

MEASURE.

OPTIMIZE.

ColorAnt 6

Quick Start Guide

COLOR
Logic

Color **Focused.** Technology **Driven.**

Quick Start Guide for ColorAnt 6

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Introduction

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

ColorAnt, the ultimate color management solution

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 before creating a profile.

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 higher production safety.

ColorAnt's Online Help

The question mark **?** (bottom right in all program windows) opens the Online Help. This is context-sensitive, so if you click **?** in the **Redundancies** tool, the **Redundancies** online help page opens. The online help contains more detailed information about the various functions of this application.

Automatic Updates

ColorAnt can automatically search for new versions of the application at program start. Activate or deactivate the automatic update check under **Help > Check for Update**.

Enjoy analyzing and optimizing your measurement data!

Your ColorLogic Team

INSTALLING COLORANT



Getting Started with ColorAnt

Installation and licensing



Install Color

Standard Install on "M

This will take 156.3

Click Install to perfo
on the disk "Macint

Customize

System Requirements

macOS:

10.9 or higher; Measure Tool runs in 64-bit mode

Windows:

Windows XP, Vista, Windows 7, Windows 8, Windows 10; ColorAnt and Measure Tool run in 32-bit mode

Installation

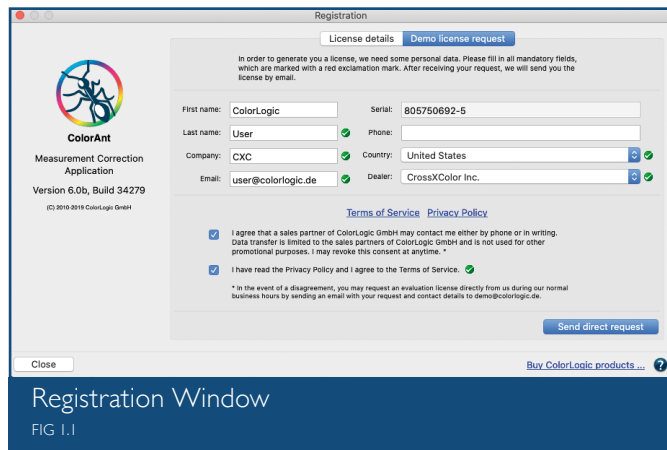
Begin installation by double-clicking on the installation package. The default installation directory for the application is either in the folder **Applications** (macOS) or **Programs** (Windows).

After accepting the Software License Agreement, select the destination volume and choose between a **Standard Installation** or a **Custom Installation**. Standard Installation installs all components (e.g., the – or ColorAnt).

Computer vs USB dongle License

Computer-based Licenses are tied to the computer on which the software (CoPrA, ZePrA or ColorAnt) is installed. This is useful for temporary test purposes. Computer-based licenses are also required if the computer lacks a USB port or space for a USB dongle, i.e., a rack server.

USB Dongle Licenses are serial-



ized to the dongle. The USB dongle communicates with the appropriate software license and enables the software to be used on different computers. To assign the license to the USB dongle, it must be connected to the computer before starting the software.

Demo Licenses

ColorLogic offers 14-day trial licenses for the applications CoPrA, ZePrA and ColorAnt, allowing the user to evaluate the software features and performance.

Requesting a Demo License

1. Click on **Registration** in the lower left corner of the sidebar.
2. Click on the tab **Demo license request**.
3. Enter all the required information.
4. After selecting the country, the software shows a list of available dealers in that region. Select a dealer and click on **Send direct request**. The demo license will be sent to the specified email address within a few minutes.

5. Save the license file (*.lic) contained in the email on the targeted computer that CoPrA is installed.
6. **Load** the license file in the tab **License details** under **Registration** to activate the respective application.
7. The expiration date of demo licenses is shown under **License details** on the lower right of the application window.

Restrictions with Demo Licenses

All profiles created with a demo license in CoPrA are encrypted and can only be used in ColorLogic applications.

All files converted with a demo license in ZePrA are watermark protected. If it becomes necessary to test ZePrA within a workflow without the watermark during the test period, contact your dealer for instructions.

Purchasing ColorLogic Products

Please contact a dealer in your region. The dealer list is available

under <https://colorlogic.de/en/contact/>.

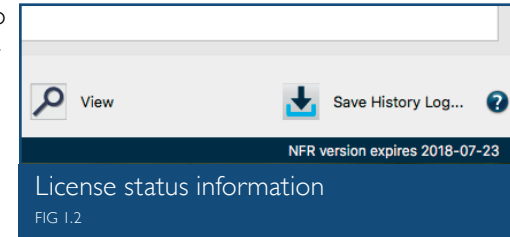
Alternatively, start the demo version of the application you would like to

purchase. Click on **Buy ColorLogic products** in the bottom right corner of the **Registration** window.

Activating the License

A permanent license will be provided by your dealer after purchasing the application.

Load the license file in the tab **License details** under **Registration** to activate the application.



Available Packages

The available ColorAnt packages include features that address every aspect of measurement data correction.

ColorAnt PACKAGES	
COLORANT M	COLORANT L
STANDARD FEATURES	All Features of ColorAnt M
View, Compare, Report	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 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	

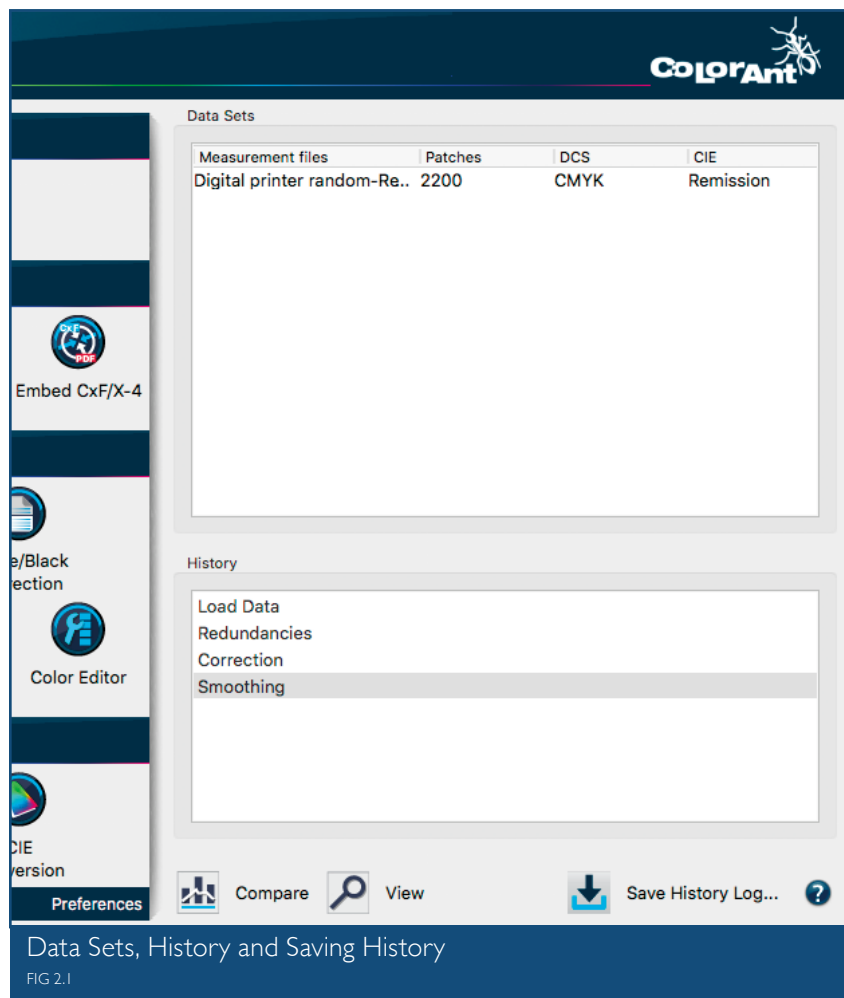




ColorAnt's Sidebar

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





Data Sets

Displays relevant information about the measurement data: Number of **Patches**, **DCS** (color model: Lab, CMYK, RGB, Multicolor) and measurement type **CIE** (colorimetric = **Lab**, spectral = **Remission**) (Fig 2.1).

History

Shows the tools and corrections applied to the measurement data of each editing step and allows switching between different editing states of a file. By clicking on an entry in the **History** window (either above or below the current status) an individual processing step can be accessed and checked, for example, in the **View** window.

Save History Log and Averaging Report

Save History Log is available at the bottom right of the main dialog (Fig 2.3). It saves all modifications applied to all files in a detailed PDF document. When double-clicking a 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 (Fig 2.2) contains 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 recognize colors with large deviations which would not be obvious by visually confirming values.

View and Compare Data

Advanced viewing options for ColorAnt's tools are located at the bottom of the main window enabling

both the inspection of measurement data (**View**) and the pre- and post-comparison of measurement

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) (±0.17)	0.29 dH (±0.18) (±0.11) (±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

data (**Compare**).

To view measurement data, select the data in the **Data Sets** area and open the **View** window. Five different options allow for a quick overview of all color patches in the measurement

file: the **2D** view shows the reference and the corresponding Lab values for each patch, **3D** shows a rotating view of the color space, **TVI** displays the curves for each channel, **Spider Web** for a top down view, and **Curves** for various gradations and various curves of gradations.

Color filters: Using the checkboxes, colors can be selectively displayed in 2D and 3D view. All other color patches are then hidden. This allows you to immediately find selected colors in the test chart layout of the 2D view.


The **3D** view displays the color body defined by the color filters. This way, the **Full Primaries**, **Limits**, **Primaries**, **Secondaries**, **White or Black** can be viewed separately. With Multicolor data, it is easy to recognize in which areas the additional colors extend the color body compared to CMY or CMYK.

There are some dependencies between the color filters, so selecting a certain color filter may automatically activate another color filter (or even several others). For example, if the **Secondaries** checkbox is activated, the **Primaries** and **White** color filters are also automatically activated. They can be deactivated if only two color combinations

(Secondaries) are to be highlighted.

Color channels: By selecting color channels, either all color patches or only the color patches of the selected color channels can be displayed. Color channels can be combined

Duplex and triplex colors can be displayed by individual selection of suitable color channels (for example, **Cyan** + **Black** shows duplex colors and **Cyan** + **Magenta** + **Black** shows triplex colors).



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	CoPAK
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
DeltaE 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
DeltaE method:	Delta-Auto
Protect lights (%):	0

ColorAnt History Log

FIG 2.3

with color filters so that, for example, only the Multicolor **Primaries** or **Secondaries** can be displayed.

2D View

Color filters highlight selected colors. View full primaries, limits, selected channels, primaries, secondaries, paper white or black. Individual color patches can be edited or deleted by selecting the patch and right-clicking to open a context menu.

3D View

Turn the color patches into the desired direction by clicking and dragging. By dragging the gamut, the color space is rotated in that direction. Increase or decrease the view by using the right side **Zoom** slider. Enlarge or minimize the color patches by using the **Point Size** slider.

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MAIN WINDOW

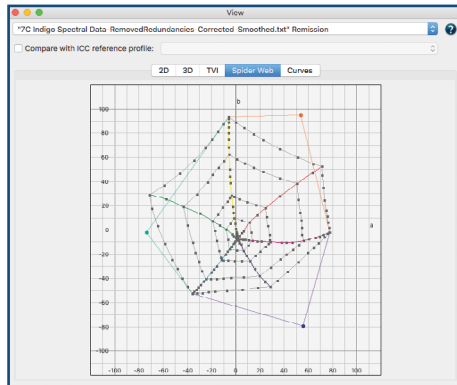
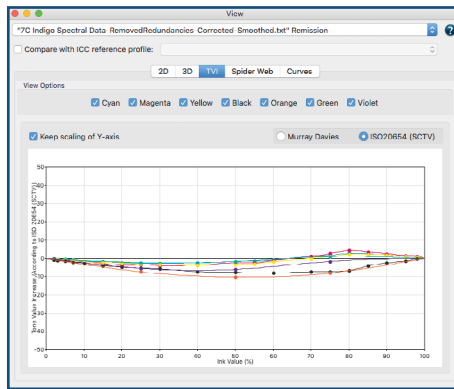
ColorLogic

ColorLogic

MAIN WINDOW

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

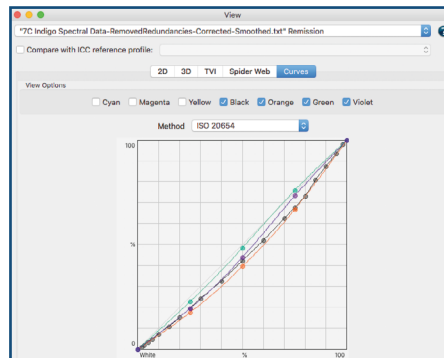


Spider Web

The **Spider Web** provides a top view of the color space in an 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

Automatic Correction

The Auto feature optimizes measurement data by applying the following tools in the specified order:

1. **Redundancies:** Clean up redundant color patches
2. **Correction:** Correcting faulty measurement values
3. **Smoothing:** 50% slider setting with no protection of highlights

Each tool that is applied is displayed in the **History** section. ColorLogic recommends to create a **Report** for detailed results and further recommendations on your measurement data.

Using Auto is the fastest method to get high quality results

Procedure

1. Load measurement data by drag-and-drop onto the **Data Sets** area or via **File > Open**.
2. Click **Auto** and then **Start**. The corrections applied to the data are displayed under **History**.
3. Save the optimized measurement data as a new file via **File > Save as**. Use the optimized measurement data in profiling software such as ColorLogic's CoPrA to create high

quality ICC printer profiles.

Measure

Measurement data is acquired with the **Measure Tool** and transferred to ColorAnt. Measurement data files are stored in the folder Users/Documents/ColorAnt/MeasurementData. The **Data Sets** section of the main window 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).

Sidebar tools will be highlighted when applicable to the measurement data, tools which are not applicable are grayed out. Use the tools by first highlighting the data (multiple files can be selected, e.g., by 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.

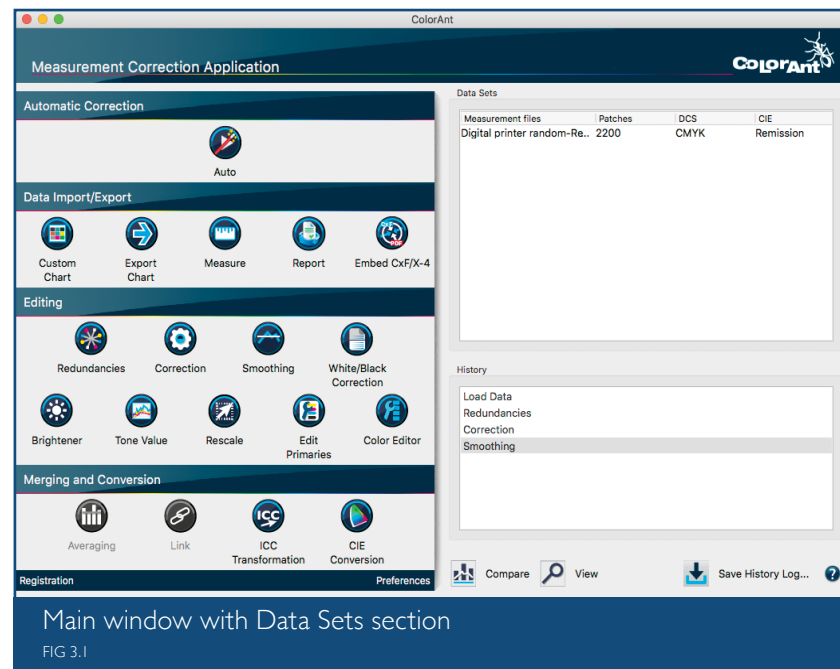
View and Compare Data

View

The **View** window provides plenty of features that facilitate the evaluation of measurement data. Filters allow the combining of individual channels. Combinations of 2, 3, 4, 5 or 6 channels, as well as one and two channels in combination with black, can be

Compare

The **Color Comparison** window shows measurement data (Fig 3.2) before and after optimization. It can also be used to view the actions taken to optimize the data (e.g., File Name Correction, File Name Smoothing). Filters allow the combination of individual channels which are to be compared.



faded in and out. These filters are available in **2D** and **3D** view.

The number of displayed color patches is shown on the left, i.e., if one or more filters are selected, the number of affected color patches as well as the total number of patches is shown on the left.

The **Mark from** and **Mark to** slider displays various levels of DeltaE deviations.

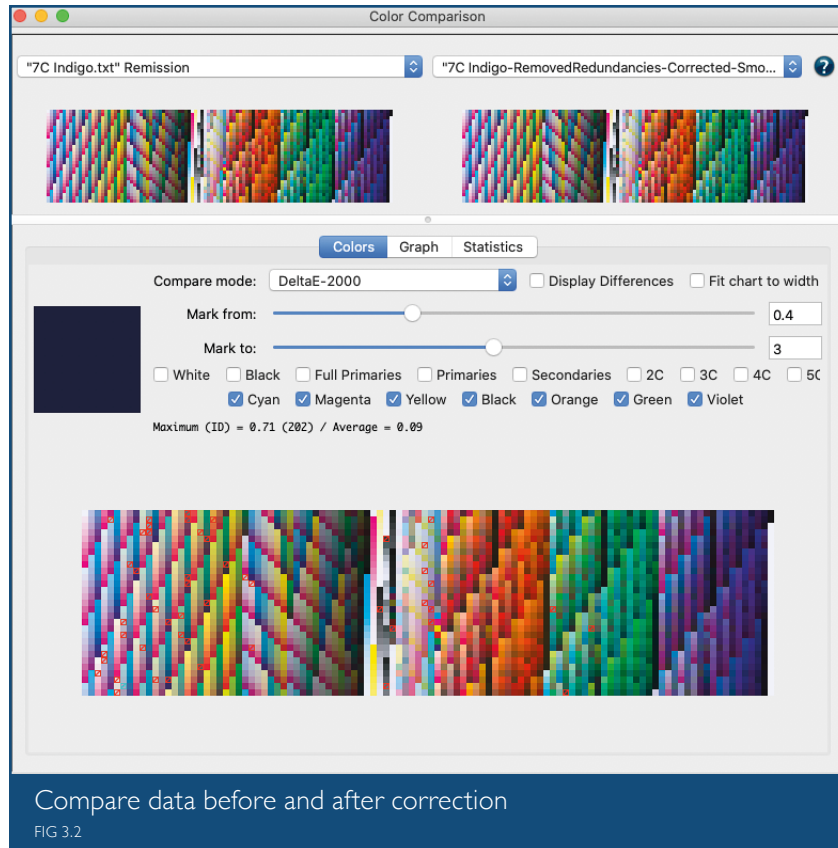
Save or export measurement data

The name of every tool applied to correct or optimize data is appended to the name of the data set (e.g., Data_smoothed_corrected). Save

the optimized measurement data with **File > Save As**. Additional export options allow conversion of spectral data to **Lab** or **Density** only. Other **Save As** options include

Generate Reports

ColorLogic recommends using the **Report** tool both on the initial data import and after the measurement



CGATS compatible TXT file, CGATS XML, Named Color ICC profile, CxF compatible CxF file format, Photoshop ACO, color table, Adobe ASE or as GMG CSC file.

data has been optimized.

DATA IMPORT & EXPORT



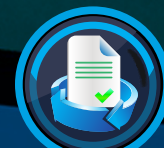
Custom Chart
Generate custom test charts



Measure
Measure printed charts or ambient light



Export Charts
Export custom charts for printing and measuring



Report
Create detailed reports on measurement data



Embed CxF/X-4
Embed CxF/X-4 data in PDF files

Custom Chart

The **Custom Chart** tool is designed to create reference files for test chart generation. A custom test chart for profiling requires a reference file containing the device data for the color space.

Note: Creating multicolor charts requires a ColorAnt L license.

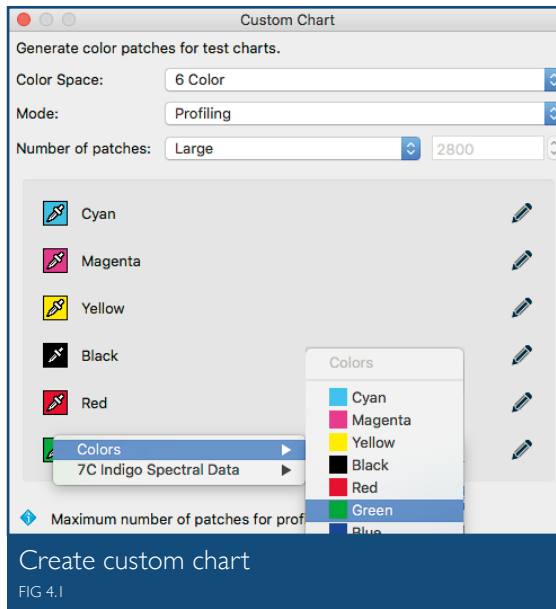
Depending on the selection of color space, the **Custom Chart** dialog provides several options:

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

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

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 channels. To



exchange the 5th 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: Select one of the presets

based on the purpose of the test chart: **Profiling**, **Flexo Profiling**, **Profile Updating**, **Linearization** or **CxF/X-4 Wedge**.

Number of patches: Affects how

precisely the device color space will be filled with color patches. Please consider the available space on your output, the required accuracy of the characterization data and the capabilities of your printer. Available choices are **Large**, **Medium** and **Small** test charts and a **Custom** option which allows entering a specific number of patches (the **Custom** option is not available for CxF/X-4).

Note: The **Custom Chart** tool works even with only a few patches. The color space is covered in the best possible way to allow proper profile creation.

Changing or defining the channel names

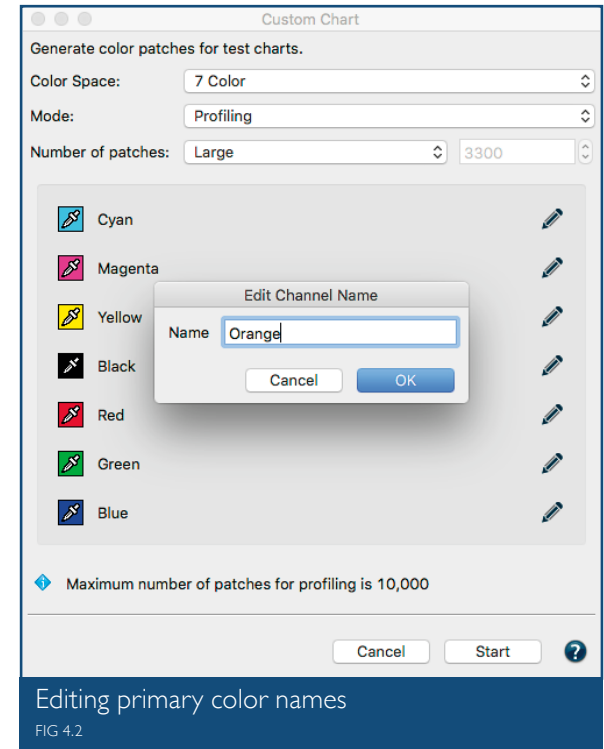
To change channel names, click the **Pencil** icon, e.g., click the Green channel and type in the new name as shown in fig 4.2.

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



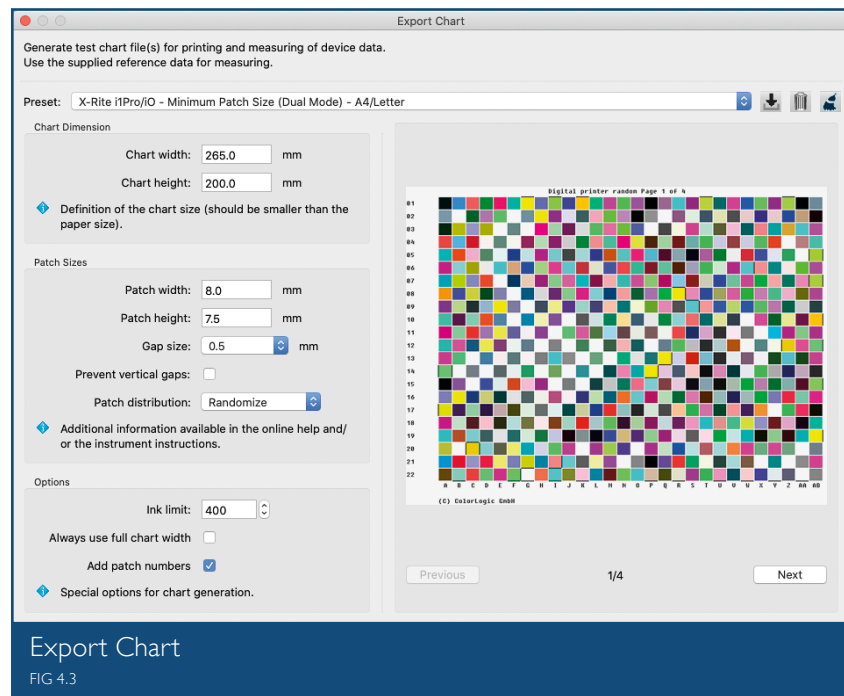
settings that provide a starting point for typical use cases to create **Linearization** test charts, **Profiling** test charts, special profiling test charts for **Flexo printing** and **Profile Updating**. The **Number of Patches** feature chooses the optimal number of patches for specific profiling situations.

Note: This option is useful for difficult print processes that are challenging to profile. 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

deleted. The largest section covers options for **Chart Dimensions**, **Patch Sizes** and additional **Options**. The section on the bottom provides information on the number of files to be created with the chosen Preset, settings and buttons to **Cancel** or create (**Start**) the test charts. The tool is optimized to work with most



reference file and click **Export Chart**.

Export Chart

Export Chart creates test charts based on device color values (e.g., RGB, CMYK, 7 Color etc.), which can be stored as PDF, TIFF or PSD files.

At the top a **Preset** covering all settings can be selected and manual presets can be created, saved or

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.

Ink Limit takes into account printing processes that can't handle 400% ink

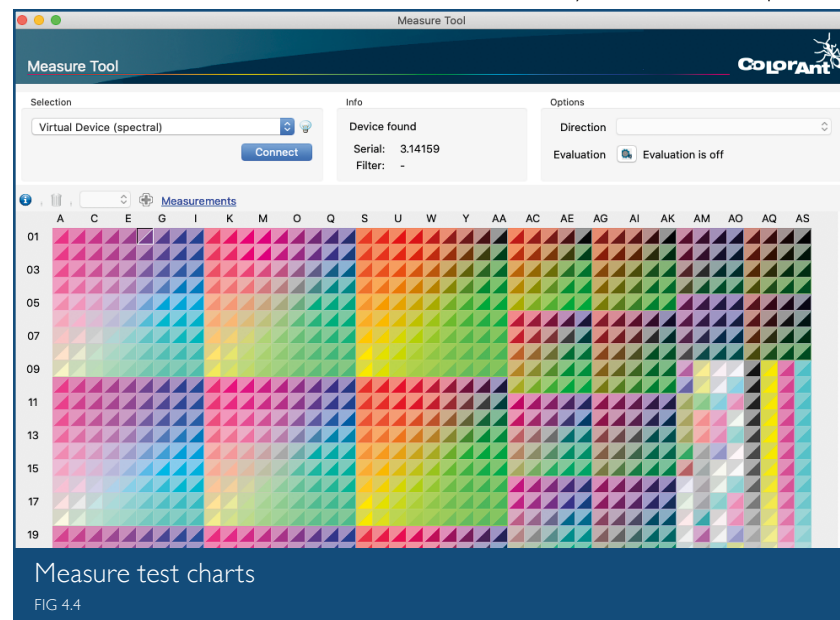
on paper/substrate. Typically each of ColorLogic's CMYK and multicolor test charts have patches with a maximum of 400% ink. If a 400% ink limit is too high for the press, or the user would like to define another ink limit, the user can enter the desired Ink Limit. The resulting chart will have ink limit integrated. Use the exported reference file for measuring and profiling.

Measure

ColorAnt's **Measure Tool** is used to measure test charts for profile creation.

Measuring test charts

1. Select **Measure** from the sidebar.
2. Select the measurement device under **Selection** and the measuring mode (**M0**, **M1**, **M2** or **M3**).
3. Connect your device and open the



Procedure

Step one: Select the reference file with the required device color values.

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

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

test chart. Charts can be opened via the **File** menu via the **Recently used files** and **Predefined Charts** entries. Your own charts can be added to the list by placing them in the ColorAnt **Wedges** folder (User\Documents\ColorAnt\Wedges). Alternatively, simply load a reference file or drag-and-drop it onto the window.

4. Select the **Direction** of scanning:

Patches - Line by line, Patches - Column by column, Scan Rows or Scan Columns.

5. Begin measuring: Follow the instructions of your measurement device. For the virtual device, double click the first patch to start the measurement.

6. Transmit Data: When measuring is completed, click the **Transmit** icon to transfer the data into ColorAnt's **Data Sets** section.

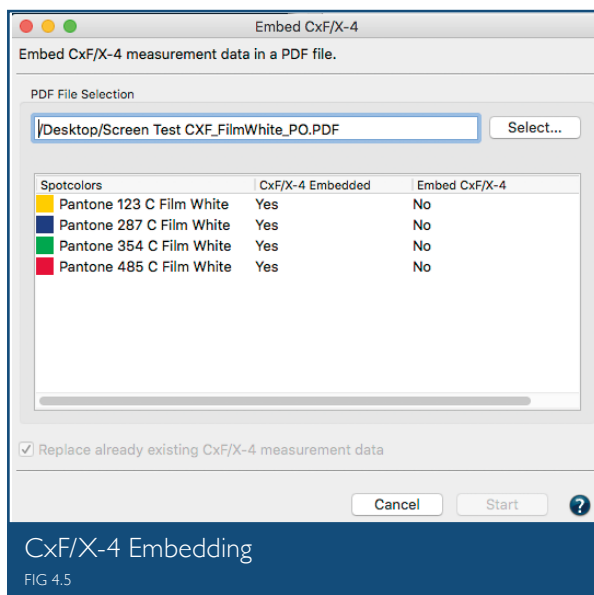
Report

A **Report** offers detailed information for measurement data analysis and provides recommendations for measurement data corrections. It can be used to verify and graphically display the data, and is therefore a powerful feature to document which types of corrections are necessary for the measurement data.

The various report pages provide an insight into the **Tonal Value Increase Curves**, the gamut representation (**Spider Web**) as well as the results of the test on the matching of redundant color patches (**Quality Evaluation** section), measurement or printing errors and the smoothness of the measurement file.

Embed CxF/X-4

Allows to embed spectral measurement data of spot colors (compliant with CxF/X-4) in a PDF file so that other CxF/X-4 compatible tools (e.g., ZePrA) are able to extract or use this data.



Procedure

Open the PDF/X file. The tool lists all spot colors of the PDF file, checks for spot color names that fit those of the CxF/X-4 measurement data and warns in case of conflicts. The data will only be embedded if the spot color names of the PDF file fit those of the CxF/X-4 file (Fig 4.5). When the spot colors match up, click on **Start**.

EDITING



Redundancies

Remove redundant patches



Tone Value

Correct data to a specific set of curves



Correction

Detect and correct inconsistent data



Rescale

Recalculate data to a different color chart



Smoothing

Smooth and correct uneven curves



Edit Primaries

Add, remove, or exchange primaries and recalculate data



White/Black Correction

Correct white and black points



Color Editor

Edit colors to match a reference file



Brightener

Correct data for optical brighteners

MERGING & CONVERSION



Averaging

Average multiple data sets into one data set



ICC Transformation

Use ICC device and DeviceLink profiles to test impact on data



Link

Combine multiple charts into one measurement file



CIE Conversion

Convert measurement data to a different viewing condition

Redundancies

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

Correction

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.

Brightener

Step one: Analysis

Brightener corrects and analyzes the

remission curve of the paper white to determine whether the paper contains optical brighteners or is merely a blue-colored paper.

Step two: Correction

Correction will be applied when 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

Corrects measurement data to a specific set of curves. Data is corrected according to specific conditions (e.g., G7, ISO 20654 SCTV). The **Protect Lights** slider can be adjusted to protect the highlights of flexo data. Correction curves can be exported as Photoshop gradation curves (ACV) and as XML according to ISO 18620 to be used in either Adobe Photoshop or any external RIP software that supports the ISO 18620 standard.

Three options are available:

Correction according to a given profile:

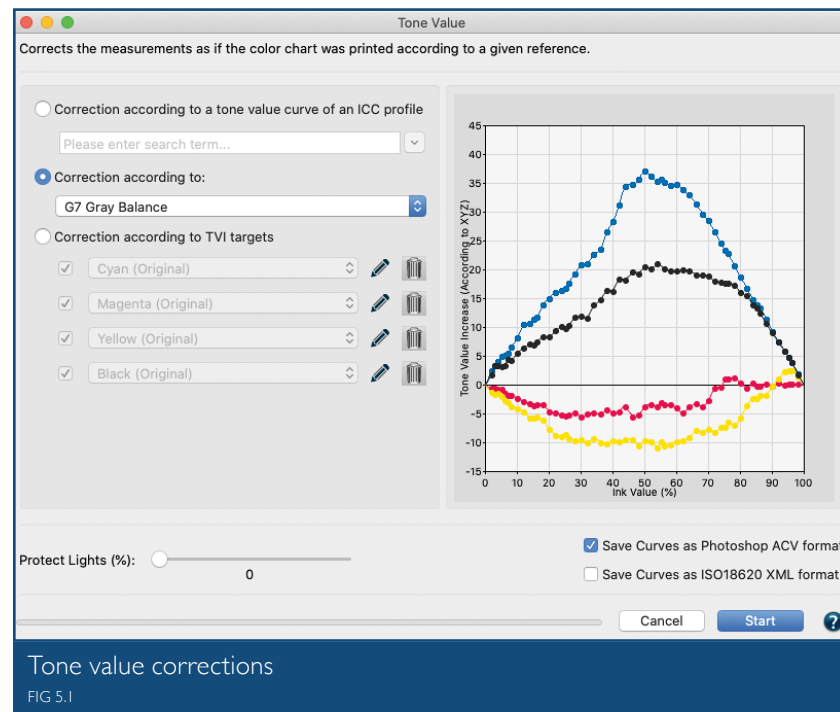
Specify a profile and the measured values are adjusted to achieve the same tone value increase curves as those of the selected profile.

Correction according to:

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

Correction according to TVI targets:

printing on uneven materials) it can be challenging to achieve artifact-free printing of a large test chart. An effective approach to measuring large charts is to place several small test strips on a single page, measure, average and scale up the test strips to a large ECI2002 test chart using the **Rescale** tool.



Manual editing of each channel (Fig 5.1) allows predefining the increases in tone value to be incorporated in the measurement data

Rescale

ColorAnt can calculate a large test chart based on several measurement files from small test charts. In some printing processes, (e.g., flexo

Averaging

Average several measurement files (e.g., press runs) of the same test chart and combine them to form a data set.

Link

Combine multiple data sets into a single large data set. We recommend to verify the obtained data using the View tool and to optimize the data with either the **Auto** function or the **Redundancies** tool.

ICC Transformation

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

CIE Conversion

Convert spectral measurement data into another viewing condition. The spectral data are converted to Lab during CIE conversion with the set illumination and the selected observer.

Edit Primaries

Add, remove, and exchange primaries or the paper/substrate in existing measurement data (Fig 5.2).

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. It also recalculates all overprints based on intelligent spectral color models. One of the major features is its ability to dynamically choose the best patches from the data provided. The more complete the provided data, the more accurate the results. This improves the exchange of gradations of the primary color and overprint information, e.g., the primary com-

bined with black. If the selected data 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 colors, e.g., Blue for Cyan or 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), 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.

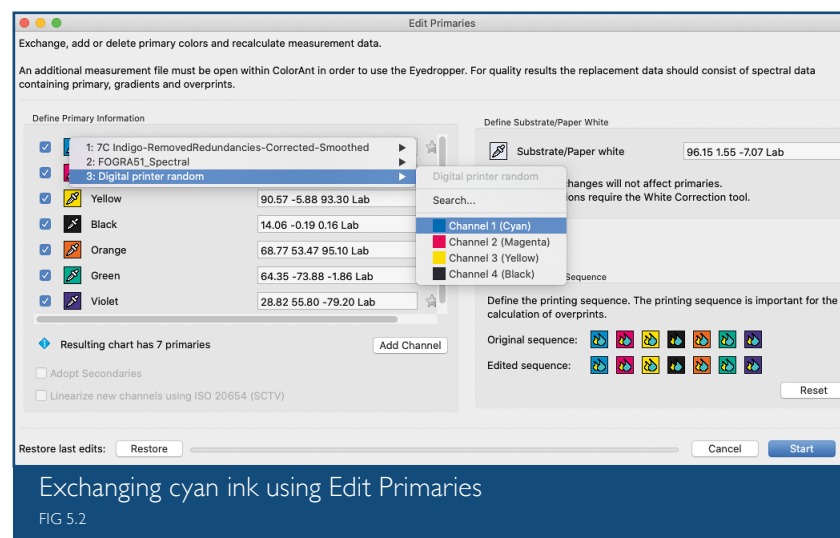
Using Edit Primaries

We suggest loading another data set with the measured new primaries, gradations of the primaries and overprint information. Select the measurement data of a test chart

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.

Verify the exchange of primaries with the **Compare** tool.



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. Fig 5.2 shows a new Cyan ink that is slightly different. Selecting ink from other

Exchange paper/substrate

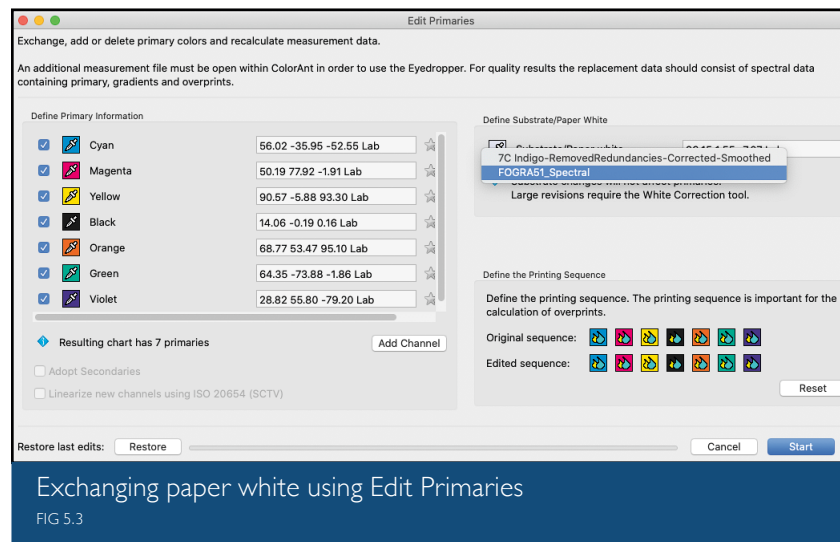
Load the test chart measurement data and load the secondary file containing information of the measured paper white into ColorAnt.

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

Click on the **Eyedropper** icon of the **Substrate/Paper white** and select the new paper white from another data set loaded in ColorAnt (Fig 5.3). 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.

channel with default gray Lab values and the channel name **Auto** is added.
4. 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. Fig 5.4 shows an example where a 5th Orange color has been added to an original CMYK data set. To rename the channel click on the **Pencil** icon and enter the new channel name. The new channel can be linearized according to the ISO 20654 (SCTV) standard by selecting



Exchanging paper white using Edit Primaries

FIG 5.3

Adding channels

1. Load the test chart measurement data and load the secondary information with the measured primaries, gradation and overprint information into ColorAnt.
2. Select the measurement data you would like to edit and click **Edit Primaries**.
3. Click on **Add Channel**. A new

the checkbox.

5. Click **OK** to generate the new data set. To view the new data set, use the **View** tool and select the tabs **2D**, **3D**, **Spider Web** and **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 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 selected channels.

Color Editor

Edit color patches and process color conversions of spot colors.

Procedure

The **Color Editor** allows the user to

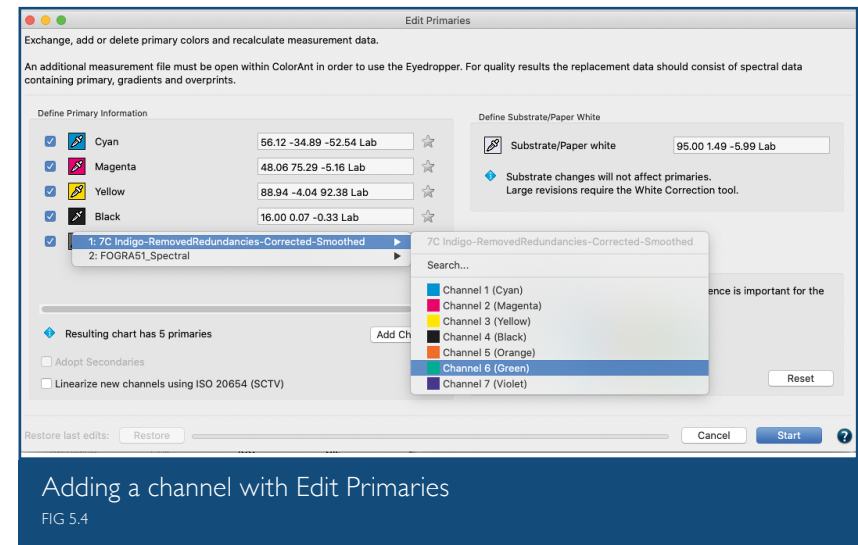
such as CxF), then click on **Color Editor**.

The window contains a table on the left showing all spot colors of the file and editing options on the right.

Select an ICC Profile from the drop-down list and a calculation **Mode**.

Six modes are available:

1. **Precise Match - Proofing**
2. **Visual Match - Utilize More Channels**
3. **Use the Least Amount of**



Adding a channel with Edit Primaries

FIG 5.4

edit patch names (Fig 5.5), Lab values or device color values (DCS).

Convert and optimize a complete 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

Channels

4. **Use one Output Channel only**
5. **Use a Maximum of two Channels**
6. **Use a Maximum of three 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 shown under **Optimize Destination 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).

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 5.6) for each color.

Clicking on **Automatic** applies the selected calculation **Mode** which typically results in a reduced amount of channels for better printability. Users can optimize each individual

Color Editor

Color	Measurement	Current (D50)	Profile (D50)	dE
PANTONE Yellow C	89.4 -2.8 111.7	24.2 2.3 100.0 0.0 0.0 0.0...	24.2 2.3 100.0 0.0 0.0...	4.1
PANTONE Yellow 012 C	87.8 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...	5.0
PANTONE Orange 021 C	62.2 63.5 86.2	0.0 37.0 36.0 0.0 97.5 0.0 0.0...	0.0 37.0 36.0 0.0 97.5 0.0...	1.2
PANTONE Warm Red C	57.9 70.1 50.5	0.0 64.7 0.0 0.0 78.1 0.0 0.0...	0.0 64.7 0.0 0.0 78.1 0.0...	2.2
PANTONE Red 032 C	53.8 73.7 45.6	0.0 79.3 7.4 0.0 71.7 0.0 0.0...	0.0 79.3 7.4 0.0 71.7 0.0...	1.7
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...	3.1
PANTONE Rhodamine Red C	52.1 77.4 -16.3	4.9 89.9 0.0 0.0 0.0 0.0 1.1...	4.9 89.9 0.0 0.0 0.0 0.0...	4.1
PANTONE Purple C	47.8 64.8 -41.9	0.0 72.1 9.4 0.0 0.0 0.0 6.1...	0.0 72.1 9.4 0.0 0.0 0.0...	9.8
PANTONE Violet C	24.0 47.3 -65.5	45.4 53.4 0.0 0.0 0.0 0.0 90.6...	45.4 53.4 0.0 0.0 0.0 0.0...	1.7
PANTONE Blue 072 C	19.7 38.1 -77.6	0.0 0.0 0.0 0.0 0.0 23.8 100.0...	0.0 0.0 0.0 0.0 0.0 23.8 100.0...	1.1
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...	6.1
PANTONE Process Blue C	48.8 -53.0 -53.9	100.0 20.6 7.7 0.5 0.0 0.0 0.0...	100.0 20.6 7.7 0.5 0.0 0.0...	3.0
PANTONE Green C	58.5 -77.2 1.9	37.3 0.1 22.2 0.0 0.0 98.4 0.0...	37.3 0.1 22.2 0.0 0.0 98.4...	0.8
PANTONE Black C	15.6 1.5 2.7	63.6 65.9 73.8 85.0 0.0 0.0 0.0...	63.6 65.9 73.8 85.0 0.0...	0.7
PANTONE Process Yellow C	90.0 -5.3 100.1	24.1 7.0 100.0 0.0 0.0 0.0 0.0...	24.1 7.0 100.0 0.0 0.0 0.0...	1.8
PANTONE Process Magenta C	45.9 75.4 -0.3	101.9 98.6 12.0 0.6 0.0 0.0 0.0...	101.9 98.6 12.0 0.6 0.0 0.0...	1.1
PANTONE Process Cyan C	57.4 -37.3 -46.8	95.0 1.4 4.6 0.0 0.0 0.0 0.0...	95.0 1.4 4.6 0.0 0.0 0.0...	0.6
PANTONE Process Black C	11.0 0.4 -0.1	79.3 75.6 66.9 91.5 0.0 0.0 0.0...	79.3 75.6 66.9 91.5 0.0...	0.8
PANTONE Hexachrome Yellow C	89.9 -19.9 99.3	0.9 4.1 100.0 0.0 0.0 0.0 0.0...	0.9 4.1 100.0 0.0 0.0 0.0...	2.0
PANTONE Hexachrome Orange C	69.5 51.8 80.5	0.9 7.6 12.2 0.0 95.7 0.0 0.0...	0.9 7.6 12.2 0.0 95.7 0.0...	2.0
PANTONE Hexachrome Magenta C	49.7 91.3 -12.6	9.5 96.4 0.0 0.0 0.0 0.0 0.0...	9.5 96.4 0.0 0.0 0.0 0.0...	3.6
PANTONE Hexachrome Cyan C	51.1 -36.1 -51.6	99.9 13.8 8.3 0.3 0.0 0.0 0.0...	99.9 13.8 8.3 0.3 0.0 0.0...	2.1
PANTONE Hexachrome Green C	60.5 -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 78.2...	3.4
PANTONE Hexachrome Black C	12.6 -0.2 -0.4	77.0 70.0 64.6 89.1 0.0 0.0 0.0...	77.0 70.0 64.6 89.1 0.0...	0.8
PANTONE 100 C	92.3 -7.9 55.3	23.0 2.2 63.2 0.0 0.0 0.0 0.0...	23.0 2.2 63.2 0.0 0.0 0.0...	0.6
PANTONE 101 C	92.3 -8.8 66.0	19.0 0.1 74.4 0.0 0.0 0.0 0.0...	19.0 0.1 74.4 0.0 0.0 0.0...	1.3
PANTONE 102 C	91.0 -6.8 100.9	23.0 0.5 100.0 0.0 0.0 0.0 0.0...	23.0 0.5 100.0 0.0 0.0 0.0...	1.9
PANTONE 103 C	71.0 -0.9 87.5	22.3 20.2 100.0 9.1 1.2 0.0...	22.3 20.2 100.0 9.1 1.2...	4.1
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 8.0...	3.4
PANTONE 105 C	51.1 -2.0 45.8	34.9 28.9 98.1 32.6 13.0 0.0...	34.9 28.9 98.1 32.6 13.0...	0.1
PANTONE 106 C	90.8 -5.3 69.8	19.0 0.8 75.6 0.0 1.8 0.0 0.0...	19.0 0.8 75.6 0.0 1.8 0.0...	0.8
PANTONE 107 C	89.6 -3.2 84.4	1.5 3.0 89.5 0.0 1.8 0.0 0.0...	1.5 3.0 89.5 0.0 1.8 0.0...	1.0

Measurement Information

Name

PANTONE Blue 072 C

CIE

19.7 38.1 -77.6

DCS

0.0 0.0 0.0 0.0 0.0 23.8 100.0

7CLR

Color Conversion Settings

Profile

7C_Indigo_Corrected.icc

Mode

Precise Match - Proofing

dE00 Limit

3.0

Optimize Output Values

Cyan

☒

0.0

Magenta

☒

0.0

Yellow

☒

0.0

Black

☒

0.0

Orange

☒

0.0

Green

☒

23.8

Violet

☒

100.0

Revert

Automatic

dE76

dE00

Color Information

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

☒ Paper white simulation

Cancel

Start

Color Editor

FIG 5.5

DCS

0.0 0.0 0.0 0.0 0.0 23.8 100.0

7CLR

Color Conversion Settings

Profile

7C_Indigo_Corrected.icc

Mode

Precise Match - Proofing

dE00 Limit

3.0

Optimize Output Values

Cyan

☒

0.0

Magenta

☒

0.0

Yellow

☒

0.0

Black

☒

0.0

Orange

☒

0.0

Green

☒

23.8

Violet

☒

100.0

Revert

Automatic

dE76

dE00

Color Information

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

☒ Paper white simulation

Cancel

Start

Color Editor correct data to a profile

FIG 5.6

color and can even enter device values manually. By clicking on **Start**, the entire list of colors is generated in the **Data Sets** section including the calculated and possibly optimized device color values.



About **ColorLogic**

We are an independent, technology driven company that creates strong and productive relationships between our partners, clients and team. We believe that it doesn't matter where or how color needs to be expressed, start with the best technology available.



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