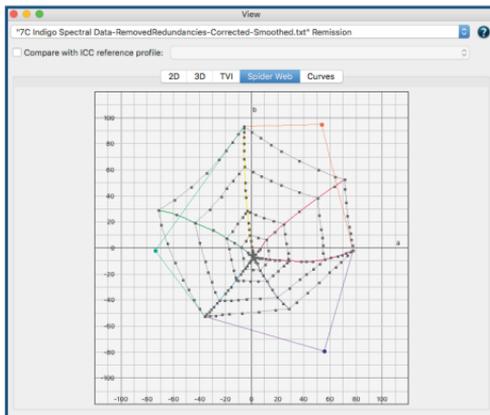
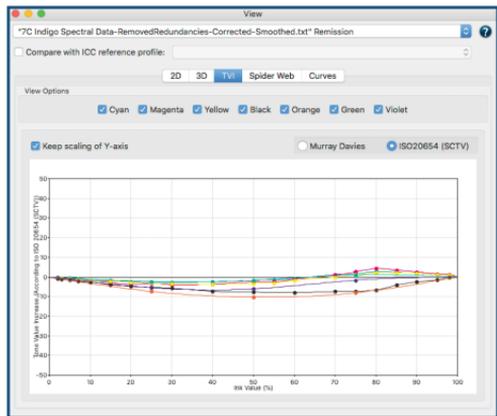
3D viewing options

The Color Filter highlights selected colors in **3D** views. Zoom and rotate the model by using the sliders. Click the **Compare ICC profile** to compare the two in the window. The same filter options are available in the 2D view.



TVI View options

Analyze tone value variation curves (**TVI**). The tone value curve works in conjunction with the curve view or any other correction which will effect the TVI. Choose either Murray-Davies or ISO 20654 (SCTV) methods

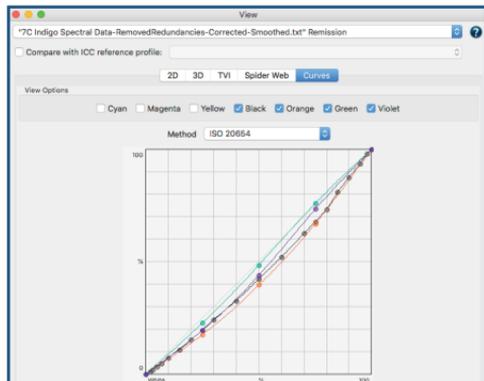


Spiderweb

The top view of the color space in a a^*b^* diagram. The measured or optimized color patches are arranged in a spider web configuration. Verify changes in the **View** dialog by moving forward or backward in the **History** list.

Curves

View the linearity curves from white to all 100% primary colors, (including multicolor data). Visualizes data and assists with analyzing non-smooth gradation curves. Choose from **ColorLogic Default**, **ISO 20654 (SCTV)** or **Tone Value**.



USING COLORANT



Automatic Correction

Correct and optimize measurement data with one click



View

View measurement data with 2D, 3D, spider web and curves



Compare

Compare measurement data before and after correction



Working with ColorAnt

ColorAnt's main window is divided into 3 sections. All tools are located and grouped by (Fig 3.1) function on the left side, measurement data is shown in the **Data Set** section on the right hand side upper window of the application window. Measurement data can be loaded or saved via the **File** menu or by dragging & dropping data to the **Data Sets** window.

Tools applied to the measurement data show are shown in the lower right hand side **History** window. Clicking on an action item in the **History** window (above or below the current status) gives the user control over individual corrective tasks.

Automatically correct and smooth measurement files

Load the measurement data file. Click on the **Auto** button and on the **OK** button. Each tool that is applied is displayed in the **History** section. ColorLogic recommends completing this process running by a **Report** for detailed results and further recommendations for your measurement data.

Recommended manual working method

Opening or Importing data

Measurement data can be loaded or imported through a variety of ways in ColorAnt. Simply open the data file (**File>Open**) or Drag and Drop to the **Data Sets** window. Predefined data sets and recently opened files are also available via the **File** menu.

Acquiring data through measuring

Measurement data is acquired with the **Measure**

tool and transferred to ColorAnt. Measurement data files **Measure** tool are stored in the Users/Documents/ColorAnt/MeasurementData folder.

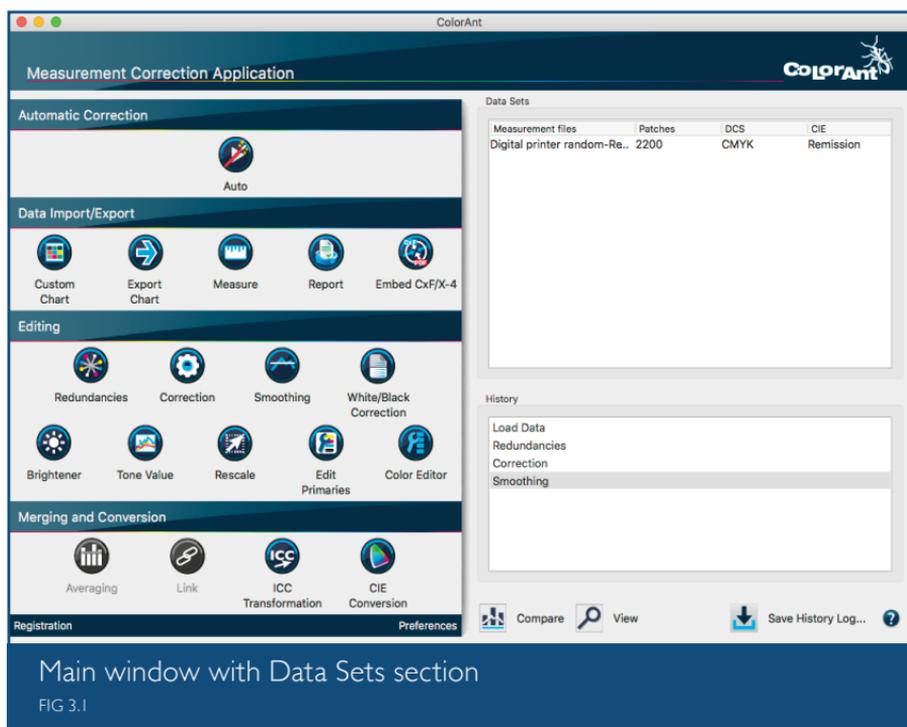
The **Data Sets** section of the main window will display pertinent information about the measurement data including: number of color patches, color model (Lab, CMYK, RGB, Multicolor), measurement value type (colorimetric = Lab - spectral = Remission).

Using Auto is the fastest method to get high quality results

Tools located on the left will be highlighted when applicable to the measurement data, tools not accessible are grayed out. Access the tools by first highlighting the data (or multiple files e.g. linking or merging several data sets together) and right click. When multiple data sets are present and no set is selected, corrections are applied to all measurement files.

Viewing and Comparing Data

Advanced viewing options for ColorAnt include tools located at the bottom of the main window that can be enabled for both viewing measurement data (**View**) and comparing the original and post comparison of measurement data (**Compare**).



Main window with Data Sets section

FIG 3.1

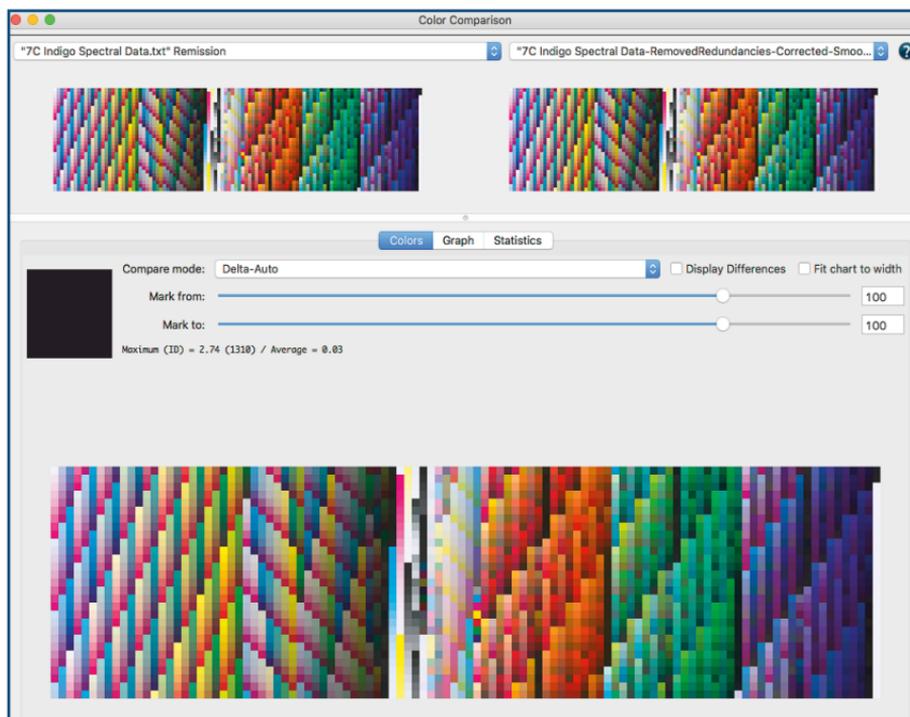
To add reference files for additional or custom profiling test charts and color wedges accessible using the **File/Open predefined** or the the **Rescale** tool - add the CGATS 1.7 compatible TXT file to Users/Documents/ColorAnt/Wedges folder.

The **View** window includes options for **2D**, **3D**, **Spider Web** and **TVI** curve options to facilitate comprehensive measurement data analysis.

Color Comparison allows the user to view measurement data (Fig 3.2) before and after optimization. The comparison window also allows the user to view the actions taken to achieve the optimized data (e.g.

File Name **Correction**, File Name **Smoothing**). The **Mark from** and **Mark to** slider displays various levels of DeltaE deviations.

allowing conversion of spectral data to Lab or Density only. Other save as options include CGATS compatible TXT file, CGATS XML, Named Color ICC profile, CxF compatible



Compare data before and after correction

FIG 3.2

Saving or exporting measurement data

Once a tool or tools have been used to correct or optimize data, the name of the data will be appended with the tool(s) that have been applied (e.g Data_smoothed_corrected).

Save the optimized measurement data by going to **File** and choose **Save as**. Additional export options

CXF file format, Photoshop ACO, color table, Adobe ASE or as GMG CSC file.

Generate Reports

ColorLogic recommends using the **Report** tool both on the initial data import and after the measurement data has been optimized.

DATA IMPORT & EXPORT



Create Custom Chart

Generate custom patches
for test charts



Measure

Measure test charts



Exporting Charts

Create custom size charts for various
measurement instruments



Creating Reports

Create detailed reports from
measurement data



Embed CxF/X-4

Embed CxF/X-4 data into PDF files



04

DATA IMPORT & EXPORT

Custom Chart

The **Custom Chart** tool is designed for creating reference files for test chart generation. To define a custom test chart for profiling, a reference file containing the device data for the color space is required. **Important:** Creating multicolor charts requires a **ColorAnt L** license.

Depending on the selection of color space, the **Custom Chart** dialog provides several options:

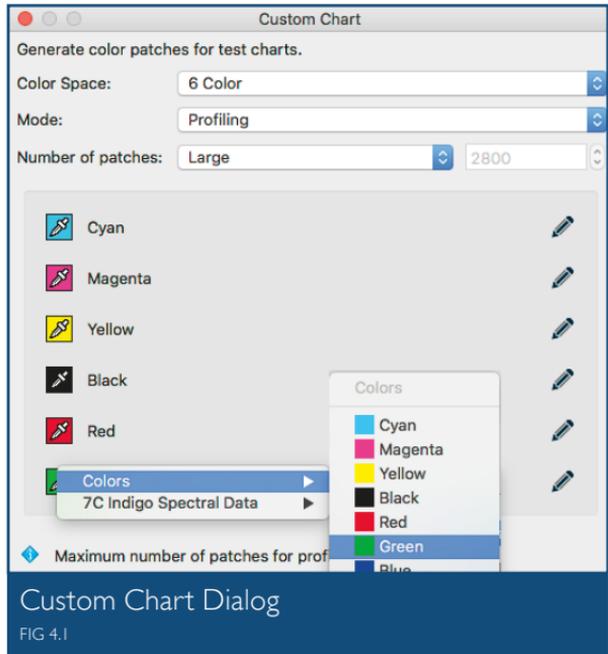
Gray, RGB and CMYK: Define the **Number of Patches** and click OK. Select the desired **Color Space** from the chooser.

CMYK: Choose the linearisation from another measurement data set or from another print run as a starting point. To use the linearisation feature, load the appropriate measurement file in ColorAnt before opening the **Custom Chart** tool and select the file in the Color Space chooser.

Multicolor Charts Modifying settings:

Select the desired **Color Space**, for

example to create a 6 color profiling chart, ColorAnt will display a pre-defined color order, in this example: CMYK+Pantone Red and Green. The **Eyedropper** function allows reordering the inks. To exchange the 5 channel which is Red with Green, similar to fig 4.1 click on the Red



Eyedropper Icon and from the **Colors** section select Green by clicking on it.

Mode:

Choose one of the presets based on the purpose of the test chart:

Profiling, Flexo profiling, Profile updating, Linearization.

Choosing the number of patches

Choose from any of the four pre-defined settings, **Small, Medium** or

Large. For a specific number of patches choose **Custom** and enter a number in the box.

Changing or defining the channel names

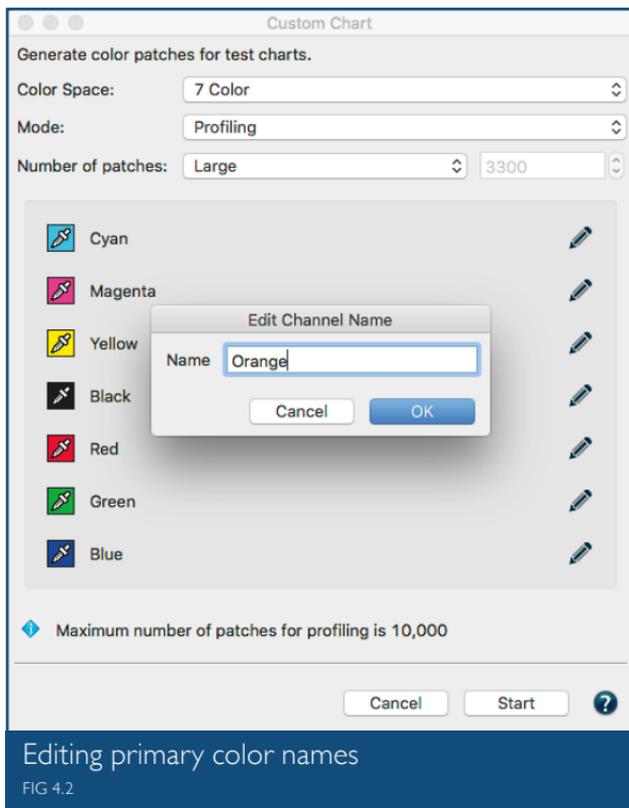
To change channel names, click the **Pencil** icon, e.g., click the green channel and type in the new name as shown in fig 4.2.

Define the channel name of each channel, (including or excluding CMYK) enter the name in the text field or click on the **eyedropper** icon and select a color from the pop up dialog that matches closest.

Linearization

ColorAnt provides intelligent settings that provides users a starting point for typical use cases such as creating linearization test charts, profiling test charts, special profiling test charts for Flexo printing and updating of profiles. **Number of Patches** chooses the optimal number of patches for specific profiling situations. More information on this topic can be found in the Online Help.

Note: This option is useful with difficult print processes that are challenging to profile without linearization or having very high dot gain. ColorAnt uses a very smooth



linearization to avoid inconsistencies in the curves.

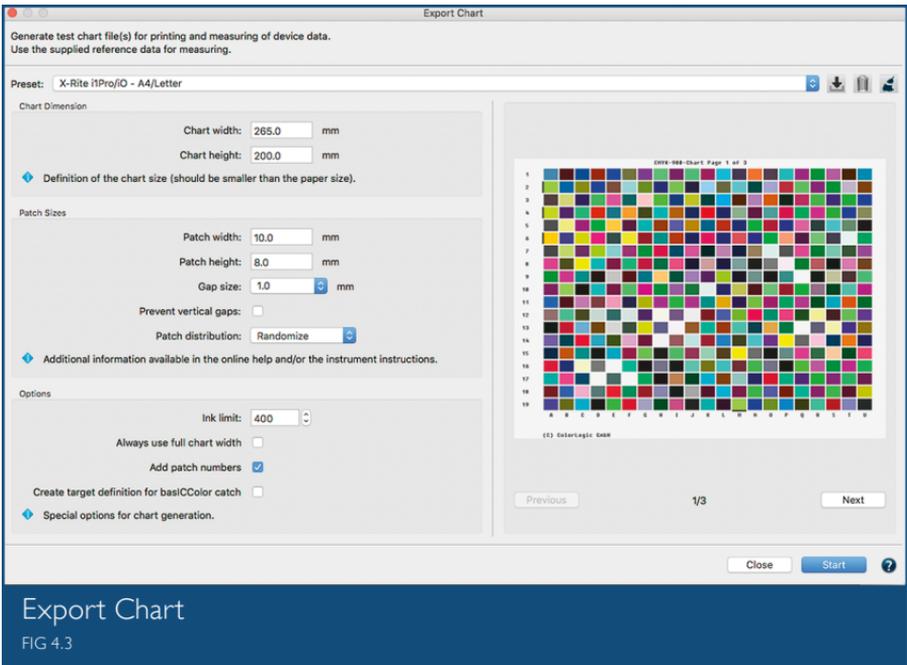
Once the color space, channel names and the **Number of Patches** are defined, click **OK** and calculate the reference file. The reference file will appear in the **Data Sets** section. Save the file if necessary for other chart generation tools. To create a test chart within ColorAnt, select the reference file and click **Export Chart.**

Export Chart

Export Chart allows creation of test charts as TIFF, PSD or PDF files.

At the top a **Preset** changing all the settings can be selected, manual presets can be created, saved or deleted. The largest section covers options for **Chart Dimensions, Patch Sizes** and additional **Options**. The section on the bottom provides information of how many files will be created

The **Ink Limit** option allows the user to take into account special printing processes that can't handle 400% ink on paper/substrate. Typically each of ColorLogic's CMYK and multicolor test charts have patches with a maximum of 400% ink. If a 400% ink limit is too high for the press, or the user would like to define another ink limit, the user can enter the desired Ink Limit. The resulting chart will have ink limit integrated. Use the



with the chosen **Preset**, settings and buttons to **Cancel** or create (**Start**) the test charts. The tool is optimized to work with most of the instruments supported in the **Measure Tool**. The **Custom Chart** tool fills the full chart width with patches minus margins for the numbering. Instruments that do not have width limitation (no ruler required) can benefit from this feature.

exported reference file for measuring and profiling.

Quick Start Procedure

Step one: Select the reference file that was created with the **Custom Chart** tool or a reference file from another source.

Step two: Choose either one of the presets, or define a custom size and patch width.

Step three: Define the number of patches to be produced.

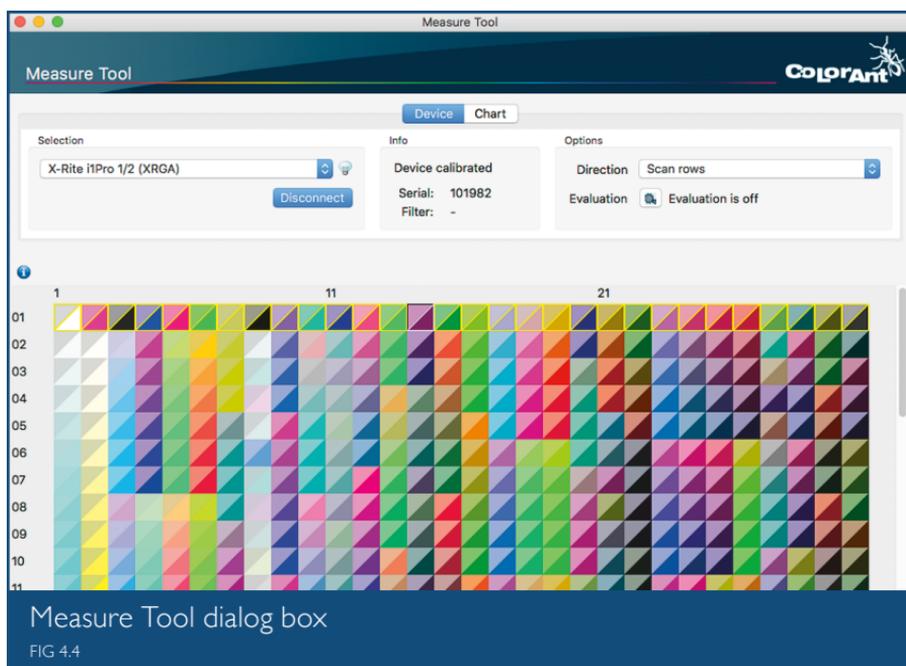
Measuring test charts

The ColorAnt **Measure** tool directly measures test charts for profile creation.

Quick Start Procedure

To Measure:

Step one: From the ColorAnt Data Import/Export module, click **Measure**. **Step two:** Connect to your device, and double click the first patch to begin measuring (may vary by instrument). To select a different chart for measurement, select the **Chart** from the dialog. For custom charts including ColorLogic's test



Productivity Feature: When measurement data is loaded into the **Data Sets** window and **Measure** is selected, the previous chart and measurement device by default are automatically loaded into the **Measure** tool.

charts, click **Load** and then select the desired chart from the pull down menu.

3. Select the measurement device under **Selection** and select the measuring mode (M1, M0 or M2 if applicable). or task.

4. Select the method of scanning: by Line by Line, Patches Column by column, Scan Rows or Scan Columns.

5. Begin measuring: As you begin measuring with the options chosen, grayed out patches are replaced by measurement data. Continue measuring until completed.

6. Transmit Data: When measuring is completed, press **Transmit** to copy the data into ColorAnt.

Report

ColorAnt offers detailed reporting for measurement data analysis and provides the user with corrective recommendations for measurement data. Users can customize the logo and report title. Reports can be generated as pdf files or .xml data.

Features of ColorAnt's **Report**

tool include Tone Value increase chart and the option of utilizing a layered PDF to view combinations of channels.

ColorAnt will report the presence of optical brightener the deltaE variance and the corrective action needed to improve the measurement data.

Other features in ColorAnt are available via ColorLogic's **Online Help**.

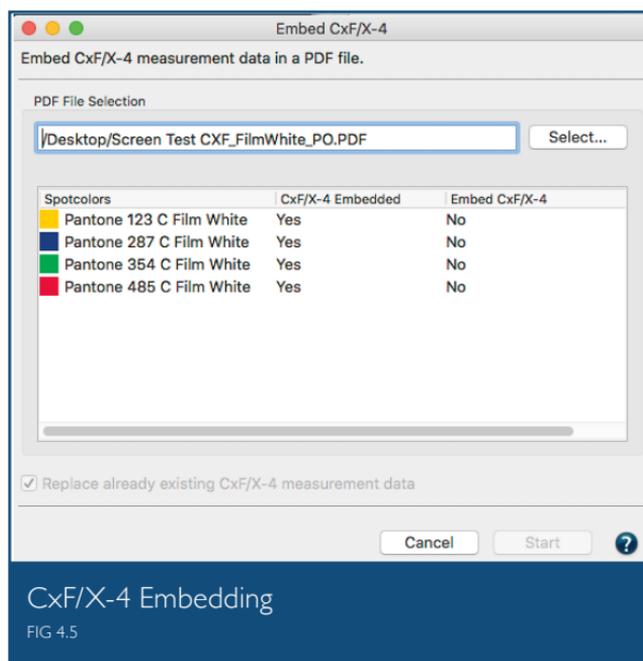
Embed CxF/X-4

Embeds CxF/X-4 compliant spectral data into pdf files. Embed CxF/X-4

is only available if the data selected in the **Data Sets** window contains spectral data that is compliant with the following standards:

CxF/X-4b single patch characterization (full tone only)

CxF/X-4a single background



characterization (full tone and gradient on white)

CxF/X-4 full characterization (full tone and gradient on white and black)

Quick Start Procedure

The tool will list all the spot colors in the PDF file vs the names that match the CxF/X-4 data (Fig 4.5). A warning message is displayed when conflicts occur.

When the spot colors match up, press **Start**.

EDITING TOOLS



Redundancies

Remove redundant patches



Tone Value

Correct data to a specific print condition



Correction

Detect and correct bad data



Rescale

Recalculate data to a different color chart



Smoothing

Smooth the characteristics of measurement data



Link

Combine separately measured charts



White/Black Correction

Correct to white and black point



CIE Conversion

Convert measurement data to a different viewing condition



Averaging

Average multiple data sets into one data set



Edit Primaries

Change primary colors and recalculate measurement data



ICC Transformation

Convert device data with ICC profiles



Color Editor

Convert spot colors to target profiles



Brightener

Correct for Optical Brighteners



Redundancies

Corrects color patches by averaging the redundant patches and replacing with the same value.

Correction

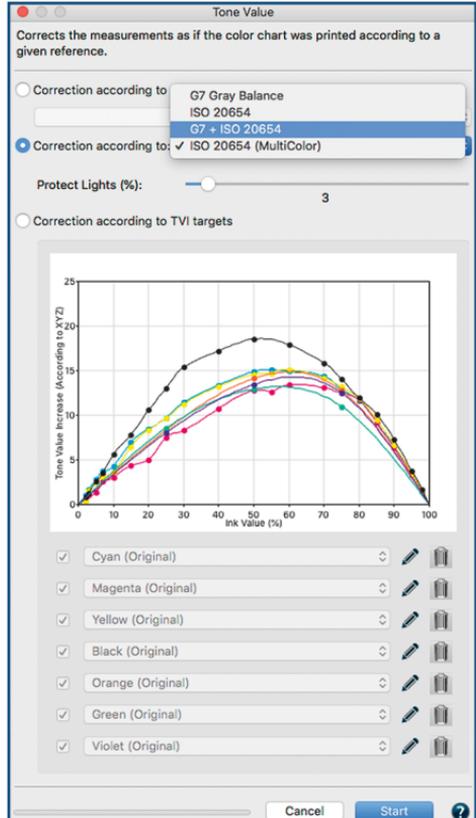
The **Correction** tool detects faulty measurements or inconsistent measured values and replaces the data with expected measurement values. Use the **Protect Lights** feature to exempt Flexo data bumps.

Smoothing

Corrects inhomogeneous measurement data and non-smooth curves by interpolating existing smoothed data. The **Auto** correction uses the maximum slider setting. Use the **Protect Lights** feature to exempt Flexo data bumps for being unintentionally smoothed.

White/Black Correction

Apply manual corrections to the most white and darkest color patches, typically the paper or other substrates. The **White/Black Correction** tool is designed to be used only on a single measurement file.



Tone Value Dialog

FIG 5.1

Brightener

Step one: Analysis

Brightener correction analyzes the remission curve of the paper white to ascertain whether the paper contains optical brighteners or blue-colored paper.

Step two: Correction

Correction will be applied if optical brightener has been detected. The correction can be adjusted via a slider control and at 100% setting, a similar result will be achieved as if the paper were measured with a UV cut filter.

Tone Value

The **Tone Value** tool corrects measurement data to a specific set of curves. Data is corrected with a "what if" the data was printed to (e.g. G7, ISO 20654 SCTV) specific conditions.

The **Protect Lights**

slider can be adjusted to accommodate the highlights of flexo data.

Three options are available:

Correct according to a given profile:

Specify a profile and measured values are adjusted to achieve the same tone value increase curves as those with the standard profile that was chosen.

Correction according to:

Tone value curves are calculated to match the requirements of **G7 Gray Balance, ISO 20654 (SCTV), G7 and ISO 20654 (SCTV) or ISO 20654 (SCTV) multicolor.**

Correction according to TVI targets

Manual editing of each channel (Fig 5.1) allows the user to predefine the tone value increases that should be incorporated in the measurement data.

Rescale

ColorAnt can calculate large test charts (Fig 5.2) that can be used for profiling from small chart measurement files. Some printing processes, (e.g. flexo printing on uneven ma-

terials) pose challenges to an artifact-free printing ECI2002 test chart. An effective approach to measuring large charts would be to

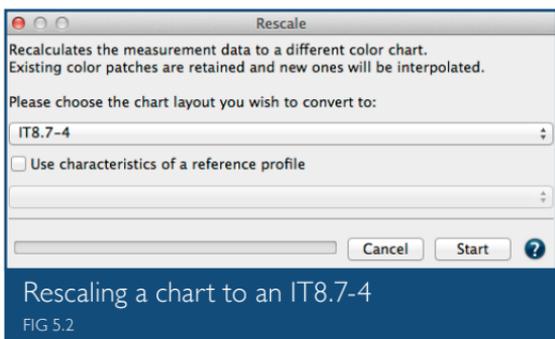
place several small test charts, e.g. ColorLogic Profile Updating strips on one page, measuring the test strips and, averaging them in ColorAnt and then scaling up to a large ECI2002 test chart with the **Rescale** tool.

Averaging

Average several measurement files (e.g. press runs) of the same test chart.

Link

Average multiple test charts into one large measurement file. The **Link** tool should be used in conjunction with the **Redundancies** tool.



ICC Transformation

Use both ICC device and DeviceLink profiles on reference data (device data like CMYK or RGB) to test the impact of an ICC color conversion with up to three profiles.

CIE Conversion

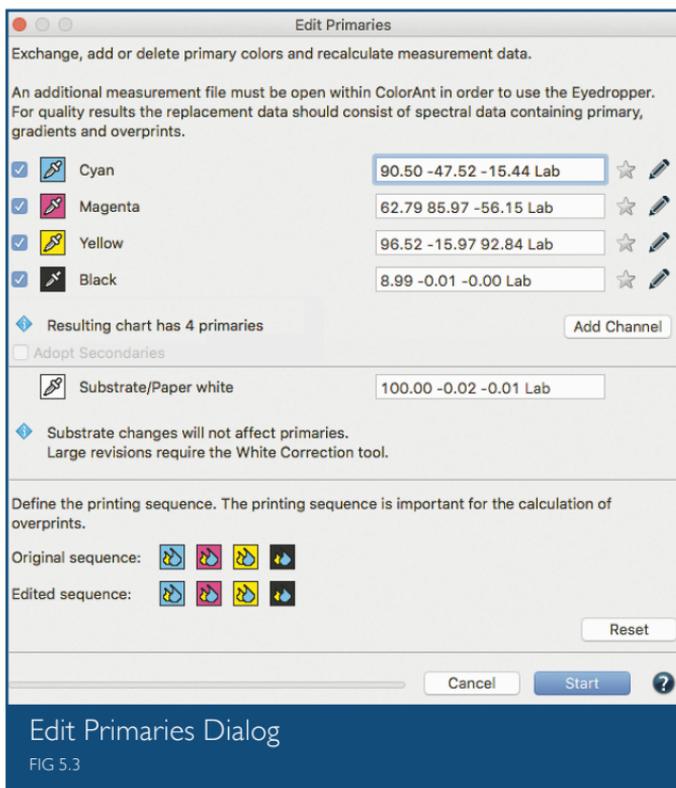
The CIE Conversion tool converts spectral remission data with a different Illuminant and Observer angles (e.g. D50, D65)

CIE Conversion also supports ambient light measurements from supported instruments via the **Measure Tool**. The readings can be saved separately for later use.

Edit Primaries

The **Edit Primaries** tool (Fig 5.3) allows users to add, remove, and exchange primaries or the paper/substrate in an existing measurement data. In typical print production, adding or swapping ink(s) requires the expense of printing a complete, full size test chart. The **Edit Primaries** tool simply requires the spectral data of the new ink(s) to be added or exchanged. **Edit Primaries** not only exchanges inks

but also recalculates all overprints based on intelligent spectral color models. One of the major features of the **Edit Primary** tool is the ability to dynamically choose the best patches from the data provided. The more complete the data that is provided to the **Edit Primaries** tool (spectral data is preferred) the more accurate the results. Items that will improve



are: the exchange of gradations of the primary color, overprint information, e.g the primary combined with black. If the data that was chosen contains overprints, such as secondary colors, the **Adapt Secondaries** feature will take the additional data into account.

Scenarios for potential efficiency gain with the **Edit Primaries** tool in production :

Modify channel names: Reorder channel names without modifying data

Variance in press condition: The characterization press run is slightly deficient in solid ink density or hue on one or more colors.

Exchange of paper/substrate: The inks are the same but a slightly different paper shall be used.

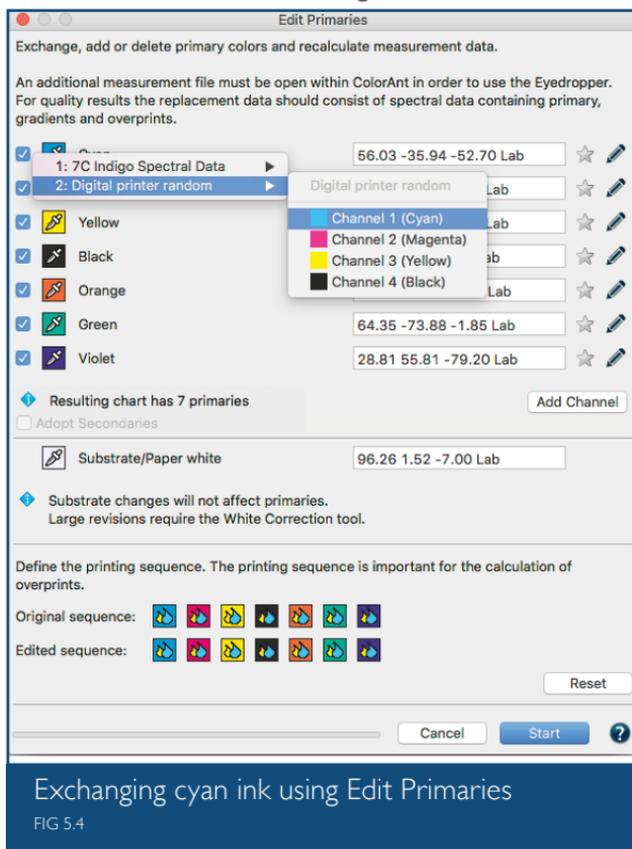
Exchanging inks in a print packaging production environment:

Create a new profile that swaps in e.g. Blue for a Cyan or a Rhodamine Red for Magenta.

Adjusting the print sequence: Allows improved overprint calculations.

Flexibility for the packaging manufacturer: Create different color variants from a full size 7 color press characterization data set by deleting channels to building new characterization data sets without

printing a new test chart. For example, from an original 7C data set (e.g. CMYK+Orange+Green+Violet) build variants for CMYK only, CMY+Violet, CMYK+Orange+Green or other



combinations. The production facility would need to ensure the press is stable and depending on the color needs of the job(s), and print select the profile with the least amount of channels.

Increasing CMYK gamut: Adding a 5th, 6th or 7th color to the CMYK printing process.

Using Edit Primaries

ColorLogic's suggested workflow:

Load another data set with the measured new primaries, gradations of the primaries and overprint information.

Select the measurement data of a test chart measurement file for editing and click **Edit Primary**.

Exchanging a primary:

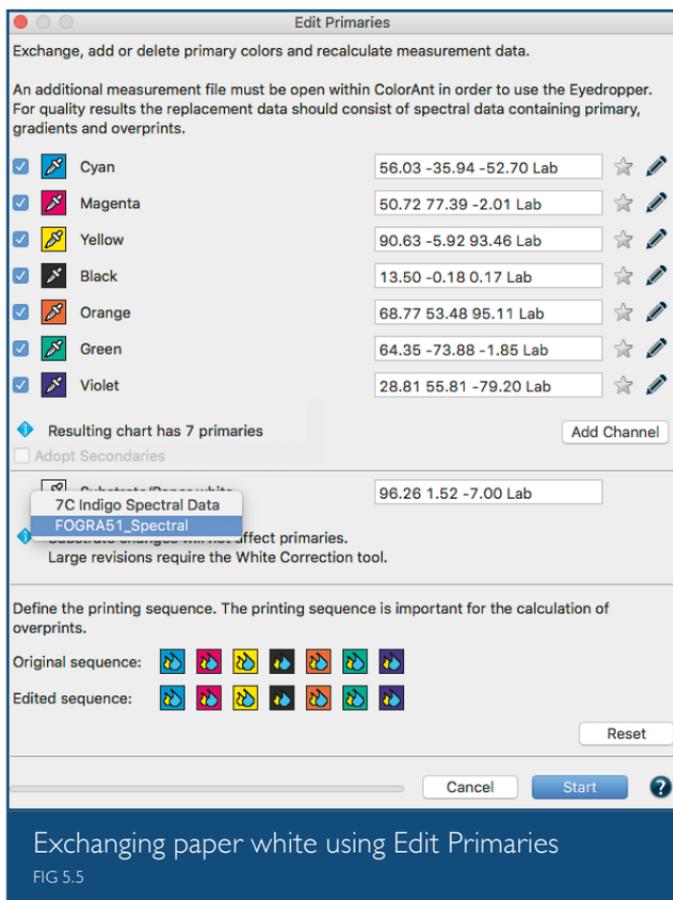
Click on the **eyedropper** icon of the color to be exchanged. Select the new primary from another data set loaded in ColorAnt. Click on the channel to be imported to the primary. The screenshot shown (Fig 5.4) with a new Cyan ink that is slightly different. Selecting ink from other channels is also possible.

Click **OK** and the data set will be modified.

Important: Using Lab values will not produce the highest quality results. ColorLogic recommends using spectral data. When a data set is present, enter a new Lab value for the selected color or select another channel from the same measurement data set

to change the printing order.

To check the exchange of primaries, use the **Compare** tool to verify the data.



Exchanging paper white using Edit Primaries

FIG 5.5

Exchange paper/substrate

Load the test chart measurement data and load the secondary file containing information of the measured paper white into ColorAnt.

Select the measurement data of a test chart for editing and click **Edit Primaries**.

Click on the **eyedropper** icon of the **Substrate/White** and select the new paper white from another data set loaded in ColorAnt (Fig 5.5) Click on the name of the data set to import the data. The second option is to manually enter the new Lab values in the text field.

Click **OK** and the data set will be modified.

For large differences in substrates, use the **White/Black correction** tool.

Adding channels

Load the test chart measurement data and load the secondary information with the measured primaries, gradation and overprint information into ColorAnt.

Select the measurement data of a test chart for editing and click **Edit Primaries**.

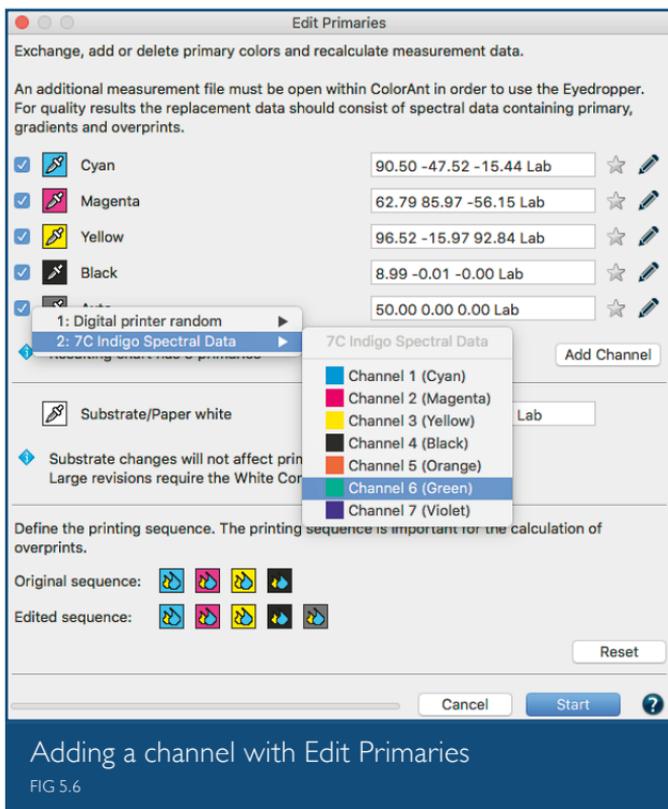
Quick Start Procedure

Step one: Click on **Add Channel**. A new channel with default gray Lab values and the channel name **Auto** is added.

Step two: Click on the **eyedropper** icon of the new channel and select the new primary from another data

set loaded in ColorAnt. Click on the **channel** to import the data.

The screenshot shows an example where a 5th Orange color (Fig 5.6) has been added to an original CMYK data set.



To rename the channel click on the **pencil** icon and enter the new channel name.

Step three: Click **OK** to generate the new data set.

To view the new data set, use the **View** tool and select the tabs **2D**, **3D**, **SpiderWeb**, **TVI** to verify all colors including overprints have been added. Additional edits can be made to the curves using the **Tone value** tool.

Removing channels

Load and select the measurement data of a test chart and click **Edit Primary**.

Disable the check boxes in front of the channels that need to be deleted and click **OK**.

The new data set will be reduced to the channels that were selected.

Color Editor

Used to edit color patches and to process color conversions of spot colors.

spot color library to a target profile for RGB, CMYK or Multicolor.

To convert spot colors to a desired target profile, first load the spot colors into the ColorAnt **Data Sets** section, e.g. a Pantone spot color library (or any supported file format such as CxF), then click on **Color Editor**. The window contains a table on the left showing all spot colors of the file and the editing options on the right. Select an ICC Profile from the drop down list and a calculation **Mode**.

Color	Measurement	Current (DCS)	Profile (DCS)
PANTONE Yellow C	89.4 - 2.6 11.7	24.2 23.1 100.0 0.0 0.0 0.0	24.2 23.1 100.0 0.0 0.0
PANTONE Yellow 012 C	87.5 4.0 113.8	0.8 5.2 100.0 0.0 3.8 0.0	0.8 5.2 100.0 0.0 3.8
PANTONE Orange 021 C	62.2 63.5 86.2	0.0 37.0 36.0 0.0 97.5 0.0	0.0 37.0 36.0 0.0 97.5
PANTONE Warm Red C	57.9 70.1 50.5	0.0 64.7 0.0 0.0 78.1 0.0	0.0 64.7 0.0 0.0 78.1
PANTONE Red 032 C	53.8 73.3 45.6	0.0 79.3 7.4 0.0 71.7 0.0	0.0 79.3 7.4 0.0 71.7
PANTONE Rubine Red C	43.3 77.5 8.6	13.8 100.0 30.4 2.0 4.2 0.0	13.8 100.0 30.4 2.0
PANTONE Rhodamine Red C	52.1 77.4 - 16.3	4.9 89.9 0.0 0.0 0.0 0.0	4.9 89.9 0.0 0.0 0.0
PANTONE Purple C	47.8 64.8 - 41.9	0.0 72.1 9.4 0.0 0.0 0.0	0.0 72.1 9.4 0.0 0.0
PANTONE Violet C	24.0 47.3 - 65.5	45.4 53.4 0.0 0.0 0.0 90.6	45.4 53.4 0.0 0.0 0.0
PANTONE Blue 072 C	19.7 38.1 - 77.6	0.0 0.0 0.0 0.0 23.8 100.0	99.9 50.5 5.7 19.0
PANTONE Reflex Blue C	19.0 25.9 - 67.8	99.7 48.7 15.7 10.9 0.0 0.0	99.7 48.7 15.7 10.9
PANTONE Process Blue C	48.8 - 33.0 - 53.9	100.0 20.6 7.7 0.5 0.0 0.0	100.0 20.6 7.7 0.5 0.0
PANTONE Green C	58.5 - 77.2 1.9	37.3 0.1 22.2 0.0 0.0 98.4	37.3 0.1 22.2 0.0 0.0
PANTONE Black C	15.6 15.5 2.7	63.6 65.9 73.8 85.0 0.0 0.0	63.6 65.9 73.8 85.0 0.0
PANTONE Process Yellow C	90.0 - 5.3 100.1	2.4 1.7 100.0 0.0 0.0 0.0	2.4 1.7 100.0 0.0 0.0
PANTONE Process Magenta C	45.9 75.4 - 0.3	10.1 99.8 13.0 0.8 0.0 0.0	10.1 99.8 13.0 0.8 0.0
PANTONE Process Cyan C	57.4 - 37.3 - 46.8	95.0 1.4 4.8 0.0 0.0 0.0	95.0 1.4 4.8 0.0 0.0
PANTONE Process Black C	11.0 0.4 - 0.1	79.3 75.6 66.9 91.5 0.0 0.0	79.3 75.6 66.9 91.5 0.0
PANTONE Hexachrome Yellow C	89.9 - 1.9 99.3	0.9 4.1 100.0 0.0 0.0 0.0	0.9 4.1 100.0 0.0 0.0
PANTONE Hexachrome Orange C	69.5 51.6 80.5	0.9 7.6 12.2 0.0 95.7 0.0	0.9 7.6 12.2 0.0 95.7
PANTONE Hexachrome Magenta C	49.7 81.3 - 12.6	9.5 96.4 0.0 0.0 0.0 0.0	9.5 96.4 0.0 0.0 0.0
PANTONE Hexachrome Cyan C	51.1 - 36.1 - 51.6	99.9 13.8 8.3 0.3 0.0 0.0	99.9 13.8 8.3 0.3 0.0
PANTONE Hexachrome Green C	76.1 - 75.7 - 35.5	43.7 0.0 71.6 0.0 0.0 78.2	43.7 0.0 71.6 0.0 0.0
PANTONE Hexachrome Black C	12.6 - 0.2 - 0.4	77.0 70.0 64.6 89.1 0.0 0.0	77.0 70.0 64.6 89.1 0.0
PANTONE 100 C	92.3 - 79 55.3	2.3 0.2 63.2 0.0 0.0 0.0	2.3 0.2 63.2 0.0 0.0
PANTONE 101 C	92.3 - 8.6 69.0	1.9 0.1 74.4 0.0 0.0 0.0	1.9 0.1 74.4 0.0 0.0
PANTONE 102 C	91.0 - 6.8 100.9	2.3 0.5 100.0 0.0 0.0 0.0	2.3 0.5 100.0 0.0 0.0
PANTONE 103 C	71.0 - 0.9 87.5	22.3 20.2 100.0 8.1 1.2 0.0	22.3 20.2 100.0 8.1
PANTONE 104 C	63.9 - 1.7 72.2	28.4 21.8 100.0 16.0 8.0 0.0	28.4 21.8 100.0 16.0
PANTONE 105 C	51.1 - 2.0 45.8	34.9 28.9 96.1 32.8 13.0 0.0	34.9 28.9 96.1 32.8
PANTONE 106 C	90.8 - 5.3 69.8	1.9 0.8 75.6 0.0 1.9 0.0	1.9 0.8 75.6 0.0 1.9
PANTONE 107 C	89.6 - 3.2 84.4	1.5 3.0 89.5 0.0 1.8 0.0	1.5 3.0 89.5 0.0 1.8

Color Editor dialog

FIG 5.7

Quick Start Procedure

Color Editor allows the user to:

Edit patch names, (Fig 5.7) Lab values or device color values (DCS).

Convert and optimize a complete

Three modes are available:

Precise Match - Proofing

Visual Match - Utilize More Channels

Use the Least Amount of Channels

The preset dE Limit highlights colors that exceed the defined threshold

If a color is selected from the table, the device color values for each channel of the selected profile are

color and can even enter device values manually. By clicking on **Start**, the entire list of colors is generated

The screenshot shows the Color Editor interface. On the left is a table of color data with columns for device values and a 'Delete' button below it. The main panel is divided into several sections:

- Color Conversion Settings:** Profile: 7C_Indigo_Corrected.icc, Mode: Precise Match - Proofing, dE00 Limit: 3.0
- Optimize Output Values:** Checkboxes for Cyan, Yellow, Orange, Violet, Magenta, Black, and Green, each with a numerical input field.
- Color Information:** A table showing Lab, dE76, and dE00 values for Reference, Profile, and Current colors, along with a color swatch.

Buttons for 'Revert', 'Automatic', 'dE76', 'dE00', 'Cancel', and 'Start' are visible at the bottom.

Color	Lab	dE76	dE00
Reference	19.7 38.1 -77.6	-	-
Profile	25.3 16.6 -56.5	30.6	7.9
Current	21.2 36.7 -76.3	2.5	1.1

Color Editor correct data to a profile

FIG 5.8

shown under **Optimize Destination Values**. As a default, the device values calculated via the ICC profile are shown without any optimization. By clicking on dE76 or dE00 the deltaE can be minimized (Fig 5.8) for each color. Clicking on **Automatic** applies the selected calculation Mode which typically results in a reduced amount of channels for better print-ability. Users can optimize each individual

in the **Data Sets** section including the calculated and possibly optimized device color values. The values can be saved for further usage in other applications in any format supported by ColorAnt (CGATS TXT and XML, CXF3, Photoshop ASE and ACO, named color ICC profile or GMG CSC).

ColorAnt 

CoRA 

DLS 

ZeRA 

COLOR
Logic

ColorLogic GmbH

www.colorlogic.de
info@colorlogic.de

CROSS COLOR
Inc.

CrossXColor, Inc.

www.crossxcolor.com
info@crossxcolor.com